

## Communication, Control, and Industrial Cable



# Get control of demanding applications



**T**he broad range of communication and control cables from Alpha Wire means you can find the right cable for your application. Our cables meet special needs, such as low-capacitance cables for extended transmission of digital signals, such as the extra flexibility of rubber insulation and jackets, or excellent shielding for electrically noisy environments.

We combine a wide range of insulation materials, shielding variations, conductor counts and gauges, as well as other options to create cables suited to any application. From traditional RS-232 connections to high-speed telemetry and data recording to high-fidelity microphone systems, our experience in materials and expertise in manufacturing means cable built to perform electrically, mechanically, and environmentally.

## Our communication and control line includes six main categories:

- **Solar cable:** a full range of solar cables for power and control.
- **Industrial automation cable:** cable for common automation protocols such as ControlNet, DeviceNet, and PROFIBUS.
- **Flexible motor supply cable:** four-conductor double-shielded cable suited for light-duty flexing.
- **Communication and control:** round multiconductor and multipair cable in configurations suited to nearly any application.
- **Low-smoke, zero-halogen cable:** minimizes the effects from smoke and harmful corrosive gases in the event of combustion.
- **Flat cable:** planar multiconductor cable used primarily inside cabinets or equipment.

# Solar Cable



**F**rom residential rooftops to solar farms harvesting energy, our solar cables and photovoltaic wire are designed for the harsh environments of solar energy applications—the hot and cold of climate extremes, ozone and UV radiation, moisture, oil, and direct burial. Our specially formulated PVC jackets provide years of reliable service by withstanding the potential environments without failing or degrading.

## A full range for power and control

No matter what your need in connecting solar power to the grid, we have wire and cable in a range of gauges and conductor counts to satisfy it.

Our cables meet regulatory and industry requirements for photovoltaic applications.

## Applications

- Panel monitoring and control
- Panel to junction box
- Panel to collector
- Collector to inverter
- Grounding
- Motor supply

## Photovoltaic Wire

For single-conductor needs, see page 417 for our line of photovoltaic wires.

# Solar Cable

## 1000 V Braid Shield, Multiconductor, PVC/Nylon, PVC



**UL TC-ER**  
**UL WTTTC (1000 V)**  
**UL MTW**  
**CSA AWM I/II A/B FT1**

### Operating Temperature

- -40°C to +90°C (static)
- -30°C to +90°C (dynamic)
- +105°C (CSA)

### Conductor Color Coding

- Chart F (page 532)

### Materials

- Stranded bare copper conductors
- PVC/nylon insulation
- Clear polyester wrap
- Tinned copper braid shield, 85% coverage
- Green PVC jacket

### Features

- UL Sunlight Resistant
- UL Oil Res. I
- UL Direct Burial
- Suitable for use in Class I, Division 2 locations per Article 501 of the National Electric Code

### Availability

Bulk, cut to length

### FIT® Tubing Recommendations

- FIT-260: Cross-linked polyolefin for ground identification
- FIT-300: Dual-wall polyolefin with meltable inner wall
- FIT-750: Bonding adhesive-lined cross-linked polyolefin

### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1803CY	3	0.329	8.36	0.050	1.27
SPM1804CY	4	0.354	8.99	0.050	1.27
SPM1805CY	5	0.381	9.68	0.050	1.27
SPM1807CY	7	0.409	10.39	0.050	1.27
SPM1809CY	9	0.466	11.84	0.050	1.27

### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 26/30 (26 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1603CY	3	0.351	8.92	0.050	1.27
SPM1604CY	4	0.378	9.60	0.050	1.27
SPM1605CY	5	0.408	10.36	0.050	1.27
SPM1607CY	7	0.439	11.15	0.050	1.27
SPM1609CY	9	0.509	12.93	0.050	1.27

### 14 AWG (2.08 mm<sup>2</sup>)

Stranding: 41/30 (41 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1403CY	3	0.381	9.68	0.050	1.27
SPM1404CY	4	0.412	10.46	0.050	1.27
SPM1405CY	5	0.446	11.33	0.050	1.27
SPM1407CY	7	0.481	12.22	0.050	1.27
SPM1409CY	9	0.590	14.99	0.065	1.65

### 12 AWG (3.29 mm<sup>2</sup>)

Stranding: 65/30 (65 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1203CY	3	0.422	10.72	0.050	1.27
SPM1204CY	4	0.458	11.63	0.050	1.27
SPM1205CY	5	0.497	12.62	0.050	1.27
SPM1207CY	7	0.574	14.58	0.065	1.65
SPM1209CY	9	0.659	16.74	0.065	1.65



# Solar Cable

## 1000 V Unshielded, Multiconductor, PVC/Nylon, PVC



UL TC-ER  
UL WTTTC (1000 V)  
UL MTW  
CSA AWM I/II A/B FT1

### Operating Temperature

- -40°C to +90°C (static)
- -30°C to +90°C (dynamic)
- +105°C (CSA)

### Conductor Color Coding

- Chart F (page 532)

### Materials

- Stranded bare copper conductors
- PVC/nylon insulation
- Clear polyester wrap
- Green PVC jacket

### Features

- UL Sunlight Resistant
- UL Oil Res. I
- UL Direct Burial
- Suitable for use in Class I, Division 2 locations per Article 501 of the National Electric Code

### Availability

Bulk, cut to length

### FIT® Tubing Recommendations

- FIT-260: Cross-linked polyolefin for ground identification
- FIT-300: Dual-wall polyolefin with meltable inner wall
- FIT-750: Bonding adhesive-lined cross-linked polyolefin

#### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1803	3	0.301	7.65	0.050	1.27
SPM1804	4	0.326	8.28	0.050	1.27
SPM1805	5	0.353	8.97	0.050	1.27
SPM1807	7	0.381	9.68	0.050	1.27
SPM1809	9	0.438	11.13	0.050	1.27

#### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 26/30 (26 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1603	3	0.323	8.20	0.050	1.27
SPM1604	4	0.350	8.89	0.050	1.27
SPM1605	5	0.380	9.65	0.050	1.27
SPM1607	7	0.411	10.44	0.050	1.27
SPM1609	9	0.475	12.07	0.050	1.27

#### 14 AWG (2.08 mm<sup>2</sup>)

Stranding: 41/30 (41 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1403	3	0.353	8.97	0.050	1.27
SPM1404	4	0.384	9.75	0.050	1.27
SPM1405	5	0.418	10.62	0.050	1.27
SPM1407	7	0.453	11.51	0.050	1.27
SPM1409	9	0.556	14.12	0.065	1.65

#### 12 AWG (3.29 mm<sup>2</sup>)

Stranding: 65/30 (65 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.12 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
SPM1203	3	0.394	10.01	0.050	1.27
SPM1204	4	0.430	10.92	0.050	1.27
SPM1205	5	0.469	11.91	0.050	1.27
SPM1207	7	0.510	12.95	0.050	1.27
SPM1209	9	0.625	15.88	0.065	1.65



# Industrial Automation Cable

Seamless communication for robust industrial environments



**W**hether you are designing a device for error proofing to increase quality or motion sensing to improve safety, trust Alpha Wire for all your Industrial Automation needs.

As industrial automation systems continue to increase in complexity, we understand the challenges that engineers and manufacturers face in designing and interconnecting system components from sensors to top-level controllers. Our range of industrial automation cables combines the industry-leading quality and exceptional reliability you expect with Alpha Wire with the performance to meet the rigorous requirements of the major automation communication architectures.

## ControlNet™

Low-loss RG-6/U coax designed to meet the high-speed, time-critical requirements of modern ControlNet factory-floor automation systems.

## RS-485

Bringing proven data transmission protocol to the factory floor, rugged RS-485 cables reduce electrical noise sensitivity to keep reliability and performance at world-class levels.

## DeviceNet™

Meeting ODVA thick and thin specifications, the cables comply with Allen-Bradley 1485 CPI-A and 1485 CPI-C, and support high data rates (500 kb/s at 100 m and 125 kb/s at 500 m).

## Fieldbus and PROFIBUS®

A complete family meets ruggedness, performance, and quality requirements of almost any fieldbus and PROFIBUS application environment.

## Industrial Twinax

A robust physical media for the transmission of PLC/DCS signals in real-time, high-throughput applications, including Allen-Bradley Data Highway networks. The cables may be installed in the same tray or conduit as 600-volt power cable.

# ControlNet

## 300 V, RG-6/U Coaxial Cable, Double Braid and Foil Shielded



**UL CL2R**  
**UL CMR**  
**CSA CMG FT4**

### Operating Temperature

- -30°C to +75°C

### Materials

- Solid bare Copperweld conductor
- Foam polyethylene insulation
- Shielding: double braid and foil  
 Foil +60% aluminum braid +  
 foil +40% aluminum braid
- Black PVC jacket

### Features

- UL Sunlight Resistant
- 75-ohm nominal impedance
- 82% velocity of propagation
- 16.2 pF/ft (53.1 pF/m) nominal capacitance

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### FIT® Tubing Recommendations

- FIT-221: General-purpose, cross-linked polyolefin
- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin

Part No.	Nominal Diameter		Center Conductor		Nominal Impedance (ohms)
	Inch	mm	AWG	mm <sup>2</sup>	
6458	0.298	7.57	18	0.82	75

Frequency (MHz)	Nominal Attenuation	
	Attenuation, Nom.	
	dB/100 ft	dB/100 m
1	0.35	1.1
2	0.38	1.2
5	0.45	1.5
10	0.59	1.9
20	0.86	2.8
50	1.37	4.5
100	1.97	6.5
200	2.82	9.3
300	3.48	11.4
400	4.04	13.3



# DeviceNet

## 300 V Power and Data, Class 2, ODVA Thick and Thin Trunks



Part No.	Type	Pairs	Nominal Diameter	
			Inch	mm
6451	Thick	1 Power: 15 AWG (1.75 mm <sup>2</sup> ), 19/0.0135 (19 x 0.35 mm) stranding	0.480	12.19
		1 Data: 18 AWG (0.96 mm <sup>2</sup> ), 19/30 (19 x 0.25 mm) stranding		
6452	Thin	1 Power: 22 AWG (0.38 mm <sup>2</sup> ), 19/34 (19 x 0.16 mm) stranding	0.280	7.11
		1 Data: 24 AWG (0.24 mm <sup>2</sup> ), 19/36 (19 x 0.13 mm) stranding		

- UL CMG
- UL PLTC-ER (Thick)
- UL CL2 (Thin)
- CSA CMG FT4
- CSA AWM I/II A/B FT4

### Operating Temperature

- -20°C to +75°C (static)
- 0°C to +80°C (dynamic)

### Conductor Color Coding

- Black-red power
- Blue-white data

### Materials

- Tinned copper conductors
- Each pair individually foil shielded
- PVC insulation (power pair)
- Foam HDPE insulation (data pair)
- 65% tinned copper braid overall
- Slate PVC jacket

### Features

- Oil resistant
- UL Sunlight Resistant
- 120-ohm nominal impedance (data pair)
- Compliant with Allen-Bradley part numbers 1485 CPI-A and 1485 CPI-C

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### FIT® Tubing Recommendations

- FIT-221: General-purpose, cross-linked polyolefin
- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin





# Fieldbus

## 300 V Single-Pair Cable, Fieldbus Types A and B



Part No.	Fieldbus Type	Pairs	Conductor		Stranding		Nominal Diameter	
			AWG	mm <sup>2</sup>	AWG	mm	Inch	mm
6459	A	1	18	0.90	7/26	7 x 0.40	0.253	6.43
6460	B	1	22	0.33	7/0.0096	7 x 0.24	0.196	4.97

**UL PLTC-ER**  
**UL CM**  
**UL ITC**  
**CSA CM**

### Operating Temperature

- -30°C to +105°C

### Conductor Color Coding

- Blue-orange

### Materials

- Tinned copper conductors
- Polyolefin insulation
- Foil shield
- Orange PVC jacket

### Features

- UL Sunlight Resistant
- 100-ohm nominal impedance

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### FIT® Tubing Recommendations

- FIT-221: General-purpose, cross-linked polyolefin
- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin



# High-Speed Fieldbus

## 300 V Single-Pair Cable



Part No.	Pairs	Conductor		Stranding		Nominal Diameter	
		AWG	mm <sup>2</sup>	AWG	mm	Inch	mm
6461	1	22	0.35	7/30	7 x 0.25	0.351	8.92

UL PLTC

UL CM

CSA CM

### Operating Temperature

- -40°C to +75°C

### Conductor Color Coding

- Blue-orange

### Materials

- Tinned copper conductors
- Foam high-density polyethylene insulation
- Foil shield
- Orange PVC jacket

### Features

- UL Sunlight Resistant
- 150-ohm nominal impedance

### Availability

100 ft (30.5 m)

500 ft (152 m)

1000 ft (305 m)

### FIT® Tubing Recommendations

- FIT-221: General-purpose, cross-linked polyolefin
- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin



# PROFIBUS-DP

## 300 V Single-Pair Cable



Part No.	Pairs	Conductor		Stranding		Nominal Diameter	
		AWG	mm <sup>2</sup>	AWG	mm	Inch	mm
<b>6462</b>	1	22	0.32	Solid		0.315	8.00
<b>6463</b>	1	22	0.35	7/30	7 x 0.25	0.315	8.00

**UL AWM 20201 (6462 only)**  
**UL PLTC**  
**UL CMG**  
**CSA CMG FT4**

### Operating Temperature

- -30°C to +75°C (PLTC, CMG)
- -30°C to +60°C (AWM)

### Conductor Color Coding

- Red-green

### Materials

- Tinned solid or stranded copper conductors
- Foam high-density polyethylene insulation
- Foil + 65% tinned copper braid shield
- Purple PVC jacket

### Features

- UL Sunlight Resistant
- 150-ohm nominal impedance

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### FIT® Tubing Recommendations

- FIT-221: General-purpose, cross-linked polyolefin
- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin



# RS-485 Cable

300 V Foil + Braid, Multipair



**UL CM, CMG**  
**UL TC, PLTC**  
**CSA CM, CMG FT1**

### Operating Temperature

- -20°C to +60°C

### Conductor Color Coding

- Chart M (page 530), except 6454

### Materials

- Tinned copper conductors
- Foam high-density polyethylene insulation
- Foil + 65% tinned copper braid shield
- Black PVC jacket

### Features

- UL Sunlight Resistant
- 120-ohm nominal impedance

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### FIT® Tubing Recommendations

- FIT-221: General-purpose, cross-linked polyolefin
- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin

22 AWG (0.35 mm <sup>2</sup> )							
Stranding: 7/30 (7 x 0.25 mm)							
Part No.	Pairs	Nominal Diameter		Insulation Thickness		Jacket Thickness	
		Inch	mm	Inch	mm	Inch	mm
6453	1	0.284	7.21	0.028	0.71	0.042	1.07
6454*	1.5	0.300	7.62	0.032	0.81	0.042	1.07
6455	2	0.408	10.36	0.024	0.61	0.053	1.35
6456	3	0.414	10.52	0.022	0.56	0.053	1.35
6457	4	0.448	11.38	0.022	0.56	0.053	1.35

\*Conductor color coding: white/orange-orange/white pair, white-blue single conductor.



# Industrial Twinax

## 600 V Foil + Braid Shield, Single Pair



Part No.	Pairs	Conductor		Stranding		Nominal Diameter	
		AWG	mm <sup>2</sup>	AWG	mm	Inch	mm
6450	1	18	0.90	7/26	7 x 0.40	0.324	8.23

UL TC, PLTC, ITC

UL CMG

CSA CMG FT4

### Operating Temperature

- -40°C to +75°C

### Conductor Color Coding

- Blue-white

### Materials

- Tinned stranded copper conductors
- Flame-resistant polypropylene insulation
- Foil + 55% tinned copper braid shield
- Blue PVC jacket

### Features

- UL Sunlight Resistant
- 78-ohm nominal impedance
- Meets the requirements of Allen-Bradley Data Highway Networks

### Availability

100 ft (30.5 m)

500 ft (152 m)

1000 ft (305 m)

### FIT® Tubing Recommendations

- FIT-221: General-purpose, cross-linked polyolefin
- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin



# Flexible Motor Supply Cable

Light Duty Flexing

600 V Foil/Braid, Four Conductor



UL TC-ER  
UL MTW  
UL WTTTC  
CSA AWM I/II A/B FT4  
CE

### Operating Temperature

- -5°C to +90°C (flexing)
- -20°C to +90°C (stationary)

### Conductor Color Coding

- One yellow/green and three numbered black

### Materials

- Finely stranded bare copper conductors
- PVC/nylon insulation
- Foil + braid shield  
Aluminum/polyester/aluminum foil shield, with 25% overlap and four tinned copper drain wires
- Tinned copper braid with 70% coverage
- Black PVC jacket

### Voltage

- 600 V (UL TC-ER, MTW)
- 1000 V (UL WTTTC)

### Availability

Bulk, cut to length

### FIT® Tubing Recommendations

- FIT-321: Medium-wall, adhesive-lined, cross-linked polyolefin
- FIT-600: Highly flexible, cross-linked elastomer

### 16 to 6 AWG (1.49 to 5.33 mm<sup>2</sup>)

Part No.	Conductors	Wire Size		Stranding		Nominal Diameter		Jacket Thickness		Insulation Thickness	
		AWG	mm <sup>2</sup>	AWG	mm	Inch	mm	Inch	mm	Inch	mm
5660	4	16	1.32	26/30	26 x 0.25	0.381	9.67	0.050	1.27	0.016	0.40
5661	4	14	2.08	41/30	41 x 0.25	0.418	10.61	0.050	1.27	0.016	0.40
5662	4	12	3.30	65/30	65 x 0.25	0.464	11.78	0.050	1.27	0.016	0.40
5663	4	10	5.32	105/30	105 x 0.25	0.579	14.70	0.063	1.60	0.022	0.55
5664	4	8	8.52	168/30	168 x 0.25	0.760	19.30	0.063	1.60	0.032	0.81
5665	4	6	13.49	266/30	266 x 0.25	0.901	22.88	0.083	2.10	0.032	0.81



# A Full Range of Communication and Control



**O**ur line-up of standard communication and control cables gives you maximum choice and fewer tradeoffs. By offering you a comprehensive collection of insulation/jacketing materials, shielding options, and conductor counts, you can easily select the cable that meets your most demanding needs. We have cables that go beyond the ordinary to satisfy rigorous requirements of EMI performance, transmission distances, flexibility, and temperature extremes.

## Communication and control typical applications:

- Audio systems: speakers, microphones, intercoms
- Broadcast and studio
- Data transmission: RS-232, 422, 485
- CAD/CAM
- Computer peripherals
- Business machines
- Security systems: alarms, cameras, sensors
- Control systems
- Instrumentation systems
- Point-of-sale systems
- Banking systems

## Communication and control key features:

- 1 - 50 conductors, 1 - 50 pairs
- Wide range of insulation/jacket materials:
  - PVC
  - Irradiated PVC
  - Plenum-rated PVC
  - Semirigid PVC
  - Rubber
  - Polyethylene
  - Polypropylene
  - Foam PP and PE
  - PTFE/FEP
  - LSZH
- Low-capacitance cables for improved transmission distances and signal integrity

## Flexible shielding options:

- Unshielded
- Overall foil shield
- Overall foil/braid
- Individual foil-shielded pairs
- Individual foil-shielded pairs with overall foil/braid

# Communication and Control Cable

300 V Unshielded, Multiconductor, LSZH



Alpha Wire's LSZH communication and control cable combines LSZH-rated insulation and jackets with the rugged performance you expect from Alpha. The specially formulated LSZH material minimizes the effects from smoke and harmful corrosive gases in the event of combustion. Low smoke means easier visibility in exiting the area and reduced danger of smoke inhalation, while low toxicity means no harm to people from halogenated gases.

**UL CM VW-1  
CSA CMG FT4**

### Operating Temperature

- -20°C to +75°C

### Materials

- Stranded tinned copper conductors
- LSZH insulation
- Slate LSZH jacket

### LSZH Properties

- LSZH Flammability: Passes IEC 60332-1
- LSZH Acid Gas Generation: Passes IEC 60754-1 and 60754-2
- LSZH Smoke Emission: Passes IEC 61034-2

### LSZH Unshielded Multiconductor Conductor Color Coding: Chart D

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1172L	2	0.161	4.09	0.028	0.71
1173L	3	0.169	4.29	0.028	0.71
1174L	4	0.189	4.80	0.028	0.71
1175L	5	0.201	5.11	0.028	0.71
1176L	6	0.209	5.31	0.030	0.76
1177L	7	0.209	5.31	0.030	0.76
1178L	8	0.220	5.59	0.030	0.76
1179L	9	0.249	6.32	0.032	0.81
1180L	10	0.260	6.60	0.035	0.88

#### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (0.32 mm)  
Insulation thickness: 0.016 (0.40 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1895L	2	0.181	4.60	0.018	0.45
1896L	3	0.189	4.80	0.020	0.50
1896/4L	4	0.209	5.31	0.020	0.50
1896/5L	5	0.232	5.89	0.020	0.50
1896/6L	6	0.276	7.01	0.020	0.50





# Communication and Control Cable

## 300 V Foil Shielded, Multipair, LSZH



Alpha Wire's LSZH communication and control cable combines LSZH-rated insulation and jackets with the rugged performance you expect from Alpha. The specially formulated LSZH material minimizes the effects from smoke and harmful corrosive gases in the event of combustion. Low smoke means easier visibility in exiting the area and reduced danger of smoke inhalation, while low toxicity means no harm to people from halogenated gases.

**UL CM VW-1  
CSA CMG FT4**

### Operating Temperature

- 20°C to +75°C

### Materials

- Stranded tinned copper conductors
- LSZH insulation (Polypropylene insulation for individually foil shielded pairs)
- Aluminum/polyester shielding, with 25% overlap min. Foil facing inward
- Tinned copper drain wire sized the same as the conductors
- Slate LSZH jacket

### LSZH Properties

- **LSZH Flammability:** Passes IEC 60332-1
- **LSZH Acid Gas Generation:** Passes IEC 60754-1 and 60754-2
- **LSZH Smoke Emission:** Passes IEC 61034-2

### LSZH Overall Foil Shielded Multipair Conductor Color Coding: Chart A

#### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
5471L	1	0.161	4.09	0.028	0.71
5472L	2	0.209	5.31	0.028	0.71
5473L	3	0.228	5.79	0.028	0.71
5474L	4	0.240	6.10	0.028	0.71
5475L	5	0.272	6.91	0.030	0.76
5476L	6	0.299	7.59	0.030	0.76
5477L	7	0.299	7.59	0.030	0.76
5478L	8	0.319	8.10	0.032	0.81
5479L	9	0.339	8.61	0.032	0.81
5480L	10	0.378	9.60	0.032	0.81

### LSZH Individually Foil-Shielded Pair Conductor Color Coding: Chart A

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2466L**	2	0.161	4.09	0.014	0.35
6010L	3	0.299	7.59	0.047	1.19
2463L**	4	0.242	6.15	0.020	0.50
6012L	6	0.386	9.80	0.040	1.01
6014L	9	0.441	11.20	0.040	1.01
6017L	12	0.492	12.50	0.040	1.01

\*Conductor color coding: 1 Red-Black, 2 Green-White, White/Red-White/Black, 4 White/Green-White/Yellow.

†0.009 (0.23) insulation thickness.

\*\*0.008 (0.20) insulation thickness.



# Communication and Control

## 300 V Unshielded, Multiconductor, PVC, PVC



**UL AWM 2576 (150 V) VW-1  
UL CM  
CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart D (page 531)

### Materials

- Stranded or solid tinned copper conductors
- PVC insulation
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### 22 AWG (0.35 mm²)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1172C	2	0.164	4.17	0.032	0.81
1173C	3	0.172	4.37	0.032	0.81
1174C	4	0.185	4.70	0.032	0.81
1175C	5	0.200	5.08	0.032	0.81
1176C	6	0.215	5.46	0.032	0.81
1177C	7	0.215	5.46	0.032	0.81
1178C	8	0.230	5.84	0.032	0.81
1179C	9	0.246	6.25	0.032	0.81
1180C	10	0.264	6.71	0.032	0.81
1181C	12	0.272	6.91	0.032	0.81
1181/15C	15	0.294	7.47	0.032	0.81
1181/20C	20	0.326	8.28	0.032	0.81
1181/25C	25	0.364	9.25	0.032	0.81
1181/30C	30	0.385	9.78	0.032	0.81
1181/40C	40	0.429	10.90	0.032	0.81
1181/50C	50	0.478	12.14	0.035	0.89
1181/60C	60	0.520	13.21	0.035	0.89

### 22 AWG (0.32 mm²)

Stranding: Solid  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1793C	2	0.157	3.99	0.032	0.81



# Communication and Control

300 V Unshielded, Multiconductor, PVC, PVC



**UL AWM 2509 VW-1**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart D (page 531)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.32 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1895C	2	0.180	4.57	0.020	0.51
1896C	3	0.191	4.85	0.020	0.51
1896/4C	4	0.209	5.31	0.020	0.51
1896/5C	5	0.230	5.84	0.020	0.51
1896/6C	6	0.251	6.38	0.020	0.51
1896/7C	7	0.251	6.38	0.020	0.51
1896/8C	8	0.273	6.93	0.020	0.51
1896/9C	9	0.301	7.65	0.023	0.58
1896/10C	10	0.320	8.13	0.020	0.51
1896/12C	12	0.331	8.41	0.020	0.51
1896/15C	15	0.382	9.70	0.030	0.76

### 18 AWG (0.81 mm<sup>2</sup>)

Stranding: 16/30 (16 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1897C	2	0.198	5.03	0.020	0.51
1898C	3	0.210	5.33	0.020	0.51
1898/4C	4	0.231	5.87	0.020	0.51
1898/5C	5	0.254	6.45	0.020	0.51
1898/6C	6	0.278	7.06	0.020	0.51
1898/7C	7	0.278	7.06	0.020	0.51
1898/8C	8	0.313	7.95	0.025	0.64
1898/9C	9	0.337	8.56	0.025	0.64
1898/10C	10	0.366	9.30	0.025	0.64
1898/12C	12	0.378	9.60	0.025	0.64
1898/15C	15	0.423	10.74	0.030	0.76
1898/19C	19	0.455	11.56	0.030	0.76
1898/25C	25	0.544	13.82	0.035	0.89

### 16 AWG (1.32 mm<sup>2</sup>)

Stranding 19/0.0117 (19 x 0.29 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1899C	2	0.222	5.64	0.020	0.51
1899/3C	3	0.236	5.99	0.020	0.51
1899/4C	4	0.260	6.60	0.020	0.51



# Communication and Control

## 300 V Unshielded, Multiconductor, PVC, PVC



**UL CL2 VW-1**  
**CSA AWM I/II A/B FT1**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CL2)

### Conductor Color Coding

- Chart D (page 531)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### 14 AWG (2.09 mm<sup>2</sup>)

Stranding: 41/30 (41 x 0.25 mm)  
Insulation thickness: 0.020 (0.51 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>1891C</b>	2	0.268	6.81	0.020	0.51
<b>1891/3C</b>	3	0.286	7.26	0.020	0.51

### 12 AWG (3.31 mm<sup>2</sup>)

Stranding: 65/30 (65 x 0.25 mm)  
Insulation thickness: 0.020 (0.51 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>1892C</b>	2	0.312	7.92	0.023	0.58
<b>1892/3C</b>	3	0.333	8.46	0.023	0.58

# Communication and Control

600 V Unshielded, Multiconductor, PVC, PVC



## UL AWM 2463 VW-1

### Operating Temperature

- 20°C to +80°C

### Conductor Color Coding

- Chart F (page 532)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Clear polyester wrap
- Slate PVC jacket

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### 16 AWG (1.32 mm<sup>2</sup>)

Stranding 19/0.0117 (19 x 0.29 mm)  
Insulation Thickness 0.032 (0.81 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1064	4	0.395	10.03	0.047	1.19
1065	5	0.430	10.92	0.047	1.19
1067	7	0.468	11.89	0.047	1.19
1069	9	0.577	14.66	0.063	1.60
1072	12	0.640	16.26	0.063	1.60
1075	15	0.694	17.63	0.063	1.60
1079	19	0.749	19.02	0.065	1.65
1085	25	0.907	23.04	0.083	2.11

### 14 AWG (2.08 mm<sup>2</sup>)

Stranding (19 x 0.0147 (19 x 0.37 mm)  
Insulation thickness: 0.047 (1.19 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1274	4	0.503	12.78	0.047	1.19
1275	5	0.584	14.83	0.063	1.60
1277	7	0.635	16.13	0.063	1.60
1279	9	0.744	18.90	0.065	1.60
1282	12	0.867	22.02	0.083	2.11



# Communication and Control

## 300 V Unshielded, Multiconductor, IRR PVC, PVC



**MIL-DTL-16878/1 (Type B)**  
**UL AWM 2576 (150 V) VW-1**

### Operating Temperature

- -55°C to +105°C (MIL)
- -55°C to +80°C (AWM)

### Conductor Color Coding

- 1 White, 2 Black, 3 Red, 4 Green

### Materials

- Stranded tinned copper conductors
- Irradiated PVC insulation
- Clear polyester wrap
- White PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

#### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6622</b>	2	0.155	3.94	0.032	0.81
<b>6623</b>	3	0.162	4.11	0.032	0.81
<b>6624</b>	4	0.173	4.39	0.032	0.81

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6632</b>	2	0.167	4.24	0.032	0.81
<b>6633</b>	3	0.175	4.44	0.032	0.81
<b>6634</b>	4	0.188	4.78	0.032	0.81

#### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.32 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6642</b>	2	0.183	4.65	0.032	0.81
<b>6643</b>	3	0.192	4.88	0.032	0.81
<b>6644</b>	4	0.207	5.26	0.032	0.81

#### 18 AWG (0.89 mm<sup>2</sup>)

Stranding: 7/26 (7 x 0.40 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6652</b>	2	0.203	5.16	0.032	0.81
<b>6653</b>	3	0.214	5.44	0.032	0.81
<b>6654</b>	4	0.232	5.89	0.032	0.81

# Communication and Control

## 300 V Unshielded and Braid Shield, Multiconductor, PVC, PVC



**UL AWM 2785 VW-1  
UL CM  
CSA CMG FT4**

### Operating Temperature

- -20°C to +75°C (CM)
- -20°C to +60°C (AWM, CMG)

### Conductor Color Coding

See tables

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Tinned copper braid shield, 80% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)\*  
500 ft (152 m)\*  
1000 ft (305 m)

\*Parts 1243, 1243/4, and 1243/5 only

### 22 AWG Composite Shielded and Unshielded, UL AWM 2785, UL CM, and CSA CMG

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding 7/30 (7 x 0.25 mm)  
Insulation Thickness 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness		Configuration	
		Inch	mm	Inch	mm	Shielded	Unshielded
<b>1243</b>	3	0.190	4.83	0.020	0.51	1	2
<b>1243/4</b>	4	0.185 x 0.285	4.70 x 7.24	0.020	0.51	2	2
<b>1243/5</b>	5	0.195 x 0.300	4.95 x 7.62	0.020	0.51	3	2

Conductor Color Coding  
Shielded: 1 White, 2 Black, 3 Red  
Unshielded: 1 Black, 2 Red

### 22 and 18 AWG Unshielded, UL CM and CSA CMG Only

#### 22 AWG (0.35 mm<sup>2</sup>)

#### 18 AWG (0.81 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)      16/30 (16 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)      0.018 (0.45 mm)

Part No.	Conductors		Nominal Diameter		Jacket Thickness	
	22 AWG	18 AWG	Inch	mm	Inch	mm
<b>1826C</b>	4	2	0.241	6.12	0.025	0.63
<b>1827C</b>	5	2	0.247	6.27	0.028	0.71
<b>1828C</b>	6	2	0.261	6.63	0.028	0.71

Conductor Color Coding  
22 AWG: Chart I (page 533)  
18 AWG: Chart D (page 531)



# Communication and Control

## 300 V Foil Shield, Multiconductor, PE, PVC



**UL AWM 2092, 2093,  
2094 VW-1**  
**UL CMG**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +75°C (CMG)
- -20°C to +60°C (AWM)

### Conductor Color Coding

- 1 Black, 2 Red, 3 Natural, 4 Green

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire (see table for sizes)
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m), spool or box  
1000 ft (305 m), spool or box

### 24 AWG (0.23 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.016 (0.41 mm)  
24 AWG (0.22 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness		AWM
		Inch	mm	Inch	mm	
<b>2400C</b>	2	0.156	3.96	0.020	0.51	2092

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm)  
22 AWG (0.35 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness		AWM
		Inch	mm	Inch	mm	
<b>2401C*</b>	2	0.168	4.27	0.020	0.51	2092
<b>2402C</b>	2	0.168	4.27	0.020	0.51	2092
<b>2403C</b>	3	0.178	4.52	0.020	0.51	2093
<b>2404C</b>	4	0.194	4.93	0.020	0.51	2094

### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.32 mm)  
Insulation thickness: 0.016 (0.41 mm)  
20 AWG (0.50 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness		AWM
		Inch	mm	Inch	mm	
<b>2411C*</b>	2	0.184	4.67	0.020	0.51	2092
<b>2412C</b>	2	0.184	4.67	0.020	0.51	2092
<b>2413C</b>	3	0.195	4.95	0.020	0.51	2093
<b>2414C</b>	4	0.213	5.41	0.020	0.51	2094

### 18 AWG (0.81 mm<sup>2</sup>)

Stranding: 16/30 (16 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm)  
20 AWG (0.50 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness		AWM
		Inch	mm	Inch	mm	
<b>2421C*</b>	2	0.202	5.13	0.020	0.51	2092
<b>2422C</b>	2	0.202	5.13	0.020	0.51	2092
<b>2423C</b>	3	0.214	5.44	0.020	0.51	2093
<b>2424C</b>	4	0.235	5.97	0.020	0.51	2094

### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 19/0.117 (19 x 0.30 mm)  
Insulation thickness: 0.016 (0.41 mm)  
18 AWG (0.81 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness		AWM
		Inch	mm	Inch	mm	
<b>2432C</b>	2	0.226	5.74	0.020	0.51	2092
<b>2433C</b>	3	0.240	6.10	0.020	0.51	2093

\*Color code: 1 black, 2 natural.





# Communication and Control

300 V Foil Shield, Multiconductor, PE, PVC



### 14 AWG (2.08 mm<sup>2</sup>)

Stranding: 41/30 (41 x 0.25 mm)  
 Insulation thickness: 0.020 (0.51 mm)  
 16 AWG (1.32 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness		UL
		Inch	mm	Inch	mm	
<b>2442C</b>	2	0.292	7.42	0.030	0.76	CL2

**UL CL2**  
**CSA AWM I/II A/B FT4**

### Operating Temperature

- -20°C to +75°C (CL2)
- -20°C to +60°C (AWM)

### Conductor Color Coding

- 1 Black, 2 Red, 3 Natural, 4 Green

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Aluminum/polyester foil shield, 25% overlap min.  
 Foil facing outward  
 Stranded tinned copper drain wire (see table for sizes)
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m), spool or box  
 1000 ft (305 m), spool or box

### 12 AWG (3.29 mm<sup>2</sup>)

Stranding: 65/30 (65 x 0.25 mm)  
 Insulation thickness: 0.020 (0.51 mm)  
 14 AWG (2.08 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness		UL
		Inch	mm	Inch	mm	
<b>2444C</b>	2	0.330	8.38	0.030	0.76	CL2



# Communication and Control

300 V Foil Shield, Multiconductor, PP, PE, PVC/PVC



**UL CM  
VW-1  
CSA CMG FT4**

### Operating Temperature

- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- 1 White, 2 Black, 3 Red, 4 Green
- 1 Black, 2 Red, 3 White, 4 Green

### Materials

- Stranded tinned copper conductors (except 2460C)
- PP, PE, or PVC insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward  
1243/3C: foil facing inward  
Stranded tinned copper drain wire (except 2460C)
- Slate PVC jacket  
2461C: slate or black

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### Polypropylene Insulation

**22 AWG (0.35 mm<sup>2</sup>)**

Stranding: 7/30 (7 x 0.25 mm) or solid  
Insulation Thickness: 0.008 (0.20 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness		Configuration	
		Inch	mm	Inch	mm	Shielded	Unshielded
<b>2460C</b>	2 (solid)	0.126	3.20	0.020	0.51	2	0
<b>2461C</b>	2	0.136	3.45	0.020	0.51	2	0

### Polyethylene Insulation

**20 AWG (0.56 mm<sup>2</sup>)**

Stranding: 7/28 (7 x 0.32 mm)  
Insulation Thickness: 0.014 (0.36 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness		Configuration	
		Inch	mm	Inch	mm	Shielded	Unshielded
<b>1243/3C</b>	3	0.210	5.33	0.030	0.76	2	1
<b>2464C</b>	4	0.165	4.19	0.020	0.51	2	2

### PVC Insulation

**20 AWG (0.56 mm<sup>2</sup>)**

Stranding: 7/28 (7 x 0.32 mm)  
Insulation Thickness: 0.015 (0.38 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness		Configuration	
		Inch	mm	Inch	mm	Shielded	Unshielded
<b>2465C</b>	4	0.240	6.10	0.030	0.76	2	2



# Communication and Control

## 300 V Foil Shield, Multiconductor, PVC, PVC



**UL AWM 2576 (150 V) VW-1  
UL CM  
CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart D (page 531)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward  
Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### 24 AWG (0.23 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1212C	2	0.156	3.96	0.032	0.81
1213C	3	0.163	4.14	0.032	0.81
1214C	4	0.174	4.42	0.032	0.81
1215C	5	0.187	4.75	0.032	0.81
1216C	6	0.201	5.11	0.032	0.81
1217C	7	0.201	5.11	0.032	0.81
1218C	8	0.214	5.44	0.032	0.81
1219C	9	0.228	5.79	0.032	0.81
1219/10C	10	0.244	6.20	0.032	0.81
1219/12C	12	0.251	6.38	0.032	0.81
1219/15C	15	0.270	6.86	0.032	0.81
1219/20C	20	0.298	7.57	0.032	0.81
1219/25C	25	0.332	8.43	0.032	0.81
1219/37C	37	0.376	9.55	0.032	0.81
1219/40C	40	0.390	9.91	0.032	0.81
1219/50C	50	0.427	10.85	0.032	0.81

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1292C	2	0.168	4.27	0.032	0.81
1293C	3	0.176	4.47	0.032	0.81
1294C	4	0.189	4.80	0.032	0.81
1295C	5	0.204	5.18	0.032	0.81
1296C	6	0.219	5.56	0.032	0.81
1297C	7	0.219	5.56	0.032	0.81
1298C	8	0.234	5.94	0.032	0.81
1299C	9	0.250	6.35	0.032	0.81
1299/10C	10	0.268	6.81	0.032	0.81
1299/12C	12	0.276	7.01	0.032	0.81
1299/15C	15	0.298	7.57	0.032	0.81
1299/20C	20	0.330	8.38	0.032	0.81
1299/25C	25	0.368	9.35	0.032	0.81
1299/30C	30	0.389	9.88	0.032	0.81
1299/37C	37	0.418	10.62	0.032	0.81
1299/40C	40	0.433	11.00	0.032	0.81
1299/50C	50	0.482	12.24	0.035	0.89



# Communication and Control

300 V Foil Shield, Multiconductor, SR-PVC, PVC



**UL AWM 2464 VW-1**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart F (page 532)

### Materials

- Stranded tinned copper conductors
- Semirigid PVC insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

## 24 AWG (0.22 mm²)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6300/3*</b>	3	0.163	4.14	0.032	0.81
<b>6300/4*</b>	4	0.174	5.44	0.032	0.81
<b>6305</b>	5	0.187	4.75	0.032	0.81
<b>6306*</b>	6	0.201	5.11	0.032	0.81
<b>6300/8*</b>	8	0.214	5.44	0.032	0.81
<b>6300/10*</b>	10	0.244	6.20	0.032	0.81
<b>6307</b>	15	0.270	6.86	0.032	0.81
<b>6308</b>	20	0.298	7.57	0.032	0.81
<b>6309</b>	25	0.332	8.43	0.032	0.81
<b>6310</b>	30	0.366	9.30	0.040	1.02
<b>6311</b>	40	0.406	10.31	0.040	1.02
<b>6312</b>	50	0.453	11.51	0.045	1.14

Mutual capacitance: 32 pF/ft (105 pF/m)  
 Ground capacitance: 58 pF/ft (190 pF/m)

\*Color coding: 1 Black, 2 White, 3 Red, 4 Green, 5 Brown, 6 Blue, 7 Orange, 8 Yellow, 9 Violet, 10 Slate.



# Communication and Control

## 300 V Spiral Shield, Multiconductor, PVC, PVC



**AWM 2095**  
**AWM 1108 (Single-conductor cables)**

### Operating Temperature

- -20°C to +80°C

### Conductor Color Coding

- 1 Black, 2 Red, 3 White, 4 Green, 5 Yellow, 6 Blue

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Clear polyester wrap (multiconductor only)
- Bare copper spiral shield, 95% coverage
- Slate PVC jacket

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2254/1</b>	1	0.112	2.84	0.020	0.51
<b>2254</b>	2	0.177	4.50	0.020	0.51
<b>2254/3</b>	3	0.187	4.75	0.020	0.51
<b>2254/4</b>	4	0.206	5.23	0.020	0.51
<b>2254/6</b>	6	0.243	6.17	0.020	0.51

#### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 10/30 (10 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2256/1</b>	1	0.119	3.02	0.020	0.51
<b>2256</b>	2	0.191	4.85	0.020	0.51
<b>2256/3</b>	3	0.202	5.13	0.020	0.51
<b>2256/4</b>	4	0.223	5.66	0.020	0.51
<b>2256/6</b>	6	0.264	6.71	0.020	0.51

#### 18 AWG (0.81 mm<sup>2</sup>)

Stranding: 16/30 (16 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2258/1</b>	1	0.129	3.28	0.020	0.51
<b>2258</b>	2	0.214	5.44	0.020	0.51
<b>2258/3</b>	3	0.226	5.74	0.020	0.51
<b>2258/4</b>	4	0.247	6.27	0.020	0.51

#### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 26/30 (26 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2260</b>	2	0.240	6.10	0.020	0.51
<b>2260/3</b>	3	0.254	6.45	0.020	0.51



# Communication and Control

600 V Braid Shield, Multiconductor, PVC, PVC



## MIL-DTL-16878/1 (Type B)

### Operating Temperature

- -55°C to +105°C

### Conductor Color Coding

- Chart F (page 532)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Clear polyester wrap
- Tinned copper braid shield, 90% coverage
- Slate PVC jacket

### Availability

- 100 ft (30.5 m)
- 1000 ft (305 m)

### 28 AWG (0.09 mm²)

Stranding: 7/36 (7 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3302</b>	2	0.119	3.02	0.012	0.30
<b>3303</b>	3	0.124	3.15	0.012	0.30
<b>3304</b>	4	0.134	3.40	0.012	0.30
<b>3306</b>	6	0.161	4.09	0.015	0.38
<b>3308</b>	8	0.171	4.34	0.015	0.38
<b>3310</b>	10	0.201	5.11	0.018	0.46
<b>3312</b>	12	0.206	5.23	0.018	0.46
<b>3315</b>	15	0.236	5.99	0.020	0.51
<b>3320</b>	20	0.261	6.63	0.022	0.56

# Communication and Control

## 600 V Braid Shield, Multiconductor, PVC/Nylon, PVC



### MIL-DTL-16878/17 (Type B/N)

#### Operating Temperature

- 55°C to +105°C

#### Conductor Color Coding

- 1 White, 2 Black, 3 Red, 4 Green (unless otherwise noted)

#### Materials

- Stranded tinned copper conductors
- PVC/nylon insulation
- Clear polyester wrap (multiconductor only)
- Tinned copper braid shield, 90% coverage
- Slate PVC jacket

#### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

#### 26 AWG (0.14 mm<sup>2</sup>)

Stranding: 7/34 (7 x 0.16 mm)  
Insulation thickness: 0.010 (0.25 mm) PVC/0.003 (0.08 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3200</b>	1	0.087	2.21	0.010	0.25
<b>3201</b>	2	0.143	3.63	0.014	0.36
<b>3202</b>	3	0.150	3.81	0.014	0.36
<b>3203</b>	4	0.166	4.22	0.016	0.41

#### 24 AWG (0.24 mm<sup>2</sup>)

Stranding: 19/36 (19 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm) PVC/0.003 (0.08 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3210</b>	1	0.093	2.36	0.010	0.25
<b>3211</b>	2	0.159	4.04	0.016	0.41
<b>3212</b>	3	0.167	4.24	0.016	0.41
<b>3213</b>	4	0.182	4.62	0.017	0.43

#### 22 AWG (0.38 mm<sup>2</sup>)

Stranding: 19/34 (19 x 0.16 mm)  
Insulation thickness: 0.010 (0.25 mm) PVC/0.003 (0.08 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3220</b>	1	0.100	2.54	0.010	0.25
<b>3221</b>	2	0.173	4.39	0.016	0.41
<b>3222</b>	3	0.184	4.67	0.017	0.43
<b>3223</b>	4	0.203	5.16	0.019	0.49
<b>3335*</b>	5	0.228	5.79	0.020	0.51
<b>3336*</b>	6	0.246	6.25	0.020	0.64
<b>3337*</b>	8	0.274	6.96	0.025	0.64

\*Color code chart F.

# Communication and Control

600 V Braid Shield, Multipair, PVC/Nylon, PVC



## MIL-DTL-16878/17 (Type B/N)

### Operating Temperature

- 55°C to +105°C

### Conductor Color Coding

- 1 White, 2 Black, 3 Red, 4 Green (unless otherwise noted)

### Materials

- Stranded tinned copper conductors
- PVC/nylon insulation
- Clear polyester wrap (multiconductor only)
- Tinned copper braid shield, 90% coverage
- Slate PVC jacket

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### 20 AWG (0.61 mm<sup>2</sup>)

Stranding: 19/32 (19 x 0.20 mm)  
Insulation thickness: 0.010 (0.25 mm) PVC/0.003 (0.08 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3230</b>	1	0.108	2.74	0.010	0.25
<b>3231</b>	2	0.195	4.95	0.019	0.49
<b>3232</b>	3	0.205	5.21	0.019	0.49
<b>3233</b>	4	0.227	5.77	0.021	0.53

### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm) PVC/0.003 (0.08 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3240</b>	1	0.122	3.10	0.012	0.30
<b>3241</b>	2	0.219	5.56	0.021	0.53
<b>3242</b>	3	0.233	5.92	0.022	0.56
<b>3243</b>	4	0.261	6.63	0.023	0.58

### 16 AWG (1.23 mm<sup>2</sup>)

Stranding: 19/29 (19 x 0.29 mm)  
Insulation thickness: 0.010 (0.25 mm) PVC/0.003 (0.08 mm) nylon

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3245</b>	1	0.136	0.136	0.016	0.41
<b>3246</b>	2	0.241	0.241	0.023	0.58
<b>3247</b>	3	0.254	0.254	0.023	0.58
<b>3248</b>	4	0.279	0.279	0.025	0.64



# Communication and Control

## 300 V Braid Shield, Multiconductor, PVC, PVC



**UL AWM 2095 VW-1**  
**UL AWM 1108**  
**(Single-Conductor Cables)**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart D (page 531)

### Materials

- Stranded or solid tinned copper conductors
- PVC insulation
- Clear polyester wrap (multiconductor only)
- Bare copper braid shield, 75% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

#### 22 AWG (0.32 mm<sup>2</sup>)

Stranding: Solid  
 Insulation thickness: 0.020 (0.51 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1775C	2	0.195	4.95	0.020	0.51

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1735	1	0.124	3.15	0.020	0.51
1736C	2	0.189	4.80	0.020	0.51
1737C	3	0.199	5.05	0.020	0.51
1738C	4	0.215	5.46	0.020	0.51

#### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.32 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1741C	2	0.205	5.21	0.020	0.51
1742C	3	0.216	5.49	0.020	0.51
1743C	4	0.234	5.94	0.020	0.51

#### 18 AWG (0.81 mm<sup>2</sup>)

Stranding: 16/30 (16 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1745	1	0.141	3.58	0.020	0.51
1746C	2	0.223	5.66	0.020	0.51
1747C	3	0.235	5.97	0.020	0.51
1747/4C	4	0.256	6.50	0.020	0.51

#### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 19/0.0117 (19 x 0.30 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1748C	2	0.247	6.27	0.020	0.51
1749C	3	0.261	6.63	0.020	0.51



# Communication and Control

## 450 V Braid Shield, Multiconductor, PVC, PVC



### 14 AWG (2.08 mm<sup>2</sup>)

Stranding: 41/30 (41 x 0.25 mm)  
Insulation thickness: 0.020 (0.51 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1750	2	0.299	7.59	0.020	0.51
1751	3	0.317	8.05	0.020	0.51

### Operating Temperature

- 20°C to +80°C

### Conductor Color Coding

- Chart D (page 531)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Clear polyester wrap
- Bare copper braid shield, 75% coverage
- Slate PVC jacket

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### 12 AWG (3.29 mm<sup>2</sup>)

Stranding: 65/30 (65 x 0.25 mm)  
Insulation thickness: 0.020 (0.51 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1760	2	0.337	8.56	0.020	0.51
1761	3	0.358	9.09	0.020	0.51

# Communication and Control

600 V Braid Shield, Multiconductor, IRR PVC, PVC



## MIL-DTL-16878/1 (Type B)

### Operating Temperature

- 55°C to +105°C

### Conductor Color Coding

- Chart G (page 532)

### Materials

- Stranded tinned copper conductors
- Irradiated PVC insulation
- Clear polyester wrap
- Tinned copper braid shield, 90% coverage
- White PVC jacket

### Availability

1000 ft (305 m)

### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
7622	2	0.163	4.14	0.025	0.64
7623	3	0.170	4.32	0.025	0.64
7624	4	0.181	4.60	0.025	0.64

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
7631	1	0.122	3.10	0.025	0.64
7632	2	0.175	4.45	0.025	0.64
7633	3	0.183	4.65	0.025	0.64
7634	4	0.196	4.98	0.025	0.64

### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.32 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
7661	1	0.130	3.30	0.025	0.64
7662	2	0.191	4.85	0.025	0.64
7663	3	0.200	5.08	0.025	0.64
7664	4	0.215	5.46	0.025	0.64

### 18 AWG (0.89 mm<sup>2</sup>)

Stranding: 7/26 (7 x 0.40 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
7671	1	0.140	3.56	0.025	0.64
7672	2	0.211	5.35	0.025	0.64
7673	3	0.222	5.64	0.025	0.64
7674	4	0.240	6.09	0.025	0.64

# Communication and Control

## 1000 V Braid Shield, Multiconductor, PVC, PVC



### MIL-DTL-16878/2 (Type C)

#### Operating Temperature

- 55°C to +105°C

#### Conductor Color Coding

- Chart F (page 532)

#### Materials

- Stranded tinned copper conductors
- PVC insulation
- Clear polyester wrap
- Tinned copper braid shield, 90% coverage
- Slate PVC jacket

#### Availability

- 100 ft (30.5 m)
- 1000 ft (305 m)

#### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3405</b>	5	0.303	7.70	0.025	0.64
<b>3408</b>	8	0.364	9.25	0.030	0.76
<b>3410</b>	10	0.429	10.90	0.035	0.89
<b>3412</b>	12	0.442	11.23	0.035	0.89
<b>3415</b>	15	0.488	12.40	0.040	1.02
<b>3420</b>	20	0.550	13.97	0.045	1.14
<b>3430</b>	30	0.667	16.94	0.055	1.40

#### 16 AWG (1.23 mm<sup>2</sup>)

Stranding: 19/29 (19 x 0.29 mm)  
Insulation thickness: 0.018 (0.45 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3444</b>	4	0.316	8.03	0.031	0.79
<b>3446</b>	6	0.376	9.55	0.034	0.86
<b>3450</b>	10	0.487	12.37	0.044	1.12
<b>3452</b>	12	0.509	12.93	0.048	1.22

# Communication and Control

## Braid or Spiral Shield, Multiconductor, PE, PVC Microphone Cable



### Operating Temperature

- 20°C to +60°C

### Conductor Color Coding

- 1-White, 2-Black

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Clear polyester wrap (multiconductor only)

- Braided tinned copper or spiral wrapped tinned copper shield, 90% coverage (85% for part no. 1712)
- Slate PVC jacket

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### 1-Conductor Cable for High-Impedance Microphones

Part No.	Voltage Rating	Wire Size		Stranding		Nominal Diameter		Shield	Jacket Thickness		Insulation Thickness		Capacitance	
		AWG	mm <sup>2</sup>	AWG	mm	Inch	mm		Inch	mm	Inch	mm	pF/ft	pF/m
1706*	4000	20	0.52	26/34	26 x 0.16	0.182	4.62	Braid	0.030	0.76	0.031	0.79	38	125
1703	3500	24	0.20	10/34	10 x 0.16	0.146	3.71	Braid	0.030	0.76	0.020	0.50	36	118
1702**	1000	26	0.14	7/34	7 x 0.16	0.101	2.57	Spiral	0.020	0.51	0.016	0.41	35	115
1705	1000	24	0.20	10/34	10 x 0.16	0.106	2.69	Spiral	0.020	0.51	0.016	0.41	41	135

\*UL AWM 1150, 300 V.

\*\*1702 has 3 strands of tinned copper and 4 strands of tinned Copperweld.

### 2-Conductor Cable for Low-Impedance Microphones

Part No.	Voltage Rating	Wire Size		Stranding		Nominal Diameter		Shield	Jacket Thickness		Insulation Thickness		Capacitance*	
		AWG	mm <sup>2</sup>	AWG	mm	Inch	mm		Inch	mm	Inch	mm	pF/ft	pF/m
1709	1000	24	0.20	10/34	10 x 0.16	0.185	4.70	Spiral	0.030	0.76	0.016	0.41	32	105
1710	1000	22	0.38	19/34	19 x 0.16	0.239	6.07	Braid	0.025	0.64	0.025	0.63	30	98
1712	600	20	0.52	26/34	26 x 0.16	0.221	5.61	Braid	0.030	0.76	0.015	0.38	44	144

\*Capacitance between one conductor and remaining conductors connected to shield.

# Communication and Control

## 600 V Braid Shield, Multiconductor, PE, PVC Audio Cable



### Materials

- Bare copper conductors
- Polyethylene insulation
- Tinned copper braid shield, 95% coverage
- PVC jacket

### Operating Temperature

- -20°C to +60°C

### Availability

- 100 ft (30.5 m)
- 1000 ft (305 m)

### Conductor Color Coding

- 1771: White, blue  
Black, red, or orange jacket
- 1772: White, blue, white, blue  
Black, brown, slate, or yellow jacket

Part No.	Conductors	Wire Size		Stranding		Nominal Diameter		Shield	Jacket Thickness		Insulation Thickness		Capacitance	
		AWG	mm <sup>2</sup>	AWG	mm	Inch	mm		Inch	mm	Inch	mm	pF/ft	pF/m
1771	2	23	0.29	60/40	60 x 0.08	0.243	6.17	Braid	0.040	1.01	0.020	0.51	17.9	58.7
1772	4	25	0.20	40/40	40 x 0.08	0.239	6.07	Braid	0.044	1.11	0.014	0.35	18	69.1

# Communication and Control

600 V Multiconductor, PE, PVC  
Braid Shield



### Operating Temperature

- -20°C to +60°C

### Conductor Color Coding

- Chart H (page 533)

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Clear polyester wrap
- Braided tinned copper shield, 85% coverage
- Slate PVC jacket

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### 20 AWG (0.52 mm<sup>2</sup>)

Stranding: 26/34 (26 x 0.16 mm)  
Insulation thickness: 0.015 (0.38 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1712	2	0.221	5.61	0.030	0.76
1713	3	0.248	6.30	0.035	0.88
1715	4	0.266	6.76	0.035	0.88
1716	5	0.285	7.24	0.035	0.88
1717	6	0.306	7.77	0.035	0.88
1719	8	0.327	8.31	0.035	0.88
1721	10	0.373	9.47	0.035	0.88
1723	12	0.384	9.75	0.035	0.88
1726	15	0.421	10.69	0.035	0.88
1728	20	0.462	11.73	0.035	0.88

# Communication and Control

## 600 V Multiconductor, Rubber, Polychloroprene Braid Shield



### Operating Temperature

- -20°C to +60°C

### Conductor Color Coding

- Chart H (page 533)

### Materials

- Stranded tinned copper conductors
- EPDM rubber insulation
- Clear polyester wrap
- Tinned copper braid shield, 85% coverage
- Black polychloroprene jacket

### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### 18 AWG (0.82 mm<sup>2</sup>)

Stranding: 41/34 (41 x 0.16 mm)  
Insulation thickness: 0.020 (0.51 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1450	2	0.298	7.57	0.045	1.14
1454	6	0.392	9.96	0.045	1.14

### 16AWG (1.31 mm<sup>2</sup>)

Stranding: 65/34 (65 x 0.16 mm)  
Insulation thickness: 0.026 (0.65 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1450/16	2	0.327	8.31	0.036	0.91
1451/16	3	0.350	8.89	0.037	0.94



# Communication and Control

600 V Multiconductor, PTFE, FEP  
Braid Shield



**MIL-DTL-16878/4 (Type E)**  
**NEMA HP3-EXBEE**

### Operating Temperature

- 55°C to +200°C

### Conductor Color Coding

- Chart G (page 532)

### Materials

- Stranded silver-plated copper conductors
- PTFE insulation
- Clear polyester wrap
- Silver-plated copper braid shield, 90% coverage
- White FEP jacket

### Availability

100 ft (30.5 m)

1000 ft (305 m)\*

\*May contain multiple lengths

#### 24 AWG (0.24 mm<sup>2</sup>)

Stranding: 19/36 (19 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2831</b>	1	0.087	2.21	0.010	0.25
<b>2831/2</b>	2	0.132	3.35	0.010	0.25
<b>2831/3</b>	3	0.139	3.53	0.010	0.25

#### 22 AWG (0.38 mm<sup>2</sup>)

Stranding: 19/34 (19 x 0.16 mm)  
Insulation thickness: 0.009 (0.23 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2834</b>	1	0.092	2.34	0.010	0.25
<b>2834/2</b>	2	0.142	3.61	0.010	0.25
<b>2834/3</b>	3	0.154	3.91	0.012	0.30

#### 20 AWG (0.62 mm<sup>2</sup>)

Stranding: 19/32 (19 x 0.20 mm)  
Insulation thickness: 0.009 (0.23 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2837/2</b>	2	0.162	4.11	0.012	0.30
<b>2837/3</b>	3	0.171	4.34	0.012	0.30

# Communication and Control

## 600 V Multiconductor, TFE, Fiberglass Braid Shield



### MIL-DTL-16878/4 (Type E) NEMA HP3-EXBEE

#### Operating Temperature

- 55°C to +200°C

#### Conductor Color Coding

- Chart G (page 532)

#### Materials

- Stranded silver-plated copper conductors
- TFE insulation
- Silver-plated copper braid shield, 90% coverage
- White PTFE-impregnated fiberglass jacket

#### Availability

100 ft (30.5 m)

1000 ft (305 m)\*

\*May contain multiple lengths

#### 24 AWG (0.24 mm<sup>2</sup>)

Stranding: 19/36 (19 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2811</b>	1	0.100	2.54	0.012	0.30
<b>2811/2</b>	2	0.145	3.68	0.012	0.30
<b>2811/3</b>	3	0.152	3.86	0.012	0.30
<b>2811/4</b>	4	0.164	4.17	0.012	0.30
<b>2811/5</b>	5	0.177	4.50	0.012	0.30
<b>2811/7</b>	7	0.191	4.85	0.012	0.30

#### 22 AWG (0.38 mm<sup>2</sup>)

Stranding: 19/34 (19 x 0.16 mm)  
Insulation thickness: 0.009 (0.23 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2814/2</b>	2	0.155	3.94	0.012	0.30
<b>2814/4</b>	4	0.176	4.47	0.012	0.30
<b>2814/6</b>	6	0.206	5.23	0.012	0.30

#### 20 AWG (0.62 mm<sup>2</sup>)

Stranding: 19/32 (19 x 0.20 mm)  
Insulation thickness: 0.009 (0.23 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2817/2</b>	2	0.171	4.34	0.012	0.30
<b>2817/3</b>	3	0.180	4.57	0.012	0.30
<b>2817/4</b>	4	0.195	4.95	0.012	0.30
<b>2817/5</b>	5	0.212	5.38	0.012	0.30
<b>2817/6</b>	6	0.230	5.84	0.012	0.30

# Communication and Control

## 600 V Multiconductor, TFE, Fiberglass Braid Shield



### MIL-DTL-16878/4 (Type E) NEMA HP3

#### Operating Temperature

- 55°C to +200°C

#### Conductor Color Coding

- Chart G (page 532)

#### Materials

- Stranded silver-plated copper conductors
- TFE insulation
- Silver-plated copper braid shield, 90% coverage
- White PTFE-impregnated fiberglass jacket

#### Availability

100 ft (30.5 m)

1000 ft (305 m)\*

\*May contain multiple lengths

#### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2819	1	0.125	3.18	0.012	0.30
2819/2	2	0.195	4.95	0.012	0.30
2819/3	3	0.206	5.23	0.012	0.30
2819/4	4	0.224	5.69	0.012	0.30
2819/5	5	0.245	6.22	0.012	0.30

#### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 19/29 (19 x 0.29 mm)  
Insulation thickness: 0.012 (0.30 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2820	1	0.135	3.43	0.012	0.30
2820/2	2	0.215	5.46	0.012	0.30
2820/3	3	0.228	5.79	0.012	0.30
2820/4	4	0.249	6.32	0.012	0.30

#### 14 AWG (1.23 mm<sup>2</sup>)

Stranding: 19/27 (19 x 0.36 mm)  
Insulation thickness: 0.012 (0.30 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2804/2	1	0.245	6.22	0.012	0.30
2804/3	2	0.260	6.60	0.012	0.30

#### 12 AWG (3.08 mm<sup>2</sup>)

Stranding: 19/25 (19 x 0.46 mm)  
Insulation thickness: 0.012 (0.30 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2803/2	2	0.283	7.19	0.012	0.30

# Communication and Control

## 600 V Multiconductor, PTFE, PTFE Tape Braid Shield



**MIL-DTL-16878/4 (Type E)**  
**NEMA HP3-EXBEE**

### Operating Temperature

- -55°C to +200°C

### Conductor Color Coding

- Chart G (page 532)

### Materials

- Stranded silver-plated copper conductors
- PTFE insulation
- Silver-plated copper braid shield, 90% coverage
- White PTFE tape jacket

### Availability

100 ft (30.5 m)

1000 ft (305 m)\*

\*May contain multiple lengths

### 24 AWG (0.24 mm<sup>2</sup>)

Stranding: 19/36 (19 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2821</b>	1	0.087	2.21	0.010	0.25
<b>2821/2</b>	2	0.136	3.45	0.012	0.30
<b>2821/3</b>	3	0.143	3.63	0.012	0.30
<b>2821/4</b>	4	0.155	3.94	0.012	0.30
<b>2821/5</b>	5	0.168	4.27	0.012	0.30
<b>2821/6</b>	6	0.182	4.62	0.012	0.30

### 22 AWG (0.38 mm<sup>2</sup>)

Stranding: 19/34 (19 x 0.16 mm)  
Insulation thickness: 0.009 (0.23 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2824</b>	1	0.092	2.34	0.010	0.25
<b>2824/2</b>	2	0.146	3.71	0.012	0.30
<b>2824/3</b>	3	0.154	3.91	0.012	0.30
<b>2824/4</b>	4	0.167	4.24	0.012	0.30
<b>2824/5</b>	5	0.182	4.62	0.012	0.30
<b>2824/6</b>	6	0.193	4.90	0.012	0.30

### 20 AWG (0.62 mm<sup>2</sup>)

Stranding: 19/32 (19 x 0.20 mm)  
Insulation thickness: 0.009 (0.23 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2827</b>	1	0.100	2.54	0.010	0.25
<b>2827/2</b>	2	0.158	4.01	0.012	0.30
<b>2827/3</b>	3	0.171	4.34	0.012	0.30
<b>2827/4</b>	4	0.186	4.72	0.012	0.30
<b>2827/5</b>	5	0.203	5.16	0.012	0.30
<b>2827/6</b>	6	0.221	5.61	0.012	0.30

# Communication and Control

600 V Multiconductor, PTFE, PTFE Tape  
Braid Shield



**MIL-DTL-16878/4 (Type E)**  
**NEMA HP3-EXBEE**

### Operating Temperature

- -55°C to +200°C

### Conductor Color Coding

- Chart G (page 532)

### Materials

- Stranded silver-plated copper conductors
- PTFE insulation
- Silver-plated copper braid shield, 90% coverage
- White PTFE tape jacket

### Availability

100 ft (30.5 m)

1000 ft (305 m)\*

\*May contain multiple lengths

#### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2829/2</b>	2	0.186	4.72	0.012	0.30
<b>2829/3</b>	3	0.197	5.00	0.012	0.30
<b>2829/4</b>	4	0.215	5.46	0.012	0.30

#### 16 AWG (1.23 mm<sup>2</sup>)

Stranding: 19/29 (19 x 0.29 mm)  
Insulation thickness: 0.012 (0.30 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2826</b>	1	0.122	3.10	0.010	0.25
<b>2826/2</b>	2	0.206	5.23	0.012	0.30
<b>2826/3</b>	3	0.219	5.56	0.012	0.30
<b>2826/4</b>	4	0.240	6.10	0.012	0.30

# Communication and Control

## 300 V Multiconductor, SR-PVC, PVC Foil/Braid Shield



**UL AWM 2464 VW-1**  
**UL CL2**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CL2)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart D (page 531)

### Materials

- Stranded tinned copper conductors
- Semirigid PVC insulation
- Foil + braid shield  
Aluminum/polyester/aluminum foil shield, 25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire equal in size to the conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

28 AWG (0.08 mm <sup>2</sup> )					
Stranding: 7/36 (7 x 0.13 mm)					
Insulation thickness: 0.010 (0.25 mm)					
Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3463*</b>	3	0.171	4.34	0.035	0.89
<b>3464C</b>	4	0.181	4.60	0.035	0.89
<b>3465C</b>	5	0.191	4.85	0.035	0.89
<b>3466C</b>	6	0.202	5.13	0.035	0.89
<b>3467C</b>	7	0.202	5.13	0.035	0.89
<b>3468C</b>	8	0.212	5.38	0.035	0.89
<b>3469C</b>	9	0.223	5.66	0.035	0.89
<b>3470C</b>	10	0.236	5.99	0.035	0.89
<b>3470/15C</b>	15	0.267	6.78	0.035	0.89
<b>3470/25C</b>	25	0.312	7.92	0.035	0.89
<b>3470/37C</b>	37	0.347	8.81	0.035	0.89
<b>3470/50C</b>	50	0.397	10.08	0.035	0.89

\*UL AWM 2464/CSA CMG only.



# Low Capacitance Data Cable

300 V Multiconductor, FPP, PVC  
Foil/Braid Shield



**UL AWM 2919 (30 V) VW-1**  
**UL CL2**  
**CSA CMG FT4**

## Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CL2)
- -20°C to +60°C (CMG)

## Conductor Color Coding

- Chart D (page 531) for 3-conductor to 9-conductor cables
- Chart F (page 532) for 25-conductor cables

## Materials

- Stranded tinned copper conductors
- Foam polypropylene insulation
- Foil + braid shield  
Aluminum/polyester/aluminum foil shield, 25% overlap min.  
Foil facing outward  
Stranded tinned copper drain wire equal in size to conductor  
Tinned copper braid shield, 65% coverage
- Slate PVC jacket

## Availability

1000 ft (305 m)

**28 AWG (0.08 mm<sup>2</sup>)**

Stranding: 7/36 (7 x 0.13 mm)  
Insulation thickness: 0.013 (0.33 mm)

Part No.*	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3483</b>	3	0.184	4.67	0.035	0.89
<b>3484C</b>	4	0.195	4.95	0.035	0.89
<b>3488C</b>	8	0.232	5.89	0.035	0.89
<b>3489C</b>	9	0.245	6.22	0.035	0.89
<b>3490/25C</b>	25	0.348	8.84	0.035	0.89

Mutual capacitance: 12 pF/ft (39.4 pF/m)  
Ground capacitance: 20 pF/ft (65.6 pF/m)

\*C suffix part no. are CL2 approved.



# Communication and Control

300 V Multiconductor, SR-PVC, PVC  
Overall Foil/Braid Shield



**UL AWM 2464 VW-1**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart F (page 532) for 15-conductor through 50-conductor cables
- See table below for 3-conductor through 10-conductor cables

### Materials

- Stranded tinned copper conductors
- Semirigid PVC insulation
- Foil + braid shield  
Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire, 24 AWG (0.22 mm<sup>2</sup>), 7/32 (7 x 0.22 mm)
- Tinned copper braid, 65% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
6327	3	0.185	4.70	0.032	0.81
6328	4	0.196	4.98	0.032	0.81
6329	5	0.209	5.31	0.032	0.81
6330	6	0.223	5.66	0.032	0.81
6331	7	0.223	5.66	0.032	0.81
6332	8	0.236	5.99	0.032	0.81
6333	9	0.250	6.35	0.032	0.81
6334	10	0.266	6.76	0.032	0.81
6335	15	0.292	7.42	0.032	0.81
6336	25	0.354	8.99	0.032	0.81
6337	37	0.398	10.11	0.032	0.81
6338	50	0.449	11.40	0.032	0.81

Mutual capacitance: 32 pF/ft (105 pF/m)  
Ground capacitance: 58 pF/ft (190 pF/m)

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
6339	3	0.198	5.03	0.032	0.81
6340	4	0.211	5.36	0.032	0.81
6341	5	0.226	5.74	0.032	0.81
6342	6	0.241	6.12	0.032	0.81
6343	7	0.241	6.12	0.032	0.81
6344	8	0.256	6.50	0.032	0.81
6345	9	0.272	6.91	0.032	0.81
6346	10	0.290	7.37	0.032	0.81
6347	15	0.320	8.13	0.032	0.81
6348	25	0.390	9.91	0.032	0.81
6349	37	0.440	11.18	0.032	0.81
6350	50	0.540	13.72	0.053	1.35

Mutual capacitance: 36 pF/ft (118 pF/m)  
Ground capacitance: 65 pF/ft (213 pF/m)

### Color Coding: 3 through 10 Conductors

1 Black	6 Blue
2 White	7 Orange
3 Red	8 Yellow
4 Green	9 Violet
5 Brown	10 Slate





# Communication and Control

## 300 V Foil/Braid Shield, Multiconductor, FPE, PVC Low Capacitance Data Cable



**UL AWM 2919 (30 V) VW-1  
UL CM  
CSA CMH FT1**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMH)

### Conductor Color Coding

- Chart F (page 532) for 15 through 37 conductors. Other parts, see table at right.

### Materials

- Stranded tinned copper conductors
- Foam polyethylene insulation
- Foil + braid shield  
Aluminum/polyester foil shield,  
25% overlap min.  
Foil facing outward  
Stranded tinned copper drain  
wire equal in size to conductor  
Tinned copper braid,  
65% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.016 (0.41 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6351</b>	3	0.217	5.51	0.035	0.89
<b>6352</b>	4	0.231	5.87	0.035	0.89
<b>6353</b>	5	0.248	6.30	0.035	0.89
<b>6354</b>	6	0.265	6.73	0.035	0.89
<b>6355</b>	7	0.265	6.73	0.035	0.89
<b>6356</b>	8	0.282	7.16	0.035	0.89
<b>6357</b>	9	0.300	7.62	0.035	0.89
<b>6358</b>	10	0.320	8.13	0.035	0.89
<b>6359</b>	15	0.353	8.97	0.035	0.89
<b>6360</b>	25	0.432	10.97	0.035	0.89
<b>6361</b>	37	0.514	13.06	0.048	1.22

Mutual capacitance: 12 pF/ft (39.4 pF/m)  
Ground capacitance: 22 pF/ft (72.2 pF/m)

### Color Coding

1 Black	5 Brown	9 Violet
2 White	6 Blue	10 Slate
3 Red	7 Orange	
4 Green	8 Yellow	



# Communication and Control

300 V Unshielded, Multipair, PVC, PVC



**UL AWM 2464, 2576 VW-1  
UL CM  
CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Slate PVC jacket

### Availability

1000 ft (305 m)

#### 22 AWG (0.32 mm<sup>2</sup>)

Stranding: Solid  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>1300C</b>	1	0.157	3.99	0.032	0.81
<b>1302C</b>	2	0.215	5.46	0.032	0.81
<b>1304C</b>	3	0.226	5.74	0.032	0.81
<b>1305C</b>	4	0.246	6.25	0.032	0.81
<b>1306C</b>	5	0.267	6.78	0.032	0.81
<b>1307C</b>	6	0.289	7.34	0.032	0.81
<b>1308/11C</b>	11	0.362	9.19	0.032	0.81
<b>1309C</b>	13	0.382	9.70	0.032	0.81
<b>1310C</b>	16	0.414	10.52	0.032	0.81
<b>1313C</b>	27	0.537	13.64	0.040	1.02

#### UL AWM 2576

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>1317C</b>	2	0.231	5.87	0.032	0.81
<b>1318C</b>	3	0.244	6.20	0.032	0.81
<b>1319C</b>	4	0.265	6.73	0.032	0.81
<b>1320C</b>	5	0.289	7.34	0.032	0.81
<b>1322C</b>	6	0.320	8.13	0.035	0.89
<b>1323C</b>	9	0.371	9.42	0.035	0.89
<b>1324C</b>	11	0.401	10.19	0.035	0.89
<b>1325C</b>	12	0.414	10.52	0.035	0.89
<b>1327C</b>	15	0.460	11.68	0.040	1.02
<b>1327/19C</b>	19	0.493	12.52	0.040	1.02

#### UL AWM 2464

#### 18AWG (0.81 mm<sup>2</sup>)

Stranding: 16/30 (16 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>1131C</b>	1	0.225	5.72	0.032	0.81
<b>1132C</b>	2	0.332	8.43	0.035	0.89
<b>1133C</b>	3	0.356	9.04	0.037	0.94
<b>1134C</b>	4	0.396	10.06	0.040	1.02
<b>1135C</b>	5	0.444	11.28	0.045	1.14
<b>1136C</b>	6	0.484	12.29	0.045	1.14
<b>1138C</b>	8	0.534	13.56	0.050	1.27
<b>1139C</b>	9	0.584	14.83	0.055	1.40
<b>1149C</b>	19	0.791	20.09	0.070	1.78



# Communication and Control

## 300 V Overall Foil Shield, Multipair, SR-PVC, PVC



**UL AWM 2464**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart K (page 529)

### Materials

- Stranded tinned copper conductors
- Semirigid PVC insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 24 AWG (0.23 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
5471C	1	0.156	3.96	0.032	0.81
5472C	2	0.212	5.38	0.032	0.81
5473C	3	0.224	5.69	0.032	0.81
5474C	4	0.243	6.17	0.032	0.81
5475C	5	0.270	6.86	0.035	0.89
5476C	6	0.292	7.42	0.035	0.89
5477C	7	0.292	7.42	0.035	0.89
5478C	8	0.316	8.03	0.035	0.89
5479C	9	0.343	8.71	0.037	0.83
5480C	10	0.373	9.47	0.040	1.02
5480/15C	15	0.415	10.54	0.040	1.02
5480/19C	19	0.445	11.30	0.040	1.02
5480/25C	25	0.527	13.39	0.045	1.14
5480/50C *	50	0.699	17.75	0.053	1.35

\*Color code chart C.

### Individually Shielded, 22 AWG (0.35 mm<sup>2</sup>), 7/30 (7 x .025) Tinned Copper Drain Wire UL VW-1

### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.33 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
6416	2	0.295	7.49	0.041	1.04

Mutual capacitance: 55 pF/ft (180 pF/m)  
 Ground capacitance: 95 pF/ft (312 pF/m)



# Communication and Control

300 V Overall Foil Shield, Multipair, PVC, PVC



**UL AWM 2464 VW-1**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart K (page 529)

### Materials

- Solid tinned copper conductors
- PVC insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

22 AWG (0.32 mm <sup>2</sup> )					
Stranding: Solid Insulation thickness: 0.013 (0.33 mm)					
Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>5902C</b>	2	0.238	6.05	0.032	0.81
<b>5905C</b>	4	0.273	6.93	0.032	0.81
<b>5906C</b>	6	0.329	8.36	0.035	0.89
<b>5909C</b>	9	0.385	9.78	0.037	0.94
<b>5909/15C</b>	15	0.471	11.96	0.040	1.02
<b>5909/19C</b>	19	0.506	12.85	0.040	1.02



# Communication and Control

## 150 and 300 V Overall Foil Shield, Multipair, PVC, PVC



**UL AWM 2576 VW-1 (150 V)**  
**UL AWM 2464 VW-1 (300 V)**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward  
Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 150 V, AWM 2576

**22 AWG (0.35 mm<sup>2</sup>)**

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2211C</b>	1	0.168	4.27	0.032	0.81
<b>2212C</b>	2	0.232	5.89	0.032	0.81
<b>2213C</b>	3	0.245	6.22	0.032	0.81
<b>2214C</b>	4	0.266	6.76	0.032	0.81
<b>2215C</b>	5	0.290	7.37	0.032	0.81
<b>2216C</b>	6	0.315	8.00	0.032	0.81
<b>2219C</b>	9	0.372	9.45	0.035	0.89
<b>2219/12C</b>	12	0.415	10.54	0.035	0.89
<b>2219/15C</b>	15	0.451	11.46	0.035	0.89
<b>2219/19C</b>	19	0.494	12.55	0.040	1.02
<b>2219/23C</b>	23	0.545	13.84	0.040	1.02
<b>2219/27C</b>	27	0.589	14.96	0.040	1.02

### 300 V, AWM 2464

**18 AWG (0.81 mm<sup>2</sup>)**

Stranding: 16/30 (16 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2241C</b>	1	0.226	5.74	0.032	0.81
<b>2242C</b>	2	0.333	8.46	0.035	0.89
<b>2243C</b>	3	0.357	9.07	0.037	0.94
<b>2244C</b>	4	0.397	10.08	0.040	1.02
<b>2245C</b>	5	0.445	11.30	0.045	1.14
<b>2246C</b>	6	0.485	12.32	0.045	1.14
<b>2249C</b>	9	0.585	14.86	0.055	1.40
<b>2249/12C</b>	12	0.652	16.56	0.055	1.40
<b>2249/19C</b>	19	0.792	20.12	0.070	1.78



# Communication and Control

300 V Overall Foil Shield, Multipair, PVC, PVC



**UL PLTC/CM**  
**UL VW-1**  
**UL Sunlight Resistant**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +105°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Black and red pairs, numbered

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Aluminum/polyester foil shield, 25% overlap min. Foil facing inward
- Stranded tinned copper drain wire, 24 AWG (0.22 mm<sup>2</sup>), 7/32 (7 x 0.20)
- Slate PVC jacket

### Availability

500 ft (152 m)  
 1000 ft (305 m)

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.013 (0.33 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6417</b>	2	0.267	6.78	0.038	0.97
<b>6418</b>	3	0.291	7.39	0.043	1.09
<b>6419</b>	4	0.315	8.00	0.043	1.09
<b>6420</b>	6	0.370	9.40	0.043	1.09
<b>6421</b>	9	0.447	11.35	0.053	1.35
<b>6422</b>	11	0.480	12.19	0.053	1.35
<b>6423</b>	15	0.545	13.84	0.053	1.35
<b>6424</b>	19	0.593	15.06	0.063	1.60
<b>6425</b>	27	0.698	17.73	0.063	1.60
<b>6426</b>	51	0.914	23.22	0.075	1.91

### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6427</b>	2	0.362	9.19	0.043	1.09
<b>6428</b>	3	0.403	10.24	0.053	1.35
<b>6429</b>	4	0.438	11.13	0.053	1.35
<b>6430</b>	6	0.518	13.16	0.053	1.35
<b>6431</b>	9	0.622	15.80	0.063	1.60
<b>6432</b>	11	0.671	17.04	0.063	1.60
<b>6433</b>	15	0.751	19.08	0.063	1.60



# Communication and Control

300 V Overall Foil Shield, Multipair, HDPE, PVC  
 Low Capacitance, Extended Distance Cable



**UL AWM 2919 (30 V) VW-1  
 UL CM  
 CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart M (page 530)

### Materials

- Stranded tinned copper conductors
- High-density polyethylene insulation
- Aluminum/polyester/aluminum foil shield, 25% overlap min.  
 Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

## 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6083C</b>	3	0.235	5.97	0.035	0.89
<b>6084C</b>	4	0.254	6.45	0.035	0.89
<b>6087C</b>	7	0.297	7.54	0.035	0.89
<b>6089C</b>	9	0.342	8.69	0.035	0.89
<b>6089/18C</b>	18	0.440	11.18	0.035	0.89

Characteristic impedance: 100 ohms  
 Mutual capacitance: 15 pF/ft (49.2 pF/m)  
 Ground capacitance: 27 pF/ft (88.6 pF/m)



# Communication and Control

300 V Overall Foil Shield, Multipair, PE, PVC  
 Low Capacitance Data Cable



## 24 AWG (0.22 mm²)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6301</b>	6	0.351	8.92	0.035	0.89
<b>6304</b>	12.5	0.455	11.56	0.035	0.89

Characteristic impedance: 120 ohms  
 Mutual capacitance: 12.8 pF/ft (42 pF/m)  
 Ground capacitance: 23 pF/ft (75.4 pF/m)

**UL AWM 2919 (30 V) VW-1**  
**UL CM**  
**CSA CMH FT1**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMH)

### Conductor Color Coding

- Chart M (page 530)

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Aluminum/polyester foil shield, 25% overlap min.  
 Foil facing outward
- Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)





# Communication and Control

## 300 V Overall Foil Shield, Multipair, FPP, PVC Low Capacitance Data Cable



**UL AWM 2919 (30 V) VW-1  
UL CM  
CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Stranded tinned copper conductors
- Foam polypropylene insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

500 ft (152 m)  
1000 ft (305 m)

### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.016 (0.41 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6202C</b>	2	0.258	6.55	0.035	0.89
<b>6203C</b>	3	0.272	6.91	0.035	0.89
<b>6204C</b>	4.5*	0.304	7.72	0.035	0.89
<b>6205C</b>	5	0.323	8.20	0.035	0.89
<b>6206C</b>	6	0.351	8.92	0.035	0.89
<b>6207C</b>	7	0.351	8.92	0.035	0.89
<b>6208C</b>	8	0.379	9.63	0.035	0.89
<b>6209C</b>	9	0.408	10.36	0.035	0.89
<b>6210C</b>	10	0.441	11.20	0.035	0.89
<b>6210/12C</b>	12.5*	0.455	11.56	0.035	0.89
<b>6210/15C</b>	15	0.496	12.60	0.035	0.89
<b>6210/18C</b>	18.5*	0.554	14.07	0.050	1.27
<b>6210/25C</b>	25	0.655	16.64	0.050	1.27

\*Single conductor colors: 4.5 = black, 12.5 = red, 18.5 = white

Characteristic impedance: 105 ohms  
Mutual capacitance: 12.5 pF/ft (41 pF/m)  
Ground capacitance: 22 pF/ft (72 pF/m)

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.020 (0.51 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6212C</b>	2	0.304	7.72	0.035	0.89
<b>6213C</b>	3	0.322	8.18	0.035	0.89
<b>6216C</b>	6	0.420	10.67	0.035	0.89
<b>6217C</b>	7	0.420	10.67	0.035	0.89
<b>6218C</b>	8	0.456	11.58	0.035	0.89
<b>6220C</b>	10	0.563	14.30	0.050	1.27
<b>6220/12C</b>	12.5*	0.580	14.73	0.050	1.27
<b>6220/15C</b>	15	0.631	16.03	0.050	1.27
<b>6220/18C</b>	18.5*	0.667	16.94	0.050	1.27
<b>6220/25C</b>	25	0.793	20.14	0.050	1.27

\*Single conductor colors: 12.5 = red, 18.5 = white

Characteristic impedance: 105 ohms  
Mutual capacitance: 12.5 pF/ft (41 pF/m)  
Ground capacitance: 22 pF/ft (72 pF/m)



# Communication and Control

## 600 V Overall Foil Shield, Multipair, PE, PVC



### UL AWM 2106 VW-1

#### Operating Temperature

- 20°C to +60°C

#### Conductor Color Coding

- Black, clear

#### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire one even AWG size smaller than conductor
- Slate PVC jacket

#### Availability

- 100 ft (30.5 m)
- 500 ft (152 m)
- 1000 ft (305 m)

### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 19/0.0117 (19 x 0.30 mm)  
Insulation thickness: 0.032 (0.81 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2471	1	0.314	7.98	0.035	0.89

Mutual capacitance: 20.5 pF/ft (67.3 pF/m)  
Ground capacitance: 37 pF/ft (121.4 pF/m)

### 14 AWG (1.94 mm<sup>2</sup>)

Stranding: 19/27 (19 x 0.36 mm)  
Insulation thickness: 0.032 (0.81 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2472	1	0.344	8.74	0.035	0.89

Mutual capacitance: 22.7 pF/ft (74.5 pF/m)  
Ground capacitance: 41 pF/ft (134.5 pF/m)

### 12 AWG (3.08 mm<sup>2</sup>)

Stranding: 19/25 (19 x 0.45 mm)  
Insulation thickness: 0.037 (0.94 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
2473	1	0.412	10.46	0.040	1.02

Mutual capacitance: 23.9 pF/ft (78.4 pF/m)  
Ground capacitance: 43 pF/ft (141.1 pF/m)



# Communication and Control

400 V Multiconductor, Multipair, PE, PVC  
Foil Shielded Pairs and Overall Foil Shield



### 25 AWG (0.18 mm<sup>2</sup>)

Stranding: 3/33 TC +4/33 TCW (3 x 0.18 +4 x 0.18 mm)  
Insulation thickness: 0.013 (0.33 mm)

Part No.	Conductors	Pairs	Nominal Diameter		Jacket Thickness	
			Inch	mm	Inch	mm
<b>2468</b>	2	1	0.165	4.19	0.020	0.51

### Operating Temperature

- -20°C to +60°C

### Conductor Color Coding

- Conductors: 1 White, 2 Green  
Pair: Black-Red

### Materials

- Stranded tinned and steel-coated copper conductors
- Polyethylene insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward  
Stranded tinned copper drain wire, 25 AWG (0.18 mm<sup>2</sup>), 7/33 (7 x 0.18 mm)
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)



# Communication and Control

300 V Overall Foil/Braid Shield, Multipair, SR-PVC, PVC



**UL AWM 2464 VW-1**  
**UL CL2**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CL2)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Stranded tinned copper conductors
- Semirigid PVC insulation
- Foil + braid shield  
 Aluminum/polyester foil shield,  
 25% overlap min.  
 Foil facing outward  
 Stranded tinned copper drain  
 wire equal in size to conductor  
 Tinned copper braid,  
 65% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 28 AWG (0.09 mm<sup>2</sup>)

Stranding: 7/36 (7 x 0.13 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		Availability
		Inch	mm	Inch	mm	
<b>3472C</b>	2	0.211	5.36	0.035	0.89	100
<b>3474C</b>	4	0.235	5.97	0.035	0.89	100
<b>3475C</b>	5	0.258	6.55	0.035	0.89	100, 1000
<b>3476C</b>	6	0.275	6.99	0.035	0.89	100
<b>3477C</b>	7	0.275	6.99	0.035	0.89	100
<b>3480C</b>	10	0.332	8.43	0.035	0.89	100, 500, 1000
<b>3480/12C</b>	12.5	0.342	8.69	0.035	0.89	100, 500, 1000
<b>3480/18C</b>	18	0.389	9.88	0.035	0.89	100, 500, 1000
<b>3480/25C</b>	25	0.446	11.33	0.035	0.89	100, 500, 1000



# Communication and Control

## 300 V Overall Foil/Braid Shield, Multipair, SR-PVC, PVC



**UL AWM 2464 VW-1**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- See tables

### Materials

- Stranded tinned copper conductors
- Semirigid PVC insulation
- Foil + braid shield  
 Aluminum/polyester foil, 25% overlap min.  
 Foil facing outward  
 Stranded tinned copper drain wire, 24 AWG (0.23 mm<sup>2</sup>), 7/32 (7 x 0.20 mm)  
 Tinned copper braid, 65% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 24 AWG (0.23 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		Color Code
		Inch	mm	Inch	mm	
6362	2	0.234	5.94	0.032	0.81	M
6363	3	0.246	6.25	0.032	0.81	M
6364	4	0.265	6.73	0.032	0.81	M
6365	5	0.286	7.26	0.032	0.81	M
6366	6	0.308	7.82	0.032	0.81	M
6367	7	0.308	7.82	0.032	0.81	M
6368	10	0.379	9.63	0.032	0.81	M
6369	12.5	0.389	9.62	0.032	0.81	M
6370	15	0.421	10.69	0.032	0.81	M
6371	18	0.451	11.46	0.032	0.81	M
6372	25	0.523	13.28	0.032	0.81	M

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		Color Code
		Inch	mm	Inch	mm	
6373	2	0.254	6.45	0.032	0.81	A
6374	3	0.267	6.78	0.032	0.81	A
6375	4	0.288	7.32	0.032	0.81	A
6376	5	0.312	7.92	0.032	0.81	Chart below
6377	6	0.337	8.56	0.032	0.81	A
6378	7	0.337	8.56	0.032	0.81	A
6379	8	0.363	9.22	0.032	0.81	Chart below
6380	10	0.418	10.62	0.032	0.81	A
6381	12.5	0.430	10.92	0.032	0.81	A
6382	15	0.467	11.86	0.032	0.81	A
6383	18	0.500	12.70	0.032	0.81	A
6384	25	0.595	15.11	0.032	0.81	A

### Color Code Chart (Part No. 6376 and 6379)

Pair No.	Color	Pair No.	Color
1	Black, Red	5	Black, Yellow
2	Black, White	6	Black, Brown
3	Black, Green	7	Black, Orange
4	Black, Blue	8	Red, White



# Communication and Control

300 V Overall Foil/Braid Shield, Multipair, PE, PVC  
Low Capacitance Data Cable



**UL AWM 2960 VW-1**  
**UL CL2**  
**CSA CMH FT1**

### Operating Temperature

- -20°C to +75°C (CL2)
- -20°C to +60°C (AWM, CMH)

### Conductor Color Coding

- Chart K (page 529)

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Foil + braid shielding  
Aluminum/polyester foil shield,  
25% overlap min.  
Foil facing outward  
Stranded tinned copper drain  
wire equal in size to conductor  
Tinned copper braid,  
90% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### 28 AWG (0.089 mm<sup>2</sup>)

Stranding: 7/36 (7 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6390</b>	2	0.211	5.36	0.035	0.89
<b>6391</b>	3	0.220	5.59	0.035	0.89
<b>6392</b>	4	0.235	5.97	0.035	0.89
<b>6393</b>	5	0.252	6.40	0.035	0.89
<b>6394</b>	7	0.269	6.83	0.035	0.89
<b>6395</b>	9	0.305	7.75	0.035	0.89
<b>6396</b>	12	0.335	8.51	0.035	0.89
<b>6397</b>	13	0.341	8.66	0.035	0.89
<b>6398</b>	18	0.383	9.73	0.035	0.89
<b>6399</b>	25	0.440	11.18	0.035	0.89
<b>6400</b>	31	0.470	11.94	0.035	0.89

Characteristic impedance: 100 ohms  
Mutual capacitance: 15.5 pF/ft (50.9 pF/m)  
Ground capacitance: 27.5 pF/ft (90.2 pF/m)



# Communication and Control

## 300 V Overall Foil/Braid Shield, Multipair, PE, PVC Low Capacitance Data Cable



**UL AWM 2919 VW-1**  
**UL CM**  
**CSA CM FT1**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)

### Conductor Color Coding

- Chart M (page 530)

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Foil + braid shielding  
Aluminum/polyester foil shield,  
25% overlap min.  
Foil facing outward  
Stranded tinned copper drain  
wire equal in size to conductor  
Tinned copper braid, 65% or  
90% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

### 24 AWG (0.23 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.016 (0.41 mm)  
65% braid coverage

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
6401	2	0.280	7.11	0.035	0.89
6402	3	0.294	7.47	0.035	0.89
6403	4	0.318	8.08	0.035	0.89
6404	5	0.345	8.76	0.035	0.89
6405	6	0.373	9.47	0.035	0.89
6406	7	0.373	9.47	0.035	0.89
6407	9	0.430	10.92	0.035	0.89
6408	10	0.463	11.76	0.035	0.89
6409	12	0.478	12.14	0.035	0.89
6410	18	0.580	14.73	0.047	1.19
6411	25	0.671	17.04	0.047	1.19

Characteristic impedance: 100 ohms  
Mutual capacitance: 15.5 pF/ft (50.9 pF/m)  
Ground capacitance: 27.5 pF/ft (90.2 pF/m)

### 24 AWG (0.23 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.016 (0.41 mm)  
90% braid coverage

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
6412	1	0.208	5.28	0.035	0.89
6413	2	0.280	7.11	0.035	0.89
6414	3	0.294	7.47	0.035	0.89
6415	4	0.318	8.08	0.035	0.89

Characteristic impedance: 120 ohms  
Mutual capacitance: 12.8 pF/ft (42 pF/m)  
Ground capacitance: 23 pF/ft (75.5 pF/m)



# Communication and Control

300 V Overall Foil/Braid Shield, Multipair, FPP, PVC  
Low Capacitance Data Cable



**UL AWM 2919 (30 V) VW-1**  
**UL CL2**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CL2)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart M (page 530)

### Materials

- Stranded tinned copper conductors
- Foam polypropylene insulation
- Foil + braid shielding  
Aluminum/polyester foil shield,  
25% overlap min.  
Foil facing outward
- Stranded tinned copper drain  
wire equal in size to conductor
- Tinned copper braid,  
65% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

## 28 AWG (0.089 mm<sup>2</sup>)

Stranding: 7/36 (7 x 0.13 mm)  
Insulation thickness: 0.013 (0.33 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>3492C</b>	2	0.230	5.84	0.035	0.89
<b>3493C</b>	3	0.241	6.12	0.035	0.89
<b>3494C</b>	4	0.265	6.73	0.035	0.89
<b>3495C</b>	5	0.284	7.21	0.035	0.89
<b>3496C</b>	6	0.305	7.75	0.035	0.89
<b>3498C</b>	8	0.326	8.28	0.035	0.89
<b>3500/12C</b>	12.5	0.381	9.67	0.035	0.89
<b>3500/18C</b>	18	0.439	11.15	0.035	0.89
<b>3500/25C</b>	25	0.531	13.49	0.048	1.22

Mutual capacitance: 12 pF/ft (39.3 pF/m)  
Ground capacitance: 20 pF/ft (65.5 pF/m)



# Communication and Control

## 300 V Overall Foil/Braid Shield, Multipair, FPP, PVC Low Capacitance Data Cable



**UL AWM 2919 (30 V) VW-1  
UL CM  
CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart M (page 530)

### Materials

- Stranded tinned copper conductors
- Foam polypropylene insulation
- Foil + braid shielding  
Aluminum/polyester foil shield,  
25% overlap min.  
Foil facing outward  
Stranded tinned copper drain  
wire equal in size to conductor  
Tinned copper braid,  
65% coverage
- Slate PVC jacket

### Availability

500 ft (152 m)  
1000 ft (305 m)

24 AWG (0.23 mm <sup>2</sup> )					
Stranding: 7/32 (7 x 0.20 mm) Insulation thickness: 0.016 (0.41 mm)					
Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6222C</b>	2	0.280	7.11	0.035	0.89
<b>6223C</b>	3	0.294	7.47	0.035	0.89
<b>6224C</b>	4	0.318	8.08	0.035	0.89
<b>6225C</b>	5	0.345	8.76	0.035	0.89
<b>6226C</b>	6	0.373	9.47	0.035	0.89
<b>6227C</b>	7	0.373	9.47	0.035	0.89
<b>6228C</b>	8	0.401	10.19	0.035	0.89
<b>6230C</b>	10	0.463	11.76	0.035	0.89
<b>6230/12C</b>	12.5	0.477	12.12	0.035	0.89
<b>6230/15C</b>	15	0.518	13.16	0.035	0.89
<b>6230/18C</b>	18	0.586	14.88	0.050	1.27
<b>6230/25C</b>	25	0.677	17.20	0.050	1.27

Characteristic impedance: 105 ohms  
Mutual capacitance: 12.5 pF/ft (41 pF/m)  
Ground capacitance: 22 pF/ft (72 pF/m)



# Communication and Control

## 300 V Individually Foil Shielded Pairs, Multipair, PVC, PVC



**UL AWM 2919 (30 V) VW-1**  
**UL CL2**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Individual aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire
- PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)  
 22 AWG (0.35 mm<sup>2</sup>) drain wire

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6052C</b>	2	0.316	8.03	0.043	1.09
<b>6053C</b>	3	0.334	8.48	0.043	1.09
<b>6054C</b>	4	0.364	9.25	0.043	1.09
<b>6056C</b>	6	0.451	11.46	0.053	1.35
<b>6059C</b>	9	0.522	13.26	0.053	1.35
<b>6059/11C</b>	11	0.581	14.76	0.053	1.35
<b>6059/15C</b>	15	0.644	16.36	0.053	1.35
<b>6059/19C</b>	19	0.698	17.73	0.063	1.60
<b>6059/27C</b>	27	0.828	21.03	0.063	1.60

### 18 AWG (0.81 mm<sup>2</sup>)

Stranding: 16/30 (16 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)  
 20 AWG (0.51 mm<sup>2</sup>) drain wire

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6062C</b>	2	0.376	9.55	0.043	1.09
<b>6063C</b>	3	0.418	10.62	0.053	1.35
<b>6064C</b>	4	0.456	11.58	0.053	1.35
<b>6066C</b>	6	0.541	13.74	0.053	1.35
<b>6069C</b>	9	0.650	16.51	0.063	1.60
<b>6069/15C</b>	15	0.804	20.42	0.063	1.60



# Communication and Control

## 300 V Individually Foil Shielded Pairs, Multipair, PP, PVC



**UL 2493 VW-1**  
**UL CM, CMG**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +75°C (CM)
- -20°C to +60°C (AWM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Solid or stranded tinned copper conductors
- Polypropylene insulation
- Individual aluminum/polyester foil shield, 25% overlap min. Foil facing inward
- Solid or stranded tinned copper drain wire, 22 AWG (0.35 mm<sup>2</sup>), 7/30 (7 x 0.25 mm)
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 22 AWG (0.32 mm<sup>2</sup>)

Stranding: Solid  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		UL
		Inch	mm	Inch	mm	
6000C	3	0.278	7.06	0.047	1.19	CM
6008C	15	0.492	12.50	0.047	1.19	CM

Characteristic impedance: 62 ohms  
 Mutual capacitance: 25 pF/ft (82 pF/m)  
 Ground capacitance: 45 pF/ft (147 pF/m)

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		UL
		Inch	mm	Inch	mm	
6010C	3	0.298	7.57	0.048	1.22	CMG
6012C	6	0.378	9.60	0.048	1.22	CMG
6014C	9	0.436	11.07	0.048	1.22	CMG
6016C	11	0.483	12.27	0.048	1.22	CMG
6017C	12	0.483	12.27	0.048	1.22	CMG
6018C	15	0.565	14.35	0.063	1.60	CM
6019C	17	0.593	15.06	0.063	1.60	CM
6020C	19	0.593	15.06	0.063	1.60	CM
6022C	27	0.698	17.73	0.063	1.60	CM

Characteristic impedance: 55 ohms  
 Mutual capacitance: 28 pF/ft (91.9 pF/m)  
 Ground capacitance: 50 pF/ft (164 pF/m)

### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.33 mm)  
 Insulation thickness: 0.013 (0.33 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		UL
		Inch	mm	Inch	mm	
6032C	2	0.331	8.41	0.047	1.19	CMG
6033C	3	0.349	8.86	0.047	1.19	CMG
6036C	6	0.450	11.43	0.047	1.19	CMG
6039C	9	0.555	14.10	0.063	1.60	CMG
6042C	12	0.615	15.62	0.063	1.60	CMG

Characteristic impedance: 61 ohms  
 Mutual capacitance: 25 pF/ft (82 pF/m)  
 Ground capacitance: 45 pF/ft (147.6 pF/m)

### 18 AWG (0.81 mm<sup>2</sup>)

Stranding: 16/30 (16 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		UL
		Inch	mm	Inch	mm	
6023C	3	0.406	10.31	0.047	1.19	CM
6024C	6	0.561	14.25	0.063	1.60	CM
6025C	9	0.650	16.51	0.063	1.60	CM

Characteristic impedance: 59 ohms  
 Mutual capacitance: 26 pF/ft (85.3 pF/m)  
 Ground capacitance: 47 pF/ft (154.2 pF/m)



# Communication and Control

## 300 V Individually Foil Shielded Pairs, Multipair, PVC, PVC



**UL PLTC**  
**UL CM**  
**UL VW-1**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +105°C (PLTC, CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Black and red pairs, numbered

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Individual aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire
- Slate PVC jacket

### Availability

500 ft (152 m)  
 1000 ft (305 m)

### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
 Insulation thickness: 0.013 (0.33 mm)  
 24 AWG (0.23 mm<sup>2</sup>) drain wire

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6434</b>	2	0.295	7.49	0.043	1.09
<b>6435</b>	3	0.311	7.89	0.043	1.09
<b>6436</b>	4	0.338	8.58	0.043	1.35
<b>6437</b>	6	0.420	10.66	0.053	1.35
<b>6438</b>	9	0.484	12.29	0.053	1.35
<b>6439</b>	11	0.537	13.63	0.053	1.35
<b>6440</b>	19	0.646	16.40	0.063	1.60
<b>6441</b>	51	1.020	25.90	0.075	1.91

### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
 Insulation thickness: 0.016 (0.41 mm)  
 20 AWG (0.56 mm<sup>2</sup>) drain wire

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6442</b>	2	0.406	10.31	0.053	1.35
<b>6443</b>	3	0.429	10.90	0.053	1.35
<b>6444</b>	4	0.468	11.89	0.053	1.35
<b>6445</b>	6	0.557	14.15	0.053	1.35
<b>6446</b>	9	0.669	16.99	0.063	1.60
<b>6447</b>	11	0.746	18.95	0.063	1.60
<b>6448</b>	15	0.829	21.06	0.063	1.60



# Communication and Control

## 350 V Individually Foil Shielded Pairs, Multipair, PP, PE Direct Burial



### 20 AWG (0.51 mm<sup>2</sup>)

Stranding: 10/30 (10 x 0.25 mm)  
Insulation thickness: 0.008 (0.20 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6314</b>	3	0.291	7.39	0.040	1.02
<b>6315</b>	6	0.385	9.78	0.045	1.14

Characteristic impedance: 48 ohms  
Mutual capacitance: 31 pF/ft (101.7 pF/m)  
Ground capacitance: 56 pF/ft (183.7 pF/m)

### Operating Temperature

- -20°C to +80°C

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Stranded tinned copper conductors
- Polypropylene insulation
- Individual aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire, 22 AWG (0.35 mm<sup>2</sup>), 7/30 (7 x 0.25 mm)
- Black polyethylene jacket

### Availability

1000 ft (305 m)  
500 ft (152 m)

# Communication and Control

## 300 V Individually Foil Shielded Pairs, Multipair, PE, PVC



**UL AWM 2919 (30 V) VW-1**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +80°C (AWM)
- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- Chart A (page 528)

### Materials

- Stranded tinned copper conductors
- Polyethylene insulation
- Individual aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire equal in size to conductor
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.010 (0.25 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6385</b>	3	0.247	6.27	0.035	0.89
<b>6386</b>	6	0.317	8.05	0.035	0.89
<b>6387</b>	9	0.368	9.35	0.035	0.89
<b>6388</b>	12	0.411	10.44	0.035	0.89
<b>6389</b>	25	0.599	15.21	0.047	1.19

Characteristic impedance: 60 ohms  
 Mutual capacitance: 25 pF/ft (82 pF/m)  
 Ground capacitance: 47 pF/ft (154.2 pF/m)



# Communication and Control

## 300 V Individually Foil Shielded Pairs, Multipair, PP, PVC



**UL CMG**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +75°C (CM)
- -20°C to +60°C (CMG)

### Conductor Color Coding

- See tables

### Materials

- Stranded tinned copper conductors
- Polypropylene insulation
- Individual aluminum/polyester foil shield, 25% overlap min. Stranded tinned copper drain wire (see tables for sizes)
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)



### Individually Shielded Pairs

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.010 (0.25 mm)  
24 AWG (0.22 mm<sup>2</sup>) drain wire  
Foil facing outward

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2466C</b>	2	0.170	4.32	0.020	0.51

Characteristic impedance: 60 ohms  
Mutual capacitance: 25 pF/ft (82 pF/m)  
Ground capacitance: 45 pF/ft (147.6 pF/m)

Color code: 1 Red-Black, 2 Green-White.

### Individually Shielded Pairs, UL CM

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.008 (0.20 mm)  
24 AWG (0.22 mm<sup>2</sup>) drain wire  
Foil facing outward

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2463C</b>	4	0.230	5.84	0.020	0.51

Characteristic impedance: 53 ohms  
Mutual capacitance: 29 pF/ft (95.1 pF/m)  
Ground capacitance: 52 pF/ft (170.6 pF/m)

Color code: 1 Red-Black, 2 Green-White, 3 White/Red-White/Black, 4 White/Green-White/Yellow.

### Individually Shielded Pairs

#### 20 AWG (0.56 mm<sup>2</sup>)

Stranding: 7/28 (7 x 0.32 mm)  
Insulation thickness: 0.015 (0.38 mm)  
22 AWG (0.35 mm<sup>2</sup>) drain wire  
Foil facing inward

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>2467C</b>	4	0.340	8.64	0.030	0.76

Characteristic impedance: 66 ohms  
Mutual capacitance: 23 pF/ft (75.5 pF/m)  
Ground capacitance: 41 pF/ft (134.5 pF/m)

Color code: 1 Red-Black, 2 Green-White, 3 White/Red-White/Black, 4 White/Green-White/Yellow.

### Individually Shielded Pairs +Overall Shield, AWM 2717

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.009 (0.23 mm)  
22 AWG (0.35 mm<sup>2</sup>) drain wire  
Foil facing inward

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>1243/2C</b>	2	0.245	6.22	0.030	0.76

Characteristic impedance: 57 ohms  
Mutual capacitance: 27 pF/ft (88.6 pF/m)  
Ground capacitance: 49 pF/ft (160.7 pF/m)

Color code: 1 Red-Black, 2 Green-White.



# Communication and Control

300 V Individually Foil Shielded Pairs and Overall Foil/Braid, Multipair, FPE, PVC, Low Capacitance Data Cable



**UL AWM 2493 VW-1**  
**UL CM**  
**CSA CM FT1**

### Operating Temperature

- -20°C to +75°C (CM)
- -20°C to +60°C (AWM, CMG)

### Conductor Color Coding

- Chart A (page 528)
- (See table at right for Part No. 6319 and 6322)

### Materials

- Stranded tinned copper conductors
- Foam polyethylene insulation
- Individual aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward  
Stranded tinned copper drain wire, 24 AWG (0.23 mm<sup>2</sup>), 7/32 (7 x 0.20 mm)
- Overall foil + braid shielding  
Aluminum/polyester foil, 25% overlap min.  
Foil facing outward  
Stranded tinned copper drain wire equal in size to conductor  
Tinned copper braid, 65% coverage
- Slate PVC jacket

### Availability

100 ft (30.5 m)  
 500 ft (152 m)  
 1000 ft (305 m)

## 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
 Insulation thickness: 0.019 (0.49 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>6316</b>	2	0.349	8.86	0.048	1.22
<b>6317</b>	3	0.353	8.97	0.048	1.22
<b>6318</b>	4	0.397	10.08	0.048	1.22
<b>6319*</b>	5	0.430	10.92	0.048	1.22
<b>6320</b>	6	0.464	11.79	0.048	1.22
<b>6321</b>	7	0.464	11.79	0.048	1.22
<b>6322*</b>	8	0.499	12.67	0.048	1.22
<b>6323</b>	10	0.606	15.39	0.063	1.60
<b>6324</b>	15	0.687	17.45	0.063	1.60
<b>6325</b>	18	0.721	18.31	0.063	1.60
<b>6326</b>	25	0.901	22.89	0.085	2.16

Characteristic impedance: 100 ohms  
 Mutual capacitance: 12.5 pF/ft (41 pF/m)  
 Ground capacitance: 22 pF/ft (72.2 pF/m)

### \*Color Code

Pair No.	Color	Pair No.	Color
1	Black, Red	5	Black, Yellow
2	Black, White	6	Black, Brown
3	Black, Green	7	Black, Orange
4	Black, Blue	8	Red, White





# Communication and Control

300 V Foil Shield, Multiconductor, PVC, PVC  
Plenum Rated



**UL CL2P**  
**UL CMP**  
**CSA CMP FT6**

### Operating Temperature

- 5°C to +75°C

### Conductor Color Coding

- Chart D2 (page 531)

### Materials

- Stranded bare copper conductors
- Plenum-rated PVC insulation
- Foil shield  
Aluminum/polyester foil shield,  
25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire (see tables for size)
- Slate plenum-rated PVC jacket

### Availability

500 ft (152 m)  
1000 ft (305 m)

#### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.008 (0.020 mm)  
24 AWG (0.22 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
58401	2	0.120	3.05	0.015	0.39
57003	3	0.120	3.05	0.015	0.39
57004	4	0.131	3.33	0.015	0.39
57006	6	0.154	3.91	0.015	0.39
57008	8	0.167	4.24	0.015	0.39
57010	10	0.194	4.93	0.015	0.39
57015	15	0.217	5.51	0.015	0.39
58110/25	25	0.262	6.65	0.015	0.39

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.008 (0.020 mm)  
24 AWG (0.22 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
58411	2	0.126	3.20	0.015	0.39
58113	3	0.133	3.38	0.015	0.39
58114	4	0.145	3.68	0.015	0.39
58116	6	0.172	4.37	0.015	0.39
58117	7	0.172	4.37	0.015	0.39
58118	8	0.187	4.75	0.015	0.39
58119	9	0.201	5.11	0.015	0.39
58120	10	0.218	5.54	0.015	0.39
58120/12	12	0.225	5.72	0.015	0.39
58120/15	15	0.245	6.22	0.015	0.39
58120/25	25	0.314	7.98	0.017	0.43

#### 20 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/0.0121 (7 x 0.31 mm)  
Insulation thickness: 0.008 (0.020 mm)  
22 AWG (0.35 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
58421	2	0.138	3.51	0.015	0.39
58124	4	0.160	4.06	0.015	0.39
58126	6	0.191	4.85	0.015	0.39



# Communication and Control

300 V Foil Shield, Multiconductor, PVC, PVC  
Plenum Rated



**UL CL2P**  
**UL CMP**  
**CSA CMP FT6**

### Operating Temperature

- 5°C to +75°C

### Conductor Color Coding

- Chart D2 (page 531)

### Materials

- Stranded bare copper conductors
- Plenum-rated PVC insulation
- Foil shield  
Aluminum/polyester foil shield,  
25% overlap min.  
Foil facing outward  
Stranded tinned copper drain  
wire (see tables for size)
- Slate plenum-rated PVC jacket

### Availability

500 ft (152 m)  
1000 ft (305 m)

#### 18 AWG (0.82 mm<sup>2</sup>)

Stranding: 7/0.0152 (7 x 0.39 mm)  
Insulation thickness: 0.009 (0.023 mm)  
22 AWG (0.35 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58431</b>	2	0.162	4.11	0.015	0.39
<b>58133</b>	3	0.172	4.37	0.015	0.39
<b>58134</b>	4	0.189	4.80	0.015	0.39
<b>58136</b>	6	0.227	5.77	0.015	0.39

#### 16 AWG (1.31 mm<sup>2</sup>)

Stranding: 7/0.0192 (7 x 0.49 mm)  
Insulation thickness: 0.009 (0.023 mm)  
18 AWG (0.82 mm<sup>2</sup>) drain wire

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58142</b>	2	0.186	4.72	0.015	0.39
<b>58144</b>	4	0.218	5.54	0.015	0.39



# Communication and Control

300/150 V Foil Shield, Multipair, PVC, PVC  
Plenum Rated



**UL CL2P**  
**UL CMP**  
**CSA CMP FT6**

### Operating Temperature

- 5°C to +75°C

### Conductor Color Coding

- Chart A1 (page 528)

### Materials

- Stranded bare copper conductors
- Plenum-rated PVC insulation
- Foil shield
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing outward
- Stranded tinned copper drain wire (see tables for size)
- Slate plenum-rated PVC jacket

### Availability

500 ft (152 m)  
1000 ft (305 m)

#### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.008 (0.020 mm)  
24 AWG (0.22 mm<sup>2</sup>) drain wire

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>57602</b>	2	0.165	4.19	0.015	0.39
<b>57603</b>	3	0.175	4.45	0.015	0.39
<b>57604</b>	4	0.193	4.90	0.015	0.39
<b>57605</b>	5	0.212	5.38	0.015	0.39
<b>57606</b>	6	0.231	5.87	0.015	0.39

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.008 (0.020 mm)  
24 AWG (0.22 mm<sup>2</sup>) drain wire

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58412</b>	2	0.185	4.70	0.015	0.39
<b>58413</b>	3	0.197	5.00	0.015	0.39
<b>58414</b>	4	0.217	5.51	0.015	0.39
<b>58415</b>	5	0.239	6.07	0.015	0.39
<b>58416</b>	6	0.261	6.63	0.015	0.39
<b>57628</b>	8	0.285	7.24	0.015	0.39
<b>58419</b>	9	0.311	7.90	0.016	0.41
<b>58420/19</b>	19	0.418	10.62	0.018	0.46

#### 20 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/0.0121 (7 x 0.31 mm)  
Insulation thickness: 0.008 (0.020 mm)  
22 AWG (0.35 mm<sup>2</sup>) drain wire

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>57632</b>	2	0.205	5.21	0.015	0.39
<b>57634</b>	4	0.240	6.10	0.015	0.39
<b>57636</b>	6	0.291	7.39	0.015	0.39



# Communication and Control

150 V Foil Shield, Multipair, FEP, PVDF  
Plenum Rated, Low- and Mid-Capacitance



**UL CL2P**  
**UL CMP**  
**CSA CMP FT6**

### Operating Temperature

- 25°C to +125°C

### Conductor Color Coding

- Chart A1 (page 528)

### Materials

- Stranded tinned copper conductors
- FEP insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire, 24 AWG (0.22 mm<sup>2</sup>), 7/32 (7 x 0.20 mm)
- Slate PVDF jacket

### Availability

500 ft (152 m)

1000 ft (305 m)\*

\*May contain multiple lengths

### Individually Shielded Pairs

#### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.007 (0.18 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58602</b>	2	0.164	4.17	0.009	0.23
<b>58603</b>	3	0.175	4.45	0.009	0.23
<b>58604</b>	4	0.194	4.93	0.009	0.23

Mutual capacitance: 25 pF/ft (82 pF/m)  
Ground capacitance: 45 pF/ft (147.6 pF/m)

### Overall Shield

#### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.007 (0.18 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58802</b>	2	0.154	3.91	0.011	0.28
<b>58803</b>	3	0.163	4.14	0.011	0.28
<b>58804</b>	4	0.180	4.57	0.011	0.28
<b>58806</b>	6	0.217	5.51	0.011	0.28
<b>58809</b>	9	0.256	6.50	0.011	0.28
<b>58812</b>	12.5	0.294	7.47	0.011	0.28

Mutual capacitance: 20 pF/ft (65.6 pF/m)  
Ground capacitance: 36 pF/ft (118.1 pF/m)

### Overall Shield

#### 24 AWG (0.22 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.012 (0.30 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58902</b>	2	0.186	4.72	0.011	0.28
<b>58903</b>	3	0.199	5.05	0.011	0.28
<b>58904</b>	4	0.219	5.56	0.011	0.28
<b>58906</b>	6	0.266	6.76	0.011	0.28
<b>58909</b>	9	0.315	8.00	0.011	0.28
<b>58912</b>	12.5	0.367	9.32	0.011	0.28

Mutual capacitance: 12.5 pF/ft (41 pF/m)  
Ground capacitance: 23 pF/ft (75.5 pF/m)



# Communication and Control

150 V Foil Shield, Multipair, FEP, PVDF  
Plenum Rated, Low- and Mid-Capacitance



**UL CL2P**  
**UL CMP**  
**CSA CMP FT6**

### Operating Temperature

- 55°C to +125°C

### Conductor Color Coding

- Chart A1 (page 528)

### Materials

- Stranded tinned copper conductors
- FEP insulation
- Aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire, 24 AWG (0.22 mm<sup>2</sup>), 7/32 (7 x 0.20 mm)
- Slate PVDF jacket

### Availability

500 ft (152 m)  
1000 ft (305 m)\*

\*May contain multiple lengths

### Overall Foil Shield, Individually Shielded Pairs

#### 22 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/30 (7 x 0.25 mm)  
Insulation thickness: 0.007 (0.18 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58612</b>	2	0.189	4.80	0.009	0.23
<b>58613</b>	3	0.202	5.13	0.009	0.23
<b>58616</b>	6	0.272	6.91	0.009	0.23

Mutual capacitance: 29 pF/ft (95.1 pF/m)  
Ground capacitance: 51 pF/ft (167.3 pF/m)

### Individually Shielded Pairs, Overall Shield

#### 18 AWG (0.82 mm<sup>2</sup>)

Stranding: 7/0.0152 (7 x 0.39 mm)  
Insulation thickness: 0.007 (0.18 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58632</b>	2	0.247	6.27	0.010	0.25
<b>58633</b>	3	0.264	6.71	0.012	0.30

Mutual capacitance: 35 pF/ft (114.8 pF/m)  
Ground capacitance: 63 pF/ft (206.7 pF/m)

### Individually Shielded Pairs

#### 16 AWG (0.35 mm<sup>2</sup>)

Stranding: 7/0.0192 (7 x 0.49 mm)  
Insulation thickness: 0.007 (0.18 mm)

Part No.	Pairs	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
<b>58642</b>	2	0.289	7.34	0.012	0.30
<b>58643</b>	3	0.309	7.85	0.012	0.30

Mutual capacitance: 39 pF/ft (128 pF/m)  
Ground capacitance: 69 pF/ft (226.4 pF/m)



## Communication and Control

### 200 V Unshielded and Shielded, Multiconductor PVC, PVC Hi-Fi and Stereo Cable



#### Operating Temperature

- 20°C to +80°C

#### Conductor Color Coding

- 1 Black, 2 Red, 3 White, 4 Green

#### Materials

- Stranded tinned copper conductors
- PVC insulation
- Conductors twisted in an extra tight lay

#### Availability

100 ft (30.5 m)  
1000 ft (305 m)

### Miniature Shielded Cable

#### Conductor Color Coding

- 1 Black, 2 Red, 3 White, 4 Green

#### Materials

- Stranded tinned copper conductors
- Color-coded PVC insulation
- Tinned copper braid shield, 80% coverage
- Clear PVC jacket

#### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)

#### 32 AWG (0.03 mm<sup>2</sup>)

Stranding: 7/40 (7 x 0.08 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter	
		Inch	mm
1101	3	0.063	1.60
1102	4	0.072	1.83

#### 30 AWG (0.05 mm<sup>2</sup>)

Stranding: 7/38 (7 x 0.10 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter	
		Inch	mm
1115	2	0.064	1.63
1116	3	0.070	1.78

#### 28 AWG (0.09 mm<sup>2</sup>)

Stranding: 7/36 (7 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Jacket Thickness	
		Inch	mm	Inch	mm
1120	2	0.115	2.92	0.010	0.25
1121	3	0.120	3.05	0.010	0.25
1122	4	0.130	3.30	0.010	0.25

# Communication and Control

## 150 V Unshielded Multiconductor PP, PVC Silver Satin Oval Telephone Cable



### 26 AWG (0.14 mm<sup>2</sup>)

Stranding: 7/34 (7 x 0.16 mm)  
Insulation thickness: 0.009 (0.23 mm)

Part No.	Conductors	Nominal Outer Dimension		Jacket Thickness	
		Inch	mm	Inch	mm
<b>1604</b>	4	0.090 x 0.190	2.28 x 4.83	0.020	0.51
<b>1606</b>	6	0.090 x 0.270	2.28 x 6.85	0.024	0.61
<b>1608</b>	8	0.090 x 0.350	2.28 x 8.89	0.024	0.61

### Temperature Rating

- -20°C to +60°C

### Conductor Color Coding

- See table

### Materials

- Stranded bare copper conductors
- Polypropylene insulation
- Silver PVC jacket

### Conductor Color Coding

Conductor No.	1604	1606	1608
1	Black	White	Slate
2	Red	Black	Orange
3	Green	Red	Black
4	Yellow	Green	Red
5		Yellow	Green
6		Blue	Yellow
7			Blue
8			Brown

### Availability

328 ft (100 m), box  
1000 ft (305 m), box

# Communication and Control

300 V Individually Foil Shielded Pairs or Overall Foil Shielded, Multipair, FPP, PVC



## Individually Foil Shielded Pairs

### 24 AWG (0.23 mm<sup>2</sup>)

Stranding: 7/32 (7 x 0.20 mm)  
Insulation thickness: 0.023 (0.58)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		AWM
		Inch	mm	Inch	mm	
6073C	3	0.374	9.50	0.048	1.22	2493
6076C	6	0.483	12.27	0.048	1.22	2493
6079C	9	0.597	15.16	0.065	1.65	2493
6079/11C	11	0.643	16.33	0.065	1.65	2493
6079/12C	12	0.663	16.84	0.065	1.65	2493
6079/15C	15	0.719	18.26	0.065	1.65	2493
6079/27C	27	0.962	24.43	0.087	2.21	2490

Characteristic impedance: 115 ohms  
Mutual capacitance: 12 pF/ft (41 pF/m)

## Overall Foil Shield

### 22 AWG (0.32 mm<sup>2</sup>)

Stranding: Solid  
Insulation thickness: 0.023 (0.58)

Part No.	Pairs	Nominal Diameter		Jacket Thickness		AWM
		Inch	mm	Inch	mm	
6072C*	2	0.42	9.50	0.035	0.89	2668

Characteristic impedance: 150 ohms  
Mutual capacitance: 8.8 pF/ft (28.9 pF/m)

\*Black jacket.

**UL AWM 2490, 2493, 2668**  
**VW-1**  
**UL CM**  
**CSA CMG FT4**

### Operating Temperature

- -20°C to +75°C (CM)
- -20°C to +60 (AWM, CMG)

### Conductor Color Coding

- Chart K (page 529)

### Materials

- Solid or stranded tinned copper conductors
- Foam polypropylene insulation
- Individual aluminum/polyester foil shield, 25% overlap min.  
Foil facing inward
- Stranded tinned copper drain wire, 24 AWG (0.23 mm<sup>2</sup>), 7/32 (7 x 0.20 mm)
- Slate PVC jacket (unless otherwise noted)

### Availability

100 ft (30.5 m)  
500 ft (152 m)  
1000 ft (305 m)





# Communication and Control

## 300 V Unshielded, Flat Cable, 0.050 (1.27 mm) Centerline



### UL AWM 2651, 20932 VW-1

#### Operating Temperature

- 20°C to +105°C

#### Materials

- Stranded tinned copper conductors
- Extruded PVC insulation (slate cable)
- Thermally bonded PVC with clear PVC covering (color-coded cable)

#### Color

- AWM 2651: slate cable, with red polarity stripe on leading edge
- AWM 20932: color-coded cable: brown, red, orange, yellow, green, blue, violet, slate, white, black . . . repeats

#### Electrical Characteristics

- Capacitance: 14 pF/ft (45.9 pF/m) nom. at 1 MHz
- Propagation delay: 1.4 ns/ft (4.6 ns/m) @ 0.18 ns risetime
- Impedance: 105 ohms (G-S-G configuration)
- Near-end crosstalk: 3.2%
- Far-end crosstalk: 11.5%
- Crosstalk measured on adjacent lines, 1 ns risetime, 10 ft (3.05 m) length

#### Availability

100 ft (30.5 m)

May contain multiple lengths

28 AWG (0.09 mm <sup>2</sup> )							
Stranding: 7/36 (7 x 0.13 mm) Insulation thickness: 0.010 (0.25 mm)							
Part No.		Conductors	Width (W)		Span (S)		
Slate (AWM 2651)	Color Coded (AWM 20932)		Inch	mm	Inch	mm	
<b>3580/9</b>	<b>3583/9</b>	9	0.45	11.43	0.40	10.16	
<b>3580/10</b>	<b>3583/10</b>	10	0.50	12.70	0.45	11.43	
<b>3580/14</b>	<b>3583/14</b>	14	0.70	17.78	0.65	16.51	
<b>3580/15</b>	<b>3583/15</b>	15	0.75	19.05	0.70	17.78	
<b>3580/16</b>	<b>3583/16</b>	16	0.80	20.32	0.75	19.05	
<b>3580/20</b>	<b>3583/20</b>	20	1.00	25.40	0.95	24.13	
<b>3580/24</b>	<b>3583/24</b>	24	1.20	30.48	1.15	29.21	
<b>3580/25</b>	<b>3583/25</b>	25	1.25	31.75	1.20	30.48	
<b>3580/26</b>	<b>3583/26</b>	26	1.30	33.02	1.25	31.75	
<b>3580/34</b>	<b>3583/34</b>	34	1.70	43.18	1.65	41.91	
<b>3580/37</b>	<b>3583/37</b>	37	1.85	46.99	1.80	45.72	
<b>3580/40</b>	<b>3583/40</b>	40	2.00	50.80	1.95	49.53	
<b>3580/50</b>	<b>3583/50</b>	50	2.50	63.50	2.45	62.23	
<b>3580/60</b>	<b>3583/60</b>	60	3.00	76.20	2.95	74.93	
<b>3580/64</b>	<b>3583/64</b>	64	3.20	81.28	3.15	80.01	



## Communication and Control

300 V Foil + Braid Shield, Round to Flat  
Flat Cable, 0.050 (1.27 mm) Centerline



**UL AWM 20381 (300 V)**  
**UL CL2 (150 V)**

### Operating Temperature

- -20°C to +105°C

### Materials

- Stranded tinned copper conductors
- PVC insulation
- Foil + braid shield  
Aluminum/polyester  
Tinned copper braid  
(90% coverage)
- Black PVC jacket, 0.030  
(0.08 mm) thick

### Configuration

- Flat cable termination area is 0.75 (19 mm) long and occurs every 1.5 (38 mm)

### Electrical Characteristics

- Capacitance: 24 pF/ft (78.7 pF/m) nom at 1 MHz
- Impedance: 70 ohms

### Availability

100 ft (30.5 m)

May contain multiple lengths

#### 28 AWG (0.09 mm<sup>2</sup>)

Stranding: 7/36 (7 x 0.13 mm)  
Insulation thickness: 0.010 (0.25 mm)

Part No.	Conductors	Nominal Diameter		Nominal Width	
		Inch	mm	Inch	mm
<b>3585/25</b>	25	0.34	8.64	1.20	30.48
<b>3585/26</b>	26	0.35	8.89	1.65	41.91
<b>3585/40</b>	40	0.40	10.20	1.95	49.53
<b>3585/50</b>	50	0.46	11.70	2.45	62.23



# Communication and Control

150 V, Jacketed, Foil Shield, Flat Cable, 0.050 (1.27 mm) Centerline



28 AWG (0.09 mm <sup>2</sup> )					
Stranding: 7/36 (7 x 0.13 mm)					
Insulation thickness: 0.010 (0.25 mm)					
Part No.	Conductors	Nom. Core Width (A)		Nom. Jacket Width (C)	
		Inch	mm	Inch	mm
3590/10	10	0.50	12.70	0.57	14.48
3590/14	14	0.70	17.78	0.77	19.56
3590/16	16	0.80	20.32	0.87	22.10
3590/26	26	1.30	33.02	1.37	34.80

**UL AWM 2912**  
**UL Type CL2**

### Operating Temperature

- -20°C to +105°C

### Materials

- Stranded tinned copper conductors
- Extruded slate PVC insulation with red polarity stripe
- Aluminum/polyester/aluminum foil shield
- Two 28 AWG (0.09 mm<sup>2</sup>) stranded tinned copper drain wires
- Slate PVC jacket, 0.030 (0.08 mm) thick

### Electrical Characteristics

- Capacitance: 20 pF/ft (65.6 pF/m) nom. at 1 MHz
- Propagation delay: 1.45 ns/ft (4.8 ns/m) at 0.18 ns risetime
- Impedance: 70 ohms
- Near-end crosstalk: 5.5%
- Far-end crosstalk: 1.6%
- Crosstalk measured on adjacent lines, 3.5 ns risetime

### Availability

100 ft (30.5 m)

May contain multiple lengths



# Communication and Control

## 150 V Unshielded, Flat Cable, 0.025 (0.64 mm) Centerline



### 30 AWG (0.05 mm<sup>2</sup>)

Stranding: Solid  
Insulation thickness: 0.013 (0.33 mm)

Part No.	Conductors	Width (W)		Span (S)	
		Inch	mm	Inch	mm
<b>3582/26</b>	26	0.65	16.51	0.625	15.88
<b>3582/40</b>	40	1.00	25.40	0.975	24.76
<b>3582/50</b>	50	1.25	31.75	1.225	31.15
<b>3582/60</b>	60	1.50	38.10	1.475	37.46

### UL AWM 2678 VW-1

#### Operating Temperature

- -20°C to +105°C

#### Color

- Slate, with red polarity stripe on leading edge

#### Materials

- Solid bare copper conductors
- PVC insulation

#### Electrical Characteristics

- Capacitance:
  - 24.9 pF/ft (82 pF/m) nom. (G-S-G) at 1 kHz
  - 14.3 pF/ft (47 pF/m) nom. (G-S) at 1 kHz
- Propagation delay: 1.52 ns/ft (4.9 ns/m)
- Impedance:
  - 78 ohms (G-S-G single-ended configuration)
  - 131 ohms nom. (G-S differential configuration)
- Skew: 0.036 ns/ft (0.12 ns/m) max

#### Availability

100 ft (30.5 m)

May contain multiple lengths



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