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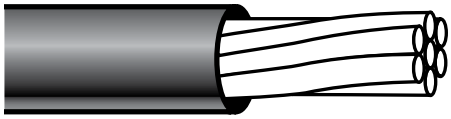
MIL-DTL-16878/1



Thermoplastic Insulation

Tinned Copper Stranded

For internal wiring of electronic equipment - the most popular military hookup wire. Formerly "Type B."

Electronic Hookup Wire

- **Vinyl Primary Insulation**
- **Nominal .010" Wall (No Outer Covering)**
- **-54ºC to +105ºC**
- **600 Volts. R.M.S. (working)**

Meets UL Styles 1061 and CSA AWM I A/B (previously S-R PVC, T2) except where noted.

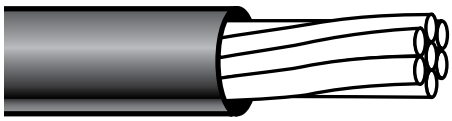
Military Voltage Rating	600 volts.
Factory Spark-Test Voltage	3400 VAC.
Impulse Spark Test Voltage	8000 V pulse-peak, or 5700 V @3 kHz
Insulation Breakdown Voltage	> 5000 volts, peak.
IR: Insulation Resistance, wet	> 1500 megohm/100 meter, metal to water bath at +20ºC.
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 26 to 32	Bends over 1 inch mandrel while at -54ºC.
Cold Bending for gauges 14 to 24	Bends over 2 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	MIL-SPEC PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NB132U*†	M16878/1 BAA	1	32	.0080	*.203*	.028	*.711*	178.0	*584*	0.69	*1.03*
32	NB740U*†	M16878/1 BAB	7	40	.0090	*.229*	.029	*.737*	182.0	*597*	0.70	*1.04*
30	NB130U	M16878/1 BBA	1	30	.0100	*.254*	.030	*.762*	114.0	*374*	0.72	*1.07*
30	NB738U	M16878/1 BBB	7	38	.0120	*.305*	.032	*.813*	108.0	*354*	0.75	*1.12*
28	NB128U	M16878/1 BCA	1	28	.0126	*.320*	.033	*.838*	70.8	*232*	1.00	*1.49*
28	NB736U	M16878/1 BCB	7	36	.0150	*.381*	.035	*.889*	68.2	*224*	1.00	*1.49*
26	NB126U	M16878/1 BDA	1	26	.0159	*.404*	.360	*.914*	44.5	*146*	1.35	*2.00*
26	NB734U	M16878/1 BDB	7	34	.0190	*.483*	.390	*.991*	42.6	*140*	1.50	*2.23*
26	NB1938U	M16878/1 BDE	19	38	.0190	*.483*	.390	*.991*	40.1	*132*	1.50	*2.23*
24	NB124U	M16878/1 BEA	1	24	.0201	*.511*	.040	*1.02*	27.2	*89*	1.80	*2.67*
24	NB732U	M16878/1 BEB	7	32	.0240	*.610*	.044	*1.12*	26.2	*86*	2.00	*2.97*
24	NB1936U	M16878/1 BEE	19	36	.0240	*.610*	.044	*1.12*	25.4	*83*	2.00	*2.97*
22	NB122U	M16878/1 BFA	1	22	.0253	*.643*	.046	*1.17*	17.2	*56*	2.60	*3.87*
22	NB730U	M16878/1 BFB	7	30	.0300	*.762*	.050	*1.27*	16.7	*55*	3.00	*4.46*
22	NB1934U	M16878/1 BFE	19	34	.0300	*.762*	.050	*1.27*	15.9	*52*	3.00	*4.46*
20	NB120U	M16878/1 BGA	1	20	.0320	*.813*	.052	*1.32*	10.7	*35*	3.50	*5.80*
20	NB728U	M16878/1 BGB	7	28	.0380	*.965*	.058	*1.47*	10.4	*34*	4.40	*6.55*
20	NB1932U	M16878/1 BGE	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*
18	NB118U	M16878/1 BHA	1	18	.0430	*1.02*	.060	*1.52*	6.78	*22*	5.70	*8.48*
18	NB726U	M16878/1 BHB	7	26	.0480	*1.22*	.068	*1.73*	6.54	*21*	6.10	*9.08*
18	NB1930U	M16878/1 BHE	19	30	.0480	*1.22*	.068	*1.73*	6.22	*20*	6.50	*9.67*
16	NB116U	M16878/1 BJA	1	16	.0508	*1.29*	.071	*1.80*	4.26	*14*	9.50	*14.10*
16	NB1929*†	M16878/1 BJE	19	29	.0540	*1.37*	.077	*1.96*	4.82	*16*	9.00	*13.40*
14	NB114U*†	M16878/1 BKA	1	14	.0641	*1.63*	.084	*2.13*	2.68	*9*	14.80	*22.00*
14	NB1927U*†	M16878/1 BKE	19	27	.0690	*1.75*	.091	*2.31*	3.05	*10*	14.00	*20.80*

iStandard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Not C.S.A. Certified
† Not U.L. Recognized

MIL-DTL-16878/2



Thermoplastic Insulation

Tinned Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Type C."

Electronic Hookup Wire

- **Vinyl Primary Insulation**
- **Nominal .015" Wall (No Outer Covering)**
- **-54ºC to +105ºC**
- **1000 Volts. R.M.S. (working)**

Meets UL Styles 1007, 1569 and CSA TR-64 except where noted.

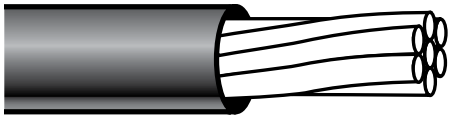
Military Voltage Rating	1000 volts.
Sine-wave Spark-Test Voltage	5000 VAC.
Impulse Spark Test Voltage	10000 V pulse-peak, or 7100 V @3 kHz
Insulation Breakdown Voltage	> 7000 volts, peak.
IR: Insulation Resistance, wet	> 2000 megohm/100 meter, metal to water bath at +20ºC
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 16 to 26	Bends over 2 inch mandrel while at -54ºC.
Cold Bending for gauges 12 to 14	Bends over 3 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	MIL-SPEC PART NO.	NUMBER OF STRANDS (AWG	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
26	NC126U*	M16878/2 BDA	1	26	.0159	*.404*	.050	*1.27*	44.50	*146*	2.00	*3.0*
26	NC734U*	M16878/2 BDB	7	34	.0190	*.483*	.053	*1.35*	42.60	*140*	2.10	*3.1*
26	NC1938U*	M16878/2 BDE	19	38	.0190	*.483*	.053	*1.35*	40.10	*132*	2.20	*3.3*
24	NC124U	M16878/2 BEA	1	24	.0201	*.511*	.054	*1.97*	27.50	*89*	2.50	*3.7*
24	NC732U	M16878/2 BEB	7	32	.0240	*.610*	.058	*1.47*	26.20	*82*	2.60	*3.9*
24	NC1936U	M16878/2 BEE	19	36	.0240	*.610*	.058	*1.47*	25.40	*73*	2.75	*4.1*
22	NC122U	M16878/2 BFA	1	22	.0253	*.643*	.059	*1.50*	17.20	*56*	3.50	*5.2*
22	NC730U	M16878/2 BFB	7	30	.0300	*762*	.064	*1.63*	16.70	*55*	3.65	*5.4*
22	NC1934U	M16878/2 BFE	19	34	.0300	*.762*	.064	*1.63*	15.90	*52*	3.75	*5.6*
20	NC120U	M16878/2 BGA	1	20	.0320	*.813*	.066	*1.68*	10.70	*35*	5.30	*7.9*
20	NC728U	M16878/2 BGB	7	28	.0380	*.965*	.072	*1.83*	10.40	*34*	5.40	*8.0*
20	NC1030U	M16878/2 BGC	10	30	.0380	*.965*	.072	*1.83*	11.80	*39*	5.45	*8.1*
20	NC1932U	M16878/2 BGE	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	NC118U	M16878/2 BHA	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	NC726U	M16878/2 BHB	7	26	.0480	*1.22*	.082	*2.08*	6.54	*21*	7.90	*11.8*
18	NC1930U	M16878/2 BHE	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	NC116U	M16878/2 BJA	1	16	.0508	*1.29*	.085	*2.16*	4.26	*14*	8.50	*12.7*
16	NC1929U*	M16878/2 BJE	19	26	.0540	*1.37*	.091	*2.31*	4.82	*16*	10.00	*14.9*
16	NC2630U	M16878/2 BJF	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*
14	NC114U†	M16878/2 BKA	1	14	.0641	*1.63*	.098	*2.49*	2.68	*9*	15.50	*23.1*
14	NC1927U†*	M16878/2 BKE	19	27	.0690	*1.75*	.105	*2.67*	3.05	*10*	15.00	*22.3*
14	NC4130U†	M16878/2 BKH	41	30	.0710	*1.80*	.112	*2.84*	2.94	*9.7*	14.50	*21.5*
12	NC1925U†*	M16878/2 BLE	19	25	.0890	*2.26*	.124	*3.15*	1.92	*6.3*	24.00	*35.7*
12	NC3728U†*	M16878/2 BLG	37	28	.0890	*2.26*	.124	*3.15*	2.01	*6.6*	25.00	*37.2*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Not C.S.A. Certified
† Not U.L. Recognized

MIL-DTL-16878/3



Thermoplastic Insulation

Tinned Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Type D."

Electronic Hookup Wire

- **Vinyl Primary Insulation**
- **Nominal .031" WALL (No Outer Covering)**
- **-54ºC to +105ºC**
- **3000 Volts. R.M.S. (working)**

Meets UL Styles 1011, 1013, 1015 and CSA TR-32 or TEW except where noted.

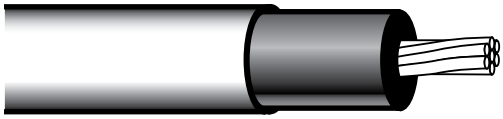
Military Voltage Rating	3000 volts.
Sine-wave Spark-Test Voltage	8000 VAC.
Impulse Spark Test Voltage	12000 V pulse-peak, or 8500 V @3 kHz
Insulation Breakdown Voltage	> 12,000 volts, peak.
IR: Insulation Resistance, wet	> 2900 megohm/100 meter, metal to water bath at +20ºC
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 32 to 22	Bends over 2 inch mandrel while at -54ºC.
Cold Bending for gauges 20 to -14	Bends over 3 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	MIL-SPEC PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	ND124U	M16878/3 BEA	1	24	.0201	*.511*	.082	*2.08*	27.2	*89*	4.2	*6.25*
24	ND732U	M16878/3 BEB	7	32	.0240	*.610*	.086	*2.18*	26.2	*86*	4.0	*5.95*
24	ND1936U	M16878/3 BEE	19	36	.0240	*.610*	.086	*2.18*	25.4	*83*	4.1	*6.10*
22	ND122U	M16878/3 BFA	1	22	.0253	*.643*	.088	*2.24*	17.2	*56*	5.0	*7.44*
22	ND730U	M16878/3 BFB	7	30	.0300	*.762*	.092	*2.34*	16.7	*55*	5.2	*7.74*
22	ND1934U	M16878/3 BFE	19	34	.0300	*.762*	.092	*2.34*	15.9	*52*	5.3	*7.88*
20	ND120U	M16878/3 BGA	1	20	.0320	*.813*	.094	*2.39*	10.7	*35*	6.8	*10.11*
20	ND728U	M16878/3 BGB	7	28	.0380	*.965*	.100	*2.54*	10.4	*34*	7.3	*10.86*
20	ND1932U	M16878/3 BGE	19	32	.0380	*.965*	.100	*2.54*	9.76	*32*	7.3	*10.86*
18	ND118U	M16878/3 BHA	1	18	.0403	*1.02*	.102	*2.59*	6.78	*22*	9.3	*13.84*
18	ND726U	M16878/3 BHB	7	26	.0480	*1.22*	.110	*2.79*	6.54	*21*	9.7	*14.43*
18	ND1930U	M16878/3 BHE	19	30	.0480	*1.22*	.110	*2.79*	6.22	*20*	10.0	*14.88*
16	ND116U	M16878/3 BJA	1	16	.0508	*1.29*	.113	*2.87*	4.26	*14*	12.6	*18.75*
16	ND1929U*†	M16878/3 BJE	19	19	.0540	*1.37*	.116	*2.95*	4.82	*16*	12.0	*17.86*
16	ND2630U	M16878/3 BJF	26	30	.0550	*1.40*	.117	*2.97*	4.59	*15*	12.5	*18.60*
14	ND114U	M16878/3 BKA	1	14	.0641	*1.63*	.126	*3.20*	2.68	*9*	16.9	*25.15*
14	ND1927U*†	M16878/3 BKE	19	27	.0690	*1.75*	.131	*3.33*	3.05	*10*	17.1	*25.44*
14	ND4130U	M16878/3 BKH	41	30	.0710	*1.80*	.134	*3.40*	2.94	*9.6*	17.9	*26.64*
12	ND1925U*†	M16878/3 BLE	19	25	.0890	*2.26*	.161	*4.09*	1.92	*6.3*	27.4	*40.77*
12	ND3728U*	M16878/3 BLG	37	28	.0890	*2.26*	.156	*3.96*	2.01	*6.6*	28.9	*43.00*
12	ND6530U	M16878/3 BLJ	65	30	.0890	*2.26*	.165	*4.19*	1.85	*6.1*	28.5	*42.41*
10	ND3726U*	M16878/3 BMG	37	26	.1070	*2.72*	.178	*4.52*	1.26	*4.1*	38.6	*57.44*
8	ND13329U*	M16878/3 BNL	133	29	.1670	*4.24*	.244	*6.20*	.701	*2.3*	70.5	*104.90*
6	ND13327*	M16878/3 BPL	133	27	.2100	*5.33*	.290	*7.37*	.444	*1.4*	104.0	*154.75*
4	ND13325U*	M16878/3 BRL	133	25	.2660	*6.76*	.351	*8.92*	.280	*0.9*	154.0	*229.15*
2	ND66530U*	M16878/3 BSP	665	30	.3420	*8.69*	.425	*10.80*	.183	*0.6*	231.0	*343.73*
1	ND81730U*	M16878/3 BTR	817	30	.3820	*9.70*	.475	*12.07*	.149	*0.5*	284.0	*422.59*
1/0	ND104530U*	M16878/3 BUS	1045	30	.4310	*10.95*	.530	*13.46*	.116	*0.4*	361.0	*537.17*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Not C.S.A. Certified
† Not U.L. Recognized

MIL-DTL-16878/17



Extruded Nylon Jacket Overall | Thermoplastic Insulation | Tinned Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Type BN."

Electronic Hookup Wire

- **Vinyl Primary Insulation - Nominal .010" Wall**
- **Nylon Secondary Jacket - Nominal Wall .003"**
- **-54ºC to +105ºC**
- **600 Volts. R.M.S. (working)**

Military Voltage Rating	600 volts.
Factory Spark-Test Voltage	3400 VAC.
Impulse Spark Test Voltage	8000 V pulse-peak, or 5700 V @3 kHz
Insulation Breakdown Voltage	> 5000 volts, peak.
IIR: Insulation Resistance, wet	> 1500 megohm/100 meter, metal to water bath at +20ºC.
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 26 to 32	Bends over 1 inch mandrel while at -54ºC.
Cold Bending for gauges 14 to 24	Bends over 2 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

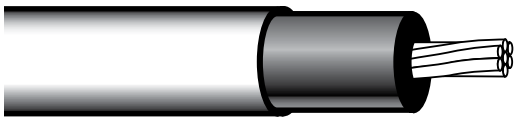
Meets UL Style 1004, 1005, 1006 except where noted.

GAUGE (AWG)	PART NO.	MIL-SPEC PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NB132N†	M16878/17 BAA	1	32	.0080	*.203*	.034	*.864*	178.00	*584*	.074	*1.10*
32	NB740N†	M16878/17 BAB	7	40	.0090	*.229*	.035	*.890*	182.00	*597*	0.75	*1.12*
30	NB130N	M16878/17 BBA	1	30	.0100	*.254*	.036	*.914*	114.00	*374*	0.77	*1.15*
30	NB738N	M16878/17 BBB	7	38	.0120	*.305*	.038	*.965*	108.00	*654*	1.00	*1.49*
28	NB128N	M16878/17 BCA	1	28	.0126	*.320*	.039	*.991*	70.80	*232*	1.15	*1.71*
28	NB736N	M16878/17 BCB	7	36	.0150	*.381*	.041	*1.04*	68.20	*224*	1.22	*1.82*
26	NB126N	M16878/17 BDA	1	26	.0159	*.404*	.042	*1.07*	44.50	*146*	1.52	*2.26*
26	NB734N	M16878/17 BDB	7	34	.0190	*.483*	.045	*1.14*	42.60	*140*	1.65	*2.46*
26	NB1938N	M16878/17 BDE	19	38	.0190	*.483*	.045	*1.14*	40.10	*132*	1.75	*2.60*
24	NB124N	M16878/17 BEA	1	24	.0201	*.511*	.046	*1.17*	27.20	*89*	2.00	*2.98*
24	NB732N	M16878/17 BEB	7	32	.0240	*.610*	.050	*1.27*	26.20	*86*	2.15	*3.20*
24	NB1936N	M16878/17 BEE	19	36	.0240	*.610*	.050	*1.27*	25.40	*83*	2.25	*3.35*
22	NB122N	M16878/17 BFA	1	22	.0253	*.643*	.052	*1.32*	17.20	*56*	3.00	*4.46*
22	NB730N	M16878/17 BFB	7	30	.0300	*.762*	.056	*1.42*	16.70	*55*	3.15	*4.69*
22	NB1934N	M16878/17 BFE	19	34	.0300	*.762*	.056	*1.42*	15.90	*52*	3.25	*4.84*
20	NB120N	M16878/17 BGA	1	20	.0320	*.813*	.058	*1.47*	10.70	*35*	4.50	*6.70*
20	NB728N	M16878/17 BGB	7	28	.0380	*.965*	.064	*1.63*	10.40	*34*	4.60	*6.85*
20	NB1030N	M16878/17 BGC	10	30	.0380	*.965*	.064	*1.63*	11.80	*39*	4.70	*7.00*
20	NB1932N	M16878/17 BGE	19	32	.0380	*.965*	.064	*1.63*	9.76	*32*	4.75	*7.10*
18	NB118N	M16878/17 BHA	1	18	.0430	*1.02*	.066	*1.68*	6.78	*22*	6.20	*9.23*
18	NB726N	M16878/17 BHB	7	26	.0480	*1.22*	.074	*1.88*	6.54	*21*	6.60	*9.82*
18	NB1930N	M16878/17 BHE	19	30	.0480	*1.22*	.074	*1.88*	6.22	*20*	7.00	*10.42*
16	NB116N	M16878/17 BJA	1	16	.0508	*1.29*	.079	*2.01*	4.26	*14*	8.40	*12.50*
16	NB1929N†	M16878/17 BJE	19	29	.0540	*1.37*	.085	*2.16*	4.82	*16*	9.00	*13.40*
16	NB2630N	M16878/17 BJF	26	30	.0550	*1.40*	.085	*2.16*	4.59	*15*	9.50	*14.14*
14	NB114N†	M16878/17 BKA	1	14	.0641	*1.63*	.092	*2.34*	2.68	*9*	14.25	*21.20*
14	NB1927N†	M16878/17 BKE	19	27	.0690	*1.75*	.099	*2.52*	3.05	*10*	14.70	*21.87*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

† Not U.L. Recognized

MIL-DTL-16878/18



Extruded Nylon Jacket Overall | Thermoplastic Insulation | Tinned Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Type CN "

Electronic Hookup Wire

- **Vinyl Primary Insulation - Nominal .015" Wall**
- **Nylon Secondary Jacket - Nominal Wall .003"**
- **-54ºC to +105ºC**
- **1000 Volts. R.M.S. (working)**

Meets UL Styles 1008, 1009, 1010, CSA TR-64 with nylon except where noted.

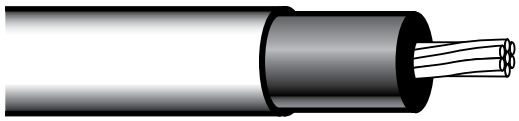
Military Voltage Rating	1000 volts.
Sine-wave Spark-Test Voltage	5000 VAC.
Impulse Spark Test Voltage	10000 V pulse-peak, or 7100 V @3 kHz
Insulation Breakdown Voltage	> 7000 volts, peak.
IR: Insulation Resistance, wet	> 2000 megohm/100 meter, metal to water bath at +20ºC
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 16 to 26	Bends over 2 inch mandrel while at -54ºC.
Cold Bending for gauges 12 to 14	Bends over 3 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	MIL-SPEC PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
26	NC126N*	M16878/18 BDA	1	26	.0159	*.404*	.056	*1.42*	44.50	*146*	2.50	*3.7*
26	NC734N*	M16878/18 BDB	7	34	.0190	*.483*	.059	*1.50*	42.60	*140*	2.60	*3.9*
26	NC1938N*	M16878/18 BDE	19	38	.0190	*.483*	.059	*1.50*	40.10	*132*	2.70	*4.0*
24	NC124N	M16878/18 BEA	1	24	.0201	*.511*	.060	*1.52*	27.20	*89*	3.15	*4.7*
24	NC732N	M16878/18 BEB	7	32	.0240	*.610*	.064	*1.63*	26.20	*86*	3.25	*4.8*
24	NC1936N	M16878/18 BEE	19	36	.0240	*.610*	.064	*1.63*	25.40	*83*	3.35	*5.0*
22	NC122N	M16878/18 BFA	1	22	.0253	*.643*	.065	*1.65*	17.20	*56*	3.70	*5.5*
22	NC730N	M16878/18 BFB	7	30	.0300	*.762*	.070	*1.78*	16.70	*55*	3.90	*5.8*
22	NC1934N	M16878/18 BFE	19	34	.0300	*.762*	.070	*1.78*	15.90	*52*	4.00	*6.0*
20	NC120N	M16878/18 BGA	1	20	.0320	*.813*	.072	*1.83*	10.70	*35*	5.50	*8.2*
20	NC728N	M16878/18 BGB	7	28	.0380	*.965*	.078	*1.98*	10.40	*34*	6.00	*8.9*
20	NC1030N	M16878/18 BGC	10	30	.0380	*.965*	.078	*1.98*	11.80	*39*	5.70	*8.5*
20	NC1932N	M16878/18 BGE	19	32	.0380	*.965*	.078	*1.98*	9.76	*32*	6.00	*8.9*
18	NC118N	M16878/18 BHA	1	18	.0403	*1.02*	.083	*2.11*	6.78	*22*	7.90	*11.8*
18	NC726N	M16878/18 BHB	7	26	.0480	*1.22*	.090	*2.29*	6.54	*21*	8.30	*12.4*
18	NC1930N	M16878/18 BHE	19	30	.0480	*1.22*	.090	*2.29*	6.22	*20*	8.50	*12.6*
16	NC116N	M16878/18 BJA	1	16	.0508	*1.29*	.093	*2.36*	4.26	*14*	11.25	*16.7*
16	NC1929N*†	M16878/18 BJE	19	29	.0540	*1.37*	.099	*2.52*	482	*16*	10.75	*16.0*
16	NC2630N	M16878/18 BJF	26	30	.0550	*1.40*	.102	*2.60*	4.59	*15*	11.25	*16.7*
14	NC114N	M16878/18 BKA	1	14	.0641	*1.63*	.106	*2.70*	2.68	*9*	16.50	*24.6*
14	NC1927N*†	M16878/18 BKE	19	27	.0690	*1.75*	.113	*2.87*	3.05	*10*	15.50	*23.1*
14	NC4130N	M16878/18 BKH	41	30	.0710	*1.80*	.120	*3.05*	2.94	*9.7*	16.40	*24.4*
12	NC1925N*†	M16878/18 BLE	19	25	.0890	*2.26*	.132	*3.53*	1.92	*6.3*	25.50	*37.9*
12	NC3728N*	M16878/18 BLG	37	28	.0890	*2.26*	.132	*3.53*	2.01	*6.6*	26.20	*39.0*
12	NC6530N*	M16878/18 BLJ	65	30	.0890	*2.26*	.141	*3.58*	1.85	*6.1*	2 6.50	*39.4*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Not C.S.A. Certified
† Not U.L. Recognized

MIL-DTL-16878/19



Extruded Nylon Jacket Overall | Thermoplastic Insulation | Tinned Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Type DN."

Electronic Hookup Wire

- **Vinyl Primary Insulation - Nominal .031" Wall**
- **Nylon Secondary Jacket - Nominal Wall .003"**
- **-54ºC to +105ºC**
- **3000 Volts. R.M.S. (working)**

Meets UL Styles 1012, 1014, 1016 except where noted.

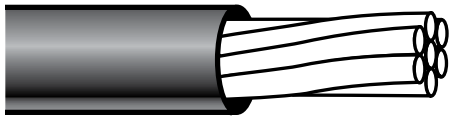
Military Voltage Rating	3000 volts.
Sine-wave Spark-Test Voltage	8000 VAC.
Impulse Spark Test Voltage	12000 V pulse-peak, or 8500 V @3 kHz
Insulation Breakdown Voltage	> 12,000 volts, peak.
IR: Insulation Resistance, wet	> 2900 megohm/100 meter, metal to water bath at +20ºC
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 32 to 22	Bends over 2 inch mandrel while at -54ºC.
Cold Bending for gauges 20 to -14	Bends over 3 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	MIL-SPEC PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	ND124N	M16878/19 BEA	1	24	.0201	*.511*	.089	*2.26*	27.200	*89*	4.5	*6.97*
24	ND732N	M16878/19 BEB	7	32	.0240	*.610*	.093	*2.36*	26.200	*86*	4.6	*6.85*
24	ND1936N	M16878/19 BEE	19	36	.0240	*.610*	.093	*2.36*	25.400	*83*	4.7	*7.00*
22	ND122N	M16878/19 BFA	1	22	.0253	*.643*	.095	*2.41*	17.200	*56*	5.3	*7.89*
22	ND730N	M16878/19 BFB	7	30	.0300	*.762*	.099	*2.52*	16.700	*55*	5.4	*8.04*
22	ND1934N	M16878/19 BFE	19	34	.0300	*.762*	.099	*2.52*	15.900	*52*	5.5	*8.18*
20	ND120N	M16878/19 BGA	1	20	.0320	*.813*	.101	*2.57*	10.700	*35*	7.4	*11.011*
20	ND728N	M16878/19 BGB	7	28	.0380	*.965*	.107	*2.72*	10.400	*34*	7.8	*11.61*
20	ND1932N	M16878/19 BGE	19	32	.0380	*.965*	.107	*2.72*	9.760	*32*	7.9	*11.76*
18	ND118N	M16878/19 BHA	1	18	.0403	*1.02*	.109	*2.77*	6.780	*22*	9.7	*14.43*
18	ND726N	M16878/19 BHB	7	26	.0480	*1.22*	.117	*2.97*	6.540	*21*	10.1	*16.03*
18	ND1930N	M16878/19 BHE	19	30	.0480	*1.22*	.117	*2.97*	6.220	*20*	10.5	*15.62*
16	ND116N	M16878/19 BJA	1	16	.0508	*1.29*	.122	*3.10*	4.260	*14*	13.0	*19.34*
16	ND1929N†	M16878/19 BJE	19	29	.0540	*1.37*	.125	*3.18*	4.820	*16*	12.7	*18.90*
16	ND2630N	M16878/19 BJF	26	30	.0550	*1.40*	.126	*3.20*	4.590	*15*	13.2	*19.64*
14	ND114N	M16878/19 BKA	1	14	.0641	*1.63*	.135	*3.43*	2.680	*9*	19.0	*28.27*
14	ND1927N†	M16878/19 BKE	19	27	.0690	*1.75*	.140	*3.56*	3.050	*10*	18.0	*26.78*
14	ND4130N	M16878/19 BKH	41	30	.0710	*1.70*	.143	*3.63*	2.940	*9.6*	19.0	*28.27*
12	ND1925N†	M16878/19 BLE	19	25	.0890	*2.26*	.170	*4.32*	1.920	*6.3*	28.0	*41.66*
12	ND3728N	M16878/19 BLG	37	28	.0890	*2.26*	.165	*4.19*	2.010	*6.6*	27.5	*40.92*
12	ND6530N*	M16878/19 BLJ	65	30	.0890	*2.26*	.174	*4.42*	1.850	*6.1*	30.0	*44.64*
10	ND3726N	M16878/19 BMG	37	26	.1070	*2.72*	.190	*4.83*	1.260	*4.1*	40.5	*60.26*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

† Not U.L. Recognized
* Not military due to undersized conductor diameter

MIL-W-76 TYPE LW



Thermoplastic Insulation

Tinned Copper Stranded or Solid

For internal wiring of meters, panels and electronic equipment .

Electronic Hookup Wire

- **Vinyl Primary Insulation**
- **Nominal .010" Wall (no outer covering)**
- **-40ºC to +80ºC**
- **300 Volts. R.M.S. (working)**
- **Insulation is same as MIL-W-16878/1**

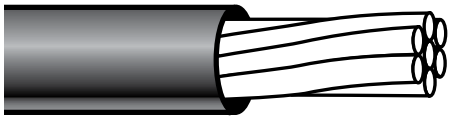
Meets UL Style 1061 and CSA AWM ***II*** A/B (previously T2 S-R PVC).,

Military Voltage Rating	600 volts.
Factory Spark-Test Voltage	3400 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 5000 volts, peak.
IR: Insulation Resistance, wet	> 1500 megohm/100 meter, metal to water bath at +20ºC
Insulation Surface Resistance	> 5 megohm-inch (>1.97 megohm-cm) @ 500 VDC.
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 26 to 32	Bends over 1 inch mandrel while at -54ºC.
Cold Bending for gauges 14 to 24	Bends over 2 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
28	NLW128U	1	28	.0126	*.320*	.033	*.838*	70.8	*232*	1.00	*1.49*
28	NLW736U	7	36	.0180	*.381*	.035	*.889*	58.2	*224*	1.00	*1.49*
26	NLW126U	1	26	.0159	*.404*	.036	*.914*	44.5	*146*	1.35	*2.00*
26	NLW734U	7	34	.0190	*.483*	.039	*.991*	42.6	*140*	1.50	*2.23*
26	NLW1938U	19	38	.0190	*.483*	.039	*.991*	40.1	*132*	1.50	*2.23*
24	NLW124U	1	24	.0201	*.511*	.040	*1.02*	27.2	*89*	1.80	*2.67*
24	NLW732U	7	32	.0240	*.610*	.044	*1.12*	26.2	*86*	2.00	*2.97*
24	NLW1936U	19	36	.0240	*.610*	.044	*1.12*	25.4	*83*	2.00	*2.97*
22	NLW122U	1	22	.0253	*.643*	.046	*1.17*	17.2	*56*	2.60	*3.87*
22	NLW730U	7	30	.0300	*.762*	.050	*1.27*	16.7	*55*	3.00	*4.46*
22	NLW1934U	19	34	.0300	*.762*	.050	*1.27*	15.9	*52*	3.00	*4.46*
20	NLW120U	1	20	.0320	*.813*	.062	*1.32*	10.7	*35*	3.50	*5.80*
20	NLW728U	7	28	.0380	*.965*	.058	*1.47*	10.4	*34*	4.40	*6.55*
20	NLW1932U	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

MIL-W-76 TYPE MW



Thermoplastic Insulation

Tinned Copper Stranded or Solid

For internal wiring of meters, panels and electronic equipment .

Electronic Hookup Wire

- **Vinyl Primary Insulation**
- **Nominal .015" Wall (no outer covering)**
- **-40ºC to +80ºC**
- **1000 Volts. R.M.S. (working)**
- **Insulation is same as MIL-W-16878/2**

Meets UL Style 1007, 1569 and CSA TR-64 except where noted.

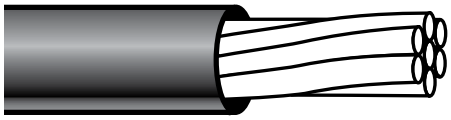
Military Voltage Rating	1000 volts.
Sine-wave Spark-Test Voltage	5000 VAC.
Impulse Spark Test Voltage	10000 V pulse-peak, or 7100 V @3 kHz
Insulation Breakdown Voltage	> 7000 volts, peak.
IR: Insulation Resistance, wet	> 2000 megohm/100 meter, metal to water bath at +20ºC
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 16 to 26	Bends over 2 inch mandrel while at -54ºC.
Cold Bending for gauges 12 to 14	Bends over 3 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	NMW124U	1	24	.0201	*.511*	.054	*1.37*	27.20	*89*	2.50	*3.7*
24	NMW732U	7	32	.0240	*.610*	.058	*1.47*	26.20	*86*	2.60	*3.9*
24	NMW1936U	19	36	.0240	*.610*	.058	*1.47*	25.40	*83*	2.75	*4.1*
22	NMW122U	1	22	.0253	*.643*	.059	*1.50*	17.20	*56*	3.50	*5.2*
22	NMW730U	7	30	.0300	*.762*	.064	*1.63*	16.70	*55*	3.65	*5.4*
22	NMW1934U	19	34	.0380	*.762*	.064	*1.63*	15.90	*52*	3.75	*5.6*
20	NMW120U	1	20	.0320	*.813*	.066	*1.68*	10.70	*35*	5.30	*7.9*
20	NMW728U	7	28	.0380	*.965*	.072	*1.83*	10.40	*34*	5.40	*8.0*
20	NMW1030U	10	30	.0380	*.965*	.072	*1.83*	11.80	*39*	5.45	*8.1*
20	NMW1932U	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	NMW118U	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	NMW1630U	16	30	.0408	*1.22*	.082	*2.08*	6.54	*21*	7.90	*11.8*
18	NMW1930U	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	NMW116U	1	16	.0602	*1.29*	.085	*1.16*	4.26	*14*	8.50	*12.7*
16	NMW1929U*	19	29	.0540	*1.37*	.091	*2.31*	4.82	*16*	10.00	*14.9*
16	NMW2630U	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*
14	NMW114U	1	14	.0641	*1.53*	.098	*2.49*	2.68	*9.0*	15.50	*23.1*
14	NMW1927U*	19	27	.0690	*1.75*	.105	*2.67*	3.05	*10*	15.00	*22.3*
14	NMW4130U	41	30	.0710	*1.80*	.112	*2.84*	2.94	*9.7*	14.50	*21.5*
12	NMW1925U*	19	25	.0890	*2.26*	.124	*3.15*	1.92	*6.3*	24.00	*35.7*
12	NMW6530U	65	30	.0890	*2.26*	.132	*3.35*	1.85	*6.1*	25.30	*37.7*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Not C.S.A. Certified

MIL-W-76 TYPE HW



Thermoplastic Insulation

Tinned Copper Stranded or Solid

For internal wiring of meters, panels and electronic equipment .

Electronic Hookup Wire

- **Vinyl Primary Insulation**
- **Nominal .031" Wall (no outer covering)**
- **-40ºC to +80ºC**
- **2500 Volts. R.M.S. (working)**
- **Insulation is same as MIL-W-16878/3**

Meets UL Style 1011, 1013,1015 and CSA TR-32 or TEW except where noted.

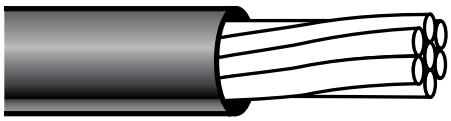
Military Voltage Rating	3000 volts.
Sine-wave Spark-Test Voltage	8000 VAC.
Impulse Spark Test Voltage	12000 V pulse-peak, or 8500 V @3 kHz
Insulation Breakdown Voltage	> 12,000 volts, peak.
IR: Insulation Resistance, wet	> 2900 megohm/100 meter, metal to water bath at +20ºC
Nominal Dielectric Constant value	4.
Flame Properties	Self extinguishing. Meets UL VW-1
Cold Bending for gauges 32 to 22	Bends over 2 inch mandrel while at -54ºC.
Cold Bending for gauges 20 to -14	Bends over 3 inch mandrel while at -54ºC.
Fungus	Fungus Resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR		NOM. FIN. WIRE DIAM.		MAX. RESISTANCE (dc at 20º C) Ω /per		NOM. WT.	
				IN.	*mm*	IN.	*mm*	1000-ft	*Km*	LBS per 1000-ft	*Kg/Km*
22	NHW122U	1	22	.0253	*.643*	.088	*2.24*	17.20	*55*	5.0	*7.44*
22	NHW730U	7	30	.0300	*.762*	.092	*2.34*	16.70	*55*	5.2	*7.74*
22	NHW1934U	19	34	.0300	*.762*	.092	*2.34*	15.90	*52*	5.3	*7.88*
20	NHW120U	1	20	.0320	*.813*	.094	*2.39*	10.70	*35*	6.8	*10.11*
20	NHW728U	7	28	.0380	*.985*	.100	*2.54*	10.40	*34*	7.3	*10.86*
20	NHW1932U	19	32	.0380	*.955*	.100	*2.54*	9.76	*32*	7.3	*10.86*
18	NHW118U	1	18	.0403	*1.02*	.102	*2.59*	6.78	*22*	8.3	*13.84*
18	NHW1630U	16	30	.0470	*1.22*	.110	*2.79*	6.51	*21*	9.7	*14.43*
18	NHW1930U	19	30	.4800	*1.22*	.110	*2.79*	6.22	*20*	10.0	*14.85*
16	NWH116U	1	16	.0508	*1.29*	.113	*2.87*	4.86	*14*	12.6	*18.75*
16	NWH1929U*	19	29	.0540	*1.37*	.116	*2.95*	4.82	*15*	12.0	*17.85*
16	NHW2630U	26	30	.0550	*1.40*	.117	*2.97*	4.59	*15*	12.5	*18.80*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Not C.S.A. Certified

NEMA HP-3 Type E



Extruded PTFE Insulation

Silver Plated Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Mil-W-16878/4"

Electronic Hookup Wire

- **Exruded Polytetrafluoroethylene (PTFE) Insulation**
- **Nominal .010" Wall**
- **-65ºC to +200ºC**
- **600 Volts. R.M.S. (working)**

Meets UL Style 1213 except where noted.

Military Voltage Rating	600 volts.
Dielectric Voltage Withstand	2000 Volts, Wet
Sine-wave Spark-Test Voltage	3400 VAC.
Impulse Spark Test Voltage	6500 V pulse-peak
Insulation Breakdown Voltage	> 6800 volts, peak.
IR: Insulation Resistance, wet	> 10000 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	2.04
Flame Properties	Self extinguishing
Cold Bending for gauges 32 to 16	Bends over a 1 inch mandrel while at -54ºC
Cold Bending for gauges 14 to 10	Bends over a 2 inch mandrel while at -54ºC
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NEMA SPEC HP3 WIRE PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NE132U	HP3-EXBAAx	1	32	.0089	*.226*	.029	*.737*	169.00	*555*	.92	*1.37*
32	NE740U	HP3-EXBABx	7	40	.0100	*.254*	.030	*.762*	173.00	*568*	.96	*1.43*
30	NE130U	HP3-EXBBAx	1	30	.0100	*.254*	.030	*.762*	108.00	*354*	1.10	*1.64*
30	NE738U	HP3-EXBBBx	7	38	.0120	*.305*	.032	*.813*	100.70	*330*	1.20	*1.79*
28	NE128U	HP3-EXBCAx	1	28	.0126	*.320*	.033	*.838*	68.00	*223*	1.40	*2.08*
28	NE736U	HP3-EXBCBx	7	36	.0150	*.381*	.035	*.889*	63.80	*209*	1.50	*2.23*
26	NE126U	HP3-EXBDAx	1	26	.0159	*.404*	.036	*.914*	42.70	*140*	1.80	*2.68*
26	NE734U	HP3-EXBDBx	7	34	.0190	*.483*	.039	*.991*	40.50	*133*	2.00	*2.98*
26	NE1938U	HP3-EXBDEx	19	38	.0200	*.508*	.039	*.991*	38.40	*126*	2.10	*3.13*
24	NE124U	HP3-EXBEAx	1	24	.0201	*.511*	.040	*1.02*	26.80	*88*	2.50	*3.72*
24	NE732U	HP3-EXBEBx	7	32	.0240	*.610*	.044	*1.12*	25.20	*83*	2.70	*4.02*
24	NE1936U	HP3-EXBEEx	19	36	.0250	*.635*	.044	*1.12*	24.30	*80*	2.80	*4.17*
22	NE122U	HP3-EXBFAx	1	22	.0254	*.645*	.045	*1.14*	17.00	*56*	3.40	*5.06*
22	NE730U	HP3-EXBFBx	7	30	.0300	*.762*	.050	*1.27*	15.90	*52*	3.70	*5.51*
22	NE1934U	HP3-EXBFEx	19	34	.0320	*.813*	.050	*1.27*	15.10	*50*	3.80	*5.65*
20	NE120U	HP3-EXBGAx	1	20	.0320	*.813*	.052	*1.32*	10.50	*35*	4.80	*7.14*
20	NE728U	HP3-EXBGBx	7	28	.0380	*.965*	.058	*1.47*	10.00	*33*	5.30	*7.89*
20	NE1932U	HP3-EXBGEx	19	32	.0400	*1.02*	.058	*1.47*	9.19	*30*	5.60	*8.33*
18	NE118U†	HP3-EXBHAx	1	18	.0403	*1.02*	.061	*1.55*	6.60	*22*	7.00	*10.4*
18	NE726U†	HP3-EXBHBx	7	26	.0480	*1.22*	.069	*1.75*	6.28	*21*	7.90	*11.8*
18	NE1930U†	HP3-EXBHEx	19	30	.0500	*1.27*	.069	*1.75*	5.879	*19*	8.30	*12.4*
16	NE116U†	HP3-EXBJAx	1	16	.0508	*1.29*	.074	*1.88*	4.20	*14*	10.50	*15.6*
16	NE1929U†	HP3-EXBJEx	19	29	.0570	*1.45*	.080	*2.03*	4.52	*15*	11.00	*16.4*
14	NE1927U†	HP3-EXBKEx	19	27	.0720	*1.83*	.095	*2.41*	2.88	*9*	16.00	*23.8*
12	NE1925U†	HP3-EXBLEx	19	25	.0910	*2.31*	.114	*2.90*	1.81	*6*	24.10	*35.9*
12	NE3728U†	HP3-EXBLGx	37	28	.0890	*2.26*	.112	*2.84*	1.90	*6*	25.00	*37.2*
10	NE3726U†	HP3-EXBMGx	37	26	.1110	*2.82*	.134	*3.40*	1.19	*4*	35.20	*52.4*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

† Not U.L. Recognized

NEMA HP-3 Type E

RoHS COMPLIANT PRODUCTS:

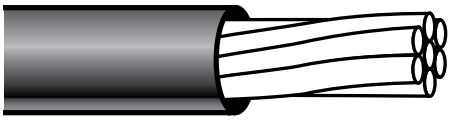
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NEMA SPEC HP3 WIRE PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NRE132U	HP3-EXBAAx	1	32	.0089	*.226*	.029	*.737*	169.00	*555*	.92	*1.37*
32	NRE740U	HP3-EXBABx	7	40	.0100	*.254*	.030	*.762*	173.00	*568*	.96	*1.43*
30	NRE130U	HP3-EXBBAx	1	30	.0100	*.254*	.030	*.762*	108.00	*354*	1.10	*1.64*
30	NRE738U	HP3-EXBBBx	7	38	.0120	*.305*	.032	*.813*	100.70	*330*	1.20	*1.79*
28	NRE128U	HP3-EXBCAx	1	28	.0126	*.320*	.033	*.838*	68.00	*223*	1.40	*2.08*
28	NRE736U	HP3-EXBCBx	7	36	.0150	*.381*	.035	*.889*	63.80	*209*	1.50	*2.23*
26	NRE126U	HP3-EXBDAx	1	26	.0159	*.404*	.036	*.914*	42.70	*140*	1.80	*2.68*
26	NRE734U	HP3-EXBDBx	7	34	.0190	*.483*	.039	*.991*	40.50	*133*	2.00	*2.98*
26	NRE1938U	HP3-EXBDEx	19	38	.0200	*.508*	.039	*.991*	38.40	*126*	2.10	*3.13*
24	NRE124U	HP3-EXBEAx	1	24	.0201	*.511*	.040	*1.02*	26.80	*88*	2.50	*3.72*
24	NRE732U	HP3-EXBEBx	7	32	.0240	*.610*	.044	*1.12*	25.20	*83*	2.70	*4.02*
24	NRE1936U	HP3-EXBEEx	19	36	.0250	*.635*	.044	*1.12*	24.30	*80*	2.80	*4.17*
22	NRE122U	HP3-EXBFAx	1	22	.0254	*.645*	.045	*1.14*	17.00	*56*	3.40	*5.06*
22	NRE730U	HP3-EXBFBx	7	30	.0300	*.762*	.050	*1.27*	15.90	*52*	3.70	*5.51*
22	NRE1934U	HP3-EXBFEx	19	34	.0320	*.813*	.050	*1.27*	15.10	*50*	3.80	*5.65*
20	NRE120U	HP3-EXBGAx	1	20	.0320	*.813*	.052	*1.32*	10.50	*35*	4.80	*7.14*
20	NRE728U	HP3-EXBGBx	7	28	.0380	*.965*	.058	*1.47*	10.00	*33*	5.30	*7.89*
20	NRE1932U	HP3-EXBGEx	19	32	.0400	*1.02*	.058	*1.47*	9.19	*30*	5.60	*8.33*
18	NRE118U†	HP3-EXBHAx	1	18	.0403	*1.02*	.061	*1.55*	6.60	*22*	7.00	*10.4*
18	NRE726U†	HP3-EXBHBx	7	26	.0480	*1.22*	.069	*1.75*	6.28	*21*	7.90	*11.8*
18	NRE1930U†	HP3-EXBHEx	19	30	.0500	*1.27*	.069	*1.75*	5.879	*19*	8.30	*12.4*
16	NRE116U†	HP3-EXBJAx	1	16	.0508	*1.29*	.074	*1.88*	4.20	*14*	10.50	*15.6*
16	NRE1929U†	HP3-EXBJEx	19	29	.0570	*1.45*	.080	*2.03*	4.52	*15*	11.00	*16.4*
14	NRE1927U†	HP3-EXBKEx	19	27	.0720	*1.83*	.095	*2.41*	2.88	*9*	16.00	*23.8*
12	NRE1925U†	HP3-EXBLEx	19	25	.0910	*2.31*	.114	*2.90*	1.81	*6*	24.10	*35.9*
12	NRE3728U†	HP3-EXBLGx	37	28	.0890	*2.26*	.112	*2.84*	1.90	*6*	25.00	*37.2*
10	NRE3726U†	HP3-EXBMGx	37	26	.1110	*2.82*	.134	*3.40*	1.19	*4*	35.20	*52.4*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

† Not U.L. Recognized

NEMA HP-3 Type EE



Extruded PTFE Insulation

Silver Plated Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Mil-W-16878/5."

Electronic Hookup Wire

- **Exruded Polytetrafluoroethylene (PTFE) Insulation**
- **Nominal .015" Wall**
- **-65ºC to +200ºC**
- **1000 Volts. R.M.S. (working)**

Meets UL Style 1180 except where noted.

Military Voltage Rating	1000 volts.
Dielectric Voltage Withstand	3000 Volts, Wet
Sine-wave Spark-Test Voltage	5000 VAC.
Impulse Spark Test Voltage	8000 V pulse-peak
Insulation Breakdown Voltage	> 8500 volts, peak.
IR: Insulation Resistance, wet	> 15000 megohm/100 mtr, metal to water bath at +20˚C
Nominal Dielectric Constant value	2.04
Flame Properties	Self extinguishing
Cold Bending for gauges 32 to 16	Bends over a 1 inch mandrel while at -54ºC
Cold Bending for gauges 14 to 12	Bends over a 2 inch mandrel while at -54ºC
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NEMA SPEC HP-3 WIRE PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NEE132U†	HP3-EEXBAAx	1	32	.0089	*.226*	.038	*.965*	169.000	*555*	1.2	*1.79*
32	NEE740U†	HP3-EEXBABx	7	40	.0100	*.254*	.040	*1.02*	173.000	*568*	1.3	*1.93*
30	NEE130U†	HP3-EEXBBAx	1	30	.0100	*.254*	.040	*1.02*	108.000	*354*	1.4	*2.08*
30	NEE738U†	HP3-EEXBBBx	7	38	.0120	*.305*	.042	*1.07*	100.700	*330*	1.6	*2.38*
28	NEE128U	HP3-EEXBCAx	1	28	.0126	*.320*	.043	*1.09*	68.000	*223*	1.8	*2.68*
28	NEE736U	HP3-EEXBCBx	7	36	.0150	*.381*	.045	*1.14*	63.800	*209*	1.9	*2.83*
26	NEE126U	HP3-EEXBDAx	1	26	.0159	*.404*	.046	*1.17*	42.700	*140*	2.2	*3.27*
26	NEE734U	HP3-EEXBDBx	7	34	.0190	*.483*	.049	*1.25*	40.500	*133*	2.2	*3.27*
26	NEE1938U	HP3-EEXBDEx	19	38	.0200	*.508*	.049	*1.25*	38.400	*126*	2.4	*3.57*
24	NEE124U	HP3-EEXBEAx	1	24	.0201	*.511*	.050	*1.27*	26.800	*88*	3.3	*4.91*
24	NEE732U	HP3-EEXBEBx	7	32	.0240	*.610*	.054	*1.37*	25.200	*83*	3.5	*5.21*
24	NEE1936U	HP3-EEXBEEx	19	36	.0250	*.635*	.054	*1.37*	24.300	*80*	3.6	*5.36*
22	NEE122U	HP3-EEXBFAx	1	22	.0254	*.645*	.056	*1.42*	17.000	*56*	4.2	*6.25*
22	NEE730U	HP3-EEXBFBx	7	30	.0300	*.762*	.060	*1.52*	15.900	*52*	4.6	*6.85*
22	NEE1934U	HP3-EEXBFEx	19	34	.0320	*.813*	.060	*1.52*	15.100	*50*	4.7	*7.00*
20	NEE120U	HP3-EEXBGAx	1	20	.0320	*.813*	.062	*1.58*	10.500	*35*	5.8	*8.63*
20	NEE728U	HP3-EEXBGBx	7	28	.0380	*.965*	.068	*1.73*	10.000	*33*	6.3	*9.37*
20	NEE1932U	HP3-EEXBGEx	19	32	.0400	*1.02*	.068	*1.73*	9.190	*30*	6.6	*9.82*
18	NEE118U	HP3-EEXBHAx	1	18	.0403	*1.02*	.071	*1.80*	60.600	*22*	8.0	*11.9*
18	NEE726U	HP3-EEXBHBx	7	26	.0480	*1.22*	.079	*2.01*	6.280	*21*	9.1	*13.5*
18	NEE1930U	HP3-EEXBHEx	19	30	.0500	*1.27*	.079	*2.01*	5.790	*19*	9.5	*14.1*
16	NEE1929U†	HP3-EEXBJEx	19	29	.0570	*1.45*	.089	*2.26*	4.520	*156*	12.1	*18.0*
14	NEE1927U†	HP3-EEXBKEx	19	27	.0720	*1.83*	.106	*2.69*	2.880	*9*	17.9	*26.6*
12	NEE1925U†	HP3-EEXBLEx	19	25	.0910	*2.31*	.125	*3.18*	1.810	*6*	26.3	*39.1*
10	NEE3726U†	HP3-EEXBMGx	37	26	.1110	*2.82*	.145	*3.68*	1.190	*4*	37.8	*56.3*
8	NEE13329U†	HP3-EEXBNLx	133	29	.1690	*4.29*	.209	*5.31*	0.658	*2*	70.2	*104.5*
6	NEE13327U†	HP3-EEXBPLx	133	27	.2130	*5.41*	.263	*6.68*	0.418	*1*	122.0	*181.5*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

† Not U.L. Recognized

NEMA HP-3 Type EE

RoHS COMPLIANT PRODUCTS:

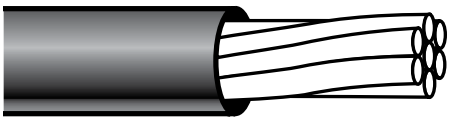
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NEMA SPEC HP-3 WIRE PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NREE132U†	HP3-EEXBAAx	1	32	.0089	*.226*	.038	*.965*	169.000	*555*	1.2	*1.79*
32	NREE740U†	HP3-EEXBABx	7	40	.0100	*.254*	.040	*1.02*	173.000	*568*	1.3	*1.93*
30	NREE130U†	HP3-EEXBBAx	1	30	.0100	*.254*	.040	*1.02*	108.000	*354*	1.4	*2.08*
30	NREE738U†	HP3-EEXBBBx	7	38	.0120	*.305*	.042	*1.07*	100.700	*330*	1.6	*2.38*
28	NREE128U	HP3-EEXBCAx	1	28	.0126	*.320*	.043	*1.09*	68.000	*223*	1.8	*2.68*
28	NREE736U	HP3-EEXBCBx	7	36	.0150	*.381*	.045	*1.14*	63.800	*209*	1.9	*2.83*
26	NREE126U	HP3-EEXBDAx	1	26	.0159	*.404*	.046	*1.17*	42.700	*140*	2.2	*3.27*
26	NREE734U	HP3-EEXBDBx	7	34	.0190	*.483*	.049	*1.25*	40.500	*133*	2.2	*3.27*
26	NREE1938U	HP3-EEXBDEx	19	38	.0200	*.508*	.049	*1.25*	38.400	*126*	2.4	*3.57*
24	NREE124U	HP3-EEXBEAx	1	24	.0201	*.511*	.050	*1.27*	26.800	*88*	3.3	*4.91*
24	NREE732U	HP3-EEXBEBx	7	32	.0240	*.610*	.054	*1.37*	25.200	*83*	3.5	*5.21*
24	NREE1936U	HP3-EEXBEEx	19	36	.0250	*.635*	.054	*1.37*	24.300	*80*	3.6	*5.36*
22	NREE122U	HP3-EEXBFAx	1	22	.0254	*.645*	.056	*1.42*	17.000	*56*	4.2	*6.25*
22	NREE730U	HP3-EEXBFBx	7	30	.0300	*.762*	.060	*1.52*	15.900	*52*	4.6	*6.85*
22	NREE1934U	HP3-EEXBFEx	19	34	.0320	*.813*	.060	*1.52*	15.100	*50*	4.7	*7.00*
20	NREE120U	HP3-EEXBGAx	1	20	.0320	*.813*	.062	*1.58*	10.500	*35*	5.8	*8.63*
20	NREE728U	HP3-EEXBGBx	7	28	.0380	*.965*	.068	*1.73*	10.000	*33*	6.3	*9.37*
20	NREE1932U	HP3-EEXBGEx	19	32	.0400	*1.02*	.068	*1.73*	9.190	*30*	6.6	*9.82*
18	NREE118U	HP3-EEXBHAx	1	18	.0403	*1.02*	.071	*1.80*	60.600	*22*	8.0	*11.9*
18	NREE726U	HP3-EEXBHBx	7	26	.0480	*1.22*	.079	*2.01*	6.280	*21*	9.1	*13.5*
18	NREE1930U	HP3-EEXBHEx	19	30	.0500	*1.27*	.079	*2.01*	5.790	*19*	9.5	*14.1*
16	NREE1929U†	HP3-EEXBJEx	19	29	.0570	*1.45*	.089	*2.26*	4.520	*156*	12.1	*18.0*
14	NREE1927U†	HP3-EEXBKEx	19	27	.0720	*1.83*	.106	*2.69*	2.880	*9*	17.9	*26.6*
12	NREE1925U†	HP3-EEXBLEx	19	25	.0910	*2.31*	.125	*3.18*	1.810	*6*	26.3	*39.1*
10	NREE3726U†	HP3-EEXBMGx	37	26	.1110	*2.82*	.145	*3.68*	1.190	*4*	37.8	*56.3*
8	NREE13329U†	HP3-EEXBNLx	133	29	.1690	*4.29*	.209	*5.31*	0.658	*2*	70.2	*104.5*
6	NREE13327U†	HP3-EEXBPLx	133	27	.2130	*5.41*	.263	*6.68*	0.418	*1*	122.0	*181.5*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

† Not U.L. Recognized

NEMA HP-3 Type ET



Extruded PTFE Insulation

Silver Plated Copper Stranded

For internal wiring of meters, panels and electronic equipment . Formerly "Mil-W-16878/6."

Electronic Hookup Wire

- **Exruded Polytetrafluoroethylene (PTFE) Insulation**
- **Nominal .005" Wall**
- **-65ºC to +200ºC**
- **250 Volts. R.M.S. (working)**

Meets UL Styles 1371 and 1531 for 105ºC only.

Military Voltage Rating	250 volts.
Dielectric Voltage Withstand	1500 Volts, Wet
Sine-wave Spark-Test Voltage	2900 VAC.
Impulse Spark Test Voltage	4000 V pulse-peak
Insulation Breakdown Voltage	> 4500 volts, peak.
IR: Insulation Resistance, wet	> 10000 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	2.04
Flame Properties	Self extinguishing
Cold Bending for gauges 32 to 16	Bends over a 1 inch mandrel while at -54ºC
Cold Bending for gauges 14 to 12	Bends over a 2 inch mandrel while at -54ºC
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NEMA SPEC HP3 WIRE PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NET 740U	HP3-ETXBABx	7	40	.0100	*.254*	.022	*.559*	173.00	*568*	.54	*.80*
30	NET 130U	HP3-ETXBBAx	1	30	.0100	*.254*	.022	*.559*	108.00	*354*	.68	*1.01*
30	NET 738U	HP3-ETXBBBx	7	38	.0120	*.305*	.024	*.610*	100.70	*330*	.75	*1.12*
28	NET 128U	HP3-ETXBCAx	1	28	.0126	*.320*	.025	*.635*	68.00	*223*	.95	*1.41*
28	NET 736U	HP3-ETXBCBx	7	36	.0150	*.381*	.027	*.686*	63.80	*209*	1.01	*1.50*
26	NET 126U	HP3-ETXBDAx	1	26	.0159	*.404*	.028	*.711*	42.70	*140*	1.30	*1.93*
26	NET 734U	HP3-ETXBDBx	7	34	.0190	*.483*	.031	*.787*	40.50	*133*	1.40	*2.08*
26	NET 1938U	HP3-ETXBDEx	19	38	.0200	*.508*	.031	*.787*	38.40	*126*	1.50	*2.23*
24	NET 124U	HP3-ETXBEAx	1	24	.0201	*.511*	.032	*.813*	26.80	*88*	1.90	*2.83*
24	NET 732U	HP3-ETXBEBx	7	32	.0240	*.610*	.036	*.914*	25.20	*83*	2.70	*4.02*
24	NET 1936U	HP3-ETXBEEx	19	36	.0250	*.635*	.036	*.914*	24.30	*80*	2.10	*3.13*
22	NET 122U	HP3-ETXBFAx	1	22	.0254	*.645*	.038	*.965*	17.00	*56*	2.70	*4.02*
22	NET 730U	HP3-ETXBFBx	7	30	.0300	*.762*	.042	*1.07*	15.90	*52*	3.70	*5.51*
22	NET 1934U	HP3-ETXBFEx	19	34	.0320	*.813*	.042	*1.07*	15.10	*50*	3.10	*4.61*
20	NET 120U	HP3-ETXBGAx	1	20	.0320	*.813*	.044	*1.12*	10.50	*35*	4.10	*6.10*
20	NET 728U	HP3-ETXBGBx	7	28	.0380	*.965*	.050	*1.27*	10.00	*33*	4.40	*6.55*
20	NET 1932U	HP3-ETXBGEx	19	32	.0400	*1.02*	.050	*1.27*	9.19	*30*	4.70	*7.00*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

NEMA HP-3 Type ET

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NEMA SPEC HP3 WIRE PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
32	NRET 740U	HP3-ETXBABx	7	40	.0100	*.254*	.022	*.559*	173.00	*568*	.54	*.80*
30	NRET 130U	HP3-ETXBBAx	1	30	.0100	*.254*	.022	*.559*	108.00	*354*	.68	*1.01*
30	NET 738U	HP3-ETXBBBx	7	38	.0120	*.305*	.024	*.610*	100.70	*330*	.75	*1.12*
28	NRET 128U	HP3-ETXBCAx	1	28	.0126	*.320*	.025	*.635*	68.00	*223*	.95	*1.41*
28	NRET 736U	HP3-ETXBCBx	7	36	.0150	*.381*	.027	*.686*	63.80	*209*	1.01	*1.50*
26	NRET 126U	HP3-ETXBDAx	1	26	.0159	*.404*	.028	*.711*	42.70	*140*	1.30	*1.93*
26	NRET 734U	HP3-ETXBDBx	7	34	.0190	*.483*	.031	*.787*	40.50	*133*	1.40	*2.08*
26	NRET 1938U	HP3-ETXBDEx	19	38	.0200	*.508*	.031	*.787*	38.40	*126*	1.50	*2.23*
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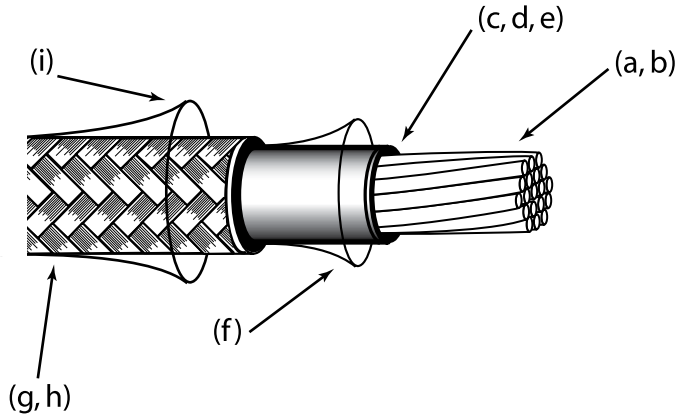
24	NRET 732U	HP3-ETXBEBx	7	32	.0240	*.610*	.036	*.914*	25.20	*83*	2.70	*4.02*
24	NRET 1936U	HP3-ETXBEEx	19	36	.0250	*.635*	.036	*.914*	24.30	*80*	2.10	*3.13*
22	NRET 122U	HP3-ETXBFAx	1	22	.0254	*.645*	.038	*.965*	17.00	*56*	2.70	*4.02*
22	NRET 730U	HP3-ETXBFBx	7	30	.0300	*.762*	.042	*1.07*	15.90	*52*	3.70	*5.51*
22	NRET 1934U	HP3-ETXBFEx	19	34	.0320	*.813*	.042	*1.07*	15.10	*50*	3.10	*4.61*
20	NRET 120U	HP3-ETXBGAx	1	20	.0320	*.813*	.044	*1.12*	10.50	*35*	4.10	*6.10*
20	NRET 728U	HP3-ETXBGBx	7	28	.0380	*.965*	.050	*1.27*	10.00	*33*	4.40	*6.55*
20	NRET 1932U	HP3-ETXBGEx	19	32	.0400	*1.02*	.050	*1.27*	9.19	*30*	4.70	*7.00*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

HOW TO SPECIFY WIRE

IF NOT IDENTIFIED BY THE MANUFACTURER'S PART NUMBER
WIRE IS SPECIFIED BY THE FOLLOWING CHARACTERISTICS:



a. Gauge (awg)
b. Standing (bare or tinned) Number of strands
c. Type of primary insulation material. PVC, Polytetrafluoroethylene (PTFE), etc.
d. Thickness of primary insulation or working voltage for which the wire is to be used.
e. Color or coding of primary insulation**
f. Type and thickness of covering over primary insulation when required (i.e., nylon)
g. Type of shielding, braided or foil, if required
h. If braided, shield strand size, % of coverage, bare or tinned wire strands
i Overall jacket material, temperature range, thickness, color**, marking or coding

HOW NATIONAL WIRE PART NUMBERS ARE DERIVED

EXAMPLE

N C 1936U 9 - 0 - 2

- 2 — RED TRACER
- 0 — BLACK TRACER
- 9 — INSULATION COLOR
- 1936U — CATALOG NO.

BASIC COLOR CODE

0 - Black	5 - Green
1 - Brown	6 - Blue
2 - Red	7 - Violet (Purple)
3 - Orange	8 - Slate (Grey)
4 - Yellow	9 - White

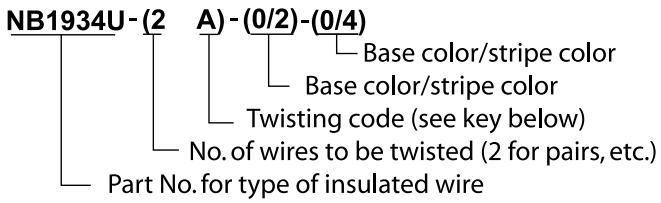
N..... stands for National Wire and Cable Corporation.
C..... stands for Type "C" (as previously referred to in the spec).
1936..... means 19 srands of #36 copper which is equivalent to 24 gauge
U..... means "uncovered." That is, no jacket over the primary insulation.
902..... refers to primary insulation base color and tracer colors as shown in the chart above. Tracers are numbered according to standard color code.

**Color limitation of tints is specified in MIL-STD-104, which comes supplied with a set of colored tabs for color comparison and identification.

HOW TO SPECIFY PAIRS

WE RECOMMEND THE FOLLOWING FORMAT WHEN SPECIFYING TWISTED PAIRS AND TRIOS:

EXAMPLE



Part No. (see “How to Specify Wire”, Page 22)

KEY TO TWISTING CODE

A = SHORT TWINNER LAY
B = STANDARD TWINNER LAY
C = SHORT PLANETARY LAY
D = STANDARD PLANETRY LAY

THE “SHORT” LAY IS DEFINED AS EQUAL TO 5 X D X N AND THE “STANDARD” LAY IS DEFINED AS 10 X D X N WHERE D = CONDUCTOR DIAMETER, N = NO. OF CONDUCTORS

DIFFERENCES IN PAIR TWISTING

THE MOST COMMON COMMERCIAL PAIR-FORMING MACHINES ARE CALLED “TWINNERS.” THIS TYPE OF PAIR-FORMING IS THE LEAST EXPENSIVE WAY TO FROM TWISTED PAIRS. HOWEVER, PAIRS FORMED ON THIS TYPE OF EQUIPMENT HAVE BEEN KNOWN TO EXPERIENCE DEFORMATION OF THE STRANDED COPPER, STRAIN IN THE INSULATION AND POOR ELECTRICAL BALANCE.

THE SUPERIOR METHOD OF PAIR-FORMING IS BY USE OF A PLANETARY OR TUBULAR CABLING MACHINE IN SUCH A MANNER THAT NO RESIDUAL TWIST IS IMPARTED TO THE INDIVIDUAL WIRES FORMING THE TWISTED GROUP. THIS RESULTS IN BETTER ELECTRICAL BALANCE AND IMPROVES FLEXIBILITY.

NATIONAL IS EQUIPPED FOR ALL OF THE ABOVE DESCRIBED TECHNIQUES. CHOOSE THE METHOD BEST SUITED FOR YOUR PARTICULR APPLICATION.

National Wire & Cable
Custom Cable Manufacturing

UL/CSA Recognized Wire Catalog

Visit us online at:
www.NationalWire.com

UL/CSA RECOGNIZED WIRE
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UL/CSA RECOGNIZED WIRE

SYNOPOSIS OF POPULAR UNDERWRITERS & CANADIAN STANDARDS ASSN. ELECTRONIC HOOK UP WIRES

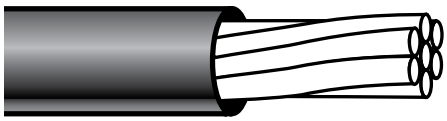
UNDERWRITERS APPLIANCE WIRING MATERIAL (AWM) HOOKUP WIRES

U.L. STYLE NUMBER	UL RATING VOLTAGE	TEMP ºC	WIRE INSULATION TYPE	SIZE RANGE (AWG)	USAGE
1004	none	80	.008" PVC + nylon	30 - 16	General purpose appliance wiring.
1005	none	90	.008" PVC + nylon	30 - 16	
1006	none	105	.008" PVC + nylon	30 - 16	
1503	150	85	.010" PVC + shid + jkt	26 - 20	
1007	300	80	1/64" PVC	32 - 16	600 volt rating for electronic use. Rated 300 volts for appliance usage.
1569	300	105	1/64" PVC	30 - 10	
1008	300	80	1/64" PVC + nylon	28 - 12	
1009	300	90	1/64" PVC + nylon	28 - 12	
1010	300	105	1/64" PVC + nylon	28 - 12	
1195	300	80	.015" PVC	30 - 14	Internal wiring in electric bookkeeping, accounting or time-recording machine.
1208	300	80	.013" PVC	30 - 16	
1011	600	80	1/32" PVC	28 - 9	Rated 600 volts for general appliance use, 2500 volts for electronic use.
1013	600	90	1/32" PVC	28 - 9	
1015	600	105	1/32" PVC	28 - 9	
1015	600	105	1/32" PVC	8 - 7	
1015	600	105	1/32" PVC	6 - 2	
1015	600	105	1/32" PVC	1 - 3/0	
1012	600	80	1/32" PVC + nylon	28 - 9	General purpose appliance wiring 2500 volt electronic use.
1014	600	90	1/32" PVC + nylon	28 - 9	
1016	600	105	1/32" PVC + nylon	28 - 9	
1017	600	80	3/64" PVC	22 - 8	General purpose appliance wiring.
1018	600	80	3/64" PVC	8 - 6	
1019	600	80	1/16" PVC	8 - 2	
1020	600	80	5/64" PVC	1 - 4/0	
1021	600	80	3/32" PVC	225 - 500 MCM	
1022	600	80	7/64" PVC	525 - 1M, MCM	
1023	600	80	1/8" PVC	1.1 - 2M, MCM	
1024	600	90	3/64" PVC	22 - 8	
1025	600	90	1/16" PVC	8 - 6	
1026	600	90	1/16" PVC	8 - 2	
1027	600	90	5/64" PVC	1 - 4/0	
1028	600/2500	105	3/64" PVC	22 - 8	General purpose appliance wiring 2500 volts electronic use.
1029	600/2500	105	3/64" PVC + nylon	8 - 6	
1316	600	105	.015" + nylon	26 - 12	General purpose appliance wiring. Similar to THHN.
1317	600	105	.020" + nylon	10	
1318	600	105	.030" + nylon	8 - 6	
1319	600	105	.040" + nylon	4 - 2	
1320	600	105	.050" + nylon	1 - 4/0	
1321	600	105	.060" + nylon	250 - 100 MCM	
1731	300	105	.009" PVC (semi-rigid)	32 - 16	For further processing in cables for electronic equipment.
1061	300	80	.009" PVC (semi-rigid)	30 - 16	Business machine and electronic equipment
1354	30	80 - 60	.002" - .125" P.E.	40 AWG Min.	Coaxial cable.
1434	30	60	.009" - .012" F.R.P.E. + nylon	30 - 20	Flame retardant coaxial cable
10493	300	80	.008" PP	32 - 20	For further processing in cables for electronic equipment or appliances
10493	300	80	.010" PP	18 - 16	
10493	300	80	.012" PP	14 - 10	

CANADIAN STANDARDS ASSOCIATION CERTIFIED HOOKUP WIRES

U.L. STYLE NUMBER	UL RATING VOLTAGE	TEMP ºC	WIRE INSULATION TYPE	SIZE RANGE (AWG)	USAGE
TR-64 Radio Wire	300	90	1/64" PVC	28 - 14	General radio and electronic usage. Wires having both CSA and U.L. approval are available.
TR-32 Radio Wire and AWM	600	90	1/32" PVC	24 - 10	
1 A/B	300	90	.009" PVC	30 - 16	(Previously S-R PVC, T2) Internal wiring of process control computers and business machines
TEW	600	105	various PVC, walls 1/32" min.	26 - 4/0	Thermoplastic equipment wire
1722	600	125	.031 TPR	28 - 10	600V Appliance 2500V Electronic Use

U/L RECOGNIZED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires recognized by the Underwriters' Laboratories, Inc for operation in an air environment, U.L. File #E35793.

U.L. AWM Style 1061

- **U/L Recognized Appliance Wiring Material**
- **VW-1 Rated**
- **80ºC Service**
- **.009" Semi-Rigid Vinyl Insulation**
- **300 Volt**

Meets MIL-W-16878/1 and CSA AWM I A/B (previously S-R PVC, T2) for 80º Service, except where noted.

Agency Voltage Rating	300 volts.
Factory Spark-Test Voltage	3400 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 5000 volts, peak.
IR: Insulation Resistance, wet	> 1500 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	N304-130U-X	1	30	.0100	*.254*	.030	*.762*	114.00	*374*	0.72	*1.07*
30	N304-738U	7	38	.0120	*.305*	.032	*.813*	108.00	*354*	0.75	*1.12*
28	N304-128U	1	28	.0126	*.320*	.033	*.838*	70.80	*232*	1.00	*1.49*
28	N304-736U	7	36	.0150	*.381*	.035	*.889*	68.20	*224*	1.00	*1.49*
28*	N304-1940U	19	40	.0150	*.381*	.035	*.889*	56.70	*186*	1.40	*2.08*
26	N304-126U	1	26	.0159	*.404*	.036	*.914*	44.50	*146*	1.35	*2.01*
26	N304-734U	7	34	.0190	*.483*	.039	*.991*	42.60	*140*	1.50	*2.23*
26	N304-1938U	19	38	.0190	*.483*	.039	*.991*	40.10	*132*	1.50	*2.23*
26	N304-6544U*	65	44	.0201	*.511*	.040	*1.02*	50.30	*165*	1.40	*2.08*
24	N304-124U	1	24	.0201	*.511*	.040	*1.02*	27.20	*89*	1.80	*2.68*
24	N304-732U	7	32	.0240	*.610*	.044	*1.12*	26.20	*86*	2.00	*2.98*
24	N304-1936U	19	36	.0240	*.610*	.044	*1.12*	25.40	*83*	2.00	*2.98*
24	N304-4140U*	41	40	.0245	*.622*	.045	*1.14*	25.60	*84*	1.90	*2.83*
22	N304-122U	1	22	.0253	*.643*	.046	*1.17*	17.20	*56*	2.60	*3.87*
22	N304-730U	7	30	.0300	*.762*	.050	*1.27*	16.70	*55*	3.00	*4.46*
22	N304-1934U	19	34	.0300	*.762*	.050	*1.27*	15.90	*52*	3.00	*4.46*
22	N304-4138U *	41	38	.0300	*.762*	.050	*1.27*	18.93	*62*	3.60	*5.36*
20	N304-120U	1	20	.0320	*.813*	.052	*1.32*	10.70	*35*	3.90	*5.80*
20	N304-728U	7	28	.0380	*.965*	.058	*1.47*	10.40	*34*	4.40	*6.55*
20	N304-1030U*	10	30	.0380	*.965*	.058	*1.47*	11.80	*39*	4.30	*6.40*
20	N304-1932U	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*
20	N304-4136U*	41	36	.0380	*.965*	.058	*1.47*	11.99	*39*	4.10	*6.10*
18	N304-118U	1	18	.0403	*1.02*	.060	*1.52*	6.78	*22*	5.70	*8.48*
18	N304-726U	7	26	.0480	*1.22*	.068	*1.73*	6.54	*21*	6.10	*9.08*
18	N304-1630U*	16	30	.450	*1.14*	.066	*1.68*	6.48	*21*	6.40	*9.52*
18	N304-1930U	19	30	.0480	*1.22*	0.68	*1.73*	6.22	*20*	6.50	*9.67*
18	N304-6536U*	65	36	.0510	*1.30*	.071	*1.80*	6.40	*21*	6.30	*9.37*
16	N304-116U	1	16	.0508	*1.29*	.071	*1.80*	4.26	*14*	9.50	*14.14*
16	N304-2630U*	26	30	.0550	*1.40*	.076	*1.93*	4.59	*15*	9.50	*14.14*
16	N304-10536U*	105	36	.0650	*1.65*	.085	*2.16*	4.00	*13*	9.60	*14.29*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, per MIL-STD-681, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "920". That color number, "920" is appended to the part number. Sample part number might be "xxxxxx-xxx-920"

* Non-Military

U/L RECOGNIZED WIRE

U.L. AWM Style 1061

RoHS COMPLIANT PRODUCTS:

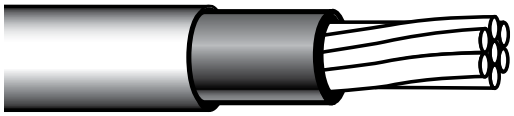
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	NR304-130U-X	1	30	.0100	*.254*	.030	*.762*	114.00	*374*	0.72	*1.07*
30	NR304-738U	7	38	.0120	*.305*	.032	*.813*	108.00	*354*	0.75	*1.12*
28	NR304-128U	1	28	.0126	*.320*	.033	*.838*	70.80	*232*	1.00	*1.49*
28	NR304-736U	7	36	.0150	*.381*	.035	*.889*	68.20	*224*	1.00	*1.49*
28*	NR304-1940U	19	40	.0150	*.381*	.035	*.889*	56.70	*186*	1.40	*2.08*
26	NR304-126U	1	26	.0159	*.404*	.036	*.914*	44.50	*146*	1.35	*2.01*
26	NR304-734U	7	34	.0190	*.483*	.039	*.991*	42.60	*140*	1.50	*2.23*
26	NR304-1938U	19	38	.0190	*.483*	.039	*.991*	40.10	*132*	1.50	*2.23*
26	NR304-6544U*	65	44	.0201	*.511*	.040	*1.02*	50.30	*165*	1.40	*2.08*
24	NR304-124U	1	24	.0201	*.511*	.040	*1.02*	27.20	*89*	1.80	*2.68*
24	NR304-732U	7	32	.0240	*.610*	.044	*1.12*	26.20	*86*	2.00	*2.98*
24	NR304-1936U	19	36	.0240	*.610*	.044	*1.12*	25.40	*83*	2.00	*2.98*
24	NR304-4140U*	41	40	.0245	*.622*	.045	*1.14*	25.60	*84*	1.90	*2.83*
22	NR304-122U	1	22	.0253	*.643*	.046	*1.17*	17.20	*56*	2.60	*3.87*
22	NR304-730U	7	30	.0300	*.762*	.050	*1.27*	16.70	*55*	3.00	*4.46*
22	NR304-1934U	19	34	.0300	*.762*	.050	*1.27*	15.90	*52*	3.00	*4.46*
22	NR304-4138U *	41	38	.0300	*.762*	.050	*1.27*	18.93	*62*	3.60	*5.36*
20	NR304-120U	1	20	.0320	*.813*	.052	*1.32*	10.70	*35*	3.90	*5.80*
20	NR304-728U	7	28	.0380	*.965*	.058	*1.47*	10.40	*34*	4.40	*6.55*
20	NR304-1030U*	10	30	.0380	*.965*	.058	*1.47*	11.80	*39*	4.30	*6.40*
20	NR304-1932U	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*
20	NR304-4136U*	41	36	.0380	*.965*	.058	*1.47*	11.99	*39*	4.10	*6.10*
18	NR304-118U	1	18	.0403	*1.02*	.060	*1.52*	6.78	*22*	5.70	*8.48*
18	NR304-726U	7	26	.0480	*1.22*	.068	*1.73*	6.54	*21*	6.10	*9.08*
18	NR304-1630U*	16	30	.450	*1.14*	.066	*1.68*	6.48	*21*	6.40	*9.52*
18	NR304-1930U	19	30	.0480	*1.22*	0.68	*1.73*	6.22	*20*	6.50	*9.67*
18	NR304-6536U*	65	36	.0510	*1.30*	.071	*1.80*	6.40	*21*	6.30	*9.37*
16	NR304-116U	1	16	.0508	*1.29*	.071	*1.80*	4.26	*14*	9.50	*14.14*
16	NR304-2630U*	26	30	.0550	*1.40*	.076	*1.93*	4.59	*15*	9.50	*14.14*
16	NR304-10536U*	105	36	.0650	*1.65*	.085	*2.16*	4.00	*13*	9.60	*14.29*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, per MIL-STD-681, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "920". That color number, "920" is appended to the part number. Sample part number might be "xxxxxx-xxx-920"

* Non-Military

U/L RECOGNIZED WIRE



Extruded Nylon Armor Layer | Thermoplastic Insulation | Tinned Copper Stranded

Wires recognized by the Underwriters' Laboratories, Inc for operation in an air or an oil environment, U.L. File #E35793.

U.L. AWM Style 1006

- **U/L Recognized Appliance Wiring Material**
- **Available as VW-1 Rated**
- **105ºC Service**
- **.008" Vinyl Plus Nylon Jacket**
- **Voltage Not Specified**

Meets MIL-W-16878/17 UL Style 1004 for 80ºC Service, and UL Style 1005 for 90ºC Service, except where noted.

Agency Voltage Rating	Not specified by UL; depends on intended use.
Factory Spark-Test Voltage	3400 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 5000 volts, peak.
IR: Insulation Resistance, wet	> 1500 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	N305-130N	1	30	.0100	*.254*	.036	*.914*	114.00	*374*	0.77	*1.15*
30	N305-738N	7	38	.0120	*.305*	.038	*.965*	108.00	*354*	1.00	*1.49*
28	N305-128N	1	28	.0126	*.320*	.039	*.991*	70.80	*232*	1.15	*1.71*
28	N305-736N	7	36	.0150	*.381*	.041	*1.04*	68.20	*224*	1.22	*1.82*
28	N305-1940N*	19	40	.0150	*.381*	.041	*1.04*	56.70	*186*	1.88	*2.80*
26	N305-126N	1	26	.0159	*.404*	.042	*1.07*	44.50	*146*	1.52	*2.26*
26	N305-734N	7	34	.0190	*.483*	.045	*1.14*	42.60	*140*	1.65	*2.46*
26	N305-1938N	19	38	.0190	*.483*	.045	*1.14*	40.10	*132*	1.75	*2.60*
24	N305-124N	1	24	.0201	*.511*	.046	*1.17*	27.20	*89*	2.00	*2.97*
24	N305-732N	7	32	.0240	*.610*	.050	*1.27*	26.20	*86*	2.15	*3.20*
24	N305-1936N	19	36	.0240	*.610*	.050	*1.27*	25.40	*83*	2.25	*3.85*
22	N305-122N	1	22	.0253	*.643*	.052	*1.32*	17.20	*56*	3.00	*4.46*
22	N305-730N	7	30	.0300	*.762*	.056	*1.42*	16.70	*55*	3.15	*4.69*
22	N305-1934N	19	34	.0300	*.762*	.056	*1.42*	15.90	*52*	3.25	*4.84*
20	N305-120N	1	20	.0320	*.813*	.056	*1.42*	10.70	*35*	4.50	*6.70*
20	N305-728N	7	28	.0380	*.965*	.064	*1.63*	10.40	*34*	4.60	*6.85*
20	N305-1030N	10	30	.0380	*.965*	.064	*1.63*	11.80	*39*	4.70	*7.00*
20	N305-1932N	19	32	.0380	*.965*	.064	*1.63*	9.76	*32*	4.75	*7.10*
18	N305-118N	1	18	.0430	*1.02*	.066	*1.68*	6.78	*22*	6.20	*9.23*
18	N305-726N	7	26	.0480	*1.22*	.074	*1.88*	6.54	*21*	6.60	*9.82*
18	N305-1630N*	16	30	.0450	*1.14*	.071	*1.80*	6.48	*21*	7.00	*6.70*
18	N305-1930N	19	30	.0480	*1.22*	.074	*1.88*	6.22	*20*	7.00	*10.42*
16	N305-116N	1	16	.0508	*1.29*	.079	*2.01*	4.26	*14*	8.40	*12.50*
16	N305-2630N	26	30	.0550	*1.40*	.085	*2.16*	4.59	*15*	9.50	*14.14*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

U/L RECOGNIZED WIRE

U.L. AWM Style 1006

RoHS COMPLIANT PRODUCTS:

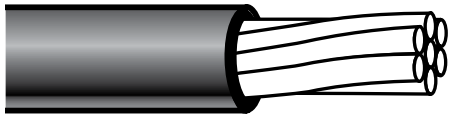
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	NR305-130N	1	30	.0100	*.254*	.036	*.914*	114.00	*374*	0.77	*1.15*
30	NR305-738N	7	38	.0120	*.305*	.038	*.965*	108.00	*354*	1.00	*1.49*
28	NR305-128N	1	28	.0126	*.320*	.039	*.991*	70.80	*232*	1.15	*1.71*
28	NR305-736N	7	36	.0150	*.381*	.041	*1.04*	68.20	*224*	1.22	*1.82*
28	NR305-1940N*	19	40	.0150	*.381*	.041	*1.04*	56.70	*186*	1.88	*2.80*
26	NR305-126N	1	26	.0159	*.404*	.042	*1.07*	44.50	*146*	1.52	*2.26*
26	NR305-734N	7	34	.0190	*.483*	.045	*1.14*	42.60	*140*	1.65	*2.46*
26	NR305-1938N	19	38	.0190	*.483*	.045	*1.14*	40.10	*132*	1.75	*2.60*
24	NR305-124N	1	24	.0201	*.511*	.046	*1.17*	27.20	*89*	2.00	*2.97*
24	NR305-732N	7	32	.0240	*.610*	.050	*1.27*	26.20	*86*	2.15	*3.20*
24	NR305-1936N	19	36	.0240	*.610*	.050	*1.27*	25.40	*83*	2.25	*3.85*
22	NR305-122N	1	22	.0253	*.643*	.052	*1.32*	17.20	*56*	3.00	*4.46*
22	NR305-730N	7	30	.0300	*.762*	.056	*1.42*	16.70	*55*	3.15	*4.69*
22	NR305-1934N	19	34	.0300	*.762*	.056	*1.42*	15.90	*52*	3.25	*4.84*
20	NR305-120N	1	20	.0320	*.813*	.056	*1.42*	10.70	*35*	4.50	*6.70*
20	NR305-728N	7	28	.0380	*.965*	.064	*1.63*	10.40	*34*	4.60	*6.85*
20	NR305-1030N	10	30	.0380	*.965*	.064	*1.63*	11.80	*39*	4.70	*7.00*
20	NR305-1932N	19	32	.0380	*.965*	.064	*1.63*	9.76	*32*	4.75	*7.10*
18	NR305-118N	1	18	.0430	*1.02*	.066	*1.68*	6.78	*22*	6.20	*9.23*
18	NR305-726N	7	26	.0480	*1.22*	.074	*1.88*	6.54	*21*	6.60	*9.82*
18	NR305-1630N*	16	30	.0450	*1.14*	.071	*1.80*	6.48	*21*	7.00	*6.70*
18	NR305-1930N	19	30	.0480	*1.22*	.074	*1.88*	6.22	*20*	7.00	*10.42*
16	NR305-116N	1	16	.0508	*1.29*	.079	*2.01*	4.26	*14*	8.40	*12.50*
16	NR305-2630N	26	30	.0550	*1.40*	.085	*2.16*	4.59	*15*	9.50	*14.14*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

U/L RECOGNIZED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires recognized by the Underwriters' Laboratories, Inc for operation in an air or an oil environment, U.L. File #E35793.

U.L. AWM Style 1007

- **U/L Recognized Appliance Wiring Material**
- **Available as VW-1 Rated - 80ºC Service**
- **1/64" Vinyl Insulation U.L. Rated**
- **300 Volt Appliance 600 Volt Electronic**

Meets MIL-W-16878/2 and UL Style 1569 for 80ºC, 90ºC, 105ºC, 300V, except where noted.

Agency Voltage Rating	300 V for appliance use, 600 V peak, for electronic use.
Factory Spark-Test Voltage	5000 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 7000 volts, peak.
IR: Insulation Resistance, wet	> 2000 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR		NOM. FIN. WIRE DIAM.		MAX. RESISTANCE (dc at 20º C) Ω /per		NOM. WT.	
				IN.	*mm*	IN.	*mm*	1000-ft	*Km*	LBS per 1000-ft	*Kg/Km*
28	N303-736U	7	36	.0150	*.381*	.047	*1.19*	68.2	*224*	1.56	*2.32*
26	N303-126U	1	26	.0159	*.404*	.050	*1.27*	44.5	*146*	2.00	*2.98*
26	N303-734U	7	34	.0190	*.483*	.053	*1.35*	42.6	*140*	2.10	*3.1*
26	N303-1938U	19	38	.0190	*.483*	.053	*1.35*	40.1	*132*	2.20	*3.3*
24	N303-124U	1	24	.0201	*.511*	.054	*1.37*	27.2	*89*	2.50	*3.7*
24	N303-732U	7	32	.0240	*.610*	.058	*1.47*	26.2	*86*	2.60	*3.9*
24	N303-1936U	19	36	.0240	*.610*	.058	*1.47*	25.4	*83*	2.75	*4.1*
22	N303-122U	1	22	.0253	*.643*	.059	*1.50*	17.2	*56*	3.50	*5.2*
22	N303-730U	7	30	.0300	*.762*	.064	*1.63*	16.7	*55*	3.65	*5.4*
22	N303-1934U	19	34	.0300	*.762*	.064	*1.63*	15.9	*52*	3.75	*5.6*
20	N303-120U	1	20	.0320	*.813*	.066	*1.68*	10.7	*35*	5.30	*7.9*
20	N303-728U	7	28	.0380	*.965*	.072	*1.83*	10.4	*34*	5.40	*8.0*
20	N303-1030U	10	30	.0380	*.965*	.072	*1.83*	11.8	*39*	5.45	*8.1*
20	N303-1932U	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	N303-118U	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	N303-726U	7	26	.0480	*1.22*	.082	*2.08*	6.54	*21*	7.90	*11.8*
18	N303-1630U*	16	30	.0450	*1.14*	.077	*1.96*	6.48	*21*	7.90	*11.8*
18	N303-1930U	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	N303-116U	1	16	.0508	*1.29*	.085	*2.16*	4.26	*14*	8.50	*12.7*
16	N303-2630U	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, per MIL-STD-681, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "920". That color number, "920" is appended to the part number. Sample part number might be "xxxxxx-xxx-920"

* Non-Military

U/L RECOGNIZED WIRE

U.L. AWM Style 1007

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
28	NR303-736U	7	36	.0150	*.381*	.047	*1.19*	68.2	*224*	1.56	*2.32*
26	NR303-126U	1	26	.0159	*.404*	.050	*1.27*	44.5	*146*	2.00	*2.98*
26	NR303-734U	7	34	.0190	*.483*	.053	*1.35*	42.6	*140*	2.10	*3.1*
26	NR303-1938U	19	38	.0190	*.483*	.053	*1.35*	40.1	*132*	2.20	*3.3*
24	NR303-124U	1	24	.0201	*.511*	.054	*1.37*	27.2	*89*	2.50	*3.7*
24	NR303-732U	7	32	.0240	*.610*	.058	*1.47*	26.2	*86*	2.60	*3.9*
24	NR303-1936U	19	36	.0240	*.610*	.058	*1.47*	25.4	*83*	2.75	*4.1*
22	NR303-122U	1	22	.0253	*.643*	.059	*1.50*	17.2	*56*	3.50	*5.2*
22	NR303-730U	7	30	.0300	*.762*	.064	*1.63*	16.7	*55*	3.65	*5.4*
22	NR303-1934U	19	34	.0300	*.762*	.064	*1.63*	15.9	*52*	3.75	*5.6*
20	NR303-120U	1	20	.0320	*.813*	.066	*1.68*	10.7	*35*	5.30	*7.9*
20	NR303-728U	7	28	.0380	*.965*	.072	*1.83*	10.4	*34*	5.40	*8.0*
20	NR303-1030U	10	30	.0380	*.965*	.072	*1.83*	11.8	*39*	5.45	*8.1*
20	NR303-1932U	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	NR303-118U	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	NR303-726U	7	26	.0480	*1.22*	.082	*2.08*	6.54	*21*	7.90	*11.8*
18	NR303-1630U*	16	30	.0450	*1.14*	.077	*1.96*	6.48	*21*	7.90	*11.8*
18	NR303-1930U	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	NR303-116U	1	16	.0508	*1.29*	.085	*2.16*	4.26	*14*	8.50	*12.7*
16	NR303-2630U	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, per MIL-STD-681, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "920". That color number, "920" is appended to the part number. Sample part number might be "xxxxxx-xxx-920"

* Non-Military

U/L RECOGNIZED WIRE

Extruded Nylon Armor Layer | Thermoplastic Insulation | Tinned Copper Stranded

Wires recognized by the Underwriters' Laboratories, Inc for operation in an air or an oil environment, U.L. File #E35793.

U.L. AWM Style 1010

- **U/L Recognized Appliance Wiring Material**
- **VW-1 Rated**
- **1/64" Vinyl Plus Nylon Jacket**
- **105ºC Service** - U.L. Rated**
- **300 Volt Appliance 600 Volt Electronic**

Meets MIL-W-16878/18 UL Style 1008 for 80ºC Service, and UL Style 1009 for 90ºC Service, except where noted.

Agency Voltage Rating	300 V for appliance use, 600 V peak, for electronic use.
Factory Spark-Test Voltage	5000 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 7000 volts, peak.
IR: Insulation Resistance, wet	> 2000 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
26	N300-126N	1	26	.0159	*.404*	.056	*1.42*	44.50	*146*	2.00	*3.0*
26	N300-734N	7	34	.0190	*.483*	.059	*1.50*	42.60	*140*	2.60	*3.9*
26	N300-1938N	19	38	.0190	*.483*	.059	*1.50*	40.10	*132*	2.70	*4.0*
24	N300-124N	1	24	.0201	*.511*	.060	*1.52*	27.2	*89*	3.15	*4.7*
24	N300-732N	7	32	.0240	*.610*	.064	*1.63*	26.20	*86*	3.25	*4.8*
24	N300-1936N	19	36	.0240	*.610*	.064	*1.63*	25.40	*83*	3.25	*4.8*
22	N300-122N	1	22	.0253	*.643*	.065	*1.65*	17.20	*56*	3.70	*5.5*
22	N300-730N	7	30	.0300	*.762*	.070	*1.78*	16.70	*55*	3.90	*5.8*
22	N300-1934N	19	34	.0300	*.762*	.070	*1.78*	15.90	*52*	4.00	*6.0*
20	N300-120N	1	20	.0320	*.813*	.072	*1.83*	10.70	*35*	5.50	*8.2*
20	N300-728N	7	28	.0380	*.965*	.078	*1.98*	10.40	*34*	6.00	*8.9*
20	N300-1030N	10	30	.0380	*.965*	.078	*1.98*	11.80	*39*	5.70	*8.5*
20	N300-1932N	19	32	.0380	*.965*	.078	*1.98*	9.76	*32*	6.00	*8.9*
18	N300-118N	1	18	.0403	*1.02*	.083	*2.11*	6.78	*22*	7.90	*11.8*
18	N300-726N	7	26	.0480	*1.22*	.090	*2.29*	6.54	*21*	8.30	*12.4*
18	N300-1630N*	16	30	.0450	*1.14*	.082	*2.08*	6.48	*21*	8.37	*12.5*
18	N300-1930N	19	30	.0480	*1.22*	.090	*2.29*	6.22	*20*	8.50	*12.7*
16	N300-116N	1	16	.0508	*1.29*	.093	*2.36*	4.26	*14*	11.25	*16.7*
16	N300-2630N	26	30	.0550	*1.40*	.102	*2.60*	4.59	*15*	11.25	*16.7*
14	N300-114N	1	14	.0641	*1.63*	.106	*2.70*	2.68	*9.0*	16.50	*24.6*
14	N300-4130N	41	30	.0710	*1.80*	.120	*3.05*	2.94	*9.7*	16.40	*24.4*
12	N300-3728N	37	28	.0890	*2.26*	.132	*3.53*	2.01	*6.6*	25.00	*37.2*
12	N300-6530N	65	30	.0890	*2.26*	.141	*3.58*	1.85	*6.1*	26.50	*39.4*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

** Suitable for operation at +105ºC in air or up to 80ºC in oil

U/L RECOGNIZED WIRE

U.L. AWM Style 1010

RoHS COMPLIANT PRODUCTS:

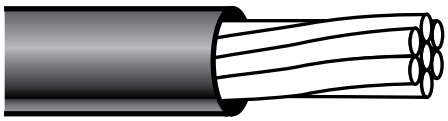
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
26	NR300-126N	1	26	.0159	*.404*	.056	*1.42*	44.50	*146*	2.00	*3.0*
26	NR300-734N	7	34	.0190	*.483*	.059	*1.50*	42.60	*140*	2.60	*3.9*
26	NR300-1938N	19	38	.0190	*.483*	.059	*1.50*	40.10	*132*	2.70	*4.0*
24	NR300-124N	1	24	.0201	*.511*	.060	*1.52*	27.2	*89*	3.15	*4.7*
24	NR300-732N	7	32	.0240	*.610*	.064	*1.63*	26.20	*86*	3.25	*4.8*
24	NR300-1936N	19	36	.0240	*.610*	.064	*1.63*	25.40	*83*	3.25	*4.8*
22	NR300-122N	1	22	.0253	*.643*	.065	*1.65*	17.20	*56*	3.70	*5.5*
22	NR300-730N	7	30	.0300	*.762*	.070	*1.78*	16.70	*55*	3.90	*5.8*
22	NR300-1934N	19	34	.0300	*.762*	.070	*1.78*	15.90	*52*	4.00	*6.0*
20	NR300-120N	1	20	.0320	*.813*	.072	*1.83*	10.70	*35*	5.50	*8.2*
20	NR300-728N	7	28	.0380	*.965*	.078	*1.98*	10.40	*34*	6.00	*8.9*
20	NR300-1030N	10	30	.0380	*.965*	.078	*1.98*	11.80	*39*	5.70	*8.5*
20	NR300-1932N	19	32	.0380	*.965*	.078	*1.98*	9.76	*32*	6.00	*8.9*
18	NR300-118N	1	18	.0403	*1.02*	.083	*2.11*	6.78	*22*	7.90	*11.8*
18	NR300-726N	7	26	.0480	*1.22*	.090	*2.29*	6.54	*21*	8.30	*12.4*
18	NR300-1630N*	16	30	.0450	*1.14*	.082	*2.08*	6.48	*21*	8.37	*12.5*
18	NR300-1930N	19	30	.0480	*1.22*	.090	*2.29*	6.22	*20*	8.50	*12.7*
16	NR300-116N	1	16	.0508	*1.29*	.093	*2.36*	4.26	*14*	11.25	*16.7*
16	NR300-2630N	26	30	.0550	*1.40*	.102	*2.60*	4.59	*15*	11.25	*16.7*
14	NR300-114N	1	14	.0641	*1.63*	.106	*2.70*	2.68	*9.0*	16.50	*24.6*
14	NR300-4130N	41	30	.0710	*1.80*	.120	*3.05*	2.94	*9.7*	16.40	*24.4*
12	NR300-3728N	37	28	.0890	*2.26*	.132	*3.53*	2.01	*6.6*	25.00	*37.2*
12	NR300-6530N	65	30	.0890	*2.26*	.141	*3.58*	1.85	*6.1*	26.50	*39.4*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military
** Suitable for operation at +105ºC in air or up to 80ºC in oil

U/L RECOGNIZED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires recognized by the Underwriters' Laboratories, Inc for operation in an air environment, U.L. File #E35793. Intended use: for further processing in cables for electronic equipment.

U.L. AWM Style 1731

- **U/L Recognized Appliance Wiring Material**
- **105ºC Service**
- **.009" Semi-Rigid Vinyl Insulation**
- **U.L. Rated: 300 Volt Service**

Meets MIL-W-16878/1 and CSA Type I A/B (previously S-R PVC) for 80º Service, except where noted

Agency Voltage Rating	300 volts.
Factory Spark-Test Voltage	3400 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 5000 volts, peak.
IR: Insulation Resistance, wet	> 1500 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	N304-31-130U	1	30	.0100	*.254*	.030	*.762*	114.00	*374*	0.72	*1.07*
30	N304-31-738U	7	38	.0120	*.305*	.032	*.813*	108.00	*354*	0.75	*1.12*
28	N304-31-128U	1	28	.0126	*.320*	.033	*.838*	70.80	*232*	1.00	*1.49*
28	N304-31-736U	7	36	.0150	*.381*	.035	*.889*	68.20	*224*	1.00	*1.49*
28	N304-31-1940U*	19	40	.0150	*.381*	.036	*.914*	56.70	*186*	1.40	*2.08*
26	N304-31-126U	1	26	.0159	*.404*	.036	*.914*	44.50	*146*	1.35	*2.00*
26	N304-31-734U	7	34	.0190	*.483*	.039	*.991*	42.60	*140*	1.50	*2.23*
26	N304-31-1938U	19	38	.0190	*.483*	.039	*.991*	40.10	*132*	1.50	*2.23*
24	N304-31-124U	1	24	.0201	*.511*	.040	*1.02*	27.20	*89*	1.80	*2.67*
24	N304-31-732U	7	32	.0240	*.610*	.044	*1.12*	26.20	*86*	2.00	*2.97*
24	N304-31-1936U	19	36	.0240	*.610*	.044	*1.12*	25.40	*83*	2.00	*2.97*
22	N301-31-122U	1	22	.0253	*.643*	.046	*1.17*	17.20	*56*	2.60	*3.87*
22	N304-31-730U	7	30	.0300	*.762*	.050	*1.27*	16.70	*55*	3.00	*4.46*
22	N304-31-1934U	19	34	.0300	*.762*	.050	*1.27*	15.90	*52*	3.00	*4.46*
20	N304-31-120U	1	20	.0320	*.813*	.052	*1.32*	10.70	*35*	3.90	*5.80*
20	N304-31-728U	7	28	.0380	*.965*	.058	*1.47*	10.40	*34*	4.40	*6.55*
20	N304-31-1030U*	10	30	.0380	*.965*	.058	*1.47*	11.80	*39*	4.30	*6.40*
20	N304-31-1932U	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*
18	N304-31-118U	1	18	.0403	*1.02*	.060	*1.52*	6.78	*22*	5.70	*8.48*
18	N304-31-726U	7	26	.0480	*1.22*	.068	*1.73*	6.54	*21*	6.10	*9.08*
18	N304-31-1630U*	16	30	.0450	*1.14*	.066	*1.68*	6.48	*21*	6.40	*9.52*
18	N304-31-1930U	19	30	.0480	*1.22*	.068	*1.73*	6.22	*20*	6.50	*9.67*
16	N304-31-116U	1	16	.0508	*1.29*	.071	*1.80*	4.26	*14*	9.50	*14.10*
16	N304-31-2630U*	26	30	.0550	*1.40*	.076	*1.93*	4.59	*15*	9.50	*14.10*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

U/L RECOGNIZED WIRE

U.L. AWM Style 1731

RoHS COMPLIANT PRODUCTS:

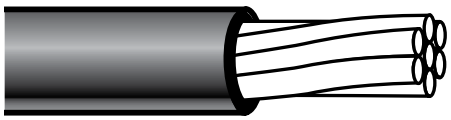
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	NR304-31-130U	1	30	.0100	*.254*	.030	*.762*	114.00	*374*	0.72	*1.07*
30	NR304-31-738U	7	38	.0120	*.305*	.032	*.813*	108.00	*354*	0.75	*1.12*
28	NR304-31-128U	1	28	.0126	*.320*	.033	*.838*	70.80	*232*	1.00	*1.49*
28	NR304-31-736U	7	36	.0150	*.381*	.035	*.889*	68.20	*224*	1.00	*1.49*
28	NR304-31-1940U*	19	40	.0150	*.381*	.036	*.914*	56.70	*186*	1.40	*2.08*
26	NR304-31-126U	1	26	.0159	*.404*	.036	*.914*	44.50	*146*	1.35	*2.00*
26	NR304-31-734U	7	34	.0190	*.483*	.039	*.991*	42.60	*140*	1.50	*2.23*
26	NR304-31-1938U	19	38	.0190	*.483*	.039	*.991*	40.10	*132*	1.50	*2.23*
24	NR304-31-124U	1	24	.0201	*.511*	.040	*1.02*	27.20	*89*	1.80	*2.67*
24	NR304-31-732U	7	32	.0240	*.610*	.044	*1.12*	26.20	*86*	2.00	*2.97*
24	NR304-31-1936U	19	36	.0240	*.610*	.044	*1.12*	25.40	*83*	2.00	*2.97*
22	NR301-31-122U	1	22	.0253	*.643*	.046	*1.17*	17.20	*56*	2.60	*3.87*
22	NR304-31-730U	7	30	.0300	*.762*	.050	*1.27*	16.70	*55*	3.00	*4.46*
22	NR304-31-1934U	19	34	.0300	*.762*	.050	*1.27*	15.90	*52*	3.00	*4.46*
20	NR304-31-120U	1	20	.0320	*.813*	.052	*1.32*	10.70	*35*	3.90	*5.80*
20	NR304-31-728U	7	28	.0380	*.965*	.058	*1.47*	10.40	*34*	4.40	*6.55*
20	NR304-31-1030U*	10	30	.0380	*.965*	.058	*1.47*	11.80	*39*	4.30	*6.40*
20	NR304-31-1932U	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*
18	NR304-31-118U	1	18	.0403	*1.02*	.060	*1.52*	6.78	*22*	5.70	*8.48*
18	NR304-31-726U	7	26	.0480	*1.22*	.068	*1.73*	6.54	*21*	6.10	*9.08*
18	NR304-31-1630U*	16	30	.0450	*1.14*	.066	*1.68*	6.48	*21*	6.40	*9.52*
18	NR304-31-1930U	19	30	.0480	*1.22*	.068	*1.73*	6.22	*20*	6.50	*9.67*
16	NR304-31-116U	1	16	.0508	*1.29*	.071	*1.80*	4.26	*14*	9.50	*14.10*
16	NR304-31-2630U*	26	30	.0550	*1.40*	.076	*1.93*	4.59	*15*	9.50	*14.10*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

U/L RECOGNIZED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires recognized by the Underwriters' Laboratories, Inc for operation in an air or an oil environment, U.L. File #E35793.

U.L. AWM Style 1569

- **U/L Recognized Appliance Wiring Material**
- **VW-1 Rated**
- **80ºC, 90ºC or 105ºC**
- **1/64" Vinyl Insulation UL Rated**
- **300 Volt Appliance 600 Volt Electronic**

Meets MIL-W-16878/2 unless noted.
Also meets UL Style 1007, 80ºC 300V

Agency Voltage Rating	300 V for appliance use, 600 V peak, for electronic use.
Factory Spark-Test Voltage	5000 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 7000 volts, peak.
IR: Insulation Resistance, wet	> 2000 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
28	N303-69-736U	7	36	.0150	*.300*	.047	*1.19*	64.90	*213*	1.56	*2.3*
26	N303-69-126U	1	26	.0159	*.404*	.050	*1.27*	44.50	*146*	3.00	*2.6*
26	N303-69-734U	7	34	.0190	*.483*	.053	*1.35*	42.60	*140*	2.10	*3.1*
26	N303-69-1938U	19	38	.0190	*.483*	.053	*1.35*	40.10	*132*	2.20	*3.3*
24	N303-69-124U	1	24	.0201	*.511*	.054	*1.37*	27.20	*89*	2.50	*3.7*
24	N303-69-732U	7	32	.0240	*.610*	.058	*1.47*	26.20	*86*	2.60	*3.9*
24	N303-69-1936U	19	36	.0240	*.610*	.058	*1.47*	25.40	*83*	2.75	*4.1*
22	N303-69-122U	1	22	.0253	*.643*	.059	*1.50*	17.20	*56*	3.50	*5.2*
22	N303-69-730U	7	30	.0300	*.762*	.064	*1.63*	16.70	*55*	3.65	*5.4*
22	N303-69-1934U	19	34	.0300	*.762*	.064	*1.63*	15.90	*52*	3.75	*5.6*
20	N303-69-120U	1	20	.0320	*.813*	.066	*1.68*	10.70	*35*	5.30	*7.9*
20	N303-69-728U	7	28	.0380	*.965*	.072	*1.83*	10.40	*34*	5.40	*8.0*
20	N303-69-1030U	10	30	.0380	*.965*	.072	*1.83*	11.80	*39*	5.45	*8.1*
20	N303-69-1932U	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	N303-69-118U	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	N303-69-726U	7	26	.0480	*1.22*	.082	*2.00*	6.54	*21*	7.90	*11.8*
18	N303-69-1630U*	16	30	.0450	*1.14*	.077	*1.96*	6.48	*21*	7.90	*11.8*
18	N303-69-1930U	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	N303-69-116U	1	16	.0508	*1.29*	.085	*2.16*	4.26	*14*	8.50	*12.7*
16	N303-69-2630U	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*
14	N303-69-114U	1	14	.0641	*1.63*	.098	*2.49*	2.68	*9.0*	15.50	*23.1*
14	N303-69-4130U†	41	30	.0710	*1.80*	.112	*2.84*	2.94	*9.7*	14.50	*21.5*
12	N303-69-3728U†	37	28	.0890	*2.26*	.124	*3.15*	2.01	*6.6*	25.00	*37.2*
12	N303-69-6530U†	65	30	.0890	*2.26*	.132	*3.35*	1.85	*6.1*	25.30	*37.7*
10	N303-69-3726U‡	37	26	.1070	*2.72*	.139	*3.53*	1.26	*4.1*	32.00	*47.26*
10	N303-69-4927U‡	49	27	.1100	*2.79*	.142	*3.61*	1.09	*3.6*	33.70	*50.0*
10	N303-69-1053U‡	105	30	.1150	*2.92*	.149	*3.79*	.98	*3.2*	35.70	*53.1*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "920". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military † Non-UL1007
‡ UL 1569 Only

U/L RECOGNIZED WIRE

U.L. AWM Style 1569

RoHS COMPLIANT PRODUCTS:

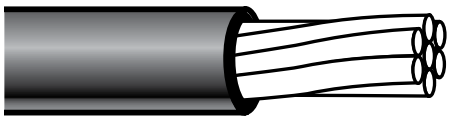
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
28	NR303-69-736U	7	36	.0150	*.300*	.047	*1.19*	64.90	*213*	1.56	*2.3*
26	NR303-69-126U	1	26	.0159	*.404*	.050	*1.27*	44.50	*146*	3.00	*2.6*
26	NR303-69-734U	7	34	.0190	*.483*	.053	*1.35*	42.60	*140*	2.10	*3.1*
26	NR303-69-1938U	19	38	.0190	*.483*	.053	*1.35*	40.10	*132*	2.20	*3.3*
24	NR303-69-124U	1	24	.0201	*.511*	.054	*1.37*	27.20	*89*	2.50	*3.7*
24	NR303-69-732U	7	32	.0240	*.610*	.058	*1.47*	26.20	*86*	2.60	*3.9*
24	NR303-69-1936U	19	36	.0240	*.610*	.058	*1.47*	25.40	*83*	2.75	*4.1*
22	NR303-69-122U	1	22	.0253	*.643*	.059	*1.50*	17.20	*56*	3.50	*5.2*
22	NR303-69-730U	7	30	.0300	*.762*	.064	*1.63*	16.70	*55*	3.65	*5.4*
22	NR303-69-1934U	19	34	.0300	*.762*	.064	*1.63*	15.90	*52*	3.75	*5.6*
20	NR303-69-120U	1	20	.0320	*.813*	.066	*1.68*	10.70	*35*	5.30	*7.9*
20	NR303-69-728U	7	28	.0380	*.965*	.072	*1.83*	10.40	*34*	5.40	*8.0*
20	NR303-69-1030U	10	30	.0380	*.965*	.072	*1.83*	11.80	*39*	5.45	*8.1*
20	NR303-69-1932U	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	NR303-69-118U	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	NR303-69-726U	7	26	.0480	*1.22*	.082	*2.00*	6.54	*21*	7.90	*11.8*
18	NR303-69-1630U*	16	30	.0450	*1.14*	.077	*1.96*	6.48	*21*	7.90	*11.8*
18	NR303-69-1930U	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	NR303-69-116U	1	16	.0508	*1.29*	.085	*2.16*	4.26	*14*	8.50	*12.7*
16	NR303-69-2630U	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*
14	NR303-69-114U	1	14	.0641	*1.63*	.098	*2.49*	2.68	*9.0*	15.50	*23.1*
14	NR303-69-4130U†	41	30	.0710	*1.80*	.112	*2.84*	2.94	*9.7*	14.50	*21.5*
12	NR303-69-3728U†	37	28	.0890	*2.26*	.124	*3.15*	2.01	*6.6*	25.00	*37.2*
12	NR303-69-6530U†	65	30	.0890	*2.26*	.132	*3.35*	1.85	*6.1*	25.30	*37.7*
10	NR303-69-3726U‡	37	26	.1070	*2.72*	.139	*3.53*	1.26	*4.1*	32.00	*47.26*
10	NR303-69-4927U‡	49	27	.1100	*2.79*	.142	*3.61*	1.09	*3.6*	33.70	*50.0*
10	NR303-69-1053U‡	105	30	.1150	*2.92*	.149	*3.79*	.98	*3.2*	35.70	*53.1*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "920". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military † Non-UL1007
‡ UL 1569 Only

U/L RECOGNIZED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires recognized by the Underwriters' Laboratories, Inc for operation in an air or an oil environment, U.L. File #E35793.

U.L. AWM Style 1015

- **U/L Recognized Appliance Wiring Material**
- **VW-1 Rated**
- **1/32" Vinyl Insulation for 24 - 10 gauge**
- **105ºC Service** UL Rated**
- **2500 Volts Electronic 600 Volts Appliance**

Meets MIL-W-16878/3, UL Style 1011 for 80ºC Service and UL Style 1013 for 90ºC Service except where noted.

Agency Voltage Rating	600 V for appliance use, 2500 V peak, for electronic use.
Factory Spark-Test Voltage	6000 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 8000 volts, peak.
IR: Insulation Resistance, wet	> 2900 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

****Suitable for operation at +105ºC in air or up to 80ºC in oil.**

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	N600-124U	1	24	.0201	*.511*	.082	*2.08*	27.20	*89*	4.2	*6.25*
24	N600-732U	7	32	.0240	*.610*	.086	*2.18*	26.20	*86*	4.0	*5.95*
24	N600-1936	19	36	.0240	*.610*	.086	*2.18*	25.40	*83*	4.1	*6.10*
22	N600-122U	1	22	.0253	*.643*	.088	*2.24*	17.20	*56*	5.0	*7.44*
22	N600-730U	7	30	.0300	*.762*	.092	*2.34*	16.70	*55*	5.2	*7.74*
22	N600-1934U	19	34	.0300	*.762*	.092	*2.34*	15.90	*52*	5.3	*7.88*
20	N600-120U	1	20	.0320	*.813*	.094	*2.39*	10.70	*35*	6.8	*10.11*
20	N600-728U	7	28	.0380	*.965*	.100	*2.54*	10.40	*34*	7.3	*10.86*
20	N600-1030U*	10	30	.0380	*.965*	.100	*2.54*	11.80	*39*	7.3	*10.86*
20	N600-1932U	19	32	.0380	*.965*	.100	*2.54*	9.76	*32*	7.3	*10.86*
18	N600-118U	1	18	.0403	*1.02*	.102	*2.59*	6.78	*22*	9.3	*13.84*
18	N600-726U	7	28	.0480	*1.22*	.110	*2.79*	6.54	*21*	9.7	*14.43*
18	N600-1630U*	16	30	.0450	*1.14*	.107	*2.72*	6.48	*21*	9.8	*14.58*
18	N600-1930U	19	30	.0480	*1.22*	.110	*2.79*	6.22	*20*	10.0	*14.88*
16	N600-116U	1	16	.0508	*1.29*	.113	*2.87*	4.26	*14*	12.6	*18.75*
16	N600-2630U	26	30	.0550	*1.40*	.117	*2.97*	4.59	*15*	12.5	*18.60*
14	N600-114U	1	14	.0641	*1.63*	.126	*3.20*	2.68	*9*	16.9	*25.15*
14	N600-4130U	41	30	.0710	*1.80*	.134	*3.40*	2.94	*9.6*	17.9	*26.64*
12	N600-3728U	37	28	.0890	*2.26*	.156	*3.96*	2.01	*6.6*	28.9	*43.00*
12	N600-6530U	65	30	.0890	*2.26*	.165	*4.19*	1.85	*6.1*	28.5	*42.41*
10	N600-3726U	37	26	.1070	*2.72*	.178	*4.52*	1.26	*4.1*	38.6	*57.44*
10	N600-4927U*	49	27	.1100	*2.79*	.174	*4.42*	1.09	*3.6*	40.6	*60.41*
10	N600-10530U*	105	30	.1150	*2.92*	.179	*4.55*	.98	*3.2*	41.5	*61.75*
8	N600-13329U	133	29	.167	*4.24*	.257	*6.52*	.710	*2.328*	70.8	*106*
6	N600-13327U	133	27	.210	*5.3*	.330	*8.38*	.444	*1.456*	110	*165*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

U/L RECOGNIZED WIRE

U.L. AWM Style 1015

RoHS COMPLIANT PRODUCTS:

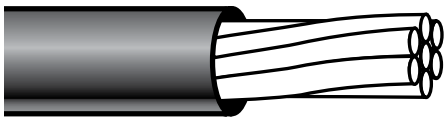
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	NR600-124U	1	24	.0201	*.511*	.082	*2.08*	27.20	*89*	4.2	*6.25*
24	NR600-732U	7	32	.0240	*.610*	.086	*2.18*	26.20	*86*	4.0	*5.95*
24	NR600-1936	19	36	.0240	*.610*	.086	*2.18*	25.40	*83*	4.1	*6.10*
22	NR600-122U	1	22	.0253	*.643*	.088	*2.24*	17.20	*56*	5.0	*7.44*
22	NR600-730U	7	30	.0300	*.762*	.092	*2.34*	16.70	*55*	5.2	*7.74*
22	NR600-1934U	19	34	.0300	*.762*	.092	*2.34*	15.90	*52*	5.3	*7.88*
20	NR600-120U	1	20	.0320	*.813*	.094	*2.39*	10.70	*35*	6.8	*10.11*
20	NR600-728U	7	28	.0380	*.965*	.100	*2.54*	10.40	*34*	7.3	*10.86*
20	NR600-1030U*	10	30	.0380	*.965*	.100	*2.54*	11.80	*39*	7.3	*10.86*
20	NR600-1932U	19	32	.0380	*.965*	.100	*2.54*	9.76	*32*	7.3	*10.86*
18	NR600-118U	1	18	.0403	*1.02*	.102	*2.59*	6.78	*22*	9.3	*13.84*
18	NR600-726U	7	28	.0480	*1.22*	.110	*2.79*	6.54	*21*	9.7	*14.43*
18	NR600-1630U*	16	30	.0450	*1.14*	.107	*2.72*	6.48	*21*	9.8	*14.58*
18	NR600-1930U	19	30	.0480	*1.22*	.110	*2.79*	6.22	*20*	10.0	*14.88*
16	NR600-116U	1	16	.0508	*1.29*	.113	*2.87*	4.26	*14*	12.6	*18.75*
16	NR600-2630U	26	30	.0550	*1.40*	.117	*2.97*	4.59	*15*	12.5	*18.60*
14	NR600-114U	1	14	.0641	*1.63*	.126	*3.20*	2.68	*9*	16.9	*25.15*
14	NR600-4130U	41	30	.0710	*1.80*	.134	*3.40*	2.94	*9.6*	17.9	*26.64*
12	NR600-3728U	37	28	.0890	*2.26*	.156	*3.96*	2.01	*6.6*	28.9	*43.00*
12	NR600-6530U	65	30	.0890	*2.26*	.165	*4.19*	1.85	*6.1*	28.5	*42.41*
10	NR600-3726U	37	26	.1070	*2.72*	.178	*4.52*	1.26	*4.1*	38.6	*57.44*
10	NR600-4927U*	49	27	.1100	*2.79*	.174	*4.42*	1.09	*3.6*	40.6	*60.41*
10	NR600-10530U*	105	30	.1150	*2.92*	.179	*4.55*	.98	*3.2*	41.5	*61.75*
8	NR600-13329U	133	29	.167	*4.24*	.257	*6.52*	.710	*2.328*	70.8	*106*
6	NR600-13327U	133	27	.210	*5.3*	.330	*8.38*	.444	*1.456*	110	*165*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

CSA CERTIFIED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires certified by the Canadian Standards Association for radio or electronic use. Case File No. LL-32511.

CSA-Certified

- **Business Machine Wire**
- **AWM I A/B (previously S-R PVC, T2)**
- **Rated: 80ºC or 300 Volt**
- **.009" Semi-Rigid Vinyl Insulation**

Meets UL Style 1061 and MIL-W-16878/1, except where noted.

Agency Voltage Rating	300 volts.
Factory Spark-Test Voltage	3400 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 5000 volts, peak.
IR: Insulation Resistance, wet	> 1500 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	N309-130U	1	30	.0100	*.254*	.030	*.762*	114.00	*374*	.072	*1.07*
30	N309-738U	7	38	.0120	*.305*	.032	*.813*	108.00	*354*	.075	*1.12*
28	N309-128U	1	28	.0126	*.320*	.033	*.838*	70.80	*232*	1.00	*1.49*
28	N309-736U	7	36	.0150	*.381*	.035	*.889*	68.20	*224*	1.00	*1.49*
28	N309-1940U*	19	40	.0150	*.381*	.036	*.914*	56.70	*186*	1.40	*2.08*
26	N309-126U	1	26	.0159	*.404*	.036	*.914*	44.50	*146*	1.35	*2.00*
26	N309-734U	7	34	.0190	*.483*	.039	*.991*	42.60	*140*	1.50	*2.23*
26	N309-1938U	19	38	.0190	*.483*	.039	*.991*	40.10	*132*	1.50	*2.23*
24	N309-124U	1	24	.0201	*.511*	.040	*1.02*	27.20	*89*	1.80	*2.67*
24	N309-732U	7	32	.0240	*.610*	.044	*1.12*	26.20	*86*	2.00	*2.97*
24	N309-1936U	19	36	.0240	*.610*	.044	*1.12*	25.40	*83*	2.00	*2.97*
22	N309-122U	1	22	.0253	*.643*	.046	*1.17*	17.20	*56*	2.60	*3.87*
22	N309-730U	7	30	.0300	*.762*	.050	*1.27*	16.70	*55*	3.00	*4.46*
22	N309-1934U	19	34	.0300	*.762*	.050	*1.27*	15.90	*52*	3.00	*4.46*
20	N309-120U	1	20	.0320	*.813*	.052	*1.32*	10.70	*35*	3.90	*5.80*
20	N309-728U	7	28	.0380	*.965*	.058	*1.47*	10.40	*34*	4.40	*6.55*
20	N309-1030U*	10	30	.0380	*.965*	.058	*1.47*	11.80	*39*	4.30	*6.40*
20	N309-1932U	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*
18	N309-118U	1	18	.0403	*1.02*	.060	*1.52*	6.78	*22*	5.70	*8.48*
18	N309-726U	7	26	.0480	*1.22*	.068	*1.73*	6.54	*21*	6.10	*9.08*
18	N309-1630U*	16	30	.0450	*1.22*	.066	*1.68*	6.48	*21*	6.40	*9.52*
18	N309-1930U	19	30	.0480	*1.22*	.068	*1.73*	6.22	*20*	6.50	*9.67*
16	N309-116U	1	16	.0508	*1.29*	.071	*1.80*	4.26	*14*	9.50	*14.10*
16	N309-2630U*	26	30	.0550	*1.40*	.076	*1.93*	4.59	*15*	9.20	*14.10*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

CSA CERTIFIED WIRE

Business Machine Wire

RoHS COMPLIANT PRODUCTS:

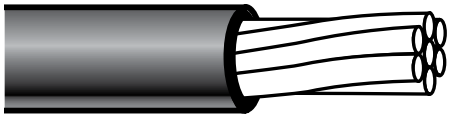
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
30	NR309-130U	1	30	.0100	*.254*	.030	*.762*	114.00	*374*	.072	*1.07*
30	NR309-738U	7	38	.0120	*.305*	.032	*.813*	108.00	*354*	.075	*1.12*
28	NR309-128U	1	28	.0126	*.320*	.033	*.838*	70.80	*232*	1.00	*1.49*
28	NR309-736U	7	36	.0150	*.381*	.035	*.889*	68.20	*224*	1.00	*1.49*
28	NR309-1940U*	19	40	.0150	*.381*	.036	*.914*	56.70	*186*	1.40	*2.08*
26	NR309-126U	1	26	.0159	*.404*	.036	*.914*	44.50	*146*	1.35	*2.00*
26	NR309-734U	7	34	.0190	*.483*	.039	*.991*	42.60	*140*	1.50	*2.23*
26	NR309-1938U	19	38	.0190	*.483*	.039	*.991*	40.10	*132*	1.50	*2.23*
24	NR309-124U	1	24	.0201	*.511*	.040	*1.02*	27.20	*89*	1.80	*2.67*
24	NR309-732U	7	32	.0240	*.610*	.044	*1.12*	26.20	*86*	2.00	*2.97*
24	NR309-1936U	19	36	.0240	*.610*	.044	*1.12*	25.40	*83*	2.00	*2.97*
22	NR309-122U	1	22	.0253	*.643*	.046	*1.17*	17.20	*56*	2.60	*3.87*
22	NR309-730U	7	30	.0300	*.762*	.050	*1.27*	16.70	*55*	3.00	*4.46*
22	NR309-1934U	19	34	.0300	*.762*	.050	*1.27*	15.90	*52*	3.00	*4.46*
20	NR309-120U	1	20	.0320	*.813*	.052	*1.32*	10.70	*35*	3.90	*5.80*
20	NR309-728U	7	28	.0380	*.965*	.058	*1.47*	10.40	*34*	4.40	*6.55*
20	NR309-1030U*	10	30	.0380	*.965*	.058	*1.47*	11.80	*39*	4.30	*6.40*
20	NR309-1932U	19	32	.0380	*.965*	.058	*1.47*	9.76	*32*	4.50	*6.70*
18	NR309-118U	1	18	.0403	*1.02*	.060	*1.52*	6.78	*22*	5.70	*8.48*
18	NR309-726U	7	26	.0480	*1.22*	.068	*1.73*	6.54	*21*	6.10	*9.08*
18	NR309-1630U*	16	30	.0450	*1.22*	.066	*1.68*	6.48	*21*	6.40	*9.52*
18	NR309-1930U	19	30	.0480	*1.22*	.068	*1.73*	6.22	*20*	6.50	*9.67*
16	NR309-116U	1	16	.0508	*1.29*	.071	*1.80*	4.26	*14*	9.50	*14.10*
16	NR309-2630U*	26	30	.0550	*1.40*	.076	*1.93*	4.59	*15*	9.20	*14.10*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

CSA CERTIFIED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires certified by the Canadian Standards Association for radio or electronic use.
Case File No. LR20482/LL-32511

CSA-Certified

- **Radio Wire**
- **Type TR-64**
- **Rated: 90ºC, 300 Volt**
- **1/64" Vinyl Insulation**
- **Also certified as AWM I A/B at 105ºC 300 Volt**

Meets UL Style 1007, 1569 and MIL-W-16878/2 except where noted.

Agency Voltage Rating	300 Volts
Factory Spark-Test Voltage	5000 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 7000 volts, peak.
IR: Insulation Resistance, wet	> 2000 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20º C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	N308-124U	1	24	.0201	*.511*	.054	*1.37*	27.20	*89*	2.50	*3.7*
24	N308-732U	7	32	.0204	*.610*	.058	*1.47*	26.20	*86*	2.60	*3.9*
24	N308-1936U	19	36	.0240	*.610*	.058	*1.47*	25.40	*83*	2.75	*4.1*
22	N308-122U	1	22	.0253	*.643*	.059	*1.50*	17.20	*56*	3.50	*5.2*
22	N308-730U	7	30	.0300	*.762*	.064	*1.63*	16.70	*55*	3.65	*5.4*
22	N308-1934U	19	34	.0300	*.762*	.064	*1.63*	15.90	*52*	3.75	*5.6*
20	N308-120U	1	20	.0320	*.813*	.066	*1.68*	10.70	*35*	5.30	*7.9*
20	N308-728U	7	28	.0380	*.965*	.072	*1.83*	10.40	*34*	5.40	*8.0*
20	N308-1030U	20	30	.0380	*.965*	.072	*1.83*	11.80	*39*	5.45	*8.1*
20	N308-1932U	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	N308-118U	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	N308-726U	7	26	.0480	*1.22*	.082	*2.08*	6.54	*21*	7.90	*11.8*
18	N308-1630U*	16	30	.0450	*1.22*	.077	*1.96*	6.48	*21*	7.90	*11.8*
18	N308-1930U	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	N308-116U	1	16	.0508	*1.29*	.085	*2.16*	4.26	*14*	8.50	*12.7*
16	N308-2630U	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*
14	N308-114U†	1	14	.0641	*1.63*	.098	*2.49*	2.68	*9.0*	15.50	*23.1*
14	N308-4130U†	41	30	.0710	*1.80*	.112	*2.84*	2.94	*9.7*	14.50	*21.5*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military
† Non-UL 1007

CSA CERTIFIED WIRE

Radio Wire

RoHS COMPLIANT PRODUCTS:

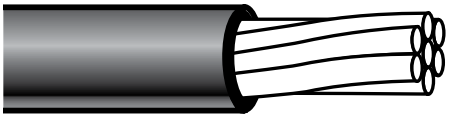
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	NR308-124U	1	24	.0201	*.511*	.054	*1.37*	27.20	*89*	2.50	*3.7*
24	NR308-732U	7	32	.0204	*.610*	.058	*1.47*	26.20	*86*	2.60	*3.9*
24	NR308-1936U	19	36	.0240	*.610*	.058	*1.47*	25.40	*83*	2.75	*4.1*
22	NR308-122U	1	22	.0253	*.643*	.059	*1.50*	17.20	*56*	3.50	*5.2*
22	NR308-730U	7	30	.0300	*.762*	.064	*1.63*	16.70	*55*	3.65	*5.4*
22	NR308-1934U	19	34	.0300	*.762*	.064	*1.63*	15.90	*52*	3.75	*5.6*
20	NR308-120U	1	20	.0320	*.813*	.066	*1.68*	10.70	*35*	5.30	*7.9*
20	NR308-728U	7	28	.0380	*.965*	.072	*1.83*	10.40	*34*	5.40	*8.0*
20	NR308-1030U	20	30	.0380	*.965*	.072	*1.83*	11.80	*39*	5.45	*8.1*
20	NR308-1932U	19	32	.0380	*.965*	.072	*1.83*	9.76	*32*	5.50	*8.2*
18	NR308-118U	1	18	.0403	*1.02*	.075	*1.91*	6.78	*22*	7.80	*11.6*
18	NR308-726U	7	26	.0480	*1.22*	.082	*2.08*	6.54	*21*	7.90	*11.8*
18	NR308-1630U*	16	30	.0450	*1.22*	.077	*1.96*	6.48	*21*	7.90	*11.8*
18	NR308-1930U	19	30	.0480	*1.22*	.082	*2.08*	6.22	*20*	8.00	*11.9*
16	NR308-116U	1	16	.0508	*1.29*	.085	*2.16*	4.26	*14*	8.50	*12.7*
16	NR308-2630U	26	30	.0550	*1.40*	.094	*2.39*	4.59	*15*	10.50	*15.6*
14	NR308-114U†	1	14	.0641	*1.63*	.098	*2.49*	2.68	*9.0*	15.50	*23.1*
14	NR308-4130U†	41	30	.0710	*1.80*	.112	*2.84*	2.94	*9.7*	14.50	*21.5*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military
† Non-UL 1007

CSA CERTIFIED WIRE



Thermoplastic Insulation

Tinned Copper Stranded

Wires certified by the Canadian Standards Association for radio or electronic use. Case File No. LL-32511, LR-39099.

CSA-Certified

- **Type TEW Thermoplastic Equipment Wire**
- **105ºC, 600 Volt**
- **1/32" Vinyl Insulation**
- **Also certified as CSA Type TR-32 Radio Wire 90ºC, 600 Volt and AWM I A/B 105ºC, 600 Volt**

Meets UL AWM style 1015 and MIL-W-16878/3, except where noted.

Agency Voltage Rating	600 Volts
Factory Spark-Test Voltage	8000 VAC. 100% of all wire is tested at this voltage.
Insulation Breakdown Voltage	> 11000 volts, peak.
IR: Insulation Resistance, wet	> 2900 megohm/100 mtr, metal to water bath at +20ºC
Nominal Dielectric Constant value	4
Flame Properties	Self extinguishing. Meets UL VW-1
Fungus	Fungus resistant

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR		NOM. FIN. WIRE DIAM.		MAX. RESISTANCE (dc at 20º C) Ω /per		NOM. WT.	
				IN.	*mm*	IN.	*mm*	1000-ft	*Km*	LBS per 1000-ft	*Kg/Km*
24	N307-124U	1	24	.0201	*.511*	.082	*2.08*	27.20	*89*	4.2	*6.25*
24	N307-732U	7	32	.0204	*.610*	.086	*2.18*	26.20	*86*	4.0	*5.95*
24	N307-1936U	19	36	.0240	*.610*	.086	*2.18*	25.40	*83*	4.1	*6.10*
22	N307-122U	1	22	.0253	*.643*	.088	*2.24*	17.20	*56*	5.0	*7.44*
22	N307-730U	7	30	.0300	*.762*	.092	*2.34*	16.70	*55*	5.2	*7.74*
22	N307-1934U	19	34	.0300	*.762*	.092	*2.34*	15.90	*52*	5.3	*7.88*
20	N307-120U	1	20	.0320	*.813*	.094	*2.39*	10.70	*35*	6.8	*10.11*
20	N307-728U	7	28	.0380	*.965*	.100	*2.54*	10.40	*34*	7.3	*10.86*
20	N307-1030U*	10	30	.0380	*.965*	.100	*2.54*	11.80	*39*	7.4	*11.01*
20	N307-1932U	19	32	.0380	*.965*	.100	*2.54*	9.76	*32*	7.3	*10.86*
18	N307-118U	1	18	.0403	*1.02*	.102	*2.59*	6.78	*22*	9.3	*13.64*
18	N307-726U	7	26	.0480	*1.22*	.110	*2.79*	6.54	*21*	9.7	*14.43*
18	N307-1630U*	16	30	.0450	*1.22*	.107	*2.99*	6.48	*21*	9.8	*14.58*
18	N307-1930U	19	30	.0480	*1.22*	.110	*2.79*	6.22	*20*	10.0	*14.88*
16	N307-116U	1	16	.0508	*1.29*	.113	*2.87*	4.26	*14*	12.6	*18.75*
16	N307-2630U	26	30	.0550	*1.40*	.117	*2.97*	4.59	*15*	12.5	*18.60*
14	N307-114U*	1	14	.0641	*1.63*	.126	*3.20*	2.68	*9.0*	16.9	*25.15*
14	N307-4130U	41	30	.0710	*1.80*	.134	*3.40*	2.94	*9.7*	17.9	*26.64*
12	N307-6530U	65	30	.0890	*2.26*	.165	*4.19*	1.85	*6.1*	28.5	*42.41*
10	N307-1053U*	105	30	.1150	*2.92*	.179	*4.55*	0.98	*3.2*	41.5	*61.75*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

CSA CERTIFIED WIRE

Type TEW Thermoplastic Equipment Wire

RoHS COMPLIANT PRODUCTS:

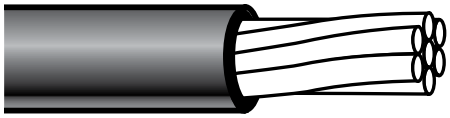
all RoHS products have the letter "R" written into the second position of the Part No.

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	*mm*	NOM. FIN. WIRE DIAM. IN.	*mm*	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	*Km*	NOM. WT. LBS per 1000-ft	*Kg/Km*
24	NR307-124U	1	24	.0201	*.511*	.082	*2.08*	27.20	*89*	4.2	*6.25*
24	NR307-732U	7	32	.0204	*.610*	.086	*2.18*	26.20	*86*	4.0	*5.95*
24	NR307-1936U	19	36	.0240	*.610*	.086	*2.18*	25.40	*83*	4.1	*6.10*
22	NR307-122U	1	22	.0253	*.643*	.088	*2.24*	17.20	*56*	5.0	*7.44*
22	NR307-730U	7	30	.0300	*.762*	.092	*2.34*	16.70	*55*	5.2	*7.74*
22	NR307-1934U	19	34	.0300	*.762*	.092	*2.34*	15.90	*52*	5.3	*7.88*
20	NR307-120U	1	20	.0320	*.813*	.094	*2.39*	10.70	*35*	6.8	*10.11*
20	NR307-728U	7	28	.0380	*.965*	.100	*2.54*	10.40	*34*	7.3	*10.86*
20	NR307-1030U*	10	30	.0380	*.965*	.100	*2.54*	11.80	*39*	7.4	*11.01*
20	NR307-1932U	19	32	.0380	*.965*	.100	*2.54*	9.76	*32*	7.3	*10.86*
18	NR307-118U	1	18	.0403	*1.02*	.102	*2.59*	6.78	*22*	9.3	*13.64*
18	NR307-726U	7	26	.0480	*1.22*	.110	*2.79*	6.54	*21*	9.7	*14.43*
18	NR307-1630U*	16	30	.0450	*1.22*	.107	*2.99*	6.48	*21*	9.8	*14.58*
18	NR307-1930U	19	30	.0480	*1.22*	.110	*2.79*	6.22	*20*	10.0	*14.88*
16	NR307-116U	1	16	.0508	*1.29*	.113	*2.87*	4.26	*14*	12.6	*18.75*
16	NR307-2630U	26	30	.0550	*1.40*	.117	*2.97*	4.59	*15*	12.5	*18.60*
14	NR307-114U*	1	14	.0641	*1.63*	.126	*3.20*	2.68	*9.0*	16.9	*25.15*
14	NR307-4130U	41	30	.0710	*1.80*	.134	*3.40*	2.94	*9.7*	17.9	*26.64*
12	NR307-6530U	65	30	.0890	*2.26*	.165	*4.19*	1.85	*6.1*	28.5	*42.41*
10	NR307-1053U*	105	30	.1150	*2.92*	.179	*4.55*	0.98	*3.2*	41.5	*61.75*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

* Non-Military

NABOND™ BONDED WIRE



Thermoplastic Insulation

Tinned Copper Stranded & Bonded

NABOND™ is a special bonding technique used on the tinned stranded copper conductors in an insulated wire.

Bonded Stranded Conductor

- **Forms just like a solid wire - no loose strands**
- **Absolutely smooth & round - NOT just a tin copper coating**
- **Conductor conforms to ASTM B470, Type II, "Light Bonding"**

The Nabond bonded strand can be used with almost any type of insulation

U.L. AWM STYLE 1061 WITH NABOND VW-1 RATED

ALSO AVAILABLE AS CSA T-2

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	NOM. DIAM. OF STRANDED CONDUCTOR mm	NOM. FIN. WIRE DIAM. IN.	NOM. FIN. WIRE DIAM. mm	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	MAX. RESISTANCE (dc at 20° C) Ω /per Km	NOM. WT. LBS per 1000-ft	NOM. WT. Kg/Km
26	N304-734UB	7	34	.019	*.483*	.039	*.991*	42.50	*140*	1.50	*2.23*
24	N304-732UB	7	32	.024	*.610*	.044	*1.12*	26.20	*86*	3.0	*4.46*
22	N304-730UB	7	30	.030	*.762*	.050	*1.27*	16.70	*55*	3.8	*5.65*
20	N304-728UB	7	28	.038	*.965*	.058	*1.47*	11.80	*39*	5.7	*8.48*
18	N304-1630UB	16	30	.048	*1.22*	.068	*1.73*	7.68	*25*	8.0	*11.9*

U.L. AWM STYLE 1007 WITH NABOND VW-1 RATED

ALSO AVAILABLE AS CSA TR-64

26	N303-734UB	7	34	.019	*.483*	.053	*1.35*	42.60	*140*	1.8	*2.68*
24	N303-732UB	7	32	.024	*.610*	.058	*1.47*	26.20	*86*	3.2	*4.76*
22	N303-730UB	7	30	.030	*.762*	.064	*1.63*	16.70	*55*	4.0	*5.95*
20	N303-728UB	7	28	.038	*.965*	.072	*1.83*	11.80	*39*	6.0	*8.93*
18	N303-1630UB	16	30	.048	*1.22*	.082	*2.08*	7.68	*25*	8.5	*12.70*

U.L. AWM STYLE 1015 WITH NABOND VW-1 RATED

ALSO AVAILABLE AS CSA TR-32 and TYPE TEW

26	N600-734UB	7	34	.019	*.483*	.081	*2.06*	42.50	*140*	3.7	*5.51*
24	N600-732UB	7	32	.024	*.610*	.086	*2.18*	26.20	*86*	5.3	*7.89*
22	N600-730UB	7	30	.030	*.762*	.092	*2.34*	16.70	*55*	6.3	*9.37*
20	N600-728UB	7	28	.038	*.965*	.100	*2.54*	11.80	*39*	8.5	*12.70*
18	N600-1630UB	16	30	.048	*1.22*	.110	*2.79*	7.68	*25*	11.3	*16.80*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

NABOND™ BONDED WIRE

RoHS COMPLIANT PRODUCTS: all RoHS products have the letter "R" written into the second position of the Part No.

U.L. AWM STYLE 1061 WITH NABOND VW-1 RATED

ALSO AVAILABLE AS CSA T-2

GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR IN.	mm	NOM. FIN. WIRE DIAM. IN.	mm	MAX. RESISTANCE (dc at 20° C) Ω /per 1000-ft	Km	NOM. WT. LBS per 1000-ft	Kg/Km
26	NR304-734UB	7	34	.019	*.483*	.039	*.991*	42.50	*140*	1.50	*2.23*
24	NR304-732UB	7	32	.024	*.610*	.044	*1.12*	26.20	*86*	3.0	*4.46*
22	NR304-730UB	7	30	.030	*.762*	.050	*1.27*	16.70	*55*	3.8	*5.65*
20	NR304-728UB	7	28	.038	*.965*	.058	*1.47*	11.80	*39*	5.7	*8.48*
18	NR304-1630UB	16	30	.048	*1.22*	.068	*1.73*	7.68	*25*	8.0	*11.9*

U.L. AWM STYLE 1007 WITH NABOND VW-1 RATED

ALSO AVAILABLE AS CSA TR-64

26	NR303-734UB	7	34	.019	*.483*	.053	*1.35*	42.60	*140*	1.8	*2.68*
24	NR303-732UB	7	32	.024	*.610*	.058	*1.47*	26.20	*86*	3.2	*4.76*
22	NR303-730UB	7	30	.030	*.762*	.064	*1.63*	16.70	*55*	4.0	*5.95*
20	NR303-728UB	7	28	.038	*.965*	.072	*1.83*	11.80	*39*	6.0	*8.93*
18	NR303-1630UB	16	30	.048	*1.22*	.082	*2.08*	7.68	*25*	8.5	*12.70*

U.L. AWM STYLE 1015 WITH NABOND VW-1 RATED

ALSO AVAILABLE AS CSA TR-32 and TYPE TEW

26	NR600-734UB	7	34	.019	*.483*	.081	*2.06*	42.50	*140*	3.7	*5.51*
24	NR600-732UB	7	32	.024	*.610*	.086	*2.18*	26.20	*86*	5.3	*7.89*
22	NR600-730UB	7	30	.030	*.762*	.092	*2.34*	16.70	*55*	6.3	*9.37*
20	NR600-728UB	7	28	.038	*.965*	.100	*2.54*	11.80	*39*	8.5	*12.70*
18	NR600-1630UB	16	30	.048	*1.22*	.110	*2.79*	7.68	*25*	11.3	*16.80*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

ASTM-B-33

Solid Tinned Copper Conductor

SIZES: All gauges, 30 through 12

Solid Tinned Copper

• Part Number
N1000-XX
XX = Gauge

Part No.	Gauge	Dia. (Inches)	Circular Mil Area	Pounds/MFT
N1000-30	30	.0100	101	.301
N1000-28	28	.0126	160	.484
N1000-26	26	.0159	254	.769
N1000-24	24	.0201	404	1.220
N1000-22	22	.0253	642	1.940
N1000-20	20	.0320	1020	3.090
N1000-18	18	.0403	1620	4.920
N1000-16	16	.0508	2580	7.820
N1000-14	14	.0641	4110	12.400
N1000-12	12	.0808	6530	19.800

HIGH-FLEX CONDUCTORS

National manufactures special high-flex insulated wires using an unusually large number of fine tinned copper single wires to form the stranded conductors.

The processes for forming the stranding are handled in a novel manner to provide low bending torque.

Additionally, the insulations are specially chosen for limp properties and are applied using methods to permit maximum flex life.

Some items are also agency-listed although slight sacrifice of limpness may occur due to the requirements of the listing agency as to insulation hardness and other properties.

The tables below list some of our regular high-flexibility conductor sizes. We provide many other wires on a custom order basis and are equipped to do small extrusion runs of special colors or diameters.

We also offer ultra-limp conductors in our custom cables.

GAUGE (AWG)	NUMBER OF STRANDS	NUMBER OF STRANDS	NOM. DIAM. OF CONDUCTOR		MAX. OHMS (dc at 20° C)		WEIGHT	
			IN.	*mm*	1000-ft	*Km*	LBS per 1000-ft	*Kg/Km*
24	41	40	.0245	*.622*	25.60	*84*	1.200	*1.79*
22	41	38	.0300	*.762*	18.93	*62*	2.800	*4.16*
20	41	36	.0380	*.965*	11.99	*39*	3.200	*4.76*
18	65	36	.0510	*1.30*	6.40	*21*	4.000	*5.95*
16	105	36	.0650	*1.65*	4.00	*13*	8.100	*12.05*

ASTM-B-33

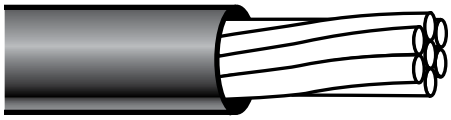
Solid Tinned Copper

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

Part No.	Gauge	Dia. (Inches)	Circular Mil Area	Pounds/MFT
NR1000-30	30	.0100	101	.301
NR1000-28	28	.0126	160	.484
NR1000-26	26	.0159	254	.769
NR1000-24	24	.0201	404	1.220
NR1000-22	22	.0253	642	1.940
NR1000-20	20	.0320	1020	3.090
NR1000-18	18	.0403	1620	4.920
NR1000-16	16	.0508	2580	7.820
NR1000-14	14	.0641	4110	12.400
NR1000-12	12	.0808	6530	19.800

SILICONE RUBBER LEADWIRE



Extruded Silicone Rubber Insulation

Tinned Copper Stranded

Recommended for internal use in television receivers or other uses where the acceptability has been determined by UL.

UL Style 3239

High Voltage

Stranded tin coated copper conductor insulated with extruded flame-retardant (VW-1) 150°C Silicone Rubber. Available in DC voltage ratings of 10, 20, 30, and 40KV. Non-UL grades with similar performance characteristics are available for general high voltage use.

CONDUCTOR						NOMINAL FINISHED DIAMETER							
GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR		10 KVDC .036 WALL		20 KVDC .045 WALL		30 KVDC .055 WALL		40 KVDC .090 WALL	
				IN.	*mm*	IN.	*mm*	IN.	*mm*	IN.	*mm*	IN.	*mm*
24	NHVSRXX0732	7	30	.024	*.610*	.099	*2.52*	.117	*2.97*	.137	3.48	.208	*5.28*
22	NHVSRXX0730	7	30	.030	*.762*	.109	*2.77*	.123	*3.12*	.143	3.63	.215	*5.46*
22	NHVSRXX1934	19	34	.030	*.762*	.109	*2.77*	.123	*3.12*	.143	3.63	.215	*5.46*
20	NHVSRXX1030	10	30	.038	*.965*	.112	*2.85*	.130	*3.30*	.150	3.81	.227	*5.77*
20	NHVSRXX1932	19	32	.038	*.965*	.112	*2.85*	.130	*3.30*	.150	3.81	.227	*5.77*
18	NHVSRXX1630	16	30	.045	*1.14*	.122	*3.10*	.141	*3.58*	.161	4.10	.232	*5.89*
16	NHVSRXX2630	26	30	.055	*1.40*	.137	*3.48*	.155	*3.94*	.175	4.45	.246	*6.25*
14	NHVSRXX4130	41	30	.077	*1.80*	.150	*3.81*	.168	*4.27*	.188	4.78	.250	*6.35*
12	NHVSRXX6530	65	30	.095	*2.41*	.170	*4.32*	.188	*4.78*	.210	5.33	.280	*7.11*
10	NHVSRXX6528	65	28	.119	*3.02*	.195	*4.95*	.215	*5.46*	.235	5.97	.305	*7.75*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

*Optional conductor considerations such as nickel or silver coated available subject to minimum quantities
XX Denotes voltage rating

SILICONE RUBBER LEADWIRE

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

CONDUCTOR				NOMINAL FINISHED DIAMETER									
GAUGE (AWG)	PART NO.	NUMBER OF STRANDS (AWG)	GAUGE OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR		10 KVDC .036 WALL		20 KVDC .045 WALL		30 KVDC .055 WALL		40 KVDC .090 WALL	
				IN.	*mm*	IN.	*mm*	IN.	*mm*	IN.	*mm*	IN.	*mm*
24	NRHVSRXX0732	7	30	.024	*.610*	.099	*2.52*	.117	*2.97*	.137	3.48	.208	*5.28*
22	NRHVSRXX0730	7	30	.030	*.762*	.109	*2.77*	.123	*3.12*	.143	3.63	.215	*5.46*
22	NRHVSRXX1934	19	34	.030	*.762*	.109	*2.77*	.123	*3.12*	.143	3.63	.215	*5.46*
20	NRHVSRXX1030	10	30	.038	*.965*	.112	*2.85*	.130	*3.30*	.150	3.81	.227	*5.77*
20	NRHVSRXX1932	19	32	.038	*.965*	.112	*2.85*	.130	*3.30*	.150	3.81	.227	*5.77*
18	NRHVSRXX1630	16	30	.045	*1.14*	.122	*3.10*	.141	*3.58*	.161	4.10	.232	*5.89*
16	NRHVSRXX2630	26	30	.055	*1.40*	.137	*3.48*	.155	*3.94*	.175	4.45	.246	*6.25*
14	NRHVSRXX4130	41	30	.077	*1.80*	.150	*3.81*	.168	*4.27*	.188	4.78	.250	*6.35*
12	NRHVSRXX6530	65	30	.095	*2.41*	.170	*4.32*	.188	*4.78*	.210	5.33	.280	*7.11*
10	NRHVSRXX6528	65	28	.119	*3.02*	.195	*4.95*	.215	*5.46*	.235	5.97	.305	*7.75*

Standard basic insulation color numbers are: Black: 0, Brown: 1, Red: 2, Orange: 3, Yellow: 4, Green: 5, Blue: 6, Violet: 7, Gray: 8, White: 9. The insulation color code number, may be 1, 2 or 3 digits depending on the number or absence of stripes. The 1st number is color of Insulation, 2nd number is color of first stripe; 3rd number is color of the second stripe. Example: White wire(9) + Red stripe(2) + Black stripe(0) makes a color code number of "9-2-0". That color number, "9-2-0" is appended to the part number. Sample part number might be "xxxxxx-xxx-9-2-0"

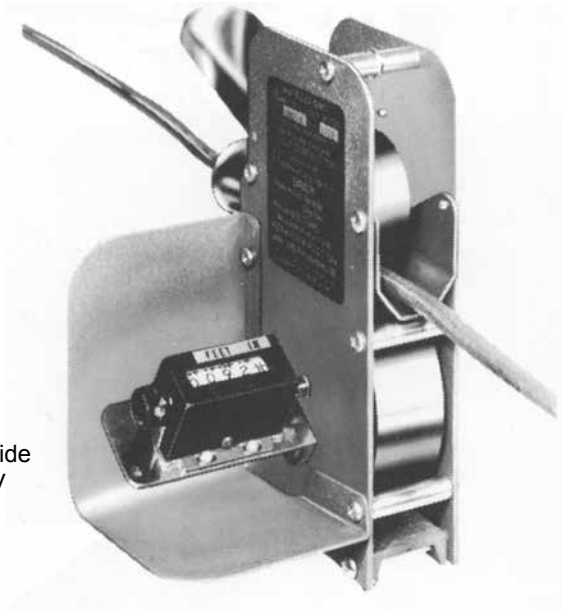
*Optional conductor considerations such as nickel or silver coated available subject to minimum quantities
XX Denotes voltage rating

Olympic® Instruments

National carries a full line of wire and cordage metering equipment. Contact us for a detailed separate brochure.

Wire Cordage and Length Meters

Manufactured by Olympic Instruments, Inc.
Vashon Washington, U.S.A.

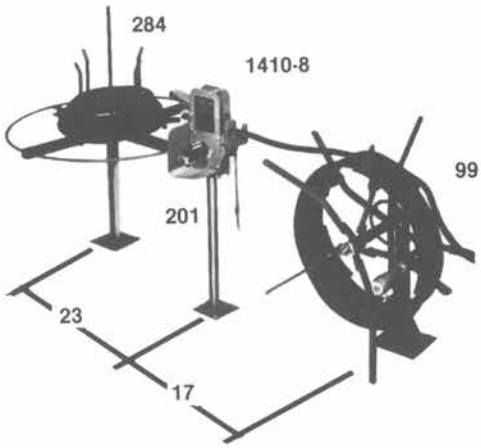


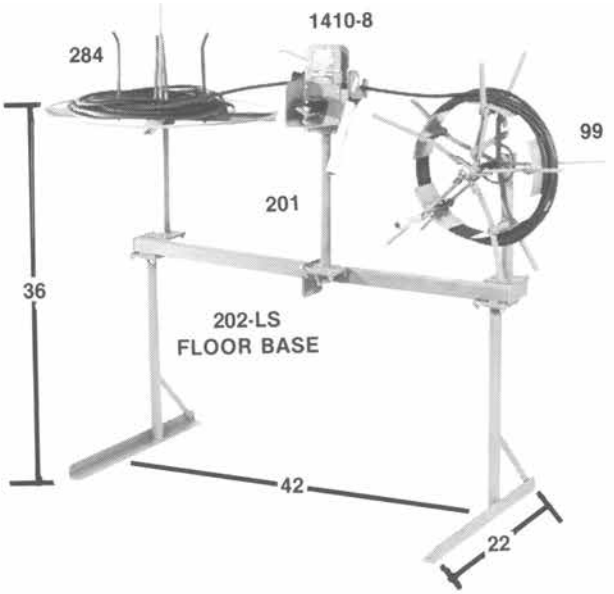
NO. 1410 OLYMPIC METER

Combines superior accuracy with the reading ease afforded by a Veeder-Root counter. Ideal for merchandising or rapid, repetitive measuring where fast, accurate delivery of a variety of materials is necessary. Quickly interchangeable guide tubes accommodate many hard to measure materials such as nylon fishing line, TV ribbon as well as wire and flexible electric cable. Numerals indicating length can be read from either side of the meter by customer or operator.
Approved by weights and Measures Authorities, U.S. and Canada.

SPECIFICATIONS:

Wire Measurer 1410 accommodates a wide variety of flexible materials from 1/16" (.4mm) to 7/8" (24mm) diameter. Measures wire rope and stiff materials to 1/2" (13mm) diameter. Quickly interchangeable Guide Tubes with I.D.'s of 1/4" (6.3mm) and 1" (25mm) afford accurate guiding of many hard-to-measure materials, Stainless and heat treated steels used for all shafts and surfaces subject to wear by materials passage. Digital counter indicates FEET and INCHES to 9,000' - 11" and continues, Subtracts, Resets to ZERO with one turn of Knob. Mechanical Cutter available (See Accessories) adds 2" (51mm) to width of Measurer. Order Stand or Bracket separately. (See Accessories). Optimum accuracy and convenience obtained with Measurer is used in complete SET.
Shipping weight is 5 lbs.





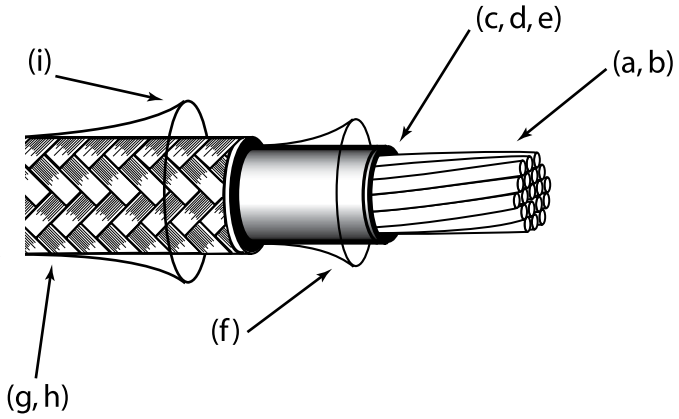
1-18 COUNTER SET

2-18 FLOOR SET

Illustrated above are two typical SET combinations of Olympic equipment. The compenents may be mounted on a counter top as shown at the left. the addition of the 202-LS Floor Base Adapter (shown at right) frees valuable counter space and creates a Set which may be portable or lagged down. requires only 2' x 5' of space. 202-LS also accommodates Light Duty components. Contact National Wire for other meters and accessories.

HOW TO SPECIFY WIRE

IF NOT IDENTIFIED BY THE MANUFACTURER'S PART NUMBER
WIRE IS SPECIFIED BY THE FOLLOWING CHARACTERISTICS:



a. Gauge (awg)
b. Standing (bare or tinned) Number of strands
c. Type of primary insulation material. PVC, Polytetrafluoroethylene (PTFE), etc.
d. Thickness of primary insulation or working voltage for which the wire is to be used.
e. Color or coding of primary insulation**
f. Type and thickness of covering over primary insulation when required (i.e., nylon)
g. Type of shielding, braided or foil, if required
h. If braided, shield strand size, % of coverage, bare or tinned wire strands
i Overall jacket material, temperature range, thickness, color**, marking or coding

HOW NATIONAL WIRE PART NUMBERS ARE DERIVED

EXAMPLE

N C 1936U 9 - 0 - 2

- 2 — RED TRACER
- 0 — BLACK TRACER
- 9 — INSULATION COLOR
- 1936U — CATALOG NO.

BASIC COLOR CODE

0 - Black	5 - Green
1 - Brown	6 - Blue
2 - Red	7 - Violet (Purple)
3 - Orange	8 - Slate (Grey)
4 - Yellow	9 - White

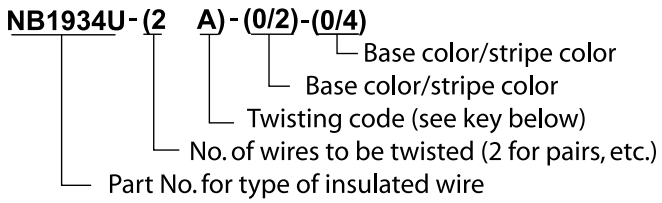
N..... stands for National Wire and Cable Corporation.
C..... stands for Type "C" (as previously referred to in the spec).
1936..... means 19 srands of #36 copper which is equivalent to 24 gauge
U..... means "uncovered." That is, no jacket over the primary insulation.
902..... refers to primary insulation base color and tracer colors as shown in the chart above. Tracers are numbered according to standard color code.

**Color limitation of tints is specified in MIL-STD-104, which comes supplied with a set of colored tabs for color comparison and identification.

HOW TO SPECIFY PAIRS

WE RECOMMEND THE FOLLOWING FORMAT WHEN SPECIFYING TWISTED PAIRS AND TRIOS:

EXAMPLE



Part No. (see “How to Specify Wire”, Page 20)

KEY TO TWISTING CODE

A = SHORT TWINNER LAY
B = STANDARD TWINNER LAY
C = SHORT PLANETARY LAY
D = STANDARD PLANETRY LAY

THE “SHORT” LAY IS DEFINED AS EQUAL TO 5 X D X N AND THE “STANDARD” LAY IS DEFINED AS 10 X D X N WHERE D = CONDUCTOR DIAMETER, N = NO. OF CONDUCTORS

DIFFERENCES IN PAIR TWISTING

THE MOST COMMON COMMERCIAL PAIR-FORMING MACHINES ARE CALLED “TWINNERS.” THIS TYPE OF PAIR-FORMING IS THE LEAST EXPENSIVE WAY TO FROM TWISTED PAIRS. HOWEVER, PAIRS FORMED ON THIS TYPE OF EQUIPMENT HAVE BEEN KNOWN TO EXPERIENCE DEFORMATION OF THE STRANDED COPPER, STRAIN IN THE INSULATION AND POOR ELECTRICAL BALANCE.

THE SUPERIOR METHOD OF PAIR-FORMING IS BY USE OF A PLANETARY OR TUBULAR CABLING MACHINE IN SUCH A MANNER THAT NO RESIDUAL TWIST IS IMPARTED TO THE INDIVIDUAL WIRES FORMING THE TWISTED GROUP. THIS RESULTS IN BETTER ELECTRICAL BALANCE AND IMPROVES FLEXIBILITY.

NATIONAL IS EQUIPPED FOR ALL OF THE ABOVE DESCRIBED TECHNIQUES. CHOOSE THE METHOD BEST SUITED FOR YOUR PARTICULR APPLICATION.

National Wire & Cable
Custom Cable Manufacturing

Geophysical Cables Catalog

Visit us online at:
www.NationalWire.com

GEOPHYSICAL CABLES

National Wire & Cable has decades of real-world experience designing and manufacturing the toughest, most dependable geophysical cables in the world. Our engineers have the technical knowledge to deliver cable that meets or exceeds your specifications no matter how harsh the environment.

CAPABILITIES

Cable Design
* Any mix of: insulated copper wires
* coax
* twisted pairs
* subcables
* optical fibers
* Tubing, hose, tension members metal or synthetic
* Jacket-embedded braid for crush/cut resistance

Conductor Wires
* Any mix of: Regular annealed copper
* High-strength copper-alloys
* Copper-jacketed steel
* Extra-high strand counts

Wire Insulation
* Polypropylene
* HDPE
* LDPE
* Tefzel®
* TFE Polytetrafluoroethylene (PTFE)
* FEP Polytetrafluoroethylene (PTFE)
* PFA Polytetrafluoroethylene (PTFE)
* PVC
* RoHS-compliant-PVC
* Silicone
* Polyurethane
* Polyolefin
* TPR®
* TPE
* cross-linked XLPE
* XLPVC
* Double-insulated wires a specialty.
* Wet-immersion-tested insulations
* High IR insulations
* Striped or number-printed insulation

RFI-Shielding
* Braided wire shields
* one or more layers
* over wires
* cabled wire-bundle.
* In copper
* tinned copper
* silver-plated copper
* nickel-plated copper
* Conetic alloys
* Foil Shields with drain wire
* Using Alum./Polyester
* Copper/Polyester
* Copper foil
* Conetic
* Fernetic magnetic foils
* Combinations of the above layers to reduce EMP effects.

Cable Jackets
* Polyurethane
* HDPE
* LDPE
* PVC
* Hytrel
* TPR®
* TPE
* RoHS-compliant PVC
* Belted (fully pressure-filled round) cable jackets
* Jackets with embedded re-enforcing braid for cut/crush resistance.
* Double-Layer-Bonded Jackets. Multi-colored.
* Ribbed or Splined jacket outer surface.
* National's "Easy-Drag" splined-surface cable jackets a specialty.

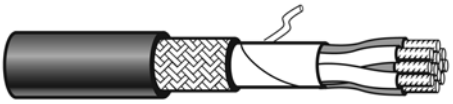
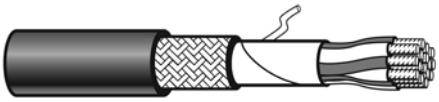
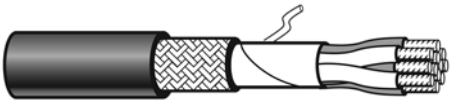
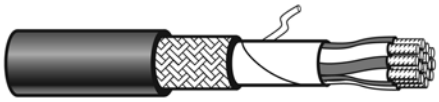
Cable-Forming
* Many cablers, of many sizes
* Planetary cable forming
* Unilay single-direction forming, all layers
* Planetary cable forming
* Contra-helical alternating direction each layer
* Specialty: Patented close-balance pair twisting for digital signaling.
* Pair, Trio, Quad, Quint, Sub-cabling for maximized flexing lifetime.

Cable-Interstice-Filling
* Vistanex®
* WaterGard®
* DPR,
* SecretSauce.

GEOPHYSICAL CABLES
TABLE OF CONTENTS

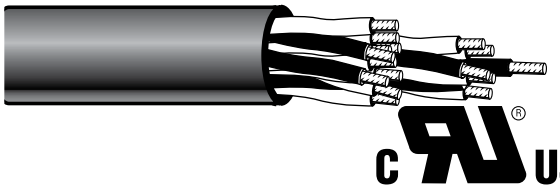
GEOPHYSICAL CABLE
ROUGH USAGE CABLES

CABLE CLASS DESCRIPTIONS FOR
- Electronic Multi-conductor Instrumentation Cables
- Special-Purpose Oil Rig Cables
- Seismic-Search Cables
- Water & Oil Resistant Cables

Annealed Tinned Copper	Call 323-225-5611 for gauge sizes and conductor counts	
800 Series: Tough	Conductors are stranded tinned copper; Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	
820 Series: Tension Member	Same as 800 Series, + Central Kevlar Tension Member. Conductors are stranded tinned copper; Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	
840 Series: Tough + Tension Member + Waterblock	Same as 820 Series, + waterblocking gel. Conductors are stranded tinned copper; Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	
860 Series: Tough + Tension Member + Waterblock + Reinforced jkt	Same as 840 Series, + Reinforcing braid between bonded 2-layer PU jacket. Highly cut-resistant and torque-resistant. Conductors are stranded tinned copper; Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	
Ultra High-Strength Cables with high-strength alloy copper conductors	Call 323-225-5611 for gauge sizes and conductor counts	
900 Series: Tough + High-strength metal	Conductors are stranded high-strength alloy copper, Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	
920 Series: Tough + High-strength metal + Tension Member	Same as 900 Series, + Central Kevlar Tension Member. Conductors are stranded high-strength alloy copper, Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	
940 Series: Tough + High-strength metal + Tension Member + Waterblock	Same as 920 Series, + Central Kevlar Tension Member + waterblocking gel. Conductors are stranded high-strength alloy copper, Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	
960 Series: Tough + High-strength metal + Tension Member + Waterblock + Reinforced jkt	Same as 940 Series, + Central Kevlar Tension Member + Filled with waterblocking gel + Cut-resistant and torque-resistant reinforcing braid between bonded 2-layer PU jacket. Conductors are stranded high-strength alloy copper, Polypropylene-insulated, helically cable-formed, Polyurethane outer jacket. Very flexible.	

NV & NVP CABLES

Suitable for Rough Usage - 20 AWG



- **AWM Style 20233**
- **80ºC, 300 Volt, VW-1**
- **CSA AWM *II* A/B, 80ºC, 300 V, FT-1**

National Wire & Cable Corporation manufactures a family of highly flexible miniature **rough-usage** low-voltage instrument control cable. These are available as cabled pairs or singles, with optional overall shield of foil with drain wire.

Conductors are stranded tinned copper with .011" wall of super-tough extruded polypropylene primary insulation, having excellent electrical properties. Wires are color coded using ten std. colors + stripes. The color table for cabled twisted pairs can be viewed in the National Wire Cable Designers Guide, page 7-13.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier tape under braids, if used.

Shielded cables have 100% coverage aluminum-foil shield in contact with a stranded drain wire for easy termination. Optional tinned copper braid of >90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback is available on special order.

Outer jacket is highly flexible poly-ether-urethane thermoplastic, very resistant to oils, fuels, flame, and UV. Polyurethane is noted for outstanding resistance to scuffing and tearing.

Standard cable has super-durable black polyurethane jacket, or may be supplied with blue outer jacket for use in "Intrinsically Safe" applications. (Ref. National Electric Code, Chapter 5, Section 504.)

Finished cable meets the UL Vertical Flame Test type VW-1 and CSA FT-1 flame test.

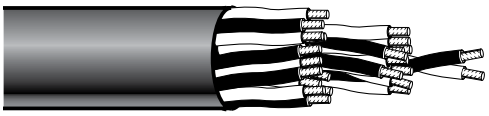
Finished cable is UL Recognized and meets all requirements of Appliance Wiring Material Style 20233 wich bears the agency intended-use of "External connection of electronic equipment."

Widely used for molded-connector assemblies due to uniform controlled diameter. All cables bear printed marks for UL rated voltage (300 V.), temperature (+80ºC), and flame resistance (UL VW-1). **Available in other conductor counts, sizes, stranding, from 28 AWG through 10 AWG, and mixed AWG. Please consult factory.**

Property	Technical Data for 20 AWG
Agency Cable Style	UL AWM Style 20233
Agency voltage rating	300 Volts
Agency temperature rating	+80ºC.
Agency Flame Rating	UL VW-1 and also Canadian CSA FT-1
Factory HiPot test volts	1500 VAC each conductor to all others & shield, connected in common.
Factory spark test (dry) individual wires	100 % of all wire passes 3400 VAC "spark test" before processing.
Cold Bending	Passes cold bend (180º over 2x mandrel) at -20ºC. Storage OK at -40ºC.
Conductor Resistance, single, not pair	9.5 ohms per 1000 feet; (3.1 ohms per 100 meter) (20 awg)
Conductor Resistance, single, in a pair	10 ohms per 1000 feet; (3.3 ohms per 100 meter) (20 awg)
Wire Insulation Resistance (IR)	3,000 megohms per 100 meters, from one conductor to all else in common + shield, nom.
Jacket Insulation Resistance (Wet IR)	100 megohm per 100 meters from conductor group + shield to water bath electrode, nom.
Jacket Capacitance (Fully immersed)	95 nFd per 100 meters from wires & shield, grouped, to bath electrode.
Capacitance , one wire to group + shield	17 nFd per 100 meters @ 1000 Hz, nominal (20 awg)
Pair Capacitance wire-wire	9.7 nFd per 100 meters @ 1000 Hz, nominal (20 awg)
Pair Inductance, 2-wire Loop	.064 milli-Henry per 100 meters @ 1000 Hz, nominal. (20 awg)
Pair Impedance, wire-wire	90 ohm diff. impedance, for pairs, nominal (20 awg)
Single conductor Inductance	3.33 milli-Henry per 100 m, end-to-end, @ 1000 Hz. nominal. (20 awg)

NV FAMILY OF CABLED SINGLE WIRES

UNSHIELDED CABLED SINGLE WIRES						20 AWG OVERALL FOIL-SHIELDED OVER CABLED SINGLE WIRES				
Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km		Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km
NV220J	2	20(19)	.184 | 4.7	16 | 24		NV220FSJ	2	20(19)	.186 | 4.7	20 | 30
NV320J	3	20(19)	.193 | 4.9	21 | 31		NV320FSJ	3	20(19)	.195 | 5.0	25 | 37
NV420J	4	20(19)	.207 | 5.3	26 | 39		NV420FSJ	4	20(19)	.209 | 5.3	30 | 45
NV520J	5	20(19)	.225 | 5.7	31 | 47		NV520FSJ	5	20(19)	.227 | 5.8	35 | 52
NV620J	6	20(19)	.242 | 6.1	37 | 55		NV620FSJ	6	20(19)	.244 | 6.2	40 | 60
NV920J	9	20(19)	.300 | 7.6	53 | 79		NV920FSJ	9	20(19)	.302 | 7.7	57 | 84
NV1220J	12	20(19)	.309 | 7.9	67 | 99		NV1220FSJ	12	20(19)	.311 | 7.9	71 | 105



NVP FAMILY OF CABLED TWISTED PAIRS

UNSHIELDED CABLED PAIRS						20 AWG OVERALL FOIL-SHIELDED OVER CABLED PAIRS				
Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km		Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km
NVP220J	2	20(19)	.261 | 6.7	20 | 30		NVP220FSJ	2	20(19)	.263 | 6.8	24 | 36
NVP320J	3	20(19)	.277 | 7.1	26 | 38		NVP320FSJ	3	20(19)	.279 | 7.2	29 | 44
NVP420J	4	20(19)	.301 | 7.9	31 | 47		NVP420FSJ	4	20(19)	.303 | 8.0	35 | 53
NVP520J	5	20(19)	.330 | 8.8	37 | 56		NVP520FSJ	5	20(19)	.332 | 8.8	41 | 62
NVP620J	6	20(19)	.360 | 9.7	43 | 65		NVP620FSJ	6	20(19)	.362 | 9.7	47 | 71
NVP920J	9	20(19)	.458 | 11.2	62 | 93		NVP920FSJ	9	20(19)	.460 | 11.2	66 | 99
NVP1220J	12	20(19)	.474 | 12.1	77 | 115		NVP1220FSJ	12	20(19)	.476 | 12.2	81 | 121

NV & NVP CABLES

Suitable for Rough Usage - 20 AWG

AWM Style 20233

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

NV FAMILY OF CABLED SINGLE WIRES

UNSHIELDED CABLED SINGLE WIRES						20 AWG OVERALL FOIL-SHIELDED OVER CABLED SINGLE WIRES				
Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km		Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km
NRV220J	2	20(19)	.184 | 4.7	16 | 24		NRV220FSJ	2	20(19)	.186 | 4.7	20 | 30
NRV320J	3	20(19)	.193 | 4.9	21 | 31		NRV320FSJ	3	20(19)	.195 | 5.0	25 | 37
NRV420J	4	20(19)	.207 | 5.3	26 | 39		NRV420FSJ	4	20(19)	.209 | 5.3	30 | 45
NRV520J	5	20(19)	.225 | 5.7	31 | 47		NRV520FSJ	5	20(19)	.227 | 5.8	35 | 52
NRV620J	6	20(19)	.242 | 6.1	37 | 55		NRV620FSJ	6	20(19)	.244 | 6.2	40 | 60
NRV920J	9	20(19)	.300 | 7.6	53 | 79		NRV920FSJ	9	20(19)	.302 | 7.7	57 | 84
NRV1220J	12	20(19)	.309 | 7.9	67 | 99		NRV1220FSJ	12	20(19)	.311 | 7.9	71 | 105

NVP FAMILY OF CABLED TWISTED PAIRS

UNSHIELDED CABLED PAIRS						20 AWG OVERALL FOIL-SHIELDED OVER CABLED PAIRS				
Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km		Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight Lb/M | kg/km
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NRVP1220J	12	20(19)	.474 | 12.1	77 | 115		NRVP1220FSJ	12	20(19)	.476 | 12.2	81 | 121

GEOPHYSICAL CABLE
BOTTOM TELEMETRY

D-2436 TWINAX (Bottom Telemetry): shielded twisted pair cables with 135-ohm controlled impedance, for digital signal use, one of our specialties: National is recognized in the seismic industry for our trouble-free D2436/D2440 Twinax using our proprietary “Self-Healing Dielectric” in our “Industry Standard Twinax” widely used to carry digital telemetry in ocean-bottom seismic-search cables.

(NWC: Dynatronic Cable Engineering Division)
Technical Data on Seismic Digital Telemetry Data Twinax Type D-2436-X
Qualified for use with the Sercel/Syntron “Syntrak” system bottom cables

MECHANICAL		
Jacket Material:	Polyethylene	Polyethylene
Diameter over jacket:	0.370 inch, nom.	9.4 mm
Temperature Range:	-50 °C to + 80 °C	-50 °C to + 80 °C
Suggested Min. Bend radius:	6 x Cable diameter	6 x Cable durchmesser
Weight (Dry, in air):	74 pounds/1000 feet	110. KG/KM
ELECTRICAL		
Characteristic Impedance:	135 Ohms	135 Ohms
Capacitance:	13.6 Picofarads/ Foot	44.6 Picofarads/ Meter
RF Loss at 20. Mhz:	1.35 db/100 feet	4.42 db/100 Meter
High Voltage Tested at:	5000 VAC 60 Hz	5000 VAC 60 Hz

Notes:
1- Every length is RF sweep-tested to verify performance. A RF Loss plot is provided with each length.
2- All product goes through our proprietary “Normalization” process.
3- All materials are essentially unaffected by immersion in Vistanex.
4- Colors: This cable product is available with a choice of colors for the outer jacket.
The part number to specify a given color is shown below.

Part No.	Jacket Color	Pair Color
D2436-5	Green	Green, Paired with Natural Trans.
D2436-6	Blue	Green, Paired with Natural Trans.

GEOPHYSICAL CABLE
STREAMER CABLE TELEMETRY

D-2520 Preferred Seismic Towed Streamer Telemetry Twisted Pair (unshielded):
D-2520 Streamer Telemetry pair presents a low-loss 135-ohm impedance when oil-immersed in Kerosene, or Niroma. This product has been tested and qualified for use with Sercel/Syntron digital marine repeaters. Widely used in US-made original-equipment towed streamer cables. A preferred rugged replacement telemetry pair for use with Sercel/Syntron digital marine repeaters.

(NWC: Dynatronic Cable Engineering Division)
Technical Data on Seismic Digital Telemetry Data Twinax Type D-2520-X
Qualified for use with the Sercel/Syntron "Syntrak" system steamer cables

MECHANICAL		
Outer Covering:	Free-flooding braid	Free-flooding braid
Insulation Type:	Modified Polyolefin	Modified Polyolefin
Diameter over cover:	0.272 inch, nom.	6.9 mm
Temperature Range:	-50.°C. to + 80.°C	-50.°C. to + 80.°C
Weight (Dry, in air):	17. pounds/1000 feet	25.3 KG/KM
Installation Tension per wire:	16. pounds suggested max	7.3 KG suggested max.
ELECTRICAL		
Characteristic Impedance:	135 Ohms	135 Ohms
Capacitance in air, reeled:	12.1 Picofarads/ Foot	39.7 Picofarads/ Meter
RF Loss at 20. Mhz, dry:	-1.25 db/100 feet	-4.1 db/100 Meter
High Voltage Tested at:	5000 VAC 60 Hz	5000 VAC 60 Hz

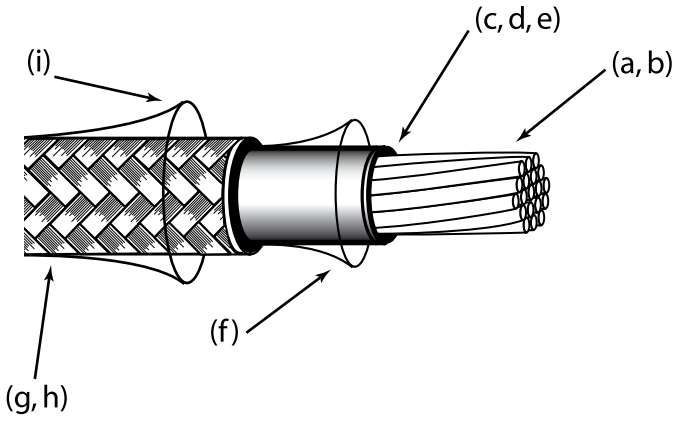
Notes:
1- Every length is RF sweep-tested to verify performance. A RF Loss plot is provided with each length.
2- All cable goes through our proprietary "Normalization" process. OK in Niroma, Isopar M, Streamer 9
3-Color Code: This cable is available with a choice of colors for the two paired wires. The part number suffix (-X) shown below is used to specify a given color combination. Colors will be pastel.

Pair Color	Part Dash #
Natural Trans. Paired with Black:	-0
Natural Trans. Paired with Brown:	-1
Natural Trans. Paired with Red:	-2
Natural Trans. Paired with Orange:	-3
Natural Trans. Paired with Yellow:	-4

Pair Color	Part Dash #
Natural Trans. Paired with Green:	-5
Natural Trans. Paired with Blue:	-6
Natural Trans. Paired with Violet:	-7
Natural Trans. Paired with Gray:	-8
Natural Trans. Paired with White:	-9

HOW TO SPECIFY WIRE

IF NOT IDENTIFIED BY THE MANUFACTURER'S PART NUMBER
WIRE IS SPECIFIED BY THE FOLLOWING CHARACTERISTICS:



a. Gauge (awg)
b. Standing (bare or tinned) Number of strands
c. Type of primary insulation material. PVC, Polytetrafluoroethylene (PTFE), etc.
d. Thickness of primary insulation or working voltage for which the wire is to be used.
e. Color or coding of primary insulation**
f. Type and thickness of covering over primary insulation when required (i.e., nylon)
g. Type of shielding, braided or foil, if required
h. If braided, shield strand size, % of coverage, bare or tinned wire strands
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HOW NATIONAL WIRE PART NUMBERS ARE DERIVED

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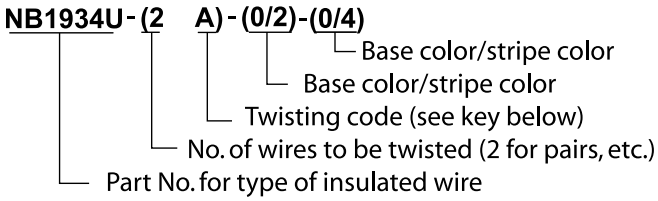

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DIFFERENCES IN PAIR TWISTING

THE MOST COMMON COMMERCIAL PAIR-FORMING MACHINES ARE CALLED “TWINNERS.” THIS TYPE OF PAIR-FORMING IS THE LEAST EXPENSIVE WAY TO FROM TWISTED PAIRS. HOWEVER, PAIRS FORMED ON THIS TYPE OF EQUIPMENT HAVE BEEN KNOWN TO EXPERIENCE DEFORMATION OF THE STRANDED COPPER, STRAIN IN THE INSULATION AND POOR ELECTRICAL BALANCE.

THE SUPERIOR METHOD OF PAIR-FORMING IS BY USE OF A PLANETARY OR TUBULAR CABLING MACHINE IN SUCH A MANNER THAT NO RESIDUAL TWIST IS IMPARTED TO THE INDIVIDUAL WIRES FORMING THE TWISTED GROUP. THIS RESULTS IN BETTER ELECTRICAL BALANCE AND IMPROVES FLEXIBILITY.

NATIONAL IS EQUIPPED FOR ALL OF THE ABOVE DESCRIBED TECHNIQUES. CHOOSE THE METHOD BEST SUITED FOR YOUR PARTICULR APPLICATION.

National Wire & Cable
Custom Cable Manufacturing

Shielded & Coaxial Cable Catalog

Visit us online at:
www.NationalWire.com

SHIELDED CABLE
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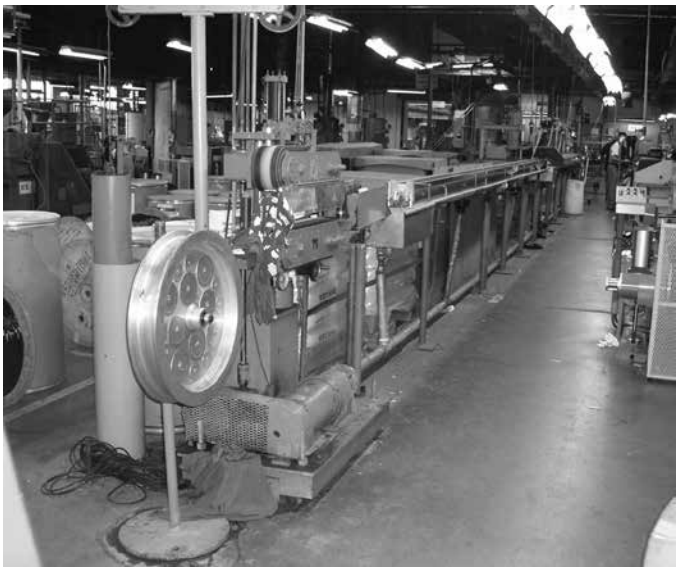
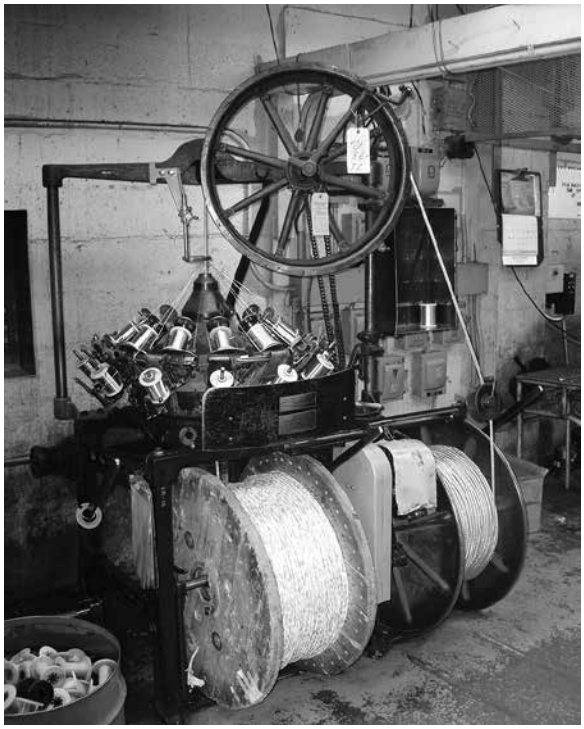


WIRE EXTRUSION

JACKET EXTRUSION

CABLING

SHIELDING



SHIELDED INSTRUMENT CABLE

MIL-C-27072

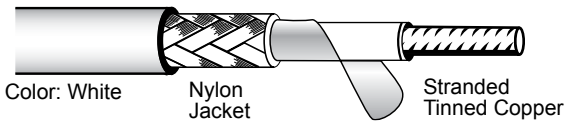
National Wire & Cable Corp. manufactures a line of shielded instrument cables for MILITARY and UL applications.

All insulated wires use double-insulated (ie: Nylon-armored over PVC vinyl primary insulation) stranded tinned copper wires per MIL-W-16878/17. (BN) All 19 strand. Shields are full Military 90% min. coverage tinned copper braid.Overall sheath is tough, flexible white PVC compound.

Meets MIL-C-27072 as subcable.**(105°C, 600 volt)
Standard putups: 500 & 1000 ft. on no-deposit reels. Special lengths to order.
**Using type I wire, shielded, with Class B jacket

TECHNICAL SPECIFICATIONS	
Military:	600 VAC Working
UL Agency:	300 VAC Working
Spark Test:	Passes 3400 VAC Stress on every wire.
Hipot Test:	Passes 1500 VAC as finished cable.
Puncture:	Nominal 5000 VAC as insulated.
Temp:	Military: working -40°C to +105°C UL Agency: working -40°C to +80°C
Cold Bend:	Cables can be formed into a circle diameter of 6 cable diameters to temperatures as low as -20°C. Recommended flex diameters should be greater than 20 cables diameters for bending at -40°C.
Leakage:	200 megohms/1000 feet min. @ 500 VDC from any conductor to all else in cable.(@25°C)
Capacitance	See tables below

NOTE: Can be supplied cabled into highly flexible multicables with overall shield and sheath. See our type NTS/NTP cable families. Meets MIL-W-16878/17 UL Style 1004 for 80ºC Service, and UL Style 1005 for 90ºC Service, except where noted.



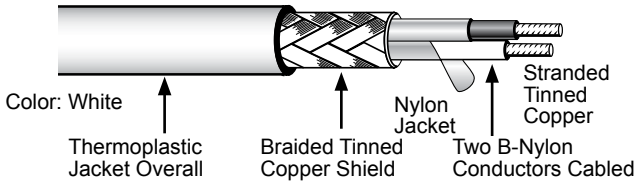
SINGLE CONDUCTOR SHIELDED AND JACKETED

- **-54ºC to +105ºC**
- **600 Volts (Working)**

The color table for single conductors can be viewed in the National Wire Cable Designers Guide, page 7-12.

CONDUCTOR INSULATION COLOR: WHITE

GAUGE OF CONDUCTORS	PART NO.	NUMBER OF STRANDS PER COND.	GAUGE OF STRANDS	O/A DIAM. OF STRANDED CONDUCTOR IN.	O/A DIAM. OF STRANDED CONDUCTOR mm	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE- WIRE pt/FT	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE-SHIELD pt/FT	NOM. WT. LBS per 1000-ft	NOM. WT. Kg/Km
26	NB1938N1SJ	19	38	.087	2.21	-	65.1	6.2	9.2
24	NB1936N1SJ	19	36	.097	2.46	-	74.8	8.1	12.1
22	NB1934N1SJ	19	34	.110	2.79	-	82.8	9.6	14.3
20	NB1932N1SJ	19	32	.120	3.05	-	101.0	15.1	22.5
18	NB1930N1SJ	19	30	.123	3.12	-	115.0	15.1	22.5
16	NB1929N1SJ	19	29	.134	3.40	-	123.0	18.0	26.8



TWO CONDUCTOR, TWISTED SHIELDED AND JACKETED

- **-54ºC to +105ºC**
- **600 Volts (Working)**

CONDUCTOR INSULATION COLORS: BLACK & WHITE or RED & BLUE

GAUGE OF CONDUCTORS	PART NO.	NUMBER OF STRANDS PER COND.	GAUGE OF STRANDS	O/A DIAM. OF STRANDED CONDUCTOR IN.	O/A DIAM. OF STRANDED CONDUCTOR mm	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE- WIRE pt/FT	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE-SHIELD pt/FT	NOM. WT. LBS per 1000-ft	NOM. WT. Kg/Km
26	NB1938N2SJ	19	38	.150	3.81	31.2	56.9	14.	20.8
24	NB1936N2SJ	19	36	.155	3.94	35.9	65.5	18.	26.8
22	NB1934N2SJ	19	34	.170	4.32	39.7	72.4	21.	31.2
20	NB1932N2SJ	19	32	.190	4.83	48.5	88.4	27.	40.2
18	NB1930N2SJ	19	30	.215	5.46	55.1	101.0	32.	47.6
16	NB1929N2SJ	19	29	.235	5.99	59.0	123.0	35.	52.1

*Note: Other conductor combinations available on request

SHIELDED INSTRUMENT CABLE

MIL-C-27072

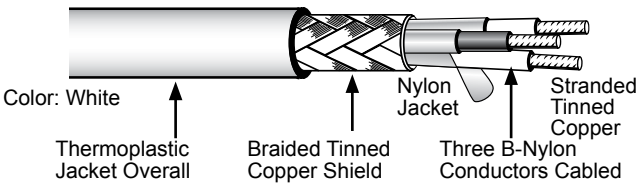
National Wire & Cable Corp. manufactures a line of shielded instrument cables for MILITARY and UL applications.

All insulated wires use double-insulated (ie: Nylon-armored over PVC vinyl primary insulation) stranded tinned copper wires per MIL-W-16878/17. (BN) All 19 strand. Shields are full Military 90% min. coverage tinned copper braid.Overall sheath is tough, flexible white PVC compound.

Meets MIL-C-27072 as subcable.**(105°C, 600 volt)
Standard putups: 500 & 1000 ft. on no-deposit reels. Special lengths to order.
**Using type I wire, shielded, with Class B jacket

TECHNICAL SPECIFICATIONS	
Military:	600 VAC Working
UL Agency:	300 VAC Working
Spark Test:	Passes 3400 VAC Stress on every wire.
Hipot Test:	Passes 1500 VAC as finished cable.
Puncture:	Nominal 5000 VAC as insulated.
Temp:	Military: working -40°C to +105°C UL Agency: working -40°C to +80°C
Cold Bend:	Cables can be formed into a circle diameter of 6 cable diameters to temperatures as low as -20°C. Recommended flex diameters should be greater than 20 cables diameters for bending at -40°C.
Leakage:	200 megohms/1000 feet min. @ 500 VDC from any conductor to all else in cable.(@25°C). 10 megohms/1000 feet @ 500 vdc from overall shield through sheath to water bath. (@25°C)
Capacitance	See tables below

NOTE: Can be supplied cabled into highly flexible multicables with overall shield and sheath. See our type NTT/NTQ cable families.

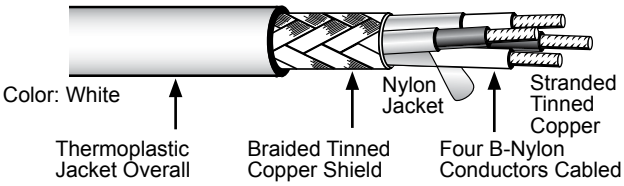


THREE CONDUCTOR SHIELDED AND JACKETED

- **-54ºC to +105ºC**
- **600 Volts (Working)**

CONDUCTOR INSULATION COLOR: WHITE

GAUGE OF CONDUCTORS	PART NO.	NUMBER OF STRANDS PER COND.	GAUGE OF STRANDS	O/A DIAM. OF STRANDED CONDUCTOR IN.	O/A DIAM. OF STRANDED CONDUCTOR mm	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE- WIRE pt/FT	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE-SHIELD pt/FT	NOM. WT. LBS per 1000-ft	NOM. WT. Kg/Km
26	NB1938N3SJ	19	38	.154	3.91	29.6	53.3	16.2	24.1
24	NB1936N3SJ	19	36	.165	4.19	34.0	61.4	21.0	31.2
22	NB1934N3SJ	19	34	.178	4.52	37.7	67.9	23.3	34.7
20	NB1932N3SJ	19	32	.199	5.05	46.0	82.8	29.8	44.3
18	NB1930N3SJ	19	30	.229	5.82	52.3	94.2	39.5	58.8
16	NB1929N3SJ	19	29	.254	6.45	55.9	101.0	48.0	71.4



FOUR CONDUCTOR SHIELDED AND JACKETED

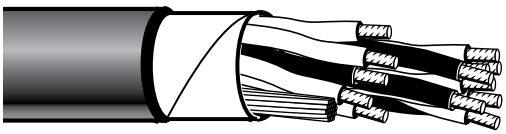
- **-54ºC to +105ºC**
- **600 Volts (Working)**

CONDUCTOR INSULATION COLORS: BLACK, WHITE RED, GREEN

GAUGE OF CONDUCTORS	PART NO.	NUMBER OF STRANDS PER COND.	GAUGE OF STRANDS	O/A DIAM. OF STRANDED CONDUCTOR IN.	O/A DIAM. OF STRANDED CONDUCTOR mm	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE- WIRE pt/FT	NOMINAL VALUES OF CAPACITANCE PER FOOT WIRE-SHIELD pt/FT	NOM. WT. LBS per 1000-ft	NOM. WT. Kg/Km
26	NB1938N4SJ	19	38	.166	4.22	27.3	54.0	19.0	28.3
24	NB1936N4SJ	19	36	.178	4.52	31.4	62.1	22.2	33.0
22	NB1934N4SJ	19	34	.195	4.95	34.8	68.7	28.0	41.7
20	NB1932N4SJ	19	32	.211	5.36	42.4	83.9	35.7	53.1
18	NB1930N4SJ	19	30	.240	6.10	48.2	95.4	48.1	71.6
16	NB1929N4SJ	19	29	.262	6.65	51.6	102.0	58.4	86.6

*Note: Other conductor combinations available on request

DIGITAL DATA TRANSMISSION CABLES



Low Voltage Computer Cable

• D-200 Series are multi-pair cables of 110-ohm twisted pairs, group shielded
• UL AWM Style 2835 60ºC, 30 volt

Meets E.I.A. Standards RS-422, RS-423, RS-485

THE D-200 SERIES CABLE ARE MULTIPLE-PAIR FLEXIBLE CABLES DESIGNED FOR TRANSMISSION OF DIGITAL PULSE SIGNALS.

DESIGN FEATURES OF THE D-200 SERIES DIGITAL DATA CABLE
Unlike conventional flexible cable construction, the primary features offered by the D-200 series data cable are the high and accurately controlled characteristic impedance of every pair, regardless of its position in the cable and special geometry chosen to reduce crosstalk.

ADVANTAGES
1. Less Crosstalk and noise from mismatches due to consistent impedance along the cable.
2. Special geometry and pair construciton provide exceptionally uniform capacitance between pair wires, reducing crosstalk.

STANDARD DATA CABLE CONSTRUCTIONS

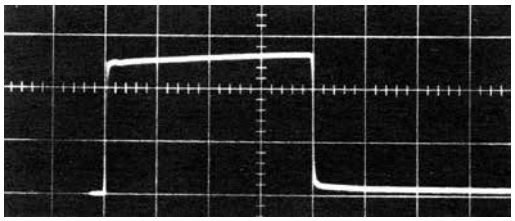
BLACK JACKET	GREY JACKET	NO. OF PAIRS	COND.AWG.	DELAY NS/FT	CABLE DIAMETER		WEIGHT	
					Inches	MM	Lbs per 1000 ft.	Kg/Km
D-200-4	D-200-4G	4	24	1.61	.315"	8.00	41.	61.0
D-200-7	D-200-7G	7	24	1.61	.410"	10.41	73.	109.0
D-200-12	D-200-12G	12	24	1.61	.455"	11.56	96.	143.0
D-200-15	D-200-15G	15	24	1.61	.510"	12.95	120.	179.0
D-200-20	D-200-20G	20	24	1.61	.635"	16.13	160.	238.0
D-200-24	D-200-24G	24	24	1.61	.660"	16.76	180.	268.0
D-200-27	D-200-27G	27	24	1.61	.690"	17.53	210.	312.0
D-200-30	D-200-30G	30	24	1.61	.710"	18.03	230.	342.0
D-200-33	D-200-33G	33	24	1.61	.750"	19.05	250.	372.
D-200-42	D-200-42G	42	24	1.61	.840"	21.34	280.	417.0
D-200-50	D-200-50G	50	24	1.61	.910"	23.10	320.	476.0

TECHNICAL DATA

Characteristic	Balanced**	Single-endedΔ
Characteristic Impedance	110. ohms ±5%	78. ohms ± 4%
Capacitance	14. pf/ft (46. PF/MTR)	21. pf/ft (68.9 PF/MTR)
Signal Delay	1.61 ns/ft (5.28 NS/MTR)	1.61 ns/ft (5.28 NS/MTR)
DC Resistance/100 ft.	5.6 ohms loop	2.8 ohms
Insulation Breakdown	6. KV min. DC	6. KV min DC
Insulation Resistance	>1000. megohms/M'	>1000. megohms/M'
Temperature Range	-20°C up to +80°C (60°C for U.L.)	
Min. Bend Radius	6 x cable diameter	

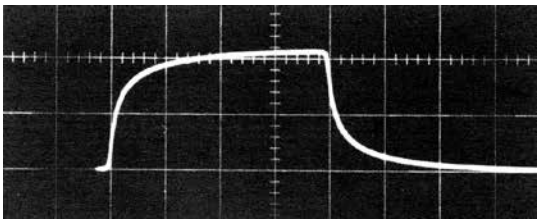
The Photos below (for a 1.25 megabit clock rate) show typical waveforms.

INPUT PULSE



Horizontal: 200. ns/cm
Vertical: 2 volts/cm

OUTPUT PULSE at 500 FT.

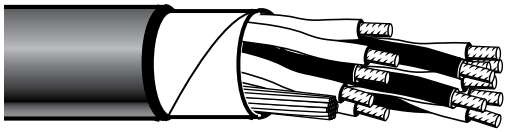


Horizontal: 200. ns/cm
Vertical: 2 volts/cm

Pulse transmission loss in data cables causes a moderate amplitude loss, with definite rounding of the leading and trailing edges. We recommend the use of differential (balanced) pair drivers and differential-input pair receivers for lowest crosstalk and best pulse shape. Where the system uses differential (balanced) drive and receive, all D-200 pairs exhibit 110-ohm characteristic impedance. Where the system uses single ended (unbalanced) drive and receive, all D-200 pairs exhibit 78-ohm impedance. Since these line receivers cannot discriminate between noise and the desired signal, crosstalk may limit the cable length over which transmission is reliable. Although the use of balanced drive and differential line reception will avoid most noise problems, there can be installations where the expected external noise is unknown but assumed to be very great. Here the use of data cables having individually-shielded pairs may be considered as conservative engineering practice. The assurance of a lower received noise may justify the increased size and cost.

The D-210 series cables (using individual shields over pairs) are recommended for high noise or long run application. See the following page.

DIGITAL DATA TRANSMISSION CABLES



Low Voltage Computer Cable

- **D-210 Series**
- **UL AWM Style 2835**

Characteristic	Balanced**	Single-ended
Impedance	110. ohms ±10%	63. ohms ± 7%
Capacitance	14. pf/ft (46. pf/mtr)	23. pf/ft (68.9 pf/mtr)
Signal Delay	1.61 ns/ft (5.28 ns/mtr)	1.61 ns/ft (5.28 ns/mtr)
DC Resistance/100 ft.	5.6 ohms loop	5.6 ohms loop
Insulation Breakdown	6. KV DC	6. KV DC
Insulation Resistance	>1000. megohms/1000 ft	>1000. megohms/1000 ft
Temperature Range	-20°C up to +75°C (+60°C for U.L. 2835)	
Min. Bend Radius	9 x cable diameter	

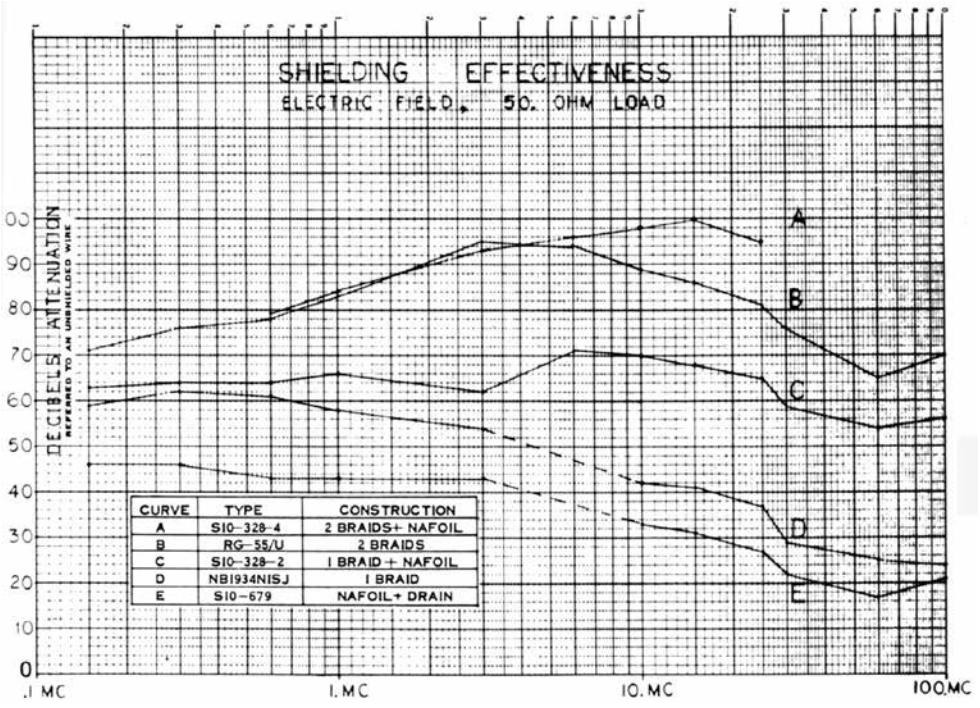
Cabled multiple D-210 individually shielded & jacketed 110-ohm pairs						
Part No.	**No. of Pairs**	**Cond. AWG /Strand**	**Diameter Inches**	**Diameter mm**	**O'all TC Braid Shield**	**O' all Sheath**
D-210-1	1	24(7)	.220	5.6	NO	PVC
D-210-12	12	24(7)	.980	24.9	NO	PVC
D-210-15	15	24(7)	1.06	26.9	NO	PVC
D-210-20	20	24 (7)	1.20	30.5	NO	PVC
D-210-1-RF	1	24(7)	.240	6.1	YES	PVC
D-210-12-RF	12	24(7)	1.01	25.7	YES	PVC
D-210-15-RF	15	24(7)	1.09	27.7	YES	PVC
D-210-20-RF	20	24 (7)	1.23	31.2	YES	PVC

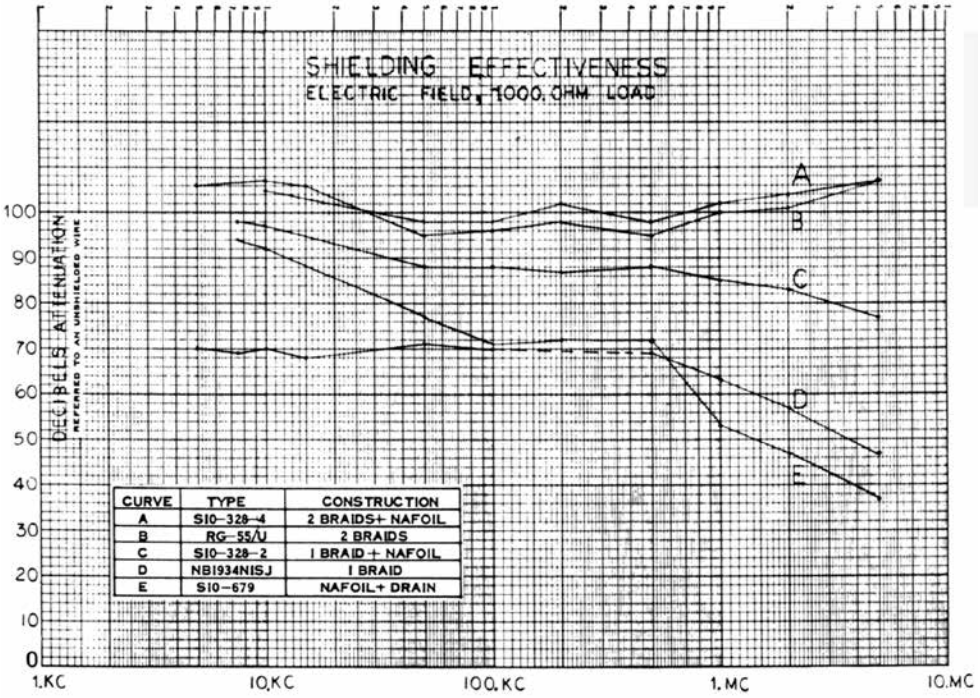
Individual pairs are identified by use of a colored spiral stripe on the white PVC jacket. All pairs have one green wire and one white (natural) wire. Pair insulation is polyethylene.

For high-noise and long run applications, National has developed the D-210 series individually-shielded & jacketed 110-ohm data pair cables. Pair shields are aluminum-polyester foil with drain wire.

An additional overall isolated tinned-copper shield braid may be specified by the suffix-RF on the part number.

SHIELD EFFECTIVENESS





NOTE:
The zero db. Reference Level is the field from the unshielded wire.

These graphs are of test measurements made on various shielded wires. They are intended to assist the designer in the proper choice of shielding for various applications.

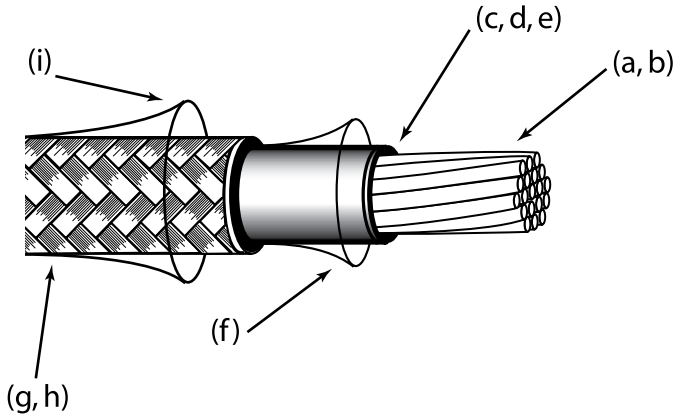
the data is obviously not offered as being an absolute measurement of shield performance. It may be noted that the graphs include irregularities which are due to variations in equipment calibration. However, for comparative performance of one shielding method over another, the information may be of value.

The performance of a NAFOIL shield over a conventional braided shield below 100 KC may be noted in the calibration high impedance load.

Contact National Wire & cable engineering department for information concerning your chielding problems.

HOW TO SPECIFY WIRE

IF NOT IDENTIFIED BY THE MANUFACTURER'S PART NUMBER
WIRE IS SPECIFIED BY THE FOLLOWING CHARACTERISTICS:



a. Gauge (awg)
b. Standing (bare or tinned) Number of strands
c. Type of primary insulation material. PVC, Polytetrafluoroethylene (PTFE), etc.
d. Thickness of primary insulation or working voltage for which the wire is to be used.
e. Color or coding of primary insulation**
f. Type and thickness of covering over primary insulation when required (i.e., nylon)
g. Type of shielding, braided or foil, if required
h. If braided, shield strand size, % of coverage, bare or tinned wire strands
i Overall jacket material, temperature range, thickness, color**, marking or coding

HOW NATIONAL WIRE PART NUMBERS ARE DERIVED

EXAMPLE

N C 1936U 9 - 0 - 2

- 2 — RED TRACER
- 0 — BLACK TRACER
- 9 — INSULATION COLOR
- 1936U — CATALOG NO.

BASIC COLOR CODE

0 - Black	5 - Green
1 - Brown	6 - Blue
2 - Red	7 - Violet (Purple)
3 - Orange	8 - Slate (Grey)
4 - Yellow	9 - White

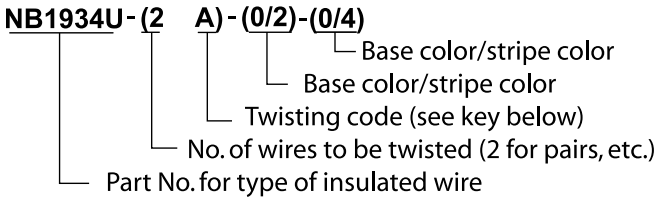
N..... stands for National Wire and Cable Corporation.
C..... stands for Type "C" (as previously referred to in the spec).
1936..... means 19 srands of #36 copper which is equivalent to 24 gauge
U..... means "uncovered." That is, no jacket over the primary insulation.
902..... refers to primary insulation base color and tracer colors as shown in the chart above. Tracers are numbered according to standard color code.

**Color limitation of tints is specified in MIL-STD-104, which comes supplied with a set of colored tabs for color comparison and identification.

HOW TO SPECIFY PAIRS

WE RECOMMEND THE FOLLOWING FORMAT WHEN SPECIFYING TWISTED PAIRS AND TRIOS:

EXAMPLE



Part No. (see “How to Specify Wire”, Page 12)

KEY TO TWISTING CODE

A = SHORT TWINNER LAY
B = STANDARD TWINNER LAY
C = SHORT PLANETARY LAY
D = STANDARD PLANETRY LAY

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THE SUPERIOR METHOD OF PAIR-FORMING IS BY USE OF A PLANETARY OR TUBULAR CABLING MACHINE IN SUCH A MANNER THAT NO RESIDUAL TWIST IS IMPARTED TO THE INDIVIDUAL WIRES FORMING THE TWISTED GROUP. THIS RESULTS IN BETTER ELECTRICAL BALANCE AND IMPROVES FLEXIBILITY.

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Multi-Conductor Cables Catalog

Visit us online at:
www.NationalWire.com

CUSTOM-MADE & MULTICONDUCTOR CABLES

COMPLETE WIRE AND CABLE FACILITIES TO MEET YOUR NEEDS

If the standard cables shown on the following pages do not meet your application requirements, Custom-Made Cables to your own applications are available promptly -- and at lower cost than you may suppose.

We invite your inquiries on fiber optic cables. National Wire & Cable can manufacture multi-color fiber optic cables as well as hybrid cables consisting of fiber and copper conductors.

BECAUSE NATIONAL HAS:

1. The organization & experience to handle short-runs or rush schedules with consistent quality.

2. All types of mill machinery for fabricating cable and all intermediate operations.

3. An enormous wire inventory to draw from for material for your cable. Over 160 million feet in stock.

4. Technical consultants to aid you in properly specifying your cable needs.

DESIGNERS: May We Suggest

A. See section 7 (Cable Designers Guide) for technical details regarding custom cables.

B. Call our engineering department (323-225-5611) and discuss your needs with our technical consultants They will speak your language and may have just the answers you need.

C. Our consultants will assist you in design, obtain cost and delivery information, provide quotations and drawings and assist with sales & procurement liaison.

D. On most custom cables, we can print your company name and part number at regular intervals on the outside jacket at no extra cost. This will make your packaging truly “Custom.”

E. Custom color your outer jacket to match your equipment.

Multiconductor Cables
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CABLES, MULTICONDUCTOR, SIGNAL & CONTROL (2 TO 120 COND)
UL/AWM, SUITABLE FOR ANALOG & DIGITAL APPLICATIONS

CABLES, SHIELDED SIGNAL & CONTROL, FULL MILITARY MIL-C-27072 + UL RECOGNIZED
-40C TO +105ºC 600 VOLT. ALL MEMBERS HAVE INDIVIDUAL PVC JACKETS

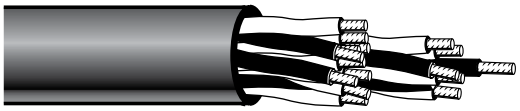
UNDERWRITERS-RECOGNIZED MULTI-CONDUCTOR BUSINESS MACHINE AND COMPUTER CONTROL CABLE

UL STYLE #	U.L. RATING		U.L.	WIRE INSULATION TYPE	SIZE RANGE (AWG)	CONSTRUCTION
	Voltage	Temp°C	Intended Use			
1503	150	80	1	.010" PVC	26-20	Shielded and jacketed single, like coax
1533	-	80	1	.009" PVC	30-16	Double shielded, double jacketed single, like triax
1185	300	80	2	.009" PVC	30-16	Shielded single
2547	300 **	80	1	.009" PVC	30-16	2x3 conductor flexible jacketed cable per UL 62 for Flexible Cord and Fixture Wires, shield optional
1777	300	80	4	.009" PVC	30-16	Multi-conductor flexible jacketed cable per UL 62 Flexible Cord ad Fixture Wires, shield optional
2343	same as wire ins.	80	4	Any AWM 300 or 600 volt	30 AWG min.	Multi-conductor flexible jacketed cable. shield optional, body OD to 700"; .060" jkt
2344	same as wire ins.	80	4	Any AWM 300 or 600 volt	30 AWG min.	Multi-conductor flexible jacketed cable, shield optional, body OD .701 to 1.5", with .080" jkt wall
2384-2388	30	60	5	Any AWM	40 AWG min.	Multi-conductor, flexible low voltage, jacketed cable, shield optional. Jacket wall depends on cable diameter and style.
2464	300	60	6	Any AWM for 80C or better	30 AWG min.	Multi-conductor flexible jacketed cable, shield optional. Body OD less than .700" allows .031" jkt wall .701" to 1.5" - .080" wall
2560	30	60	7	Any AWM	40 AWG min.	Multi-conductor flexible low voltage jacketed cable, shield optional. Body OD up to .425" requires .035" min jkt wall.
2448	30	60	5	Not Specified	40 AWG min.	Multi-conductor flexible low voltage jacketed cable, shield optional. Body OD up to .425" requires .035" min jkt wall. Jkt UL ID printing is required.
2835	30	60	8	Not Specified	40 AWG min.	Multi-conductor flexible low voltage jacketed cable, shield optional. Body OD up to .425" requires .035" min jkt wall.
20197	30	60	9	36-16 AWG	.010"PP insulation .035" PU jkt.	Straight or coiled cable
2661	300	105	10	+105oC rated PVC, .010" wall	40 AWG minimum, to 6 AWG, solid or stranded	Multi-conductor flexible PVC-jacketed cable. Shield optional.
20233	300	80	10	Polypropylene is standard on .010" wall, or any AWM rated for 300V, 80°C.	36 AWG minimum, solid or stranded	Multi-conductor flexible cable with tough **PU-jacket**. Shield optional. Low weight. Suitable for Rough Usage.

Abbreviations: AWM is UL's 'Appliance Wiring Material", "PVC" is Polyvinylchloride, "PP" is Polypropylene, "PU" is Polyurethane.
(**300 Volt as produced by NWC)Multi-conductor flexible low voltage jacketed cable, shield optional. Body OD up to .425" requires .035" min jkt wall.

UL "INTENDED USE" STATEMENTS FOR EACH UL STYLE	
1	"Internal wiring of electronic equipment where not exposed to movement or mechanical abuse."
2	"Internal wiring of appliances and electronic equipment."
3	"External or internal wiring of electrical equipment."
4	"External interconnection of computers and electronic equipment."
5	"As internal wiring or external interconnection in Class II circuits of electronic equipment."
6	"Internal wiring or external interconnection of electronic equipment (such as desk-type calculators, dictating machines or x-ray equipment."
7	"Interconnecting cable for use with EDP equipment where terminated in connectors and located entirely exterior tot he equipment, Class II wiring systems only."
8	"Internal wiring in Class II circuits of electronic equipment where each end is terminated in connectors. Or CABLES using 30 mils or greater jacket thickness only: External interconnection or internal wiring in Class II circuits of electronic equipment where each end is terminated in connectors."
9	"For internal or external interconnection of electronic equipment."
10	"External interconnection of electronic equipment"

CABLED SINGLE CONDUCTORS



NQ SERIES

- Single Conductors
- Mil Spec, U.L. AWM

Recognized Style 2464 and CSA Certified AWM *II* A/B

GRAY PVC JACKET

National Wire & Cable Corporation manufactures a complete line of highly flexible micro-miniature low-voltage instrument control cable .These are available as cabled pairs or singles, with optional overall shield of either foil with drain or a braided shield.

Conductors are stranded tinned copper with .010" wall of tough extruded polyvinyl chloride primary insulation, rated for 300 volt use at +80°C under U.L. style 1061*. All are color coded using ten standard colors plus white with stripes per MIL-STD-681. View Color Table in the National Wire Cable Designers Guide, page 7-13.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier under braids. Shielded cables have a tinned copper braid of 90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback; or have 100% coverage foil shield in intimate contact with a drain wire for easy termination.

The outer jacket is highly flexible abrasion-resistant gray polyvinyl chloride thermoplastic, meeting the requirements of U.L. style 2464. The jacket material is military rated for 105°C; meets MIL-I-631, Type F. Meets EIA for RS-232, 18-24 gauges.

Military certification furnished only when requested.
All materials are flame retardant and fungus resistant. Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

*Wire also meets MIL-W-16878, rated 600 volts, +105°C.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 3400 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 pf/ft at 1 kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500 VDC form conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500 VDC from shield or conductor group through sheath to ground.
Temperature Range:	U.L. rating: +80°C per U.L. style 2464. Military: Continuous use from -40°C to +105°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult the factory.
Foil Shielded Cables:	The nominal over-all diameter of foil shielded cables will be .006" greater than the non-shielded cables of the same conductor count and wire size.
Characteristic Impedance (NQP Paired Cables)	Ranges from 150 ohms to 45 ohms, dependent on wire size (AWG), geometry and drive method. Consult our technical staff for data on specific cable types.

MULTI-CONDUCTOR STOCK CABLED SINGLES

Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

NQ SERIES UNSHIELDED - 28 and 26 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NQ-228J	2	28	.035	*.9*	.032	*.8*	.138	*3.5*	8	*12*
NQ-328J	3	28	.035	*.9*	.032	*.8*	.144	*3.6*	10	*14*
NQ-428J	4	28	.035	*.9*	.032	*.8*	.152	*3.9*	11	*17*
NQ-528J	5	28	.035	*.9*	.032	*.8*	.163	*4.1*	13	*19*
NQ-628J	6	28	.035	*.9*	.032	*.8*	.173	*4.4*	14	*21*
NQ-728J	7	28	.035	*.9*	.032	*.8*	.173	*4.4*	15	*23*
NQ-828J	8	28	.035	*.9*	.032	*.8*	.198	*5.0*	18	*27*
NQ-928J	9	28	.035	*.9*	.032	*.8*	.208	*5.3*	20	*29*
NQ-1028J	10	28	.035	*.9*	.032	*.8*	.208	*5.3*	21	*31*
NQ-1228J	12	28	.035	*.9*	.032	*.8*	.214	*5.4*	23	*34*
NQ-1528J	15	28	.035	*.9*	.032	*.8*	.233	*5.9*	27	*40*
NQ-1928J	19	28	.035	*.9*	.032	*.8*	.243	*6.2*	32	*47*
NQ-2728J	27	28	.035	*.9*	.032	*.8*	.284	*7.2*	42	*63*
NQ-3728J	37	28	.035	*.9*	.032	*.8*	.313	*8.0*	54	*81*
NQ-226J	2	26	.039	*1.0*	.032	*.8*	.146	*3.7*	10	*14*
NQ-326J	3	26	.039	*1.0*	.032	*.8*	.152	*3.9*	11	*17*
NQ-426J	4	26	.039	*1.0*	.032	*.8*	.162	*4.1*	13	*20*
NQ-526J	5	26	.039	*1.0*	.032	*.8*	.173	*4.4*	15	*23*
NQ-626J	6	26	.039	*1.0*	.032	*.8*	.185	*4.7*	18	*26*
NQ-726J	7	26	.039	*1.0*	.032	*.8*	.185	*4.7*	19	*28*
NQ-826J	8	26	.039	*1.0*	.032	*.8*	.212	*5.4*	22	*33*
NQ-926J	9	26	.039	*1.0*	.032	*.8*	.224	*5.7*	24	*36*
NQ-1026J	10	26	.039	*1.0*	.032	*.8*	.224	*5.7*	25	*38*
NQ-1226J	12	26	.039	*1.0*	.032	*.8*	.230	*5.8*	29	*43*
NQ-1526J	15	26	.039	*1.0*	.032	*.8*	.251	*6.4*	34	*51*
NQ-1926J	19	26	.039	*1.0*	.032	*.8*	.263	*6.7*	40	*60*
NQ-2726J	27	26	.039	*1.0*	.032	*.8*	.308	*7.8*	54	*81*
NQ-3726J	37	26	.039	*1.0*	.032	*.8*	.341	*8.7*	71	*105*
NQ-4826J	48	26	.039	*1.0*	.032	*.8*	.039	*9.8*	89	*132*

NQ SERIES OVERALL BRAIDED SHIELD - 28 and 26 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NQ-228SJ	2	28	.035	*.9*	.032	*.8*	.158	*4.0*	15	*22*
NQ-328SJ	3	28	.035	*.9*	.032	*.8*	.164	*4.2*	16	*24*
NQ-428SJ	4	28	.035	*.9*	.032	*.8*	.172	*4.4*	18	*27*
NQ-528SJ	5	28	.035	*.9*	.032	*.8*	.183	*4.6*	21	*31*
NQ-628SJ	6	28	.035	*.9*	.032	*.8*	.193	*4.9*	23	*34*
NQ-728SJ	7	28	.035	*.9*	.032	*.8*	.193	*4.9*	24	*36*
NQ-828SJ	8	28	.035	*.9*	.032	*.8*	.218	*5.5*	28	*42*
NQ-928SJ	9	28	.035	*.9*	.032	*.8*	.228	*5.8*	31	*45*
NQ-1028SJ	10	28	.035	*.9*	.032	*.8*	.228	*5.8*	32	*47*
NQ-1228SJ	12	28	.035	*.9*	.032	*.8*	.234	*5.9*	34	*51*
NQ-1528SJ	15	28	.035	*.9*	.032	*.8*	.253	*6.4*	40	*59*
NQ-1928SJ	19	28	.035	*.9*	.032	*.8*	.263	*6.7*	45	*67*
NQ-2728SJ	27	28	.035	*.9*	.032	*.8*	.304	*7.7*	50	*87*
NQ-3728SJ	37	28	.035	*.9*	.032	*.8*	.333	*8.5*	72	*108*
NQ-226SJ	2	26	.039	*1.0*	.032	*.8*	.166	*4.2*	16	*24*
NQ-326SJ	3	26	.039	*1.0*	.032	*.8*	.172	*4.4*	19	*28*
NQ-426SJ	4	26	.039	*1.0*	.032	*.8*	.182	*4.6*	21	*32*
NQ-526SJ	5	26	.039	*1.0*	.032	*.8*	.193	*4.9*	24	*36*
NQ-626SJ	6	26	.039	*1.0*	.032	*.8*	.205	*5.2*	27	*40*
NQ-726SJ	7	26	.039	*1.0*	.032	*.8*	.205	*5.2*	28	*42*
NQ-826SJ	8	26	.039	*1.0*	.032	*.8*	.232	*5.9*	33	*50*
NQ-926SJ	9	26	.039	*1.0*	.032	*.8*	.244	*6.2*	36	*54*
NQ-1026SJ	10	26	.039	*1.0*	.032	*.8*	.244	*6.2*	38	*56*
NQ-1226SJ	12	26	.039	*1.0*	.032	*.8*	.250	*6.4*	41	*61*
NQ-1526SJ	15	26	.039	*1.0*	.032	*.8*	.271	*6.9*	48	*72*
NQ-1926SJ	19	26	.039	*1.0*	.032	*.8*	.283	*7.2*	55	*82*
NQ-2726SJ	27	26	.039	*1.0*	.032	*.8*	.320	*8.3*	72	*108*
NQ-3726SJ	37	26	.039	*1.0*	.032	*.8*	.361	*9.2*	91	*135*
NQ-4826SJ	48	26	.039	*1.0*	.032	*.8*	.409	*10.4*	120	*179*

CABLED SINGLE CONDUCTORS - NQ series

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

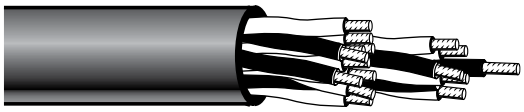
NRQ SERIES UNSHIELDED - 28 and 26 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NRQ-228J	2	28	.035	*.9*	.032	*.8*	.138	*3.5*	8	*12*
NRQ-328J	3	28	.035	*.9*	.032	*.8*	.144	*3.6*	10	*14*
NRQ-428J	4	28	.035	*.9*	.032	*.8*	.152	*3.9*	11	*17*
NRQ-528J	5	28	.035	*.9*	.032	*.8*	.163	*4.1*	13	*19*
NRQ-628J	6	28	.035	*.9*	.032	*.8*	.173	*4.4*	14	*21*
NRQ-728J	7	28	.035	*.9*	.032	*.8*	.173	*4.4*	15	*23*
NRQ-828J	8	28	.035	*.9*	.032	*.8*	.198	*5.0*	18	*27*
NRQ-928J	9	28	.035	*.9*	.032	*.8*	.208	*5.3*	20	*29*
NRQ-1028J	10	28	.035	*.9*	.032	*.8*	.208	*5.3*	21	*31*
NRQ-1228J	12	28	.035	*.9*	.032	*.8*	.214	*5.4*	23	*34*
NRQ-1528J	15	28	.035	*.9*	.032	*.8*	.233	*5.9*	27	*40*
NRQ-1928J	19	28	.035	*.9*	.032	*.8*	.243	*6.2*	32	*47*
NRQ-2728J	27	28	.035	*.9*	.032	*.8*	.284	*7.2*	42	*63*
NRQ-3728J	37	28	.035	*.9*	.032	*.8*	.313	*8.0*	54	*81*
NRQ-226J	2	26	.039	*1.0*	.032	*.8*	.146	*3.7*	10	*14*
NRQ-326J	3	26	.039	*1.0*	.032	*.8*	.152	*3.9*	11	*17*
NRQ-426J	4	26	.039	*1.0*	.032	*.8*	.162	*4.1*	13	*20*
NRQ-526J	5	26	.039	*1.0*	.032	*.8*	.173	*4.4*	15	*23*
NRQ-626J	6	26	.039	*1.0*	.032	*.8*	.185	*4.7*	18	*26*
NRQ-726J	7	26	.039	*1.0*	.032	*.8*	.185	*4.7*	19	*28*
NRQ-826J	8	26	.039	*1.0*	.032	*.8*	.212	*5.4*	22	*33*
NRQ-926J	9	26	.039	*1.0*	.032	*.8*	.224	*5.7*	24	*36*
NRQ-1026J	10	26	.039	*1.0*	.032	*.8*	.224	*5.7*	25	*38*
NRQ-1226J	12	26	.039	*1.0*	.032	*.8*	.230	*5.8*	29	*43*
NRQ-1526J	15	26	.039	*1.0*	.032	*.8*	.251	*6.4*	34	*51*
NRQ-1926J	19	26	.039	*1.0*	.032	*.8*	.263	*6.7*	40	*60*
NRQ-2726J	27	26	.039	*1.0*	.032	*.8*	.308	*7.8*	54	*81*
NRQ-3726J	37	26	.039	*1.0*	.032	*.8*	.341	*8.7*	71	*105*
NRQ-4826J	48	26	.039	*1.0*	.032	*.8*	.039	*9.8*	89	*132*

NRQ SERIES OVERALL BRAIDED SHIELD - 28 and 26 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NRQ-228SJ	2	28	.035	*.9*	.032	*.8*	.158	*4.0*	15	*22*
NRQ-328SJ	3	28	.035	*.9*	.032	*.8*	.164	*4.2*	16	*24*
NRQ-428SJ	4	28	.035	*.9*	.032	*.8*	.172	*4.4*	18	*27*
NRQ-528SJ	5	28	.035	*.9*	.032	*.8*	.183	*4.6*	21	*31*
NRQ-628SJ	6	28	.035	*.9*	.032	*.8*	.193	*4.9*	23	*34*
NRQ-728SJ	7	28	.035	*.9*	.032	*.8*	.193	*4.9*	24	*36*
NRQ-828SJ	8	28	.035	*.9*	.032	*.8*	.218	*5.5*	28	*42*
NRQ-928SJ	9	28	.035	*.9*	.032	*.8*	.228	*5.8*	31	*45*
NRQ1028SJ	10	28	.035	*.9*	.032	*.8*	.228	*5.8*	32	*47*
NRQ1228SJ	12	28	.035	*.9*	.032	*.8*	.234	*5.9*	34	*51*
NRQ1528SJ	15	28	.035	*.9*	.032	*.8*	.253	*6.4*	40	*59*
NRQ1928SJ	19	28	.035	*.9*	.032	*.8*	.263	*6.7*	45	*67*
NRQ2728SJ	27	28	.035	*.9*	.032	*.8*	.304	*7.7*	50	*87*
NRQ3728SJ	37	28	.035	*.9*	.032	*.8*	.333	*8.5*	72	*108*
NRQ-226SJ	2	26	.039	*1.0*	.032	*.8*	.166	*4.2*	16	*24*
NRQ-326SJ	3	26	.039	*1.0*	.032	*.8*	.172	*4.4*	19	*28*
NRQ-426SJ	4	26	.039	*1.0*	.032	*.8*	.182	*4.6*	21	*32*
NRQ-526SJ	5	26	.039	*1.0*	.032	*.8*	.193	*4.9*	24	*36*
NRQ-626SJ	6	26	.039	*1.0*	.032	*.8*	.205	*5.2*	27	*40*
NRQ-726SJ	7	26	.039	*1.0*	.032	*.8*	.205	*5.2*	28	*42*
NRQ-826SJ	8	26	.039	*1.0*	.032	*.8*	.232	*5.9*	33	*50*
NRQ-926SJ	9	26	.039	*1.0*	.032	*.8*	.244	*6.2*	36	*54*
NRQ1026SJ	10	26	.039	*1.0*	.032	*.8*	.244	*6.2*	38	*56*
NRQ1226SJ	12	26	.039	*1.0*	.032	*.8*	.250	*6.4*	41	*61*
NRQ1526SJ	15	26	.039	*1.0*	.032	*.8*	.271	*6.9*	48	*72*
NRQ1926SJ	19	26	.039	*1.0*	.032	*.8*	.283	*7.2*	55	*82*
NRQ2726SJ	27	26	.039	*1.0*	.032	*.8*	.320	*8.3*	72	*108*
NRQ-3726SJ	37	26	.039	*1.0*	.032	*.8*	.361	*9.2*	91	*135*
NRQ4826SJ	48	26	.039	*1.0*	.032	*.8*	.409	*10.4*	120	*179*

CABLED SINGLE CONDUCTORS



MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

NQ SERIES UNSHEILDED - 24, 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NQ-224J	2	24	.044	1.1	.032	.8	.156	4.0	11	17
NQ-324J	3	24	.044	1.1	.032	.8	.163	34.1	14	21
NQ-424J	4	24	.044	1.1	.032	.8	.174	4.4	17	25
NQ-524J	5	24	.044	1.1	.032	.8	.187	4.7	19	29
NQ-624J	6	24	.044	1.1	.032	.8	.200	5.1	22	33
NQ-724J	7	24	.044	1.1	.032	.8	.200	5.1	24	36
NQ-824J	8	24	.044	1.1	.032	.8	.231	5.9	28	42
NQ-924J	9	24	.044	1.1	.032	.8	.244	6.2	31	46
NQ-1024J	10	24	.044	1.1	.032	.8	.244	6.2	33	49
NQ-1224J	12	24	.044	1.1	.032	.8	.251	6.4	37	56
NQ-1524J	15	24	.044	1.1	.032	.8	.275	7.0	45	67
NQ-1924J	19	24	.044	1.1	.032	.8	.288	7.3	54	80
NQ-2724J	27	24	.044	1.1	.032	.8	.339	8.6	73	109
NQ-3724J	37	24	.044	1.1	.032	.8	.376	9.6	96	142
NQ-4824J	48	24	.044	1.1	.032	.8	.424	10.8	121	180
NQ-6024J	60	24	.044	1.1	.032	.8	.464	11.8	148	220
NQ-222J	2	22	.050	1.3	.032	.8	.168	4.3	14	21
NQ-322J	3	22	.050	1.3	.032	.8	.176	4.5	17	26
NQ-422J	4	22	.050	1.3	.032	.8	.188	4.8	21	31
NQ-522J	5	22	.050	1.3	.032	.8	.203	5.2	25	37
NQ-622J	6	22	.050	1.3	.032	.8	.218	5.5	29	43
NQ-722J	7	22	.050	1.3	.032	.8	.218	5.5	32	47
NQ-822J	8	22	.050	1.3	.032	.8	.253	6.4	37	54
NQ-922J	9	22	.050	1.3	.032	.8	.268	6.8	40	60
NQ-1022J	10	22	.050	1.3	.032	.8	.268	6.8	43	64
NQ-1222J	12	22	.050	1.3	.032	.8	.276	7.0	50	74
NQ-1522J	15	22	.050	1.3	.032	.8	.303	7.7	60	89
NQ-1922J	19	22	.050	1.3	.032	.8	.318	8.1	73	108
NQ-2722J	27	22	.050	1.3	.032	.8	.376	9.6	100	148
NQ-3722J	37	22	.050	1.3	.032	.8	.418	10.6	131	196
NQ-4822J	48	22	.050	1.3	.032	.8	.473	12.0	167	248
NQ-6022J	60	22	.050	1.3	.032	.8	.518	13.2	205	305
NQ-220J	2	20	.058	1.5	032	.8	.184	4.7	18	27
NQ-320J	3	20	.058	1.5	.032	.8	.193	4.9	24	35
NQ-420J	4	20	.058	1.5	.032	.8	.207	5.3	29	44
NQ-520J	5	20	.058	1.5	.032	.8	.225	5.7	35	52
NQ-620J	6	20	.058	1.5	.032	.8	.242	6.1	41	61
NQ-720J	7	20	.058	1.5	.032	.8	.242	6.1	46	68
NQ-820J	8	20	.058	1.5	.032	.8	.283	7.2	53	78
NQ-920J	9	20	.058	1.5	.032	.8	.300	7.6	63	94
NQ-1020J	10	20	.058	1.5	.032	.8	.300	7.6	63	94
NQ-1220J	12	20	.058	1.5	.032	.8	.309	7.9	73	109
NQ-1520J	15	20	.058	1.5	.032	.8	.341	8.7	89	133
NQ-1920J	19	20	.058	1.5	.032	.8	.358	9.1	109	162
NQ-2720J	27	20	.058	1.5	.032	.8	.425	10.8	151	225
NQ-3720J	37	20	.058	1.5	.032	.8	.474	12.0	201	299
NQ-218J	2	18	068	1.7	.032	.8	.204	5.2	24	36
NQ-318J	3	18	.068	1.7	.032	.8	.215	5.5	32	47
NQ-418J	4	18	.068	1.7	.032	.8	.231	5.9	40	59
NQ-518J	5	18	.068	1.7	.032	.8	.252	6.4	48	71
NQ-618J	6	18	.068	1.7	.032	.8	.272	6.9	56	83
NQ-718J	7	18	.068	1.7	.032	.8	.272	6.9	63	94
NQ-818J	8	18	.068	1.7	.032	.8	.320	8.1	73	108
NQ-918J	9	18	.068	1.7	.032	.8	.340	8.6	81	120
NQ-1018J	10	18	.068	1.7	.032	.8	.340	8.6	88	131
NQ-1218J	12	18	.068	1.7	.032	.8	.351	8.9	102	152
NQ-1518J	15	18	.068	1.7	.032	.8	.388	9.8	126	187
NQ-1918J	19	18	.068	1.7	.032	.8	.408	10.4	155	230
NQ-2718J	27	18	.068	1.7	.032	.8	.487	12.4	215	320

NQ SERIES OVERALL BRAIDED SHIELD - 24, 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NQ-224SJ	2	24	.044	*1.1*	.032	*.8*	.176	4.5	19	*28*
NQ-324SJ	3	24	.044	*1.1*	.032	*.8*	.183	4.6	22	*32*
NQ-424SJ	4	24	.044	*1.1*	.032	*.8*	.194	4.9	25	*37*
NQ-524SJ	5	24	.044	*1.1*	.032	*.8*	.207	5.3	29	*43*
NQ-624SJ	6	24	.044	*1.1*	.032	*.8*	.220	5.6	33	*49*
NQ-724SJ	7	24	.044	*1.1*	.032	*.8*	.220	5.6	35	*52*
NQ-824SJ	8	24	.044	*1.1*	.032	*.8*	.251	6.4	41	*60*
NQ-924SJ	9	24	.044	*1.1*	.032	*.8*	.264	6.7	44	*66*
NQ-1024SJ	10	24	.044	*1.1*	.032	*.8*	.264	6.7	46	*69*
NQ-1224SJ	12	24	.044	*1.1*	.032	*.8*	.271	6.9	51	*76*
NQ-1524SJ	15	24	.044	*1.1*	.032	*.8*	.295	7.5	61	*90*
NQ-1924SJ	19	24	.044	*1.1*	.032	*.8*	.308	7.8	70	*105*
NQ-2724SJ	27	24	.044	*1.1*	.032	*.8*	.359	9.1	93	*139*
NQ-3724SJ	37	24	.044	*1.1*	.032	*.8*	.401	10.2	127	*189*
NQ-4824SJ	48	24	.044	*1.1*	.032	*.8*	.450	11.4	157	*233*
NQ-6024SJ	60	24	.044	*1.1*	.032	*.8*	.489	12.4	187	*278*
NQ-222SJ	2	22	050	*1.3*	.032	*.8*	.188	4.8	22	*33*
NQ-322SJ	3	22	.050	*1.3*	.032	*.8*	.196	5.0	26	*39*
NQ-422SJ	4	22	.050	*1.3*	.032	*.8*	.208	5.3	31	*46*
NQ-522SJ	5	22	.050	*1.3*	.032	*.8*	.223	5.7	35	*53*
NQ-622SJ	6	22	.050	*1.3*	.032	*.8*	.238	6.0	40	*60*
NQ-722SJ	7	22	.050	*1.3*	.032	*.8*	.238	6.0	43	*64*
NQ-822SJ	8	22	.050	*1.3*	.032	*.8*	.273	6.9	51	*75*
NQ-922SJ	9	22	.050	*1.3*	.032	*.8*	.288	7.3	56	*83*
NQ-1022SJ	10	22	.050	*1.3*	.032	*.8*	.288	7.3	58	*87*
NQ-1222SJ	12	22	.050	*1.3*	.032	*.8*	.296	7.5	65	*97*
NQ-1522SJ	15	22	.050	*1.3*	.032	*.8*	.323	8.2	78	*115*
NQ-1922SJ	19	22	.050	*1.3*	.032	*.8*	.338	8.6	91	*136*
NQ-2722SJ	27	22	.050	*1.3*	.032	*.8*	.401	10.2	131	*194*
NQ-3722SJ	37	22	.050	*1.3*	.032	*.8*	.443	11.3	167	*248*
NQ-4822SJ	48	22	.050	*1.3*	.032	*.8*	.498	12.7	207	*308*
NQ-6022SJ	60	22	.050	*1.3*	.032	*.8*	.543	13.8	249	*371*
NQ-220SJ	2	20	.058	*1.5*	.032	*.8*	.204	5.2	28	*41*
NQ-320SJ	3	20	.058	*1.5*	.032	*.8*	.213	5.4	34	*50*
NQ-420SJ	4	20	.058	*1.5*	.032	*.8*	.227	5.8	40	*60*
NQ-520SJ	5	20	.058	*1.5*	.032	*.8*	.245	6.2	47	*70*
NQ-620SJ	6	20	.058	*1.5*	.032	*.8*	.262	6.7	54	*81*
NQ-720SJ	7	20	.058	*1.5*	.032	*.8*	.262	6.7	59	*88*
NQ-820SJ	8	20	.058	*1.5*	.032	*.8*	.303	7.7	69	*102*
NQ-920SJ	9	20	.058	*1.5*	.032	*.8*	.320	8.1	76	*113*
NQ-1020SJ	10	20	.058	*1.5*	.032	*.8*	.329	8.1	80	*120*
NQ-1220SJ	12	20	.058	*1.5*	.032	*.8*	.329	8.4	91	*136*
NQ-1520SJ	15	20	.058	*1.5*	.032	*.8*	.361	9.2	109	*163*
NQ-1920SJ	19	20	.058	*1.5*	.032	*.8*	.378	9.6	130	*194*
NQ-2720SJ	27	20	.058	*1.5*	.032	*.8*	.450	11.4	187	*278*
NQ-3720SJ	37	20	.058	*1.5*	.032	*.8*	.499	12.7	242	*359*
NQ-218SJ	2	18	.068	*1.7*	.032	*.8*	.224	5.7	35	*52*
NQ-318SJ	3	18	.068	*1.7*	.032	*.8*	.235	6.0	43	*64*
NQ-418SJ	4	18	.068	*1.7*	.032	*.8*	.251	6.4	52	*78*
NQ-518SJ	5	18	.068	*1.7*	.032	*.8*	.272	6.9	62	*92*
NQ-618SJ	6	18	.068	*1.7*	.032	*.8*	.292	7.4	71	*106*
NQ-718SJ	7	18	.068	*1.7*	.032	*.8*	.292	7.4	78	*117*
NQ-818SJ	8	18	.068	*1.7*	.032	*.8*	.340	8.6	91	*136*
NQ-918SJ	9	18	.068	*1.7*	.032	*.8*	.360	9.1	101	*150*
NQ-1018SJ	10	18	.068	*1.7*	.032	*.8*	.360	9.1	100	*161*
NQ-1218SJ	12	18	.068	*1.7*	.032	*.8*	.371	9.4	123	*183*
NQ-1518SJ	15	18	.068	*1.7*	.032	*.8*	.413	10.5	158	*235*
NQ-1918SJ	19	18	.068	*1.7*	.032	*.8*	.433	11.0	189	*281*
NQ-2718SJ	27	18	.068	*1.7*	.032	*.8*	.512	13.0	257	*382*

CABLED SINGLE CONDUCTORS - NQ series

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

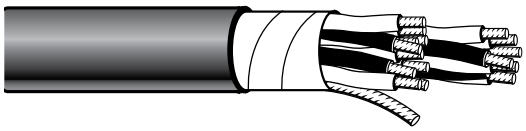
NRQ SERIES UNSHEILDED - 24, 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NRQ-224J	2	24	.044	1.1	.032	.8	.156	4.0	11	17
NRQ-324J	3	24	.044	1.1	.032	.8	.163	34.1	14	21
NRQ-424J	4	24	.044	1.1	.032	.8	.174	4.4	17	25
NRQ-524J	5	24	.044	1.1	.032	.8	.187	4.7	19	29
NRQ-624J	6	24	.044	1.1	.032	.8	.200	5.1	22	33
NRQ-724J	7	24	.044	1.1	.032	.8	.200	5.1	24	36
NRQ-824J	8	24	.044	1.1	.032	.8	.231	5.9	28	42
NRQ-924J	9	24	.044	1.1	.032	.8	.244	6.2	31	46
NRQ-1024J	10	24	.044	1.1	.032	.8	.244	6.2	33	49
NRQ-1224J	12	24	.044	1.1	.032	.8	.251	6.4	37	56
NRQ-1524J	15	24	.044	1.1	.032	.8	.275	7.0	45	67
NRQ-1924J	19	24	.044	1.1	.032	.8	.288	7.3	54	80
NRQ-2724J	27	24	.044	1.1	.032	.8	.339	8.6	73	109
NRQ-3724J	37	24	.044	1.1	.032	.8	.376	9.6	96	142
NRQ-4824J	48	24	.044	1.1	.032	.8	.424	10.8	121	180
NRQ-6024J	60	24	.044	1.1	.032	.8	.464	11.8	148	220
NRQ-222J	2	22	.050	1.3	.032	.8	.168	4.3	14	21
NRQ-322J	3	22	.050	1.3	.032	.8	.176	4.5	17	26
NRQ-422J	4	22	.050	1.3	.032	.8	.188	4.8	21	31
NRQ-522J	5	22	.050	1.3	.032	.8	.203	5.2	25	37
NRQ-622J	6	22	.050	1.3	.032	.8	.218	5.5	29	43
NRQ-722J	7	22	.050	1.3	.032	.8	.218	5.5	32	47
NRQ-822J	8	22	.050	1.3	.032	.8	.253	6.4	37	54
NRQ-922J	9	22	.050	1.3	.032	.8	.268	6.8	40	60
NRQ-1022J	10	22	.050	1.3	.032	.8	.268	6.8	43	64
NRQ-1222J	12	22	.050	1.3	.032	.8	.276	7.0	50	74
NRQ-1522J	15	22	.050	1.3	.032	.8	.303	7.7	60	89
NRQ-1922J	19	22	.050	1.3	.032	.8	.318	8.1	73	108
NRQ-2722J	27	22	.050	1.3	.032	.8	.376	9.6	100	148
NRQ-3722J	37	22	.050	1.3	.032	.8	.418	10.6	131	196
NRQ-4822J	48	22	.050	1.3	.032	.8	.473	12.0	167	248
NRQ-6022J	60	22	.050	1.3	.032	.8	.518	13.2	205	305
NRQ-220J	2	20	.058	1.5	032	.8	.184	4.7	18	27
NRQ-320J	3	20	.058	1.5	.032	.8	.193	4.9	24	35
NRQ-420J	4	20	.058	1.5	.032	.8	.207	5.3	29	44
NRQ-520J	5	20	.058	1.5	.032	.8	.225	5.7	35	52
NRQ-620J	6	20	.058	1.5	.032	.8	.242	6.1	41	61
NRQ-720J	7	20	.058	1.5	.032	.8	.242	6.1	46	68
NRQ-820J	8	20	.058	1.5	.032	.8	.283	7.2	53	78
NRQ-920J	9	20	.058	1.5	.032	.8	.300	7.6	63	94
NRQ-1020J	10	20	.058	1.5	.032	.8	.300	7.6	63	94
NRQ-1220J	12	20	.058	1.5	.032	.8	.309	7.9	73	109
NRQ-1520J	15	20	.058	1.5	.032	.8	.341	8.7	89	133
NRQ-1920J	19	20	.058	1.5	.032	.8	.358	9.1	109	162
NRQ-2720J	27	20	.058	1.5	.032	.8	.425	10.8	151	225
NRQ-3720J	37	20	.058	1.5	.032	.8	.474	12.0	201	299
NRQ-218J	2	18	068	1.7	.032	.8	.204	5.2	24	36
NRQ-318J	3	18	.068	1.7	.032	.8	.215	5.5	32	47
NRQ-418J	4	18	.068	1.7	.032	.8	.231	5.9	40	59
NRQ-518J	5	18	.068	1.7	.032	.8	.252	6.4	48	71
NRQ-618J	6	18	.068	1.7	.032	.8	.272	6.9	56	83
NRQ-718J	7	18	.068	1.7	.032	.8	.272	6.9	63	94
NRQ-818J	8	18	.068	1.7	.032	.8	.320	8.1	73	108
NRQ-918J	9	18	.068	1.7	.032	.8	.340	8.6	81	120
NRQ-1018J	10	18	.068	1.7	.032	.8	.340	8.6	88	131
NRQ-1218J	12	18	.068	1.7	.032	.8	.351	8.9	102	152
NRQ-1518J	15	18	.068	1.7	.032	.8	.388	9.8	126	187
NRQ-1918J	19	18	.068	1.7	.032	.8	.408	10.4	155	230
NRQ-2718J	27	18	.068	1.7	.032	.8	.487	12.4	215	320

NRQ SERIES OVERALL BRAIDED SHIELD - 24, 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NRQ-224SJ	2	24	.044	*1.1*	.032	*.8*	.176	4.5	19	*28*
NRQ-324SJ	3	24	.044	*1.1*	.032	*.8*	.183	4.6	22	*32*
NRQ-424SJ	4	24	.044	*1.1*	.032	*.8*	.194	4.9	25	*37*
NRQ-524SJ	5	24	.044	*1.1*	.032	*.8*	.207	5.3	29	*43*
NRQ-624SJ	6	24	.044	*1.1*	.032	*.8*	.220	5.6	33	*49*
NRQ-724SJ	7	24	.044	*1.1*	.032	*.8*	.220	5.6	35	*52*
NRQ-824SJ	8	24	.044	*1.1*	.032	*.8*	.251	6.4	41	*60*
NRQ-924SJ	9	24	.044	*1.1*	.032	*.8*	.264	6.7	44	*66*
NRQ-1024SJ	10	24	.044	*1.1*	.032	*.8*	.264	6.7	46	*69*
NRQ-1224SJ	12	24	.044	*1.1*	.032	*.8*	.271	6.9	51	*76*
NRQ-1524SJ	15	24	.044	*1.1*	.032	*.8*	.295	7.5	61	*90*
NRQ-1924SJ	19	24	.044	*1.1*	.032	*.8*	.308	7.8	70	*105*
NRQ-2724SJ	27	24	.044	*1.1*	.032	*.8*	.359	9.1	93	*139*
NRQ-3724SJ	37	24	.044	*1.1*	.032	*.8*	.401	10.2	127	*189*
NRQ-4824SJ	48	24	.044	*1.1*	.032	*.8*	.450	11.4	157	*233*
NRQ-6024SJ	60	24	.044	*1.1*	.032	*.8*	.489	12.4	187	*278*
NRQ-222SJ	2	22	050	*1.3*	.032	*.8*	.188	4.8	22	*33*
NRQ-322SJ	3	22	.050	*1.3*	.032	*.8*	.196	5.0	26	*39*
NRQ-422SJ	4	22	.050	*1.3*	.032	*.8*	.208	5.3	31	*46*
NRQ-522SJ	5	22	.050	*1.3*	.032	*.8*	.223	5.7	35	*53*
NRQ-622SJ	6	22	.050	*1.3*	.032	*.8*	.238	6.0	40	*60*
NRQ-722SJ	7	22	.050	*1.3*	.032	*.8*	.238	6.0	43	*64*
NRQ-822SJ	8	22	.050	*1.3*	.032	*.8*	.273	6.9	51	*75*
NRQ-922SJ	9	22	.050	*1.3*	.032	*.8*	.288	7.3	56	*83*
NRQ-1022SJ	10	22	.050	*1.3*	.032	*.8*	.288	7.3	58	*87*
NRQ-1222SJ	12	22	.050	*1.3*	.032	*.8*	.296	7.5	65	*97*
NRQ-1522SJ	15	22	.050	*1.3*	.032	*.8*	.323	8.2	78	*115*
NRQ-1922SJ	19	22	.050	*1.3*	.032	*.8*	.338	8.6	91	*136*
NRQ-2722SJ	27	22	.050	*1.3*	.032	*.8*	.401	10.2	131	*194*
NRQ-3722SJ	37	22	.050	*1.3*	.032	*.8*	.443	11.3	167	*248*
NRQ-4822SJ	48	22	.050	*1.3*	.032	*.8*	.498	12.7	207	*308*
NRQ-6022SJ	60	22	.050	*1.3*	.032	*.8*	.543	13.8	249	*371*
NRQ-220SJ	2	20	.058	*1.5*	.032	*.8*	.204	5.2	28	*41*
NRQ-320SJ	3	20	.058	*1.5*	.032	*.8*	.213	5.4	34	*50*
NRQ-420SJ	4	20	.058	*1.5*	.032	*.8*	.227	5.8	40	*60*
NRQ-520SJ	5	20	.058	*1.5*	.032	*.8*	.245	6.2	47	*70*
NRQ-620SJ	6	20	.058	*1.5*	.032	*.8*	.262	6.7	54	*81*
NRQ-720SJ	7	20	.058	*1.5*	.032	*.8*	.262	6.7	59	*88*
NRQ-820SJ	8	20	.058	*1.5*	.032	*.8*	.303	7.7	69	*102*
NRQ-920SJ	9	20	.058	*1.5*	.032	*.8*	.320	8.1	76	*113*
NRQ-1020SJ	10	20	.058	*1.5*	.032	*.8*	.329	8.1	80	*120*
NRQ-1220SJ	12	20	.058	*1.5*	.032	*.8*	.329	8.4	91	*136*
NRQ-1520SJ	15	20	.058	*1.5*	.032	*.8*	.361	9.2	109	*163*
NRQ-1920SJ	19	20	.058	*1.5*	.032	*.8*	.378	9.6	130	*194*
NRQ-2720SJ	27	20	.058	*1.5*	.032	*.8*	.450	11.4	187	*278*
NRQ-3720SJ	37	20	.058	*1.5*	.032	*.8*	.499	12.7	242	*359*
NRQ-218SJ	2	18	.068	*1.7*	.032	*.8*	.224	5.7	35	*52*
NRQ-318SJ	3	18	.068	*1.7*	.032	*.8*	.235	6.0	43	*64*
NRQ-418SJ	4	18	.068	*1.7*	.032	*.8*	.251	6.4	52	*78*
NRQ-518SJ	5	18	.068	*1.7*	.032	*.8*	.272	6.9	62	*92*
NRQ-618SJ	6	18	.068	*1.7*	.032	*.8*	.292	7.4	71	*106*
NRQ-718SJ	7	18	.068	*1.7*	.032	*.8*	.292	7.4	78	*117*
NRQ-818SJ	8	18	.068	*1.7*	.032	*.8*	.340	8.6	91	*136*
NRQ-918SJ	9	18	.068	*1.7*	.032	*.8*	.360	9.1	101	*150*
NRQ-1018SJ	10	18	.068	*1.7*	.032	*.8*	.360	9.1	100	*161*
NRQ-1218SJ	12	18	.068	*1.7*	.032	*.8*	.371	9.4	123	*183*
NRQ-1518SJ	15	18	.068	*1.7*	.032	*.8*	.413	10.5	158	*235*
NRQ-1918SJ	19	18	.068	*1.7*	.032	*.8*	.433	11.0	189	*281*
NRQ-2718SJ	27	18	.068	*1.7*	.032	*.8*	.512	13.0	257	*382*

CABLED SINGLE CONDUCTORS



NQ SERIES

- Single Conductors
- Overall Foil Shield with Drain

U.L. and CSA certification furnished

NQ SERIES OVERALL FOIL SHIELD WITH DRAIN - 28, 26 and 24 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NQ-228FSJ	2	28	.035	*.9*	.032	*.8*	.140	*3.6*	9	*13*
NQ-328FSJ	3	28	.035	*.9*	.032	*.8*	.146	*3.7*	10	*15*
NQ-428FSJ	4	28	.035	*.9*	.032	*.8*	.154	*3.9*	12	*18*
NQ-528FSJ	5	28	.035	*.9*	.032	*.8*	.165	*4.2*	13	*20*
NQ-628FSJ	6	28	.035	*.9*	.032	*.8*	.175	*4.4*	15	*22*
NQ-728FSJ	7	28	.035	*.9*	.032	*.8*	.175	*4.4*	16	*24*
NQ-828FSJ	8	28	.035	*.9*	.032	*.8*	.200	*5.1*	19	*28*
NQ-928FSJ	9	28	.035	*.9*	.032	*.8*	.210	*5.3*	20	*30*
NQ-1028FSJ	10	28	.035	*.9*	.032	*.8*	.210	*5.3*	21	*32*
NQ-1228FSJ	12	28	.035	*.9*	.032	*.8*	.216	*5.5*	24	*35*
NQ-1528FSJ	15	28	.035	*.9*	.032	*.8*	.235	*6.0*	28	*41*
NQ-1928FSJ	19	28	.035	*.9*	.032	*.8*	.245	*6.2*	32	*48*
NQ-2728FSJ	27	28	.035	*.9*	.032	*.8*	.286	*7.3*	43	*64*
NQ-3728FSJ	37	28	.035	*.9*	.032	*.8*	.315	*8.0*	55	*82*
NQ-226FSJ	2	26	.039	*1.0*	.032	*.8*	.148	*3.8*	11	*16*
NQ-326FSJ	3	26	.039	*1.0*	.032	*.8*	.154	*3.9*	12	*18*
NQ-426FSJ	4	26	.039	*1.0*	.032	*.8*	.164	*4.2*	14	*21*
NQ-526FSJ	5	26	.039	*1.0*	.032	*.8*	.175	*4.5*	16	*24*
NQ-626FSJ	6	26	.039	*1.0*	.032	*.8*	.187	*4.7*	18	*28*
NQ-726FSJ	7	26	.039	*1.0*	.032	*.8*	.187	*4.7*	20	*30*
NQ-826FSJ	8	26	.039	*1.0*	.032	*.8*	.214	*5.4*	23	*34*
NQ-926FSJ	9	26	.039	*1.0*	.032	*.8*	.226	*5.7*	25	*37*
NQ-1026FSJ	10	26	.039	*1.0*	.032	*.8*	.226	*5.7*	26	*39*
NQ-1226FSJ	12	26	.039	*1.0*	.032	*.8*	.232	*5.9*	30	*44*
NQ-1526FSJ	15	26	.039	*1.0*	.032	*.8*	.253	*6.4*	35	*52*
NQ-1926FSJ	19	26	.039	*1.0*	.032	*.8*	.265	*6.7*	41	*62*
NQ-2726FSJ	27	26	.039	*1.0*	.032	*.8*	.310	*7.9*	55	*82*
NQ-3726FSJ	37	26	.039	*1.0*	.032	*.8*	.343	*8.7*	71	*106*
NQ-4826FSJ	48	26	.039	*1.0*	.032	*.8*	.386	*9.8*	90	*133*
NQ-224FSJ	2	24	.044	*1.1*	.032	*.8*	.158	*4.0*	13	*19*
NQ-524FSJ	5	24	.044	*1.1*	.032	*.8*	.189	*4.8*	21	*31*
NQ-324FSJ	3	24	.044	*1.1*	.032	*.8*	.165	*4.2*	15	*23*
NQ-424FSJ	4	24	.044	*1.1*	.032	*.8*	.176	*4.5*	18	*27*
NQ-624FSJ	6	24	.044	*1.1*	.032	*.8*	.202	*5.1*	24	*35*
NQ-724FSJ	7	24	.044	*1.1*	.032	*.8*	.202	*5.1*	26	*38*
NQ-824FSJ	8	24	.044	*1.1*	.032	*.8*	.233	*5.9*	30	*44*
NQ-924FSJ	9	24	.044	*1.1*	.032	*.8*	.246	*6.2*	32	*48*
NQ-1024FSJ	10	24	.044	*1.1*	.032	*.8*	.246	*6.2*	34	*51*
NQ-1224FSJ	12	24	.044	*1.1*	.032	*.8*	.253	*6.4*	39	*58*
NQ-1524FSJ	15	24	.044	*1.1*	.032	*.8*	.277	*7.0*	46	*69*
NQ-1924FSJ	19	24	.044	*1.1*	.032	*.8*	.290	*7.4*	55	*82*
NQ-2724FSJ	27	24	.044	*1.1*	.032	*.8*	.341	*8.7*	75	*111*
NQ-3724FSJ	37	24	.044	*1.1*	.032	*.8*	.378	*9.6*	97	*145*
NQ-4824FSJ	48	24	.044	*1.1*	.032	*.8*	.426	*10.8*	122	*182*
NQ-6024FSJ	60	24	.044	*1.1*	.032	*.8*	.466	*11.8*	149	*222*

NQ SERIES OVERALL FOIL SHIELD WITH DRAIN - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NQ-222FSJ	2	22	.050	*1.3*	.032	.8	.170	*4.3*	16	*24*
NQ-322FSJ	3	22	.050	*1.3*	.032	.8	.178	*4.5*	20	*29*
NQ-422FSJ	4	22	.050	*1.3*	.032	.8	.190	*4.8*	23	*35*
NQ-522FSJ	5	22	.050	*1.3*	.032	.8	.205	*5.2*	27	*40*
NQ-622FSJ	6	22	.050	*1.3*	.032	.8	.220	*5.6*	31	*46*
NQ-722FSJ	7	22	.050	*1.3*	.032	.8	.220	*5.6*	34	*50*
NQ-822FSJ	8	22	.050	*1.3*	.032	.8	.255	*6.5*	39	*58*
NQ-922FSJ	9	22	.050	*1.3*	.032	.8	.270	*6.9*	43	*63*
NQ-1022FSJ	10	22	.050	*1.3*	.032	.8	.270	*6.9*	46	*68*
NQ-1222FSJ	12	22	.050	*1.3*	.032	.8	.278	*7.1*	52	*77*
NQ-1522FSJ	15	22	.050	*1.3*	.032	.8	.305	*7.7*	62	*93*
NQ-1922FSJ	19	22	.050	*1.3*	.032	.8	.320	*8.1*	75	*111*
NQ-2722FSJ	27	22	.050	*1.3*	.032	.8	.378	*9.6*	102	*152*
NQ-3722FSJ	37	22	.050	*1.3*	.032	.8	.420	*10.7*	134	*199*
NQ-4822FSJ	48	22	.050	*1.3*	.032	.8	.475	*12.1*	169	*252*
NQ-6022FSJ	60	22	.050	*1.3*	.032	.8	.520	*13.2*	207	*308*
NQ-220FSJ	2	20	.058	*1.5*	.032	.8	.186	*4.7*	22	*33*
NQ-320FSJ	3	20	.058	*1.5*	.032	.8	.195	*5.0*	28	*41*
NQ-420FSJ	4	20	.058	*1.5*	.032	.8	.209	*5.3*	33	*49*
NQ-520FSJ	5	20	.058	*1.5*	.032	.8	.227	*5.8*	39	*58*
NQ-620FSJ	6	20	.058	*1.5*	.032	.8	.244	*6.2*	45	*66*
NQ-720FSJ	7	20	.058	*1.5*	.032	.8	.244	*6.2*	49	*73*
NQ-820FSJ	8	20	.058	*1.5*	.032	.8	.285	*7.2*	56	*84*
NQ-920FSJ	9	20	.058	*1.5*	.032	.8	.302	*7.7*	62	*93*
NQ-1020FSJ	10	20	.058	*1.5*	.032	.8	.302	*7.7*	67	*100*
NQ-1220FSJ	12	20	.058	*1.5*	.032	.8	.311	*7.9*	77	*114*
NQ-1520FSJ	15	20	.058	*1.5*	.032	.8	.343	*8.7*	93	*138*
NQ-1920FSJ	19	20	.058	*1.5*	.032	.8	.360	*9.1*	113	*168*
NQ-2720FSJ	27	20	.058	*1.5*	.032	.8	.427	*10.9*	155	*230*
NQ-3720FSJ	37	20	.058	*1.5*	.032	.8	.476	*12.0*	205	*305*
NQ-218FSJ	2	18	.068	*1.7*	.032	.8	.206	*5.2*	30	*45*
NQ-318FSJ	3	18	.068	*1.7*	.032	.8	.217	*5.5*	38	*56*
NQ-418FSJ	4	18	.068	*1.7*	.032	.8	.245	*5.9*	46	*68*
NQ-518FSJ	5	18	.068	*1.7*	.032	.8	.254	*6.4*	54	*80*
NQ-618FSJ	6	18	.068	*1.7*	.032	.8	.274	*7.0*	62	*92*
NQ-718FSJ	7	18	.068	*1.7*	.032	.8	.274	*7.0*	69	*102*
NQ-818FSJ	8	18	.068	*1.7*	.032	.8	.322	*8.2*	79	*117*
NQ-918FSJ	9	18	.068	*1.7*	.032	.8	.342	*8.7*	87	*129*
NQ-1018FSJ	10	18	.068	*1.7*	.032	.8	.342	*8.7*	94	*139*
NQ-1218FSJ	12	18	.068	*1.7*	.032	.8	.353	*9.0*	100	*161*
NQ-1518FSJ	15	18	.068	*1.7*	.032	.8	.390	*9.9*	131	*196*
NQ-1918FSJ	19	18	.068	*1.7*	.032	.8	.410	*10.4*	150	*239*
NQ-2718FSJ	27	18	.068	*1.7*	.032	.8	.489	*12.4*	221	*329*

CABLED SINGLE CONDUCTORS - NQ series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

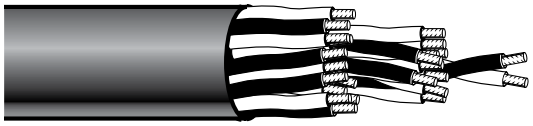
NRQ SERIES OVERALL FOIL SHIELD WITH DRAIN - 28, 26 and 24 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NRQ-228FSJ	2	28	.035	*.9*	.032	*.8*	.140	*3.6*	9	*13*
NRQ-328FSJ	3	28	.035	*.9*	.032	*.8*	.146	*3.7*	10	*15*
NRQ-428FSJ	4	28	.035	*.9*	.032	*.8*	.154	*3.9*	12	*18*
NRQ-528FSJ	5	28	.035	*.9*	.032	*.8*	.165	*4.2*	13	*20*
NRQ-628FSJ	6	28	.035	*.9*	.032	*.8*	.175	*4.4*	15	*22*
NRQ-728FSJ	7	28	.035	*.9*	.032	*.8*	.175	*4.4*	16	*24*
NRQ-828FSJ	8	28	.035	*.9*	.032	*.8*	.200	*5.1*	19	*28*
NRQ-928FSJ	9	28	.035	*.9*	.032	*.8*	.210	*5.3*	20	*30*
NRQ-1028FSJ	10	28	.035	*.9*	.032	*.8*	.210	*5.3*	21	*32*
NRQ-1228FSJ	12	28	.035	*.9*	.032	*.8*	.216	*5.5*	24	*35*
NRQ-1528FSJ	15	28	.035	*.9*	.032	*.8*	.235	*6.0*	28	*41*
NRQ-1928FSJ	19	28	.035	*.9*	.032	*.8*	.245	*6.2*	32	*48*
NRQ-2728FSJ	27	28	.035	*.9*	.032	*.8*	.286	*7.3*	43	*64*
NRQ-3728FSJ	37	28	.035	*.9*	.032	*.8*	.315	*8.0*	55	*82*
NRQ-226FSJ	2	26	.039	*1.0*	.032	*.8*	.148	*3.8*	11	*16*
NRQ-326FSJ	3	26	.039	*1.0*	.032	*.8*	.154	*3.9*	12	*18*
NRQ-426FSJ	4	26	.039	*1.0*	.032	*.8*	.164	*4.2*	14	*21*
NRQ-526FSJ	5	26	.039	*1.0*	.032	*.8*	.175	*4.5*	16	*24*
NRQ-626FSJ	6	26	.039	*1.0*	.032	*.8*	.187	*4.7*	18	*28*
NRQ-726FSJ	7	26	.039	*1.0*	.032	*.8*	.187	*4.7*	20	*30*
NRQ-826FSJ	8	26	.039	*1.0*	.032	*.8*	.214	*5.4*	23	*34*
NRQ-926FSJ	9	26	.039	*1.0*	.032	*.8*	.226	*5.7*	25	*37*
NRQ-1026FSJ	10	26	.039	*1.0*	.032	*.8*	.226	*5.7*	26	*39*
NRQ-1226FSJ	12	26	.039	*1.0*	.032	*.8*	.232	*5.9*	30	*44*
NRQ-1526FSJ	15	26	.039	*1.0*	.032	*.8*	.253	*6.4*	35	*52*
NRQ-1926FSJ	19	26	.039	*1.0*	.032	*.8*	.265	*6.7*	41	*62*
NRQ-2726FSJ	27	26	.039	*1.0*	.032	*.8*	.310	*7.9*	55	*82*
NRQ-3726FSJ	37	26	.039	*1.0*	.032	*.8*	.343	*8.7*	71	*106*
NRQ-4826FSJ	48	26	.039	*1.0*	.032	*.8*	.386	*9.8*	90	*133*
NRQ-224FSJ	2	24	.044	*1.1*	.032	*.8*	.158	*4.0*	13	*19*
NRQ-524FSJ	5	24	.044	*1.1*	.032	*.8*	.189	*4.8*	21	*31*
NRQ-324FSJ	3	24	.044	*1.1*	.032	*.8*	.165	*4.2*	15	*23*
NRQ-424FSJ	4	24	.044	*1.1*	.032	*.8*	.176	*4.5*	18	*27*
NRQ-624FSJ	6	24	.044	*1.1*	.032	*.8*	.202	*5.1*	24	*35*
NRQ-724FSJ	7	24	.044	*1.1*	.032	*.8*	.202	*5.1*	26	*38*
NRQ-824FSJ	8	24	.044	*1.1*	.032	*.8*	.233	*5.9*	30	*44*
NRQ-924FSJ	9	24	.044	*1.1*	.032	*.8*	.246	*6.2*	32	*48*
NRQ-1024FSJ	10	24	.044	*1.1*	.032	*.8*	.246	*6.2*	34	*51*
NRQ-1224FSJ	12	24	.044	*1.1*	.032	*.8*	.253	*6.4*	39	*58*
NRQ-1524FSJ	15	24	.044	*1.1*	.032	*.8*	.277	*7.0*	46	*69*
NRQ-1924FSJ	19	24	.044	*1.1*	.032	*.8*	.290	*7.4*	55	*82*
NRQ-2724FSJ	27	24	.044	*1.1*	.032	*.8*	.341	*8.7*	75	*111*
NRQ-3724FSJ	37	24	.044	*1.1*	.032	*.8*	.378	*9.6*	97	*145*
NRQ-4824FSJ	48	24	.044	*1.1*	.032	*.8*	.426	*10.8*	122	*182*
NRQ-6024FSJ	60	24	.044	*1.1*	.032	*.8*	.466	*11.8*	149	*222*

NRQ SERIES OVERALL FOIL SHIELD WITH DRAIN - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KGKM*
NRQ-222FSJ	2	22	.050	*1.3*	.032	.8	.170	*4.3*	16	*24*
NRQ-322FSJ	3	22	.050	*1.3*	.032	.8	.178	*4.5*	20	*29*
NRQ-422FSJ	4	22	.050	*1.3*	.032	.8	.190	*4.8*	23	*35*
NRQ-522FSJ	5	22	.050	*1.3*	.032	.8	.205	*5.2*	27	*40*
NRQ-622FSJ	6	22	.050	*1.3*	.032	.8	.220	*5.6*	31	*46*
NRQ-722FSJ	7	22	.050	*1.3*	.032	.8	.220	*5.6*	34	*50*
NRQ-822FSJ	8	22	.050	*1.3*	.032	.8	.255	*6.5*	39	*58*
NRQ-922FSJ	9	22	.050	*1.3*	.032	.8	.270	*6.9*	43	*63*
NRQ-1022FSJ	10	22	.050	*1.3*	.032	.8	.270	*6.9*	46	*68*
NRQ-1222FSJ	12	22	.050	*1.3*	.032	.8	.278	*7.1*	52	*77*
NRQ-1522FSJ	15	22	.050	*1.3*	.032	.8	.305	*7.7*	62	*93*
NRQ-1922FSJ	19	22	.050	*1.3*	.032	.8	.320	*8.1*	75	*111*
NRQ-2722FSJ	27	22	.050	*1.3*	.032	.8	.378	*9.6*	102	*152*
NRQ-3722FSJ	37	22	.050	*1.3*	.032	.8	.420	*10.7*	134	*199*
NRQ-4822FSJ	48	22	.050	*1.3*	.032	.8	.475	*12.1*	169	*252*
NRQ-6022FSJ	60	22	.050	*1.3*	.032	.8	.520	*13.2*	207	*308*
NRQ-220FSJ	2	20	.058	*1.5*	.032	.8	.186	*4.7*	22	*33*
NRQ-320FSJ	3	20	.058	*1.5*	.032	.8	.195	*5.0*	28	*41*
NRQ-420FSJ	4	20	.058	*1.5*	.032	.8	.209	*5.3*	33	*49*
NRQ-520FSJ	5	20	.058	*1.5*	.032	.8	.227	*5.8*	39	*58*
NRQ-620FSJ	6	20	.058	*1.5*	.032	.8	.244	*6.2*	45	*66*
NRQ-720FSJ	7	20	.058	*1.5*	.032	.8	.244	*6.2*	49	*73*
NRQ-820FSJ	8	20	.058	*1.5*	.032	.8	.285	*7.2*	56	*84*
NRQ-920FSJ	9	20	.058	*1.5*	.032	.8	.302	*7.7*	62	*93*
NRQ-1020FSJ	10	20	.058	*1.5*	.032	.8	.302	*7.7*	67	*100*
NRQ-1220FSJ	12	20	.058	*1.5*	.032	.8	.311	*7.9*	77	*114*
NRQ-1520FSJ	15	20	.058	*1.5*	.032	.8	.343	*8.7*	93	*138*
NRQ-1920FSJ	19	20	.058	*1.5*	.032	.8	.360	*9.1*	113	*168*
NRQ-2720FSJ	27	20	.058	*1.5*	.032	.8	.427	*10.9*	155	*230*
NRQ-3720FSJ	37	20	.058	*1.5*	.032	.8	.476	*12.0*	205	*305*
NRQ-218FSJ	2	18	.068	*1.7*	.032	.8	.206	*5.2*	30	*45*
NRQ-318FSJ	3	18	.068	*1.7*	.032	.8	.217	*5.5*	38	*56*
NRQ-418FSJ	4	18	.068	*1.7*	.032	.8	.245	*5.9*	46	*68*
NRQ-518FSJ	5	18	.068	*1.7*	.032	.8	.254	*6.4*	54	*80*
NRQ-618FSJ	6	18	.068	*1.7*	.032	.8	.274	*7.0*	62	*92*
NRQ-718FSJ	7	18	.068	*1.7*	.032	.8	.274	*7.0*	69	*102*
NRQ-818FSJ	8	18	.068	*1.7*	.032	.8	.322	*8.2*	79	*117*
NRQ-918FSJ	9	18	.068	*1.7*	.032	.8	.342	*8.7*	87	*129*
NRQ-1018FSJ	10	18	.068	*1.7*	.032	.8	.342	*8.7*	94	*139*
NRQ-1218FSJ	12	18	.068	*1.7*	.032	.8	.353	*9.0*	100	*161*
NRQ-1518FSJ	15	18	.068	*1.7*	.032	.8	.390	*9.9*	131	*196*
NRQ-1918FSJ	19	18	.068	*1.7*	.032	.8	.410	*10.4*	150	*239*
NRQ-2718FSJ	27	18	.068	*1.7*	.032	.8	.489	*12.4*	221	*329*

CABLED TWISTED PAIRS CONDUCTORS



NQP SERIES

- Twisted Pair Conductors
- Mil Spec, U.L. AWM

Recognized Style 2464 and CSA Certified AWM *II* A/B

GRAY PVC JACKET

National Wire & Cable Corporation manufactures a complete line of highly flexible micro-miniature low-voltage instrument control cable. These are available as cabled pairs or singles, with optional overall shield of either foil with drain or a braided shield.

Conductors are stranded tinned copper with .010" wall of tough extruded polyvinyl chloride primary insulation, rated for 300 volt use at +80°C under U.L. style 1061*-. All are color coded using ten standard colors plus white with stripes per MIL-STD-681. View Color Table in the National Wire Cable Designers Guide, page 7-13.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier under braids. Shielded cables have a tinned copper braid of 90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback;or have a 100% coverage foil shield in intimate contact with a drain wire for easy termination.

Outer jacket is highly flexible abrasion-resistant gray polyvinyl chloride thermoplastic, meeting the requirements of U.L. style 2464. **U.L. & CSA certification furnished.

Military certification furnished only when requested.
All materials are flame retardant and fungus resistant. Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

*Wire also meets MIL-W-16878 rated 600 volts, +105°C.
**Jacket material is military rated for 105°C; meets MIL-I-631, Type F.
Meets E.I.A. Standards RS-232 for 18-24 gauges.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 3400 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 pf/ft at 1 kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500 VDC form conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500 VDC from shield or conductor group through sheath to ground.
Temperature Range:	U.L. rating: +80°C per U.L. style 2464. Military: Continuous use from -40°C to +105°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult the factory.
Foil Shielded Cables:	The nominal over-all diameter of foil shielded cables will be .006" greater than the non-shielded cables of the same conductor count and wire size.
Characteristic Impedance (NQP Paired Cables)	Ranges from 150 ohms to 45 ohms, dependent on wire size (AWG), geometry and drive method. Consult our technical staff for data on specific cable types.

For color code of pairs, view the Color Table in the National Wire Cable Designers Guide, page 7-13.

MULTI-CONDUCTOR STOCK CABLED SINGLES

Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

NQP SERIES UNSHIELDED - 28 and 26 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NQP-228J	2	28	.035	*.9*	.032	*.8*	.187	*4.7*	14	*22*
NQP-328J	3	28	.035	*.9*	.032	*.8*	.197	*5.0*	17	*26*
NQP-428J	4	28	.035	*.9*	.032	*.8*	.215	*5.5*	20	*30*
NQP-528J	5	28	.035	*.9*	.032	*.8*	.236	*6.0*	23	*35*
NQP-628J	6	28	.035	*.9*	.032	*.8*	.257	*6.5*	27	*40*
NQP-728J	7	28	.035	*.9*	.032	*.8*	.247	*6.3*	29	*43*
NQP-828J	8	28	.035	*.9*	.032	*.8*	.306	*7.8*	34	*50*
NQP-928J	9	28	.035	*.9*	.032	*.8*	.292	*7.4*	37	*55*
NQP-1028J	10	28	.035	*.9*	.032	*.8*	.306	*7.8*	39	*58*
NQP-1228J	12	28	.035	*.9*	.032	*.8*	.316	*8.0*	44	*65*
NQP-1528J	15	28	.035	*.9*	.032	*.8*	.355	*9.0*	52	*77*
NQP-1928J	19	28	.035	*.9*	.032	*.8*	.366	*9.3*	61	*91*
NQP-2728J	27	28	.035	*.9*	.032	*.8*	.435	*11.1*	82	*122*
NQP-3728J	37	28	.035	*.9*	.032	*.8*	.485	*12.2*	106	*158*
NQP-226J	2	26	.039	*1.0*	.032	*.8*	.201	*5.1*	17	*25*
NQP-326J	3	26	.039	*1.0*	.032	*.8*	.211	*5.4*	21	*31*
NQP-426J	4	26	.039	*1.0*	.032	*.8*	.232	*5.9*	25	*36*
NQP-526J	5	26	.039	*1.0*	.032	*.8*	.255	*6.5*	29	*43*
NQP-626J	6	26	.039	*1.0*	.032	*.8*	.279	*7.1*	33	*49*
NQP-726J	7	26	.039	*1.0*	.032	*.8*	.267	*6.8*	36	*53*
NQP-826J	8	26	.039	*1.0*	.032	*.8*	.333	*8.5*	42	*62*
NQP-926J	9	26	.039	*1.0*	.032	*.8*	.318	*8.1*	46	*68*
NQP-1026J	10	26	.039	*1.0*	.032	*.8*	.333	*8.5*	49	*73*
NQP-1226J	12	26	.039	*1.0*	.032	*.8*	.344	*8.7*	55	*82*
NQP-1526J	15	26	.039	*1.0*	.032	*.8*	.388	*9.9*	66	*98*
NQP-1926J	19	26	.039	*1.0*	.032	*.8*	.400	*10.1*	79	*117*
NQP-2726J	27	26	.039	*1.0*	.032	*.8*	.476	*12.1*	107	*159*
NQP-3726J	37	26	.039	*1.0*	.032	*.8*	.532	*13.5*	139	*207*

NQP SERIES OVERALL BRAIDED SHIELD - 28 and 26 AWG

Part No.	No. of pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NQP-228SJ	2	28	.035	.9	.032	*.8*	.207	*5.3*	26	*38*
NQP-328SJ	3	28	.035	.9	.032	*.8*	.217	*5.5*	29	*43*
NQP-428SJ	4	28	.035	.9	.032	*.8*	.235	*6.0*	33	*49*
NQP-528SJ	5	28	.035	.9	.032	*.8*	.256	*6.5*	38	*56*
NQP-628SJ	6	28	.035	.9	.032	*.8*	.277	*7.0*	43	*63*
NQP-728SJ	7	28	.035	.9	.032	*.8*	.267	*6.8*	45	*66*
NQP-828SJ	8	28	.035	.9	.032	*.8*	.326	*8.3*	53	*79*
NQP-928SJ	9	28	.035	.9	.032	*.8*	.312	*7.9*	58	*86*
NQP-1028SJ	10	28	.035	.9	.032	*.8*	.326	*8.3*	60	*89*
NQP-1228SJ	12	28	.035	.9	.032	*.8*	.336	*8.5*	65	*97*
NQP-1528SJ	15	28	.035	.9	.032	*.8*	.375	*9.5*	76	*113*
NQP-1928SJ	19	28	.035	.9	.032	*.8*	.386	*9.8*	87	*129*
NQP-2728SJ	27	28	.035	.9	.032	*.8*	.460	*11.7*	125	*189*
NQP-3728SJ	37	28	.035	.9	.032	*.8*	.510	*12.9*	155	*231*
NQP-226SJ	2	26	.039	1.0	.032	*.8*	.221	*5.6*	29	*43*
NQP-326SJ	3	26	.039	1.0	.032	*.8*	.231	*5.9*	34	*50*
NQP-426SJ	4	26	.039	1.0	.032	*.8*	.252	*6.4*	39	*58*
NQP-526SJ	5	26	.039	1.0	.032	*.8*	.275	*7.0*	45	*66*
NQP-626SJ	6	26	.039	1.0	.032	*.8*	.299	*7.6*	50	*75*
NQP-726SJ	7	26	.039	1.0	.032	*.8*	.287	*7.3*	53	*79*
NQP-826SJ	8	26	.039	1.0	.032	*.8*	.353	*9.0*	63	*94*
NQP-926SJ	9	26	.039	1.0	.032	*.8*	.338	*8.6*	69	*102*
NQP-1026SJ	10	26	.039	1.0	.032	*.8*	.353	*9.0*	72	*107*
NQP-1226SJ	12	26	.039	1.0	.032	*.8*	.364	*9.2*	79	*117*
NQP-1526SJ	15	26	.039	1.0	.032	*.8*	.413	*10.5*	103	*153*
NQP-1926SJ	19	26	.039	1.0	.032	*.8*	.425	*10.8*	118	*175*
NQP-2726SJ	27	26	.039	1.0	.032	*.8*	.502	*12.7*	154	*230*
NQP-3726SJ	37	26	.039	1.0	.032	*.8*	.557	*14.2*	193	*288*

CABLED TWISTED PAIRS - NQP series

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

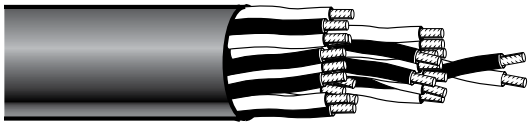
NRQP SERIES UNSHIELDED - 28 and 26 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	KG/KM
			Inches	MM	Inches	MM	Inches	MM		
NRQP-228J	2	28	.035	.9	.032	.8	.187	4.7	14	22
NRQP-328J	3	28	.035	.9	.032	.8	.197	5.0	17	26
NRQP-428J	4	28	.035	.9	.032	.8	.215	5.5	20	30
NRQP-528J	5	28	.035	.9	.032	.8	.236	6.0	23	35
NRQP-628J	6	28	.035	.9	.032	.8	.257	6.5	27	40
NRQP-728J	7	28	.035	.9	.032	.8	.247	6.3	29	43
NRQP-828J	8	28	.035	.9	.032	.8	.306	7.8	34	50
NRQP-928J	9	28	.035	.9	.032	.8	.292	7.4	37	55
NRQP-1028J	10	28	.035	.9	.032	.8	.306	7.8	39	58
NRQP-1228J	12	28	.035	.9	.032	.8	.316	8.0	44	65
NRQP-1528J	15	28	.035	.9	.032	.8	.355	9.0	52	77
NRQP-1928J	19	28	.035	.9	.032	.8	.366	9.3	61	91
NRQP-2728J	27	28	.035	.9	.032	.8	.435	11.1	82	122
NRQP-3728J	37	28	.035	.9	.032	.8	.485	12.2	106	158
NRQP-226J	2	26	.039	1.0	.032	.8	.201	5.1	17	25
NRQP-326J	3	26	.039	1.0	.032	.8	.211	5.4	21	31
NRQP-426J	4	26	.039	1.0	.032	.8	.232	5.9	25	36
NRQP-526J	5	26	.039	1.0	.032	.8	.255	6.5	29	43
NRQP-626J	6	26	.039	1.0	.032	.8	.279	7.1	33	49
NRQP-726J	7	26	.039	1.0	.032	.8	.267	6.8	36	53
NRQP-826J	8	26	.039	1.0	.032	.8	.333	8.5	42	62
NRQP-926J	9	26	.039	1.0	.032	.8	.318	8.1	46	68
NRQP-1026J	10	26	.039	1.0	.032	.8	.333	8.5	49	73
NRQP-1226J	12	26	.039	1.0	.032	.8	.344	8.7	55	82
NRQP-1526J	15	26	.039	1.0	.032	.8	.388	9.9	66	98
NRQP-1926J	19	26	.039	1.0	.032	.8	.400	10.1	79	117
NRQP-2726J	27	26	.039	1.0	.032	.8	.476	12.1	107	159
NRQP-3726J	37	26	.039	1.0	.032	.8	.532	13.5	139	207

NRQP SERIES OVERALL BRAIDED SHIELD - 28 and 26 AWG

Part No.	No. of pairs	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	KG/KM
			Inches	MM	Inches	MM	Inches	MM		
NRQP-228SJ	2	28	.035	.9	.032	.8	.207	5.3	26	38
NRQP-328SJ	3	28	.035	.9	.032	.8	.217	5.5	29	43
NRQP-428SJ	4	28	.035	.9	.032	.8	.235	6.0	33	49
NRQP-528SJ	5	28	.035	.9	.032	.8	.256	6.5	38	56
NRQP-628SJ	6	28	.035	.9	.032	.8	.277	7.0	43	63
NRQP-728SJ	7	28	.035	.9	.032	.8	.267	6.8	45	66
NRQP-828SJ	8	28	.035	.9	.032	.8	.326	8.3	53	79
NRQP-928SJ	9	28	.035	.9	.032	.8	.312	7.9	58	86
NRQP-1028SJ	10	28	.035	.9	.032	.8	.326	8.3	60	89
NRQP-1228SJ	12	28	.035	.9	.032	.8	.336	8.5	65	97
NRQP-1528SJ	15	28	.035	.9	.032	.8	.375	9.5	76	113
NRQP-1928SJ	19	28	.035	.9	.032	.8	.386	9.8	87	129
NRQP-2728SJ	27	28	.035	.9	.032	.8	.460	11.7	125	189
NRQP-3728SJ	37	28	.035	.9	.032	.8	.510	12.9	155	231
NRQP-226SJ	2	26	.039	1.0	.032	.8	.221	5.6	29	43
NRQP-326SJ	3	26	.039	1.0	.032	.8	.231	5.9	34	50
NRQP-426SJ	4	26	.039	1.0	.032	.8	.252	6.4	39	58
NRQP-526SJ	5	26	.039	1.0	.032	.8	.275	7.0	45	66
NRQP-626SJ	6	26	.039	1.0	.032	.8	.299	7.6	50	75
NRQP-726SJ	7	26	.039	1.0	.032	.8	.287	7.3	53	79
NRQP-826SJ	8	26	.039	1.0	.032	.8	.353	9.0	63	94
NRQP-926SJ	9	26	.039	1.0	.032	.8	.338	8.6	69	102
NRQP-1026SJ	10	26	.039	1.0	.032	.8	.353	9.0	72	107
NRQP-1226SJ	12	26	.039	1.0	.032	.8	.364	9.2	79	117
NRQP-1526SJ	15	26	.039	1.0	.032	.8	.413	10.5	103	153
NRQP-1926SJ	19	26	.039	1.0	.032	.8	.425	10.8	118	175
NRQP-2726SJ	27	26	.039	1.0	.032	.8	.502	12.7	154	230
NRQP-3726SJ	37	26	.039	1.0	.032	.8	.557	14.2	193	288

CABLED TWISTED PAIRS CONDUCTORS



NQP SERIES

- Twisted Pair Conductors
- Mil Spec, U.L. AWM

Recognized Style 2464 and CSA Certified AWM *II* A/B

For color code of pairs, view the Color Table in the National Wire Cable Designers Guide, page 7-13.

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

NQP SERIES UNSHIELD - 24, 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NQP-224J	2	24	.044	*1.1*	.032	*.8*	.218	*5.5*	21	*31*
NQP-324J	3	24	.044	*1.1*	.032	*.8*	.230	*5.8*	26	*38*
NQP-424J	4	24	.044	*1.1*	.032	*.8*	.253	*6.4*	31	*46*
NQP-524J	5	24	.044	*1.1*	.032	*.8*	.279	*7.1*	37	*54*
NQP-624J	6	24	.044	*1.1*	.032	*.8*	.306	*7.8*	42	*63*
NQP-724J	7	24	.044	*1.1*	.032	*.8*	.292	*7.4*	46	*69*
NQP-824J	8	24	.044	*1.1*	.032	*.8*	.367	*9.3*	54	*80*
NQP-924J	9	24	.044	*1.1*	.032	*.8*	.350	*8.9*	60	*89*
NQP-1024J	10	24	.044	*1.1*	.032	*.8*	.367	*9.3*	64	*95*
NQP-1224J	12	24	.044	*1.1*	.032	*.8*	.379	*9.6*	73	*108*
NQP-1524J	15	24	.044	*1.1*	.032	*.8*	.429	*10.9*	88	*130*
NQP-1924J	19	24	.044	*1.1*	.032	*.8*	.442	*11.2*	106	*157*
NQP-2724J	27	24	.044	*1.1*	.032	*.8*	.529	*13.4*	144	*214*
NQP-222J	2	22	.050	*1.3*	.032	*.8*	.238	*6.0*	26	*38*
NQP-322J	3	22	.050	*1.3*	.032	*.8*	.252	*6.4*	33	*48*
NQP-422J	4	22	.050	*1.3*	.032	*.8*	.278	*7.1*	40	*59*
NQP-522J	5	22	.050	*1.3*	.032	*.8*	.308	*7.8*	47	*71*
NQP-622J	6	22	.050	*1.3*	.032	*.8*	.338	*8.6*	55	*82*
NQP-722J	7	22	.050	*1.3*	.032	*.8*	.323	*8.2*	61	*91*
NQP-822J	8	22	.050	*1.3*	.032	*.8*	.408	*10.4*	71	*106*
NQP-922J	9	22	.050	*1.3*	.032	*.8*	.388	*9.9*	79	*117*
NQP-1022J	10	22	.050	*1.3*	.032	*.8*	.408	*10.4*	85	*126*
NQP-1222J	12	22	.050	*1.3*	.032	*.8*	.422	*10.7*	97	*145*
NQP-1522J	15	22	.050	*1.3*	.032	*.8*	.478	*12.1*	118	*176*
NQP-1922J	19	22	.050	*1.3*	.032	*.8*	.493	*12.5*	143	*213*
NQP-2722J	27	22	.050	*1.3*	.032	*1.3*	.628	*15.9*	221	*328*
NQP-220J	2	20	.058	*1.5*	.032	*.8*	.265	*6.7*	35	*52*
NQP-320J	3	20	.058	*1.5*	.032	*.8*	.281	*7.1*	45	*67*
NQP-420J	4	20	.058	*1.5*	.032	*.8*	.312	*7.9*	56	*84*
NQP-520J	5	20	.058	*1.5*	.032	*.8*	.346	*8.8*	668	*101*
NQP-620J	6	20	.058	*1.5*	.032	*.8*	.381	*9.7*	79	*118*
NQP-720J	7	20	.058	*1.5*	.032	*.8*	.364	*9.2*	89	*132*
NQP-820J	8	20	.058	*1.5*	.032	*.8*	.462	*11.7*	103	*154*
NQP-920J	9	20	.058	*1.5*	.032	*.8*	.439	*11.2*	115	*171*
NQP-1020J	10	20	.058	*1.5*	.032	*.8*	.462	*11.7*	124	*185*
NQP-1220J	12	20	.058	*1.5*	.032	*.8*	.478	*12.1*	144	*214*
NQP-1520J	15	20	.058	*1.5*	.032	*.8*	.544	*13.8*	176	*262*
NQP-1920J	19	20	.058	*1.5*	.032	*.8*	.561	*14.2*	216	*321*
NQP-2720J	27	20	.058	*1.5*	.032	*.8*	.711	*18.1*	326	*486*
NQP-218J	2	18	.068	*1.7*	.032	*.8*	.299	*7.6*	46	*69*
NQP-318J	3	18	.068	*1.7*	.032	*.8*	.318	*8.1*	61	*91*
NQP-418J	4	18	.068	*1.7*	.032	*.8*	.354	*9.0*	77	*115*
NQP-518J	5	18	.068	*1.7*	.032	*.8*	.394	*10.0*	94	*139*
NQP-618J	6	18	.068	*1.7*	.032	*.8*	.435	*11.1*	110	*163*
NQP-718J	7	18	.068	*1.7*	.032	*.8*	.415	*10.5*	124	*184*
NQP-1218J	12	18	.068	*1.7*	.032	*.8*	.549	*13.9*	203	*302*

NQP SERIES OVERALL BRAIDED SHIELD - 24, 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NQP-224SJ	2	24	.044	*1.1*	.032	*.8*	.238	*6.0*	34	*51*
NQP-324SJ	3	24	.044	*1.1*	.032	*.8*	.250	*6.3*	40	*60*
NQP-424SJ	4	24	.044	*1.1*	.032	*.8*	.273	*6.9*	47	*70*
NQP-524SJ	5	24	.044	*1.1*	.032	*.8*	.299	*7.6*	54	*81*
NQP-624SJ	6	24	.044	*1.1*	.032	*.8*	.326	*8.3*	62	*92*
NQP-724SJ	7	24	.044	*1.1*	.032	*.8*	.312	*7.9*	66	*98*
NQP-824SJ	8	24	.044	*1.1*	.032	*.8*	.387	*9.8*	78	*116*
NQP-924SJ	9	24	.044	*1.1*	.032	*.8*	.370	*9.4*	85	*127*
NQP-1024SJ	10	24	.044	*1.1*	.032	*.8*	.387	*9.8*	89	*133*
NQP-1224SJ	12	24	.044	*1.1*	.032	*.8*	.404	*10.3*	109	*163*
NQP-1524SJ	15	24	.044	*1.1*	.032	*.8*	.454	*11.5*	129	*192*
NQP-1924SJ	19	24	.044	*1.1*	.032	*.8*	.467	*11.9*	149	*222*
NQP-2724SJ	27	24	.044	*1.1*	.032	*.8*	.554	*14.1*	198	*294*
NQP-222SJ	2	22	.050	*1.3*	.032	*.8*	.258	*6.6*	41	*61*
NQP-322SJ	3	22	.050	*1.3*	.032	*.8*	.272	*6.9*	49	*73*
NQP-422SJ	4	22	.050	*1.3*	.032	*.8*	.298	*7.6*	58	*86*
NQP-522SJ	5	22	.050	*1.3*	.032	*.8*	.328	*8.3*	67	*100*
NQP-622SJ	6	22	.050	*1.3*	.032	*.8*	.350	*9.1*	77	*115*
NQP-722SJ	7	22	.050	*1.3*	.032	*.8*	.343	*8.7*	83	*123*
NQP-822SJ	8	22	.050	*1.3*	.032	*.8*	.433	*11.0*	108	*161*
NQP-922SJ	9	22	.050	*1.3*	.032	*.8*	.413	*10.5*	119	*176*
NQP-1022SJ	10	22	.050	*1.3*	.032	*.8*	.433	*11.0*	124	*185*
NQP-1222SJ	12	22	.050	*1.3*	.032	*.8*	.447	*11.3*	139	*206*
NQP-1522SJ	15	22	.050	*1.3*	.032	*.8*	.503	*12.8*	165	*245*
NQP-1922SJ	19	22	.050	*1.3*	.032	*.8*	.518	*13.2*	193	*287*
NQP-2722SJ	27	22	.050	*1.3*	.032	*.8*	.653	*16.6*	282	*419*
NQP-220SJ	2	20	.058	*1.5*	.032	*.8*	.285	*7.2*	52	*78*
NQP-320SJ	3	20	.058	*1.5*	.032	*.8*	.301	*7.6*	64	*95*
NQP-420SJ	4	20	.058	*1.5*	.032	*.8*	.332	*8.4*	77	*114*
NQP-520SJ	5	20	.058	*1.5*	.032	*.8*	.336	*9.3*	91	*135*
NQP-620SJ	6	20	.058	*1.5*	.032	*.8*	.401	*10.2*	105	*156*
NQP-720SJ	7	20	.058	*1.5*	.032	*.8*	.384	*9.7*	114	*170*
NQP-820SJ	8	20	.058	*1.5*	.032	*.8*	.488	*12.4*	146	*217*
NQP-920SJ	9	20	.058	*1.5*	.032	*.8*	.464	*11.8*	161	*239*
NQP-1020SJ	10	20	.058	*1.5*	.032	*.8*	.488	*12.4*	170	*253*
NQP-1220SJ	12	20	.058	*1.5*	.032	*.8*	.503	*12.8*	192	*285*
NQP-1520SJ	15	20	.058	*1.5*	.032	*1.3*	.605	*15.4*	252	*375*
NQP-1920SJ	19	20	.058	*1.5*	.032	*1.3*	.622	*15.8*	296	*441*
NQP-2720SJ	27	20	.058	*1.5*	.032	*1.3*	.737	*18.7*	397	*591*
NQP-218SJ	2	18	.068	*1.7*	.032	*.8*	.319	*8.1*	66	*98*
NQP-318SJ	3	18	.068	*1.7*	.032	*.8*	.338	*8.6*	83	*123*
NQP-418SJ	4	18	.068	*1.7*	.032	*.8*	.374	*9.5*	101	*150*
NQP-518SJ	5	18	.068	*1.7*	.032	*.8*	.420	*10.7*	130	*194*
NQP-618SJ	6	18	.068	*1.7*	.032	*.8*	.460	*11.7*	151	*224*
NQP-718SJ	7	18	.068	*1.7*	.032	*.8*	.440	*11.2*	164	*245*
NQP-1218SJ	12	18	.068	*1.7*	.032	*.8*	.610	*15.5*	281	*418*

CABLED TWISTED PAIRS - NQP series

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

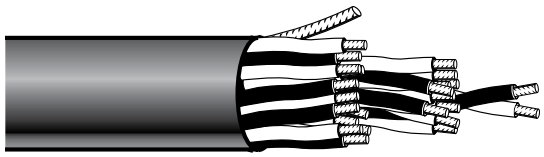
NRQP SERIES UNSHIELD - 24, 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. MM	Jacket Wall Inches	Jacket Wall MM	Nom. Diam. Inches	Nom. Diam. MM	Weight lbs per 1000 ft	Weight KG/KM
NRQP-224J	2	24	.044	1.1	.032	.8	.218	5.5	21	31
NRQP-324J	3	24	.044	1.1	.032	.8	.230	5.8	26	38
NRQP-424J	4	24	.044	1.1	.032	.8	.253	6.4	31	46
NRQP-524J	5	24	.044	1.1	.032	.8	.279	7.1	37	54
NRQP-624J	6	24	.044	1.1	.032	.8	.306	7.8	42	63
NRQP-724J	7	24	.044	1.1	.032	.8	.292	7.4	46	69
NRQP-824J	8	24	.044	1.1	.032	.8	.367	9.3	54	80
NRQP-924J	9	24	.044	1.1	.032	.8	.350	8.9	60	89
NRQP-1024J	10	24	.044	1.1	.032	.8	.367	9.3	64	95
NRQP-1224J	12	24	.044	1.1	.032	.8	.379	9.6	73	108
NRQP-1524J	15	24	.044	1.1	.032	.8	.429	10.9	88	130
NRQP-1924J	19	24	.044	1.1	.032	.8	.442	11.2	106	157
NRQP-2724J	27	24	.044	1.1	.032	.8	.529	13.4	144	214
NRQP-222J	2	22	.050	1.3	.032	.8	.238	6.0	26	38
NRQP-322J	3	22	.050	1.3	.032	.8	.252	6.4	33	48
NRQP-422J	4	22	.050	1.3	.032	.8	.278	7.1	40	59
NRQP-522J	5	22	.050	1.3	.032	.8	.308	7.8	47	71
NRQP-622J	6	22	.050	1.3	.032	.8	.338	8.6	55	82
NRQP-722J	7	22	.050	1.3	.032	.8	.323	8.2	61	91
NRQP-822J	8	22	.050	1.3	.032	.8	.408	10.4	71	106
NRQP-922J	9	22	.050	1.3	.032	.8	.388	9.9	79	117
NRQP-1022J	10	22	.050	1.3	.032	.8	.408	10.4	85	126
NRQP-1222J	12	22	.050	1.3	.032	.8	.422	10.7	97	145
NRQP-1522J	15	22	.050	1.3	.032	.8	.478	12.1	118	176
NRQP-1922J	19	22	.050	1.3	.032	.8	.493	12.5	143	213
NRQP-2722J	27	22	.050	1.3	.032	1.3	.628	15.9	221	328
NRQP-220J	2	20	.058	1.5	.032	.8	.265	6.7	35	52
NRQP-320J	3	20	.058	1.5	.032	.8	.281	7.1	45	67
NRQP-420J	4	20	.058	1.5	.032	.8	.312	7.9	56	84
NRQP-520J	5	20	.058	1.5	.032	.8	.346	8.8	668	101
NRQP-620J	6	20	.058	1.5	.032	.8	.381	9.7	79	118
NRQP-720J	7	20	.058	1.5	.032	.8	.364	9.2	89	132
NRQP-820J	8	20	.058	1.5	.032	.8	.462	11.7	103	154
NRQP-920J	9	20	.058	1.5	.032	.8	.439	11.2	115	171
NRQP-1020J	10	20	.058	1.5	.032	.8	.462	11.7	124	185
NRQP-1220J	12	20	.058	1.5	.032	.8	.478	12.1	144	214
NRQP-1520J	15	20	.058	1.5	.032	.8	.544	13.8	176	262
NRQP-1920J	19	20	.058	1.5	.032	.8	.561	14.2	216	321
NRQP-2720J	27	20	.058	1.5	.032	.8	.711	18.1	326	486
NRQP-218J	2	18	.068	1.7	.032	.8	.299	7.6	46	69
NRQP-318J	3	18	.068	1.7	.032	.8	.318	8.1	61	91
NRQP-418J	4	18	.068	1.7	.032	.8	.354	9.0	77	115
NRQP-518J	5	18	.068	1.7	.032	.8	.394	10.0	94	139
NRQP-618J	6	18	.068	1.7	.032	.8	.435	11.1	110	163
NRQP-718J	7	18	.068	1.7	.032	.8	.415	10.5	124	184
NRQP-1218J	12	18	.068	1.7	.032	.8	.549	13.9	203	302

NRQP SERIES OVERALL BRAIDED SHIELD - 24, 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. MM	Jacket Wall Inches	Jacket Wall MM	Nom. Diam. Inches	Nom. Diam. MM	Weight lbs per 1000 ft	Weight KGKM
NRQP-224SJ	2	24	.044	1.1	.032	.8	.238	6.0	34	51
NRQP-324SJ	3	24	.044	1.1	.032	.8	.250	6.3	40	60
NRQP-424SJ	4	24	.044	1.1	.032	.8	.273	6.9	47	70
NRQP-524SJ	5	24	.044	1.1	.032	.8	.299	7.6	54	81
NRQP-624SJ	6	24	.044	1.1	.032	.8	.326	8.3	62	92
NRQP-724SJ	7	24	.044	1.1	.032	.8	.312	7.9	66	98
NRQP-824SJ	8	24	.044	1.1	.032	.8	.387	9.8	78	116
NRQP-924SJ	9	24	.044	1.1	.032	.8	.370	9.4	85	127
NRQP-1024SJ	10	24	.044	1.1	.032	.8	.387	9.8	89	133
NRQP-1224SJ	12	24	.044	1.1	.032	.8	.404	10.3	109	163
NRQP-1524SJ	15	24	.044	1.1	.032	.8	.454	11.5	129	192
NRQP-1924SJ	19	24	.044	1.1	.032	.8	.467	11.9	149	222
NRQP-2724SJ	27	24	.044	1.1	.032	.8	.554	14.1	198	294
NRQP-222SJ	2	22	.050	1.3	.032	.8	.258	6.6	41	61
NRQP-322SJ	3	22	.050	1.3	.032	.8	.272	6.9	49	73
NRQP-422SJ	4	22	.050	1.3	.032	.8	.298	7.6	58	86
NRQP-522SJ	5	22	.050	1.3	.032	.8	.328	8.3	67	100
NRQP-622SJ	6	22	.050	1.3	.032	.8	.350	9.1	77	115
NRQP-722SJ	7	22	.050	1.3	.032	.8	.343	8.7	83	123
NRQP-822SJ	8	22	.050	1.3	.032	.8	.433	11.0	108	161
NRQP-922SJ	9	22	.050	1.3	.032	.8	.413	10.5	119	176
NRQP-1022SJ	10	22	.050	1.3	.032	.8	.433	11.0	124	185
NRQP-1222SJ	12	22	.050	1.3	.032	.8	.447	11.3	139	206
NRQP-1522SJ	15	22	.050	1.3	.032	.8	.503	12.8	165	245
NRQP-1922SJ	19	22	.050	1.3	.032	.8	.518	13.2	193	287
NRQP-2722SJ	27	22	.050	1.3	.032	.8	.653	16.6	282	419
NRQP-220SJ	2	20	.058	1.5	.032	.8	.285	7.2	52	78
NRQP-320SJ	3	20	.058	1.5	.032	.8	.301	7.6	64	95
NRQP-420SJ	4	20	.058	1.5	.032	.8	.332	8.4	77	114
NRQP-520SJ	5	20	.058	1.5	.032	.8	.336	9.3	91	135
NRQP-620SJ	6	20	.058	1.5	.032	.8	.401	10.2	105	156
NRQP-720SJ	7	20	.058	1.5	.032	.8	.384	9.7	114	170
NRQP-820SJ	8	20	.058	1.5	.032	.8	.488	12.4	146	217
NRQP-920SJ	9	20	.058	1.5	.032	.8	.464	11.8	161	239
NRQP-1020SJ	10	20	.058	1.5	.032	.8	.488	12.4	170	253
NRQP-1220SJ	12	20	.058	1.5	.032	.8	.503	12.8	192	285
NRQP-1520SJ	15	20	.058	1.5	.032	1.3	.605	15.4	252	375
NRQP-1920SJ	19	20	.058	1.5	.032	1.3	.622	15.8	296	441
NRQP-2720SJ	27	20	.058	1.5	.032	1.3	.737	18.7	397	591
NRQP-218SJ	2	18	.068	1.7	.032	.8	.319	8.1	66	98
NRQP-318SJ	3	18	.068	1.7	.032	.8	.338	8.6	83	123
NRQP-418SJ	4	18	.068	1.7	.032	.8	.374	9.5	101	150
NRQP-518SJ	5	18	.068	1.7	.032	.8	.420	10.7	130	194
NRQP-618SJ	6	18	.068	1.7	.032	.8	.460	11.7	151	224
NRQP-718SJ	7	18	.068	1.7	.032	.8	.440	11.2	164	245
NRQP-1218SJ	12	18	.068	1.7	.032	.8	.610	15.5	281	418

CABLED TWISTED PAIRS CONDUCTORS



NQP SERIES

- Twisted Pair Conductors
- Mil Spec, U.L. AWM

Recognized Style 2464 and CSA Certified AWM *II* A/B

For color code of pairs, view the Color Table in the National Wire Cable Designers Guide, page 7-13.

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

NQP SERIES OVERALL FOIL SHIELD WITH DRAIN - 28, 26 and 24 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NQP-228FSJ	2	28	.035	*.9*	.032	*.8*	.189	*4.8*	15	*23*
NQP-328FSJ	3	28	.035	*.9*	.032	*.8*	.199	*5.0*	18	*27*
NQP-428FSJ	4	28	.035	*.9*	.032	*.8*	.217	*5.5*	21	*31*
NQP-528FSJ	5	28	.035	*.9*	.032	*.8*	.238	*6.0*	24	*36*
NQP-628FSJ	6	28	.035	*.9*	.032	*.8*	.259	*6.6*	27	*41*
NQP-728FSJ	7	28	.035	*.9*	.032	*.8*	.249	*6.3*	29	*44*
NQP-828FSJ	8	28	.035	*.9*	.032	*.8*	.308	*7.8*	34	*51*
NQP-928FSJ	9	28	.035	*.9*	.032	*.8*	.294	*7.5*	38	*56*
NQP-1028FSJ	10	28	.035	*.9*	.032	*.8*	.308	*7.8*	40	*59*
NQP-1228FSJ	12	28	.035	*.9*	.032	*.8*	.318	*8.1*	44	*66*
NQP-1528FSJ	15	28	.035	*.9*	.032	*.8*	.357	*9.1*	53	*78*
NQP-1928FSJ	19	28	.035	*.9*	.032	*.8*	.368	*9.3*	62	*92*
NQP-2728FSJ	27	28	.035	*.9*	.032	*.8*	.437	*11.1*	83	*124*
NQP-3728FSJ	37	28	.035	*.9*	.032	*.8*	.487	*12.3*	107	*159*
NQP-226FSJ	2	26	.039	*1.0*	.032	*.8*	.203	*5.1*	18	*27*
NQP-326FSJ	3	26	.039	*1.0*	.032	*.8*	.213	*5.4*	22	*32*
NQP-426FSJ	4	26	.039	*1.0*	.032	*.8*	.234	*5.9*	25	*38*
NQP-526FSJ	5	26	.039	*1.0*	.032	*.8*	.257	*6.5*	30	*44*
NQP-626FSJ	6	26	.039	*1.0*	.032	*.8*	.281	*7.1*	34	*50*
NQP-726FSJ	7	26	.039	*1.0*	.032	*.8*	.269	*6.8*	37	*55*
NQP-826FSJ	8	26	.039	*1.0*	.032	*.8*	.335	*8.5*	43	*64*
NQP-926FSJ	9	26	.039	*1.0*	.032	*.8*	.320	*8.1*	47	*70*
NQP-1026FSJ	10	26	.039	*1.0*	.032	*.8*	.335	*8.5*	50	*74*
NQP-1226FSJ	12	26	.039	*1.0*	.032	*.8*	.346	*8.8*	56	*84*
NQP-1526FSJ	15	26	.039	*1.0*	.032	*.8*	.390	*9.9*	67	*100*
NQP-1926FSJ	19	26	.039	*1.0*	.032	*.8*	.402	*10.2*	80	*119*
NQP-2726FSJ	27	26	.039	*1.0*	.032	*.8*	.478	*12.2*	108	*160*
NQP-3726FSJ	37	26	.039	*1.0*	.032	*.8*	.534	*13.5*	140	*209*
NQP-224FSJ	2	24	.044	*1.1*	.032	*.8*	.220	*5.6*	22	*3*
NQP-324FSJ	3	24	.044	*1.1*	.032	*.8*	.232	*5.9*	27	*40*
NQP-424FSJ	4	24	.044	*1.1*	.032	*.8*	.255	*6.5*	32	*48*
NQP-524FSJ	5	24	.044	*1.1*	.032	*.8*	.281	*7.1*	38	*57*
NQP-624FSJ	6	24	.044	*1.1*	.032	*.8*	.308	*7.8*	44	*65*
NQP-724FSJ	7	24	.044	*1.1*	.032	*.8*	.294	*7.5*	48	*71*
NQP-824FSJ	8	24	.044	*1.1*	.032	*.8*	.369	*9.4*	55	*83*
NQP-924FSJ	9	24	.044	*1.1*	.032	*.8*	.352	*8.9*	61	*91*
NQP-1024FSJ	10	24	.044	*1.1*	.032	*.8*	.369	*9.4*	65	*97*
NQP-1224FSJ	12	24	.044	*1.1*	.032	*.8*	.381	*8.9*	61	*91*
NQP-1524FSJ	15	24	.044	*1.1*	.032	*.8*	.431	*10.9*	89	*133*
NQP-1924FSJ	19	24	.044	*1.1*	.032	*.8*	.444	*11.3*	107	*159*
NQP-2724FSJ	24	24	.044	*1.1*	.032	*.8*	.531	*13.5*	146	*217*

NQP SERIES OVERALL FOIL SHIELD WITH DRAIN - 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NQP-222FSJ	2	22	.050	*1.3*	032	*.8*	.240	*6.1*	28	*42*
NQP-322FSJ	3	22	.050	*1.3*	.032	*.8*	.254	*6.4*	35	*52*
NQP-422FSJ	4	22	.050	*1.3*	.032	*.8*	.280	*7.1*	42	*63*
NQP-522FSJ	5	22	.050	*1.3*	.032	*.8*	.310	*7.9*	50	*74*
NQP-622FSJ	6	22	.050	*1.3*	.032	*.8*	.340	*8.6*	57	*85*
NQP-722FSJ	7	22	.050	*1.3*	.032	*.8*	.325	*8.3*	63	*94*
NQP-822FSJ	8	22	.050	*1.3*	.032	*.8*	.410	*10.4*	73	*109*
NQP-922FSJ	9	22	.050	*1.3*	.032	*.8*	.390	*9.9*	81	*120*
NQP-1022FSJ	10	22	.050	*1.3*	.032	*.8*	.410	*10.4*	87	*129*
NQP-1222FSJ	12	22	.050	*1.3*	.032	*.8*	.424	*10.8*	99	*148*
NQP-1522FSJ	15	22	.050	*1.3*	.032	*.8*	.480	*12.2*	120	*179*
NQP-1922FSJ	19	22	.050	*1.3*	.032	*.8*	.495	*12.6*	146	*216*
NQP-2722FSJ	27	22	.050	*1.3*	.032	*.8*	.630	*16.0*	223	*331*
NQP-220FSJ	2	20	.058	*1.5*	.032	*.8*	.267	*6.8*	39	*57*
NQP-320FSJ	3	20	.058	*1.5*	.032	*.8*	.283	*7.2*	49	*73*
NQP-420FSJ	4	20	.058	*1.5*	.032	*.8*	.314	*8.0*	60	*90*
NQP-520FSJ	5	20	.058	*1.5*	.032	*.8*	.348	*8.8*	72	*107*
NQP-620FSJ	6	20	.058	*1.5*	.032	*.8*	.383	*9.7*	83	*124*
NQP-720FSJ	7	20	.058	*1.5*	.032	*.8*	.366	*9.3*	93	*138*
NQP-820FSJ	8	20	.058	*1.5*	.032	*.8*	.464	*11.8*	107	*159*
NQP-920FSJ	9	20	.058	*1.5*	.032	*.8*	.441	*11.2*	119	*176*
NQP-1020FSJ	10	20	.058	*1.5*	.032	*.8*	.464	*11.8*	128	*190*
NQP-1220FSJ	12	20	.058	*1.5*	.032	*.8*	.480	*12.2*	148	*220*
NQP-1520FSJ	15	20	.058	*1.5*	.032	*.8*	.546	*13.9*	180	*268*
NQP-1920FSJ	19	20	.058	*1.5*	.032	*.8*	.563	*14.3*	220	*327*
NQP-2720FSJ	27	20	.058	*1.5*	.032	*.8*	.713	*18.1*	330	*492*
NQP-218FSJ	2	18	.068	*1.7*	.032	*.8*	.301	*7.7*	52	*77*
NQP-318FSJ	3	18	.068	*1.7*	.032	*.8*	.320	*8.1*	67	*100*
NQP-418FSJ	4	18	.068	*1.7*	.032	*.8*	.356	*9.0*	83	*124*
NQP-518FSJ	5	18	.068	*1.7*	.032	*.8*	.396	*10.1*	99	*148*
NQP-618FSJ	6	18	.068	*1.7*	.032	*.8*	.437	*11.1*	116	*172*
NQP-718FSJ	7	18	.068	*1.7*	.032	*.8*	.417	*10.6*	130	*193*
NQP-1218FSJ	12	18	.068	*1.7*	.032	*.8*	.551	*14.0*	209	*310*

CABLED TWISTED PAIRS - NQP series

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 28, 26, 24, 22 are 7 strand. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

NRQP SERIES OVERALL FOIL SHIELD WITH DRAIN - 28, 26 and 24 AWG

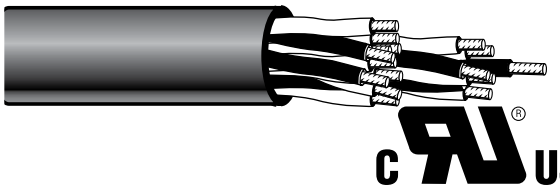
Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. MM	Jacket Wall Inches	Jacket Wall MM	Nom. Diam. Inches	Nom. Diam. MM	Weight lbs per 1000 ft	Weight KG/KM
NRQP-228FSJ	2	28	.035	.9	.032	.8	.189	4.8	15	23
NRQP-328FSJ	3	28	.035	.9	.032	.8	.199	5.0	18	27
NRQP-428FSJ	4	28	.035	.9	.032	.8	.217	5.5	21	31
NRQP-528FSJ	5	28	.035	.9	.032	.8	.238	6.0	24	36
NRQP-628FSJ	6	28	.035	.9	.032	.8	.259	6.6	27	41
NRQP-728FSJ	7	28	.035	.9	.032	.8	.249	6.3	29	44
NRQP-828FSJ	8	28	.035	.9	.032	.8	.308	7.8	34	51
NRQP-928FSJ	9	28	.035	.9	.032	.8	.294	7.5	38	56
NRQP-1028FSJ	10	28	.035	.9	.032	.8	.308	7.8	40	59
NRQP-1228FSJ	12	28	.035	.9	.032	.8	.318	8.1	44	66
NRQP-1528FSJ	15	28	.035	.9	.032	.8	.357	9.1	53	78
NRQP-1928FSJ	19	28	.035	.9	.032	.8	.368	9.3	62	92
NRQP-2728FSJ	27	28	.035	.9	.032	.8	.437	11.1	83	124
NRQP-3728FSJ	37	28	.035	.9	.032	.8	.487	12.3	107	159
NRQP-226FSJ	2	26	.039	1.0	.032	.8	.203	5.1	18	27
NRQP-326FSJ	3	26	.039	1.0	.032	.8	.213	5.4	22	32
NRQP-426FSJ	4	26	.039	1.0	.032	.8	.234	5.9	25	38
NRQP-526FSJ	5	26	.039	1.0	.032	.8	.257	6.5	30	44
NRQP-626FSJ	6	26	.039	1.0	.032	.8	.281	7.1	34	50
NRQP-726FSJ	7	26	.039	1.0	.032	.8	.269	6.8	37	55
NRQP-826FSJ	8	26	.039	1.0	.032	.8	.335	8.5	43	64
NRQP-926FSJ	9	26	.039	1.0	.032	.8	.320	8.1	47	70
NRQP-1026FSJ	10	26	.039	1.0	.032	.8	.335	8.5	50	74
NRQP-1226FSJ	12	26	.039	1.0	.032	.8	.346	8.8	56	84
NRQP-1526FSJ	15	26	.039	1.0	.032	.8	.390	9.9	67	100
NRQP-1926FSJ	19	26	.039	1.0	.032	.8	.402	10.2	80	119
NRQP-2726FSJ	27	26	.039	1.0	.032	.8	.478	12.2	108	160
NRQP-3726FSJ	37	26	.039	1.0	.032	.8	.534	13.5	140	209
NRQP-224FSJ	2	24	.044	1.1	.032	.8	.220	5.6	22	3
NRQP-324FSJ	3	24	.044	1.1	.032	.8	.232	5.9	27	40
NRQP-424FSJ	4	24	.044	1.1	.032	.8	.255	6.5	32	48
NRQP-524FSJ	5	24	.044	1.1	.032	.8	.281	7.1	38	57
NRQP-624FSJ	6	24	.044	1.1	.032	.8	.308	7.8	44	65
NRQP-724FSJ	7	24	.044	1.1	.032	.8	.294	7.5	48	71
NRQP-824FSJ	8	24	.044	1.1	.032	.8	.369	9.4	55	83
NRQP-924FSJ	9	24	.044	1.1	.032	.8	.352	8.9	61	91
NRQP-1024FSJ	10	24	.044	1.1	.032	.8	.369	9.4	65	97
NRQP-1224FSJ	12	24	.044	1.1	.032	.8	.381	8.9	61	91
NRQP-1524FSJ	15	24	.044	1.1	.032	.8	.431	10.9	89	133
NRQP-1924FSJ	19	24	.044	1.1	.032	.8	.444	11.3	107	159
NRQP-2724FSJ	24	24	.044	1.1	.032	.8	.531	13.5	146	217

NRQP SERIES OVERALL FOIL SHIELD WITH DRAIN - 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. MM	Jacket Wall Inches	Jacket Wall MM	Nom. Diam. Inches	Nom. Diam. MM	Weight lbs per 1000 ft	Weight KG/KM
NRQP-222FSJ	2	22	.050	1.3	032	.8	.240	6.1	28	42
NRQP-322FSJ	3	22	.050	1.3	.032	.8	.254	6.4	35	52
NRQP-422FSJ	4	22	.050	1.3	.032	.8	.280	7.1	42	63
NRQP-522FSJ	5	22	.050	1.3	.032	.8	.310	7.9	50	74
NRQP-622FSJ	6	22	.050	1.3	.032	.8	.340	8.6	57	85
NRQP-722FSJ	7	22	.050	1.3	.032	.8	.325	8.3	63	94
NRQP-822FSJ	8	22	.050	1.3	.032	.8	.410	10.4	73	109
NRQP-922FSJ	9	22	.050	1.3	.032	.8	.390	9.9	81	120
NRQP-1022FSJ	10	22	.050	1.3	.032	.8	.410	10.4	87	129
NRQP-1222FSJ	12	22	.050	1.3	.032	.8	.424	10.8	99	148
NRQP-1522FSJ	15	22	.050	1.3	.032	.8	.480	12.2	120	179
NRQP-1922FSJ	19	22	.050	1.3	.032	.8	.495	12.6	146	216
NRQP-2722FSJ	27	22	.050	1.3	.032	.8	.630	16.0	223	331
NRQP-220FSJ	2	20	.058	1.5	.032	.8	.267	6.8	39	57
NRQP-320FSJ	3	20	.058	1.5	.032	.8	.283	7.2	49	73
NRQP-420FSJ	4	20	.058	1.5	.032	.8	.314	8.0	60	90
NRQP-520FSJ	5	20	.058	1.5	.032	.8	.348	8.8	72	107
NRQP-620FSJ	6	20	.058	1.5	.032	.8	.383	9.7	83	124
NRQP-720FSJ	7	20	.058	1.5	.032	.8	.366	9.3	93	138
NRQP-820FSJ	8	20	.058	1.5	.032	.8	.464	11.8	107	159
NRQP-920FSJ	9	20	.058	1.5	.032	.8	.441	11.2	119	176
NRQP-1020FSJ	10	20	.058	1.5	.032	.8	.464	11.8	128	190
NRQP-1220FSJ	12	20	.058	1.5	.032	.8	.480	12.2	148	220
NRQP-1520FSJ	15	20	.058	1.5	.032	.8	.546	13.9	180	268
NRQP-1920FSJ	19	20	.058	1.5	.032	.8	.563	14.3	220	327
NRQP-2720FSJ	27	20	.058	1.5	.032	.8	.713	18.1	330	492
NRQP-218FSJ	2	18	.068	1.7	.032	.8	.301	7.7	52	77
NRQP-318FSJ	3	18	.068	1.7	.032	.8	.320	8.1	67	100
NRQP-418FSJ	4	18	.068	1.7	.032	.8	.356	9.0	83	124
NRQP-518FSJ	5	18	.068	1.7	.032	.8	.396	10.1	99	148
NRQP-618FSJ	6	18	.068	1.7	.032	.8	.437	11.1	116	172
NRQP-718FSJ	7	18	.068	1.7	.032	.8	.417	10.6	130	193
NRQP-1218FSJ	12	18	.068	1.7	.032	.8	.551	14.0	209	310

NV & NVP CABLES

Suitable for Rough Usage - 20 AWG



- AWM Style 20233
- 80ºC, 300 Volt, VW-1
- CSA AWM *II* A/B, 80ºC, 300 V, FT-1

National Wire & Cable Corporation manufactures a family of highly flexible miniature **rough-usage** low-voltage instrument control cable. These are available as cabled pairs or singles, with optional overall shield of foil with drain wire.

Conductors are stranded tinned copper with .011" wall of super-tough extruded polypropylene primary insulation, having excellent electrical properties. Wires are color coded using ten std. colors + stripes meeting UL style 10493.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier tape under braids, if used.

Shielded cables have 100% coverage aluminum-foil shield in contact with a stranded drain wire for easy termination. Optional tinned copper braid of >90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback is available on special order.

Outer jacket is highly flexible poly-ether-urethane thermoplastic, very resistant to oils, fuels, flame, and UV. Polyurethane is noted for outstanding resistance to scuffing and tearing.

Standard cable has super-durable black polyurethane jacket, or may be supplied with blue outer jacket for use in "Intrinsically Safe" applications. (Ref. National Electric Code, Chapter 5, Section 504.)

Finished cable meets the UL Vertical Flame Test type VW-1 and CSA FT-1 flame test.

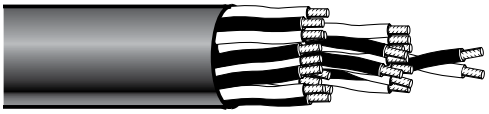
Finished cable is UL Recognized and meets all requirements of Appliance Wiring Material Style 20233 wich bears the agency intended-use of "External connection of electronic equipment."

Widely used for molded-connector assemblies due to uniform controlled diameter. All cables bear printed marks for UL rated voltage (300 V.), temperature (+80ºC), and flame resistance (UL VW-1). Available in other conductor AWG sizes and stranding. Please consult factory.

Property	Technical Data for 20 AWG
Agency Cable Style	UL AWM Style 20233
Agency voltage rating	300 Volts
Agency temperature rating	+80ºC.
Agency Flame Rating	UL VW-1 and also Canadian CSA FT-1
Factory HiPot test volts	1500 VAC each conductor to all others & shield, connected in common.
Factory spark test (dry) individual wires	100 % of all wire passes 3400 VAC "spark test" before processing.
Cold Bending	Passes cold bend (180º over 2x mandrel) at -20ºC. Storage OK at -40ºC.
Conductor Resistance, single, not pair	9.5 ohms per 1000 feet; (3.1 ohms per 100 meter) (20 awg)
Conductor Resistance, single, in a pair	10 ohms per 1000 feet; (3.3 ohms per 100 meter) (20 awg)
Wire Insulation Resistance (IR)	3,000 megohms per 100 meters, from one conductor to all else in common + shield, nom.
Jacket Insulation Resistance (Wet IR)	100 megohm per 100 meters from conductor group + shield to water bath electrode, nom.
Jacket Capacitance (Fully immersed)	95 nFd per 100 meters from wires & shield, grouped, to bath electrode.
Capacitance , one wire to group + shield	17 nFd per 100 meters @ 1000 Hz, nominal (20 awg)
Pair Capacitance wire-wire	9.7 nFd per 100 meters @ 1000 Hz, nominal (20 awg)
Pair Inductance, 2-wire Loop	.064 milli-Henry per 100 meters @ 1000 Hz, nominal. (20 awg)
Pair Impedance, wire-wire	90 ohm diff. impedance, for pairs, nominal (20 awg)
Single conductor Inductance	3.33 milli-Henry per 100 m, end-to-end, @ 1000 Hz. nominal. (20 awg)

NV FAMILY OF CABLED SINGLE WIRES

UNSHIELDED CABLED SINGLE WIRES						20 AWG OVERALL FOIL-SHIELDED OVER CABLED SINGLE WIRES				
Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**		Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**
NV220J	2	20(19)	.184 | 4.7	16 | 24		NV220FSJ	2	20(19)	.186 | 4.7	20 | 30
NV320J	3	20(19)	.193 | 4.9	21 | 31		NV320FSJ	3	20(19)	.195 | 5.0	25 | 37
NV420J	4	20(19)	.207 | 5.3	26 | 39		NV420FSJ	4	20(19)	.209 | 5.3	30 | 45
NV520J	5	20(19)	.225 | 5.7	31 | 47		NV520FSJ	5	20(19)	.227 | 5.8	35 | 52
NV620J	6	20(19)	.242 | 6.1	37 | 55		NV620FSJ	6	20(19)	.244 | 6.2	40 | 60
NV920J	9	20(19)	.300 | 7.6	53 | 79		NV920FSJ	9	20(19)	.302 | 7.7	57 | 84
NV1220J	12	20(19)	.309 | 7.9	67 | 99		NV1220FSJ	12	20(19)	.311 | 7.9	71 | 105



NVP FAMILY OF CABLED TWISTED PAIRS

UNSHIELDED CABLED PAIRS						20 AWG OVERALL FOIL-SHIELDED OVER CABLED PAIRS				
Part No.	No. of Pairs	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**		Part No.	No. of Pairs	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**
NVP220J	2	20(19)	.261 | 6.7	20 | 30		NVP220FSJ	2	20(19)	.263 | 6.8	24 | 36
NVP320J	3	20(19)	.277 | 7.1	26 | 38		NVP320FSJ	3	20(19)	.279 | 7.2	29 | 44
NVP420J	4	20(19)	.301 | 7.9	31 | 47		NVP420FSJ	4	20(19)	.303 | 8.0	35 | 53
NVP520J	5	20(19)	.330 | 8.8	37 | 56		NVP520FSJ	5	20(19)	.332 | 8.8	41 | 62
NVP620J	6	20(19)	.360 | 9.7	43 | 65		NVP620FSJ	6	20(19)	.362 | 9.7	47 | 71
NVP920J	9	20(19)	.458 | 11.2	62 | 93		NVP920FSJ	9	20(19)	.460 | 11.2	66 | 99
NVP1220J	12	20(19)	.474 | 12.1	77 | 115		NVP1220FSJ	12	20(19)	.476 | 12.2	81 | 121

NV & NVP CABLES

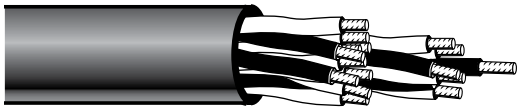
RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

UNSHIELDED CABLED SINGLE WIRES						20 AWG OVERALL FOIL-SHIELDED OVER CABLED SINGLE WIRES				
Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**		Part No.	No. of Wires	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**
NRV220J	2	20(19)	.184 | 4.7	16 | 24		NRV220FSJ	2	20(19)	.186 | 4.7	20 | 30
NRV320J	3	20(19)	.193 | 4.9	21 | 31		NRV320FSJ	3	20(19)	.195 | 5.0	25 | 37
NRV420J	4	20(19)	.207 | 5.3	26 | 39		NRV420FSJ	4	20(19)	.209 | 5.3	30 | 45
NRRV520J	5	20(19)	.225 | 5.7	31 | 47		NRV520FSJ	5	20(19)	.227 | 5.8	35 | 52
NRV620J	6	20(19)	.242 | 6.1	37 | 55		NRV620FSJ	6	20(19)	.244 | 6.2	40 | 60
NRV920J	9	20(19)	.300 | 7.6	53 | 79		NRV920FSJ	9	20(19)	.302 | 7.7	57 | 84
NRV1220J	12	20(19)	.309 | 7.9	67 | 99		NRV1220FSJ	12	20(19)	.311 | 7.9	71 | 105

UNSHIELDED CABLED PAIRS						20 AWG OVERALL FOIL-SHIELDED OVER CABLED PAIRS				
Part No.	No. of Pairs	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**		Part No.	No. of Pairs	Wire AWG & Strands	Diameter Inch | mm	Weight **Lb/M | kg/km**
NRVP220J	2	20(19)	.261 | 6.7	20 | 30		NRVP220FSJ	2	20(19)	.263 | 6.8	24 | 36
NRVP320J	3	20(19)	.277 | 7.1	26 | 38		NRVP320FSJ	3	20(19)	.279 | 7.2	29 | 44
NRVP420J	4	20(19)	.301 | 7.9	31 | 47		NRVP420FSJ	4	20(19)	.303 | 8.0	35 | 53
NRVP520J	5	20(19)	.330 | 8.8	37 | 56		NRVP520FSJ	5	20(19)	.332 | 8.8	41 | 62
NRVP620J	6	20(19)	.360 | 9.7	43 | 65		NRVP620FSJ	6	20(19)	.362 | 9.7	47 | 71
NRVP920J	9	20(19)	.458 | 11.2	62 | 93		NRVP920FSJ	9	20(19)	.460 | 11.2	66 | 99
NRVP1220J	12	20(19)	.474 | 12.1	77 | 115		NRVP1220FSJ	12	20(19)	.476 | 12.2	81 | 121

CABLED SINGLE CONDUCTORS



NX SERIES

- Single Conductors
- Mil Spec, U.L. AWM

Recognized Style 2343 and CSA Certified AWM *II* A/B*

National Wire & Cable Corporation manufactures a complete line of MINIATURE low voltage signal and control cable. Available as cabled pairs or cabled singles, with optional overall shield. Conductors are stranded tinned copper with .010" wall of vinyl primary insulation for use up to 105°C. per MIL-W-16878/1.

Insulated for 600 volts working voltage. (Also meets U.L. AWM Type 1061; 300 volt, 80°C.) All are coded using 10 standard colors plus stripes on white per MIL-STD-681. View Color Table in the National Wire Cable Designers Guide, page 7-13.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape barrier undershields. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078;and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C. vinyl meeting MIL-I-631 Type F. All materials are self-extinguishing and fungus-resistant. All items are U.L. STYLE 2343 COMPUTER CABLE; rated 80°C (Higher temp. ratings apply for any non-U.L. service). Meets E.I.A. Standard RS-232 for 18-24 gauges.

*CSA certification furnished only when requested.
Standard Putups: 500 and 1000 ft. No-deposit reels.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 3400 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 45 to 70 pf/ft at 1 kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500 VDC form conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500 VDC from shield or conductor group through sheath to ground.
Temperature Range:	Suitable for continuous use from -40°C to +105°C. (U.L. Service limited to +80°C)
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult the factory.

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 24, 22 are 7 strand. All others are 19 strand.

NX SERIES UNSHIELDED - 24, 22 and 20 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NX-524J	5	24	.044	*1.1*	.062	*1.6*	.247	*6.3*	31	*47*
NX-724J	7	24	.044	*1.1*	.062	*1.6*	.260	*6.6*	37	*55*
NX-1224J	12	24	.044	*1.1*	.062	*1.6*	.311	*7.9*	53	*79*
NX-1524J	15	24	.044	*1.1*	.062	*1.6*	.335	*8.5*	62	*92*
NX-1924J	19	24	.044	*1.1*	.062	*1.6*	.348	*8.8*	72	*106*
NX-2724J	27	24	.044	*1.1*	.062	*1.6*	.399	*10.1*	94	*139*
NX-3724J	37	24	.044	*1.1*	.062	*1.6*	.436	*11.1*	118	*176*
NX-4824J	48	24	.044	*1.1*	.062	*1.6*	.484	*12.3*	146	*217*
NX-6024J	60	24	.044	*1.1*	.062	*1.6*	.524	*13.3*	175	*261*
NX-522J	5	22	.050	*1.3*	.062	*1.6*	.263	*6.7*	38	*56*
NX-722J	7	22	.050	*1.3*	.062	*1.6*	.278	*7.1*	45	*67*
NX-1222J	12	22	.050	*1.3*	.062	*1.6*	.336	*8.5*	67	*99*
NX-1522J	15	22	.050	*1.3*	.062	*1.6*	.363	*9.2*	79	*117*
NX-1922J	19	22	.050	*1.3*	.062	*1.6*	.378	*9.6*	92	*137*
NX-2722J	27	22	.050	*1.3*	.062	*1.6*	.436	*11.1*	122	*182*
NX-3722J	37	22	.050	*1.3*	.062	*1.6*	.478	*12.1*	156	*233*
NX-4822J	48	22	.050	*1.3*	.062	*1.6*	.533	*13.5*	195	*290*
NX-6022J	60	22	.050	*1.3*	.062	*1.6*	.578	*14.7*	235	*350*
NX-520J	5	20	.062	*1.5*	.062	*1.6*	.285	*7.2*	49	*73*
NX-720J	7	20	.062	*1.5*	.062	*1.6*	.302	*7.7*	61	*90*
NX-1220J	12	20	.062	*1.5*	.062	*1.6*	.369	*9.4*	92	*137*
NX-1520J	15	20	.062	*1.5*	.062	*1.6*	.401	*10.2*	110	*163*
NX-1920J	19	20	.062	*1.5*	.062	*1.6*	.418	*10.6*	131	*194*
NX-2720J	27	20	.062	*1.5*	.062	*1.6*	.485	*12.3*	176	*262*
NX-3720J	37	20	.062	*1.5*	.062	*1.6*	.534	*13.6*	229	*341*
NX-4820J	48	20	.062	*1.5*	.062	*1.6*	.598	*15.2*	288	*429*
NX-6020J	60	20	.062	*1.5*	.062	*1.6*	.650	*16.5*	351	*522*

NX SERIES OVERALL SHIELDED - 24, 22 and 20 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NX-524SJ	5	24	.044	*1.1*	.062	*1.6*	.267	*6.8*	42	*63*
NX-724SJ	7	24	.044	*1.1*	.062	*1.6*	.280	*7.1*	49	*72*
NX-1224SJ	12	24	.044	*1.1*	.062	*1.6*	.331	*8.4*	63	*101*
NX-1524SJ	15	24	.044	*1.1*	.062	*1.6*	.355	*9.0*	79	*117*
NX-1924SJ	19	24	.044	*1.1*	.062	*1.6*	.368	*9.3*	89	*133*
NX-2724SJ	27	24	.044	*1.1*	.062	*1.6*	.419	*10.6*	115	*171*
NX-3724SJ	37	24	.044	*1.1*	.062	*1.6*	.461	*11.7*	151	*224*
NX-4824SJ	48	24	.044	*1.1*	.062	*1.6*	.510	*12.9*	183	*273*
NX-6024SJ	60	24	.044	*1.1*	.062	*1.6*	.549	*13.9*	216	*321*
NX-522SJ	5	22	.050	*1.3*	.062	*1.6*	.283	*7.2*	50	*74*
NX-722SJ	7	22	.050	*1.3*	.062	*1.6*	.298	*7.6*	58	*87*
NX-1222SJ	12	22	.050	*1.3*	.062	*1.6*	.356	*9.0*	83	*124*
NX-1522SJ	15	22	.050	*1.3*	.062	*1.6*	.383	*9.7*	97	*145*
NX-1922SJ	19	22	.050	*1.3*	.062	*1.6*	.398	*10.1*	112	*166*
NX-2722SJ	27	22	.050	*1.3*	.062	*1.6*	.461	*11.7*	155	*230*
NX-3722SJ	37	22	.050	*1.3*	.062	*1.6*	.503	*12.8*	193	*287*
NX-4822SJ	48	22	.050	*1.3*	.062	*1.6*	.558	*14.2*	237	*352*
NX-6022SJ	60	22	.050	*1.3*	.062	*1.6*	.603	*15.3*	281	*419*
NX-520SJ	5	20	.058	*1.5*	.062	*1.6*	.305	*7.7*	62	*93*
NX-720SJ	7	20	.058	*1.5*	.062	*1.6*	.322	*8.2*	75	*112*
NX-1220SJ	12	20	.058	*1.5*	.062	*1.6*	.389	*9.9*	111	*165*
NX-1520SJ	15	20	.058	*1.5*	.062	*1.6*	.421	*10.7*	131	*195*
NX-1920SJ	19	20	.058	*1.5*	.062	*1.6*	.438	*11.1*	153	*228*
NX-2720SJ	27	20	.058	*1.5*	.062	*1.6*	.510	*13.0*	213	*317*
NX-3720SJ	37	20	.058	*1.5*	.062	*1.6*	.559	*14.2*	271	*403*
NX-4820SJ	48	20	.058	*1.5*	.062	*1.6*	.623	*15.8*	336	*500*
NX-6020SJ	60	20	.058	*1.5*	.062	*1.6*	.675	*17.2*	404	*601*

CABLED SINGLE CONDUCTORS - NX Series

MULTI-CONDUCTOR STOCK CABLED SINGLES Conductor sizes 24, 22 are 7 strand. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

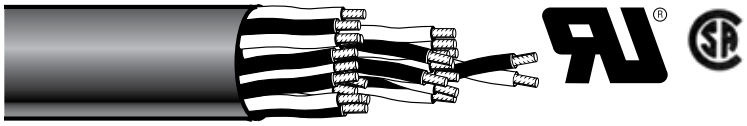
NRX SERIES UNSHIELDED - 24, 22 and 20 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	Weight KG/KM
			Inches	MM	Inches	MM	Inches	MM		
NRX-524J	5	24	.044	1.1	.062	1.6	.247	6.3	31	47
NRX-724J	7	24	.044	1.1	.062	1.6	.260	6.6	37	55
NRX-1224J	12	24	.044	1.1	.062	1.6	.311	7.9	53	79
NRX-1524J	15	24	.044	1.1	.062	1.6	.335	8.5	62	92
NRX-1924J	19	24	.044	1.1	.062	1.6	.348	8.8	72	106
NRX-2724J	27	24	.044	1.1	.062	1.6	.399	10.1	94	139
NRX-3724J	37	24	.044	1.1	.062	1.6	.436	11.1	118	176
NRX-4824J	48	24	.044	1.1	.062	1.6	.484	12.3	146	217
NRX-6024J	60	24	.044	1.1	.062	1.6	.524	13.3	175	261
NRX-522J	5	22	.050	1.3	.062	1.6	.263	6.7	38	56
NRX-722J	7	22	.050	1.3	.062	1.6	.278	7.1	45	67
NRX-1222J	12	22	.050	1.3	.062	1.6	.336	8.5	67	99
NRX-1522J	15	22	.050	1.3	.062	1.6	.363	9.2	79	117
NRX-1922J	19	22	.050	1.3	.062	1.6	.378	9.6	92	137
NRX-2722J	27	22	.050	1.3	.062	1.6	.436	11.1	122	182
NRX-3722J	37	22	.050	1.3	.062	1.6	.478	12.1	156	233
NRX-4822J	48	22	.050	1.3	.062	1.6	.533	13.5	195	290
NRX-6022J	60	22	.050	1.3	.062	1.6	.578	14.7	235	350
NRX-520J	5	20	.062	1.5	.062	1.6	.285	7.2	49	73
NRX-720J	7	20	.062	1.5	.062	1.6	.302	7.7	61	90
NRX-1220J	12	20	.062	1.5	.062	1.6	.369	9.4	92	137
NRX-1520J	15	20	.062	1.5	.062	1.6	.401	10.2	110	163
NRX-1920J	19	20	.062	1.5	.062	1.6	.418	10.6	131	194
NRX-2720J	27	20	.062	1.5	.062	1.6	.485	12.3	176	262
NRX-3720J	37	20	.062	1.5	.062	1.6	.534	13.6	229	341
NRX-4820J	48	20	.062	1.5	.062	1.6	.598	15.2	288	429
NRX-6020J	60	20	.062	1.5	.062	1.6	.650	16.5	351	522

NRX SERIES OVERALL SHIELDED - 24, 22 and 20 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	Weight KG/KM
			Inches	MM	Inches	MM	Inches	MM		
NRX-524SJ	5	24	.044	1.1	.062	1.6	.267	6.8	42	63
NRX-724SJ	7	24	.044	1.1	.062	1.6	.280	7.1	49	72
NRX-1224SJ	12	24	.044	1.1	.062	1.6	.331	8.4	63	101
NRX-1524SJ	15	24	.044	1.1	.062	1.6	.355	9.0	79	117
NRX-1924SJ	19	24	.044	1.1	.062	1.6	.368	9.3	89	133
NRX-2724SJ	27	24	.044	1.1	.062	1.6	.419	10.6	115	171
NRX-3724SJ	37	24	.044	1.1	.062	1.6	.461	11.7	151	224
NRX-4824SJ	48	24	.044	1.1	.062	1.6	.510	12.9	183	273
NRX-6024SJ	60	24	.044	1.1	.062	1.6	.549	13.9	216	321
NRX-522SJ	5	22	.050	1.3	.062	1.6	.283	7.2	50	74
NRX-722SJ	7	22	.050	1.3	.062	1.6	.298	7.6	58	87
NRX-1222SJ	12	22	.050	1.3	.062	1.6	.356	9.0	83	124
NRX-1522SJ	15	22	.050	1.3	.062	1.6	.383	9.7	97	145
NRX-1922SJ	19	22	.050	1.3	.062	1.6	.398	10.1	112	166
NRX-2722SJ	27	22	.050	1.3	.062	1.6	.461	11.7	155	230
NRX-3722SJ	37	22	.050	1.3	.062	1.6	.503	12.8	193	287
NRX-4822SJ	48	22	.050	1.3	.062	1.6	.558	14.2	237	352
NRX-6022SJ	60	22	.050	1.3	.062	1.6	.603	15.3	281	419
NRX-520SJ	5	20	.058	1.5	.062	1.6	.305	7.7	62	93
NRX-720SJ	7	20	.058	1.5	.062	1.6	.322	8.2	75	112
NRX-1220SJ	12	20	.058	1.5	.062	1.6	.389	9.9	111	165
NRX-1520SJ	15	20	.058	1.5	.062	1.6	.421	10.7	131	195
NRX-1920SJ	19	20	.058	1.5	.062	1.6	.438	11.1	153	228
NRX-2720SJ	27	20	.058	1.5	.062	1.6	.510	13.0	213	317
NRX-3720SJ	37	20	.058	1.5	.062	1.6	.559	14.2	271	403
NRX-4820SJ	48	20	.058	1.5	.062	1.6	.623	15.8	336	500
NRX-6020SJ	60	20	.058	1.5	.062	1.6	.675	17.2	404	601

CABLED TWISTED PAIRS CONDUCTORS



NXP SERIES

- Twisted Pair Conductors
- Mil Spec, U.L. AWM

Recognized Style 2343 or 2344 and CSA Certified AWM *II* A/B*

National Wire & Cable Corporation manufactures a complete line of MINIATURE low voltage signal and control cable. Available as cabled pairs or cabled singles, with optional overall shield. Conductors are stranded tinned copper with .010" wall of vinyl primary insulation for use up to 105°C. per MIL-W-16878/1.

Insulated for 600 volts working voltage. (Also meets U.L. AWM Type 1061; 300 volt, 80°C.) All are coded using 10 standard colors plus stripes on white as per the Color Table in the National Wire Cable Designers Guide, page 7-13.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape barrier under shields. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078;and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C. vinyl meeting MIL-I-631 Type F. All materials are self-extinguishing and fungus-resistant. All items are U.L. STYLE 2343 COMPUTER CABLE; rated 80°C (Higher temp. ratings apply for any non-U.L. service). Meets RS-423 for 20-24 gauges.

*U.L. and/or CSA certification furnished only when requested.
Standard Putups: 500 and 1000 ft. No-deposit reels.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 45 to 70 pf/ft at 1 kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500 VDC form conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500 VDC from shield or conductor group through sheath to ground.
Temperature Range:	Suitable for continuous use from -40°C to +105°C. (U.L. Service limited to +80°C)
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult the factory.
Impedance: (24 AWG pairs)	Balanced: 87 ohms ± 5% Unbalanced: 52 ohms ± 5%

For color code of pairs, view the Color Table in the National Wire Cable Designers Guide, page 7-13.

MULTI-CONDUCTOR STOCK CABLED PAIRS Conductor sizes 24, 22 are 7 strand. All others are 19 strand.

NXP SERIES UNSHIELDED - 24, 22 and 20 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NXP-524J	5	24	.044	*1.1*	.062	*1.6*	.339	*8.6*	55	*82*
NXP-724J	7	24	.044	*1.1*	.062	*1.6*	.352	*9.0*	66	*99*
NXP-1224J	12	24	.044	*1.1*	.062	*1.6*	.439	*11.2*	98	*146*
NXP-1524J	15	24	.044	*1.1*	.062	*1.6*	.489	*12.4*	116	*173*
NXP-1924J	19	24	.044	*1.1*	.062	*1.6*	.502	*12.8*	135	*201*
NXP-2724J	27	24	.044	*1.1*	.062	*1.6*	.589	*15.0*	180	*267*
NXP-3724J	37	24	.044	*1.1*	.062	*1.6*	.652	*16.6*	229	*340*
NXP-4824J	48	24	.044	*1.1*	.062	*1.6*	.734	*18.6*	285	*424*
NXP-6024J	60	24	.044	*1.1*	.062	*1.6*	.801	*20.4*	343	*510*
NXP-522J	5	22	.050	*1.3*	.062	*1.6*	.368	*9.3*	68	*101*
NXP-722J	7	22	.050	*1.3*	.062	*1.6*	.383	*9.7*	83	*124*
NXP-1222J	12	22	.050	*1.3*	.062	*1.6*	.482	*12.2*	126	*187*
NXP-1522J	15	22	.050	*1.3*	.062	*1.6*	.538	*13.7*	150	*223*
NXP-1922J	19	22	.050	*1.3*	.062	*1.6*	.553	*14.0*	177	*263*
NXP-2722J	27	22	.050	*1.3*	.062	*1.6*	.652	*16.6*	237	*352*
NXP-3722J	37	22	.050	*1.3*	.062	*1.6*	.723	*18.4*	305	*454*
NXP-4822J	48	22	.050	*1.3*	.062	*1.6*	.817	*20.7*	382	*569*
NXP-6022J	60	22	.050	*1.3*	.062	*2.0*	.929	*23.6*	498	*741*
NXP-520J	5	20	.058	*1.5*	.062	*1.6*	.406	*10.3*	91	*135*
NXP-720J	7	20	.058	*1.5*	.062	*1.6*	.424	*10.8*	114	*169*
NXP-1220J	12	20	.058	*1.5*	.062	*1.6*	.538	*13.7*	176	*262*
NXP-1520J	15	20	.058	*1.5*	.062	*1.6*	.604	*15.3*	212	*315*
NXP-1920J	19	20	.058	*1.5*	.062	*1.6*	.621	*15.8*	254	*378*
NXP-2720J	27	20	.058	*1.5*	.062	*1.6*	.735	*18.7*	345	*513*
NXP-3720J	37	20	.058	*1.5*	.062	*1.6*	.818	*20.8*	451	*670*
NXP-4820J	48	20	.058	*1.5*	.062	*1.6*	.963	*24.5*	605	*901*
NXP-6020J	60	20	.058	*1.5*	.062	*1.6*	.1051	*26.7*	734	*1092*

NXP SERIES OVERALL SHIELDED - 24, 22 and 20 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NXP-524SJ	5	24	.044	*1.1*	.062	*1.6*	.359	*9.1*	74	*110*
NXP-724SJ	7	24	.044	*1.1*	.062	*1.6*	.372	*9.5*	87	*129*
NXP-1224SJ	12	24	.044	*1.1*	.062	*1.6*	.464	*11.8*	137	*203*
NXP-1524SJ	15	24	.044	*1.1*	.062	*1.6*	.514	*13.1*	159	*236*
NXP-1924SJ	19	24	.044	*1.1*	.062	*1.6*	.527	*13.4*	181	*269*
NXP-2724SJ	27	24	.044	*1.1*	.062	*1.6*	.614	*15.6*	234	*349*
NXP-3724SJ	37	24	.044	*1.1*	.062	*1.6*	.677	*17.2*	291	*432*
NXP-4824SJ	48	24	.044	*1.1*	.062	*1.6*	.759	*19.3*	356	*529*
NXP-6024SJ	60	24	.044	*1.1*	.062	*1.6*	.862	*21.9*	453	*674*
NXP-522SJ	5	22	.050	*1.3*	.062	*1.6*	.388	*9.9*	89	*132*
NXP-722SJ	7	22	.050	*1.3*	.062	*1.6*	.403	*10.2*	106	*158*
NXP-1222SJ	12	22	.050	*1.3*	.062	*1.6*	.507	*12.9*	169	*251*
NXP-1522SJ	15	22	.050	*1.3*	.062	*1.6*	.563	*14.3*	198	*294*
NXP-1922SJ	19	22	.050	*1.3*	.062	*1.6*	.578	*14.7*	227	*338*
NXP-2722SJ	27	22	.050	*1.3*	.062	*1.6*	.677	*17.2*	299	*444*
NXP-3722SJ	37	22	.050	*1.3*	.062	*1.6*	.748	*19.0*	375	*558*
NXP-4822SJ	48	22	.050	*1.3*	.062	*1.6*	.878	*22.3*	495	*737*
NXP-6022SJ	60	22	.050	*1.3*	.062	*1.6*	.954	*24.2*	588	*874*
NXP-520SJ	5	20	.058	*1.5*	.062	*1.6*	.426	*10.8*	115	*171*
NXP-720SJ	7	20	.058	*1.5*	.062	*1.6*	.444	*11.3*	140	*208*
NXP-1220SJ	12	20	.058	*1.5*	.062	*1.6*	.563	*14.3*	226	*336*
NXP-1520SJ	15	20	.058	*1.5*	.062	*1.6*	.629	*16.0*	267	*397*
NXP-1920SJ	19	20	.058	*1.5*	.062	*1.6*	.646	*16.4*	312	*464*
NXP-2720SJ	27	20	.058	*1.5*	.062	*1.6*	.761	*19.3*	416	*619*
NXP-3720SJ	37	20	.058	*1.5*	.062	*1.6*	.879	*22.3*	564	*839*
NXP-4820SJ	48	20	.058	*1.5*	.062	*1.6*	.988	*25.1*	699	*1039*
NXP-6020SJ	60	20	.058	*1.5*	.062	*1.6*	1.077	*27.3*	838	*1246*

CABLED TWISTED PAIRS - NXP Series

MULTI-CONDUCTOR STOCK CABLED PAIRS Conductor sizes 24, 22 are 7 strand. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

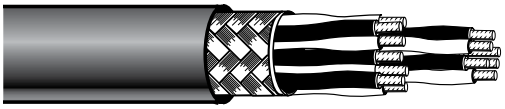
NRXP SERIES UNSHIELDED - 24, 22 and 20 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRXP-524J	5	24	.044	*1.1*	.062	*1.6*	.339	*8.6*	55	*82*
NRXP-724J	7	24	.044	*1.1*	.062	*1.6*	.352	*9.0*	66	*99*
NRXP-1224J	12	24	.044	*1.1*	.062	*1.6*	.439	*11.2*	98	*146*
NRXP-1524J	15	24	.044	*1.1*	.062	*1.6*	.489	*12.4*	116	*173*
NRXP-1924J	19	24	.044	*1.1*	.062	*1.6*	.502	*12.8*	135	*201*
NRXP-2724J	27	24	.044	*1.1*	.062	*1.6*	.589	*15.0*	180	*267*
NRXP-3724J	37	24	.044	*1.1*	.062	*1.6*	.652	*16.6*	229	*340*
NRXP-4824J	48	24	.044	*1.1*	.062	*1.6*	.734	*18.6*	285	*424*
NRXP-6024J	60	24	.044	*1.1*	.062	*1.6*	.801	*20.4*	343	*510*
NRXP-522J	5	22	.050	*1.3*	.062	*1.6*	.368	*9.3*	68	*101*
NRXP-722J	7	22	.050	*1.3*	.062	*1.6*	.383	*9.7*	83	*124*
NRXP-1222J	12	22	.050	*1.3*	.062	*1.6*	.482	*12.2*	126	*187*
NRXP-1522J	15	22	.050	*1.3*	.062	*1.6*	.538	*13.7*	150	*223*
NRXP-1922J	19	22	.050	*1.3*	.062	*1.6*	.553	*14.0*	177	*263*
NRXP-2722J	27	22	.050	*1.3*	.062	*1.6*	.652	*16.6*	237	*352*
NRXP-3722J	37	22	.050	*1.3*	.062	*1.6*	.723	*18.4*	305	*454*
NRXP-4822J	48	22	.050	*1.3*	.062	*1.6*	.817	*20.7*	382	*569*
NRXP-6022J	60	22	.050	*1.3*	.062	*2.0*	.929	*23.6*	498	*741*
NRXP-520J	5	20	.058	*1.5*	.062	*1.6*	.406	*10.3*	91	*135*
NRXP-720J	7	20	.058	*1.5*	.062	*1.6*	.424	*10.8*	114	*169*
NRXP-1220J	12	20	.058	*1.5*	.062	*1.6*	.538	*13.7*	176	*262*
NRXP-1520J	15	20	.058	*1.5*	.062	*1.6*	.604	*15.3*	212	*315*
NRXP-1920J	19	20	.058	*1.5*	.062	*1.6*	.621	*15.8*	254	*378*
NRXP-2720J	27	20	.058	*1.5*	.062	*1.6*	.735	*18.7*	345	*513*
NRXP-3720J	37	20	.058	*1.5*	.062	*1.6*	.818	*20.8*	451	*670*
NRXP-4820J	48	20	.058	*1.5*	.062	*1.6*	.963	*24.5*	605	*901*
NRXP-6020J	60	20	.058	*1.5*	.062	*1.6*	.1051	*26.7*	734	*1092*

NRXP SERIES OVERALL SHIELDED - 24, 22 and 20 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRXP-524SJ	5	24	.044	*1.1*	.062	*1.6*	.359	*9.1*	74	*110*
NRXP-724SJ	7	24	.044	*1.1*	.062	*1.6*	.372	*9.5*	87	*129*
NRXP-1224SJ	12	24	.044	*1.1*	.062	*1.6*	.464	*11.8*	137	*203*
NRXP-1524SJ	15	24	.044	*1.1*	.062	*1.6*	.514	*13.1*	159	*236*
NRXP-1924SJ	19	24	.044	*1.1*	.062	*1.6*	.527	*13.4*	181	*269*
NRXP-2724SJ	27	24	.044	*1.1*	.062	*1.6*	.614	*15.6*	234	*349*
NRXP-3724SJ	37	24	.044	*1.1*	.062	*1.6*	.677	*17.2*	291	*432*
NRXP-4824SJ	48	24	.044	*1.1*	.062	*1.6*	.759	*19.3*	356	*529*
NRXP-6024SJ	60	24	.044	*1.1*	.062	*1.6*	.862	*21.9*	453	*674*
NRXP-522SJ	5	22	.050	*1.3*	.062	*1.6*	.388	*9.9*	89	*132*
NRXP-722SJ	7	22	.050	*1.3*	.062	*1.6*	.403	*10.2*	106	*158*
NRXP-1222SJ	12	22	.050	*1.3*	.062	*1.6*	.507	*12.9*	169	*251*
NRXP-1522SJ	15	22	.050	*1.3*	.062	*1.6*	.563	*14.3*	198	*294*
NRXP-1922SJ	19	22	.050	*1.3*	.062	*1.6*	.578	*14.7*	227	*338*
NRXP-2722SJ	27	22	.050	*1.3*	.062	*1.6*	.677	*17.2*	299	*444*
NRXP-3722SJ	37	22	.050	*1.3*	.062	*1.6*	.748	*19.0*	375	*558*
NRXP-4822SJ	48	22	.050	*1.3*	.062	*1.6*	.878	*22.3*	495	*737*
NRXP-6022SJ	60	22	.050	*1.3*	.062	*1.6*	.954	*24.2*	588	*874*
NRXP-520SJ	5	20	.058	*1.5*	.062	*1.6*	.426	*10.8*	115	*171*
NRXP-720SJ	7	20	.058	*1.5*	.062	*1.6*	.444	*11.3*	140	*208*
NRXP-1220SJ	12	20	.058	*1.5*	.062	*1.6*	.563	*14.3*	226	*336*
NRXP-1520SJ	15	20	.058	*1.5*	.062	*1.6*	.629	*16.0*	267	*397*
NRXP-1920SJ	19	20	.058	*1.5*	.062	*1.6*	.646	*16.4*	312	*464*
NRXP-2720SJ	27	20	.058	*1.5*	.062	*1.6*	.761	*19.3*	416	*619*
NRXP-3720SJ	37	20	.058	*1.5*	.062	*1.6*	.879	*22.3*	564	*839*
NRXP-4820SJ	48	20	.058	*1.5*	.062	*1.6*	.988	*25.1*	699	*1039*
NRXP-6020SJ	60	20	.058	*1.5*	.062	*1.6*	1.077	*27.3*	838	*1246*

CABLED SINGLE CONDUCTORS



Heavy Duty

- Single Conductors (NW Series)
- Mil Spec, U.L. AWM

Recognized Style 2343 or 2344 and CSA Certified
AWM *II* A/B**

National Wire & Cable Corp. manufactures a complete line of multiple conductor control cable. All conductors are stranded tinned copper with .015" wall of vinyl primary insulation for use up to 105°C per MIL-W-16878/2*. Insulated for 1000 volts working voltage. Color coded using 10 standard plus stripes on white per MIL-STD-681. View Color Table in the National Wire Cable Designers Guide, page 7-13.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape serve over cable bundle. Shielded cables have a tinned copper braid overall, of 90% coverage per MIL-C-7078 and braid angles below 40° for easy pushback.

The outer jacket is black, abrasion-resistant 105°C vinyl meeting MIL-I-631 Type F. All materials are self-extinguishing and fungus resistant. Also available with Neoprene jacket as a custom product. Consult factory for details.

*Insulated wires also meet U.L. Style 1007 or 1569 as appropriate for gauge.
**Cables are U.L. STYLE 2343 or 2344, rated 80°C, and CSA CERTIFIED for 105°C. U.L. and/or CSA certification furnished only when requested.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60cps.
U.L. Voltage Rating:	300 volts RMS AC (appliance use). 600 volts RMS AC (electronic use).
CSA Voltage Rating:	300 volts RMS AC (appliance use).
Military Voltage Rating:	1000 volts RMS
Capacitance:	Nominal capacitance from a wire to all else in the cable ranges from 40 to 65 pf., @ 1000 cps, dependent on gauge an position.
Insulation Leakage Res.:	200 megohms/1000 ft. min. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Res.:	10 megohms/1000 ft. min. at 500 VDC form overall shield through sheath to outside world.
Usable Temp. Range:	Suitable for continuous use from -40°C to +105°C.
Cold Bending Capability:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing application consult the factory.

MULTI-CONDUCTOR STOCK CABLES

Conductor sizes 22, 20, 18, 16, 14 & 12 gauge. 22 AWG is 7 stranded. All others are 19 strand.

NW SERIES UNSHIELDED - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NW-722J	7	22	.064	*1.6*	.062	*1.6*	.320	*8.1*	55	*82*
NW-1222J	12	22	.064	*1.6*	.062	*1.6*	.394	*10.1*	82	*123*
NW-1922J	19	22	.064	*1.6*	.062	*1.6*	.448	*11.4*	114	*170*
NW-2722J	27	22	.064	*1.6*	.062	*1.6*	.522	*13.3*	152	*227*
NW-3722J	37	22	.064	*1.6*	.062	*1.6*	.576	*14.6*	195	*291*
NW-4822J	48	22	.064	*1.6*	.062	*1.6*	.646	*16.4*	244	*363*
NW-6022J	60	22	.064	*1.6*	.062	*1.6*	.704	*17.9*	295	*438*
NW-7222J	72	22	.064	*1.6*	.062	*1.6*	.768	*19.5*	346	*515*
NW-8822J	82	22	.064	*1.6*	.080	*2.0*	.868	*22.0*	441	*656*
NW-10222J	102	22	.064	*1.6*	.080	*2.0*	.932	*23.7*	502	*747*
NW-720J	7	20	.072	*1.6*	.062	*1.6*	.344	*8.7*	71	*106*
NW-1220J	12	20	.072	*1.6*	.062	*1.6*	.428	*10.9*	109	*162*
NW-1920J	19	20	.072	*1.6*	.062	*1.6*	.488	*12.4*	155	*230*
NW-2720J	27	20	.072	*1.6*	.062	*1.6*	.572	*14.5*	209	*311*
NW-3720J	37	20	.072	*1.6*	.062	*1.6*	.632	*16.1*	272	*405*
NW-4820J	48	20	.072	*1.6*	.062	*1.6*	.711	*18.1*	342	*509*
NW-6020J	60	20	.072	*1.6*	.062	*1.6*	.776	*19.7*	417	*620*
NW-7220J	72	20	.072	*1.6*	.080	*2.0*	.884	*22.5*	521	*775*
NW-8820J	88	20	.072	*1.6*	.080	*2.0*	.956	*24.3*	621	*924*
NW-10220J	102	20	.072	*1.6*	.080	*2.0*	1.028	*26.1*	710	*1056*
NW-718J	7	18	.082	*2.1*	.062	*1.6*	.374	*9.5*	91	*136*
NW-1218J	12	18	.082	*2.1*	.062	*1.6*	.469	*11.9*	142	*211*
NW-1918J	19	18	.082	*2.1*	.062	*1.6*	.538	*13.7*	206	*306*
NW-2718J	27	18	.082	*2.1*	.062	*1.6*	.633	*16.01*	280	*417*
NW-3718J	37	18	.082	*2.1*	.062	*1.6*	.702	*17.8*	368	*547*
NW-4818J	48	18	.082	*2.1*	.062	*1.6*	.792	*20.1*	465	*692*
NW-6018J	60	18	.082	*2.1*	.080	*2.0*	.092	*22.9*	599	*891*
NW-7218J	72	18	.082	*2.1*	.080	*2.0*	.984	*25.0*	706	*1051*

NW SERIES OVERALL BRAIDED SHIELD - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NW-722SJ	7	22	.064	*1.6*	.062	*1.6*	.340	*8.6*	71	*106*
NW-1222SJ	12	22	.064	*1.6*	.062	*1.6*	.414	*10.5*	103	*153*
NW-1922SJ	19	22	.064	*1.6*	.062	*1.6*	.473	*12.0*	148	*220*
NW-2722SJ	27	22	.064	*1.6*	.062	*1.6*	.547	*13.9*	193	*287*
NW-3722SJ	37	22	.064	*1.6*	.062	*1.6*	.601	*15.3*	241	*359*
NW-4822SJ	48	22	.064	*1.6*	.062	*1.6*	.672	*17.0*	296	*441*
NW-6022SJ	60	22	.064	*1.6*	.062	*1.6*	.729	*18.5*	353	*525*
NW-7222SJ	72	22	.064	*1.6*	.062	*1.6*	.793	*20.1*	410	*610*
NW-8822SJ	88	22	.064	*1.6*	.080	*2.0*	.893	*22.7*	512	*761*
NW-10222SJ	102	22	.064	*1.6*	.080	*2.0*	.957	*24.3*	579	*861*
NW-720SJ	7	20	.072	*1.8*	.062	*1.6*	.364	*9.2*	89	*132*
NW-1220SJ	12	20	.072	*1.8*	.062	*1.6*	.448	*11.4*	132	*196*
NW-1920SJ	19	20	.072	*1.8*	.062	*1.6*	.513	*13.0*	192	*286*
NW-2720SJ	27	20	.072	*1.8*	.062	*1.6*	.597	*15.2*	255	*379*
NW-3720SJ	37	20	.072	*1.8*	.062	*1.6*	.657	*16.7*	323	*481*
NW-4820SJ	48	20	.072	*1.8*	.062	*1.6*	.736	*18.7*	401	*597*
NW-6020SJ	60	20	.072	*1.8*	.062	*1.6*	.801	*20.4*	482	*716*
NW-7220SJ	72	20	.072	*1.8*	.080	*2.0*	.909	*23.1*	593	*883*
NW-8820SJ	88	20	.072	*1.8*	.080	*2.0*	.981	*24.9*	700	*1042*
NW-10220SJ	102	20	.072	*1.8*	.080	*2.0*	1.053	*26.8*	796	*1184*
NW-718SJ	7	18	.082	*2.1*	.062	*1.6*	.394	*10.0*	111	*165*
NW-1218SJ	12	18	.082	*2.1*	.062	*1.6*	.494	*12.6*	178	*265*
NW-1918SJ	19	18	.082	*2.1*	.062	*1.6*	.563	*14.3*	248	*369*
NW-2718SJ	27	18	.082	*2.1*	.062	*1.6*	.658	*16.7*	332	*493*
NW-3718SJ	37	18	.082	*2.1*	.062	*1.6*	.727	*18.5*	425	*633*
NW-4818SJ	48	18	.082	*2.1*	.062	*1.6*	.817	*20.8*	532	*791*
NW-6018SJ	60	18	.082	*2.1*	.080	*2.0*	.927	*23.6*	673	*1001*
NW-7218SJ	72	18	.082	*2.1*	.080	*2.0*	1.009	*25.6*	788	*1173*

CABLED SINGLE CONDUCTORS - NW Series

MULTI-CONDUCTOR STOCK CABLES Conductor sizes 22, 20, 18, 16, 14 & 12 gauge. 22 AWG is 7 stranded. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

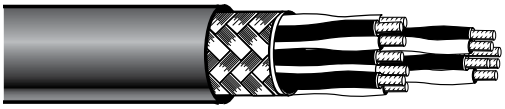
NRW SERIES UNSHIELDED - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NRW-722J	7	22	.064	*1.6*	.062	*1.6*	.320	*8.1*	55	*82*
NRW-1222J	12	22	.064	*1.6*	.062	*1.6*	.394	*10.1*	82	*123*
NRW-1922J	19	22	.064	*1.6*	.062	*1.6*	.448	*11.4*	114	*170*
NRW-2722J	27	22	.064	*1.6*	.062	*1.6*	.522	*13.3*	152	*227*
NRW-3722J	37	22	.064	*1.6*	.062	*1.6*	.576	*14.6*	195	*291*
NRW-4822J	48	22	.064	*1.6*	.062	*1.6*	.646	*16.4*	244	*363*
NRW-6022J	60	22	.064	*1.6*	.062	*1.6*	.704	*17.9*	295	*438*
NRW-7222J	72	22	.064	*1.6*	.062	*1.6*	.768	*19.5*	346	*515*
NRW-8822J	82	22	.064	*1.6*	.080	*2.0*	.868	*22.0*	441	*656*
NRW-10222J	102	22	.064	*1.6*	.080	*2.0*	.932	*23.7*	502	*747*
NRW-720J	7	20	.072	*1.6*	.062	*1.6*	.344	*8.7*	71	*106*
NRW-1220J	12	20	.072	*1.6*	.062	*1.6*	.428	*10.9*	109	*162*
NRW-1920J	19	20	.072	*1.6*	.062	*1.6*	.488	*12.4*	155	*230*
NRW-2720J	27	20	.072	*1.6*	.062	*1.6*	.572	*14.5*	209	*311*
NRW-3720J	37	20	.072	*1.6*	.062	*1.6*	.632	*16.1*	272	*405*
NRW-4820J	48	20	.072	*1.6*	.062	*1.6*	.711	*18.1*	342	*509*
NRW-6020J	60	20	.072	*1.6*	.062	*1.6*	.776	*19.7*	417	*620*
NRW-7220J	72	20	.072	*1.6*	.080	*2.0*	.884	*22.5*	521	*775*
NRW-8820J	88	20	.072	*1.6*	.080	*2.0*	.956	*24.3*	621	*924*
NRW-10220J	102	20	.072	*1.6*	.080	*2.0*	1.028	*26.1*	710	*1056*
NRW-718J	7	18	.082	*2.1*	.062	*1.6*	.374	*9.5*	91	*136*
NRW-1218J	12	18	.082	*2.1*	.062	*1.6*	.469	*11.9*	142	*211*
NRW-1918J	19	18	.082	*2.1*	.062	*1.6*	.538	*13.7*	206	*306*
NRW-2718J	27	18	.082	*2.1*	.062	*1.6*	.633	*16.01*	280	*417*
NRW-3718J	37	18	.082	*2.1*	.062	*1.6*	.702	*17.8*	368	*547*
NRW-4818J	48	18	.082	*2.1*	.062	*1.6*	.792	*20.1*	465	*692*
NRW-6018J	60	18	.082	*2.1*	.080	*2.0*	.092	*22.9*	599	*891*
NRW-7218J	72	18	.082	*2.1*	.080	*2.0*	.984	*25.0*	706	*1051*

NRW SERIES OVERALL BRAIDED SHIELD - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	lbs per 1000 ft	*KG/KM*
NRW-722SJ	7	22	.064	*1.6*	.062	*1.6*	.340	*8.6*	71	*106*
NRW-1222SJ	12	22	.064	*1.6*	.062	*1.6*	.414	*10.5*	103	*153*
NRW-1922SJ	19	22	.064	*1.6*	.062	*1.6*	.473	*12.0*	148	*220*
NRW-2722SJ	27	22	.064	*1.6*	.062	*1.6*	.547	*13.9*	193	*287*
NRW-3722SJ	37	22	.064	*1.6*	.062	*1.6*	.601	*15.3*	241	*359*
NRW-4822SJ	48	22	.064	*1.6*	.062	*1.6*	.672	*17.0*	296	*441*
NRW-6022SJ	60	22	.064	*1.6*	.062	*1.6*	.729	*18.5*	353	*525*
NRW-7222SJ	72	22	.064	*1.6*	.062	*1.6*	.793	*20.1*	410	*610*
NRW-8822SJ	88	22	.064	*1.6*	.080	*2.0*	.893	*22.7*	512	*761*
NRW-10222SJ	102	22	.064	*1.6*	.080	*2.0*	.957	*24.3*	579	*861*
NRW-720SJ	7	20	.072	*1.8*	.062	*1.6*	.364	*9.2*	89	*132*
NRW-1220SJ	12	20	.072	*1.8*	.062	*1.6*	.448	*11.4*	132	*196*
NRW-1920SJ	19	20	.072	*1.8*	.062	*1.6*	.513	*13.0*	192	*286*
NRW-2720SJ	27	20	.072	*1.8*	.062	*1.6*	.597	*15.2*	255	*379*
NRW-3720SJ	37	20	.072	*1.8*	.062	*1.6*	.657	*16.7*	323	*481*
NRW-4820SJ	48	20	.072	*1.8*	.062	*1.6*	.736	*18.7*	401	*597*
NRW-6020SJ	60	20	.072	*1.8*	.062	*1.6*	.801	*20.4*	482	*716*
NRW-7220SJ	72	20	.072	*1.8*	.080	*2.0*	.909	*23.1*	593	*883*
NRW-8820SJ	88	20	.072	*1.8*	.080	*2.0*	.981	*24.9*	700	*1042*
NRW-10220SJ	102	20	.072	*1.8*	.080	*2.0*	1.053	*26.8*	796	*1184*
NRW-718SJ	7	18	.082	*2.1*	.062	*1.6*	.394	*10.0*	111	*165*
NRW-1218SJ	12	18	.082	*2.1*	.062	*1.6*	.494	*12.6*	178	*265*
NRW-1918SJ	19	18	.082	*2.1*	.062	*1.6*	.563	*14.3*	248	*369*
NRW-2718SJ	27	18	.082	*2.1*	.062	*1.6*	.658	*16.7*	332	*493*
NRW-3718SJ	37	18	.082	*2.1*	.062	*1.6*	.727	*18.5*	425	*633*
NRW-4818SJ	48	18	.082	*2.1*	.062	*1.6*	.817	*20.8*	532	*791*
NRW-6018SJ	60	18	.082	*2.1*	.080	*2.0*	.927	*23.6*	673	*1001*
NRW-7218SJ	72	18	.082	*2.1*	.080	*2.0*	1.009	*25.6*	788	*1173*

CABLED SINGLE CONDUCTORS



Heavy Duty

- Single Conductors (NW Series)
- Mil Spec, U.L. AWM

Recognized Style 2343 or 2344 and CSA Certified
AWM *II* A/B**

MULTI-CONDUCTOR STOCK CABLES

The products shown in the following tables are MIL-SPEC only. UL and CSA do not recognize 19 strand conductors in this gauge. See the NWC table below for UL/CSA.

NW SERIES UNSHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NW-716J	7	16	.091	*2.3*	.062	*1.6*	.401	*10.2*	108	*161*
NW-1216J	12	16	.091	*2.3*	.062	*1.6*	.507	*12.9*	170	*253*
NW-1916J	19	16	.091	*2.3*	.062	*1.6*	.583	*14.8*	248	*369*
NW-2716J	27	16	.091	*2.3*	.062	*1.6*	.689	*17.5*	339	*504*
NW-3716J	37	16	.091	*2.3*	.062	*1.6*	.765	*19.4*	446	*664*
NW-4816J	48	16	.091	*2.3*	.080	*2.0*	.901	*22.9*	576	*857*
NW-6016J	60	16	.091	*2.3*	.080	*2.0*	.983	*25.0*	270	*1071*
NW-714J	7	14	.105	*2.7*	.062	*1.6*	.443	*11.2*	146	*217*
NW-1214J	12	14	.105	*2.7*	.062	*1.6*	.565	*14.3*	233	*347*
NW-1914J	19	14	.105	*2.7*	.062	*1.6*	.653	*16.6*	345	*513*
NW-2714J	27	14	.105	*2.7*	.062	*1.6*	.775	*19.7*	476	*708*
NW-512J	5	12	.124	*3.1*	.062	*1.6*	.463	*11.7*	157	*234*
NW-712J	7	12	.124	*3.1*	.062	*1.6*	.500	*12.7*	205	*305*
NW-1212J	12	12	.124	*3.1*	.062	*1.6*	.644	*16.4*	332	*494*
NW-1912J	19	12	.124	*3.1*	.062	*1.6*	.748	*19.0*	499	*743*

NW SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NW-716SJ	7	16	.091	*2.3*	.062	*1.6*	.421	*10.7*	129	*192*
NW-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.532	*13.5*	209	*311*
NW-1916SJ	19	16	.091	*2.3*	.062	*1.6*	.608	*15.4*	294	*437*
NW-2716SJ	27	16	.091	*2.3*	.062	*1.6*	.714	*18.1*	395	*588*
NW-3716SJ	37	16	.091	*2.3*	.062	*1.6*	.790	*20.0*	510	*759*
NW-4816SJ	48	16	.091	*2.3*	.080	*2.0*	.926	*23.5*	670	*997*
NW-6016SJ	60	16	.091	*2.3*	.080	*2.0*	1.008	*25.6*	808	*1202*
NW-714SJ	7	14	.105	*2.7*	.062	*1.6*	.468	*11.9*	175	*260*
NW-1214SJ	12	14	.105	*2.7*	.062	*1.6*	.590	*15.0*	270	*402*
NW-1914SJ	19	14	.105	*2.7*	.062	*1.6*	.678	*17.2*	399	*594*
NW-2714SJ	27	14	.105	*2.7*	.062	*1.6*	.805	*20.4*	530	*789*
NW-512SJ	5	12	.124	*3.1*	.062	*1.6*	.488	*12.4*	192	*286*
NW-712SJ	7	12	.124	*3.1*	.062	*1.6*	.525	*13.3*	244	*363*
NW-1212SJ	12	12	.124	*3.1*	.062	*1.6*	.669	*17.0*	385	*573*
NW-1912SJ	19	12	.124	*3.1*	.062	*1.6*	.773	*19.6*	562	*836*

The following cables in 16-12 gauge are similar to NW series but utilize materials to qualify for CSA cetification for AWM *II* A/B 105ºC service at 300 volts as well as styles 2343 and 2344. Items below are not stocked and are subject to minimum run quantities.

NWC SERIES UNSHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NWC-716J	7	16	.091	*2.3*	.062	*1.6*	.401	*10.2*	108	*161*
NWC-1216J	12	16	.091	*2.3*	.062	*1.6*	.507	*12.9*	170	*253*
NWC-1916J	19	16	.091	*2.3*	.062	*1.6*	.583	*14.8*	248	*369*
NWC-2716J	27	16	.091	*2.3*	.062	*1.6*	.689	*17.5*	339	*504*
NWC-3716J	37	16	.091	*2.3*	.062	*1.6*	.765	*19.4*	446	*664*
NWC-4816J	48	16	.091	*2.3*	.080	*2.0*	.901	*22.9*	576	*857*
NWC-6016J	60	16	.091	*2.3*	.080	*2.0*	.983	*25.0*	720	*1071*
NWC-714J	7	14	.105	*2.7*	.062	*1.6*	.443	*11.2*	146	*217*
NWC-1214J	12	14	.105	*2.7*	.062	*1.6*	.565	*14.3*	233	*347*
NWC-1914J	19	14	.105	*2.7*	.062	*1.6*	.653	*16.6*	345	*513*
NWC-2714J	27	14	.105	*2.7*	.062	*1.6*	.775	*19.7*	476	*708*
NWC-512J	5	12	.124	*3.1*	.062	*1.6*	.463	*11.7*	157	*234*
NWC-712J	7	12	.124	*3.1*	.062	*1.6*	.500	*12.7*	205	*305*
NWC-1212J	12	12	.124	*3.1*	.062	*1.6*	.644	*16.4*	332	*494*
NWC-1912J	19	12	.124	*3.1*	.062	*1.6*	.748	*19.0*	499	*743*

NWC SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NWC-716SJ	7	16	.091	*2.3*	.062	*1.6*	.421	*10.7*	129	*192*
NWC-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.532	*13.5*	209	*311*
NWC-1916SJ	19	16	.091	*2.3*	.062	*1.6*	.608	*15.4*	294	*437*
NWC-2716SJ	27	16	.091	*2.3*	.062	*1.6*	.714	*18.1*	395	*588*
NWC-3716SJ	37	16	.091	*2.3*	.062	*1.6*	.790	*20.0*	510	*759*
NWC-4816SJ	48	16	.091	*2.3*	.062	*1.6*	.926	*23.5*	670	*997*
NWC-6016SJ	60	16	.091	*2.3*	.062	*1.6*	1.008	*25.6*	808	*1202*
NWC-714SJ	7	14	.105	*2.7*	.062	*1.6*	.468	*11.9*	175	*260*
NWC-1214SJ	12	14	.105	*2.7*	.062	*1.6*	.590	*15.0*	270	*402*
NWC-1914SJ	19	14	.105	*2.7*	.062	*1.6*	.678	*17.2*	399	*594*
NWC-2714SJ	27	14	.105	*2.7*	.062	*1.6*	.805	*20.4*	530	*789*
NWC-512SJ	5	12	.124	*3.1*	.062	*1.6*	.488	*12.4*	192	*286*
NWC-712SJ	7	12	.124	*3.1*	.062	*1.6*	.525	*13.3*	244	*363*
NWC-1212SJ	12	12	.124	*3.1*	.062	*1.6*	.669	*17.0*	385	*573*
NWC-1912SJ	19	12	.124	*3.1*	.062	*1.6*	.773	*19.6*	562	*836*

UL/CSA -- CONDUCTOR SIZE & STRANDING
16 AWG (26 x 30)
14 AWG (41 x 30)
12 AWG (65 x 30)

CABLED SINGLE CONDUCTORS - NW Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

NRW SERIES UNSHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRW-716J	7	16	.091	*2.3*	.062	*1.6*	.401	*10.2*	108	*161*
NRW-1216J	12	16	.091	*2.3*	.062	*1.6*	.507	*12.9*	170	*253*
NRW-1916J	19	16	.091	*2.3*	.062	*1.6*	.583	*14.8*	248	*369*
NRW-2716J	27	16	.091	*2.3*	.062	*1.6*	.689	*17.5*	339	*504*
NRW-3716J	37	16	.091	*2.3*	.062	*1.6*	.765	*19.4*	446	*664*
NRW-4816J	48	16	.091	*2.3*	.080	*2.0*	.901	*22.9*	576	*857*
NRW-6016J	60	16	.091	*2.3*	.080	*2.0*	.983	*25.0*	270	*1071*
NRW-714J	7	14	.105	*2.7*	.062	*1.6*	.443	*11.2*	146	*217*
NRW-1214J	12	14	.105	*2.7*	.062	*1.6*	.565	*14.3*	233	*347*
NRW-1914J	19	14	.105	*2.7*	.062	*1.6*	.653	*16.6*	345	*513*
NRW-2714J	27	14	.105	*2.7*	.062	*1.6*	.775	*19.7*	476	*708*
NRW-512J	5	12	.124	*3.1*	.062	*1.6*	.463	*11.7*	157	*234*
NRW-712J	7	12	.124	*3.1*	.062	*1.6*	.500	*12.7*	205	*305*
NRW-1212J	12	12	.124	*3.1*	.062	*1.6*	.644	*16.4*	332	*494*
NRW-1912J	19	12	.124	*3.1*	.062	*1.6*	.748	*19.0*	499	*743*

NRW SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRW-716SJ	7	16	.091	*2.3*	.062	*1.6*	.421	*10.7*	129	*192*
NRW-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.532	*13.5*	209	*311*
NRW-1916SJ	19	16	.091	*2.3*	.062	*1.6*	.608	*15.4*	294	*437*
NRW-2716SJ	27	16	.091	*2.3*	.062	*1.6*	.714	*18.1*	395	*588*
NRW-3716SJ	37	16	.091	*2.3*	.062	*1.6*	.790	*20.0*	510	*759*
NRW-4816SJ	48	16	.091	*2.3*	.080	*2.0*	.926	*23.5*	670	*997*
NRW-6016SJ	60	16	.091	*2.3*	.080	*2.0*	1.008	*25.6*	808	*1202*
NRW-714SJ	7	14	.105	*2.7*	.062	*1.6*	.468	*11.9*	175	*260*
NRW-1214SJ	12	14	.105	*2.7*	.062	*1.6*	.590	*15.0*	270	*402*
NRW-1914SJ	19	14	.105	*2.7*	.062	*1.6*	.678	*17.2*	399	*594*
NRW-2714SJ	27	14	.105	*2.7*	.062	*1.6*	.805	*20.4*	530	*789*
NRW-512SJ	5	12	.124	*3.1*	.062	*1.6*	.488	*12.4*	192	*286*
NRW-712SJ	7	12	.124	*3.1*	.062	*1.6*	.525	*13.3*	244	*363*
NRW-1212SJ	12	12	.124	*3.1*	.062	*1.6*	.669	*17.0*	385	*573*
NRW-1912SJ	19	12	.124	*3.1*	.062	*1.6*	.773	*19.6*	562	*836*

The following cables in 16-12 gauge are similar to NW series but utilize materials to qualify for CSA cetification for AWM *II* A/B 105ºC service at 300 volts as well as styles 2343 and 2344. Items below are not stocked and are subject to minimum run quantities.

NRWC SERIES UNSHIELDED - 16, 14 and 12 AWG

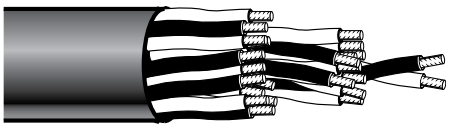
Part No.	No. Cond	Cond AWG	Cond..Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRWC-716J	7	16	.091	*2.3*	.062	*1.6*	.401	*10.2*	108	*161*
NRWC-1216J	12	16	.091	*2.3*	.062	*1.6*	.507	*12.9*	170	*253*
NRWC-1916J	19	16	.091	*2.3*	.062	*1.6*	.583	*14.8*	248	*369*
NRWC-2716J	27	16	.091	*2.3*	.062	*1.6*	.689	*17.5*	339	*504*
NRWC-3716J	37	16	.091	*2.3*	.062	*1.6*	.765	*19.4*	446	*664*
NRWC-4816J	48	16	.091	*2.3*	.080	*2.0*	.901	*22.9*	576	*857*
NRWC-6016J	60	16	.091	*2.3*	.080	*2.0*	.983	*25.0*	720	*1071*
NRWC-714J	7	14	.105	*2.7*	.062	*1.6*	.443	*11.2*	146	*217*
NRWC-1214J	12	14	.105	*2.7*	.062	*1.6*	.565	*14.3*	233	*347*
NRWC-1914J	19	14	.105	*2.7*	.062	*1.6*	.653	*16.6*	345	*513*
NRWC-2714J	27	14	.105	*2.7*	.062	*1.6*	.775	*19.7*	476	*708*
NRWC-512J	5	12	.124	*3.1*	.062	*1.6*	.463	*11.7*	157	*234*
NRWC-712J	7	12	.124	*3.1*	.062	*1.6*	.500	*12.7*	205	*305*
NRWC-1212J	12	12	.124	*3.1*	.062	*1.6*	.644	*16.4*	332	*494*
NRWC-1912J	19	12	.124	*3.1*	.062	*1.6*	.748	*19.0*	499	*743*

NRWC SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond.. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRWC-716SJ	7	16	.091	*2.3*	.062	*1.6*	.421	*10.7*	129	*192*
NRWC-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.532	*13.5*	209	*311*
NRWC-1916SJ	19	16	.091	*2.3*	.062	*1.6*	.608	*15.4*	294	*437*
NRWC-2716SJ	27	16	.091	*2.3*	.062	*1.6*	.714	*18.1*	395	*588*
NRWC-3716SJ	37	16	.091	*2.3*	.062	*1.6*	.790	*20.0*	510	*759*
NRWC-4816SJ	48	16	.091	*2.3*	.062	*1.6*	.926	*23.5*	670	*997*
NRWC-6016SJ	60	16	.091	*2.3*	.062	*1.6*	1.008	*25.6*	808	*1202*
NRWC-714SJ	7	14	.105	*2.7*	.062	*1.6*	.468	*11.9*	175	*260*
NRWC-1214SJ	12	14	.105	*2.7*	.062	*1.6*	.590	*15.0*	270	*402*
NRWC-1914SJ	19	14	.105	*2.7*	.062	*1.6*	.678	*17.2*	399	*594*
NRWC-2714SJ	27	14	.105	*2.7*	.062	*1.6*	.805	*20.4*	530	*789*
NRWC-512SJ	5	12	.124	*3.1*	.062	*1.6*	.488	*12.4*	192	*286*
NRWC-712SJ	7	12	.124	*3.1*	.062	*1.6*	.525	*13.3*	244	*363*
NRWC-1212SJ	12	12	.124	*3.1*	.062	*1.6*	.669	*17.0*	385	*573*
NR WC-1912SJ	19	12	.124	*3.1*	.062	*1.6*	.773	*19.6*	562	*836*

UL/CSA -- CONDUCTOR SIZE & STRANDING
16 AWG (26 x 30)
14 AWG (41 x 30)
12 AWG (65 x 30)

CABLED TWISTED PAIRS CONDUCTORS



Heavy Duty

- Twisted Pairs (NWP Series)
- Mil Spec, U.L. AWM

Recognized Style 2343 or 2344 and CSA Certified
AWM II A/B*

Identical to National's NW-Series Cables except offered as twisted pairs.

National Wire & Cable Corp. manufactures a complete line of multiple pair control cables. Conductors are of tinned copper strand with .015" vinyl primary insulation for use up to 105°C per MIL-W16878/2*. Insulated for 1000 volts working voltage. Conductors are color coded using 10 standard basic colors, plus spiral tracers on white. View Color Table in the National Wire Cable Designers Guide, page 7-13.

All pairs are planetary cabled and contra-helically laid with a Mylar tape serve over the cable bundle. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078, and braid angles below 40° for easy pushback.

The outer jacket is black, abrasion-resistant 105°C vinyl meeting MIL-I-631 Type F. This material is self-extinguishing and fungus resistant. Also available with Neoprene to MIL-R-6855 Class 2 Grade 60 specification, non-U.L. applications. Also available with Neoprene jacket as a custom product. Consult factory for details.

**Cables are U.L. STYLE 2343 or 2344, rated 80°C, and CSA CERTIFIED for 105°C as described below. U.L. and/or CSA certification furnished only when requested.
*Insulated wires also meet U.L. Style 1007 or 1569 as appropriate for gauge.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60cps.
U.L. Voltage Rating:	300 volts RMS AC (appliance use).
600 volts RMS AC (electronic use).	
CSA Voltage Rating:	300 volts RMS AC (appliance use).
Military Voltage Rating:	1000 volts RMS
Capacitance:	Nominal capacitance wire to wire for a pair ranges from 27 to 40 pf/ft Capacitance from both wires tied together measured to all else in common ranges from 35 to 60 mmfd/ft. dependent on gauge and position. Overall shield has negligible effect on W-W capacitance.
Insulation Leakage Res.:	200 megohms/1000 ft. min. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Res.:	10 megohms/1000 ft. min. at 500 VDC form overall shield through sheath to outside world.
Usable Temp. Range:	Suitable for continuous use from +105°C to -40°C.
Cold Bending Capability:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing application consult the factory.

For color code of pairs, view the Color Table in the National Wire Cable Designers Guide, page 7-13.

MULTI-CONDUCTOR STOCK CABLES Conductor sizes 22 AWG is 7 stranded. All others are 19 strand.

NWP SERIES UNSHIELD - 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NWP-722J	7	22	.064	*1.6*	.062	*1.6*	.454	*11.5*	103	*154*
NWP-1222J	12	22	.064	*1.6*	.062	*1.6*	.581	*14.7*	157	*234*
NWP-1922J	19	22	.064	*1.6*	.062	*1.6*	.672	*17.1*	221	*329*
NWP-2722J	27	22	.064	*1.6*	.062	*1.6*	.798	*20.3*	297	*442*
NWP-3722J	37	22	.064	*1.6*	.080	*2.0*	.926	*23.5*	418	*621*
NWP-4822J	48	22	.064	*1.6*	.080	*2.0*	1.045	*26.6*	520	*773*
NWP-6022J	60	22	.064	*1.6*	.080	*2.0*	1.143	*29.0*	625	*930*
NWP-720J	7	20	.072	*1.8*	.062	*1.6*	.495	*12.6*	135	*201*
NWP-1220J	12	20	.072	*1.8*	.062	*1.6*	.637	*16.2*	210	*313*
NWP-1920J	19	20	.072	*1.8*	.062	*1.6*	.740	*18.8*	302	*450*
NWP-2720J	27	20	.072	*1.8*	.080	*2.0*	.918	*23.3*	445	*662*
NWP-3720J	37	20	.072	*1.8*	.080	*2.0*	1.021	*25.9*	575	*855*
NWP-4820J	48	20	.072	*1.8*	.080	*2.0*	1.155	*29.3*	721	*1073*
NWP-6020J	60	20	.072	*1.8*	.080	*2.0*	1.266	*32.1*	874	*1300*
NWP-718J	7	18	.082	*2.1*	.062	*1.6*	.546	*13.9*	175	*261*
NWP-1218J	12	18	.082	*2.1*	.062	*1.6*	.708	*18.0*	277	*412*
NWP-1918J	19	18	.082	*2.1*	.080	*2.0*	.861	*21.9*	436	*649*
NWP-2718J	27	18	.082	*2.1*	.080	*2.0*	1.023	*26.0*	591	*880*
NWP-3718J	37	18	.082	*2.1*	.080	*2.0*	1.140	*29.0*	771	*1147*
NWP-4818J	48	18	.082	*2.1*	.080	*2.0*	1.293	*32.8*	973	*1447*

NWP SERIES OVERALL SHIELDED - 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NWP-722SJ	7	22	.064	*1.6*	.062	*1.6*	.480	*12.2*	143	*213*
NWP-1222SJ	12	22	.064	*1.6*	.062	*1.6*	.606	*15.4*	211	*314*
NWP-1922SJ	19	22	.064	*1.6*	.062	*1.6*	.697	*17.7*	285	*424*
NWP-2722SJ	27	22	.064	*1.6*	.062	*1.6*	.823	*20.9*	375	*558*
NWP-3722SJ	37	22	.064	*1.6*	.080	*2.0*	.951	*24.2*	507	*754*
NWP-4822SJ	48	22	.064	*1.6*	.080	*2.0*	1.070	*27.2*	622	*926*
NWP-6022SJ	60	22	.064	*1.6*	.080	*2.0*	1.168	*29.7*	739	*1099*
NWP-720SJ	7	20	.072	*1.8*	.062	*1.6*	.520	*13.2*	180	*267*
NWP-1220SJ	12	20	.072	*1.8*	.062	*1.6*	.662	*16.8*	270	*402*
NWP-1920SJ	19	20	.072	*1.8*	.062	*1.6*	.765	*19.4*	374	*556*
NWP-2720SJ	27	20	.072	*1.8*	.080	*2.0*	.943	*24.0*	534	*794*
NWP-3720SJ	37	20	.072	*1.8*	.080	*2.0*	1.046	*26.6*	675	*1004*
NWP-4820SJ	48	20	.072	*1.8*	.080	*2.0*	1.181	*30.0*	836	*1243*
NWP-6020SJ	60	20	.072	*1.8*	.080	*2.0*	1.291	*32.8*	1001	*1490*
NWP-718SJ	7	18	.082	*2.1*	.062	*1.6*	.571	*14.5*	225	*335*
NWP-1218SJ	12	18	.082	*2.1*	.062	*1.6*	.733	*18.6*	345	*513*
NWP-1918SJ	19	18	.082	*2.1*	.080	*2.0*	.886	*22.5*	518	*771*
NWP-2718SJ	27	18	.082	*2.1*	.080	*2.0*	1.048	*26.6*	692	*1029*
NWP-3718SJ	37	18	.082	*2.1*	.080	*2.0*	1.165	*29.6*	884	*1315*
NWP-4818SJ	48	18	.082	*2.1*	.080	*2.0*	1.318	*33.5*	1103	*1641*

CABLED TWISTED PAIRS - NWP Series

MULTI-CONDUCTOR STOCK CABLES Conductor sizes 22 AWG is 7 stranded. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

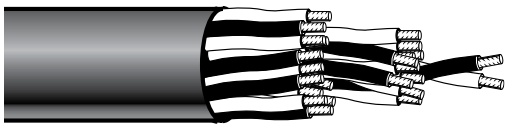
all RoHS products have the letter "R" written into the second position of the Part No.

NRWP SERIES UNSHIELD - 22, 20 and 18 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NRWP-722J	7	22	.064	*1.6*	.062	*1.6*	.454	*11.5*	103	*154*
NRWP-1222J	12	22	.064	*1.6*	.062	*1.6*	.581	*14.7*	157	*234*
NRWP-1922J	19	22	.064	*1.6*	.062	*1.6*	.672	*17.1*	221	*329*
NRWP-2722J	27	22	.064	*1.6*	.062	*1.6*	.798	*20.3*	297	*442*
NRWP-3722J	37	22	.064	*1.6*	.080	*2.0*	.926	*23.5*	418	*621*
NRWP-4822J	48	22	.064	*1.6*	.080	*2.0*	1.045	*26.6*	520	*773*
NRWP-6022J	60	22	.064	*1.6*	.080	*2.0*	1.143	*29.0*	625	*930*
NRWP-720J	7	20	.072	*1.8*	.062	*1.6*	.495	*12.6*	135	*201*
NRWP-1220J	12	20	.072	*1.8*	.062	*1.6*	.637	*16.2*	210	*313*
NRWP-1920J	19	20	.072	*1.8*	.062	*1.6*	.740	*18.8*	302	*450*
NRWP-2720J	27	20	.072	*1.8*	.080	*2.0*	.918	*23.3*	445	*662*
NRWP-3720J	37	20	.072	*1.8*	.080	*2.0*	1.021	*25.9*	575	*855*
NRWP-4820J	48	20	.072	*1.8*	.080	*2.0*	1.155	*29.3*	721	*1073*
NRWP-6020J	60	20	.072	*1.8*	.080	*2.0*	1.266	*32.1*	874	*1300*
NRWP-718J	7	18	.082	*2.1*	.062	*1.6*	.546	*13.9*	175	*261*
NRWP-1218J	12	18	.082	*2.1*	.062	*1.6*	.708	*18.0*	277	*412*
NRWP-1918J	19	18	.082	*2.1*	.080	*2.0*	.861	*21.9*	436	*649*
NRWP-2718J	27	18	.082	*2.1*	.080	*2.0*	1.023	*26.0*	591	*880*
NRWP-3718J	37	18	.082	*2.1*	.080	*2.0*	1.140	*29.0*	771	*1147*
NRWP-4818J	48	18	.082	*2.1*	.080	*2.0*	1.293	*32.8*	973	*1447*

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NRWP-722SJ	7	22	.064	*1.6*	.062	*1.6*	.480	*12.2*	143	*213*
NRWP-1222SJ	12	22	.064	*1.6*	.062	*1.6*	.606	*15.4*	211	*314*
NRWP-1922SJ	19	22	.064	*1.6*	.062	*1.6*	.697	*17.7*	285	*424*
NRWP-2722SJ	27	22	.064	*1.6*	.062	*1.6*	.823	*20.9*	375	*558*
NRWP-3722SJ	37	22	.064	*1.6*	.080	*2.0*	.951	*24.2*	507	*754*
NRWP-4822SJ	48	22	.064	*1.6*	.080	*2.0*	1.070	*27.2*	622	*926*
NRWP-6022SJ	60	22	.064	*1.6*	.080	*2.0*	1.168	*29.7*	739	*1099*
NRWP-720SJ	7	20	.072	*1.8*	.062	*1.6*	.520	*13.2*	180	*267*
NRWP-1220SJ	12	20	.072	*1.8*	.062	*1.6*	.662	*16.8*	270	*402*
NRWP-1920SJ	19	20	.072	*1.8*	.062	*1.6*	.765	*19.4*	374	*556*
NRWP-2720SJ	27	20	.072	*1.8*	.080	*2.0*	.943	*24.0*	534	*794*
NRWP-3720SJ	37	20	.072	*1.8*	.080	*2.0*	1.046	*26.6*	675	*1004*
NRWP-4820SJ	48	20	.072	*1.8*	.080	*2.0*	1.181	*30.0*	836	*1243*
NRWP-6020SJ	60	20	.072	*1.8*	.080	*2.0*	1.291	*32.8*	1001	*1490*
NRWP-718SJ	7	18	.082	*2.1*	.062	*1.6*	.571	*14.5*	225	*335*
NRWP-1218SJ	12	18	.082	*2.1*	.062	*1.6*	.733	*18.6*	345	*513*
NRWP-1918SJ	19	18	.082	*2.1*	.080	*2.0*	.886	*22.5*	518	*771*
NRWP-2718SJ	27	18	.082	*2.1*	.080	*2.0*	1.048	*26.6*	692	*1029*
NRWP-3718SJ	37	18	.082	*2.1*	.080	*2.0*	1.165	*29.6*	884	*1315*
NRWP-4818SJ	48	18	.082	*2.1*	.080	*2.0*	1.318	*33.5*	1103	*1641*

CABLED TWISTED PAIRS CONDUCTORS



Heavy Duty

- Twisted Pairs (NWP Series)
- Mil Spec, U.L. AWM

Recognized Style 2343 or 2344 and CSA Certified
AWM II A/B*

For color code of pairs, view the Color Table in the National Wire Cable Designers Guide, page 7-13.

The products shown in the following tables are MIL-SPEC only. UL and CSA do not recognize 19 strand conductors in this gauge. See the NWPC table below for UL/CSA.

NWP SERIES UNSHIELDED - 16 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NWP-716J	7	16	.091	*2.3*	.062	*1.6*	.592	15.0	209	*310*
NWP-1216J	12	16	.091	*2.3*	.062	*1.6*	.772	19.6	332	*493*
NWP-1916J	19	16	.091	*2.3*	.080	*2.0*	.938	23.8	523	*777*
NWP-2716J	27	16	.091	*2.3*	.080	*2.0*	1.117	28.4	712	*1059*
NWP-3716J	37	16	.091	*2.3*	.080	*2.0*	1.247	31.7	932	*1387*

NWP SERIES OVERALL SHIELDED - 16 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NWP-716SJ	7	16	.091	*2.3*	.062	*1.6*	.617	*15.7*	264	*392*
NWP-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.797	*20.2*	407	*605*
NWP-1916SJ	19	16	.091	*2.3*	.080	*2.0*	.963	*24.5*	613	*912*
NWP-2716SJ	27	16	.091	*2.3*	.080	*2.0*	1.142	*29.0*	823	*1224*
NWP-3716SJ	37	16	.091	*2.3*	.080	*2.0*	1.272	*32.3*	1057	*1573*

The following cables in 16 gauge are similar to NWP series but utilize materials to qualify for CSA cetification for AWM II A/B 105ºC service at 300 volts as well as styles 2343 and 2344. Items below are not stocked and are subject to minimum run quantities.

NWPC SERIES UNSHIELDED - 16 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NWPC-716J	7	16	.091	*2.3*	.062	*1.6*	.614	*15.0*	209	*310*
NWPC-1216J	12	16	.091	*2.3*	.062	*1.6*	.772	*19.6*	332	*493*
NWPC-1916J	19	16	.091	*2.3*	.062	*1.6*	.938	*23.8*	523	*777*
NWPC-2716J	27	16	.091	*2.3*	.062	*1.6*	1.117	*28.4*	712	*1059*
NWPC-3716J	37	16	.091	*2.3*	.062	*1.6*	1.247	*31.7*	932	*1387*

NWPC SERIES OVERALL SHIELDED - 16 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NWPC-716SJ	7	16	.091	*2.3*	.062	*1.6*	.617	*15.7*	264	*392*
NWPC-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.797	*20.2*	407	*605*
NWPC-1916SJ	19	16	.091	*2.3*	.062	*1.6*	.963	*24.5*	613	*912*
NWPC-2716SJ	27	16	.091	*2.3*	.062	*1.6*	1.142	*29.0*	823	*1224*
NWPC-3716SJ	37	16	.091	*2.3*	.062	*1.6*	1.272	*32.3*	1057	*1573*

UL/CSA -- CONDUCTOR SIZE & STRANDING
16 AWG (26 x 30)

CABLED TWISTED PAIRS - NWP Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

NRWP SERIES UNSHIELDED - 16 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NRWP-716J	7	16	.091	*2.3*	.062	*1.6*	.592	15.0	209	*310*
NRWP-1216J	12	16	.091	*2.3*	.062	*1.6*	.772	19.6	332	*493*
NRWP-1916J	19	16	.091	*2.3*	.080	*2.0*	.938	23.8	523	*777*
NRWP-2716J	27	16	.091	*2.3*	.080	*2.0*	1.117	28.4	712	*1059*
NRWP-3716J	37	16	.091	*2.3*	.080	*2.0*	1.247	31.7	932	*1387*

NRWP SERIES OVERALL SHIELDED - 16 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NRWP-716SJ	7	16	.091	*2.3*	.062	*1.6*	.617	*15.7*	264	*392*
NRWP-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.797	*20.2*	407	*605*
NRWP-1916SJ	19	16	.091	*2.3*	.080	*2.0*	.963	*24.5*	613	*912*
NRWP-2716SJ	27	16	.091	*2.3*	.080	*2.0*	1.142	*29.0*	823	*1224*
NRWP-3716SJ	37	16	.091	*2.3*	.080	*2.0*	1.272	*32.3*	1057	*1573*

NRWPC SERIES UNSHIELDED - 16 AWG

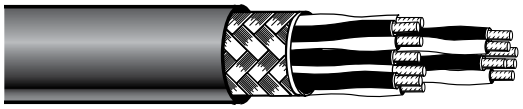
Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NRWPC-716J	7	16	.091	*2.3*	.062	*1.6*	.614	*15.0*	209	*310*
NRWPC-1216J	12	16	.091	*2.3*	.062	*1.6*	.772	*19.6*	332	*493*
NRWPC-1916J	19	16	.091	*2.3*	.062	*1.6*	.938	*23.8*	523	*777*
NRWPC-2716J	27	16	.091	*2.3*	.062	*1.6*	1.117	*28.4*	712	*1059*
NRWPC-3716J	37	16	.091	*2.3*	.062	*1.6*	1.247	*31.7*	932	*1387*

NRWPC SERIES OVERALL SHIELDED - 16 AWG

Part No.	No. of Pairs	Cond. AWG	Cond. Diameter Inches	*MM*	Jacket Wall Inches	*MM*	Nominal Diameter Inches	*MM*	Weight Lbs. per 1000 ft.	*KG/KM*
NRWPC-716SJ	7	16	.091	*2.3*	.062	*1.6*	.617	*15.7*	264	*392*
NRWPC-1216SJ	12	16	.091	*2.3*	.062	*1.6*	.797	*20.2*	407	*605*
NRWPC-1916SJ	19	16	.091	*2.3*	.062	*1.6*	.963	*24.5*	613	*912*
NRWPC-2716SJ	27	16	.091	*2.3*	.062	*1.6*	1.142	*29.0*	823	*1224*
NRWPC-3716SJ	37	16	.091	*2.3*	.062	*1.6*	1.272	*32.3*	1057	*1573*

UL/CSA -- CONDUCTOR SIZE & STRANDING
16 AWG (26 x 30)

CABLED SINGLE CONDUCTORS



Extra Heavy Duty

- Single Conductors (NWH Series)
- Mil Spec, U.L. AWM

Recognized Style 2343 or 2344 and CSA Certified
AWM *II* A/B*

National Wire & Cable Corp. manufactures a complete line of extra heavy duty multi-conductor control cables. Conductors are of tinned copper strand with .031" wall of polyvinylchloride primary insulation for use up to 105°C. Per MIL-W-16878/3, insulated for 3000 volts working voltage**.

Conductors are color coded using 10 standard basic colors, plus spiral tracers on white per MIL-STD-681. View Color Table in the National Wire Cable Designers Guide, page 7-13.

All conductor are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape serve over cable bundle. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078, and braid angles below 40° for easy pushback.

The outer jacket is black, abrasion-resistant 105°C vinyl meeting MIL-I-631 Type F. This material is self-extinguishing and fungus resistant. Neoprene to MIL-R-6855 Class 2 Grade 60 specifications also available on special for non-U.L. applications.

*Cables are U.L. STYLE 2343 or 2344, rated 80°C, and CSA CERTIFIED for 105°C U.L. and/or CSA Certification furnished only when requested.
**Insulated wires also meet Style 1015.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 12000 volts AC RMS, 60cps.
U.L. Voltage Rating:	600 volts RMS AC (appliance use). 2500 volts RMS AC (electronic use).
CSA Voltage Rating:	600 volts RMS AC (appliance use).
Military Voltage Rating:	3000 volts RMS
Capacitance:	Nominal capacitance from a wire to all else in the cable ranges from 40 to 65 pf per ft. @ 1000 cps. dependent on gauge and position.
Insulation Leakage Res.:	200 megohms/1000 ft. min. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Res.:	10 megohms/1000 ft. min. at 500 VDC form overall shield through sheath to outside world.
Usable Temp. Range:	Suitable for continuous use from +105°C to -40°C.
Cold Bending Capability:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing application consult the factory.

MULTI-CONDUCTOR STOCK CABLES Conductor sizes 22 AWG is 7 stranded. All others are 19 strand.

NWH SERIES UNSHIELD - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	KG/KM
			Inches	MM	Inches	MM	Inches	MM		
NWH-722J	7	22	.092	2.3	.080	2.0	.992	25.2	479	713
NWH-1222J	12	22	.092	2.3	.080	2.0	1.084	27.5	562	835
NWH-1922J	19	22	.092	2.3	.080	2.0	1.176	29.9	667	992
NWH-2722J	27	22	.092	2.3	.080	2.0	1.268	32.2	761	1132
NWH-3722J	37	22	.092	2.3	.062	1.6	.772	19.6	294	437
NWH-4822J	48	22	.092	2.3	.080	2.0	.909	23.1	398	592
NWH-6022J	60	22	.092	2.3	.080	2.0	.992	25.2	479	713
NWH-7222J	72	22	.092	2.3	.080	2.0	1.084	27.5	562	835
NWH-8822J	88	22	.092	2.3	.080	2.0	1.176	29.9	667	992
NWH-10222J	102	22	.092	2.3	.080	2.0	1.268	32.2	761	1132
NWH-720J	7	20	.098	2.5	.062	1.6	.422	10.7	95	141
NWH-1220J	12	20	.098	2.5	.062	1.6	.536	13.6	146	218
NWH-1920J	19	20	.098	2.5	.062	1.6	.618	15.7	209	311
NWH-2720J	27	20	.098	2.5	.062	1.6	.732	18.6	284	422
NWH-3720J	37	20	.098	2.5	.062	1.6	.814	20.7	370	550
NWH-4820J	48	20	.098	2.5	.080	2.0	.958	24.3	497	740
NWH-6020J	60	20	.098	2.5	.080	2.0	1.046	26.6	602	896
NWH-7220J	72	20	.098	2.5	.080	2.0	1.144	29.1	709	1054
NWH-8820J	88	20	.098	2.5	.080	2.0	1.242	31.5	846	1258
NWH-10220J	102	20	.098	2.5	.080	2.0	1.340	34.0	967	1439
NWH-718J	7	18	.110	2.8	.062	1.6	.458	11.6	119	177
NWH-1218J	12	18	.110	2.8	.062	1.6	.586	14.9	186	276
NWH-1918J	19	18	.110	2.8	.062	1.6	.678	17.2	270	401
NWH-2718J	27	18	.110	2.8	.062	1.6	.806	20.5	368	548
NWH-3718J	37	18	.110	2.8	.080	2.0	.934	23.7	514	765
NWH-4818J	48	18	.110	2.8	.080	2.0	1.055	26.8	647	963
NWH-6018J	60	18	.110	2.8	.080	2.0	1.154	29.3	788	1171
NWH-7218J	72	18	.110	2.8	.080	2.0	1.264	32.1	930	1383

NWH SERIES OVERALL SHIELDED - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	KG/KM
			Inches	MM	Inches	MM	Inches	MM		
NWH-722SJ	7	22	.092	2.3	.062	1.6	.424	10.8	101	150
NWH-1222SJ	12	22	.092	2.3	.062	1.6	.536	13.6	160	238
NWH-1922SJ	19	22	.092	2.3	.062	1.6	.613	15.6	216	322
NWH-2722SJ	27	22	.092	2.3	.062	1.6	.720	18.3	285	423
NWH-3722SJ	37	22	.092	2.3	.062	1.6	.797	20.2	358	533
NWH-4822SJ	48	22	.092	2.3	.080	2.0	.934	23.7	473	704
NWH-6022SJ	60	22	.092	2.3	.080	2.0	1.017	25.8	562	836
NWH-7222SJ	72	22	.092	2.3	.080	2.0	1.109	28.2	653	971
NWH-8822SJ	88	22	.092	2.3	.080	2.0	1.176	29.9	667	992
NWH-10222SJ	102	22	.092	2.3	.080	2.0	1.293	32.8	870	1294
NWH-720SJ	7	20	.098	2.5	.062	1.6	.422	10.7	95	141
NWH-1220SJ	12	20	.098	2.5	.062	1.6	.536	13.6	146	218
NWH-1920SJ	19	20	.098	2.5	.062	1.6	.618	15.7	209	311
NWH-2720SJ	27	20	.098	2.5	.062	1.6	.732	18.6	284	422
NWH-3720SJ	37	20	.098	2.5	.062	1.6	.814	20.7	370	550
NWH-4820SJ	48	20	.098	2.5	.080	2.0	.958	24.3	497	740
NWH-6020SJ	60	20	.098	2.5	.080	2.0	1.046	26.6	602	896
NWH-7220SJ	72	20	.098	2.5	.080	2.0	1.144	29.1	709	1054
NWH-8820JS	88	20	.098	2.5	.080	2.0	1.242	31.5	846	1258
NWH-10220SJ	102	20	.098	2.5	.080	2.0	1.365	34.7	1083	1611
NWH-718SJ	7	18	.110	2.8	.062	1.6	.458	11.6	119	177
NWH-1218SJ	12	18	.110	2.8	.062	1.6	.586	14.9	186	276
NWH-1918SJ	19	18	.110	2.8	.062	1.6	.678	17.2	270	401
NWH-2718SJ	27	18	.110	2.8	.062	1.6	.806	20.5	368	548
NWH-3718SJ	37	18	.110	2.8	.080	2.0	.934	23.7	514	765
NWH-4818SJ	48	18	.110	2.8	.080	2.0	1.055	26.8	647	963
NWH-6018SJ	60	18	.110	2.8	.080	2.0	1.154	29.3	788	1171
NWH-7218SJ	72	18	.110	2.8	.080	2.0	1.264	32.1	930	1383

CABLED SINGLE CONDUCTORS - NWH Series

MULTI-CONDUCTOR STOCK CABLES Conductor sizes 22 AWG is 7 stranded. All others are 19 strand.

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

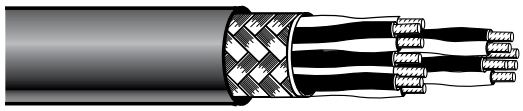
NRWH SERIES UNSHIELD - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	1000 ft	*KG/KM*
NRWH-722J	7	22	.092	*2.3*	.080	*2.0*	.992	*25.2*	479	*713*
NRWH-1222J	12	22	.092	*2.3*	.080	*2.0*	1.084	*27.5*	562	*835*
NRWH-1922J	19	22	.092	*2.3*	.080	*2.0*	1.176	*29.9*	667	*992*
NRWH-2722J	27	22	.092	*2.3*	.080	*2.0*	1.268	*32.2*	761	*1132*
NRWH-3722J	37	22	.092	*2.3*	.062	*1.6*	.772	*19.6*	294	*437*
NRWH-4822J	48	22	.092	*2.3*	.080	*2.0*	.909	*23.1*	398	*592*
NRWH-6022J	60	22	.092	*2.3*	.080	*2.0*	.992	*25.2*	479	*713*
NRWH-7222J	72	22	.092	*2.3*	.080	*2.0*	1.084	*27.5*	562	*835*
NRWH-8822J	88	22	.092	*2.3*	.080	*2.0*	1.176	*29.9*	667	*992*
NRWH-10222J	102	22	.092	*2.3*	.080	*2.0*	1.268	*32.2*	761	*1132*
NRWH-720J	7	20	.098	*2.5*	.062	*1.6*	.422	*10.7*	95	*141*
NRWH-1220J	12	20	.098	*2.5*	.062	*1.6*	.536	*13.6*	146	*218*
NRWH-1920J	19	20	.098	*2.5*	.062	*1.6*	.618	*15.7*	209	*311*
NRWH-2720J	27	20	.098	*2.5*	.062	*1.6*	.732	*18.6*	284	*422*
NRWH-3720J	37	20	.098	*2.5*	.062	*1.6*	.814	*20.7*	370	*550*
NRWH-4820J	48	20	.098	*2.5*	.080	*2.0*	.958	*24.3*	497	*740*
NRWH-6020J	60	20	.098	*2.5*	.080	*2.0*	1.046	*26.6*	602	*896*
NRWH-7220J	72	20	.098	*2.5*	.080	*2.0*	1.144	*29.1*	709	*1054*
NRWH-8820J	88	20	.098	*2.5*	.080	*2.0*	1.242	*31.5*	846	*1258*
NRWH-10220J	102	20	.098	*2.5*	.080	*2.0*	1.340	*34.0*	967	*1439*
NRWH-718J	7	18	.110	*2.8*	.062	*1.6*	.458	*11.6*	119	*177*
NRWH-1218J	12	18	.110	*2.8*	.062	*1.6*	.586	*14.9*	186	*276*
NRWH-1918J	19	18	.110	*2.8*	.062	*1.6*	.678	*17.2*	270	*401*
NRWH-2718J	27	18	.110	*2.8*	.062	*1.6*	.806	*20.5*	368	*548*
NRWH-3718J	37	18	.110	*2.8*	.080	*2.0*	.934	*23.7*	514	*765*
NRWH-4818J	48	18	.110	*2.8*	.080	*2.0*	1.055	*26.8*	647	*963*
NRWH-6018J	60	18	.110	*2.8*	.080	*2.0*	1.154	*29.3*	788	*1171*
NRWH-7218J	72	18	.110	*2.8*	.080	*2.0*	1.264	*32.1*	930	*1383*

NRWH SERIES OVERALL SHIELDED - 22, 20 and 18 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	1000 ft	*KG/KM*
NRWH-722SJ	7	22	.092	*2.3*	.062	*1.6*	.424	*10.8*	101	*150*
NRWH-1222SJ	12	22	.092	*2.3*	.062	*1.6*	.536	*13.6*	160	*238*
NRWH-1922SJ	19	22	.092	*2.3*	.062	*1.6*	.613	*15.6*	216	*322*
NRWH-2722SJ	27	22	.092	*2.3*	.062	*1.6*	.720	*18.3*	285	*423*
NRWH-3722SJ	37	22	.092	*2.3*	.062	*1.6*	.797	*20.2*	358	*533*
NRWH-4822SJ	48	22	.092	*2.3*	.080	*2.0*	.934	*23.7*	473	*704*
NRWH-6022SJ	60	22	.092	*2.3*	.080	*2.0*	1.017	*25.8*	562	*836*
NRWH-7222SJ	72	22	.092	*2.3*	.080	*2.0*	1.109	*28.2*	653	*971*
NRWH-8822SJ	88	22	.092	*2.3*	.080	*2.0*	1.176	*29.9*	667	*992*
NRWH-10222SJ	102	22	.092	*2.3*	.080	*2.0*	1.293	*32.8*	870	*1294*
NRWH-720SJ	7	20	.098	*2.5*	.062	*1.6*	.422	*10.7*	95	*141*
NRWH-1220SJ	12	20	.098	*2.5*	.062	*1.6*	.536	*13.6*	146	*218*
NRWH-1920SJ	19	20	.098	*2.5*	.062	*1.6*	.618	*15.7*	209	*311*
NRWH-2720SJ	27	20	.098	*2.5*	.062	*1.6*	.732	*18.6*	284	*422*
NRWH-3720SJ	37	20	.098	*2.5*	.062	*1.6*	.814	*20.7*	370	*550*
NRWH-4820SJ	48	20	.098	*2.5*	.080	*2.0*	.958	*24.3*	497	*740*
NRWH-6020SJ	60	20	.098	*2.5*	.080	*2.0*	1.046	*26.6*	602	*896*
NRWH-7220SJ	72	20	.098	*2.5*	.080	*2.0*	1.144	*29.1*	709	*1054*
NRWH-8820JS	88	20	.098	*2.5*	.080	*2.0*	1.242	*31.5*	846	*1258*
NRWH-10220SJ	102	20	.098	*2.5*	.080	*2.0*	1.365	*34.7*	1083	*1611*
NRWH-718SJ	7	18	.110	*2.8*	.062	*1.6*	.458	*11.6*	119	*177*
NRWH-1218SJ	12	18	.110	*2.8*	.062	*1.6*	.586	*14.9*	186	*276*
NRWH-1918SJ	19	18	.110	*2.8*	.062	*1.6*	.678	*17.2*	270	*401*
NRWH-2718SJ	27	18	.110	*2.8*	.062	*1.6*	.806	*20.5*	368	*548*
NRWH-3718SJ	37	18	.110	*2.8*	.080	*2.0*	.934	*23.7*	514	*765*
NRWH-4818SJ	48	18	.110	*2.8*	.080	*2.0*	1.055	*26.8*	647	*963*
NRWH-6018SJ	60	18	.110	*2.8*	.080	*2.0*	1.154	*29.3*	788	*1171*
NRWH-7218SJ	72	18	.110	*2.8*	.080	*2.0*	1.264	*32.1*	930	*1383*

CABLED SINGLE CONDUCTORS



Extra Heavy Duty

- Single Conductors (NWH Series)
- Mil Spec, U.L. AWM

Recognized Style 2343 or 2344 and CSA Certified
AWM *II* A/B*

MULTI-CONDUCTOR STOCK CABLES

The products shown in the following tables are MIL-SPEC only. UL and CSA do not recognize 19 strand conductors in this gauge. See the NWHC table below for UL/CSA.

NWH SERIES UNSHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NWH-716J	7	16	.092	2.3	.062	1.6	.424	10.8	101	150
NWH-1216J	12	16	.092	2.3	.062	1.6	.536	13.6	160	238
NWH-1916J	19	16	.092	2.3	.062	1.6	.613	15.6	216	322
NWH-2716J	27	16	.092	2.3	.062	1.6	.720	18.3	285	423
NWH-3716J	37	16	.092	2.3	.062	1.6	.797	20.2	358	533
NWH-4816J	48	16	.092	2.3	.080	2.0	.934	23.7	473	704
NWH-6016J	60	16	.092	2.3	.080	2.0	1.017	25.8	562	836
NWH-714J	7	14	.131	3.3	.062	1.6	.521	13.2	175	261
NWH-1214J	12	14	.131	3.3	.062	1.6	.673	17.1	280	417
NWH-1914J	19	14	.131	3.3	.062	1.6	.783	19.9	415	617
NWH-2714J	27	14	.131	3.3	.062	1.6	.971	24.7	604	899
NWH-512J	5	12	.161	4.1	.062	1.6	.563	14.3	193	287
NWH-712J	7	12	.161	4.1	.062	1.6	.611	15.5	253	376
NWH-1212J	12	12	.161	4.1	.062	1.6	.789	20.3	410	609
NWH-1912J	19	12	.161	4.1	.080	2.0	.969	24.6	646	962

NWH SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NWH-716SJ	7	16	.116	2.9	.062	1.6	.501	12.7	170	253
NWH-1216SJ	12	16	.116	2.9	.062	1.6	.636	16.1	260	386
NWH-1916SJ	19	16	.116	2.9	.062	1.6	.733	18.6	366	545
NWH-2716SJ	27	16	.116	2.9	.080	2.0	.904	23.0	523	777
NWH-3716SJ	37	16	.116	2.9	.080	2.0	1.001	25.4	669	996
NWH-4816SJ	48	16	.116	2.9	.080	2.0	1.129	28.7	836	1243
NWH-6016SJ	60	16	.116	2.9	.080	2.0	1.233	31.3	1009	1501
NWH-714SJ	7	14	.131	3.3	.062	1.6	.546	13.9	216	321
NWH-1214SJ	12	14	.131	3.3	.062	1.6	.698	17.7	335	498
NWH-1914SJ	19	14	.131	3.3	.062	1.6	.808	20.5	481	715
NWH-2714SJ	27	14	.131	3.3	.080	2.0	.996	25.3	685	1019
NWH-512SJ	5	12	.161	4.1	.062	1.6	.588	14.9	238	353
NWH-712SJ	7	12	.161	4.1	.062	1.6	.636	16.2	302	449
NWH-1212SJ	12	12	.161	4.1	.062	1.6	.823	20.9	476	709
NWH-1912SJ	19	12	.161	4.1	.080	2.0	.994	25.3	727	1081

The following cables in 16 gauge are similar to NWH series but utilize materials to qualify for CSA cetification for AWM *II* A/B 105ºC service at 600 volts as well as styles 2343 and 2344. Items below are not stocked and are subject to minimum run quantities.

NWHC SERIES UNSHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NWHC-716J	7	16	.116	2.9	.062	1.6	.476	12.1	134	199
NWHC-1216J	12	16	.116	2.9	.062	1.6	.611	15.5	211	313
NWHC-1916J	19	16	.116	2.9	.062	1.6	.708	18.0	308	458
NWHC-2716J	27	16	.116	2.9	.080	2.0	.879	22.3	451	670
NWHC-3716J	37	16	.116	2.9	.080	2.0	.976	24.8	588	875
NWHC-4816J	48	16	.116	2.9	.080	2.0	1.104	28.0	742	1104
NWHC-6016J	60	16	.116	2.9	.080	2.0	1.208	30.7	905	1347
NWHC-714J	7	14	.131	3.3	.062	1.6	.521	13.2	175	261
NWHC-1214J	12	14	.131	3.3	.062	1.6	.673	17.1	280	417
NWHC-1914J	19	14	.131	3.3	.062	1.6	.783	19.9	415	617
NWHC-2714J	27	14	.131	3.3	.080	2.0	.971	24.7	604	899
NWHC-512J	5	12	.161	4.1	.062	1.6	.563	14.3	193	287
NWHC-712J	7	12	.161	4.1	.062	1.6	.611	15.5	253	376
NWHC-1212J	12	12	.161	4.1	.062	1.6	.798	20.3	410	609
NWHC-1912J	19	12	.161	4.1	.080	2.0	.969	24.6	646	962

NWHC SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NWHC-716SJ	7	16	.116	2.9	.062	1.6	.501	12.7	170	253
NWHC-1216SJ	12	16	.116	2.9	.062	1.6	.636	16.1	260	386
NWHC-1916SJ	19	16	.116	2.9	.062	1.6	.733	18.6	366	545
NWHC-2716SJ	27	16	.116	2.9	.080	2.0	.904	23.0	523	777
NWHC-3716SJ	37	16	.116	2.9	.080	2.0	1.001	25.4	669	996
NWHC-4816SJ	48	16	.116	2.9	.080	2.0	1.129	28.7	836	1243
NWHC-6016SJ	60	16	.116	2.9	.080	2.0	1.233	31.3	1009	1501
NWHC-714SJ	7	14	.131	3.3	.062	1.6	.546	13.9	216	321
NWHC-1914SJ	19	14	.131	3.3	.062	1.6	.808	20.5	481	715
NWHC-2714SJ	27	14	.131	3.3	.080	2.0	.996	25.3	685	1019
NWHC-1214SJ	12	14	.131	3.3	.062	1.6	.698	17.7	335	498
NWHC-512SJ	5	12	.161	4.1	.062	1.6	.588	14.9	238	353
NWHC-712SJ	7	12	.161	4.1	.062	1.6	.636	16.2	302	449
NWHC-1212SJ	12	12	.161	4.1	.062	1.6	.823	20.9	476	709
NWHC-1912SJ	19	12	.161	4.1	.080	2.0	.994	25.3	727	1081

UL/CSA -- CONDUCTOR SIZE & STRANDING
16 AWG (26 x 30)
14 AWG (41 x 30)
12 AWG (65 x 30)

CABLED SINGLE CONDUCTORS - NWH Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

NRWH SERIES UNSHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NRWH-716J	7	16	.092	2.3	.062	1.6	.424	10.8	101	150
NRWH-1216J	12	16	.092	2.3	.062	1.6	.536	13.6	160	238
NRWH-1916J	19	16	.092	2.3	.062	1.6	.613	15.6	216	322
NRWH-2716J	27	16	.092	2.3	.062	1.6	.720	18.3	285	423
NRWH-3716J	37	16	.092	2.3	.062	1.6	.797	20.2	358	533
NRWH-4816J	48	16	.092	2.3	.080	2.0	.934	23.7	473	704
NRWH-6016J	60	16	.092	2.3	.080	2.0	1.017	25.8	562	836
NRWH-714J	7	14	.131	3.3	.062	1.6	.521	13.2	175	261
NRWH-1214J	12	14	.131	3.3	.062	1.6	.673	17.1	280	417
NRWH-1914J	19	14	.131	3.3	.062	1.6	.783	19.9	415	617
NRWH-2714J	27	14	.131	3.3	.062	1.6	.971	24.7	604	899
NRWH-512J	5	12	.161	4.1	.062	1.6	.563	14.3	193	287
NRWH-712J	7	12	.161	4.1	.062	1.6	.611	15.5	253	376
NRWH-1212J	12	12	.161	4.1	.062	1.6	.789	20.3	410	609
NRWH-1912J	19	12	.161	4.1	.080	2.0	.969	24.6	646	962

NRWH SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NRWH-716SJ	7	16	.116	2.9	.062	1.6	.501	12.7	170	253
NRWH-1216SJ	12	16	.116	2.9	.062	1.6	.636	16.1	260	386
NRWH-1916SJ	19	16	.116	2.9	.062	1.6	.733	18.6	366	545
NRWH-2716SJ	27	16	.116	2.9	.080	2.0	.904	23.0	523	777
NRWH-3716SJ	37	16	.116	2.9	.080	2.0	1.001	25.4	669	996
NRWH-4816SJ	48	16	.116	2.9	.080	2.0	1.129	28.7	836	1243
NRWH-6016SJ	60	16	.116	2.9	.080	2.0	1.233	31.3	1009	1501
NRWH-714SJ	7	14	.131	3.3	.062	1.6	.546	13.9	216	321
NRWH-1214SJ	12	14	.131	3.3	.062	1.6	.698	17.7	335	498
NRWH-1914SJ	19	14	.131	3.3	.062	1.6	.808	20.5	481	715
NRWH-2714SJ	27	14	.131	3.3	.080	2.0	.996	25.3	685	1019
NRWH-512SJ	5	12	.161	4.1	.062	1.6	.588	14.9	238	353
NRWH-712SJ	7	12	.161	4.1	.062	1.6	.636	16.2	302	449
NRWH-1212SJ	12	12	.161	4.1	.062	1.6	.823	20.9	476	709
NRWH-1912SJ	19	12	.161	4.1	.080	2.0	.994	25.3	727	1081

NRWHC SERIES UNSHIELDED - 16, 14 and 12 AWG

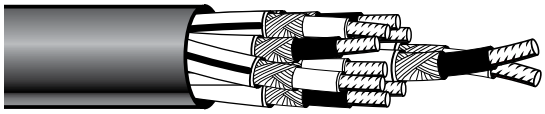
Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NRWHC-716J	7	16	.116	2.9	.062	1.6	.476	12.1	134	199
NRWHC-1216J	12	16	.116	2.9	.062	1.6	.611	15.5	211	313
NRWHC-1916J	19	16	.116	2.9	.062	1.6	.708	18.0	308	458
NRWHC-2716J	27	16	.116	2.9	.080	2.0	.879	22.3	451	670
NRWHC-3716J	37	16	.116	2.9	.080	2.0	.976	24.8	588	875
NRWHC-4816J	48	16	.116	2.9	.080	2.0	1.104	28.0	742	1104
NRWHC-6016J	60	16	.116	2.9	.080	2.0	1.208	30.7	905	1347
NRWHC-714J	7	14	.131	3.3	.062	1.6	.521	13.2	175	261
NRWHC-1214J	12	14	.131	3.3	.062	1.6	.673	17.1	280	417
NRWHC-1914J	19	14	.131	3.3	.062	1.6	.783	19.9	415	617
NRWHC-2714J	27	14	.131	3.3	.080	2.0	.971	24.7	604	899
NRWHC-512J	5	12	.161	4.1	.062	1.6	.563	14.3	193	287
NRWHC-712J	7	12	.161	4.1	.062	1.6	.611	15.5	253	376
NRWHC-1212J	12	12	.161	4.1	.062	1.6	.798	20.3	410	609
NRWHC-1912J	19	12	.161	4.1	.080	2.0	.969	24.6	646	962

NRWHC SERIES OVERALL SHIELDED - 16, 14 and 12 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NRWHC-716SJ	7	16	.116	2.9	.062	1.6	.501	12.7	170	253
NRWHC-1216SJ	12	16	.116	2.9	.062	1.6	.636	16.1	260	386
NRWHC-1916SJ	19	16	.116	2.9	.062	1.6	.733	18.6	366	545
NRWHC-2716SJ	27	16	.116	2.9	.080	2.0	.904	23.0	523	777
NRWHC-3716SJ	37	16	.116	2.9	.080	2.0	1.001	25.4	669	996
NRWHC-4816SJ	48	16	.116	2.9	.080	2.0	1.129	28.7	836	1243
NRWHC-6016SJ	60	16	.116	2.9	.080	2.0	1.233	31.3	1009	1501
NRWHC-714SJ	7	14	.131	3.3	.062	1.6	.546	13.9	216	321
NRWHC-1914SJ	19	14	.131	3.3	.062	1.6	.808	20.5	481	715
NRWHC-2714SJ	27	14	.131	3.3	.080	2.0	.996	25.3	685	1019
NRWHC-1214SJ	12	14	.131	3.3	.062	1.6	.698	17.7	335	498
NRWHC-512SJ	5	12	.161	4.1	.062	1.6	.588	14.9	238	353
NRWHC-712SJ	7	12	.161	4.1	.062	1.6	.636	16.2	302	449
NRWHC-1212SJ	12	12	.161	4.1	.062	1.6	.823	20.9	476	709
NRWHC-1912SJ	19	12	.161	4.1	.080	2.0	.994	25.3	727	1081

UL/CSA -- CONDUCTOR SIZE & STRANDING
16 AWG (26 x 30)
14 AWG (41 x 30)
12 AWG (65 x 30)

CABLED SINGLE CONDUCTORS



(PTFE) Insulated Cables

- Single Conductors (NZ Series)
- High Temp

National Wire & Cable Corp., manufactures a standard line of Polytetrafluoroethylene (PTFE) INSULATED multi-conductor signal and control cables designed for extreme environments and rough usage.

Construction is widely used in aerospace and industrial applications requiring a near-ultimate in cable physical and electrical performance plus high reliability.

Conductors are stranded silver-plated copper, insulated with .010" of extruded Polytetrafluoroethylene (PTFE) insulation rated at 600 volts working from -65°C to +200°C per NEMA HP-3. Conductors are color coded using 10 standard colors plus spiral striped on white per MIL-STD-681. (All conductors are 19 strand.) View Color Table in the National Wire Cable Designers Guide, page 7-13.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape wrap over the cabled bundle. The outer sheath is abrasion-resistant black Neoprene per MIL-R-6855, Class 2, Grade 60.

Optional overall shield is a 90% coverage tinned copper braid over the tape wrap per MIL-C-7078. Also available with paired conductors (NZP-family). For color code see page 7-13.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 3400 volts AC RMS, 60 Hz.
Capacitance:	Nominal capacitance from a wire to all else in cable ranges from 25 to 45 pf.ft. dependent on gauge and position in cable bundle.
Insulation Leakage Resistance:	5000 Megohms per 1000 ft. minimum from any wire to all else in cable.
Sheath Leakage Resistance:	20 Megohms/ft. minimum, from shield through sheath to saline bath after 24 hr. at 25°C.
Usable Temperature Range:	Suitable for continuous use from -55°C to +75°C in flexing service or stored.
Cold Bending Capability:	All cables are suitable for bending to a circle diameter as small as 4 times their diameter from -55°C to +75°C. continuous flexing to less than 6 times diameter is not recommended below -40°C.
General Performance:	Abrasion-resistant. Non-nutrient to fungus. Highly resistant to ozone, oils, mild acids and bases, high humidity.

NZ SERIES UNSHIELDED - 24, 22, 20, 18 and 16 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NZ-724J	7	24	.044	*1.1*	.062	*1.6*	.260	*6.5*	37	*54*
NZ-1224J	12	24	.044	*1.1*	.062	*1.6*	.311	*7.9*	53	*79*
NZ-1924J	19	24	.044	*1.1*	.062	*1.6*	.348	*8.8*	72	*107*
NZ-2724J	27	24	.044	*1.1*	.078	*1.9*	.431	*10.9*	106	*158*
NZ-3724J	37	24	.044	*1.1*	.078	*1.9*	.468	*11.9*	132	*196*
NZ-4824J	48	24	.044	*1.1*	.078	*1.9*	.516	*13.1*	161	*240*
NZ-6024J	60	24	.044	*1.1*	.078	*1.9*	.556	*14.1*	191	*284*
NZ-722J	7	22	.050	*1.3*	.062	*1.6*	.278	*7.1*	45	*67*
NZ-1222J	12	22	.050	*1.3*	.062	*1.6*	.336	*8.5*	67	*100*
NZ-1922J	19	22	.050	*1.3*	.062	*1.6*	.378	*9.6*	92	*137*
NZ-2722J	27	22	.050	*1.3*	.078	*1.9*	.468	*11.9*	136	*202*
NZ-3722J	37	22	.050	*1.3*	.078	*1.9*	.510	*12.9*	171	*254*
NZ-4822J	48	22	.050	*1.3*	.093	*2.3*	.595	*15.1*	227	*338*
NZ-6022J	60	22	.050	*1.3*	.093	*2.3*	.640	*16.2*	270	*402*
NZ-720J	7	20	.058	*1.5*	.062	*1.6*	.302	*7.6*	61	*91*
NZ-1220J	12	20	.058	*1.5*	.062	*1.6*	.369	*9.3*	92	*137*
NZ-1920J	19	20	.058	*1.5*	.078	*1.9*	.450	*11.4*	144	*214*
NZ-2720J	27	20	.058	*1.5*	.078	*1.9*	.517	*13.1*	191	*284*
NZ-3720J	37	20	.058	*1.5*	.093	*2.3*	.596	*15.1*	262	*390*
NZ-4820J	48	20	.058	*1.5*	.093	*2.3*	.660	*16.7*	325	*484*
NZ-6020J	60	20	.058	*1.5*	.093	*2.3*	.712	*18.0*	390	*580*
NZ-718J	7	18	.069	*1.7*	.062	*1.6*	.335	*8.51*	81	*121*
NZ-1218J	12	18	.069	*1.7*	.078	*1.9*	.447	*11.35*	138	*205*
NZ-1918J	19	18	.069	*1.7*	.078	*1.9*	.505	*12.83*	195	*290*
NZ-2718J	27	18	.069	*1.7*	.093	*2.3*	.615	*15.62*	280	*417*
NZ-3718J	37	18	.069	*1.7*	.093	*2.3*	.673	*17.09*	360	*536*
NZ-4818J	48	18	.069	*1.7*	.093	*2.3*	.749	*19.02*	450	*670*
NZ-716J	7	16	.080	*2.0*	.062	*1.6*	.368	*9.35*	98	*146*
NZ-1216J	12	16	.080	*2.0*	.078	*1.9*	.493	*12.52*	168	*250*
NZ-1916J	19	16	.080	*2.0*	.078	*1.9*	.560	*14.22*	241	*359*
NZ-2716J	27	16	.080	*2.0*	.093	*2.3*	.683	*17.35*	344	*512*
NZ-3716J	37	16	.080	*2.0*	.093	*2.3*	.750	*19.05*	446	*664*
NZ-4816J	48	16	.080	*2.0*	.093	*2.3*	.838	*21.29*	560	*833*

NZ SERIES OVERALL SHIELDED - 24, 22, 20, 18 and 16 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NZ-724SJ	7	24	.044	*1.1*	.062	*1.6*	.280	*7.0*	49	*72*
NZ-1224SJ	12	24	.044	*1.1*	.062	*1.6*	.331	*8.41*	68	*101*
NZ-1924SJ	19	24	.044	*1.1*	.062	*1.6*	.368	*9.35*	89	*132*
NZ-2724SJ	27	24	.044	*1.1*	.078	*1.9*	.451	*11.46*	128	*190*
NZ-3724SJ	37	24	.044	*1.1*	.078	*1.9*	.493	*12.52*	165	*246*
NZ-4824SJ	48	24	.044	*1.1*	.078	*1.9*	.542	*13.77*	199	*296*
NZ-6024SJ	60	24	.044	*1.1*	.078	*1.9*	.531	*13.49*	233	*347*
NZ-722SJ	7	22	.050	*1.3*	.062	*1.6*	.298	*7.57*	58	*86*
NZ-1222SJ	12	22	.050	*1.3*	.062	*1.6*	.356	*9.04*	83	*124*
NZ-1922SJ	19	22	.050	*1.3*	.062	*1.6*	.398	*10.11*	112	*167*
NZ-2722SJ	27	22	.050	*1.3*	.078	*1.9*	.493	*12.52*	169	*251*
NZ-3722SJ	37	22	.050	*1.3*	.078	*1.9*	.535	*13.59*	208	*310*
NZ-4822SJ	48	22	.050	*1.3*	.093	*2.3*	.620	*15.75*	271	*403*
NZ-6022SJ	60	22	.050	*1.3*	.093	*2.3*	.665	*16.89*	318	*473*
NZ-720SJ	7	20	.058	*1.5*	.062	*1.6*	.322	*8.18*	75	*112*
NZ-1220SJ	12	20	.058	*1.5*	.062	*1.6*	.389	*9.88*	111	*165*
NZ-1920SJ	19	20	.058	*1.5*	.078	*1.9*	.470	*11.94*	167	*248*
NZ-2720SJ	27	20	.058	*1.5*	.078	*1.9*	.542	*13.77*	229	*341*
NZ-3720SJ	37	20	.058	*1.5*	.093	*2.3*	.621	*15.77*	305	*454*
NZ-4820SJ	48	20	.058	*1.5*	.093	*2.3*	.685	*17.40*	374	*557*
NZ-6020SJ	60	20	.058	*1.5*	.093	*2.3*	.737	*18.72*	445	*662*
NZ-718SJ	7	18	.069	*1.7*	.062	*1.6*	.355	*9.02*	97	*144*
NZ-1218SJ	12	18	.069	*1.7*	.078	*1.9*	.467	*11.86*	160	*238*
NZ-1918SJ	19	18	.069	*1.7*	.078	*1.9*	.530	*13.46*	232	*345*
NZ-2718SJ	27	18	.069	*1.7*	.093	*2.3*	.640	*16.26*	325	*484*
NZ-3718SJ	37	18	.069	*1.7*	.093	*2.3*	.698	*17.73*	411	*612*
NZ-4818SJ	48	18	.069	*1.7*	.093	*2.3*	.774	*19.66*	508	*756*
NZ-716SJ	7	16	.080	*2.0*	.062	*1.6*	.388	*9.86*	117	*174*
NZ-1216SJ	12	16	.080	*2.0*	.078	*1.9*	.518	*13.16*	204	*304*
NZ-1916SJ	19	16	.080	*2.0*	.078	*1.9*	.585	*14.86*	283	*421*
NZ-2716SJ	27	16	.080	*2.0*	.093	*2.3*	.708	*17.98*	396	*589*
NZ-3716SJ	37	16	.080	*2.0*	.093	*2.3*	.775	*19.69*	504	*750*
NZ-4816SJ	48	16	.080	*2.0*	.093	*2.3*	.863	*21.92*	626	*931*

CABLED SINGLE CONDUCTORS - NZ Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

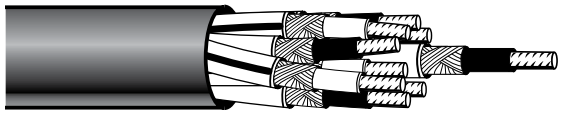
NRZ SERIES UNSHIELDED - 24, 22, 20, 18 and 16 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NRZ-724J	7	24	.044	*1.1*	.062	*1.6*	.260	*6.5*	37	*54*
NRZ-1224J	12	24	.044	*1.1*	.062	*1.6*	.311	*7.9*	53	*79*
NRZ-1924J	19	24	.044	*1.1*	.062	*1.6*	.348	*8.8*	72	*107*
NRZ-2724J	27	24	.044	*1.1*	.078	*1.9*	.431	*10.9*	106	*158*
NRZ-3724J	37	24	.044	*1.1*	.078	*1.9*	.468	*11.9*	132	*196*
NRZ-4824J	48	24	.044	*1.1*	.078	*1.9*	.516	*13.1*	161	*240*
NRZ-6024J	60	24	.044	*1.1*	.078	*1.9*	.556	*14.1*	191	*284*
NRZ-722J	7	22	.050	*1.3*	.062	*1.6*	.278	*7.1*	45	*67*
NRZ-1222J	12	22	.050	*1.3*	.062	*1.6*	.336	*8.5*	67	*100*
NRZ-1922J	19	22	.050	*1.3*	.062	*1.6*	.378	*9.6*	92	*137*
NRZ-2722J	27	22	.050	*1.3*	.078	*1.9*	.468	*11.9*	136	*202*
NRZ-3722J	37	22	.050	*1.3*	.078	*1.9*	.510	*12.9*	171	*254*
NRZ-4822J	48	22	.050	*1.3*	.093	*2.3*	.595	*15.1*	227	*338*
NRZ-6022J	60	22	.050	*1.3*	.093	*2.3*	.640	*16.2*	270	*402*
NRZ-720J	7	20	.058	*1.5*	.062	*1.6*	.302	*7.6*	61	*91*
NRZ-1220J	12	20	.058	*1.5*	.062	*1.6*	.369	*9.3*	92	*137*
NRZ-1920J	19	20	.058	*1.5*	.078	*1.9*	.450	*11.4*	144	*214*
NRZ-2720J	27	20	.058	*1.5*	.078	*1.9*	.517	*13.1*	191	*284*
NRZ-3720J	37	20	.058	*1.5*	.093	*2.3*	.596	*15.1*	262	*390*
NRZ-4820J	48	20	.058	*1.5*	.093	*2.3*	.660	*16.7*	325	*484*
NRZ-6020J	60	20	.058	*1.5*	.093	*2.3*	.712	*18.0*	390	*580*
NRZ-718J	7	18	.069	*1.7*	.062	*1.6*	.335	*8.51*	81	*121*
NRZ-1218J	12	18	.069	*1.7*	.078	*1.9*	.447	*11.35*	138	*205*
NRZ-1918J	19	18	.069	*1.7*	.078	*1.9*	.505	*12.83*	195	*290*
NRZ-2718J	27	18	.069	*1.7*	.093	*2.3*	.615	*15.62*	280	*417*
NRZ-3718J	37	18	.069	*1.7*	.093	*2.3*	.673	*17.09*	360	*536*
NRZ-4818J	48	18	.069	*1.7*	.093	*2.3*	.749	*19.02*	450	*670*
NRZ-716J	7	16	.080	*2.0*	.062	*1.6*	.368	*9.35*	98	*146*
NRZ-1216J	12	16	.080	*2.0*	.078	*1.9*	.493	*12.52*	168	*250*
NRZ-1916J	19	16	.080	*2.0*	.078	*1.9*	.560	*14.22*	241	*359*
NRZ-2716J	27	16	.080	*2.0*	.093	*2.3*	.683	*17.35*	344	*512*
NRZ-3716J	37	16	.080	*2.0*	.093	*2.3*	.750	*19.05*	446	*664*
NRZ-4816J	48	16	.080	*2.0*	.093	*2.3*	.838	*21.29*	560	*833*

NRZ SERIES OVERALL SHIELDED - 24, 22, 20, 18 and 16 AWG

Part No.	No. Cond	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NRZ-724SJ	7	24	.044	*1.1*	.062	*1.6*	.280	*7.0*	49	*72*
NRZ-1224SJ	12	24	.044	*1.1*	.062	*1.6*	.331	*8.41*	68	*101*
NRZ-1924SJ	19	24	.044	*1.1*	.062	*1.6*	.368	*9.35*	89	*132*
NRZ-2724SJ	27	24	.044	*1.1*	.078	*1.9*	.451	*11.46*	128	*190*
NRZ-3724SJ	37	24	.044	*1.1*	.078	*1.9*	.493	*12.52*	165	*246*
NRZ-4824SJ	48	24	.044	*1.1*	.078	*1.9*	.542	*13.77*	199	*296*
NRZ-6024SJ	60	24	.044	*1.1*	.078	*1.9*	.531	*13.49*	233	*347*
NRZ-722SJ	7	22	.050	*1.3*	.062	*1.6*	.298	*7.57*	58	*86*
NRZ-1222SJ	12	22	.050	*1.3*	.062	*1.6*	.356	*9.04*	83	*124*
NRZ-1922SJ	19	22	.050	*1.3*	.062	*1.6*	.398	*10.11*	112	*167*
NRZ-2722SJ	27	22	.050	*1.3*	.078	*1.9*	.493	*12.52*	169	*251*
NRZ-3722SJ	37	22	.050	*1.3*	.078	*1.9*	.535	*13.59*	208	*310*
NRZ-4822SJ	48	22	.050	*1.3*	.093	*2.3*	.620	*15.75*	271	*403*
NR Z-6022SJ	60	22	.050	*1.3*	.093	*2.3*	.665	*16.89*	318	*473*
NRZ-720SJ	7	20	.058	*1.5*	.062	*1.6*	.322	*8.18*	75	*112*
NRZ-1220SJ	12	20	.058	*1.5*	.062	*1.6*	.389	*9.88*	111	*165*
NRZ-1920SJ	19	20	.058	*1.5*	.078	*1.9*	.470	*11.94*	167	*248*
NRZ-2720SJ	27	20	.058	*1.5*	.078	*1.9*	.542	*13.77*	229	*341*
NRZ-3720SJ	37	20	.058	*1.5*	.093	*2.3*	.621	*15.77*	305	*454*
NRZ-4820SJ	48	20	.058	*1.5*	.093	*2.3*	.685	*17.40*	374	*557*
NRZ-6020SJ	60	20	.058	*1.5*	.093	*2.3*	.737	*18.72*	445	*662*
NRZ-718SJ	7	18	.069	*1.7*	.062	*1.6*	.355	*9.02*	97	*144*
NRZ-1218SJ	12	18	.069	*1.7*	.078	*1.9*	.467	*11.86*	160	*238*
NRZ-1918SJ	19	18	.069	*1.7*	.078	*1.9*	.530	*13.46*	232	*345*
NRZ-2718SJ	27	18	.069	*1.7*	.093	*2.3*	.640	*16.26*	325	*484*
NRZ-3718SJ	37	18	.069	*1.7*	.093	*2.3*	.698	*17.73*	411	*612*
NRZ-4818SJ	48	18	.069	*1.7*	.093	*2.3*	.774	*19.66*	508	*756*
NRZ-716SJ	7	16	.080	*2.0*	.062	*1.6*	.388	*9.86*	117	*174*
NRZ-1216SJ	12	16	.080	*2.0*	.078	*1.9*	.518	*13.16*	204	*304*
NRZ-1916SJ	19	16	.080	*2.0*	.078	*1.9*	.585	*14.86*	283	*421*
NRZ-2716SJ	27	16	.080	*2.0*	.093	*2.3*	.708	*17.98*	396	*589*
NRZ-3716SJ	37	16	.080	*2.0*	.093	*2.3*	.775	*19.69*	504	*750*
NRZ-4816SJ	48	16	.080	*2.0*	.093	*2.3*	.863	*21.92*	626	*931*

SHIELDED SINGLES CONDUCTORS



Military & UL Grade

- Single Conductors (NTS Series)
- RFI Shielded Cables

Meets U.L. Style 2343 or 2344 for Computer Use

National Wire & Cable Corp. manufactures a complete line of flexible signal and control cables in which each conductor is individually shielded and plastic-jacketed. Conforming to MIL-C-27072, these cables provide extended temperature, rough usage, military shielding, excellent flexibility. Provides a minimum of crosstalk between signal channels, plus complete isolation between shields. Excellent for analog signals. All jackets are moisture proof and suitable for use in duct, conduit, aerial, or burial installations.

Conductors are stranded tinned copper with .010" vinyl primary insulation plus .004" nylon insulation over the vinyl per MIL-DTL-16878/17. Insulation for 600 volts working rating at 105°C. Color-coding: White. All conductors are 19 strand.

Shielding is tinned copper braid with 85-90% coverage per MIL-C-7078, and shield angle below 40 degrees for easy pushback.

Jackets over shields are extruded white polyvinylchloride plastic per MIL-I-631, Type F. Each subcable is individually identified by color code per MIL-STD-681, starting with color #9. View Color Table in the National Wire Cable Designers Guide, page 7-12..

All sub-components are planetary cabled and contra-helically laid with a mylar tape serve over the cable bundle. The overall sheath is abrasion- resistant black 105°C vinyl thermoplastic per MIL-I-631, Type F.

Optional overall shielding of cabled bundle is 85-90% minimum coverage of tinned copper braid applied per MIL-C-7078 over the tape serve under sheath.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60 Hz.
Insulation Leakage Resistance:	200 Megohms/1000 ft. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Resistance:	10 Megohms/1000 ft. min. at 500 VDC from overall shield through sheath to saline bath at 25°C.
Usable Temperature Range:	Suitable for continuous use from +105°C to -56°C when stationary. Flexing service: +105°C to -25°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult factory.
Crosstalk:	Common-mode, adjacent subcables: Worst case, -80 db @ 1 Mhz; totaling to -100 db below 100 Mhz. (Ref. MIL-C-23437 for test method.) For 100 ft. test length.

Capacitance (pf/d/ft.):	
AWG	WIRE-SHIELD
16	132
18	117
20	97
22	83
24	72
26	62

NTS SERIES UNSHIELDED - 26, 24, 22, 20, 18 and16 AWG

Part No.	No. of Wires	Cond AWG	Cond Dia.	Jacket Wall	Nom. O.D. Inches	*MM*	Weight 1000 ft	*KG/KM*
NTS-726J	7	26	.095	.062	.413	*10.5*	94	*139*
NTS-1226J	12	26	.095	.062	.523	*13.28*	145	*216*
NTS-1926J	19	26	.095	.062	.603	*15.32*	208	*310*
NTS-2726J	27	26	.095	.062	.713	*18.11*	281	*418*
NTS-3726J	37	26	.095	.062	.793	*20.14*	367	*546*
NTS-4826J	48	26	.095	.085	.944	*24.2*	503	*748*
NTS-724J	7	24	.106	.062	.446	*11.33*	106	*158*
NTS-1224J	12	24	.106	.062	.569	*14.45*	165	*246*
NTS-1924J	19	24	.106	.062	.659	*16.74*	237	*353*
NTS-2724J	27	24	.106	.062	.781	*19.84*	323	*481*
NTS-3724J	37	24	.106	.085	.916	*23.3*	460	*684*
NTS-4824J	48	24	.106	.085	1.033	*26.2*	576	*857*
NTS-722J	7	22	.112	.062	.464	*11.79*	119	*177*
NTS-1222J	12	22	.112	.062	.594	*15.09*	186	*277*
NTS-1922J	19	22	.112	.062	.688	*17.48*	269	*400*
NTS-2722J	27	22	.112	.062	.818	*20.78*	367	*546*
NTS-3722J	37	22	.112	.085	.958	*24.3*	522	*777*
NTS-4822J	48	22	.112	.085	1.081	*27.5*	655	*975*
NTS-720J	7	20	.120	.062	.488	*12.40*	140	*208*
NTS-1220J	12	20	.120	.062	.627	*15.93*	221	*329*
NTS-1920J	19	20	.120	.062	.728	*18.49*	323	*481*
NTS-2720J	27	20	.120	.085	.913	*23.2*	401	*597*
NTS-3720J	37	20	.120	.085	1.014	*25.8*	626	*931*
NTS-718J	7	18	.130	.062	.518	*13.16*	171	*254*
NTS-1218J	12	18	.130	.062	.669	*16.99*	273	*406*
NTS-1918J	19	18	.130	.062	.778	*19.76*	404	*601*
NTS-2718J	27	18	.130	.085	.975	*24.8*	597	*888*
NTS-716J	7	16	.142	.062	.554	*14.07*	193	*287*
NTS-1216J	12	16	.142	.062	.719	*18.26*	310	*461*
NTS-1916J	19	16	.142	.085	.884	*22.45*	498	*741*

NTS SERIES OVERALL SHIELDED - 26, 24, 22, 20, 18 and16 AWG

Part No.	No. of Wires	Cond AWG	Cond Dia.	Jacket Wall	Nom. O.D. Inches	*MM*	Weight 1000 ft	*KG/KM*
NTS-726SJ	7	26	.095	.062	.433	*11.00*	116	*171*
NTS-1226SJ	12	26	.095	.062	.548	*13.92*	188	*280*
NTS-1926SJ	19	26	.095	.062	.628	*15.95*	258	*384*
NTS-2726SJ	27	26	.095	.062	.738	*18.75*	340	*506*
NTS-3726SJ	37	26	.095	.062	.818	*20.78*	434	*646*
NTS-4826SJ	48	26	.095	.085	.969	*24.60*	580	*863*
NTS-724SJ	7	24	.106	.063	.471	*11.96*	140	*208*
NTS-1224SJ	12	24	.106	.062	.594	*15.09*	210	*312*
NTS-1924SJ	19	24	.106	.062	.683	*17.35*	291	*433*
NTS-2724SJ	27	24	.106	.062	.806	*20.47*	389	*579*
NTS-3724SJ	37	24	.106	.035	.941	*23.9*	535	*796*
NTS-4824SJ	48	24	.106	.085	1.058	*26.9*	662	*985*
NTS-722SJ	7	22	.112	.062	.489	*12.42*	154	*229*
NTS-1222SJ	12	22	.112	.062	.619	*15.72*	233	*347*
NTS-1922SJ	19	22	.112	.062	.713	*18.11*	326	*485*
NTS-2722SJ	27	22	.112	.085	.889	*22.58*	473	*704*
NTS-3722SJ	37	22	.112	.085	.983	*25.0*	600	*893*
NTS-4822SJ	48	22	.112	.085	1.106	*28.1*	746	*1110*
NTS-720SJ	7	20	.120	.062	.513	*13.03*	177	*263*
NTS-1220SJ	12	20	.120	.062	.652	*16.56*	271	*403*
NTS-1920SJ	19	20	.120	.062	.753	*19.13*	382	*568*
NTS-2720SJ	27	20	.120	.085	.938	*23.80*	555	*826*
NTS-3720SJ	37	20	.120	.085	1.039	*26.40*	711	*1058*
NTS-718SJ	7	18	.130	.062	.543	*13.79*	211	*314*
NTS-1218SJ	12	18	.130	.062	.694	*17.63*	327	*487*
NTS-1918SJ	19	18	.130	.063	.803	*20.40*	469	*698*
NTS-2718SJ	27	18	.130	.085	1.000	*25.4*	677	*1007*
NTS-716SJ	7	16	.142	.062	.579	*14.71*	237	*353*
NTS-1216SJ	12	16	.142	.062	.744	*18.90*	370	*551*
NTS-1916SJ	19	16	.142	.085	.909	*23.1*	567	*844*

SHIELDED SINGLE CONDUCTORS - NTS Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

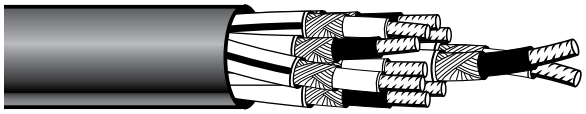
NRTS SERIES UNSHIELDED - 26, 24, 22, 20, 18 and16 AWG

Part No.	No. of Wires	Cond AWG	Cond Dia.	Jacket Wall	Nom. O.D. Inches	*MM*	Weight 1000 ft	*KG/KM*
NRTS-726J	7	26	.095	.062	.413	*10.5*	94	*139*
NRTS-1226J	12	26	.095	.062	.523	*13.28*	145	*216*
NRTS-1926J	19	26	.095	.062	.603	*15.32*	208	*310*
NRTS-2726J	27	26	.095	.062	.713	*18.11*	281	*418*
NRTS-3726J	37	26	.095	.062	.793	*20.14*	367	*546*
NRTS-4826J	48	26	.095	.085	.944	*24.2*	503	*748*
NRTS-724J	7	24	.106	.062	.446	*11.33*	106	*158*
NRTS-1224J	12	24	.106	.062	.569	*14.45*	165	*246*
NRTS-1924J	19	24	.106	.062	.659	*16.74*	237	*353*
NRTS-2724J	27	24	.106	.062	.781	*19.84*	323	*481*
NRTS-3724J	37	24	.106	.085	.916	*23.3*	460	*684*
NRTS-4824J	48	24	.106	.085	1.033	*26.2*	576	*857*
NRTS-722J	7	22	.112	.062	.464	*11.79*	119	*177*
NRTS-1222J	12	22	.112	.062	.594	*15.09*	186	*277*
NRTS-1922J	19	22	.112	.062	.688	*17.48*	269	*400*
NRTS-2722J	27	22	.112	.062	.818	*20.78*	367	*546*
NRTS-3722J	37	22	.112	.085	.958	*24.3*	522	*777*
NRTS-4822J	48	22	.112	.085	1.081	*27.5*	655	*975*
NRTS-720J	7	20	.120	.062	.488	*12.40*	140	*208*
NRTS-1220J	12	20	.120	.062	.627	*15.93*	221	*329*
NRTS-1920J	19	20	.120	.062	.728	*18.49*	323	*481*
NRTS-2720J	27	20	.120	.085	.913	*23.2*	401	*597*
NRTS-3720J	37	20	.120	.085	1.014	*25.8*	626	*931*
NRTS-718J	7	18	.130	.062	.518	*13.16*	171	*254*
NRTS-1218J	12	18	.130	.062	.669	*16.99*	273	*406*
NRTS-1918J	19	18	.130	.062	.778	*19.76*	404	*601*
NRTS-2718J	27	18	.130	.085	.975	*24.8*	597	*888*
NRTS-716J	7	16	.142	.062	.554	*14.07*	193	*287*
NRTS-1216J	12	16	.142	.062	.719	*18.26*	310	*461*
NRTS-1916J	19	16	.142	.085	.884	*22.45*	498	*741*

NRTS SERIES OVERALL SHIELDED - 26, 24, 22, 20, 18 and16 AWG

Part No.	No. of Wires	Cond AWG	Cond Dia.	Jacket Wall	Nom. O.D. Inches	*MM*	Weight 1000 ft	*KG/KM*
NRTS-726SJ	7	26	.095	.062	.433	*11.00*	116	*171*
NRTS-1226SJ	12	26	.095	.062	.548	*13.92*	188	*280*
NRTS-1926SJ	19	26	.095	.062	.628	*15.95*	258	*384*
NRTS-2726SJ	27	26	.095	.062	.738	*18.75*	340	*506*
NRTS-3726SJ	37	26	.095	.062	.818	*20.78*	434	*646*
NRTS-4826SJ	48	26	.095	.085	.969	*24.60*	580	*863*
NRTS-724SJ	7	24	.106	.063	.471	*11.96*	140	*208*
NRTS-1224SJ	12	24	.106	.062	.594	*15.09*	210	*312*
NRTS-1924SJ	19	24	.106	.062	.683	*17.35*	291	*433*
NRTS-2724SJ	27	24	.106	.062	.806	*20.47*	389	*579*
NRTS-3724SJ	37	24	.106	.035	.941	*23.9*	535	*796*
NRTS-4824SJ	48	24	.106	.085	1.058	*26.9*	662	*985*
NRTS-722SJ	7	22	.112	.062	.489	*12.42*	154	*229*
NRTS-1222SJ	12	22	.112	.062	.619	*15.72*	233	*347*
NRTS-1922SJ	19	22	.112	.062	.713	*18.11*	326	*485*
NRTS-2722SJ	27	22	.112	.085	.889	*22.58*	473	*704*
NRTS-3722SJ	37	22	.112	.085	.983	*25.0*	600	*893*
NRTS-4822SJ	48	22	.112	.085	1.106	*28.1*	746	*1110*
NRTS-720SJ	7	20	.120	.062	.513	*13.03*	177	*263*
NRTS-1220SJ	12	20	.120	.062	.652	*16.56*	271	*403*
NRTS-1920SJ	19	20	.120	.062	.753	*19.13*	382	*568*
NRTS-2720SJ	27	20	.120	.085	.938	*23.80*	555	*826*
NRTS-3720SJ	37	20	.120	.085	1.039	*26.40*	711	*1058*
NRTS-718SJ	7	18	.130	.062	.543	*13.79*	211	*314*
NRTS-1218SJ	12	18	.130	.062	.694	*17.63*	327	*487*
NRTS-1918SJ	19	18	.130	.063	.803	*20.40*	469	*698*
NRTS-2718SJ	27	18	.130	.085	1.000	*25.4*	677	*1007*
NRRTS-716SJ	7	16	.142	.062	.579	*14.71*	237	*353*
NTS-1216SJ	12	16	.142	.062	.744	*18.90*	370	*551*
NRTS-1916SJ	19	16	.142	.085	.909	*23.1*	567	*844*

CABLED SHIELDED PAIRS



Military & UL Grade

- Pairs (NTP Series)
- RFI Shielded Cables

Meets U.L. Style 2343 or 2344 for Computer Use

National Wire & Cable Corp. manufactures a complete line of flexible signal and control cables in which each pair is individually shielded and plastic-jacketed. Conforming to MIL-C-27072, these cables provide extended temperature, rough usage, military shielding, excellent flexibility. Provides a minimum of crosstalk between signal channels, plus complete isolation between shields. Excellent for analog signals. All jackets are moisture proof and suitable for use in duct, conduit, aerial, or burial installations.

Conductors are stranded tinned copper with .010" vinyl primary insulation plus .004" nylon insulation over the vinyl per MIL-DTL-16878/17. Insulation for 600 Bolts working rating at 105°C. Color-coding: Pairs - Black & White. All conductors are 19 strand.

Shielding is tinned copper braid with 85-90% coverage per MIL-C-7078, and shield angle below 40 degrees for easy pushback.

Jackets over shields are extruded 105°C white polyvinylchloride plastic per MIL-I-631, Type F. Each subcable is individually identified by color code per MIL-STD-681, starting with color #9. Refer to the Table in the National Wire Cable Designers Guide, page 7-12.

All sub-components are planetary cabled and contra-helically laid with a mylar tape serve over the cable bundle. The overall sheath is abrasion-resistant black 105°C vinyl thermoplastic per MIL-I-631, Type F.

Optional overall shielding of cabled bundle is 85-95% minimum coverage of tinned copper braid applied per MIL-C-7078 over the tape serve under sheath.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60 Hz.
Insulation Leakage Resistance:	200 Megohms/1000 ft. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Resistance:	10 Megohms/1000 ft. min. at 500 VDC from overall shield through sheath to saline bath at 25°C.
Usable Temperature Range:	Suitable for continuous use from +105°C to -55°C when stationary. Flexing service: +105°C to -25°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult factory.
Crosstalk:	Common-mode, adjacent subcables: Worst case, -50 db @ 1 Mhz; falling to -100 db below 100 kHz. (Ref. MIL-C-23437 for test method.) For 100 ft. test length.

Capacitance (pf/d/ft.):

AWG	WIRE-WIRE	WIRE-SHIELD
16	63	116
18	56	102
20	47	85
22	40	72
24	34	63
26	30	54

NTP SERIES UNSHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NTP-726J	7	26	.146	*3.7*	.062	*1.6*	.566	*14.38*	150	*223*
NTP-1226J	12	26	.146	*3.7*	.062	*1.6*	.753	*18.7*	235	*350*
NTP-1926J	19	26	.146	*3.7*	.085	*2.1*	.904	*23.0*	378	*562*
NTP-2726J	27	26	.146	*3.7*	.085	*2.1*	1.073	*27.3*	510	*759*
NTP-3726J	37	26	.146	*3.7*	.085	*2.1*	1.193	*30.3*	660	*982*
NTP-4826J	48	26	.146	*3.7*	.085	*2.1*	1.357	*34.5*	830	*1235*
NTP-724J	7	24	.156	*3.9*	.062	*1.6*	.596	*15.14*	176	*262*
NTP-1224J	12	24	.156	*3.9*	.062	*1.6*	.777	*19.74*	278	*414*
NTP-1924J	19	24	.156	*3.9*	.085	*2.1*	.954	*24.2*	447	*665*
NTP-2724J	27	24	.156	*3.9*	.085	*2.1*	1.135	*28.8*	607	*903*
NTP-3724J	37	24	.156	*3.9*	.085	*2.1*	1.266	*32.2*	791	*1177*
NTP-4824J	48	24	.156	*3.9*	.085	*2.1*	1.438	*36.5*	998	*1485*
NTP-722J	7	22	.168	*4.2*	.062	*1.6*	.632	*16.05*	205	*305*
NTP-1222J	12	22	.168	*4.2*	.085	*2.1*	.873	*22.17*	363	*540*
NTP-1922J	19	22	.168	*4.2*	.085	*2.1*	1.014	*25.8*	524	*780*
NTP-2722J	27	22	.168	*4.2*	.085	*2.1*	1.209	*30.7*	714	*1062*
NTP-3722J	37	22	.168	*4.2*	.085	*2.1*	1.350	*34.3*	935	*1391*
NTP-4822J	48	22	.168	*4.2*	.085	*2.1*	1.535	*38.9*	1183	*1760*
NTP-720J	7	20	.186	*4.7*	.062	*1.6*	.686	*17.42*	247	*368*
NTP-1220J	12	20	.186	*4.7*	.062	*2.1*	.948	*24.1*	437	*650*
NTP-1920J	19	20	.186	*4.7*	.062	*2.1*	1.104	*28.0*	637	*948*
NTP-2720J	27	20	.186	*4.7*	.062	*2.1*	1.320	*33.5*	871	*1296*
NTP-3720J	37	20	.186	*4.7*	.062	*2.1*	1.476	*37.5*	1148	*1708*
NTP-718J	7	18	.206	*5.2*	.085	*2.1*	.746	*18.95*	303	*451*
NTP-1218J	12	18	.206	*5.2*	.085	*2.1*	1.031	*26.2*	533	*793*
NTP-1918J	19	18	.206	*5.2*	.085	*2.1*	1.204	*30.6*	785	*1168*
NTP-2718J	27	18	.206	*5.2*	.085	*2.1*	1.443	*36.7*	1079	*1606*
NTP-716J	7	16	.226	*5.7*	.062	*1.6*	.806	*20.47*	348	*518*
NTP-1216J	12	16	.226	*5.7*	.085	*2.1*	1.114	*28.3*	613	*912*
NTP-1916J	19	16	.226	*5.7*	.085	*2.1*	1.304	*33.1*	906	*1348*

NTP SERIES OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam. Inches	*MM*	Jacket Wall Inches	*MM*	Nom. Diam. Inches	*MM*	Weight lbs per 1000 ft	*KG/KM*
NTP-726SJ	7	26	.146	*3.7*	.062	*1.6*	.591	*15.01*	195	*290*
NTP-1226SJ	12	26	.146	*3.7*	.062	*1.6*	.761	*19.33*	296	*440*
NTP-1926SJ	19	26	.146	*3.7*	.062	*2.1*	.929	*23.6*	452	*673*
NTP-2726SJ	27	26	.146	*3.7*	.062	*2.1*	1.099	*27.9*	599	*891*
NTP-3726SJ	37	26	.146	*3.7*	.062	*2.1*	1.221	*31.0*	762	*1134*
NTP-4826SJ	48	26	.146	*3.7*	.062	*2.1*	1.382	*35.1*	946	*1408*
NTP-724SJ	7	24	.156	*3.9*	.062	*1.6*	.621	*15.77*	223	*332*
NTP-1224SJ	12	24	.156	*3.9*	.062	*1.6*	.802	*20.37*	343	*510*
NTP-1924SJ	19	24	.156	*3.9*	.085	*2.1*	.979	*24.9*	526	*783*
NTP-2724SJ	27	24	.156	*3.9*	.085	*2.1*	1.160	*29.5*	702	*1045*
NTP-3724SJ	37	24	.156	*3.9*	.085	*2.1*	1.291	*32.8*	899	*1338*
NTP-4824SJ	48	24	.156	*3.9*	.085	*2.1*	1.463	*2.1*	1122	*1670*
NTP-722SJ	7	22	.168	*4.2*	.062	*1.6*	.657	*16.69*	256	*381*
NTP-1222SJ	12	22	.168	*4.2*	.062	*1.6*	.898	*22.8*	433	*644*
NTP-1922SJ	19	22	.168	*4.2*	.062	*1.6*	1.039	*26.4*	608	*905*
NTP-2722SJ	27	22	.168	*4.2*	.062	*1.6*	1.234	*31.3*	817	*1216*
NTP-3722SJ	37	22	.168	*4.2*	.062	*1.6*	1.375	*34.9*	1051	*1564*
NTP-4822SJ	48	22	.168	*4.2*	.062	*1.6*	1.560	*39.5*	1317	*1959*
NTP-720SJ	7	20	.186	*4.7*	.062	*1.6*	.711	*18.06*	303	*451*
NTP-1220SJ	12	20	.186	*4.7*	.085	*2.1*	.973	*24.7*	514	*765*
NTP-1920SJ	19	20	.186	*4.7*	.085	*2.1*	1.129	*28.7*	729	*1085*
NTP-2720SJ	27	20	.186	*4.7*	.085	*2.1*	1.345	*34.2*	984	*1464*
NTP-3720SJ	37	20	.186	*4.7*	.085	*2.1*	1.501	*38.1*	1274	*1896*
NTP-718SJ	7	18	.206	*5.2*	.062	*1.6*	.771	*19.58*	365	*543*
NTP-1218SJ	12	18	.206	*5.2*	.062	*2.1*	1.056	*26.8*	619	*921*
NTP-1918SJ	19	18	.206	*5.2*	.062	*2.1*	1.229	*31.2*	887	*1320*
NTP-2718SJ	27	18	.206	*5.2*	.062	*2.1*	1.468	*37.3*	1204	*1792*
NTP-716SJ	7	16	.226	*5.7*	.085	*2.1*	.877	*22.28*	453	*674*
NTP-1216SJ	12	16	.226	*5.7*	.085	*2.1*	1.139	*28.9*	707	*1052*
NTP-1916SJ	19	16	.226	*5.7*	.085	*2.1*	1.329	*33.8*	1018	*1515*

CABLED SHIELDED PAIRS - NTP Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

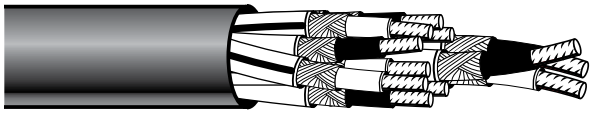
NRTP SERIES UNSHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRTP-726J	7	26	.146	*3.7*	.062	*1.6*	.566	*14.38*	150	*223*
NRTP-1226J	12	26	.146	*3.7*	.062	*1.6*	.753	*18.7*	235	*350*
NRTP-1926J	19	26	.146	*3.7*	.085	*2.1*	.904	*23.0*	378	*562*
NRTP-2726J	27	26	.146	*3.7*	.085	*2.1*	1.073	*27.3*	510	*759*
NRTP-3726J	37	26	.146	*3.7*	.085	*2.1*	1.193	*30.3*	660	*982*
NRTP-4826J	48	26	.146	*3.7*	.085	*2.1*	1.357	*34.5*	830	*1235*
NRTP-724J	7	24	.156	*3.9*	.062	*1.6*	.596	*15.14*	176	*262*
NRTP-1224J	12	24	.156	*3.9*	.062	*1.6*	.777	*19.74*	278	*414*
NRTP-1924J	19	24	.156	*3.9*	.085	*2.1*	.954	*24.2*	447	*665*
NRTP-2724J	27	24	.156	*3.9*	.085	*2.1*	1.135	*28.8*	607	*903*
NRTP-3724J	37	24	.156	*3.9*	.085	*2.1*	1.266	*32.2*	791	*1177*
NRTP-4824J	48	24	.156	*3.9*	.085	*2.1*	1.438	*36.5*	998	*1485*
NRTP-722J	7	22	.168	*4.2*	.062	*1.6*	.632	*16.05*	205	*305*
NRTP-1222J	12	22	.168	*4.2*	.085	*2.1*	.873	*22.17*	363	*540*
NRTP-1922J	19	22	.168	*4.2*	.085	*2.1*	1.014	*25.8*	524	*780*
NRTP-2722J	27	22	.168	*4.2*	.085	*2.1*	1.209	*30.7*	714	*1062*
NRTP-3722J	37	22	.168	*4.2*	.085	*2.1*	1.350	*34.3*	935	*1391*
NRTP-4822J	48	22	.168	*4.2*	.085	*2.1*	1.535	*38.9*	1183	*1760*
NRTP-720J	7	20	.186	*4.7*	.062	*1.6*	.686	*17.42*	247	*368*
NRTP-1220J	12	20	.186	*4.7*	.062	*2.1*	.948	*24.1*	437	*650*
NRTP-1920J	19	20	.186	*4.7*	.062	*2.1*	1.104	*28.0*	637	*948*
NRTP-2720J	27	20	.186	*4.7*	.062	*2.1*	1.320	*33.5*	871	*1296*
NRTP-3720J	37	20	.186	*4.7*	.062	*2.1*	1.476	*37.5*	1148	*1708*
NRTP-718J	7	18	.206	*5.2*	.085	*2.1*	.746	*18.95*	303	*451*
NRTP-1218J	12	18	.206	*5.2*	.085	*2.1*	1.031	*26.2*	533	*793*
NRTP-1918J	19	18	.206	*5.2*	.085	*2.1*	1.204	*30.6*	785	*1168*
NRTP-2718J	27	18	.206	*5.2*	.085	*2.1*	1.443	*36.7*	1079	*1606*
NRTP-716J	7	16	.226	*5.7*	.062	*1.6*	.806	*20.47*	348	*518*
NRTP-1216J	12	16	.226	*5.7*	.085	*2.1*	1.114	*28.3*	613	*912*
NRTP-1916J	19	16	.226	*5.7*	.085	*2.1*	1.304	*33.1*	906	*1348*

NRTP SERIES OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Pairs	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRTP-726SJ	7	26	.146	*3.7*	.062	*1.6*	.591	*15.01*	195	*290*
NRTP-1226SJ	12	26	.146	*3.7*	.062	*1.6*	.761	*19.33*	296	*440*
NRTP-1926SJ	19	26	.146	*3.7*	.062	*2.1*	.929	*23.6*	452	*673*
NRTP-2726SJ	27	26	.146	*3.7*	.062	*2.1*	1.099	*27.9*	599	*891*
NRTP-3726SJ	37	26	.146	*3.7*	.062	*2.1*	1.221	*31.0*	762	*1134*
NRTP-4826SJ	48	26	.146	*3.7*	.062	*2.1*	1.382	*35.1*	946	*1408*
NRTP-724SJ	7	24	.156	*3.9*	.062	*1.6*	.621	*15.77*	223	*332*
NRTP-1224SJ	12	24	.156	*3.9*	.062	*1.6*	.802	*20.37*	343	*510*
NRTP-1924SJ	19	24	.156	*3.9*	.085	*2.1*	.979	*24.9*	526	*783*
NRTP-2724SJ	27	24	.156	*3.9*	.085	*2.1*	1.160	*29.5*	702	*1045*
NRTP-3724SJ	37	24	.156	*3.9*	.085	*2.1*	1.291	*32.8*	899	*1338*
NRTP-4824SJ	48	24	.156	*3.9*	.085	*2.1*	1.463	*2.1*	1122	*1670*
NRTP-722SJ	7	22	.168	*4.2*	.062	*1.6*	.657	*16.69*	256	*381*
NRTP-1222SJ	12	22	.168	*4.2*	.062	*1.6*	.898	*22.8*	433	*644*
NRTP-1922SJ	19	22	.168	*4.2*	.062	*1.6*	1.039	*26.4*	608	*905*
NRTP-2722SJ	27	22	.168	*4.2*	.062	*1.6*	1.234	*31.3*	817	*1216*
NRTP-3722SJ	37	22	.168	*4.2*	.062	*1.6*	1.375	*34.9*	1051	*1564*
NRTP-4822SJ	48	22	.168	*4.2*	.062	*1.6*	1.560	*39.5*	1317	*1959*
NRTP-720SJ	7	20	.186	*4.7*	.062	*1.6*	.711	*18.06*	303	*451*
NRTP-1220SJ	12	20	.186	*4.7*	.085	*2.1*	.973	*24.7*	514	*765*
NRTP-1920SJ	19	20	.186	*4.7*	.085	*2.1*	1.129	*28.7*	729	*1085*
NRTP-2720SJ	27	20	.186	*4.7*	.085	*2.1*	1.345	*34.2*	984	*1464*
NRTP-3720SJ	37	20	.186	*4.7*	.085	*2.1*	1.501	*38.1*	1274	*1896*
NRTP-718SJ	7	18	.206	*5.2*	.062	*1.6*	.771	*19.58*	365	*543*
NRTP-1218SJ	12	18	.206	*5.2*	.062	*2.1*	1.056	*26.8*	619	*921*
NRTP-1918SJ	19	18	.206	*5.2*	.062	*2.1*	1.229	*31.2*	887	*1320*
NRTP-2718SJ	27	18	.206	*5.2*	.062	*2.1*	1.468	*37.3*	1204	*1792*
NRTP-716SJ	7	16	.226	*5.7*	.085	*2.1*	.877	*22.28*	453	*674*
NRTP-1216SJ	12	16	.226	*5.7*	.085	*2.1*	1.139	*28.9*	707	*1052*
NRTP-1916SJ	19	16	.226	*5.7*	.085	*2.1*	1.329	*33.8*	1018	*1515*

CABLED SHIELDED TRIOS



Military & UL Grade

- Single Conductors (NTT Series)
- RFI Shielded Cables

Meets U.L. Style 2343 or 2344 for Computer Use

National Wire & Cable Corp. manufactures a complete line of flexible signal and control cables in which each trio is individually shielded and plastic-jacketed. Conforming to MIL-C-27072, these cables provide extended temperature, rough usage, military shielding, excellent flexibility. Provides a minimum of crosstalk between signal channels, plus complete isolation between shields. Excellent for analog signals. All jackets are moisture proof and suitable for use in duct, conduit, aerial, or burial installations.

Conductors are stranded tinned copper with .010" vinyl primary insulation plus .004" nylon insulation over the vinyl per MIL-DTL-16878/17. Insulation for 600 Volts working rating at 105°C. Color-coding: Trios-Black, White, and Red. All conductors are 19 strand.

Shielding is tinned copper braid with 85-90% coverage per MIL-C-7078, and shield angle below 40 degrees for easy pushback.

Jackets over shields are extruded 105°C white polyvinylchloride plastic per MIL-I-631, Type F. Each subcable is individually identified by color code per MIL-STD-681, starting with color #9. Refer to theTable in the National Wire Cable Designers Guide, page 7-12.

All sub-components are planetary cabled and contra-helically laid with a mylar tape serve over the cable bundle. The overall sheath is abrasion-resistant black 105°C vinyl thermoplastic per MIL-I-631, Type F.

Optional overall shielding of cabled bundle is 85-95% minimum coverage of tinned copper braid applied per MIL-C-7078 over the tape serve under sheath.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60 Hz.
Insulation Leakage Resistance:	200 Megohms/1000 ft. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Resistance:	10 Megohms/1000 ft. min. at 500 VDC from overall shield through sheath to saline both at 25°C.
Usable Temperature Range:	Suitable for continuous use from +105°C to -55°C when stationary. Flexing service: +105°C to -25°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -55°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult factory.
Crosstalk:	Common-mode, adjacent trios: Worst case, -50 db @ 1 Mhz; totaling to -100 db below 100 kHz. (Ref. MIL-C-23437 for test method.) For 100 ft. test length.

Capacitance (pf/d/ft.):		
AWG	WIRE-WIRE	WIRE-SHIELD
16	60	108
18	53	96
20	44	80
22	38	68
24	33	59
26	28	51

NTT SERIES WITHOUT OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Trios	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NTT-726J	7	26	.153	*3.8*	.062	*1.6*	.587	*14.91*	173	*257*
NTT-1226J	12	26	.153	*3.8*	.062	*1.6*	.764	*19.41*	275	*409*
NTT-1926J	19	26	.153	*3.8*	.085	*2.1*	.939	*23.9*	442	*658*
NTT-2726J	27	26	.153	*3.8*	.085	*2.1*	1.116	*28.3*	599	*891*
NTT-3726J	37	26	.153	*3.8*	.085	*2.1*	1.245	*31.6*	781	*1162*
NTT-4826J	48	26	.153	*3.8*	.085	*2.1*	1.413	*35.9*	985	*1466*
NTT-724J	7	24	.164	*4.1*	.062	*1.6*	.620	*15.75*	198	*295*
NTT-1224J	12	24	.164	*4.1*	.085	*2.1*	.810	*20.57*	316	*470*
NTT-1924J	19	24	.164	*4.1*	.085	*2.1*	.994	*25.2*	507	*754*
NTT-2724J	27	24	.164	*4.1*	.085	*2.1*	1.184	*30.1*	690	*1027*
NTT-3724J	37	24	.164	*4.1*	.085	*2.1*	1.322	*33.6*	903	*1344*
NTT-722J	7	22	.177	*4.5*	.062	*1.6*	.659	*16.74*	235	*350*
NTT-1222J	12	22	.177	*4.5*	.085	*2.1*	.910	*23.1*	416	*619*
NTT-1922J	19	22	.177	*4.5*	.085	*2.1*	1.059	*26.9*	606	*902*
NTT-2722J	27	22	.177	*4.5*	.085	*2.1*	1.264	*32.1*	829	*1234*
NTT-3722J	37	22	.177	*4.5*	.085	*2.1*	1.413	*35.9*	1090	*1622*
NTT-720J	7	20	.195	*4.9*	.062	*1.6*	.713	*18.11*	294	*437*
NTT-1220J	12	20	.195	*4.9*	.085	*2.1*	.985	*25.0*	517	*769*
NTT-1920J	19	20	.195	*4.9*	.085	*2.1*	1.149	*29.2*	762	*1134*
NTT-2720J	27	20	.195	*4.9*	.085	*2.1*	1.375	*34.9*	1049	*1561*
NTT-718J	7	18	.213	*5.4*	.062	*1.6*	.767	*19.48*	366	*545*
NTT-1218J	12	18	.213	*5.4*	.085	*2.1*	1.060	*26.9*	642	*955*
NTT-1918J	19	18	.213	*5.4*	.085	*2.1*	1.239	*31.5*	955	*1421*
NTT-716J	7	16	.242	*6.1*	.085	*2.1*	.900	*22.9*	471	*701*
NTT-1216J	12	16	.242	*6.1*	.085	*2.1*	1.181	*30.0*	759	*1129*
NTT-1916J	19	16	.242	*6.1*	.085	*2.1*	1.384	*35.2*	1133	*1686*

NTT SERIES WITH OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Trios	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NTT-726SJ	7	26	.153	*3.8*	.062	*1.6*	.612	*15.54*	220	*327*
NTT-1226SJ	12	26	.153	*3.8*	.062	*1.6*	.790	*20.07*	338	*503*
NTT-1926SJ	19	26	.153	*3.8*	.085	*2.1*	.964	*24.5*	519	*772*
NTT-2726SJ	27	26	.153	*3.8*	.085	*2.1*	1.142	*29.0*	693	*1031*
NTT-3726SJ	37	26	.153	*3.8*	.085	*2.1*	1.270	*32.3*	887	*1320*
NTT-4826SJ	48	26	.153	*3.8*	.085	*2.1*	1.439	*36.6*	1107	*1647*
NTT-724SJ	7	24	.164	*4.1*	.062	*1.6*	.645	*16.38*	248	*369*
NTT-1224SJ	12	24	.164	*4.1*	.085	*2.1*	.881	*22.38*	420	*625*
NTT-1924SJ	19	24	.164	*4.1*	.085	*2.1*	1.012	*25.7*	589	*876*
NTT-2724SJ	27	24	.164	*4.1*	.085	*2.1*	1.209	*30.7*	790	*1176*
NTT-3724SJ	37	24	.164	*4.1*	.085	*2.1*	1.347	*34.2*	1017	*1513*
NTT-722SJ	7	22	.177	*4.5*	.062	*1.6*	.684	*17.37*	289	*430*
NTT-1222SJ	12	22	.177	*4.5*	.085	*2.1*	.936	*23.8*	490	*729*
NTT-1922SJ	19	22	.177	*4.5*	.085	*2.1*	1.004	*25.5*	694	*1033*
NTT-2722SJ	27	22	.177	*4.5*	.085	*2.1*	1.290	*32.8*	937	*1394*
NTT-3722SJ	37	22	.177	*4.5*	.085	*2.1*	1.438	*36.5*	1212	*1803*
NTT-720SJ	7	20	.195	*4.9*	.062	*1.6*	.738	*18.75*	353	*525*
NTT-1220SJ	12	20	.195	*4.9*	.085	*2.1*	1.010	*25.7*	599	*891*
NTT-1920SJ	19	20	.195	*4.9*	.085	*2.1*	1.174	*29.8*	859	*1278*
NTT-2720SJ	27	20	.195	*4.9*	.085	*2.1*	1.400	*35.6*	1167	*1736*
NTT-718SJ	7	18	.213	*5.4*	.062	*1.6*	.792	*20.12*	430	*640*
NTT-1218SJ	12	18	.213	*5.4*	.085	*2.1*	1.085	*27.6*	730	*1086*
NTT-1918SJ	19	18	.213	*5.4*	.085	*2.1*	1.264	*32.1*	1060	*1577*
NTT-716SJ	7	16	.242	*6.1*	.085	*2.1*	.925	*23.5*	544	*809*
NTT-1216SJ	12	16	.242	*6.1*	.085	*2.1*	1.206	*30.6*	859	*1278*
NTT-1916SJ	19	16	.242	*6.1*	.085	*2.1*	1.409	*35.8*	1253	*1864*

CABLED SHIELDED TRIOS - NTT Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

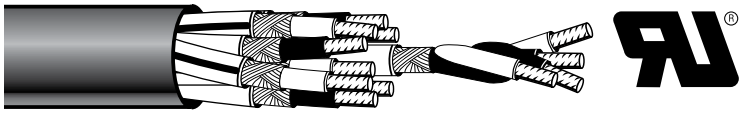
NRTT SERIES WITHOUT OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Trios	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRTT-726J	7	26	.153	*3.8*	.062	*1.6*	.587	*14.91*	173	*257*
NRTT-1226J	12	26	.153	*3.8*	.062	*1.6*	.764	*19.41*	275	*409*
NRTT-1926J	19	26	.153	*3.8*	.085	*2.1*	.939	*23.9*	442	*658*
NRTT-2726J	27	26	.153	*3.8*	.085	*2.1*	1.116	*28.3*	599	*891*
NRTT-3726J	37	26	.153	*3.8*	.085	*2.1*	1.245	*31.6*	781	*1162*
NRTT-4826J	48	26	.153	*3.8*	.085	*2.1*	1.413	*35.9*	985	*1466*
NRTT-724J	7	24	.164	*4.1*	.062	*1.6*	.620	*15.75*	198	*295*
NRTT-1224J	12	24	.164	*4.1*	.085	*2.1*	.810	*20.57*	316	*470*
NRTT-1924J	19	24	.164	*4.1*	.085	*2.1*	.994	*25.2*	507	*754*
NRTT-2724J	27	24	.164	*4.1*	.085	*2.1*	1.184	*30.1*	690	*1027*
NRTT-3724J	37	24	.164	*4.1*	.085	*2.1*	1.322	*33.6*	903	*1344*
NRTT-722J	7	22	.177	*4.5*	.062	*1.6*	.659	*16.74*	235	*350*
NRTT-1222J	12	22	.177	*4.5*	.085	*2.1*	.910	*23.1*	416	*619*
NRTT-1922J	19	22	.177	*4.5*	.085	*2.1*	1.059	*26.9*	606	*902*
NRTT-2722J	27	22	.177	*4.5*	.085	*2.1*	1.264	*32.1*	829	*1234*
NRTT-3722J	37	22	.177	*4.5*	.085	*2.1*	1.413	*35.9*	1090	*1622*
NRTT-720J	7	20	.195	*4.9*	.062	*1.6*	.713	*18.11*	294	*437*
NRTT-1220J	12	20	.195	*4.9*	.085	*2.1*	.985	*25.0*	517	*769*
NRTT-1920J	19	20	.195	*4.9*	.085	*2.1*	1.149	*29.2*	762	*1134*
NRTT-2720J	27	20	.195	*4.9*	.085	*2.1*	1.375	*34.9*	1049	*1561*
NRTT-718J	7	18	.213	*5.4*	.062	*1.6*	.767	*19.48*	366	*545*
NRTT-1218J	12	18	.213	*5.4*	.085	*2.1*	1.060	*26.9*	642	*955*
NRTT-1918J	19	18	.213	*5.4*	.085	*2.1*	1.239	*31.5*	955	*1421*
NRTT-716J	7	16	.242	*6.1*	.085	*2.1*	.900	*22.9*	471	*701*
NRTT-1216J	12	16	.242	*6.1*	.085	*2.1*	1.181	*30.0*	759	*1129*
NRTT-1916J	19	16	.242	*6.1*	.085	*2.1*	1.384	*35.2*	1133	*1686*

NRTT SERIES WITH OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Trios	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per 1000 ft	
			Inches	*MM*	Inches	*MM*	Inches	*MM*		*KG/KM*
NRTT-726SJ	7	26	.153	*3.8*	.062	*1.6*	.612	*15.54*	220	*327*
NRTT-1226SJ	12	26	.153	*3.8*	.062	*1.6*	.790	*20.07*	338	*503*
NRTT-1926SJ	19	26	.153	*3.8*	.085	*2.1*	.964	*24.5*	519	*772*
NRTT-2726SJ	27	26	.153	*3.8*	.085	*2.1*	1.142	*29.0*	693	*1031*
NRTT-3726SJ	37	26	.153	*3.8*	.085	*2.1*	1.270	*32.3*	887	*1320*
NRTT-4826SJ	48	26	.153	*3.8*	.085	*2.1*	1.439	*36.6*	1107	*1647*
NRTT-724SJ	7	24	.164	*4.1*	.062	*1.6*	.645	*16.38*	248	*369*
NRTT-1224SJ	12	24	.164	*4.1*	.085	*2.1*	.881	*22.38*	420	*625*
NRTT-1924SJ	19	24	.164	*4.1*	.085	*2.1*	1.012	*25.7*	589	*876*
NRTT-2724SJ	27	24	.164	*4.1*	.085	*2.1*	1.209	*30.7*	790	*1176*
NRTT-3724SJ	37	24	.164	*4.1*	.085	*2.1*	1.347	*34.2*	1017	*1513*
NRTT-722SJ	7	22	.177	*4.5*	.062	*1.6*	.684	*17.37*	289	*430*
NRTT-1222SJ	12	22	.177	*4.5*	.085	*2.1*	.936	*23.8*	490	*729*
NRTT-1922SJ	19	22	.177	*4.5*	.085	*2.1*	1.004	*25.5*	694	*1033*
NRTT-2722SJ	27	22	.177	*4.5*	.085	*2.1*	1.290	*32.8*	937	*1394*
NRTT-3722SJ	37	22	.177	*4.5*	.085	*2.1*	1.438	*36.5*	1212	*1803*
NRTT-720SJ	7	20	.195	*4.9*	.062	*1.6*	.738	*18.75*	353	*525*
NRTT-1220SJ	12	20	.195	*4.9*	.085	*2.1*	1.010	*25.7*	599	*891*
NRTT-1920SJ	19	20	.195	*4.9*	.085	*2.1*	1.174	*29.8*	859	*1278*
NRTT-2720SJ	27	20	.195	*4.9*	.085	*2.1*	1.400	*35.6*	1167	*1736*
NRTT-718SJ	7	18	.213	*5.4*	.062	*1.6*	.792	*20.12*	430	*640*
NRTT-1218SJ	12	18	.213	*5.4*	.085	*2.1*	1.085	*27.6*	730	*1086*
NRTT-1918SJ	19	18	.213	*5.4*	.085	*2.1*	1.264	*32.1*	1060	*1577*
NRTT-716SJ	7	16	.242	*6.1*	.085	*2.1*	.925	*23.5*	544	*809*
NRTT-1216SJ	12	16	.242	*6.1*	.085	*2.1*	1.206	*30.6*	859	*1278*
NRTT-1916SJ	19	16	.242	*6.1*	.085	*2.1*	1.409	*35.8*	1253	*1864*

CABLED SHIELDED QUADS



Military & UL Grade

- Pairs (NTQ Series)
- RFI Shielded Cables

Meets U.L. Style 2343 or 2344 for Computer Use

National Wire & Cable Corp. manufactures a complete line of flexible signal and control cables in which each quad is individually shielded and plastic-jacketed. Conforming to MIL-C-27072, these cables provide extended temperature, rough usage, military shielding, excellent flexibility. Provides a minimum of crosstalk between signal channels, plus complete isolation between shields. Excellent for analog signals. All jackets are moisture proof and suitable for use in duct, conduit, aerial, or burial installations.

Conductors are stranded tinned copper with .010" vinyl primary insulation plus .004" nylon insulation over the vinyl per MIL-DTL-16878/17. Insulation for 600 Volts working rating at 105°C. Color-coding: Quads - Black, White, Red, and Green. All conductors are 19 strand.

Shielding is tinned copper braid with 85-90% coverage per MIL-C-7078, and shield angle below 40 degrees for easy pushback.

Jackets over shields are extruded 105°C white polyvinylchloride plastic per MIL-I-631, Type F. Each subcable is individually identified by color code per MIL-STD-681, starting with color #9. Refer to theTable in the National Wire Cable Designers Guide, page 7-12.

All sub-components are planetary cables and contra-helically laid with a mylar tape serve over the cable bundle. The overall sheath is abrasion-resistant black 105°C vinyl thermoplastic per MIL-I-631, Type F.

Optional overall shielding of cabled bundle is 85-95% minimum coverage of tinned copper braid applied per MIL-C-7078 over the tape serve under sheath.

TECHNICAL DATA (ALL CABLES)	
Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60 Hz.
Insulation Leakage Resistance:	200 Megohms/1000 ft. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Resistance:	10 Megohms/1000 ft. min. at 500 VDC from overall shield through sheath to saline bath at 25°C.
Usable Temperature Range:	Suitable for continuous use from +105°C to -55°C when stationary. Flexing service: +105°C to -25°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult factory.
Crosstalk:	Common-mode, adjacent trios: Worst case, -50 db @ 1 Mhz; totaling to -100 db below 100 kHz. (Ref. MIL-C-23437 for test method.) For 100 ft. test length.

Capacitance (pf/d/ft.):		
AWG	WIRE-WIRE	WIRE-SHIELD
16	56	110
18	49	97
20	41	81
22	35	69
24	30	59
26	26	52

NTQ SERIES WITHOUT OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Quads	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NTQ-726J	7	26	.164	*4.1*	.062	*1.6*	.620	*15.75*	201	*299*
NTQ-1226J	12	26	.164	*4.1*	.062	*1.6*	.810	*20.57*	321	*478*
NTQ-1926J	19	26	.164	*4.1*	.085	*2.1*	.994	*25.2*	516	*768*
NTQ-2726J	27	26	.164	*4.1*	.085	*2.1*	1.184	*30.1*	703	*1046*
NTQ-3726J	37	26	.164	*4.1*	.085	*2.1*	1.323	*33.6*	921	*1370*
NTQ-724J	7	24	.176	*4.4*	.062	*1.6*	.666	*16.66*	232	*345*
NTQ-1224J	12	24	.176	*4.4*	.085	*2.1*	.906	*23.0*	410	*610*
NTQ-1924J	19	24	.176	*4.4*	.085	*2.1*	1.054	*26.8*	598	*890*
NTQ-2724J	27	24	.176	*4.4*	.085	*2.1*	1.258	*32.0*	817	*1216*
NTQ-3724J	37	24	.176	*4.4*	.085	*2.1*	1.406	*35.7*	1075	*1600*
NTQ-722J	7	22	.190	*4.8*	.062	*1.6*	.698	*17.73*	274	*408*
NTQ-1222J	12	22	.190	*4.8*	.085	*2.1*	.964	*24.5*	482	*717*
NTQ-1922J	19	22	.190	*4.8*	.085	*2.1*	1.124	*28.5*	708	*1054*
NTQ-2722J	27	22	.190	*4.8*	.085	*2.1*	1.344	*34.1*	972	*1446*
NTQ-720J	7	20	.210	*5.3*	.062	*1.6*	.783	*19.89*	409	*609*
NTQ-1220J	12	20	.210	*5.3*	.085	*2.1*	1.073	*27.3*	694	*1033*
NTQ-1920J	19	20	.210	*5.3*	.085	*2.1*	1.249	*31.7*	1004	*1493*
NTQ-718J	7	18	.234	*5.9*	.085	*2.1*	.876	*22.25*	474	*705*
NTQ-1218J	12	18	.234	*5.9*	.085	*2.1*	1.147	*29.1*	766	*1140*
NTQ-1918J	19	18	.234	*5.9*	.085	*2.1*	1.344	*34.1*	1147	*1707*
NTQ-716J	7	16	.262	*6.6*	.085	*2.1*	.960	*24.4*	560	*833*
NTQ-1216J	12	16	.262	*6.6*	.085	*2.1*	1.264	*32.1*	909	*1353*
NTQ-1916J	19	16	.262	*6.6*	.085	*2.1*	1.484	*37.7*	1366	*2032*

NTQ SERIES WITH OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Quads	Cond AWG	Cond. Diam. Inches	Cond. Diam. *MM*	Jacket Wall Inches	Jacket Wall *MM*	Nom. Diam. Inches	Nom. Diam. *MM*	Weight lbs per 1000 ft	Weight *KG/KM*
NTQ-726SJ	7	26	.164	*4.1*	.062	*1.6*	.645	*16.38*	251	*373*
NTQ-1226SJ	12	26	.164	*4.1*	.085	*2.1*	.881	*22.38*	426	*634*
NTQ-1926SJ	19	26	.164	*4.1*	.085	*2.1*	1.019	*25.9*	598	*890*
NTQ-2726SJ	27	26	.164	*4.1*	.085	*2.1*	1.209	*30.7*	803	*1195*
NTQ-3726SJ	37	26	.164	*4.1*	.085	*2.1*	1.347	*34.2*	1034	*1539*
NTQ-724SJ	7	24	.176	*4.4*	.062	*1.6*	.681	*17.30*	286	*426*
NTQ-1224SJ	12	24	.176	*4.4*	.085	*2.1*	.931	*23.6*	484	*720*
NTQ-1924SJ	19	24	.176	*4.4*	.085	*2.1*	1.079	*27.4*	686	*1021*
NTQ-2724SJ	27	24	.176	*4.4*	.085	*2.1*	1.283	*32.6*	925	*1376*
NTQ-3724SJ	37	24	.176	*4.4*	.085	*2.1*	1.431	*36.3*	1196	*1780*
NTQ-722SJ	7	22	.190	*4.8*	.062	*1.6*	.723	*18.36*	331	*493*
NTQ-1222SJ	12	22	.190	*4.8*	.085	*2.1*	.990	*25.1*	562	*836*
NTQ-1922SJ	19	22	.190	*4.8*	.085	*2.1*	1.149	*29.2*	803	*1195*
NTQ-2722SJ	27	22	.190	*4.8*	.085	*2.1*	1.370	*34.8*	1088	*1619*
NTQ-720SJ	7	20	.210	*5.3*	.062	*1.6*	.758	*19.25*	345	*513*
NTQ-1220SJ	12	20	.210	*5.3*	.085	*2.1*	1.048	*26.6*	607	*903*
NTQ-1920SJ	19	20	.210	*5.3*	.085	*2.1*	1.224	*31.1*	900	*1339*
NTQ-718SJ	7	18	.234	*5.9*	.085	*2.1*	.901	*22.9*	545	*811*
NTQ-1218SJ	12	18	.234	*5.9*	.085	*2.1*	1.173	*29.8*	863	*1284*
NTQ-1918SJ	19	18	.234	*5.9*	.085	*2.1*	1.369	*34.8*	1262	*1878*
NTQ-716SJ	7	16	.262	*6.6*	.085	*2.1*	.985	*25.0*	639	*951*
NTQ-1216SJ	12	16	.262	*6.6*	.085	*2.1*	1.289	*32.7*	1017	*1513*
NTQ-1916SJ	19	16	.262	*6.6*	.085	*2.1*	1.509	*38.3*	1495	*2225*

CABLED SHIELDED QUADS - NTQ Series

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

NRTQ SERIES WITHOUT OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Quads	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	1000 ft	*KG/KM*
NRTQ-726J	7	26	.164	*4.1*	.062	*1.6*	.620	*15.75*	201	*299*
NRTQ-1226J	12	26	.164	*4.1*	.062	*1.6*	.810	*20.57*	321	*478*
NRTQ-1926J	19	26	.164	*4.1*	.085	*2.1*	.994	*25.2*	516	*768*
NRTQ-2726J	27	26	.164	*4.1*	.085	*2.1*	1.184	*30.1*	703	*1046*
NRTQ-3726J	37	26	.164	*4.1*	.085	*2.1*	1.323	*33.6*	921	*1370*
NRTQ-724J	7	24	.176	*4.4*	.062	*1.6*	.666	*16.66*	232	*345*
NRTQ-1224J	12	24	.176	*4.4*	.085	*2.1*	.906	*23.0*	410	*610*
NRTQ-1924J	19	24	.176	*4.4*	.085	*2.1*	1.054	*26.8*	598	*890*
NRTQ-2724J	27	24	.176	*4.4*	.085	*2.1*	1.258	*32.0*	817	*1216*
NRTQ-3724J	37	24	.176	*4.4*	.085	*2.1*	1.406	*35.7*	1075	*1600*
NRTQ-722J	7	22	.190	*4.8*	.062	*1.6*	.698	*17.73*	274	*408*
NRTQ-1222J	12	22	.190	*4.8*	.085	*2.1*	.964	*24.5*	482	*717*
NRTQ-1922J	19	22	.190	*4.8*	.085	*2.1*	1.124	*28.5*	708	*1054*
NRTQ-2722J	27	22	.190	*4.8*	.085	*2.1*	1.344	*34.1*	972	*1446*
NRTQ-720J	7	20	.210	*5.3*	.062	*1.6*	.783	*19.89*	409	*609*
NRTQ-1220J	12	20	.210	*5.3*	.085	*2.1*	1.073	*27.3*	694	*1033*
NRTQ-1920J	19	20	.210	*5.3*	.085	*2.1*	1.249	*31.7*	1004	*1493*
NRTQ-718J	7	18	.234	*5.9*	.085	*2.1*	.876	*22.25*	474	*705*
NRTQ-1218J	12	18	.234	*5.9*	.085	*2.1*	1.147	*29.1*	766	*1140*
NRTQ-1918J	19	18	.234	*5.9*	.085	*2.1*	1.344	*34.1*	1147	*1707*
NRTQ-716J	7	16	.262	*6.6*	.085	*2.1*	.960	*24.4*	560	*833*
NRTQ-1216J	12	16	.262	*6.6*	.085	*2.1*	1.264	*32.1*	909	*1353*
NRTQ-1916J	19	16	.262	*6.6*	.085	*2.1*	1.484	*37.7*	1366	*2032*

NRTQ SERIES WITH OVERALL SHIELD - 26, 24, 22, 20, 18 and 16 AWG

Part No.	No. of Quads	Cond AWG	Cond. Diam.		Jacket Wall		Nom. Diam.		Weight lbs per	
			Inches	*MM*	Inches	*MM*	Inches	*MM*	1000 ft	*KG/KM*
NRTQ-726SJ	7	26	.164	*4.1*	.062	*1.6*	.645	*16.38*	251	*373*
NRTQ-1226SJ	12	26	.164	*4.1*	.085	*2.1*	.881	*22.38*	426	*634*
NRTQ-1926SJ	19	26	.164	*4.1*	.085	*2.1*	1.019	*25.9*	598	*890*
NRTQ-2726SJ	27	26	.164	*4.1*	.085	*2.1*	1.209	*30.7*	803	*1195*
NRTQ-3726SJ	37	26	.164	*4.1*	.085	*2.1*	1.347	*34.2*	1034	*1539*
NRTQ-724SJ	7	24	.176	*4.4*	.062	*1.6*	.681	*17.30*	286	*426*
NRTQ-1224SJ	12	24	.176	*4.4*	.085	*2.1*	.931	*23.6*	484	*720*
NRTQ-1924SJ	19	24	.176	*4.4*	.085	*2.1*	1.079	*27.4*	686	*1021*
NRTQ-2724SJ	27	24	.176	*4.4*	.085	*2.1*	1.283	*32.6*	925	*1376*
NRTQ-3724SJ	37	24	.176	*4.4*	.085	*2.1*	1.431	*36.3*	1196	*1780*
NRTQ-722SJ	7	22	.190	*4.8*	.062	*1.6*	.723	*18.36*	331	*493*
NRTQ-1222SJ	12	22	.190	*4.8*	.085	*2.1*	.990	*25.1*	562	*836*
NRTQ-1922SJ	19	22	.190	*4.8*	.085	*2.1*	1.149	*29.2*	803	*1195*
NRTQ-2722SJ	27	22	.190	*4.8*	.085	*2.1*	1.370	*34.8*	1088	*1619*
NRTQ-720SJ	7	20	.210	*5.3*	.062	*1.6*	.758	*19.25*	345	*513*
NRTQ-1220SJ	12	20	.210	*5.3*	.085	*2.1*	1.048	*26.6*	607	*903*
NRTQ-1920SJ	19	20	.210	*5.3*	.085	*2.1*	1.224	*31.1*	900	*1339*
NRTQ-718SJ	7	18	.234	*5.9*	.085	*2.1*	.901	*22.9*	545	*811*
NRTQ-1218SJ	12	18	.234	*5.9*	.085	*2.1*	1.173	*29.8*	863	*1284*
NRTQ-1918SJ	19	18	.234	*5.9*	.085	*2.1*	1.369	*34.8*	1262	*1878*
NRTQ-716SJ	7	16	.262	*6.6*	.085	*2.1*	.985	*25.0*	639	*951*
NRTQ-1216SJ	12	16	.262	*6.6*	.085	*2.1*	1.289	*32.7*	1017	*1513*
NRTQ-1916SJ	19	16	.262	*6.6*	.085	*2.1*	1.509	*38.3*	1495	*2225*

COILED INSTRUMENTATION CABLES FOR CUSTOM APPLICATIONS

Our modern coiling department is ready to design and manufacture coiled instrumentation cables for your specific requirements. These cables are available in any number of conductors and in gauge sizes 10 through 30 AWG. they are designed for high reliability, ultra-flexible long-life applications, as encountered in computer interconnects, biomedical electronics and optimum retractability and general control cable use. Call our technical staff to discuss your custom application.

CABLES WHICH MUST MEET
1987 NATIONAL ELECTRIC CODE REQUIREMENTS
FOR FLAME SPREAD OF TRAY CABLE NEC TYPES
ARTICLE 725

CL2X, CL2, CL3, PTLC
U.L. File #E 119904

The following pages describe our U.L. Listed multiconductor Low Flame-Spread N.E.C. TRAY CABLES.

Suitable for wiring within buildings without use of electrical conduit for protection.

NL Family of CL2 Cabled Singles
NLP Family of CL2 Cabled Pairs
NG Family of PLTC/CL3 Cables

For CL2X Cables, see NQ, NQP Cable Families)

NEC ITC ARTICLE 727
Exposed Run “ER”
Direct Buried “DIR BUR”
Wet Location “WET”
Sun Light Resistance “SUN RES”
VERTICAL TRAY FRAME TEST

CABLED SINGLE CONDUCTORS

Standard PLTC Cables

- NEC 725 Tray Cables
- UL Rated 300 volts, 105ºC
- UL Listed, UL File # E119904
- Extreme Flame Resistance

PAIRS:							
PLTC UNSHIELDED **PAIR** CABLE				PLTC FOIL-SHIELDED **PAIR** CABLE			
PART NO.	**COND.**	**AWG**	**DIAM. INCHES**	**PART NO.**	**COND.**	**AWG**	**DIAM. INCHES**
NG222J	2	22	.170	NG222FSJ	2	22	.176
NG220J	2	20	.190	NG220FSJ	2	20	.196
NG218J	2	18	.206	NG218FSJ	2	18	.212
NG216J	2	16	.220	NG216FSJ	2	16	.226

PLTC Cable Construction: All PLTC Cables use 0.012" (min.) wall of 105°C PVC wire insulation, plus and overall 0.032" wall of special flame-spread-resistant black PVC jacket.

U.L. listed as sunlight-resistant "PLTC" Tray Cable. (PLTC is abbreviation of NEC "Power-Limited Tray Cable"). Also available as CL3 (not sunlight resistant)

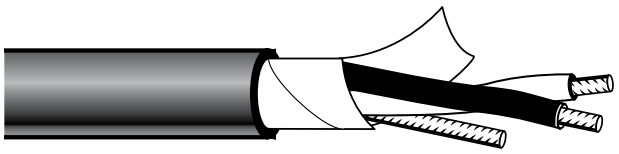
Relative Performance: The national PLTC cables are very similar in performance to the national "NQ" family of flexible cables.

Standard Putup: 500 ft. reels (non returnable reels).
Standard Colors:
Pairs: Black & Red
Trios: Black, Red, White

Many other PLTC constructions can be made to order. Consult factory for other larger "PLTC" cables.
UL Rated: 300 Volts, 105°C

TRIOS:							
PLTC UNSHIELDED **TRIO** CABLE				PLTC FOIL-SHIELDED **TRIO** CABLE			
PART NO.	**COND.**	**AWG**	**DIAM. INCHES**	**PART NO.**	**COND.**	**AWG**	**DIAM. INCHES**
NG322J	3	22	.179	NG322FSJ	3	22	.185
NG320J	3	20	.200	NG320FSJ	3	20	.206
NG318J	3	18	.218	NG318FSJ	3	18	.224
NG316J	3	16	.233	NG316FSJ	3	16	.239

CABLED SINGLE CONDUCTORS



LISTED

Standard CL2 Cables

- NEC 725 Tray Cables
- Cabled Singles (NL Series)

National Wire & Cable Corporation manufactures a complete line of DUAL-RATED multiconductor NEC TRAY CABLE Type CL2, for signal, instrumentation and control uses. Also UL rated for use as 300 Volt Appliance Wiring Material (AWM). These are available as cables singles or pairs, with optional overall shield of aluminum-Mylar foil with drain wire.

Cabled conductors use stranded tinned copper wire with 0.010" wall of tough extruded poly-vinyl-chloride (PVC) insulation, rated for 300 Volt use under U.L. Style 2464.

All wires are color coded using 10 standard solid colors plus white with stripes. Cables singles are color coded the same as our NQ and NX cable families per MIL-STD-681. Cabled pairs are color coded the same as our NQP and NXP cable families. View View Color Table in the National Wire Cable Designers Guide, page 7-13.

Conductors are helically cabled and laid for optimum flexiblility, with a Mylar tape barrier wrap (or Mylar + Foil) applied between cabled wire bundle and outer jacket.

Shielded cables have an overall Aluminum-Mylar foil shielding tape helically wrapped over cable and a tinned uninsulated drain wire for shield connection. (Use FSJ part Number suffix.) For optional composite tinned copper CFI braid(s) + foil shielding, consult factory.

Outer jacket is a special highly flexible abrasion-resistant gray polyvinylchloride (PVC) thermoplastic. DUAL-RATED jacket compound meets the requirements of both U.L./ AWM Style 2464 and U.L. 13 Type CL2 TRAY CABLE. Jacket is surface printed with both UL AWM 2464 and U.L. 13 Type CL2 TRAY CABLE identifiers. Jacket wall thickness is .032" nom.

Finished cables comply with applicable U.L. tests for N.E.C. Type CL2 TRAY CABLE Vertical Tray Flame Spread. All materials are flame-spread retardant and fungus resistant. The products are DUAL-RATED for AWM use as U.L. Style 2464 300 Volt, 80°C, OR for U.L. 13 Type CL2 TRAY CABLE 105°C use.

Standard Putups: 500 ft. and 1000 ft. No-deposit reels. For shorter quantities or specific lengths consult factory.

TECHNICAL DATA (ALL CABLES)	
Rated Working Voltage:	300 Volts for AWM uses.
Rated Temperature:	DUAL-RATED:+105°C or +80°C dependent on AGENCY intended use.
Insulation Breakdown Voltage:	Greater than 3400 Volts AC RMS as 60 Hz.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 PF/FT at 1 kHz, depending on AWG and position.
Insulation Leakage:	100 megohms/1000 ft. min. at 500 VDC from a conductor to all else in a cable, at 25°C,
U.L. Agency Voltage & Temperature Ratings:	UL rated: +80°C AWM, 300 VOLT per UL Style 2464. UL rated +105°C CL2 TRAY CABLE per UL 13, NEC Type CL2.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 8 cable diameters from +105°C to -10°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -20°C.
Characteristic Impedance:	RF Impedance of twisted pairs or adjacent singles is: 87 ohms in AWG 24; 80 ohms in AWG 22. Suitable for digital signals.

UNSHIELDED
24, 22 AWG

Part No.	No. Cond	Cond. AWG	Nom. O.D.	Weight LB/K ft.
NL-224J	2	24	.156	11
NL-324J	3	24	.163	14
NL-424J	4	24	.174	17
NL-524J	5	24	.187	19
NL-624J	6	24	.200	22
NL-724J	7	24	.200	24
NL-824J	8	24	.231	28
NL-924J	9	24	.244	31
NL-1024J	10	24	.244	33
NL-1224J	12	24	.251	37
NL-1524J	15	24	.275	45
NL-1924J	19	24	.288	54
NL-2724J	27	24	.339	73
NL-3724J	37	24	.376	96
NL-4824J	48	24	.424	121
NL-6024J	60	24	.464	148
NL-222J	2	22	.168	14
NL-322J	3	22	.176	17
NL-422J	4	22	.188	21
NL-522J	5	22	.203	25
NL-622J	6	22	.218	29
NL-722J	7	22	.218	32
NL-822J	8	22	.253	37
NL-922J	9	22	.268	40
NL-1022J	10	22	.268	43
NL-1222J	12	22	.276	50
NL-1522J	15	22	.303	60
NL-1922J	19	22	.318	73
NL-2722J	27	22	.376	100
NL-3722J	37	22	.418	131
NL-4822J	48	22	.473	167
NL-6022J	60	22	.520	207

OVERALL BRAIDED SHIELD
24, 22 AWG

Part No.	No. Cond	Cond. AWG	Nom. O.D	Weight LB/K ft.
NL-224SJ	2	24	.176	19
NL-324SJ	3	24	.183	22
NL-424SJ	4	24	.194	25
NL-524SJ	5	24	.207	29
NL-624SJ	6	24	.220	33
NL-724SJ	7	24	.220	35
NL-824SJ	8	24	.251	41
NL-924SJ	9	24	.264	44
NL-1024SJ	10	24	.264	46
NL-1224SJ	12	24	.271	51
NL-1524SJ	15	24	.295	61
NL-1924SJ	19	24	.308	70
NL-2724SJ	27	24	.359	93
NL-3724SJ	37	24	.401	127
NL-4824SJ	48	24	.450	157
NL-6024SJ	60	24	.489	187
NL-222SJ	2	22	.188	22
NL-322SJ	3	22	.196	26
NL-422SJ	4	22	.208	31
NL-522SJ	5	22	.223	35
NL-622SJ	6	22	.238	40
NL-722SJ	7	22	.238	43
NL-822SJ	8	22	.273	51
NL-922SJ	9	22	.288	56
NL-1022SJ	10	22	.288	58
NL-1222SJ	12	22	.296	65
NL-1522SJ	15	22	.323	78
NL-1922SJ	19	22	.338	91
NL-2722SJ	27	22	.401	131
NL-3722SJ	37	22	.443	167
NL-4822SJ	48	22	.498	207
NL-6022SJ	60	22	.543	249

OVERALL FOIL SHIELD WITH DRAIN
24, 22 AWG

Part No.	No. Cond	Cond. AWG	Nom. O.D	Weight LB/K ft.
NL-224FSJ	2	24	.158	13
NL-324FSJ	3	24	.165	15
NL-424FSJ	4	24	.176	18
NL-524FSJ	5	24	.189	21
NL-624FSJ	6	24	.202	24
NL-724FSJ	7	24	.202	26
NL-824FSJ	8	24	.233	30
NL-924FSJ	9	24	.246	32
NL-1024FSJ	10	24	.246	34
NL-1224FSJ	12	24	.253	39
NL-1524FSJ	15	24	.277	46
NL-1924FSJ	19	24	.290	55
NL-2724FSJ	27	24	.341	75
NL-3724FSJ	37	24	.378	97
NL-4824FSJ	48	24	.427	122
NL-6024FSJ	60	24	.466	149
NL-222FSJ	2	22	.170	16
NL-322FSJ	3	22	.178	20
NL-422FSJ	4	22	.190	23
NL-522FSJ	5	22	.205	27
NL-622FSJ	6	22	.220	31
NL-722FSJ	7	22	.220	34
NL-822FSJ	8	22	.255	39
NL-922FSJ	9	22	.270	43
NL-1022FSJ	10	22	.270	46
NL-1222FSJ	12	22	.278	52
NL-1522FSJ	15	22	.305	62
NL-1922FSJ	19	22	.320	75
NL-2722FSJ	27	22	.378	102
NL-3722FSJ	37	22	.420	134
NL-4822FSJ	48	22	.475	169
NL-6022FSJ	60	22	.528	207

CABLED SINGLE CONDUCTORS - CL2, NL

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

UNSHIELDED
24, 22 AWG

Part No.	No. Cond	Cond. AWG	Nom. O.D.	Weight LB/K ft.
NRL-224J	2	24	.156	11
NRL-324J	3	24	.163	14
NRL-424J	4	24	.174	17
NRL-524J	5	24	.187	19
NRL-624J	6	24	.200	22
NRL-724J	7	24	.200	24
NRL-824J	8	24	.231	28
NRL-924J	9	24	.244	31
NRL-1024J	10	24	.244	33
N RL-1224J	12	24	.251	37
NRL-1524J	15	24	.275	45
NRL-1924J	19	24	.288	54
NRL-2724J	27	24	.339	73
NRL-3724J	37	24	.376	96
NRL-4824J	48	24	.424	121
NRL-6024J	60	24	.464	148
NRL-222J	2	22	.168	14
NRL-322J	3	22	.176	17
NRL-422J	4	22	.188	21
NRL-522J	5	22	.203	25
NRL-622J	6	22	.218	29
NRL-722J	7	22	.218	32
NRL-822J	8	22	.253	37
NRL-922J	9	22	.268	40
NRL-1022J	10	22	.268	43
NRL-1222J	12	22	.276	50
NRL-1522J	15	22	.303	60
NRL-1922J	19	22	.318	73
NRL-2722J	27	22	.376	100
NRL-3722J	37	22	.418	131
NRL-4822J	48	22	.473	167
NRL-6022J	60	22	.520	207

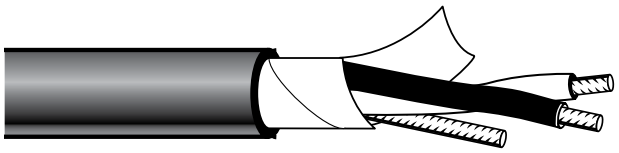
OVERALL BRAIDED SHIELD
24, 22 AWG

Part No.	No. Cond	Cond. AWG	Nom. O.D	Weight LB/K ft.
NRL-224SJ	2	24	.176	19
NRL-324SJ	3	24	.183	22
NRL-424SJ	4	24	.194	25
NRL-524SJ	5	24	.207	29
NRL-624SJ	6	24	.220	33
NRL-724SJ	7	24	.220	35
NRL-824SJ	8	24	.251	41
NRL-924SJ	9	24	.264	44
NRL-1024SJ	10	24	.264	46
NRL-1224SJ	12	24	.271	51
NRL-1524SJ	15	24	.295	61
NRL-1924SJ	19	24	.308	70
NRL-2724SJ	27	24	.359	93
NRL-3724SJ	37	24	.401	127
NRL-4824SJ	48	24	.450	157
NRL-6024SJ	60	24	.489	187
NRL-222SJ	2	22	.188	22
NRL-322SJ	3	22	.196	26
NRL-422SJ	4	22	.208	31
NRL-522SJ	5	22	.223	35
NRL-622SJ	6	22	.238	40
NRL-722SJ	7	22	.238	43
NRL-822SJ	8	22	.273	51
NRL-922SJ	9	22	.288	56
NRL-1022SJ	10	22	.288	58
NRL-1222SJ	12	22	.296	65
NRL-1522SJ	15	22	.323	78
NRL-1922SJ	19	22	.338	91
NRL-2722SJ	27	22	.401	131
NRL-3722SJ	37	22	.443	167
NRL-4822SJ	48	22	.498	207
NRL-6022SJ	60	22	.543	249

OVERALL FOIL SHIELD WITH DRAIN
24, 22 AWG

Part No.	No. Cond	Cond. AWG	Nom. O.D	Weight LB/K ft.
NRL-224FSJ	2	24	.158	13
NRL-324FSJ	3	24	.165	15
NRL-424FSJ	4	24	.176	18
NRL-524FSJ	5	24	.189	21
NRL-624FSJ	6	24	.202	24
NRL-724FSJ	7	24	.202	26
NRL-824FSJ	8	24	.233	30
NRL-924FSJ	9	24	.246	32
NRL-1024FSJ	10	24	.246	34
NRL-1224FSJ	12	24	.253	39
NRL-1524FSJ	15	24	.277	46
NRL-1924FSJ	19	24	.290	55
NRL-2724FSJ	27	24	.341	75
NRL-3724FSJ	37	24	.378	97
NRL-4824FSJ	48	24	.427	122
NRL-6024FSJ	60	24	.466	149
NRL-222FSJ	2	22	.170	16
NRL-322FSJ	3	22	.178	20
NRL-422FSJ	4	22	.190	23
NRL-522FSJ	5	22	.205	27
NRL-622FSJ	6	22	.220	31
NRL-722FSJ	7	22	.220	34
NRL-822FSJ	8	22	.255	39
NRL-922FSJ	9	22	.270	43
NRL-1022FSJ	10	22	.270	46
NRL-1222FSJ	12	22	.278	52
NRL-1522FSJ	15	22	.305	62
NRL-1922FSJ	19	22	.320	75
NRL-2722FSJ	27	22	.378	102
NRL-3722FSJ	37	22	.420	134
NRL-4822FSJ	48	22	.475	169
NRL-6022FSJ	60	22	.528	207

CABLED SINGLE CONDUCTORS



Standard CL2 Cables

- NEC 725 Tray Cables
- Cabled Singles (NL Series)

UNSHIELDED
20, 18 AWG

Part No.	No. Cond	Cond AWG.	Nom. O.D.	Weight LB/K ft
NL-220J	2	20	.184	18
NL-320J	3	20	.193	24
NL-420J	4	20	.207	29
NL-520J	5	20	.225	35
NL-620J	6	20	.242	41
NL-720J	7	20	.242	46
NL-820J	8	20	.283	53
NL-920J	9	20	.300	58
NL-1020J	10	20	.300	63
NL-1220J	12	20	.309	73
NL-1520J	15	20	.341	89
NL-1920J	19	20	.358	109
NL-2720J	27	20	.425	151
NL-3720J	37	20	.474	201
NL-218J	2	18	.204	24
NL-318J	3	18	.215	32
NL-418J	4	18	.231	40
NL-518J	5	18	.252	48
NL-618J	6	18	.272	56
NL-718J	7	18	.272	63
NL-818J	8	18	.320	73
NL-918J	9	18	.340	81
NL-1018J	10	18	.340	88
NL-1218J	12	18	.351	102
NL-1518J	15	18	.388	126
NL-1918J	19	18	.408	155
NL-2718J	27	18	.487	215

OVERALL BRAIDED SHIELDED
20, 18 AWG

Part No.	No. Cond	Cond AWG.	Nom. O.D.	Weight LB/K ft
NL-220SJ	2	20	.204	28
NL-320SJ	3	20	.213	34
NL-420SJ	4	20	.227	40
NL-520SJ	5	20	.245	47
NL-620SJ	6	20	.262	54
NL-720SJ	7	20	.262	59
NL-820SJ	8	20	.303	69
NL-920SJ	9	20	.320	76
NL-1020SJ	10	20	.320	80
NL-1220SJ	12	20	.329	91
NL-1520SJ	15	20	.361	109
NL-1920SJ	19	20	.378	130
NL-2720SJ	27	20	.450	187
NL-3720SJ	37	20	.499	242
NL-218SJ	2	18	.224	35
NL-318SJ	3	18	.235	43
NL-418SJ	4	18	.251	52
NL-518SJ	5	18	.272	62
NL-618SJ	6	18	.292	71
NL-718SJ	7	18	.293	78
NL-818SJ	8	18	.340	91
NL-918SJ	9	18	.360	101
NL-1018SJ	10	18	.360	108
NL-1218SJ	12	18	.371	123
NL-1518SJ	15	18	.413	158
NL-1918SJ	19	18	.433	189
NL-2718SJ	27	18	.512	257

OVERALL FOIL SHIELD WITH DRAIN
20, 18 AWG

Part No.	No. Cond	Cond AWG.	Nom. O.D.	Weight LB/K ft
NL-220FSJ	2	20	.186	22
NL-320FSJ	3	20	.195	28
NL-420FSJ	4	20	.209	33
NL-520FSJ	5	20	.227	39
NL-620FSJ	6	20	.244	45
NL-720FSJ	7	20	.244	49
NL-820FSJ	8	20	.285	56
NL-920FSJ	9	20	.302	62
NL-1020FSJ	10	20	.300	63
NL-1220FSJ	12	20	.311	77
NL-1520FSJ	15	20	.343	90
NL-1920FSJ	19	20	.360	113
NL-2720FSJ	27	20	.427	155
NL-3720FSJ	37	20	.476	205
NL-218FSJ	2	18	.206	20
NL-318FSJ	3	18	.217	38
NL-418FSJ	4	18	.233	46
NL-518FSJ	5	18	.254	54
NL-618FSJ	6	18	.274	62
NL-718FSJ	7	18	.274	69
NL-818FSJ	8	18	.322	79
NL-918FSJ	9	18	.342	87
NL-1018FSJ	10	18	.342	94
NL-1218FSJ	12	18	.353	108
NL-1518FSJ	15	18	.390	131
NL-1918FSJ	19	18	.410	180
NL-2718FSJ	27	18	.489	221

CABLED SINGLE CONDUCTORS - CL2, NL

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

UNSHIELDED
20, 18 AWG

Part No.	No. Cond	Cond AWG.	Nom. O.D.	Weight LB/K ft
NRL-220J	2	20	.184	18
NRL-320J	3	20	.193	24
NRL-420J	4	20	.207	29
NRL-520J	5	20	.225	35
NRL-620J	6	20	.242	41
NRL-720J	7	20	.242	46
NRL-820J	8	20	.283	53
NRL-920J	9	20	.300	58
NRL-1020J	10	20	.300	63
NRL-1220J	12	20	.309	73
NRL-1520J	15	20	.341	89
NRL-1920J	19	20	.358	109
NRL-2720J	27	20	.425	151
NRL-3720J	37	20	.474	201
NRL-218J	2	18	.204	24
NRL-318J	3	18	.215	32
NRL-418J	4	18	.231	40
NRL-518J	5	18	.252	48
NRL-618J	6	18	.272	56
NRL-718J	7	18	.272	63
NRL-818J	8	18	.320	73
NRL-918J	9	18	.340	81
NRL-1018J	10	18	.340	88
NRL-1218J	12	18	.351	102
NRL-1518J	15	18	.388	126
NRL-1918J	19	18	.408	155
NRL-2718J	27	18	.487	215

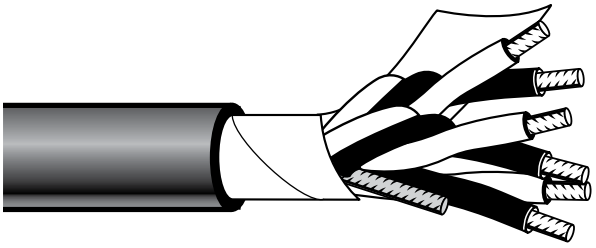
OVERALL BRAIDED SHIELDED
20, 18 AWG

Part No.	No. Cond	Cond AWG.	Nom. O.D.	Weight LB/K ft
NRL-220SJ	2	20	.204	28
NRL-320SJ	3	20	.213	34
NRL-420SJ	4	20	.227	40
NRL-520SJ	5	20	.245	47
NRL-620SJ	6	20	.262	54
NRL-720SJ	7	20	.262	59
NRL-820SJ	8	20	.303	69
NRL-920SJ	9	20	.320	76
NRL-1020SJ	10	20	.320	80
NRL-1220SJ	12	20	.329	91
NRL-1520SJ	15	20	.361	109
NRL-1920SJ	19	20	.378	130
NRL-2720SJ	27	20	.450	187
NRL-3720SJ	37	20	.499	242
NRL-218SJ	2	18	.224	35
NRL-318SJ	3	18	.235	43
NRL-418SJ	4	18	.251	52
NRL-518SJ	5	18	.272	62
NRL-618SJ	6	18	.292	71
NRL-718SJ	7	18	.293	78
NRL-818SJ	8	18	.340	91
NRL-918SJ	9	18	.360	101
NRL-1018SJ	10	18	.360	108
NRL-1218SJ	12	18	.371	123
NRL-1518SJ	15	18	.413	158
NRL-1918SJ	19	18	.433	189
NRL-2718SJ	27	18	.512	257

OVERALL FOIL SHIELD WITH DRAIN
20, 18 AWG

Part No.	No. Cond	Cond AWG.	Nom. O.D.	Weight LB/K ft
NRL-220FSJ	2	20	.186	22
NRL-320FSJ	3	20	.195	28
NRL-420FSJ	4	20	.209	33
NRL-520FSJ	5	20	.227	39
NRL-620FSJ	6	20	.244	45
NRL-720FSJ	7	20	.244	49
NRL-820FSJ	8	20	.285	.56
NRL-920FSJ	9	20	.302	62
NRL-1020FSJ	10	20	.300	63
NRL-1220FSJ	12	20	.311	77
NRL-1520FSJ	15	20	.343	90
NRL-1920FSJ	19	20	.360	113
NRL-2720FSJ	27	20	.427	155
NRL-3720FSJ	37	20	.476	205
NRL-218FSJ	2	18	.206	20
NRL-318FSJ	3	18	.217	38
NRL-418FSJ	4	18	.233	46
NRL-518FSJ	5	18	.254	54
NRL-618FSJ	6	18	.274	62
NRL-718FSJ	7	18	.274	69
NRL-818FSJ	8	18	.322	79
NRL-918FSJ	9	18	.342	87
NRL-1018FSJ	10	18	.342	94
NRL-1218FSJ	12	18	.353	108
NRL-1518FSJ	15	18	.390	131
NRL-1918FSJ	19	18	.410	180
NR L-2718FSJ	27	18	.489	221

CABLED TWISTED PAIRS CONDUCTORS



Standard CL2 Cables

- NEC 725 Tray Cables
- Twisted Pairs (NLP Series)

National Wire & Cable Corporation manufactures a complete line of DUAL-RATED multiconductor NEC TRAY CABLE Type CL2, for signal, instrumentation and control uses. Also UL rated for use as 300 Volt Appliance Wiring Material (AWM). These are available as cables singles or pairs, with optional overall shield of aluminum-Mylar foil with drain wire.

Cabled conductors use stranded tinned copper wire with 0.010" wall of tough extruded poly-vinyl-chloride (PVC) insulation, rated for 300 Volt use under U.L. Style 2464.

All wires are color coded using 10 standard solid colors plus white with stripes. Cables singles are color coded the same as our NQ and NX cable families per MIL-STD-681. Cabled pairs are color coded the same as our NQP and NXP cable families. View Color Table in the National Wire Cable Designers Guide, page 7-13.

Conductors are helically cabled and laid for optimum flexiblility, with a Mylar tape barrier wrap (or Mylar + Foil) applied between cabled wire bundle and outer jacket.

Shielded cables have an overall Aluminum-Mylar foil shielding tape helically wrapped over cable and a tinned uninsulated drain wire for shield connection. (Use FSJ part Number suffix.) For optional composite tinned copper CFI braid(s) + foil shielding, consult factory.

Outer jacket is a special highly flexible abrasion-resistant gray polyvinylchloride (PVC) thermoplastic. DUAL-RATED jacket compound meets the requirements of both U.L. AWM Style 2464 and U.L. 13 Type CL2 TRAY CABLE. Jacket is surface printed with both UL AWM 2464 and U.L. 13 Type CL2 TRAY CABLE identifiers. Jacket wall thickness is .032" nom.

Finished cables comply with applicable U.L. tests for N.E.C. Type CL2 TRAY CABLE Vertical Tray Flame Spread. All materials are flame-spread retardant and fungus resistant. The products are DUAL-RATED for AWM use as U.L. Style 2464 300 Volt, 80°C, OR for U.L. 13 Type CL2 TRAY CABLE 105°C use.

Standard Putups: 500 ft. and 1000 ft. No-deposit reels. For shorter quantities or specific lengths consult factory.

TECHNICAL DATA (ALL CABLES)	
Rated Working Voltage:	300 Volts for AWM uses.
Rated Temperature:	DUAL-RATED:+105°C or +80°C dependent on AGENCY intended use.
Insulation Breakdown Voltage:	Greater than 3400 Volts AC RMS as 60 Hz.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 PF/FT at 1 kHz, depending on AWG and position.
Insulation Leakage:	100 megohms/1000 ft. min. at 500 VDC from a conductor to all else in a cable, at 25°C,
U.L. Agency Voltage & Temperature Ratings:	UL rated: +80°C AWM, 300 VOLT per UL Style 2464. UL rated +105°C CL2 TRAY CABLE per UL 13, NEC Type CL2.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 8 cable diameters from +105°C to -10°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -20°C.
Characteristic Impedance:	RF Impedance of twisted pairs or adjacent singles is: 87 ohms in AWG 24; 80 ohms in AWG 22. Suitable for digital signals.

UNSHIELDED
24, 22 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NLP-224J	2	24	.218	21
NLP-324J	3	24	.230	26
NLP-424J	4	24	.253	31
NLP-524J	5	24	.279	37
NLP-624J	6	24	.306	42
NLP-724J	7	24	.292	46
NLP-824J	8	24	.367	54
NLP-924J	9	24	.350	60
NLP-1024J	10	24	.367	64
NLP-1224J	12	24	.379	73
NLP-1524J	15	24	.429	88
NLP-1924J	19	24	.442	106
NLP-2724J	27	24	.529	144
NLP-222J	2	22	.238	26
NLP-322J	3	22	.252	33
NLP-422J	4	22	.278	40
NLP-522J	5	22	.308	47
NLP-622J	6	22	.338	55
NLP-722J	7	22	.323	61
NLP-822J	8	22	.408	71
NLP-922J	9	22	.388	79
NLP-1022J	10	22	.408	85
NLP-1222J	12	22	.422	97
NLP-1522J	15	22	.478	118
NLP-1922J	19	22	.493	143
NLP-2722J	27	22	.592	197

OVERALL BRAIDED SHIELD
24, 22 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NLP-224SJ	2	24	.238	34
NLP-324SJ	3	24	.250	40
NLP-424SJ	4	24	.273	47
NLP-524SJ	5	24	.299	54
NLP-624SJ	6	24	.326	62
NLP-724SJ	7	24	.312	66
NLP-824SJ	8	24	.387	78
NLP-924SJ	9	24	.370	85
NLP-1024SJ	10	24	.387	89
NLP-1224SJ	12	24	.404	109
NLP-1524SJ	15	24	.454	129
NLP-1924SJ	19	24	.467	149
NLP-2724SJ	27	24	.554	198
NLP-222SJ	2	22	.258	41
NLP-322SJ	3	22	.272	49
NLP-422SJ	4	22	.298	58
NLP-522SJ	5	22	.328	67
NLP-622SJ	6	22	.358	77
NLP-722SJ	7	22	.343	83
NLP-822SJ	8	22	.433	108
NLP-922SJ	9	22	.413	119
NLP-1022SJ	10	22	.433	124
NLP-1222SJ	12	22	.447	139
NLP-1522SJ	15	22	.503	165
NLP-1922SJ	19	22	.518	193
NLP-2722SJ	27	22	.617	257

OVERALL FOIL SHIELD WITH DRAIN
24, 22 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NLP-224FSJ	2	24	.220	22
NLP-324FSJ	3	24	.232	27
NLP-424FSJ	4	24	.255	32
NLP-524FSJ	5	24	.281	38
NLP-624FSJ	6	24	.308	44
NLP-724FSJ	7	24	.294	48
NLP-824FSJ	8	24	.369	55
NLP-924FSJ	9	24	.352	61
NLP-1024FSJ	10	24	.369	65
NLP-1224FSJ	12	24	.381	74
NLP-1524FSJ	15	24	.431	89
NLP-1924FSJ	19	24	.444	107
NLP-2724FSJ	27	24	.531	146
NLP-222FSJ	2	22	.240	28
NLP-322FSJ	3	22	.254	35
NLP-422FSJ	4	22	.280	42
NLP-522FSJ	5	22	.310	50
NLP-622FSJ	6	22	.340	57
NLP-722FSJ	7	22	.325	63
NLP-822FSJ	8	22	.410	732
NLP-922FSJ	9	22	.390	81
NLP-1022FSJ	10	22	.410	87
NLP-1222FSJ	12	22	.424	99
NLP-1522FSJ	15	22	.480	120
NLP-1922FSJ	19	22	.495	146
NLP-2722FSJ	27	22	.594	199

CABLED SINGLE CONDUCTORS - CL2, NLP

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

UNSHIELDED
24, 22 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NRLP-224J	2	24	.218	21
NRLP-324J	3	24	.230	26
NRLP-424J	4	24	.253	31
NRLP-524J	5	24	.279	37
NRLP-624J	6	24	.306	42
NRLP-724J	7	24	.292	46
NRLP-824J	8	24	.367	54
NRLP-924J	9	24	.350	60
NRLP-1024J	10	24	.367	64
NRLP-1224J	12	24	.379	73
NRLP-1524J	15	24	.429	88
NRLP-1924J	19	24	.442	106
NRLP-2724J	27	24	.529	144
NRLP-222J	2	22	.238	26
NRLP-322J	3	22	.252	33
NRLP-422J	4	22	.278	40
NRLP-522J	5	22	.308	47
NRLP-622J	6	22	.338	55
NRLP-722J	7	22	.323	61
NRLP-822J	8	22	.408	71
NRLP-922J	9	22	.388	79
NRLP-1022J	10	22	.408	85
NRLP-1222J	12	22	.422	97
NRLP-1522J	15	22	.478	118
NRLP-1922J	19	22	.493	143
NRLP-2722J	27	22	.592	197

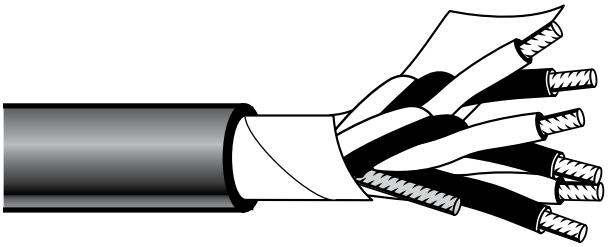
OVERALL BRAIDED SHIELD
24, 22 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NRLP-224SJ	2	24	.238	34
NRLP-324SJ	3	24	.250	40
NRLP-424SJ	4	24	.273	47
NRLP-524SJ	5	24	.299	54
NRLP-624SJ	6	24	.326	62
NRLP-724SJ	7	24	.312	66
NRLP-824SJ	8	24	.387	78
NRLP-924SJ	9	24	.370	85
NRLP-1024SJ	10	24	.387	89
NRLP-1224SJ	12	24	.404	109
NRLP-1524SJ	15	24	.454	129
NRLP-1924SJ	19	24	.467	149
NRLP-2724SJ	27	24	.554	198
NRLP-222SJ	2	22	.258	41
NRLP-322SJ	3	22	.272	49
NRLP-422SJ	4	22	.298	58
NRLP-522SJ	5	22	.328	67
NRLP-622SJ	6	22	.358	77
NRLP-722SJ	7	22	.343	83
NRLP-822SJ	8	22	.433	108
NRLP-922SJ	9	22	.413	119
NRLP-1022SJ	10	22	.433	124
NRLP-1222SJ	12	22	.447	139
NRLP-1522SJ	15	22	.503	165
NRLP-1922SJ	19	22	.518	193
NRLP-2722SJ	27	22	.617	257

OVERALL FOIL SHIELD WITH DRAIN
24, 22 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NRLP-224FSJ	2	24	.220	22
NRLP-324FSJ	3	24	.232	27
NRLP-424FSJ	4	24	.255	32
NRLP-524FSJ	5	24	.281	38
NRLP-624FSJ	6	24	.308	44
NRLP-724FSJ	7	24	.294	48
NRLP-824FSJ	8	24	.369	55
NRLP-924FSJ	9	24	.352	61
NRLP-1024FSJ	10	24	.369	65
NRLP-1224FSJ	12	24	.381	74
NRLP-1524FSJ	15	24	.431	89
NRLP-1924FSJ	19	24	.444	107
NRLP-2724FSJ	27	24	.531	146
NRLP-222FSJ	2	22	.240	28
NRLP-322FSJ	3	22	.254	35
NRLP-422FSJ	4	22	.280	42
NRLP-522FSJ	5	22	.310	50
NRLP-622FSJ	6	22	.340	57
NRLP-722FSJ	7	22	.325	63
NRLP-822FSJ	8	22	.410	732
NRLP-922FSJ	9	22	.390	81
NRLP-1022FSJ	10	22	.410	87
NRLP-1222FSJ	12	22	.424	99
NRLP-1522FSJ	15	22	.480	120
NRLP-1922FSJ	19	22	.495	146
NRLP-2722FSJ	27	22	.594	199

CABLED TWISTED PAIRS CONDUCTORS



Standard CL2 Cables

- NEC 725 Tray Cables
- Twisted Pairs (NLP Series)

For color code of pairs, View Color Table on page 5-15.

UNSHIELDED 20, 18 AWG				
Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NLP-220J	2	20	.265	35
NLP-320J	3	20	.281	45
NLP-420J	4	20	.312	56
NLP-520J	5	20	.346	68
NLP-620J	6	20	.381	79
NLP-720J	7	20	.364	89
NLP-820J	8	20	.462	103
NLP-920J	9	20	.439	115
NLP-1020J	10	20	.462	124
NLP-1220J	12	20	.478	144
NLP-1520J	15	20	.544	176
NLP-1920J	19	20	.561	216
NLP-2720J	27	20	.675	300
NLP-218J	2	18	.299	46
NLP-318J	3	18	.318	61
NLP-418J	4	18	.354	77
NLP-518J	5	18	.394	94
NLP-618J	6	18	.435	110
NLP-718J	7	18	.415	124
NLP-1218J	12	18	.549	203

OVERALL BRAIDED SHIELD 20, 18 AWG				
Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NLP-220SJ	2	20	.285	52
NLP-320SJ	3	20	.301	64
NLP-420SJ	4	20	.332	77
NLP-520SJ	5	20	.366	91
NLP-620SJ	6	20	.401	105
NLP-720SJ	7	20	.384	114
NLP-820SJ	8	20	.488	146
NLP-920SJ	9	20	.464	161
NLP-1020SJ	10	20	.488	170
NLP-1220SJ	12	20	.503	192
NLP-1520SJ	15	20	.569	230
NLP-1920SJ	19	20	.586	273
NLP-2720SJ	27	20	.701	369
NLP-218SJ	2	18	.319	66
NLP-318SJ	3	18	.338	83
NLP-418SJ	4	18	.374	101
NLP-518SJ	5	18	.420	130
NLP-618SJ	6	18	.460	151
NLP-718SJ	7	18	.440	164
NLP-1218SJ	12	18	.574	258

OVERALL FOIL SHIELD WITH DRAIN 20, 18 AWG				
Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NLP-220FSJ	2	20	.267	39
NLP-320FSJ	3	20	.293	49
NLP-420FSJ	4	20	.314	60
NLP-520FSJ	5	20	.348	72
NLP-620FSJ	6	20	.383	83
NLP-720FSJ	7	20	.366	93
NLP-820FSJ	8	20	.464	107
NLP-920FSJ	9	20	.441	119
NLP-1020FSJ	10	20	.464	128
NLP-1220FSJ	12	20	.480	148
NLP-1520FSJ	15	20	.546	180
NLP-1920FSJ	19	20	.563	220
NLP-2720FSJ	27	20	.677	304
NLP-218FSJ	2	18	.301	52
NLP-318FSJ	3	18	.320	67
NLP-418FSJ	4	18	.356	83
NLP-518FSJ	5	18	.396	99
NLP-618FSJ	6	18	.437	116
NLP-718FSJ	7	18	.417	130
NLP-1218FSJ	12	18	.551	209

NOTES:
1. Available in other conductor sizes.
2. Available in other jacket colors.

OTHER SPECIAL PURPOSE CABLES

ANTENNA ROTOR CABLE						
Part No.	No. Cond	AWG/Str.	Ins. OD	Jkt Wall	Nom. OD	Weight Lb/M'
NQ 818J	8	18/19	.068 pvc	.032	.320	73

LOW CAPACITANCE MICROPHONE CABLE (ULTRA-LIMP, ULTRA QUIET)						
Part No.	No. Cond	AWG/Str.	Ins. OD	Jkt Wall	Nom. OD	Weight Lb/M'
S10-8819	2	24/105 BC	0.060" pe	.040"	.220"	24.
S10-9109	4	24/41 BC	0.054" pe	.045"	.245"	29.

TRANSDUCER CABLE, SHIELDED (FOR LOW LEVEL USE)						
Part No.	No. Cond	AWG/Str.	Ins. OD	Jkt Wall	Nom. OD	Weight Lb/M'
S10-6023	4	22/19	0.054 PVC	.030"	.210	31.

SEISMIC GEOPHONE CABLE (DIGITAL SIGNALS)						
Part No.	No. Cond	AWG/Str.	Ins. OD	Jkt Wall	Nom. OD	Weight Lb/M'
D-2362	2	20/19	130 Ohm	.045	.370	54.

CABLED SINGLE CONDUCTORS - CL2, NLP

RoHS COMPLIANT PRODUCTS:

all RoHS products have the letter "R" written into the second position of the Part No.

UNSHIELDED
20, 18 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NRLP-220J	2	20	.265	35
NRLP-320J	3	20	.281	45
NRLP-420J	4	20	.312	56
NRLP-520J	5	20	.346	68
NRLP-620J	6	20	.381	79
NRLP-720J	7	20	.364	89
NRLP-820J	8	20	.462	103
NRLP-920J	9	20	.439	115
NRLP-1020J	10	20	.462	124
NRLP-1220J	12	20	.478	144
NRLP-1520J	15	20	.544	176
NRLP-1920J	19	20	.561	216
NRLP-2720J	27	20	.675	300
NRLP-218J	2	18	.299	46
NRLP-318J	3	18	.318	61
NRLP-418J	4	18	.354	77
NRLP-518J	5	18	.394	94
NRLP-618J	6	18	.435	110
NRLP-718J	7	18	.415	124
NRLP-1218J	12	18	.549	203

OVERALL BRAIDED SHIELD
20, 18 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NRLP-220SJ	2	20	.285	52
NRLP-320SJ	3	20	.301	64
NRLP-420SJ	4	20	.332	77
NRLP-520SJ	5	20	.366	91
NRLP-620SJ	6	20	.401	105
NRLP-720SJ	7	20	.384	114
NRLP-820SJ	8	20	.488	146
NRLP-920SJ	9	20	.464	161
NRLP-1020SJ	10	20	.488	170
NRLP-1220SJ	12	20	.503	192
NRLP-1520SJ	15	20	.569	230
NRLP-1920SJ	19	20	.586	273
NRLP-2720SJ	27	20	.701	369
NRLP-218SJ	2	18	.319	66
NRLP-318SJ	3	18	.338	83
NRLP-418SJ	4	18	.374	101
NRLP-518SJ	5	18	.420	130
NRLP-618SJ	6	18	.460	151
NRLP-718SJ	7	18	.440	164
NRLP-1218SJ	12	18	.574	258

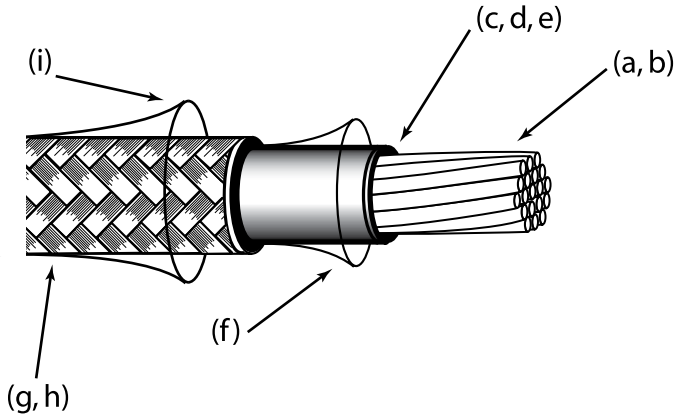
OVERALL FOIL SHIELD WITH DRAIN
20, 18 AWG

Part No.	No. of Pairs	Cond AWG	Nom. O.D.	Weight LB/K ft.
NRLP-220FSJ	2	20	.267	39
NRLP-320FSJ	3	20	.293	49
NRLP-420FSJ	4	20	.314	60
NRLP-520FSJ	5	20	.348	72
NRLP-620FSJ	6	20	.383	83
NRLP-720FSJ	7	20	.366	93
NRLP-820FSJ	8	20	.464	107
NRLP-920FSJ	9	20	.441	119
NRLP-1020FSJ	10	20	.464	128
NRLP-1220FSJ	12	20	.480	148
NRLP-1520FSJ	15	20	.546	180
NRLP-1920FSJ	19	20	.563	220
NRLP-2720FSJ	27	20	.677	304
NRLP-218FSJ	2	18	.301	52
NRLP-318FSJ	3	18	.320	67
NRLP-418FSJ	4	18	.356	83
NRLP-518FSJ	5	18	.396	99
NRLP-618FSJ	6	18	.437	116
NRLP-718FSJ	7	18	.417	130
NR LP-1218FSJ	12	18	.551	209

NOTES:
1. Available in other conductor sizes.
2. Available in other jacket colors.

HOW TO SPECIFY WIRE

IF NOT IDENTIFIED BY THE MANUFACTURER'S PART NUMBER WIRE IS SPECIFIED BY THE FOLLOWING CHARACTERISTICS:



a. Gauge (awg)
b. Standing (bare or tinned) Number of strands
c. Type of primary insulation material. PVC, Polytetrafluoroethylene (PTFE), etc.
d. Thickness of primary insulation or working voltage for which the wire is to be used.
e. Color or coding of primary insulation**
f. Type and thickness of covering over primary insulation when required (i.e., nylon)
g. Type of shielding, braided or foil, if required
h. If braided, shield strand size, % of coverage, bare or tinned wire strands
i Overall jacket material, temperature range, thickness, color**, marking or coding

HOW NATIONAL WIRE PART NUMBERS ARE DERIVED

EXAMPLE

N C 1936U 9 - 0 - 2

- 2 — RED TRACER
- 0 — BLACK TRACER
- 9 — INSULATION COLOR
- 1936U — CATALOG NO.

BASIC COLOR CODE

0 - Black	5 - Green
1 - Brown	6 - Blue
2 - Red	7 - Violet (Purple)
3 - Orange	8 - Slate (Grey)
4 - Yellow	9 - White

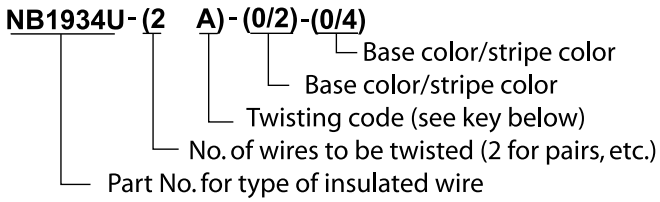
N..... stands for National Wire and Cable Corporation.
C..... stands for Type "C" (as previously referred to in the spec).
1936..... means 19 srands of #36 copper which is equivalent to 24 gauge
U..... means "uncovered." That is, no jacket over the primary insulation.
902..... refers to primary insulation base color and tracer colors as shown in the chart above. Tracers are numbered according to standard color code.

**Color limitation of tints is specified in MIL-STD-104, which comes supplied with a set of colored tabs for color comparison and identification.

HOW TO SPECIFY PAIRS

WE RECOMMEND THE FOLLOWING FORMAT WHEN SPECIFYING TWISTED PAIRS AND TRIOS:

EXAMPLE



Part No. (see “How to Specify Wire”, Page 32)

KEY TO TWISTING CODE

A = SHORT TWINNER LAY
B = STANDARD TWINNER LAY
C = SHORT PLANETARY LAY
D = STANDARD PLANETRY LAY

THE “SHORT” LAY IS DEFINED AS EQUAL TO 5 X D X N AND THE “STANDARD” LAY IS DEFINED AS 10 X D X N WHERE D = CONDUCTOR DIAMETER, N = NO. OF CONDUCTORS

DIFFERENCES IN PAIR TWISTING

THE MOST COMMON COMMERCIAL PAIR-FORMING MACHINES ARE CALLED “TWINNERS.” THIS TYPE OF PAIR-FORMING IS THE LEAST EXPENSIVE WAY TO FROM TWISTED PAIRS. HOWEVER, PAIRS FORMED ON THIS TYPE OF EQUIPMENT HAVE BEEN KNOWN TO EXPERIENCE DEFORMATION OF THE STRANDED COPPER, STRAIN IN THE INSULATION AND POOR ELECTRICAL BALANCE.

THE SUPERIOR METHOD OF PAIR-FORMING IS BY USE OF A PLANETARY OR TUBULAR CABLING MACHINE IN SUCH A MANNER THAT NO RESIDUAL TWIST IS IMPARTED TO THE INDIVIDUAL WIRES FORMING THE TWISTED GROUP. THIS RESULTS IN BETTER ELECTRICAL BALANCE AND IMPROVES FLEXIBILITY.

NATIONAL IS EQUIPPED FOR ALL OF THE ABOVE DESCRIBED TECHNIQUES. CHOOSE THE METHOD BEST SUITED FOR YOUR PARTICULAR APPLICATION.

Custom Cable Assemblies for Medical Applications and more.

National Cable Molding is one of the United States' premier suppliers of custom molded electrical assemblies for medical applications.

Our capability for very high quality, complex assemblies, short to medium runs and fast prototyping provides a perfect fit for a wide range of products in the electronics industry.

We also offer a highly experienced engineering staff who can assist you in the development of your product.

National Cable Molding

Custom Cable Assemblies

a Division of National Wire and Cable

NATIONAL CABLE MOLDING UL REGISTERED FIRM ISO 9001:2008 AS9100

FDA REGISTERED 2020439

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National Wire and Cable and National Cable Molding Headquarters
Los Angeles California

CAPABILITIES

National Cable Molding
Custom Cable Assemblies
a Division of National Wire and Cable

- Medical
- Business Machines
- Communications Equipment
- Computer Equipment
- Audio Systems
- General Instrumentation

National Cable Molding specializes in custom cable assemblies with integral-molded connectors. Our products are designed mainly for the medical environment where quality and reliability are critical. Over the last 35 years our cables have proven themselves time and time again under the most adverse conditions

National Cable Molding shares the same manufacturing facility as the parent corporation, National Wire & Cable. This allows for very tight control over the cable products that we use and eliminates the problems normally associated with buy-out components. Vertical Integration of the manufacturing process is what enables us to deliver superior quality products.

National Cable Molding can build to your exact specifications, or our engineering staff can assist you with designing the right assembly for your application.

Options include molding on an industry standard connector for superior mechanical properties, or integral molding a custom connector to fit your specific application.

THE INTEGRAL MOLDING CONCEPT

National Cable Molding
Custom Cable Assemblies
a Division of National Wire and Cable

What is the Integral Molding Concept?

1. Bulk cable ends are stripped, individual electrical contacts are attached to wires.
2. Cable end with contacts attached is placed inside proprietary mold tooling system.
3. Hot plastic is injected into tool by unique high-speed molding equipment.
4. Finished connector comes out of tool ready to use. Created directly around cable, contacts and shell.
5. A conventional connector is not used or attached to cable. Instead we form the connector body around the cable and pins by unique molding processes.

Why Integral Molding is Better:

1. Professional custom-made appearance.
2. More compact, light weight.
3. Highly reliable molded construction.
4. Cable assemblies are supplied ready to use.
5. Permits a wide choice of custom connector shapes.
6. Permits a large cost savings due to high-production techniques.

Unique Advantages:

To Purchasing

1. No connectors to buy and stock.
2. No bulk cable to buy and stock.
3. In-house assembly and soldering people not required. Training is unnecessary.
4. Cable assemblies arrive complete - ready to use.
5. Shipments scheduled to meet your needs, minimizing your inventory.
6. You deal direct with the original manufacturer of both cable and connectors.
7. No odd hardware and connector accessories to buy and stock.
8. Very low cost compared to conventional construction.

To Engineering

1. Highly reliable due to embedded construction in connector and wires.
2. No failures due to shorts. Molded insulation is excellent dielectric material.
3. Molded insulation provides a distributed strain-relief to all wires and the cable jackets, minimizing failure due to axial strain on the cable.
4. Consistent low capacitance between circuits.
5. Connector body outer surfaces are resilient, crack-proof, dent-resistent
6. Connector Pins cannot “pull back” or move due to cable tensions.

To Designers

1. Permits unlimited choice of custom connector shapes for special applications.
2. Molding allows certain shapes which cannot be obtained in metal connectors.
3. Permits wide choice of colors for connector and cable.
4. Molding allows use of plastic or metal inserts, clips, threaded nuts and other embedded materials not available in standard connectors.

To Marketing

1. Molded connectors have a custom professional appearance.
2. Molded connectors and cable can be color-matched to the equipment.
3. Molded connectors cannot tarnish. They’re always glossy, neat in appearance.
4. Your company name, trademarks or part number may be a permanent part of your connector surface.
5. Pricing advantages due to low cost of molded cables.

To Production Managers

1. In-house assembly and soldering personnel not required.
2. Inventory of cable & connectors not required.
3. Assembly personnel training not required.
4. Plant floor-space for assembly operation is free for other uses.
5. No investment in high-production cable-terminating equipment.
6. A single source is responsible for delivery of cable, connectors and effort to provide the finished item, permitting a unified control to meet our schedules.

For Quality Control

1. A single source is responsible for connectors, bulk cable, assembly and molding.
2. Separate inspections of connectors, cable, soldering are avoided.
3. Cable assembly arrives as a single unit; ready for acceptance.
4. Inspection labor time is a minimum.

THE INTEGRAL MOLDING CONCEPT

National Cable Molding
Custom Cable Assemblies
a Division of National Wire and Cable

The Overall Picture:

Integrally-molded connectors on cable assemblies are being used in increasingly wider applications by manufacturers whose product uses cord or cable assemblies.

The custom professional appearance, reliability and economy of connectors molded on the cable makes this type of assembly a logical choice over conventional methods.

The fact that a molded connector may be custom-shaped for economy, often permits a better product plus added economy, compared to conventional methods.

Although integrally-molded connectors lend themselves to high-volume production, short runs (100 pieces) are still practical due to our proprietary molding and tooling technology plus our selection of standard adjustable tooling.

We provide complete design and engineering services to assist in specifying molded cable and connectors.

As the manufacturer of all components involved in a molded cable assembly, we are able to exercise unified control of design, engineering and manufacture of all wire, cable, contacts, hardware, molding and tolling to produce truly professionals, quality molded-connector cables economically and promptly.

These quality ready-to-use cable assemblies, made to your specifications, delivered promptly, ease the load on your purchasing, supervision and production.

The Cable

National has a complete wire and cable mill for manufacturing all types of control cable and special-purpose electronic wire. We specialize in custom cable manufacture. These facilities allow us to furnish exactly the cable needed for your particular product, tailored to your own specifications.

Features: Special colors of outer plastic jacket; name or part number permanently embossed in surface of cable jacket; ultra flexible cable constructions; ultra low capacitance cables; special shielding techniques for low noise cable; engineering and design service for your special requirements.

Many standard cable constructions are carried in our warehouse where we stock over 300 different control cable types, in addition to our 100 million foot inventory of electronic hook up wires. These stocks, plus normal 2-shift factory operation, allow rapid supply of cable for molded cable assemblies.

The Connector

National's proprietary molding and tooling techniques allow us to create the connector directly on the cable by embedding cable, contacts and hardware in hot-injected plastic. Thus a conventional purchased connector is not used with consequent savings.

A connector may be only one pin molded to a leadwire or may have dozens of contacts molded onto large cable with embedded hardware. We mold on a wide selection of connectors using our standard contacts and hardware. Some common types are:

Male and female plugs on cable
Male and female contacts on leadwires
Medical electrodes
Short plugs
Molded leg breakouts on cables
Molded yokes on cables
Y and Y molded splices
Test probes and leads

The Tools

We invite your inquiries on our standard or special connector styles. Our engineering staff will be pleased to discuss your particular requirements.

The tools for high-speed injection molding are precision machines in themselves, having high-accuracy fits on internal and external portions.

By proprietary molding and tool-making techniques on our special machinery, we are able to tool cable-connector designs at greatly reduced cost compared to conventional methods.

These great savings are passed on to the customer in the form of lower unit prices.

A wide variety of standard cable-connector tools are available for producing your assembly with no tooling costs. Often our mold specialists can adjust our non-standard tools for your special needs with only a minor engineering change.

Due to their proprietary nature, tools are generally retained by us when they may be used on other work by adjustments. Where the customer must have privacy of use, there is a nominal engineering change.

How to get the Ball Rolling

1. Specify the type of cable
   a. number of conductors and wire gauge
   b. voltage ratings, shielding

   We carry many standard cables, or will make cable to your exact needs.

2. Specify connector your assembly must mate
   a. number of contacts
   b. shell style or type -- manufacturer's part number desirable

3. Specify quantity, cable length and delivery rate you'll need

4. Specify colored or special marking you prefer
   a. your name or part number on cable sheath
   b. your name or part number on connectors
   c. cable or connector color

Technical Notes

Connectors with round shells may have several clocking angles and keyway positions, allowing simple polarization of similar plugs. right-angles cable exit direction may also be controlled by position of keyway. Integrally-molded plastic strain-relief tube may be included on any connector.

Raised markings may be included on connector. Bold Gothic type is normally used. Trademarks may also be molded-in. Permanent indent-marking is available on cable sheath.

Threaded molded-in inserts for screws, external fittings are available, also alligator flat-jaw clamps and chain loops. Consult our engineering for details of accessories and mounting.

Special-purpose exterior surface shapes are available, such as flats, inset or raised areas, slots, grooves, keys, through or blind holes, finger grips, knurled or patterned areas. Consult our design service for suggestions and innovations.

National Cable Molding
Custom Cable Assemblies
a Division of National Wire and Cable

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National Cable Molding
Custom Cable Assemblies
a Division of National Wire and Cable

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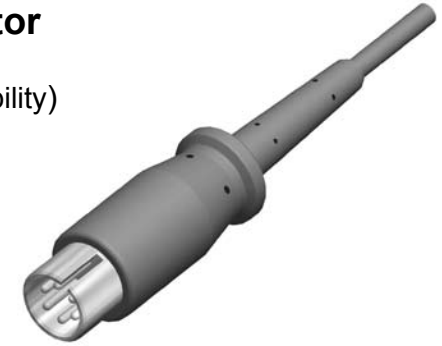
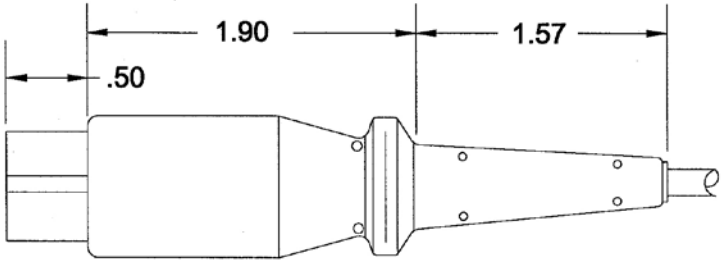
Military Style Connector

Strain Relief Version

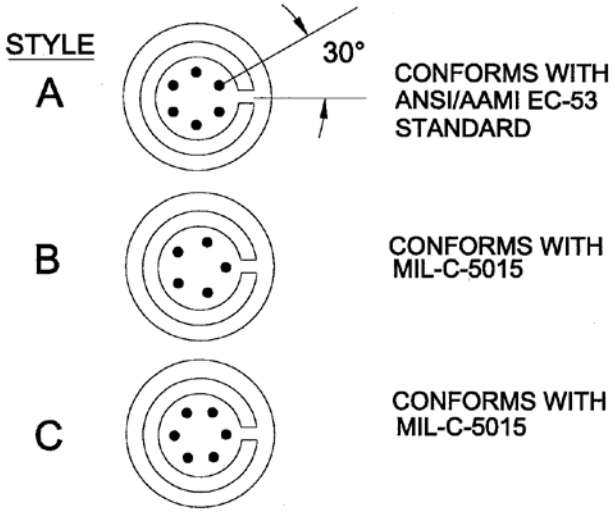
(with molded-in resistor capability)

Mold No. T-151





PIN ARRANGEMENTS



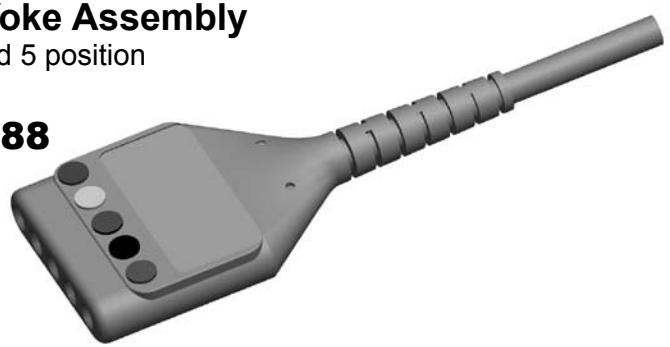
National Cable Molding
Custom Cable Assemblies

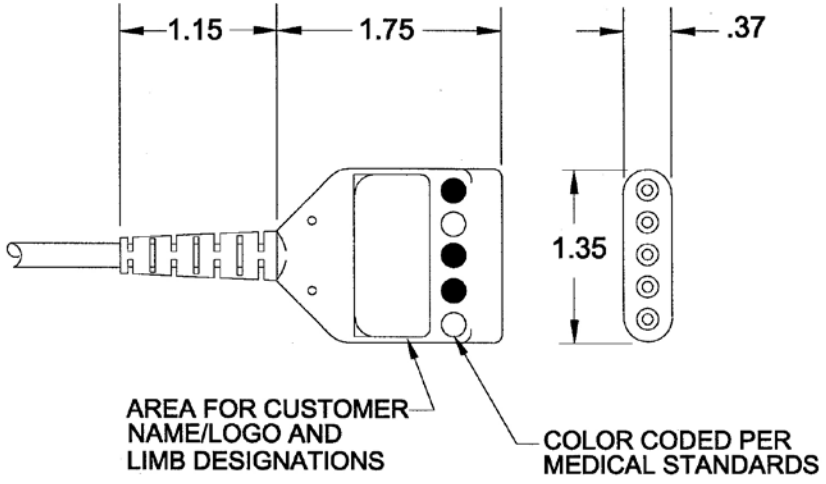
Strain Relief Yoke Assembly

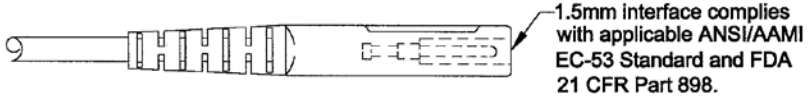
Available in 3, 4 and 5 position

(5 position shown)

Mold No. T-188





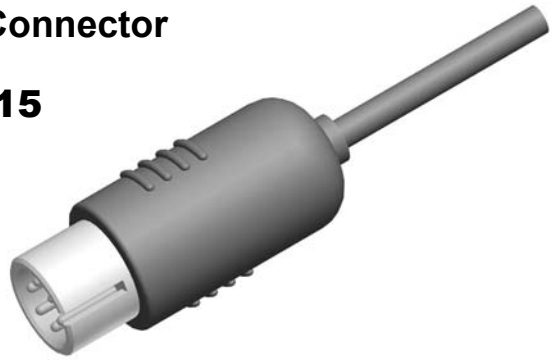


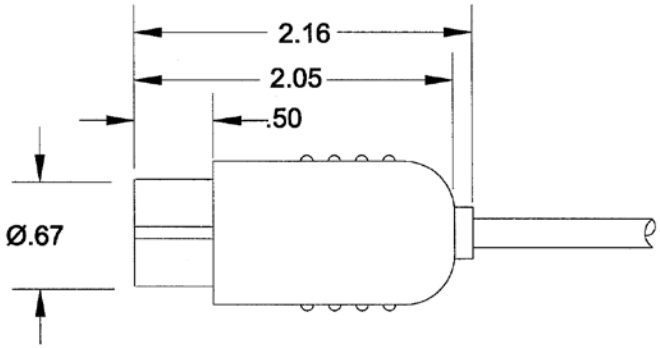
1. Assembly may be ETO gas sterilized.
2. Optional colors for cable and yoke assembly are medium gray, light gray and black. (Color matching available).
3. Mates with leadwire assemblies as shown on sheets 14 and 15.
4. Bedsheet clip cable strap available (see sheet 13).

Military Style Connector

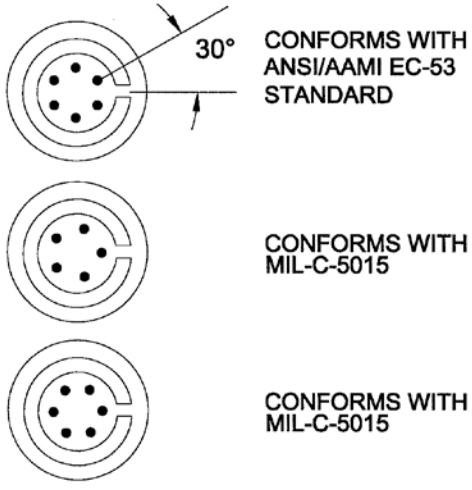
Standard Version

Mold No. T-115





PIN ARRANGEMENTS



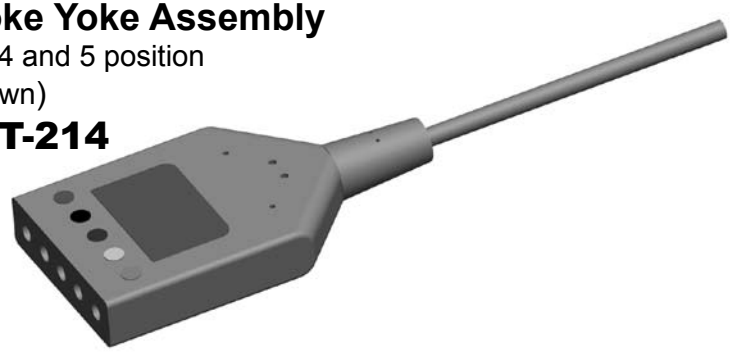
National Cable Molding
Custom Cable Assemblies

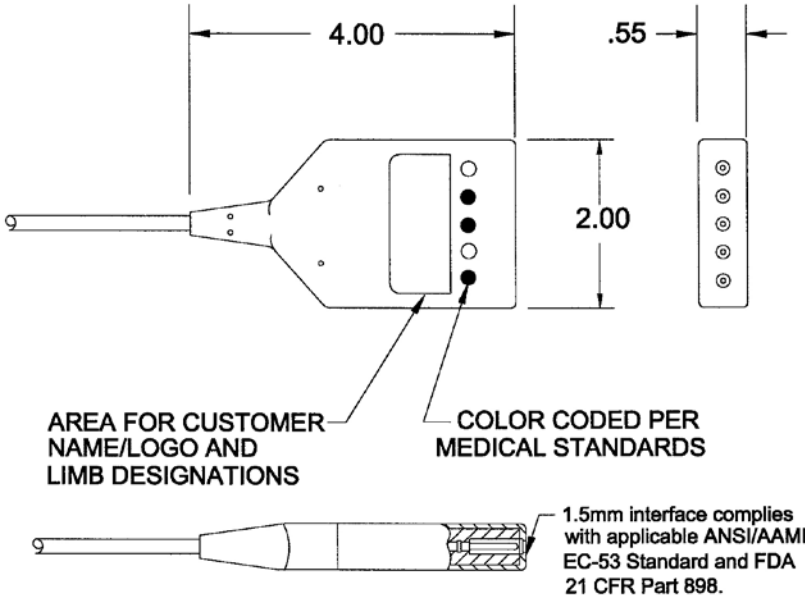
Safety Choke Yoke Assembly

Available in 3, 4 and 5 position

(5 position shown)

Mold No. T-214



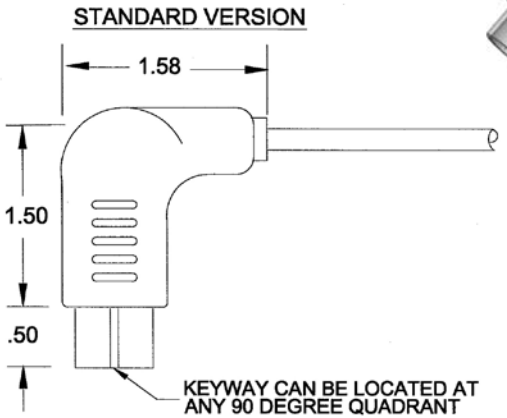


1. Assembly may be ETO gas sterilized.
2. Yoke capable of molded -in 1 Watt resistors and RF chokes in each position.
3. Optional colors for cable and yoke assembly are: Medium gray, light gray and black. (Color matching available).
4. Mates with leadwire assemblies as shown on sheets 14 and 15.
5. Bedsheet clip cable strap available (see sheet 13).

Right Angle Military Style Connector

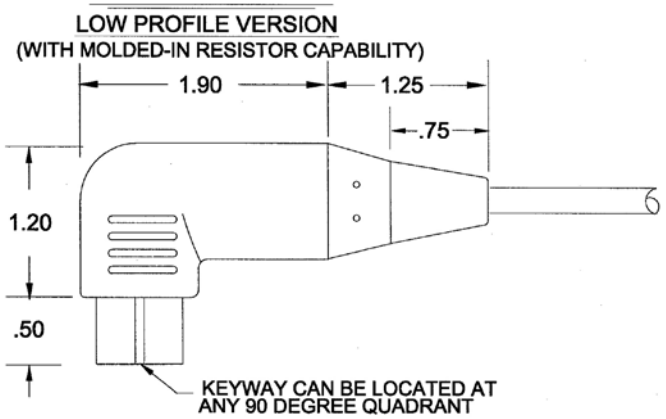
Standard Version

Mold No. T-102



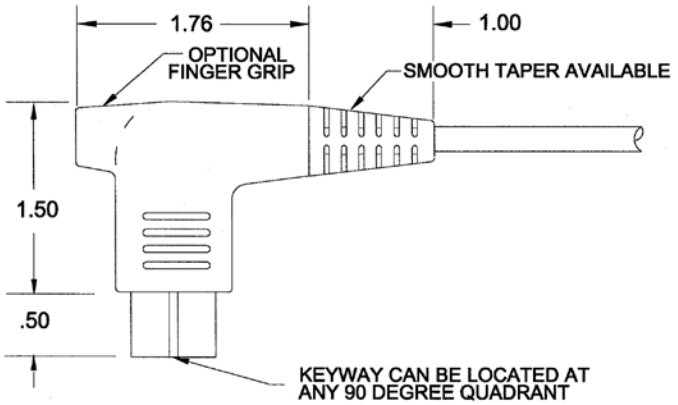
Low Profile Version
(with molded-in resistor capability)

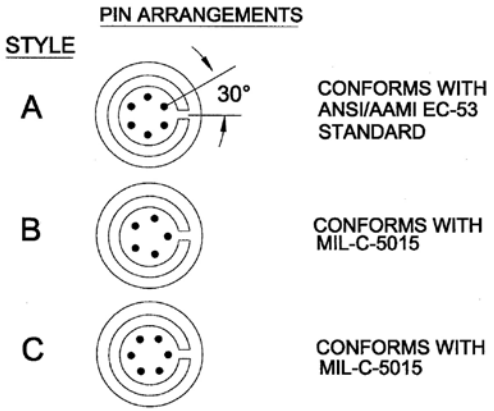
Mold No. T-215



Strain Relief Version

Mold No. B-01-090

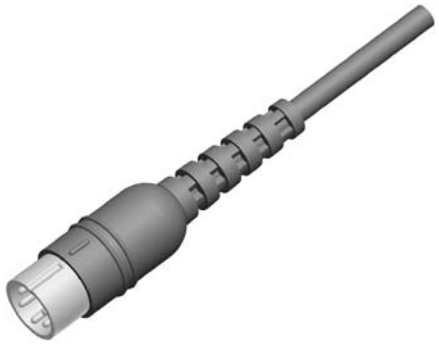


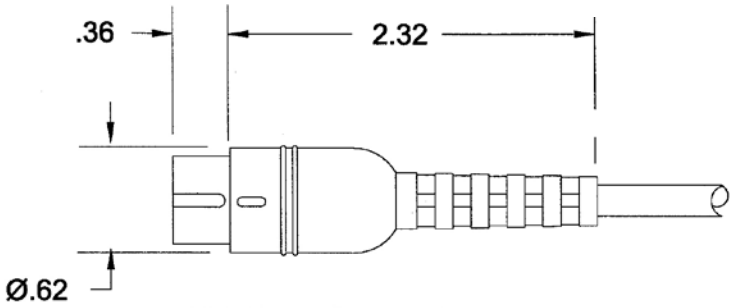


DIN Connector

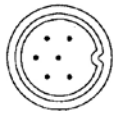
Strain Relief Version

Mold No. T-180





PIN ARRANGEMENTS

STYLE		
A		5 PIN AT 180°
B		5 PIN AT 240°
C		6 PIN AT 240°
D		7 PIN AT 270°

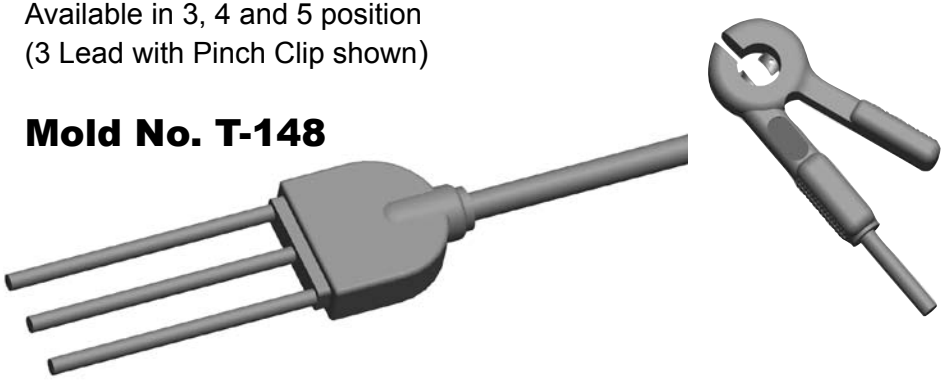
National Cable Molding
Custom Cable Assemblies

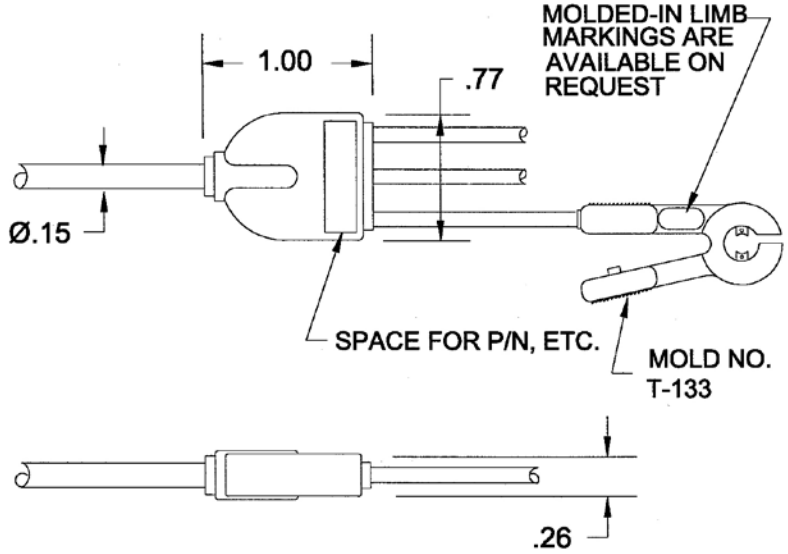
Miniature Yoke Breakout Assembly

Available in 3, 4 and 5 position

(3 Lead with Pinch Clip shown)

Mold No. T-148



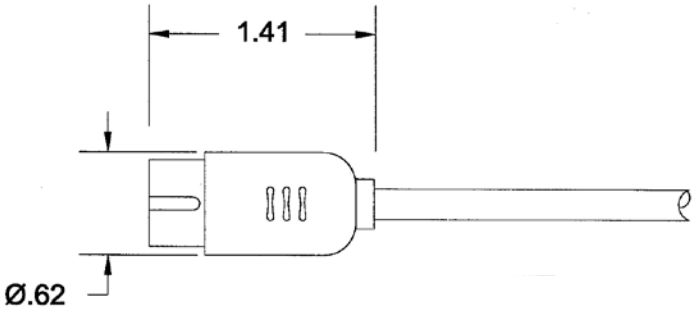


1. Assembly may be ETO gas sterilized.
2. Optional colors for cable and yoke assembly are: Medium gray, light gray and black. (Color matching available).
3. See sheet 8 for additional yoke breakout lead terminations.

DIN Connector

Standard Version

Mold No. T-109



PIN ARRANGEMENTS

STYLE		
A		5 PIN AT 180°
B		5 PIN AT 240°
C		6 PIN AT 240°
D		7 PIN AT 270°

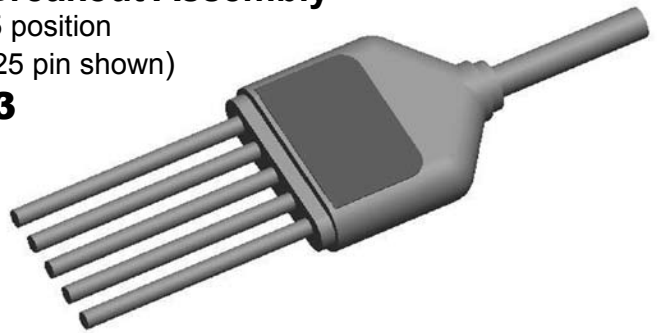
National Cable Molding
Custom Cable Assemblies

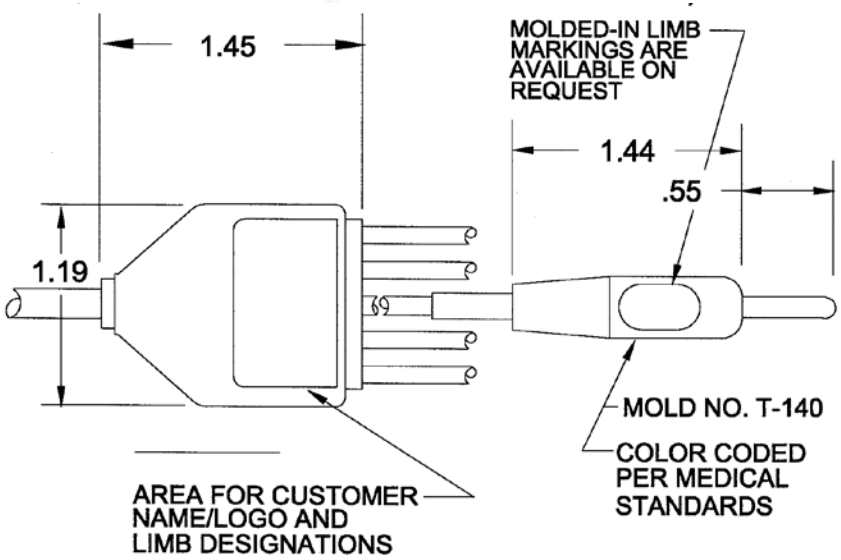
Standard Yoke Breakout Assembly

Available in 3, 4 and 5 position

(5 lead version with 125 pin shown)

Mold No. T-103



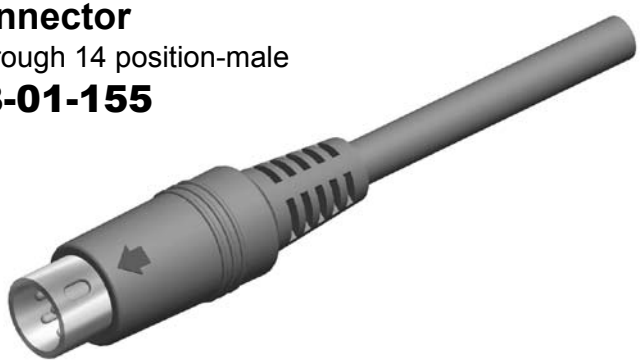


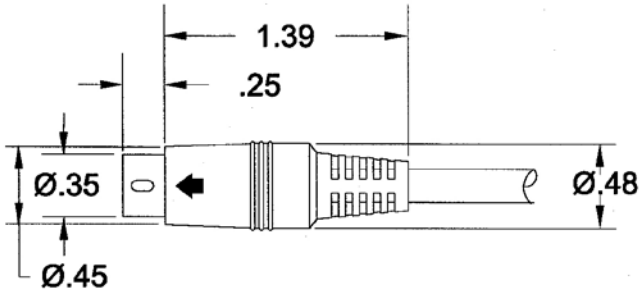
1. Assembly may be ETO gas sterilized.
2. Optional colors for cable breakout assembly and leads are: medium gray, light gray and black. (Color matching available). Colored leads available.
3. See sheet 8 for additional yoke breakout lead terminations.
4. Lead retainer with bedsheet clip available (see sheet 13).

Mini DIN Connector

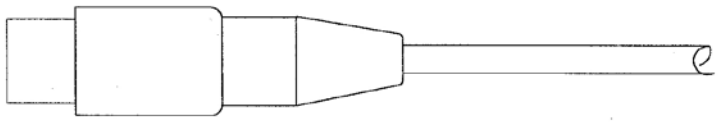
Available in 3 through 14 position-male

Mold No. B-01-155





ACCESSORY CONNECTOR



CUSTOMER SPECIFIED CONNECTOR CAN BE INSTALLED ON REQUEST

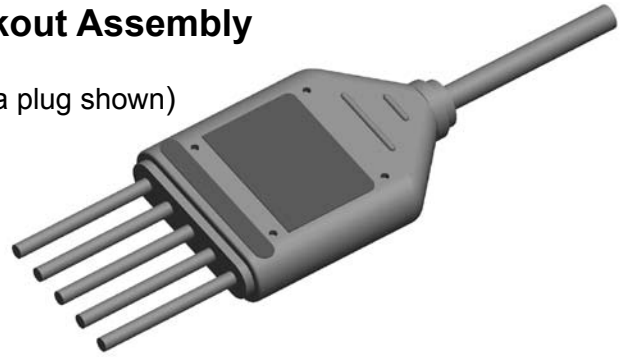
National Cable Molding
Custom Cable Assemblies

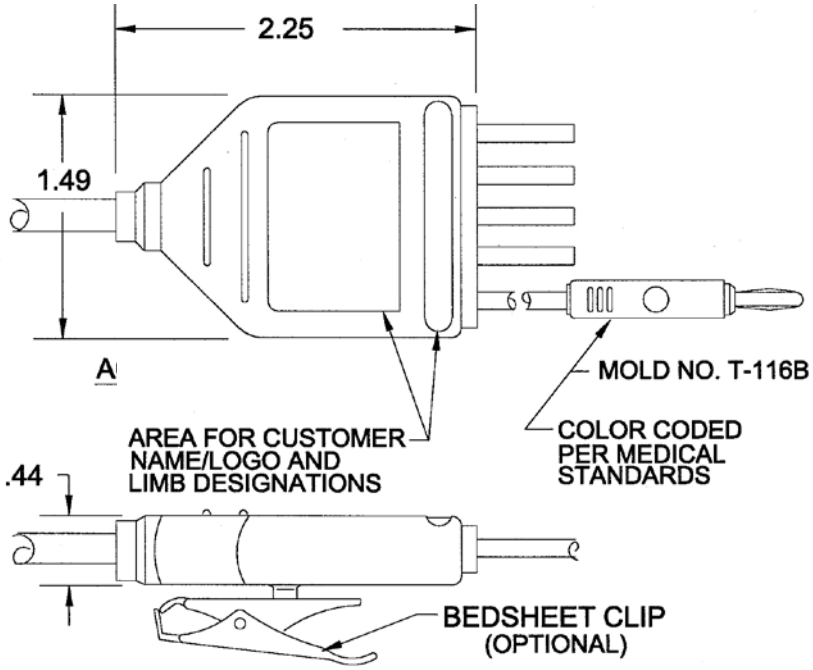
Resistor Yoke Breakout Assembly

Available in 3, 4 and 5 lead

(5 lead version with banana plug shown)

Mold No. T-131



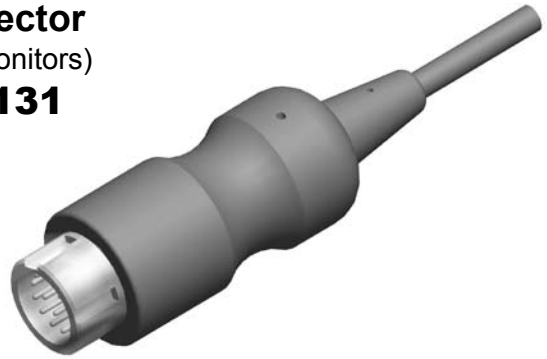


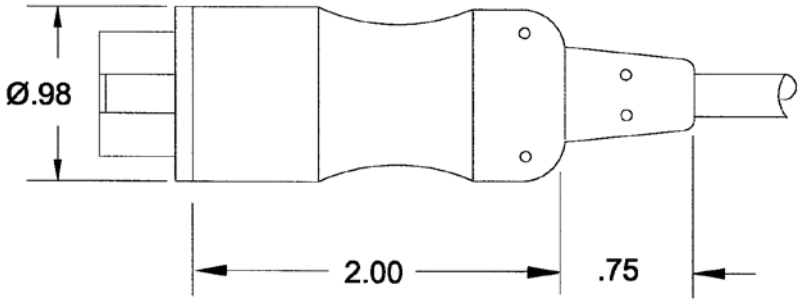
1. Assembly may be ETO gas sterilized.
2. Yoke capable of molded-in series resistors (1 Watt or smaller for each position).
3. Optional colors for cable and breakout assembly are: Medium gray, light gray and black. (Color matching available). Colored leads available.
4. See sheet 8 for additional yoke breakout leads terminations.

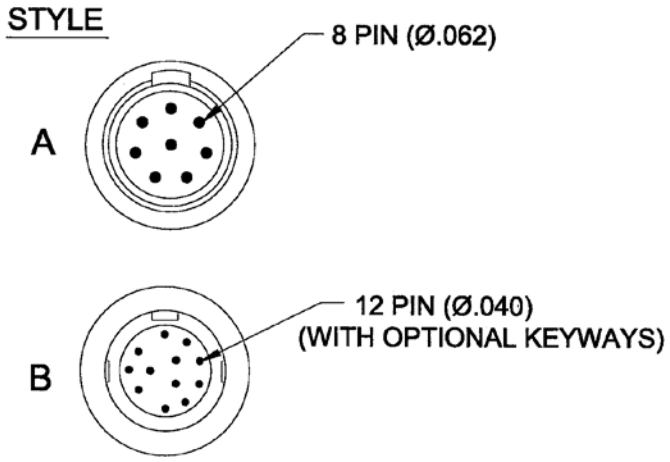
Instrument Connector

(Compatible with HP monitors)

Mold No. B-01-131







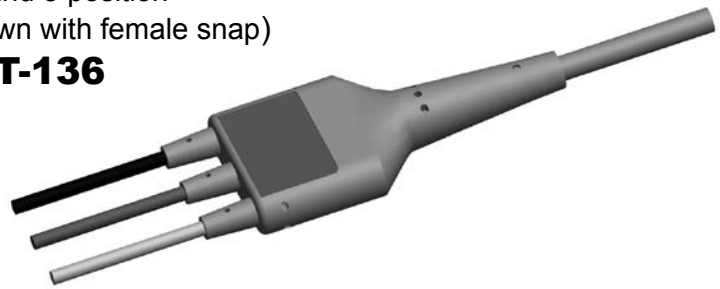
National Cable Molding
Custom Cable Assemblies

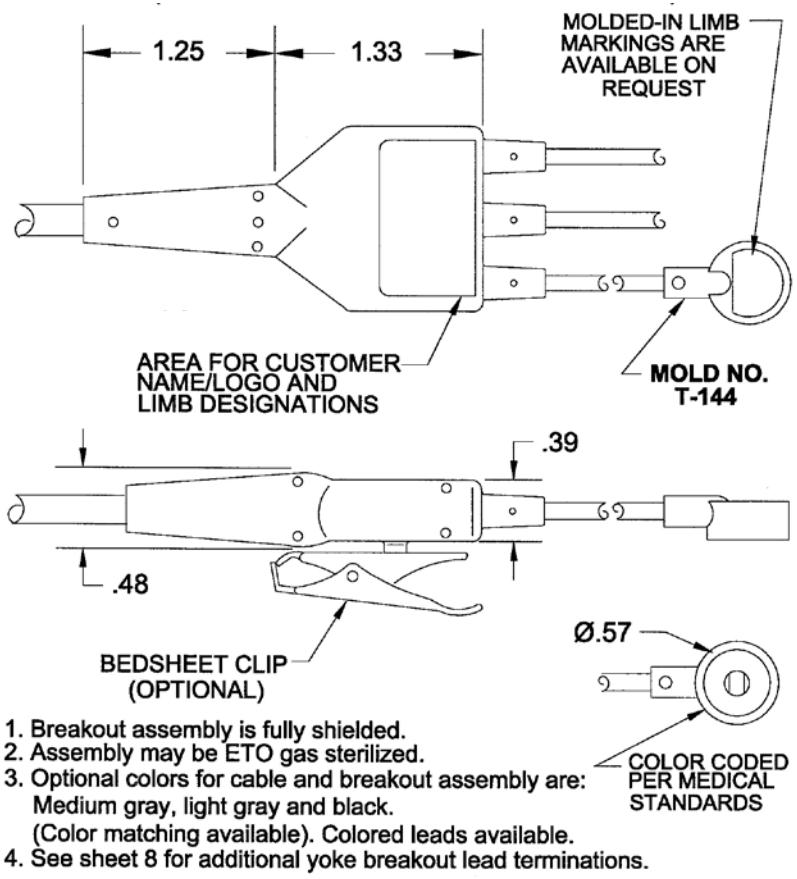
Strain Relief Yoke Breakout Assembly

Available in 3 and 5 position

(3 position shown with female snap)

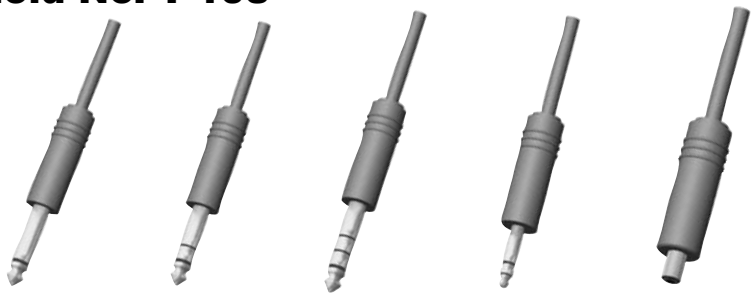
Mold No. T-136

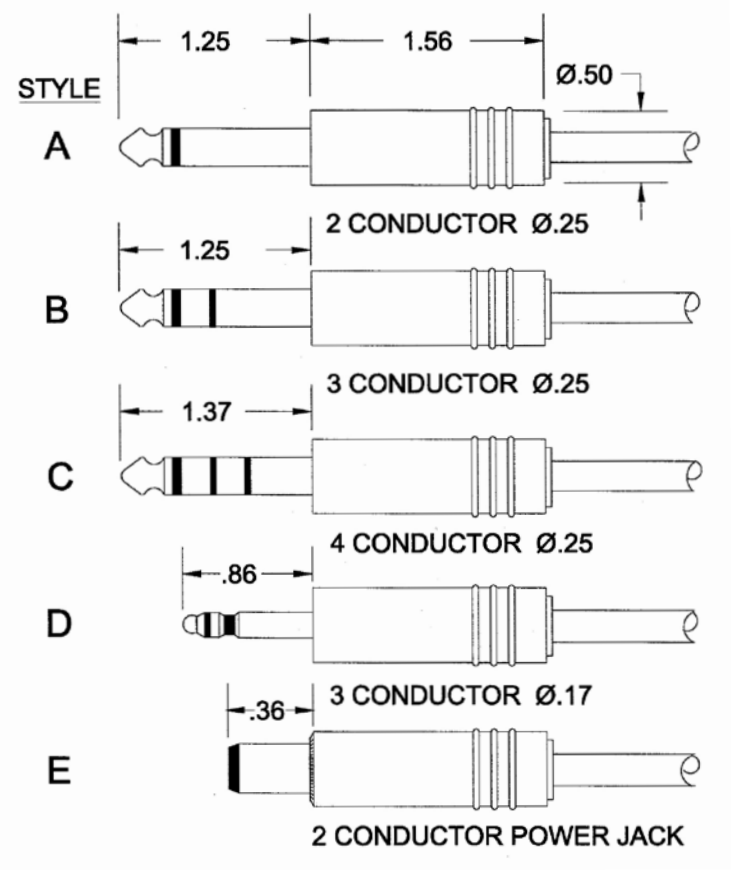




1. Breakout assembly is fully shielded.
2. Assembly may be ETO gas sterilized.
3. Optional colors for cable and breakout assembly are: Medium gray, light gray and black. (Color matching available). Colored leads available.
4. See sheet 8 for additional yoke breakout lead terminations.

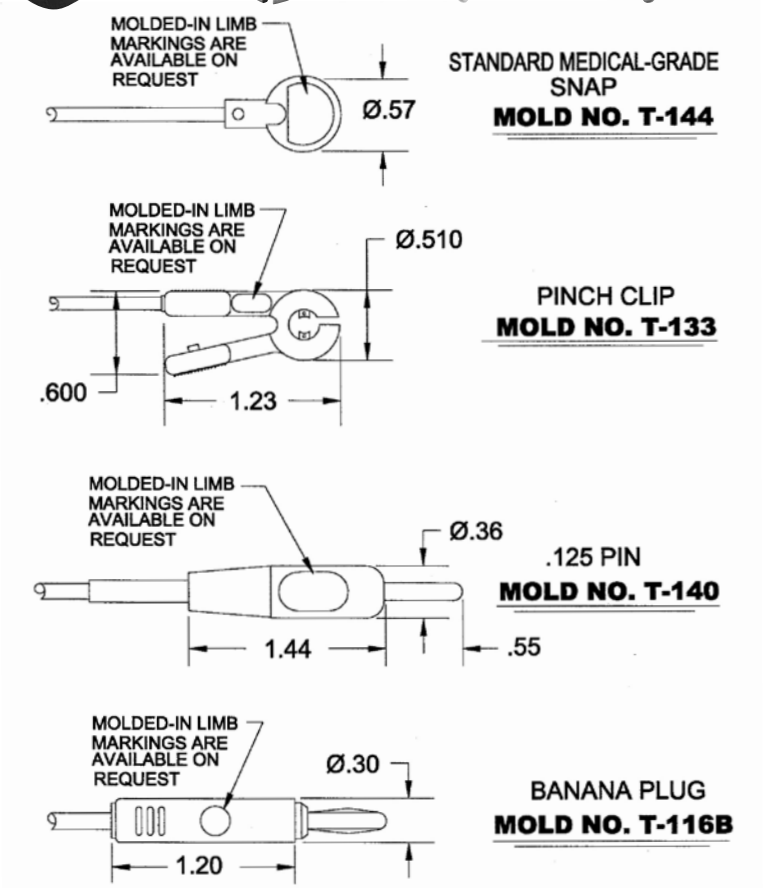
Phone Plugs
Mold No. T-108



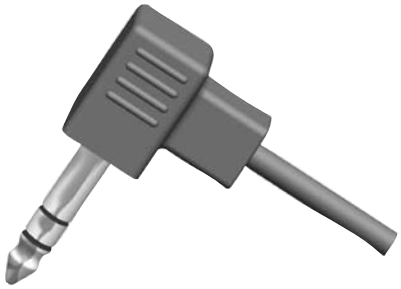


National Cable Molding
Custom Cable Assemblies

Yoke Breakout Lead Terminations

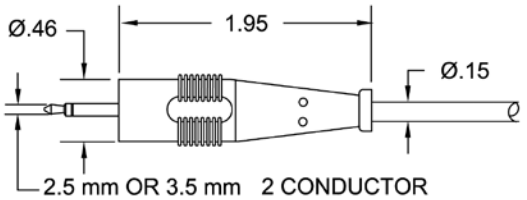


Additional Phone Plug Connectors

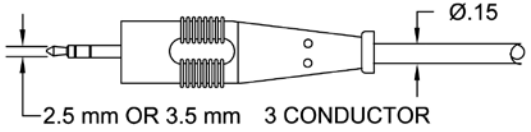


STYLE

A



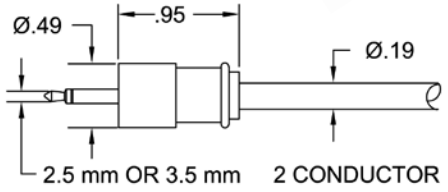
B



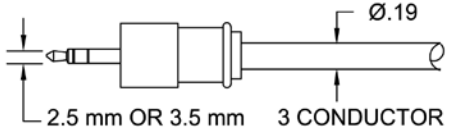
MOLD NO.T-116B

STYLE

D

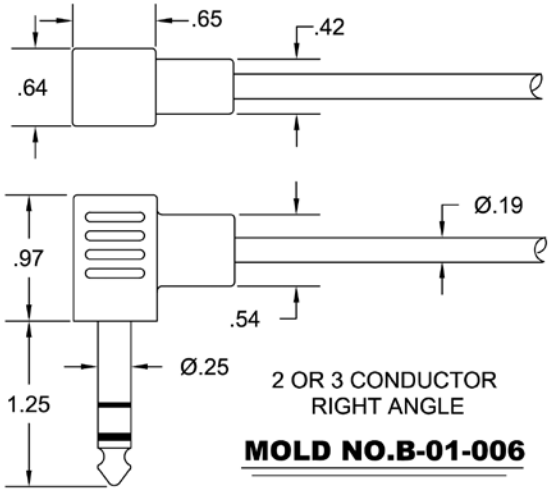


E



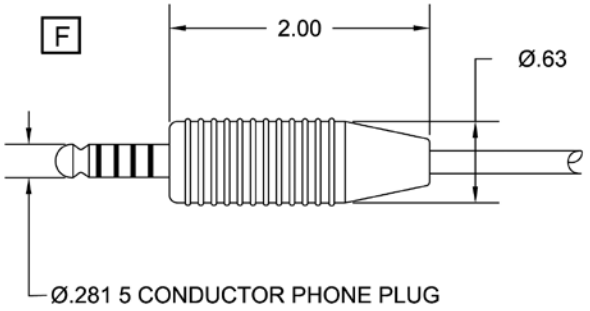
MOLD NO. B-01-026

C



MOLD NO.B-01-006

F



MOLD NO. B-01-205

Harness Assemblies

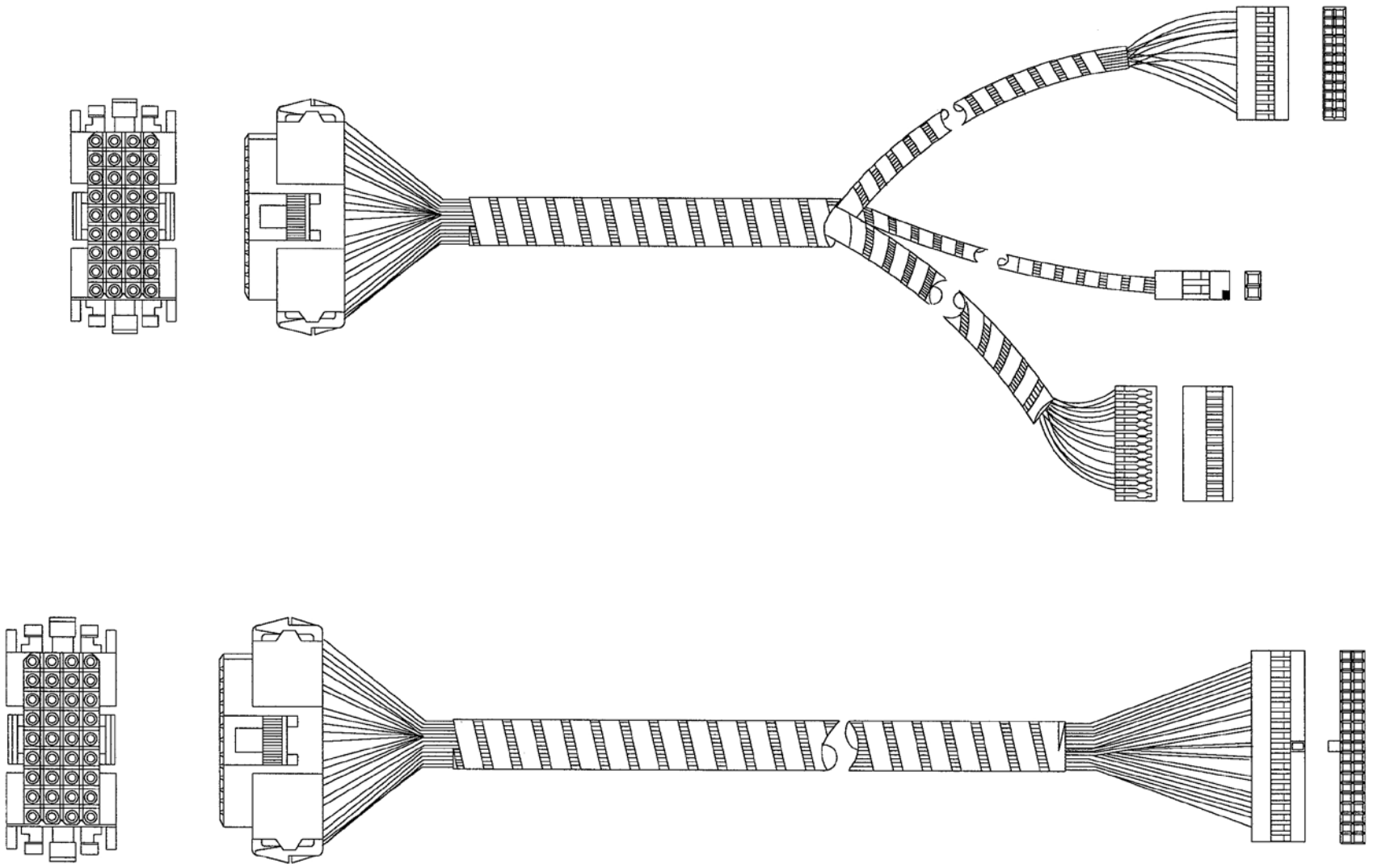
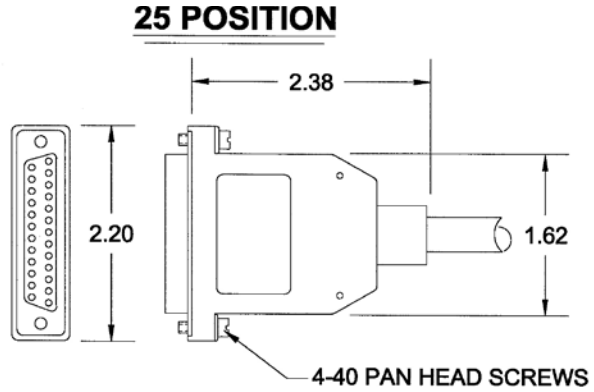
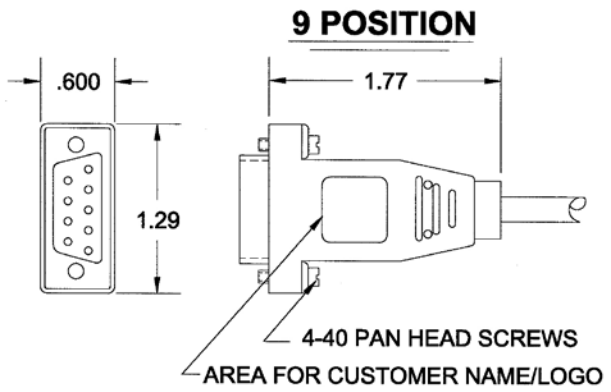


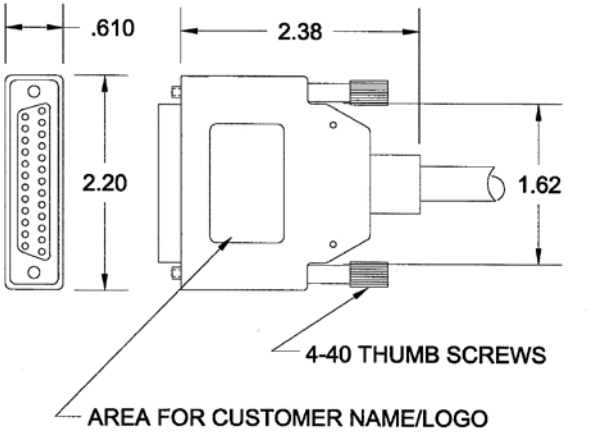
FIGURE 10

Subminiature D Connectors

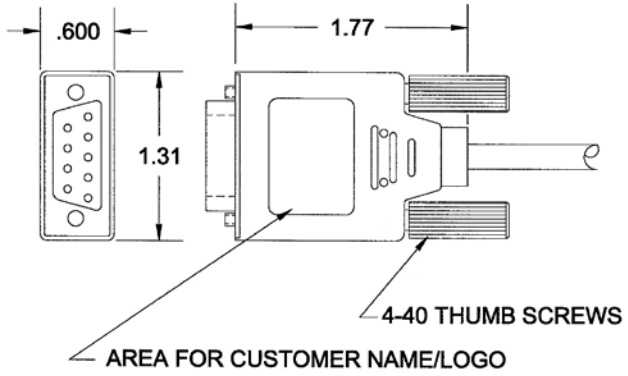




MOLD NO. T-236-1

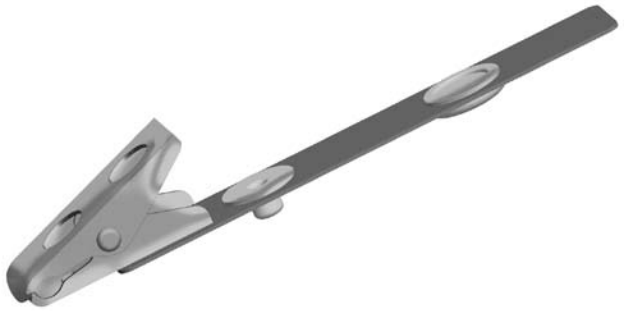


MOLD NO. T-238



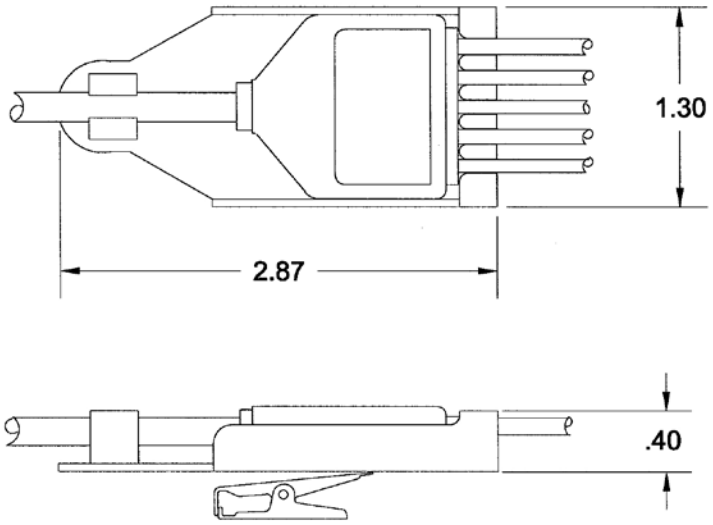
MOLD NO. T-236

Cable and Lead Retainers



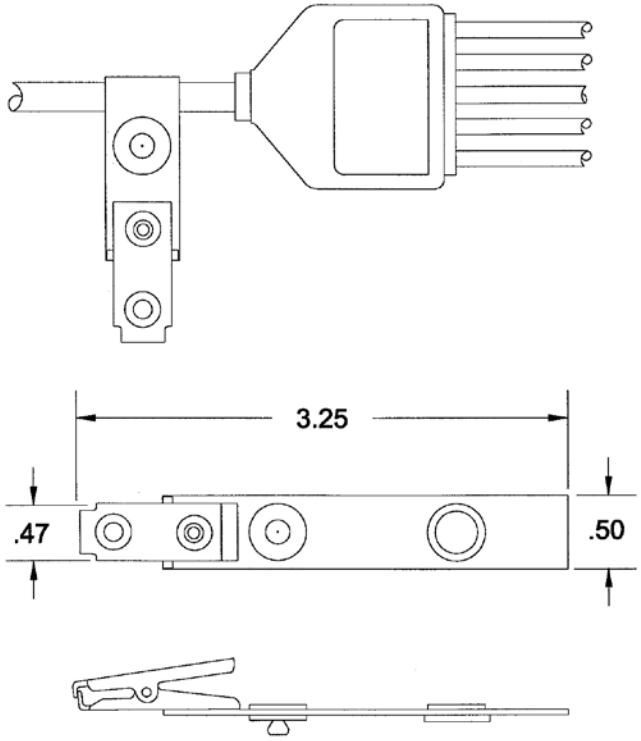
RETAINER LEAD ASSEMBLY

APPLICABLE TO T-103, 3 OR 5 LEAD YOKE ASSEMBLIES



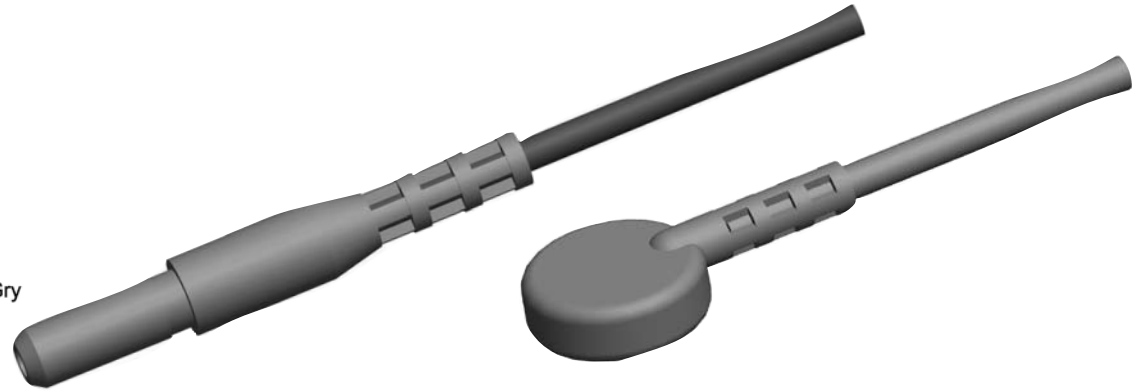
BEDSHEET CLIP WITH STRAP

APPLICABLE TO T-103, T-131, T-136



Molded Leadwire Assemblies

1. Molded assembly may be ETO gas sterilized.
2. Molded parts to be same color (Table 1.)
3. Lead wire assy. mates with T-188 and T-214 safety yokes.
4. Optional lead wire colors are: Blk, Wht, Red, Brn, Grn, Lt. Gry And medium gray (color matching available).
5. Insulated wire is 22 AWG consisting of 41 strands of 38 AWG tinned copper for high flexibility.



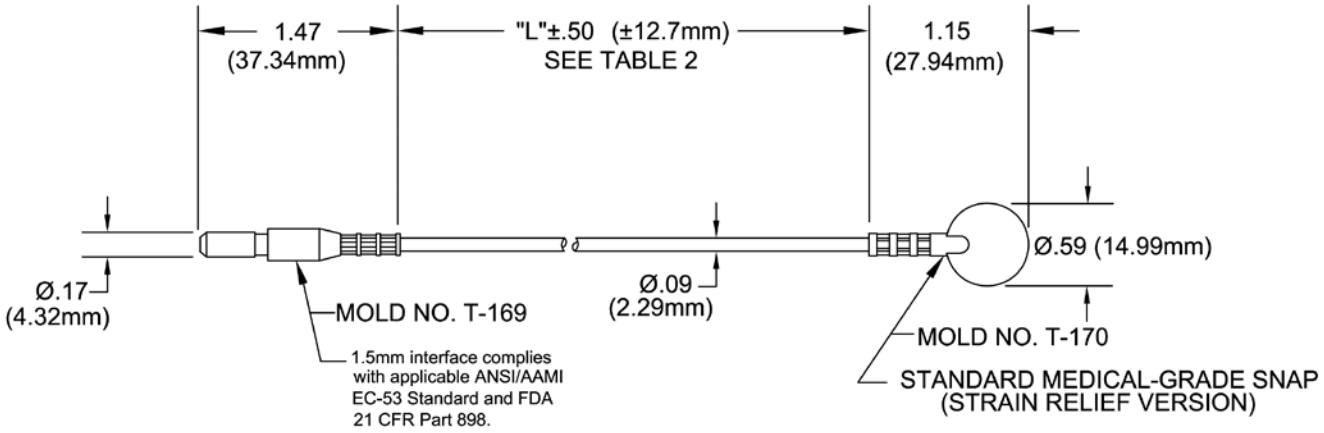
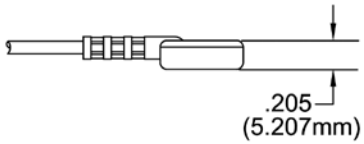


TABLE 1

DASH NO.	COLOR
-1	BLACK
-2	WHITE
-3	RED
-4	BROWN
-5	GREEN

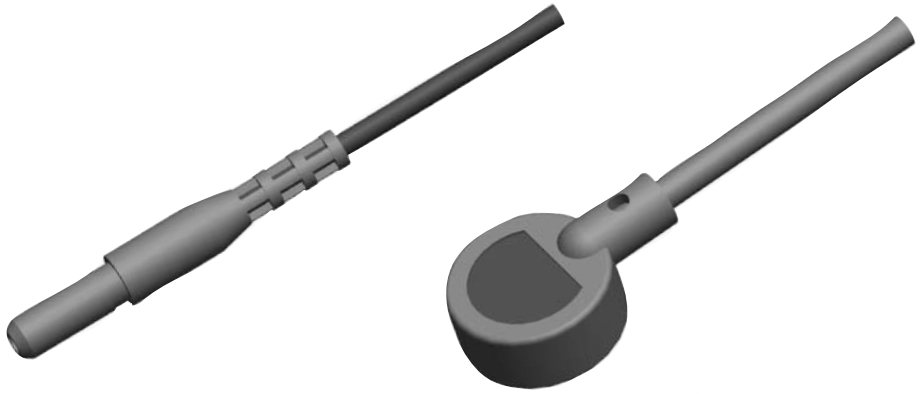
TABLE 2

DASH NO.	"L"(LENGTH)	
	INCHES	CM'S
-12	12	30.48
-16	16	40.64
-18	18	45.72
-24	24	60.96
-36	36	91.44



Molded Leadwire Assemblies

1. Molded assembly may be ETO gas sterilized.
2. Molded parts to be same color (Table 1.)
3. Lead wire assy. mates with T-188 and T-214 safety yokes.
4. Optional lead wire colors are: Blk, Wht, Red, Brn, Grn, Lt. Gry And medium gray (color matching available).
5. Insulated wire is 22 AWG consisting of 41 strands of 38 AWG tinned copper for high flexibility.



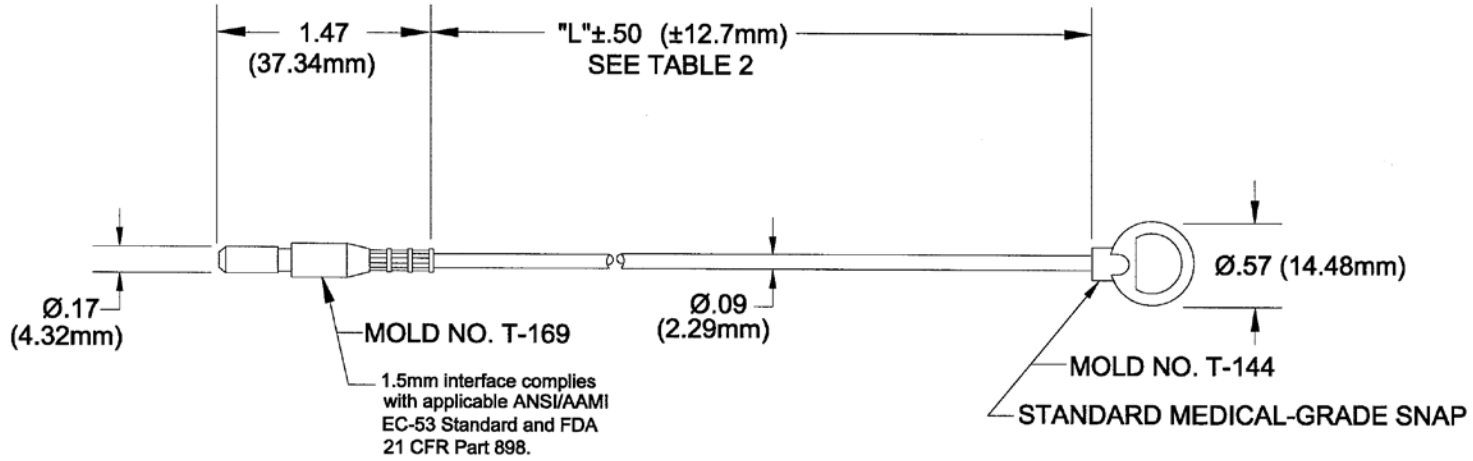
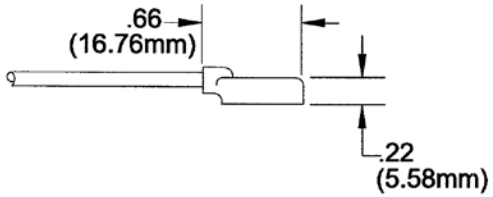


TABLE 1

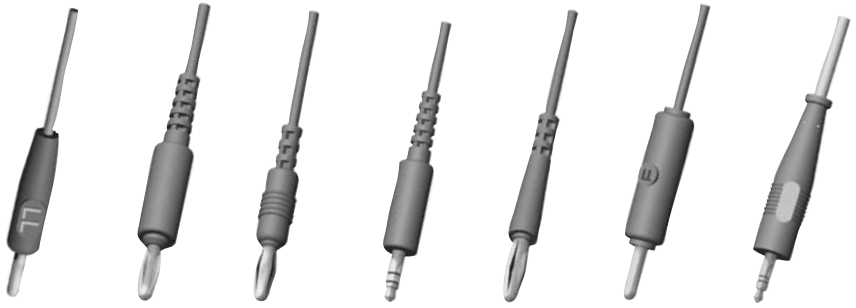
DASH NO.	COLOR
-1	BLACK
-2	WHITE
-3	RED
-4	BROWN
-5	GREEN

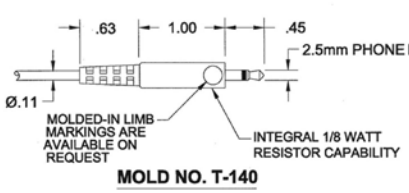
TABLE 2

DASH NO.	"L"(LENGTH)	
	INCHES	CM'S
-12	12	30.48
-16	16	40.64
-18	18	45.72
-24	24	60.96
-36	36	91.44

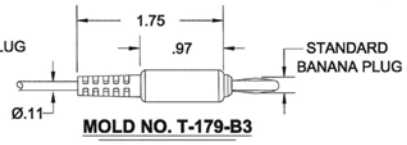


Additional Molded Leadwire Terminations

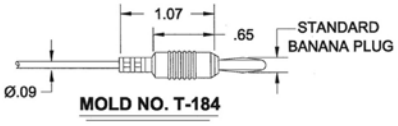




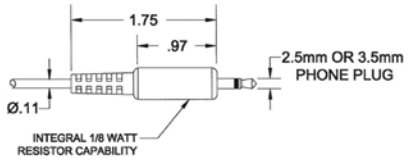
MOLD NO. T-140



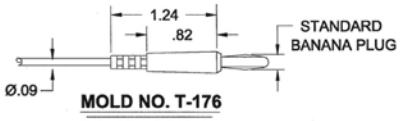
MOLD NO. T-179-B3



MOLD NO. T-184



MOLD NO. T-179-B3



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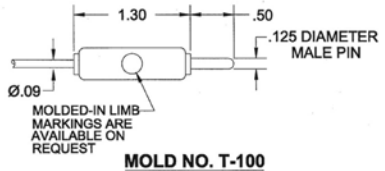

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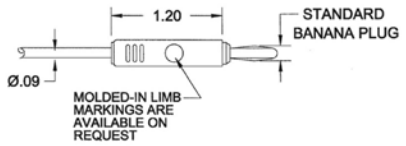

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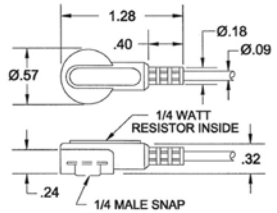

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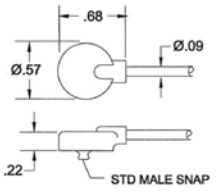

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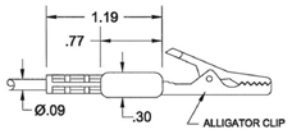

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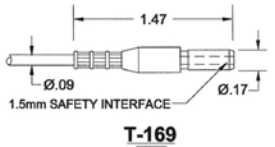

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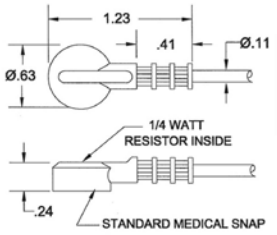

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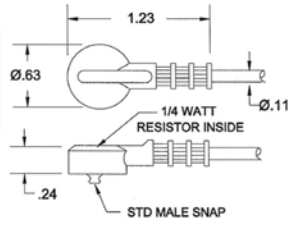

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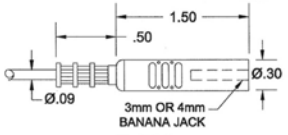

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National Wire & Cable
Custom Cable Manufacturing

Wire & Cable Design Guide

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www.NationalWire.com

CABLE DESIGNERS GUIDE
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CABLE GEOMETRY

Design Geometry of Multi-Conductor Cables

To those outside of the industry, the geometric design principles used in cable-making may not be apparent. To assist the customer in comprehensively discussing his needs with our factory engineering staff, we offer a brief guide to the major design options and tradeoffs available. A designers check list for specifying cable is offered elsewhere in this section. Not all are aware that for a given number of wires, several different geometry's may be used to form the wires into a helical cable bundle. Any of them may be justified, depending on cost, intended use and performance, or limitations of the manufacturers' equipment. National Wire & Cable Corp. has perhaps the widest and most versatile selection of modern cable-making equipment in the custom cable industry. We welcome your knotty design problems. Our 40 years of experience in wire & cable field are at your disposal.

Conductor Layup Geometry Options

A. Layer Upon layer

When all conductors have equal diameters they can be cabled in simple layers around a suitable core or central wire. Theoretically, every layer will contain 6 more wires than the preceding inner layer. This can be shown with a few round disks or coins. In practice this is not always true. Tolerances of insulation diameters enter the picture. Further, the conductors spiral in a helical path when formed into cable, and thus occupy an elliptically-shaped area around the circumference of the core. Typically, the eccentricity of the ellipse is about 5%. Thus about 19 conductors may fit, where 20 should if they were assumed to occupy a circular cross-section.

B. Subcabeling

For some constructions small groups of wires are helically cabled into subcables, which are then helically cabled to form the finished bundle. They may take these forms due to the end use requirements, (i.e.: where the design calls for twisted pairs, trios, etc.) or may do so mainly for the convenience of the lay-up of the required number of wires in an available site within the cable cross-section. Advantages of this method are improved flexibility of the cable, possible convenience in the intended end-use for the cable and the wide selection of geometry's it offers the designer. Disadvantages compared to the layer-on layer method are usually increased diameter and cost. Where there are hundreds of conductors in a cable, this method is often used to permit cabling on relatively small cabling machines.

C. Filling Interstices

When a cable contains a wide mixture of wire diameters, the larger wire sizes or subcables may be cable-formed so as to deliberately leave interstices large enough for the smaller wires to lie within tangent to two adjacent large wires, but not in contact with the inner layer or core.

D. Use of Fillers

Where a layer requires more wires than are available to properly fill all positions in that layer, round fillers are used to occupy the otherwise vacant sites. Their use ensures a round shape and provides adequate support for the outer layers of the construction. These may be spare wires, or of plastic rod, jute, or twisted yarns or tapes. They are often used as a core member, and may be deliberately designed into a layer to permit circumferential compression in a layer during flexing of the cable.

Cable Flexibility

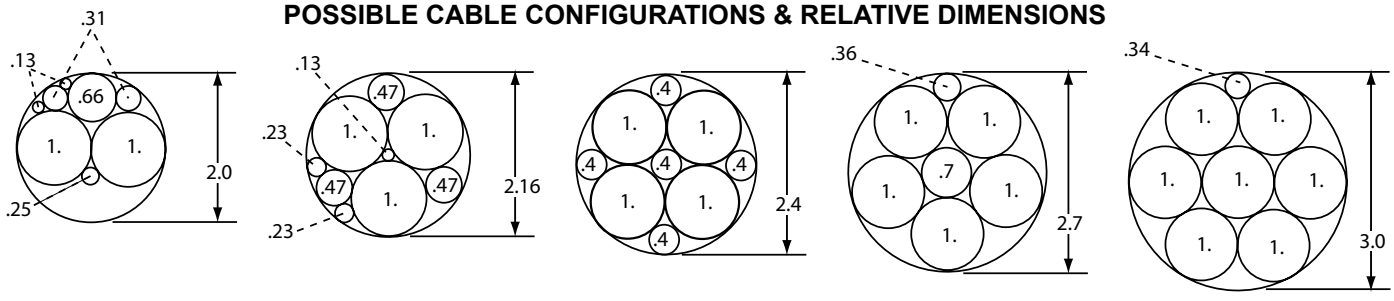
When a helically cabled bundle is flexed, each of the wires in a layer tend to slide along their helical path slightly with respect to the wires adjacent. If the wires are in firm contact around the entire layer, the friction between them inhibits the desired sliding action, and additional stiffness is imparted to the cable. Interlayer friction can also contribute to cable stiffness. In general, any stored radial forces which contribute to the friction should be avoided by proper design and manufacturing techniques. These forces may be from unduly snug jackets, braids, wraps, or serves.

Cable Flexibility Design Assistance

Due to the many variable factors which influence cable designs, we strongly recommend that the customer consult with our technical staff to ensure proper choice of dimensions and tolerances when he generates his own specification.

For design reference, a few of the common geometry's for subcabled and intersticed constructions are shown. The diameter of the large members is taken to be one unit of diameter. The size of the other members are shown as some decimal which relates their size to that of the large member. For layer-on-layer constructions, the table shows the factor by which the wire diameter can be multiplied to obtain the cabled bundle diameter.

POSSIBLE CABLE CONFIGURATIONS & RELATIVE DIMENSIONS



PAIR **TRIO** **QUAD** **QUINT** **6 AROUND 1**

DIAMETER OF HELICALLY CABLED BUNDLES*							
TO FIND THE CABLED DIAMETER OF A LAYER-ON-LAYER CONSTRUCTION, MULTIPLY THE DIAMETER OF A WIRE BY THE FACTOR SHOWN.**							
No. of Conductors	**Diameter Factor**	**No. of Conductors**	**Diameter Factor**	**Number of Conductors**	**Diameter Factor**	**Number of Conductors**	**Diameter Factor**
-	-	13-14	4.4	34-37	7.0	64-67	9.7
2	2.0	15-16	4.7	38-39	7.3	68-73	10.0
3	2.16	17-19	5.0	40-42	7.7	74	10.1
4	2.4	20	5.3	43-47	8.0	75-78	10.4
5	2.7	21-22	5.7	48	8.1	79-83	10.7
6-7	3.0	23-26	6.0	49-51	8.4	84-89	11.0
8	3.7	27	6.1	52-55	8.7	90-93	11.3
9-11	4.0	28-30	6.4	56-60	9.0	94-98	11.7
12	4.1	31-33	6.7	61-63	9.3	99-105	12.0

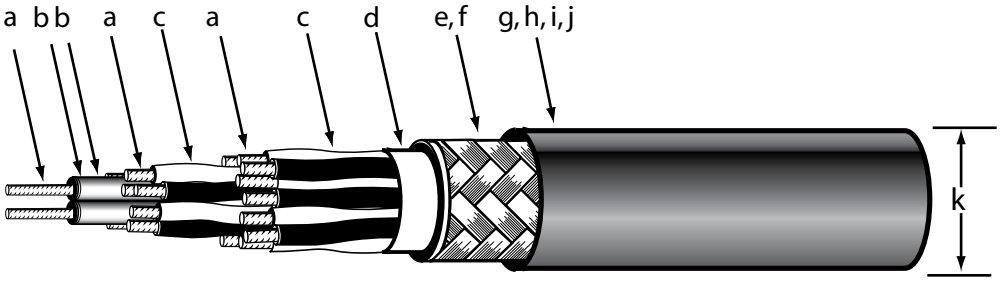
* All conductors are the same diameter

** (these factors are typical for standard helical cabling prectices; slight variations may occur on certain combinations)

HOW TO SPECIFY CABLE

Custom Cable Design Guide

If you plan to specify a special cable, we highly recommend a call to our "user Friendly" technical staff who can help speed you over the bumps.



In the absence of your own cable specification, the following checklist will assist you to completely specify the cable you want:

A. Number and gauge of conductors.
B. Specification type of wire (military or commercial).
C. Coding of conductors or subcables, striping or numbering, if any.
D. Tape barrier, used as first mechanical protective layer. Can be of Vinyl, Mylar, Tedlar, Polyethylene, or paper-fiberglass laminates.
E. Type of electrical shielding or mechanical armor.
F. % coverage required for electrical shielding
G. Type of outer jacket material.
H. Color of outer jacket, sheath markings.
I. Wall thickness of outer jacket.
J. Necessary physical or environmental requirements, see below.
K. Minimum and maximum overall diameter.

Physical Requirements

1. Length, tolerance; Diameter, tolerance.
2. Overall tensile strength, if applicable.
3. Weight limitations.
4. Minimum bend radius.

Environmental Requirements

1. Minimum and maximum operating temperatures.
2. Physical abuse: terrain, degree of movement of flexing, possible sudden impacts or pressures, etc.
3. Surrounding medium: water, oil, sunlight, ice, fuels, air, etc.

Electrical Requirements

1. Voltage rating of the conductor insulation.
2. Maximum current expected in the conductors.
3. Amount of electrical or magnetic shielding required.
4. Capacitance requirements.

HOW TO SPECIFY CABLE

Insulated Conductors

Specify quantity, gauge, stranding and insulation type for the conductors. Allowance of 10% spares is a common practice.

Preferably suggest an agency specification for the wires. (i.e.: UL, CSA, MIL and their proper type or style no.)

You may need a MIL reference to preferred wire types and jacket materials in various applications and environments.

Fillers

Fillers are used in lieu of a wire to fill space in a cable bundle so that it can retain its controlled shape and geometry. Their use promotes roundness and uniform flexibility.

Preferable fillers are plastic rods, tapes, or fibers, having physical properties similar to those of the wire insulation. Round glass-fiber braid can be used for high temperature applications. Fibrillated polypropylene is commonly used; cotton or jute is used less frequently.

Cables (within the main cable)

Individually cabled groups of wires within the cable may be referred to as sub-cables.

The constructional details of sub-cables should be just as complete as the main cable in which they are used. (i.e.: wire details, cabling, coding, shields, jacketing.)

Sub-cabling permits neat and simple formation of branch legs from the main cable and can be used to aid in identifying wire groups.

Subcables may be individually jacketed. Jackets may be solid colors, or may be color-striped over solid colors.

Cabling

The purpose of helical twist used in cabling the wires into a round bundle is twofold. It holds the wires in a unit, and it will act to neutralize the tension and compression forces which occur in the wires each time the cable is bent or flexed. Since most cables use stranded wires the cable forming must be done without untwisting the strands of the individual insulated stranded wires. This requires very special machinery, not just a drill motor.

Suggested wording: “Cabling shall be done on a tubular or planetary-type helical cabling machine in such a fashion that no residual twist is introduced into the individual cable members.”

The axial distance per turn is called the lay length. The lay length should be between 8 to 16 times the pitch diameter of that layer of wires. (Pitch diameter is measured from center-to-center of diametrically opposed wires in a given layer.)

Although the rotation direction may be the same for all layers of wires opposite directions of rotation for each layer in a cable is usually preferred and is called contra-helical construction.

Overall RFI Shielding (Over the cabled bundle of wires)

1. Metal-Foil Faced tape RFI shields

The lowest-cost, lightest and least effective shield method. Can be applied single or double-sided, in single or multiple layers. Usually applied in contact with an uninsulated “drain” wire used for connection of shield. Usually made with aluminum or copper metal foil glued to a thermoplastic polyester (Mylar) backing, the most common thickness’ of material are 0.00035” of metal foil and 0.0005” of backing tape, plus perhaps 0.00015” of glue for finished thickness of 0.001 “ . NWC normally uses a heavier backing (0.001”) for a total thickness of 0.0015” to avoid shielding degradation. Shield performance will degrade if cable handling causes tape to deform, or stretch so that metal begins to flake or crack. Cable flexibility is reduced slightly when a foil shield is added.

2. Braided RFI shields

The most common and perhaps the most durable cable shield is a braided tubular shield made of small copper wires. Wire sizes range from #38 to #32 AWG. A braid is the standard coaxial cable outer conductor. It may be applied in one or more layers. In conjunction with metallic tape or foils, performance becomes very good. Braiding is a continuous operation, any desired length can be made. A braid is machine-formed directly onto the cable as contra-helical interlocking spirals of groups of fine wires. The effectiveness of the shield braid depends on how well it covers up the surface of the cable. A minimum coverage requirement of 90% of the cable surface is common. Machinery limitations make coverage in excess of 96% impractical for a single-layer braid. For braids that must “push-back” or swell easily, the braid angle should be specified. We recommend angles between 20 and 38 degrees for that service. Various methods of shielding can be combined for optimum RFI protection. See “Shielding Effectiveness” elsewhere in this section.

Outer Jacket/Sheath

The choice of outer cable covering material is usually a compromise between cost, agency recognition/ratings, flexibility and durability.

A chart of relative properties is shown in Table A.

A thin-wall jacket is usually most flexible; however it can be prone to wrinkle at tight bends, and often shows more “wireform” of the underlying cable surface.

For plastic jacketed cables, typical wall thickness is 10% of the unjacketed diameter or 0.010” minimum. Cable jacket walls below 0.010” are not recommended. Maximum walls rarely need to exceed 0.125” in plastics, or 0.250” in rubbers.

Some agencies (UL, CSA) have their own preferred wall sizes which must be met to obtain their sanction for their stated use.

Type	Flexibility	Abrasion	Weathering	Temp F	Burial
Vinyls	Better	Better	Good	-40 +221	Good
Neoprene	Best	Best	Better	- 65 +180	Better
Polyethylenes	Good	Good	Best	-65 +160	Best
Polyurethane	Better	Best	Better	-65 +160	Better
TPR	Best	Good	Good	-65 +125	n/a

Colors

Cable sheath plastic compounds can be pigmented nearly any color, and are often color-matched to customer requirements. However, nearly all materials will discolor in sunlight or ultraviolet. Use of carbon-black pigment is very common as it readily makes the jackets opaque to UV and sunlight. Best to supply your own color sample for matching if not using black. Color samples preferably should be of the same material as the jacket compound. Specify if color must be correct for both fluorescent and daylight.

Jacket Markings

Almost any legend of your choice can be indented or ink marked continuously onto the jacket.

Agency Specifications

Contact us for a list of wire & cable specifications from various agencies.

Details of cabling design are available elsewhere in this section under “Designer’s Guide on Cable Geometry.”

BASIC INTRODUCTORY INFO

Electrical Capacitance

Electrical capacitance exists between each conductive surface in a cable and all other conductive surfaces in and around the cable An understanding of the relative amount of capacitance to be expected in a cable is helpful in specifying cable and designing terminal equipment for the cable to be used. Although capacitance in a cable may have negligible effect on DC or 60 cycle AC cable circuits used for power or control, it does affect higher frequency AC voltages.

Charge on Conductive Surfaces

Elementary electron theory states that the electron is the basic unit of negative electric charge; that a large charge is simply a large collection of electrons. The more electrons that are concentrated on a surface, the larger the electric charge on that surface. Positively charged surfaces may be regarded as having a deficiency of electrons. Charge is measured in coulombs. One coulomb consists of many trillions of electrons. Since they repel each other, a collection of electrons will distribute over a surface.

Current

We can force an exchange of charge (electrons) between two conductive surfaces if we connect any source of voltage, such as a battery, between them. Since electrons in motion constitute an electric current, flows off one surface through the battery onto the other, until the repulsion of charges being forced onto the surfaces equals the forcing voltage. When the battery is removed, a voltage equal to that of the battery exists between the surfaces due to the stored charge. If the voltage source is AC, the charge exchange occurs each half cycle. The voltage source thus must handle this charging current in addition to any other current which may pass through circuitry connected to the two surfaces.

Capacitance

This behavior of charge on surfaces is termed capacitance. Capacitance may be defined as the ratio of voltage between two surfaces, divided by their difference in charge; and is measured in units called farads. Capacitors, or condensers, are sets of surfaces deliberately arranged to control the capacitance between them. Shielded wires and cables also have capacitance between the conductors and shields which should be considered in their design and application. Commonly used values of capacitance are microfarads (mfd) or (10-6 fd) and picofarads (pf) or (10-12 fd).

Dielectrics

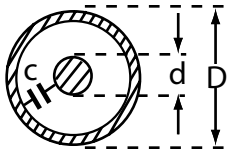
The spacing or insulating material between two surfaces of a capacitor is called a dielectric. It may be vacuum, air, or one of many insulating materials. With the exception of gases, all insulating materials increase the capacitance between the surfaces. The term dielectric constant is used to show how large this effect is for various materials. If the space between two surfaces is filled with a material having a dielectric constant of 2, then the capacitance between the surfaces will be 2 times greater than it would be for an air or vacuum dielectric.

Wire Insulation

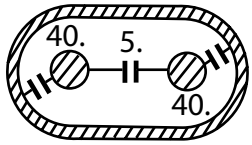
Not all dielectrics are suitable for use on wire and cable. The more commonly used insulation's are listed in Table A. Most wire insulation choices are based on a compromise among cost, electrical performance, and the physical and chemical properties required for the application. With the exception of Polytetrafluoroethylene (PTFE) and some polyolefins, most wire insulation's exhibit appreciable increases in their dielectric constant and insulation leakage with increasing temperature or frequency. This may make them undesirable for use where the capacitance, characteristic impedance or the leakage must be constant, such as in coaxial cable or instrumentation cables.

Geometry

The shape, diameter and spacing of the conductors and shields determine the capacity between them. Coaxial cables are a special application version of a single shielded conductor and may be treated in the same way.



Coaxial Conductor FIG 1.



Shielded Pairs FIG 2.

Coaxial Wires (Fig 1)

The capacitance per foot between a single insulated wire and a shield around it is:

$$C = \frac{(7.36) \times (e)}{Lg_{10}\ (D/d)} \text{ mmfd per foot}$$

...where e is the dielectric constant of the insulation between wire and shield; and D/d is the diameter ratio of shield ID to conductor OD. The only way in which the capacitance can be selected is by choice of insulation having a low dielectric constant, or by choosing a suitable value of D/d.

Shielded Pairs (Fig 2)

Shielded pairs have three capacitance's involved which combine to produce the effective wire to wire capacitance. Fig. 2 illustrates these capacities. Since the wire-to-shield capacitance's of each conductor are essentially in series, the effect of the two 40, mmfd capacitance's is to produce an apparent 20 mmfd between the two wires in addition to the 5. mmfd which will exist whether the shield is present or not. Thus the effective capacitance is 20. + 5. = 25. mmfd./ft from wire to wire.

(Ref. to Mil-C-17.)

Multi-Conductor Cable Bundles

The capacitance from a wire to all else in a large cable bundle of identical wires may vary widely depending on insulation and geometry. In general, however, it will have values ranging from 40. to 65. mmfd/ft for PVC insulation (where C=4.), and will vary from this for other materials. Conductors in the outer layer of a cable bundle which is overall-shielded will tend to have a higher capacitance than those closer to the bundle center. Typical variation for PVC' insulated wires will be a 15-20% rise in capacitance for conductors in the layer closest to the overall shield.

BASIC INTRODUCTORY INFO

Inductance

When current flows in a wire it creates a magnetic field about the wire, which generates voltages along the same wire as the current changes. These opposing voltages act to limit the rate at which the current can change. This effect is termed inductance and is measured in units called henrys. The self inductance of a round straight copper wire is on the order of .4 micro-henry/ft, and is relatively unaffected by diameter or length of wire. The self inductance of twisted pairs of wires is on the order of .08 micro-henry/ft; while the mutual inductance of a coaxial construction is .14 Lg10(D/d) micro-henrys/ft.

Signal Delay in Cables

Mechanical Delay

The electronic systems designer should consider possible problems which may arise due to cable delay. For instance, in a multi-conductor cable of coax, the coax in the center of the bundle will be shorter than those in the outer layers by 4% to 6%, which mechanically can introduce delay in the signals traveling the long path.

Dielectric Delay

Although radio waves travel at the speed of light in free space or in air, this speed is much less when the wave is guided through coax or other shielded cables, where the electric field is contained in an insulator other than air.

Suppose that a radio-frequency sine-wave signal generator is connected to both an antenna and a 1000 foot length of coaxial cable, so that its signals will be launched simultaneously into both, and we go to the far end of the cable to see which arrives first.

When the generator is keyed on, the signal from the antenna arrives first, traveling at the speed of light in air, taking about one microsecond to make the trip.

Shortly thereafter, the same identical signal will arrive at the end of the coax cable, having taken longer to travel the same distance. It did not travel as fast, so its arrival at the end of the cable was “delayed” compared to the arrival of signal from the antenna.

The velocity of a wave in a coax is usually expressed as a percentage of the velocity of light. For instance, a polyethylene insulation gives a “propagation velocity” of 65.9% of light velocity. This is sometimes expressed as a velocity factor of .659.

Characteristic Impedance

A transmission line such as a coaxial cable or shielded pair can be considered as a wave-guiding device in the broad sense. The relative amplitudes of the electric and magnetic fields due to a signal within the cable are determined by the capacitance and inductance per unit length of cable (assuming no reflections from the load.)

The characteristic impedance (Z) is the ratio of the two fields, or

$$Z = E/H = \sqrt{L/C}$$ where C and L are farads and henrys

Another equation for finding the value of Z is:

$$Z = \frac{101600}{(C)\ (\%\ V.P.)}$$

where C is in pf/ft and V.P. is the propagation velocity expressed in percent.

The resistance of the conductors and shield attenuates the signal in a transmission line, but at radio frequencies has little effect in determining the characteristic impedance.

Pulse Cables

Cables designed for transmission of pulses for digital signals have carefully controlled surge impedances and capaticance. Generally they are 93 to 120 ohm constructions. A series of these for general use are shown in the instrument cable section.

Reference Books

Radio Engineers Handbook; Terman; McGraw-Hill
Pulse, Digital, & Switching Waveforms; Millman & Taub; McGraw-Hill
Reference Data For Radio Engineers; I. T. & T. Corp.; Stratford Press

Additional Information

National Wire & Cable Corp. invites our inquiry about special-purpose shielded cable, whether coaxial or multi-conductor.

National is prepared to discuss your particular needs, provide design information and fabricate cable to meet your specifications.

TABLE A

Insulation Type	Dielectric Constant “e”	Propagation of Velocity %	Transit Time Micro/Sec/1000ft
Air	--****	Nom 95.0%****	1.06****
Polyethylene	2.26	65.9%	1.54
Polytetrafluoroethylene (PTFE) (TFE & EEP)	2.0	70.0%	1.45
Polypropylene	2.1	69.0%	1.47
Foam Polyethylene	1.55	80.0%	1.27
polyvinylchloride	4.0***	50.0%	2.03
Nylon (#610)	3.0**	57.8%	1.76
Neoprene	5.0***	44.6%	2.28
Rubber (Buna S)	2.9***	58.7%	1.73
Rubber (Butyl)	2.35***	65.3%	1.56
Silicone Rubber (SE972)	3.16***	56.3%	1.80

FOR TABLE A:
* One microsecond is one millionth of a second
** Susceptible to changes due to humidity. Absorbes moisture
***Dielectric constant varies widely with frequency. Many different values of dielectric constant may be obtained since the materials are a blend of filler and plasticizers with the base material, all of which have differing values of e.
****varies depending on the method used to support the center conductor of the cable. Inductance of shield and conductor linit upper value to about 96%.

GLOSSARY Abbreviations & Terms

Accelerator - A chemical additive which hastens the chemical reaction under given conditions, known also as a promoter.

Acceptance Test – A test made to demonstrate the degree of compliance with specified requirements.

Adhesive - A material capable of holding other materials together by surface attachment.

Aging – The change in properties of a material with time under given conditions.

Ambient Temperature – The temperature of a surrounding cooling medium, such as gas or liquid, which comes into contact with heated parts of an apparatus.

Angle of Advance - The angle between a line perpendicular to the axis of the cable and the axis of any one member or strand of the braid.

Annealed Wire – Wire which has been softened by heating. Sometimes referred to as soft drawn wire.

Armored Cable – A cable covered with a heavy outer braid of metal or spiral steel tapes for the purpose of mechanical protection.

Attenuation – The power drop or signal loss in a circuit, expressed in decibels, db.

AWG – American Wire Gauge. The standard for copper wire sizes. The diameters of successive sizes vary in geometrical progression.

B and S Gauge – Brown and Sharpe wire gauge where the conductor sizes ruse n geometrical progression. Adopted as the American Wire Gauge standard.

B.C. – Abbreviation for bare copper.

Blown Jacket – The common term given to an outer covering of insulation of a cable, that was applied by the controlled inflation of the cured jacket tube and the pulling of the cable through it.

Bond Strength – The amount of adhesion between bonded surfaces.

Braid – A woven protective outer covering over a conductor or cable. It may be composed of any filamentary materials such as cotton, glass, nylon, tinned copper, silver, or asbestos fibers.

Braid Angle – The angle between the axis of the cable and axis of any one member or strand of the braid. (Also known as Angle of Advance).

Breakdown (Puncture) – A disruptive discharge through insulation.

Breakout – A breakout is the common name given to the exit point of a conductor or number of conductors from a cable of which they are a part. This point is usually harnessed or sealed with some synthetic rubber compound.

Buna Rubber – A synthetic rubber made by polymerization of butadiene. Buna-N is a copolymer of butadiene and acrylonitrile (C3 H3 N3). Buna-S is a copolymer of butadiene and styrene.

Bunched Lay – In a bunched lay conductor or cable, the stranded members are twisted together in the same direction without regard to geometrical arrangement.

Capacitance (Capacity) - that property of a system of conductors and dielectrics which permits the storage of electricity when potential differences exist between the conductors. Its value is expressed as the ratio of a quantity of electricity to a potential difference, in farads (microfarads). A capacitance value is always positive.

Cavity – Depression in a mold.

Chromel-Alumel – Two alloys used in forming one type of thermocouple pair. Chromel is primarily an alloy of chrome and nickel, and Alumel an alloy of Aluminum, nickel, manganese, and silicone.

Circular Mil – A circular mil is a unit of area equal to Pi 4 of 78.54 percent of a square mil. The cross-sectional area of a circle in circular mils is, therefore, equal to the square of its diameter in mils. A circular inch is equal to 1,000,00 circular mils.

Coax – Abbreviation for coaxial cable. A single solid or stranded conductor over which is extruded a dielectric material. An over-all RF Shield of wire braid. Mylar-backed foil, or metal tubing is added over the inner dielectric materials with an outer sheath of dielectric material extruded over the shield to form a protective covering.

Cold Bend – Normally used with reference to a test. Cold Bend Test, which is a procedure whereby a sample of wire or cable is attached to a mandrel within a cold chamber, and when a specified temperature is reached, the wire or cable is wound around the mandrel a given number of turns at a given rate of speed. The sample is then removed and examined for defects or deteriorations. In the materials construction.

Cold Flow – See Creep.

Cold Molding – Shaping at room temperature and curing by subsequent baking.

Color Coding – Color coding is the application of a colored jacketing material on the conduction wire. Also color coding may be accomplished by the application of helically striped color on the outer surface of a jacketed wire.

Color Shades – These are the basic 12 colors as specified in MIL-STD-104, within certain limits of light and dark as shown on the color chips accompanying the standard specification. In the case of synthetic or rubber insulation, Polychloroprene (Neoprene) nylon or compound filled tapes for circuit identification, somewhat wider limits will be permitted in color shades provided all colors in the cable are easily distinguishable from each over.

Compression Molding – A method of molding thermosets. Compound (usually preheated) is placed in an open mold, is closed, and heat and pressure applied until material is cured. This process can also be used with synthetic rubber materials.

Compressive Strength – Crushing load at failure divided by the original sectional area of the specimen.

Concentric Lay – A concentric lay conductor or cable is composed of a central core surrounded by one or more layers of helically wound strands or insulated conductors.

Concentric Stranding – Stranding in which the individual filaments are spiraled in layers around a central core. As a general rule, each layer after the first has six more strands than the preceding layer and is applied in a direction contrahelical of the layer under it.

Condensation – A chemical reaction in which two or more molecules combine resulting in a molecule of greater density. For example, water vapor condenses to form water.

Conductor – A conductor is a slender rod or filament of drawn metal of circular cross section or group of such rods or filaments not insulated from one another, suitable for transmitting current.

Contrahelical – In the wire and cable industry the term is used to mean the direction of a layer with respect to the previous layer. Thus it would mean a layer spiraling in a opposite direction than a preceding layer within a wire or cable.

Copolene – A dielectric material composed of polyisobutylene and polystyrene, developed as a substitute for polystyrene. However, polyethylene is more commonly used instead of copolene.

Copper Constantan – Two alloys used in forming one type of thermocoupler pair. Constantan is an alloy of copper, nickel, manganese and iron.

Copperweld – Copperweld is the trade name for copper covered steel wire manufactured by the Copperweld steel Company. A drawing process enables a thick copper covering to be placed over a steel core so that the "copperweld" performs as one metal. Hot rolling, cold drawing, pounding or temperature changes do not affect its properties.

Corona – A luminous discharge caused by the ionization of the gas surrounding a conductor around which exists a voltage gradient exceeding a certain critical value.

Creep – the dimensional changes of a material under pressure over a period of time.

Cross-Sectional Area of a Conductor – The cross-section area of a conductor is the summation of all cross sectional areas of the individual strands in the conductor, expressed in square inches or more commonly in circular mils.

Crosstalk – Undesirable electro-magnetic coupling between adjacent signal carrying conductor pairs which may be reduced by proper overall shielding of these conductor pairs which may be reduced by proper overall shielding of these conductor pairs.

Creepage Surface – An insulating surface which provides physical separation as a form of insulation between two electrical conductors of different potential.

Cure – To change the physical properties of a material by chemical reaction, the action of heat and catalysts, alone or in combination, with or without pressure.

Curing Temperature – Temperature at which a material is subject to curing.

Curing Time – In the molding of thermosetting plastics, the time it takes for the material to be properly cured.

Curing Temperature – Temperature at which a material is subjected to curing.

Curing Time – In the molding of thermosetting plastics, the time it takes for the material to be properly cured.

Decibel (db) – Unit used to express the ratio between two amounts of power, voltage or current between two points.

$$\text{No of (db)} = 10 \log_{10} \frac{P1}{P2} = 20 \log_{10} \frac{V1}{V2} = 20 \log_{10} \frac{I\,1}{I\,2}$$

The voltages of currents in question are measured at points having identical impedances.

Density – Weight per unit volume of a substance.

Dielectric – A non-conducting material or a material having the property that the energy required to establish an electric field is recoverable, in whole or in part, as electric energy. A vacuum is a dielectric.

Dielectric Absorption – That property of an imperfect dielectric whereby there is an accumulation of electric charges within the body of the material when it is placed in an electric field.

Dielectric Constant (Specific Inductive Capacity) – that property of a dielectric which determines the electrostatic energy stored per unit volume for unit potential gradient.

GLOSSARY Abbreviations & Terms

Dielectric Loss – The time rate at which electric energy is transformed into heat in a dielectric when it is subjected to a changing electric field

Dielectric Power Factor – An expression of the energy loss in an electric current due to the effect of the dielectric.

Strength (Disruptive Gradient) – The maximum potential gradient that a material can withstand without rupture. The value obtained for the electric strength will depend upon the thickness of the material and on the method and conditions of the test. Usually expressed as a voltage gradient (such as volts per mil.)

Dielectric Tests – Tests which consist of the application of voltage higher than the rated voltage for a specific time for the purpose of determining the adequacy against breakdown of insulating materials and spacings under normal conditions.

Direction of Lay – the direction in which the individual members of a cable or stranded conductor spiral over the top of the cable in a direction going away from the observer who is standing behind the twisting apparatus.

Drain Wire – An uninsulated stranded or solid conductor which is located directly under a shield. This wire, since it comes in contact with the shield throughout the entire length of the cable, may be used to terminate the shield and eliminate a considerable amount of the inductive effects of spiral type shielding.

EIA – Abbreviation for Electronic Industries Association, formerly RETMA (Radio Electronic Television Manufacturers' Association.)

Elongation – Elongation is the extension or increase in length produced by a tension load in a section of a test specimen between branch marks placed on it, and is either expressed as a percentage of the original length between bench marks or indicated by specifying a minimum distance between benchmarks.

Epoxy Resins – Straight chain thermoplastics and thermosetting resins based on ethylene oxide, its derivatives or homologs.

Extrusion – Compacting a natural or synthetic material and forcing it through an orifice in a continuous fashion.

FEP – An abbreviation for fluorinated ethylene propylene. A thermoplastic material used as a wire insulation. FEP has outstanding insulating characteristics and retains them over a wide range of temperatures and frequencies.

Filler – Fillers are used in multi-conductor cable to occupy the interstices formed by the assembled conductors.

Flame Resistance – The ability of a material to extinguish flame once the source of the heat is removed.

Flammability – Measure of a material's ability to support combustion.

Flex-Life – The time of heat aging that an insulating material can withstand before failure when bent around a specific radius (used to evaluate thermal endurance.

Flexural Strength – The strength of a material in bending.

Foam Polyethylene – A polyethylene compound which has been whipped in the presence of an inert gas. The resulting compound has a lower dielectric constant than does basic polyethylene.

Hard Drawn – A term that refers to the temper of conductors that are drawn without annealing or that may work harden in the drawing process.

Heat Endurance – The time of heat aging that a material can withstand before failing a specific physical test.

Hi-Pot – A test designed to determine the highest potential that can be applied to a conductor without breaking through the insulation.

Hygroscopic – Having the tendency to absorb moisture.

IACS – International Annealed Copper Standard.

Impact Resistance – Relative susceptibility of material to fracture by shock.

Impedance – The apparent resistance in a circuit to the flow of an alternating current, analogous to the actual resistance to a direct current.

Impregnate – To fill the voids and interstices of a material with a compound. (This does not imply complete fill or complete coating of the surfaces by a hole-free film.)

Injection Molding – A molding procedure where by a heat softened material is forced from a cylinder into a mold cavity to give a desired shape. Cure is obtained under heat and pressure.

Insulation Resistance – The insulation resistance of an insulated conductor is the electrical resistance offered by its insulation to an impressed direct current potential tending to product leakage of current through the same. For wire usually measured in megohomes per 1000 feet.

Insulator – A material of such low electrical conductivity that it will not support electric current.

IPCEA – Insulated Power Cable Engineers Association.

Iron Constantan – A combination of metals used in thermocouplers, thermocouple wires and thermocouple lead wires. Constantan is an alloy of copper, nickel, manganese and iron.

Jacket – A protective sheath or outer covering extruded or "blown on" over a conductor or cable.

Jute – A natural fiber of plant base formed into rope like strands. Used in cables for filling the interstices to give a round cross-section.

Karma – Trade name for resistance wire composed of 74.5% nickel, 20% chromium, 2.75% aluminum and 2.75% copper.

Kel-F – Polymonochlorotrifluorethylene per MIL-W-12349. Used on hook up wire as a high temperature insulation and for tubing where temperatures are beyond the operating temperature range of PVC and where resistance to solvents is desired (-55ºC to +135ºC.)

Layer – Consecutive turns of a coil lying in a single plane.

Lay Length – The lay length of any helically wound strand or insulated conductor is the axial length of one turn of the helix, usually expressed in inches or a multiple of the pitch diameter.

Lead Cured – In applications of cable jackets, a jacket that is cured or vulcanized in an extruded metallic lead sheath is lead cured.

Litz Wire – A stranded conductor in which each strand is separately insulated.

Loss Factor – Product of the dielectric constant and the power factor and proportional to the actual power in a dielectric.

Magnet Wire – Insulated wire intended for use in windings on motor and transformer coils. The insulation is generally thinner than that for normal hook up wire.

Marker Thread – A colored thread layered parallel and adjacent to the strands of an insulated conductor which identifies the wire manufacturer and often the specification under which the wire is constructed.

MIL – 0.001" (a 1/1000 inch.)

MIL SPEC – A specification issued by the Armed Forces of the United States of America.

Mylar – A molecularly oriented polyester film with very high dielectric and tensile strength manufactured by the E.I. du Pont de Nemours and Company. It is normally used as a tape wrap over a cable bundle.

NAS-Standards – National Aerospace Standards. These are specifications compiled on different items by the Aerospace Industries Association of America, Inc.

N.E.M.A. – National Electrical Manufacturers Association. It is known for its standardization of electrical motors, components and wire / cable specifications.

Neoprene – A trade name of E.I. du Pont de Nemours for polychioroprene, a rubber-like compound which is known for its resistance to the effects of oil, solvents and abrasion.

Non-Hydroscopic – Opposite of hygryscopic, will not absorb moisture.

Nylon – A generic trade name by the E.I. du Pont de Nemours for synthetic fiber forming polyamides. A polymer of nitrogen, carbon and oxygen. Its chemical unbalance and tendency to absorb moisture limit its use as a dielectric or insulating material. However, it is often used in the wire and cable field as a jacket over polyethylene or PVC to increase temperature stability and abrasion resistance.

Nylon Jacketed – Refers to the outer covering of Nylon on wire or cable which can be either an extruded layer or a braid of Nylon filaments.

Ozone – A faintly blue, gaseous allatropic form of oxygen obtained by the silent discharge of electricity in ordinary oxygen or in air. It has the odor of weak chlorine.

pH – The measure of acidity or alkalinity of a substance. pH values run from 0 to 14, 7 indicating neutrality, numbers less than 7 increasing acidity and numbers greater than 7 increasing alkalinity.

Pitch Diameter – The pitch diameter is the diameter of the helix described by the strands or insulated conductors in any layer.

Plastic – High polymeric substances, including both natural and synthetic products that are capable of flowing under heat and pressure into desired shapes and hardening in those shapes. There are two basic classes: thermosetting and Thermoplastic.

Plastic Deformation – The change in the dimensions of an object under load that is not recovered when the load is removed.

Plasticizer – A chemical agent added to plastics to make them more soft and more flexible.

Polyamide – A compound characterized by more than one amide group. The term is generally used in the wire and cable industry as a synonym for Nylon. See NYLON.

Polychloroprene – the chemical name for neoprene. It is used for wire and cable jacketing where the wire or cable will be subject to rough usage, oils, greases, moisture, solvents and other chemicals. The name, itself indicates that it is a polymer of chloroprene, a combination of vinyl acetylene and hydrogen chloride.

GLOSSARY Abbreviations & Terms

Polyester – A resin formed by the reaction between a dibasic acid and dihydroxy alcohol.

Polyethylene – A thermoplastic material with exceptionally low dielectric losses at all frequencies that is composed of ethylene gas polymers.

Polymer – the resulting compound formed by polymerization which sets up a union of monomers or the continued reaction between lower molecular weights.

Polymerize – The change, by union of two or more molecules of the same kind into another compound having the same elements in the same proportions but a higher molecular weight and different physical properties.

Polystyrene – A thermoplastic produced by the polymerization of styrenes, vinyl benzene.

Polyurethane – A copolymer of urethane similar in properties to neoprene. Usually used as a cold curing molding compound.

Polyvinylchloride (PVC) – This is a family of thermoplastic insulating compounds composed of polymers of polyvinyl chloride or its copolymer, vinyl acetate, in combination with certain plasticizers, stabilizers, fillers and pigments.

Potted – A common term used in cable manufacturing to mean the filling or voids with some form of sealing compound.

Potting – Similar to encapsulation except that complete penetration of all of the voids in the object is insured before the resin hardens.

Primary Insulation – A non-conductive material placed directly over a current carrying conductor whose prime function is to act as an electrical barrier for the applied potential. It does not always have the purpose of abrasion resistance. See secondary insulation.

QPL – A QPL source of supply is a manufacturer that has been registered by the U.S. Government and issued a QPL number as a qualified producer of a given commodity. There are, however, other manufacturers who product identical products equal or better in quality and performance, but because unregistered, sell the product at a lower price.

Quad – A four conductor cable.

Random Winding – A winding where the wires do not lie in an even pattern.

Relative Humidity – The ratio of the quantity of water vapor present in the atmosphere to the quantity which would saturate it at the existing temperature.

Resin – An organic substance of natural or synthetic origin characterized by being polymeric in structure and predominately amorphous. Most resins, though not all, are of high molecular weight and consist of long chain or network molecular structure. Usually resins are more soluble in their lower molecular weight forms.

Resistivity – the ability of a material to resist passage of electrical current either through its cross section or on the surface. The unit of volume resistivity is the OHM-CM; of surface resistivity, the OHM.

RETMA – See EIA

RF – Abbreviation for the term “radio frequency.” Usually considered the frequency spectrum above 10,000 cycles (10 kc.)

RMS – Abbreviation for “root mean square.” When the term is applied to voltages and currents it means the effective value, that is, it produces the same heating effect as a direct current or voltage of the same magnitude.
Example: $I_{rms} = I_{max} / \sqrt{2}$

Rope Lay – In a rope lay conductor or cable, stranded members are twisted together with a concentric lay; the stranded members themselves may have either a bunched, concentric or rope lay.

S – An abbreviation for the term “shielded.”

Secondary Insulation – A non-conductive material whose prime functions are to protect the conductor against abrasion and provide a second electrical barrier placed over the primary insulation or the shield.

Serve – With reference to cable construction, a type of separator applied directly over the conductor or conductors. The serve may consist of one or more materials such as paper, cotton, silk, nylon or rayon. These materials may be applied spirally or laterally.

Shield – A metallic sheath placed around an insulated conductor or group of conductors to protect against extraneous currents and fields. Generally this shield is a metallic braid but it could be spiraled copper, aluminum backed Mylar tape or conductive vinyl or rubber.

Shielded Conductor – An insulated conductor which has been shielded by a copper braid or tape or aluminum foil or copper foil or a semi-conductive vinyl. The purpose is to confine or reject extraneous electrical fields.

Shielded Pair – A shielded pair is a twisted pair over which a metal covering has been applied. The metal covering is usually in the form of a bare or tinned copper braid but may be metal ribbon or metal-backed Mylar tape.

Silicone – Polymeric materials in which the recurring chemical group contains silicon and oxygen atoms as links in the main chain. A thermosetting plastic material used for wire and cable covering that is thermally stable and with electrical properties exceeding those of most organic polymers.

SJ – Abbreviation for “shielded and jacketed.”

SJN – Abbreviation for “shielded and jacketed with Nylon.”

SJP – Abbreviation for “shielded and jacketed with polyvinylchloride.”

Solvent – A liquid substance which dissolves other substances.

Spark Test – A test performed on wire and cable to determine the amount of detrimental porosity or defects in insulation.

Specific Gravity – The density (mass per unit volume) of any material divided by that of water at a standard temperature.

Stabilizer – An ingredient added to some plastics to maintain physical and chemical properties throughout processing and service life.

Strand – A single metallic conductor.

Surface Leakage – The passage of current over the boundary surfaces of an insulator as distinguished from passage through its volume.

Surge – A transient variation in the current and or potential at any point of the circuit.

Tape – A relatively narrow, woven or cut strip of paper, fabric or film material.

T.C. – Abbreviation for “tinned copper.”

Tedlar – Trade name for E.I. du Pont Company for polyvinyl fluoride film with outstanding weatherability and thermoformability properties.

Polytetrafluoroethylene (PTFE) – is produced by the total substitution of fluorine and hydrogen in the polyethylene molecule. This material excels all other commercially available thermoplastics in chemical inertness and operating temperature range and is well suited for high frequency applications.

Tensile Strength – The pulling stress required to break a given specimen.

Thermal Conductivity – The ability of a given material to conduct heat.

Thermal Expansion (Coefficient of) – the fractional change in length (sometimes volume) of a material for a unit change in temperature.

Thermocouple – Thermocouples are pairs of wires of dissimilar metals connected at both ends in which a voltage is generated due to a difference in temperature at the junctions, the voltage generated is of the order or magnitude of micro – or millivolts.

Thermocouple Wire – Wire drawn from special metals or alloys and calibrated to establish specifications for use as thermocouple pair. For example: Iron, Constantan, Alumel, etc.

Thermoplastic – A classification of synthetic resins that can be readily softened and resoftened by repeated heating and reharden when heat is removed.

Thermosetting – A classification of synthetic resin which hardens by chemical reaction when heated and, when hardened cannot be resoftened by heat.

Thiokol – Made from petroleum gas and used as a sealing compound for connectors, breakouts, etc. It has excellent electrical insulation and oil and solvent resistant properties.

Tolerance – A specified allowance for error from a standard or given dimension, weight or property.

Triax – A type of shielded conductor that employs a shield and jacket over the primary insulation plus a second shield and jacket overall. Aside from applications requiring maximum attenuation or radiated signals or minimum pickup of external interference, this cable can also be used to carry two separate signals.

Twisted Pair (TP) – Two insulated conductors twisted together and often color coded.

UL – “Underwriters Laboratories.” A corporation supported by underwriters for the purpose of establishing safety standards on types of equipment and components.

Viscosity – A measure of resistance to fluid flow, usually through a specific orifice.

VSWR (or SWVR) – The abbreviation for “voltage standing wave ratio.” It is the ratio of voltage maximum to voltage minimum in a transmission line.

Vulcanization – A chemical reaction in which the physical properties of an elastomer are changed by reacting it with sulfur or other cross-linking agents.

Working Life – The period of time during which a liquid resin or adhesive remains usable after mixing with a catalyst, solvent or other compounding ingredients.

Working Voltage – the recommended maximum voltage of operation for an insulated conductor. Usually set at approximately 1/3 of the breakdown voltage.

Yield Strength – the lowest stress at which a material undergoes plastic deformation. Below this stress, the material is elastic; above it, viscous.

WIRE AWG 2% VOLTAGE DROP

CONDUCTOR SIZES TO MAINTAIN TWO PERCENT MAXIMUN VOLTAGE DROP

Based on 2 (single phase) and 3 conductors in conduit, for copper temperature at 75ºC
Voltage drop calculated at the maximum for power factor between 45% and unity.

Current in Amperes	110 Volts									220 Volts								
	Distance in Feet to Center of Distribution																	
	25	50	75	100	150	200	300	400	500	25	50	75	100	150	200	300	400	500
	Conductor Size required -- AWG																	
SINGLE-PHASE A-C CIRCUIT (In Conduit)																		
1	...	...	...	...	...	...	14	12	10	...	...	...	...	...	...	...	...	14
1.5	...	...	...	...	14	14	12	10	10	...	...	...	...	...	...	14	14	12
2	...	...	...	...	14	12	10	10	8	...	...	...	...	...	...	14	12	12
3	...	...	14	14	12	10	8	8	6	...	...	...	...	14	14	12	10	10
4	...	...	14	12	10	10	8	6	6	...	...	...		14	12	10	10	8
5	...	14	12	12	10	8	6	6	4	...	...	...	14	12	12	10	8	8
6	...	14	12	10	8	8	6	4	4	...	...	14	14	12	10	8	8	6
7	...	14	12	10	8	8	6	4	2	...	...	14	14	12	10	8	8	6
8	...	12	10	10	8	6	4	2	2	...	...	14	12	10	10	8	6	6
9	...	12	10	8	8	6	4	2	2	...	14	14	12	10	8	8	6	4
10	14	12	10	8	6	6	4	2	2	...	14	12	12	10	8	6	6	4
12	14	10	8	8	6	4	2	1	1	...	14	12	10	8	8	6	4	4
14	14	10	8	8	6	4	2	0	0	...	14	12	10	8	8	6	4	2
16	12	10	8	6	4	4	2	0	00	...	12	10	10	8	6	4	4	2
18	12	8	8	6	4	2	1	00	00	12*	12	10	8	8	6	4	2	2
20	12	8	6	6	4	2	1	00	000	12*	12	10	8	6	6	4	2	2
25	10	8	6	4	2	2	0	000	0000	10*	10	8	8	6	4	2	2	1
30	10	6	4	4	2	1	00	...	...	10*	10	8	6	4	4	2	1	0
35	8*	6	4	2	2	0	000	...	...	8*	8*	8	6	4	2	2	0	00
40	8	6	4	2	1	00	0000	...	...	8*	8	6	6	4	2	1	00	0000
45	8	4	4	2	0	00	...	...	...	8*	8	6	4	4	2	0	00	0000
50	6*	4	2	2	0	0000	...	...	...	6*	6*	6	4	2	2	0	000	0000
60	6	4	2	1	00	0000	...	...	...	6*	6	4	4	2	1	00	0000	...
70	4	2	2	0	000	...	...	...	...	4*	4*	4	2	2	0	000	...	...
80	4*	2	1	00	0000	...	...	...	...	4*	4*	4	2	1	00	0000	...	...
90	2*	2	0	00	...	...	...	...	...	2*	2*	2*	2	0	00	...	...	...
100	2*	2	0	000	...	...	...	...	...	2*	2*	2	2	0	000	...	...	...
120	1*	1	00	0000	...	...	...	...	...	1*	1*	1*	1	00	0000	...	...	...

Current in Amperes	220 Volts									440 Volts								
	Distance in Feet to Center of Distribution																	
	25	50	75	100	150	200	300	400	500	25	50	75	100	150	200	300	400	500
	Conductor Size required -- AWG																	
THREE-PHASE A-C CIRCUIT (In Conduit)																		
1.5	...	...	...	...	...	...	...	14	14	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	14	14	12	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	14	12	12	10	...	...	...	...	...	...	...	14	14
4	...	...	...	...	14	14	12	10	10	...	...	...	...	...	...	14	14	12
5	...	...	...	...	14	12	10	10	8	...	...	...	...	...	...	14	12	12
6	...	...	...	14	12	12	10	8	8	...	...	...	...	...	14	12	12	10
7	...	...	14	14	12	10	8	8	6	...	...	...	...	14	14	12	10	10
8	...	...	14	14	12	10	8	6	6	...	...	...	...	14	14	12	10	10
9	...	...	14	12	10	10	8	6	6	...	...	...	...	14	12	10	10	8
10	...	...	14	12	10	10	8	6	6	...	...	...	...	14	12	10	10	8
12	...	14	12	12	10	8	6	6	4	...	...	...	...	14	12	12	10	8	8
14	...	14	12	10	8	8	6	4	4	...	...	14	14	12	10	8	8	6
16	...	14	12	10	8	8	6	4	2	...	...	12*	12*	12	10	8	8	6
18	...	12	10	10	8	6	4	4	2	...	...	12*	12	10	10	8	6	6
20	...	12	10	10	8	6	4	2	2	...	...	12*	12	10	10	8	6	6
25	10*	10*	10	8	6	6	4	2	1	...	10*	10*	10*	10	8	6	6	4
30	10*	10	8	8	6	4	2	2	0	...	10*	10*	10	8	8	6	6	4
35	8*	8*	8	6	4	4	2	1	0	...	8*	8*	8	8	6	4	4	4
40	8*	8*	8	6	4	2	2	0	00	...	8*	8*	8*	8	6	4	2	2
45	8*	8	6	6	4	2	1	0	000	8*	8*	8*	8	6	6	4	2	2
50	6*	6*	6	4	4	2	0	00	000	6*	6*	6*	6*	6	6	4	2	1
60	6*	6*	6	4	2	2	0	000	...	6*	6*	6*	6*	6	4	2	2	0
70	4*	4*	4	4	2	1	00	0000	...	4*	4*	4*	4*	4	4	2	1	0
80	4*	4	4	2	2	0	000	...	...	4*	4*	4*	4*	4	2	2	0	00
90	2*	2*	2*	2	1	0	0000	...	...	2*	2*	2*	2*	2*	2	1	0	000
100	2*	2*	2*	2	0	00	...	...	...	2*	2*	2*	2*	2*	2	0	00	000
120	1*	1*	1*	1*	0	0000	...	...	...	1*	1*	1*	1*	1*	1	0	000	0000

SYNOPSIS OF WIRE SPECIFICATIONS

MIL-C-13777	Cable Multiconductor, Missile Ground Support
MIL-C-23437	Cable, Electrical, Shielded Pairs
MIL-C-24145	(Ships) Cable, Shipboard
MIL-C-25038	Conductors, Insulated, Nickel Clad, 750 deg.
MIL-C-24643	Cable, Electrical, Low Smoke, Shipboard
MIL-C-26468	(USAF) Cables, Missile
MIL-C-27072	Cable, Multi-conductor, Ground Support
MIL-C-27212	Cable, Power, Airport Lighting Control
MIL-C-27500	Cables, Aircraft & Missile
MIL-C-55021	Cable, Pairs & Triples, Internal
MIL-C-85045	Cable, Fiber Optic
MIL-W-76	Hookup Wires, Vinyl Insulated, Types LW, MW, HW
MIL-W-538	Wire, Magnet, Electrical
MIL-W-3861	Wire, Electrical, Bare Copper
MIL-W-5086	Wire, Aircraft, Vinyl Insulated, 600V
MIL-W-5845	Wire, Electrical, Iron/Constantan Thermocouple
MIL-W-5846	Wire, Electrical, Chromel or Alumel, Thermo
MIL-W-5908	Wire, Electrical, Copper/Constantan, Thermo
MIL-W-7139	Wire, Aircraft, Polytetrafluoroethylene (PTFE)
MIL-W-8777	Wire, Aircraft, Silicone Rubber
MIL-W-16878	Wire, Electronic Hookup (many popular types)
MIL-W-19150	Wire, Insulated, Hard-drawn Copper
MIL-W-22759	Wire, Insulated Hookup (many popular types)
MIL-W-25038	Wire, Insulated, High Temperature
MIL-W-27300	Wire, Aircraft, TFE Insulated
MIL-W-81044	Wire, Insulated, X-Linked, PVF & Polyalkene
MIL-W-81381	Wire, Polyimide Insulated (Kapton, H-film)
MIL-STANDARDS:	
MIL-STD-104	Color Limits for Insulation Colors
MIL-STD-122	Color Coding, Chassis Electronic
MIL-STD-681	Color Coding, Identification, Hookup Wire
MIL-STD-685	Coding of Telephone Cables
MIL-STD-686	Cable Identification & Coding

SYNOPSIS OF WIRE & CABLE

NON-GOVERNMENT AGENCIES:

ASTM: American Society for Testing & materials

ASTM B-3	soft or annealed copper wire
ASTM B-33	tinned soft or annealed copper wire
ASTM B-286	copper conductors for use in hookup wire

C.S.A.: Canadian Standards Asociation

C22.2 #16	insulated conductors for power-operated electronic dev.
C22,2 #127	equipment wires

E.I.A.: Electronic Industry Association

RS-232	bi-polar serial digital signaling (5 to 15 V)
RS-359	color coding
RS-422	balanced digital interface circuits (5 V)
RS-423	unbalanced digital interface circuits (5 V)
RS-449	general purpose serial interface, 37 & 9 pos.
RS-485	balanced digital generators, receivers, multipt.

I.E.E.E.: Institute of Electrical & Electronic Engineering

IEEE383	nuclear reactor cables

IPCEA: Insulated Power Cable Engineer Association

S-61-402	thermoplastic-insulated power cables
S-19-81	rubber insulated wire& cable, power

U.L.: Underwriter's Laboratories

UL 62	flexible cord & fixture wire
UL 758	appliance wiring material (numerous styles)
UL 1581	ref. standard for electrical wires, cables and cords

GOVERNMENTAL AGENCIES -- Federal Standards

STD. 228	test method 228, cables
QQ-W-343	wire, copper, uninsulated

MILITARY:

MIL-C-17	cables, coaxial
MIL-C-2164	shipboard cables
MIL-C-5756	rubber insulated portable cord, low temp.
MIL-C-7078	aircraft wires, shielded

MIL-STD-681 COLOR CODING

Used on many of our standard cables. For new design, National recommends this color code system.

NO.	BASE COLOR	FIRST TRACER	SECOND TRACER	THIRD TRACER
0	Black			
1	Brown			
2	Red			
3	Orange			
4	Yellow			
5	Green			
6	Blue			
7	Violet			
8	Grey			
9	White			
10	White	Black		
11	White	Brown		
12	White	Red		
13	White	Orange		
14	White	Yellow		
15	White	Green		
16	White	Blue		
17	White	Violet		
18	White	Grey		
19	White	Black	Brown	
20	White	Black	Red	
21	White	Black	Orange	
22	White	Black	Yellow	
23	White	Black	Green	
24	White	Black	Blue	
25	White	Black	Violet	
26	White	Black	Grey	
27	White	Brown	Red	
28	White	Brown	Orange	
29	White	Brown	Yellow	
30	White	Brown	Green	
31	White	Brown	Blue	
32	White	Brown	Violet	
33	White	Brown	Grey	
34	White	Red	Orange	
35	White	Red	Yellow	
36	White	Red	Green	
37	White	Red	Blue	
38	White	Red	Violet	
39	White	Red	Grey	
40	White	Orange	Yellow	
41	White	Orange	Green	
42	White	Orange	Blue	
43	White	Orange	Violet	
44	White	Orange	Grey	
45	White	Yellow	Green	
46	White	Yellow	Blue	
47	White	Yellow	Violet	
48	White	Yellow	Grey	
49	White	Green	Blue	
50	White	Green	Violet	
51	White	Green	Grey	
52	White	Blue	Violet	
53	White	Blue	Grey	
54	White	Violet	Grey	
55	White	Black	Brown	Red
56	White	Black	Brown	Orange
57	White	Black	Brown	Yellow
58	White	Black	Brown	Green
59	White	Black	Brown	Blue
60	White	Black	Brown	Violet
61	White	Black	Brown	Grey
62	White	Black	Red	Orange
63	White	Black	Red	Yellow
64	White	Black	Red	Green
65	White	Black	Red	Blue
66	White	Black	Red	Violet
67	White	Black	Red	Grey
68	White	Black	Orange	Yellow

NO.	BASE COLOR	FIRST TRACER	SECOND TRACER	THIRD TRACER
69	White	Black	Orange	Green
70	White	Black	Orange	Blue
71	White	Black	Orange	Violet
72	White	Black	Orange	Grey
73	White	Black	Yellow	Green
74	White	Black	Yellow	Blue
75	White	Black	Yellow	Violet
76	White	Black	Yellow	Grey
77	White	Black	Green	Blue
78	White	Black	Green	Violet
79	White	Black	Green	Grey
80	White	Black	Blue	Violet
81	White	Black	Blue	Grey
82	White	Black	Violet	Grey
83	White	Brown	Red	Orange
84	White	Brown	Red	Yellow
85	White	Brown	Red	Green
86	White	Brown	Red	Blue
87	White	Brown	Red	Violet
88	White	Brown	Red	Grey
89	White	Brown	Orange	Yellow
90	White	Brown	Orange	Green
91	White	Brown	Orange	Blue
92	White	Brown	Orange	Violet
93	White	Brown	Orange	Grey
94	White	Brown	Yellow	Green
95	White	Brown	Yellow	Blue
96	White	Brown	Yellow	Violet
97	White	Brown	Yellow	Grey
98	White	Brown	Green	Blue
99	White	Brown	Green	Violet
100	White	Brown	Green	Grey
101	White	Brown	Blue	Violet
102	White	Brown	Blue	Grey
103	White	Brown	Violet	Grey
104	White	Red	Orange	Yellow
105	White	Red	Orange	Green
106	White	Red	Orange	Blue
107	White	Red	Orange	Violet
108	White	Red	Orange	Grey
109	White	Red	Yellow	Green
110	White	Red	Yellow	Blue
110	White	Red	Yellow	Violet
112	White	Red	Yellow	Grey
113	White	Red	Green	Blue
114	White	Red	Green	Violet
115	White	Red	Green	Grey
116	White	Red	Blue	Violet
117	White	Red	Blue	Grey
118	White	Red	Violet	Grey
119	White	Orange	Yellow	Green
120	White	Orange	Yellow	Blue
121	White	Orange	Yellow	Violet
122	White	Orange	Yellow	Grey
123	White	Orange	Green	Blue
124	White	Orange	Green	Violet
125	White	Orange	Green	Grey
126	White	Orange	Blue	Violet
127	White	Orange	Blue	Grey
128	White	Orange	Violet	Grey
129	White	Yellow	Green	Blue
130	White	Yellow	Green	Violet
131	White	Yellow	Green	Grey
132	White	Yellow	Blue	Violet
133	White	Yellow	Blue	Grey
134	White	Yellow	Violet	Grey
135	White	Green	Blue	Violet
136	White	Green	Blue	Grey
137	White	Green	Violet	Grey

MINIATURE SIGNAL & CONTROL CABLES - COLOR CODING

National Wire & Cable's
Table of Color Codes of Twisted Pairs
used in National's multiconductor cable families of NQP cables and NWP cables

PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS
1	White with Black	16	Black with Violet	31	Orange with Yellow	46	White /Black Striped Wire with Black
2	White with Brown	17	Black with Gray	32	Orange with Green	47	White/Black Striped Wire with Brown
3	White with Red	18	Brown with Red	33	Orange with Blue	48	White/Black Striped Wire with Red
4	White with Orange	19	Brown with Orange	34	Orange with Violet	49	White/Black Striped Wire with Orange
5	White with Yellow	20	Brown with Yellow	35	Orange with Gray	50	White/Black Striped Wire with Yellow
6	White with Green	21	Brown with Green	36	Yellow with Green	51	White/Black Striped Wire with Green
7	White with Blue	22	Brown with Blue	37	Yellow with Blue	52	White/Black Striped Wire with Blue
8	White with Violet	23	Brown with Violet	38	Yellow with Violet	53	White/Black Striped Wire with Violet
9	White with Gray	24	Brown with Gray	39	Yellow with Gray	54	White/Black Striped Wire with Gray
10	Black with Brown	25	Red with Orange	40	Green with Blue	55	White/Brown Striped Wirewith Black
11	Black with Red	26	Red with Yellow	41	Green with Violet	56	White/Brown Striped Wirewith Brown
12	Black with Orange	27	Red with Green	42	Green with Gray	57	White/Brown Striped Wirewith Red
13	Black with Yellow	28	Red with Blue	43	Blue with Violet	58	White/Brown Striped Wirewith Orange
14	Black with Green	29	Red with Violet	44	Blue with Gray	59	White/Brown Striped Wirewith Yellow
15	Black with Blue	30	Red with Gray	45	Violet with Gray	60	White/Brown Striped Wirewith Green

TABLE OF COMPARATIVE PROPERTIES

Fluorinated Ethylene Propylene (FEP)

is a modification of the basic ethylene molecule by the addition of a propyl radical held by a single chemical bond to a Carbon atom and the substitution of Fluorine atoms for all Hydrogen. FEP demonstrates excellent electrical stability over a temperature range from -65ºC to +200ºC and is suitable for ultra-high frequency applications.

Nylon (polyhexamethylene-adipamide)

is a readily extrudable complex polymer of Nitrogen, Carbon and Oxygen and is also known by its general family name, polyamide. Because of its relatively poor electrical characteristics, it is rarely used as a primary insulation wire. However, it makes an excellent outer covering when applied over vinyl insulations. Extruded Nylon Jackets are tough and are resistant to abrasion, cold flow, oils, etc. and have the tendency to increase the temperature stability of the primary insulation.

Polyethylene

is one of the most commonly used dielectric materials. The basic Carbon-Hydrogen molecule is in perfect balance. Polymerization is accomplished by breaking the double bond and connecting a large number of identical molecules in a chain. Because of its electrical balance, the polymer is excellent for high-frequency applications. Polyethylene possesses definite limitations as an insulating material due to its physical properties: safe maximum operating temperature of only 80ºC, will burn freely in the presence of an open flame, is difficult to color code and its low abrasion resistance. Some of these shortcomings have been overcome by the introduction of LINEAR or HIGH DENSITY polyethylene, This type of insulation can be used continuously at temperatures of 100ºC, has greater physical toughness, improved abrasion and chemical resistance, plus lower rates of permeability to water vapor and temperature coefficient of expansion.

Tetrafluoroethylene (TFE)

better known as Polytetrafluoroethylene (PTFE), is produced by the total substitution of Fluorine for Hydrogen in the basic ethylene molecule. Like the Carbon-Hydrogen molecule in polyethylene, this Carbon-Fluorine molecule is in excellent electrical balance and therefore is well suited for high-frequency applications. One of the better commercially available thermoplastics in chemical inertness and operating temperature range, it has provided access to the solution of different and more difficult design problems. However, its good points are often overshadowed by the fact that inherent problems of its extrusion process limit continuous lengths to one or two thousand feet. FEP, similar in temperature stability and chemical composition to Polytetrafluoroethylene (PTFE), can be readily extruded in long lengths and is being utilized in place of TFE in many cases.

Polyvinylchloride (PVC)

is a modification of the basic polyethylene structure with one Chlorine atom replacing one Hydrogen atom. This results in physical properties that surpass those of the basic polyethylene: greater abrasion resistance, better dimensional stability, higher operating temperatures and increased resistance to flame. PVC is readily extrudable by conventional thermoplastic techniques. However, the electrical unbalance of this molecule precludes the use of PVC at elevated frequencies. PVC does provide the necessary electrical protection with the least possible increase in over-all diameter and stiffness and is excellent in low-frequency applications where resistance to moisture, flame, oils, aging and many acids and alkalies is important.

Silicone Rubber (Dimethyl Siloxane Polymer)

is finding widespread applications as a wire insulation because of its high operating temperature (continuously at +200ºC and +300ºC for short intervals), constant dielectric strength over its entire operating temperature range and low temperature flexibility. However, in the presence of flame, Silicone will burn to a non-conductive ash, which, if held in place, could function as insulation in emergencies. Its abrasion resistance is usually greatly improved by the addition of a saturated glass outer braid. Unlike vinyls, polyethylene and nylon, silicone rubbers are thermo setting plastics.

WIRE TABLES

TEMPERATURE CONVERSION TABLE

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-40	-40	-10	14	20	68	50	122	80	176	110	230	140	284
-39	-38.2	-9	15.8	21	69.8	51	123.8	81	177.8	111	231.8	141	285.8
-38	-36.4	-8	17.6	22	71.6	52	125.6	82	179.6	112	233.6	142	287.6
-37	-34.6	-7	19.4	23	73.4	53	127.4	83	181.4	113	235.4	143	289.4
-36	-32.8	-6	21.2	24	75.2	54	129.2	84	183.2	114	237.2	144	291.2
-35	-31	-5	23	25	77	55	131	85	185	115	239	145	293
-34	29.2	-4	24.8	26	78.8	56	132.8	86	186.8	116	240.8	146	294.8
-33	-27.4	-3	26.6	27	80.6	57	134.6	87	188.6	117	242.6	147	296.6
-32	-25.6	-2	28.4	28	82.4	58	136.4	88	190.4	118	244.4	148	298.4
-31	-23.8	-1	30.2	29	84.2	59	138.2	89	192.2	119	246.2	149	300.2
-30	-22	0	32	30	86	60	140	90	194	120	248	150	302
-29	-20.2	1	33.8	31	87.8	61	141.8	91	195.8	121	249.8	151	303.8
-28	-18.4	2	35.6	32	89.6	62	143.6	92	197.6	122	251.6	152	305.6
-27	-16.6	3	37.4	33	91.4	63	145.4	93	199.4	123	253.4	153	307.4
-26	-14.8	4	39.2	34	93.2	64	147.2	94	201.2	124	255.2	154	309.2
-25	-13	5	41	35	95	65	149	95	203	125	257	155	311
-24	-11.2	6	42.8	36	96.8	66	150.8	96	204.8	126	258.8	156	312.8
-23	-9.4	7	44.6	37	98.6	67	152.6	97	206.6	127	260.6	157	314.6
-22	-7.6	8	46.4	38	100.4	68	154.4	98	208.4	128	262.4	158	316.4
-21	-5.8	9	48.2	39	102.2	69	156.2	99	210.2	129	264.2	159	318.2
-20	-4	10	50	40	104	70	158	100	212	130	266	160	320
-19	-2.2	11	51.8	41	105.8	71	159.8	101	213.8	131	267.8	161	321.8
-18	-0.4	12	53.6	42	107.6	72	161.6	102	215.6	132	269.6	162	323.6
-17	1.4	13	55.4	43	109.4	73	163.4	103	217.4	133	271.4	163	325.4
-16	3.2	14	57.2	44	111.2	74	165.2	104	219.2	134	273.2	164	327.2
-15	5	15	59	45	113	75	167	105	221	135	275	165	329
-14	6.8	16	60.8	46	114.8	76	168.8	106	222.8	136	276.8	166	330.8
-13	8.6	17	62.6	47	116.6	77	170.6	107	224.6	137	278.6	167	332.6
-12	10.4	18	64.4	48	118.4	78	172.4	108	226.4	138	280.4	168	334.4
-11	12.2	19	66.2	49	120.2	79	174.2	109	228.2	139	282.2	169	336.2

Conversion Formulas: ºF=9/5C+32 ºC=5/9(F-32)

DECIMAL EQUIVALENT TABLE

1/64	0.0156	11/32	0.34375	43/64	0.6719
1/32	0.03125	23/64	0.3594	11/16	0.6875
3/64	0.0469	3/8	0.3750	45/64	0.7031
1/16	0.0625	25/64	0.3906	23/32	0.71875
5/64	0.0781	13/32	0.40625	47/64	0.7344
3/32	0.09375	27/64	0.4219	3/4	0.7500
7/64	0.1094	7/16	0.4375	49/64	0.7656
1/8	0.1250	29/64	0.4531	5/32	0.78125
9/64	0.1406	15/32	0.46875	51/64	0.7969
5/32	0.15625	31/64	0.4844	13/16	0.8125
11/64	0.1719	1/2	0.5000	53/64	0.8281
3/16	0.1865	33/64	0.5156	27/32	0.84375
13/64	0.2031	17/32	0.53125	55/64	0.8594
7/32	0.21875	35/64	0.5469	7/8	0.8750
15/64	0.2344	9/16	0.5625	57/64	0.8906
1/4	0.2500	37/64	0.5781	29/32	0.90625
17/64	0.2656	19/32	0.59375	59/64	0.9219
9/32	0.28125	39/64	0.6094	15/16	0.9375
19/64	0.2969	5/8	0.6250	61/64	0.9531
5/16	0.3125	41/64	0.6406	31/32	0.96875
21/64	0.3281	21/32	0.65625	63/64	0.9844
				1	1.000

MAXIMUM CURRENT CAPACITY TABLE

WIRE GAUGE	MAXIMUM CURRENT RATINGS IN AMPERES PER:						
	MIL-W-50888 (ASG)***		NATIONAL ELECTRICAL CODE	UNDERWRITER'S LABORATORY		NAT'L BOARD OF FIRE UNDERWRITERS	500 CM ☆☆ PER AMP†
	CABLES GREATER THAN 15 COND.	SINGLE COND. IN FREE AIR		+60 C*	+80 C*		
30	.....	.....	.....	0.2	0.4	.....	0.20
28	.....	.....	.....	0.4	0.6	.....	0.32
26	.....	.....	.....	0.6	1.0	.....	0.51
24	.....	.....	.....	1.0	1.6	.....	0.81
22	5.0	.....	.....	1.6	2.5	.....	1.28
20	7.5	11.0	.....	2.5	4.0	3	2.04
18	10.0	16.0	6	4.0	6.0	5	3.24
16	13.0	22.0	10	6.0	10.0	7	5.16
14	17.0	32.0	20	10.0	16.0	15	8.22
12	23.0	41.0	30	16.0	26.0	20	13.05
10	33.0	55.0	35	.....	.....	25	20.80
8	46.0	73.0	50	.....	.....	35	33.00
6	60.0	101.0	70	.....	.....	50	52.60
4	80.0	135.0	90	.....	.....	70	83.40
2	100.0	181.0	125	.....	.....	90	132.80
1	125.0	211.0	150	.....	.....	100	167.50
0	150.0	245.0	200	.....	.....	125	212.00
00	175.0	283.0	225	.....	.....	150	266.00
000	200.0	328.0	275	.....	.....	175	336.00
0000	225.0	380.0	325	.....	.....	225	424.00

* Refers to insulation temperature rating

*** For 100ºC copper temp.

† Derated standard, Common to the wire & cable industry

☆☆ The abbreviation for circular mil

WIRE TABLES

COMMON STRANDING COMBINATIONS used to fabricate flexible wires

AWG	STRANDS	NOM. OD OF STRAND	APPROX. OD	CIRCULAR MIL AREA	WEIGHT LBS. PER 1000 FT	*MAXIMUM RESISTANCE OHMS PER 1000 FT
4/0	8512/36	.0050	.655	212800	761.6	.049
4/0	5320/34	.0063	.640	211470	634.0	.049
4/0	2109/30	.0100	.627	210900	672.5	.0576
4/0	427/23	.0226	.605	212342	663.1	.047
4/0	259/21	.0285	.606	209815		.055
3/0	1519/30	.0100	.574	152659	476.0	.061
3/0	4256/34	.0063	.555	169176	563.2	.061
3/0	1672/30	.0100	.495	168036	535.6	.0727
3/0	427/24	.0198	.536	167401	533.5	.059
3/0	259/22	.0253	.606	166381	526.4	.072
2/0	5292/36	.0050	.486	132300	480.0	.077
2/0	3332/34	.0063	.464	132447	424.6	.077
2/0	1330/30	.0100	.494	133665	435.0	.091
2/0	259/23	.0226	.414	132297	414.0	.090
2/0	133/20	.0320	.509	135926	419.0	.077
1/0	4214/35	.0050	.490	105350	382.7	.098
1/0	2646/34	.0063	.437	105178	335.0	.098
1/0	1045/30	.0100	.431	105022	350.0	.116
1/0	259/24	.0198	.422	104636	331.0	.113
1/0	133/21	.0285	.464	107743	342.4	.096
1	2107/34	.0063	.375	83753	266.0	.124
1	817/30	.0100	.382	81700	247.1	.149
1	259/25	.0179	.375	82983	262.5	.144
1	133/22	.0253	.365	85439	260.3	.121
2	2646/36	.0050	.379	66150	240.3	.157
2	665/30	.0100	.342	66832	205.5	.183
2	259/26	.0159	.325	65811	208.4	.186
2	133/23	.0226	.328	67736	209.7	.176
4	1666/36	.0050	.290	41650	130.7	.250
4	259/28	.0126	.261	41388	130.9	.200
4	133/25	.0179	.257	42613	133.0	.280
6	1050/36	.0050	.204	26250	84.0	.386
6	266/30	.0100	.210	26029	80.0	.453
6	133/27	.0142	.206	20628	80.4	.444
8	665/36	.0050	.166	16625	51.3	.620
8	133/29	.0113	.166	16851	52.9	.701
8	49/25	.0179	.166	16589	52.0	.67
10	105/30	.0100	.120	10552	32.5	1.15
10	49/27	.0142	.116	10445	32.6	1.21
10	37/26	.0159	.107	9402	29.0	1.26
12	165/34	.0063	.095	6549	19.8	1.58
12	65/30	.0100	.095	6533	20.8	1.85
12	19/25	.0179	.089	6088	18.8	1.92
12	7/20	.0320	.096	7168	21.6	1.45

AWG	STRANDS	NOM. OD OF STRAND	APPROX. OD	CIRCULAR MIL AREA	WEIGHT LBS. PER 1000 FT	*MAXIMUM RESISTANCE OHMS PER 1000 FT
14	105/34	.0063	.086	4173	13.0	2.49
14	41/30	.0100	.074	4121	12.7	2.94
14	19/27	.0142	.069	3829	11.9	3.05
16	105/36	.0050	.065	2625	8.1	3.99
16	65/34	.0063	.063	2584	8.0	4.02
16	26/30	.0100	.059	2613	8.0	4.59
16	19/29	.0113	.054	2426	7.5	4.82
16	7/24	.0201	.060	2628	8.6	3.70
18	65/36	.0050	.051	1625	5.0	6.40
18	41/34	.0063	.052	1629	5.0	6.37
18	19/30	.0100	.048	1608	4.9	6.22
18	16/30	.0100	.049	1608	4.9	6.60
18	7/26	.0159	.048	1770	5.5	6.54
20	41/36	.0050	.038	1025	3.2	10.02
20	26/34	.0063	.040	1033	3.2	10.05
20	19/32	.0080	.038	1201	3.7	9.76
20	10/30	.0100	.038	1005	3.1	11.80
20	7/28	.0126	.038	1119	3.5	10.40
22	26/36	.0050	.033	650	2.0	15.94
22	19/34	.0063	.030	754	2.3	15.90
22	7/30	.0100	.030	704	2.2	16.70
24	41/40	.0031	.0245	394	1.2	25.59
24	19/36	.0050	.024	475	1.5	25.40
24	10/34	.0063	.024	398	1.2	26.09
24	7/32	.0080	.024	448	1.4	23.30
26	19/38	.0040	.019	304	.92	40.10
26	10/36	.0050	.021	250	.77	41.48
26	7/34	.0063	.019	276	.85	42.60
28	19/40	.0031	.016	182	.563	67.70
28	7/36	.0050	.015	175	.539	68.20
30	19/42	.0025	.012	118	.359	87.30
30	7/38	.0040	.012	110	.340	108.00
32	19/44	.0020	.001	76	.230	136.40
32	7/40	.0031	.009	75	.213	182.00
34	7/42	.0025	.007	44	.132	237.00
36	7/44	.0020	.006	28	.085	371.00

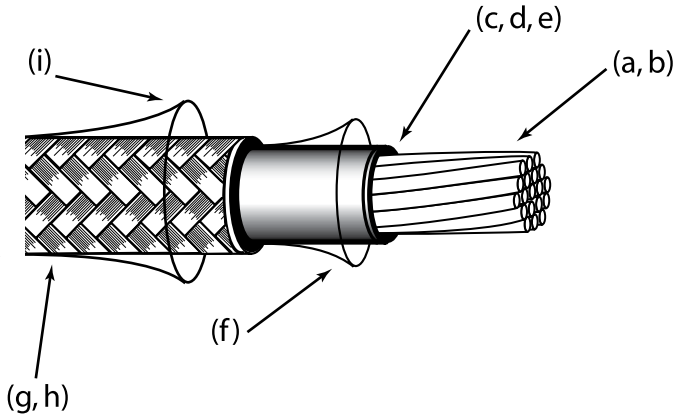
WIRE TABLES

SOLID ANNEALED COPPER WIRE

GAUGE NO.	DIAMETER in INCHES	*DIAMETER in MILS*	*DIAMETER in MM*	*AREA C MILS*	*AREA SQ. MM*	AREA SQ. INCHES	RESISTANCE Ohms/1000 Ft. @20°C	WEIGHT Lb/1000 Ft.
0000	.4600	360.0	11.684	211600.	107.2200	.1661907	0.049	641.164
000	.4096	409.6	10.404	167772.	85.0120	.1317683	0.062	508.362
00	.3648	364.8	9.266	133079.	67.4326	.1045203	0.078	403.239
0	.3249	324.9	8.252	105560.	53.4884	.0829068	0.098	318.855
1	.2893	289.3	7.348	83694.	42.4089	.0657337	0.124	253.600
2	.2576	257.6	6.543	66358.	33.6242	.0521174	0.156	201.069
3	.2294	229.4	5.827	52624.	26.6653	.0413312	0.197	159.456
4	.2043	204.3	5.189	41738.	21.1493	.0327814	0.248	126.471
5	.1819	189.9	4.620	33088.	16.7658	.0259870	0.313	100.258
6	.1620	162.0	4.115	26244.	13.2981	.0206120	0.395	79.521
7	.1443	144.3	3.665	20822.	10.5510	.0163540	0.498	63.094
8	.1285	128.5	3.264	16512.	8.3669	.0129687	0.628	50.033
9	.1144	114.4	2.906	13087.	6.6315	.0102788	0.792	39.656
10	.1019	101.9	2.588	10384.	5.2615	.0081553	0.999	31.463
11	.0907	90.7	2.304	8226.	4.1685	.0064611	1.261	24.927
12	.0800	80.8	2.052	6529.	3.3081	.0051276	1.589	19.782
13	.0720	72.0	1.829	5184.	2.6268	.0040715	2.001	15.708
14	.0641	64.1	1.628	4109.	2.0820	.0032271	2.524	12.450
15	.0571	57.1	1.450	3260.	1.6521	.0025607	3.181	9.879
16	.0508	50.8	1.290	2581.	1.3076	.0020268	4.019	7.820
17	.0453	45.3	1.151	2052.	1.0398	.0016117	5.054	6.218
18	.0403	40.3	1.024	1624.	0.8229	.0012756	6.386	4.921
19	.0359	35.9	0.912	1289.	0.6531	.0010122	8.047	3.905
20	.0320	32.0	0.813	1024.	0.5189	.0008042	10.128	3.103
21	.0285	28.5	0.724	812.	0.4116	.0006379	12.768	2.461
22	.0253	25.3	0.643	640.	0.3243	.0005027	16.202	1.940
23	.0226	22.6	0.574	511.	0.2588	.0004012	20.305	1.548
24	.0201	20.1	0.511	404.	0.2047	.0003173	25.670	1.224
25	.0179	17.9	0.455	320.	0.1624	.0002517	32.368	0.971
26	.0159	15.9	0.404	253.	0.1281	.0001986	41.023	0.766
27	.0142	14.2	0.361	202.	0.1022	.0001584	51.433	0.611
28	.0126	12.6	0.320	159.	0.0804	.0001247	65.325	0.481
29	.0113	11.3	0.287	128.	0.0647	.0001003	81.220	0.387
30	.0100	10.0	0.254	100.	0.0507	.0000785	103.710	0.303
31	.0089	8.9	0.226	79.	0.0401	.0000622	130.930	0.224
32	.0080	8.0	0.203	64.	0.0324	.0000503	162.047	0.194
33	.0071	7.1	0.180	50.	0.0255	.0000396	205.733	0.153
34	.0063	6.3	0.160	40.	0.0201	.0000312	261.300	0.120
35	.0056	5.6	0.142	31.	0.0159	.0000246	330.708	0.095
36	.0050	5.0	0.127	25.	0.0127	.0000196	414.840	0.076
37	.0045	4.5	0.114	20.	1.0103	.0000159	512.148	0.061
38	.0040	4.0	0.102	16.	0.0081	.0000126	648.187	0.048
39	.0035	3.5	0.089	12.	0.0062	.0000096	846.612	0.037
40	.0031	3.1	0.079	10.	0.0049	.0000075	1079.188	0.029

HOW TO SPECIFY WIRE

IF NOT IDENTIFIED BY THE MANUFACTURER'S PART NUMBER WIRE IS SPECIFIED BY THE FOLLOWING CHARACTERISTICS:



a. Gauge (awg)
b. Standing (bare or tinned) Number of strands
c. Type of primary insulation material. PVC, Polytetrafluoroethylene (PTFE), etc.
d. Thickness of primary insulation or working voltage for which the wire is to be used.
e. Color or coding of primary insulation**
f. Type and thickness of covering over primary insulation when required (i.e., nylon)
g. Type of shielding, braided or foil, if required
h. If braided, shield strand size, % of coverage, bare or tinned wire strands
i Overall jacket material, temperature range, thickness, color**, marking or coding

HOW NATIONAL WIRE PART NUMBERS ARE DERIVED

EXAMPLE

N C 1936U 9 - 0 - 2

- 2 — RED TRACER
- 0 — BLACK TRACER
- 9 — INSULATION COLOR
- N C 1936U — CATALOG NO.

BASIC COLOR CODE

0 - Black	5 - Green
1 - Brown	6 - Blue
2 - Red	7 - Violet (Purple)
3 - Orange	8 - Slate (Grey)
4 - Yellow	9 - White

N.....stands for National Wire and Cable Corporation.
C.....stands for Type "C" (as previously referred to in the spec).
1936.....means 19 strands of #36 copper which is equivalent to 24 gauge
U.....means "uncovered." That is, no jacket over the primary insulation.
902.....refers to primary insulation base color and tracer colors as shown in the ..chart above. Tracers are numbered according to standard color code.

**Color limitation of tints is specified in MIL-STD-104, which comes supplied with a set of colored tabs for color comparison and identification.

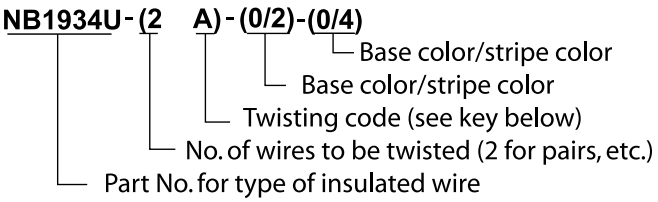
TO ORDER RoHS COMPLIANT PRODUCTS: please add the letter "R" into the second position of the Part No.
EXAMPLE: Non-RoHS Part No NK1234 EXAMPLE: RoHS Part No NRK1234

Please refer to the National Wire Catalog for specific products that are RoHS available. The above instructions (always in green) will be listed on the applicable pages for the ordering process.

HOW TO SPECIFY PAIRS

WE RECOMMEND THE FOLLOWING FORMAT WHEN SPECIFYING TWISTED PAIRS AND TRIOS:

EXAMPLE



Part No. (see “How to Specify Wire”, Page 18)

KEY TO TWISTING CODE

A = SHORT TWINNER LAY
B = STANDARD TWINNER LAY
C = SHORT PLANETARY LAY
D = STANDARD PLANETRY LAY

THE “SHORT” LAY IS DEFINED AS EQUAL TO 5 X D X N AND THE “STANDARD” LAY IS DEFINED AS 10 X D X N WHERE D = CONDUCTOR DIAMETER, N = NO. OF CONDUCTORS

DIFFERENCES IN PAIR TWISTING

THE MOST COMMON COMMERCIAL PAIR-FORMING MACHINES ARE CALLED “TWINNERS.” THIS TYPE OF PAIR-FORMING IS THE LEAST EXPENSIVE WAY TO FROM TWISTED PAIRS. HOWEVER, PAIRS FORMED ON THIS TYPE OF EQUIPMENT HAVE BEEN KNOWN TO EXPERIENCE DEFORMATION OF THE STRANDED COPPER, STRAIN IN THE INSULATION AND POOR ELECTRICAL BALANCE.

THE SUPERIOR METHOD OF PAIR-FORMING IS BY USE OF A PLANETARY OR TUBULAR CABLING MACHINE IN SUCH A MANNER THAT NO RESIDUAL TWIST IS IMPARTED TO THE INDIVIDUAL WIRES FORMING THE TWISTED GROUP. THIS RESULTS IN BETTER ELECTRICAL BALANCE AND IMPROVES FLEXIBILITY.

NATIONAL IS EQUIPPED FOR ALL OF THE ABOVE DESCRIBED TECHNIQUES. CHOOSE THE METHOD BEST SUITED FOR YOUR PARTICULR APPLICATION.