

## MIL-38999 Custom Harnesses, Mixed Signals

Complex MIL-38999 Harness • Electrical, RF, Fiber Mixed Signals • Variety of MIL-Connectors

We make hi-quality MIL-38999 harnesses using imported MIL-QPL connectors, MIL-22759 ETFE wires. We focus on complex harnesses with a variety of connectors like MIL-38999, MIL-83513 Micro-D, MIL-24308 D-Sub amongst others. Harnesses include multi-branch having mixed signals like electrical, RF, ethernet or fiber in the same harness. A hi-quality process and test setup from renowned vendors ensures reliability for Mil applications. Cable Sets incorporate QPL connectors and cables from Deutsche, Aero Inc, Habia amongst others.

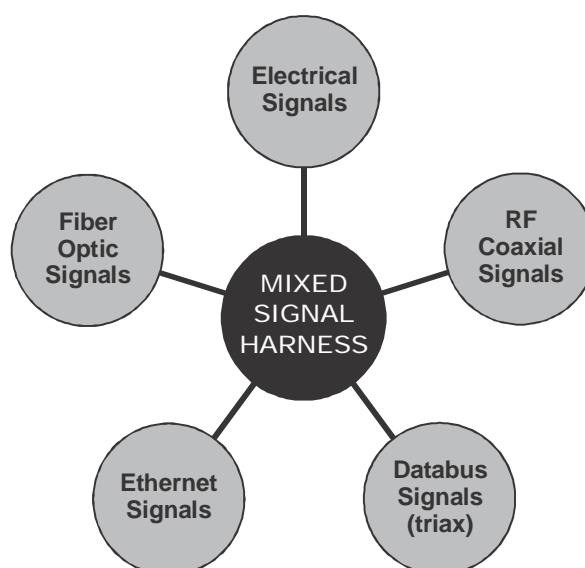


### MIL QPL MATERIALS & VENDORS

- MIL-38999 Series QPL Connectors from suppliers like Deutsche, Aero Inc
- MIL -22759 PTFE Cables from Habia or equivalent
- MIL-39029 contacts, MIL-85045 Backshells

### FEATURES

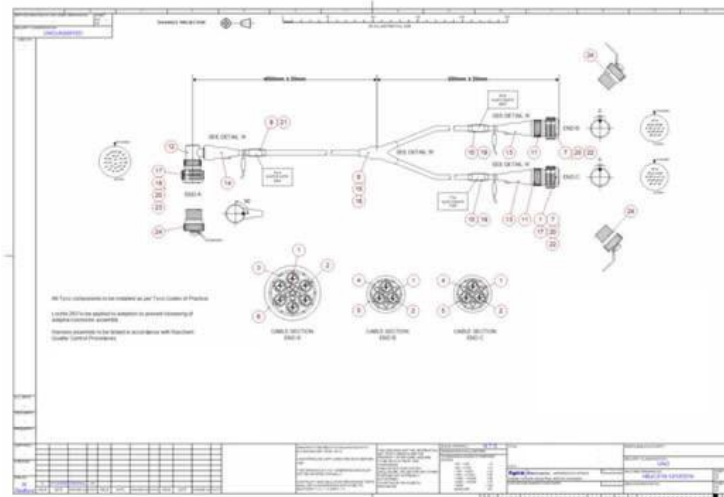
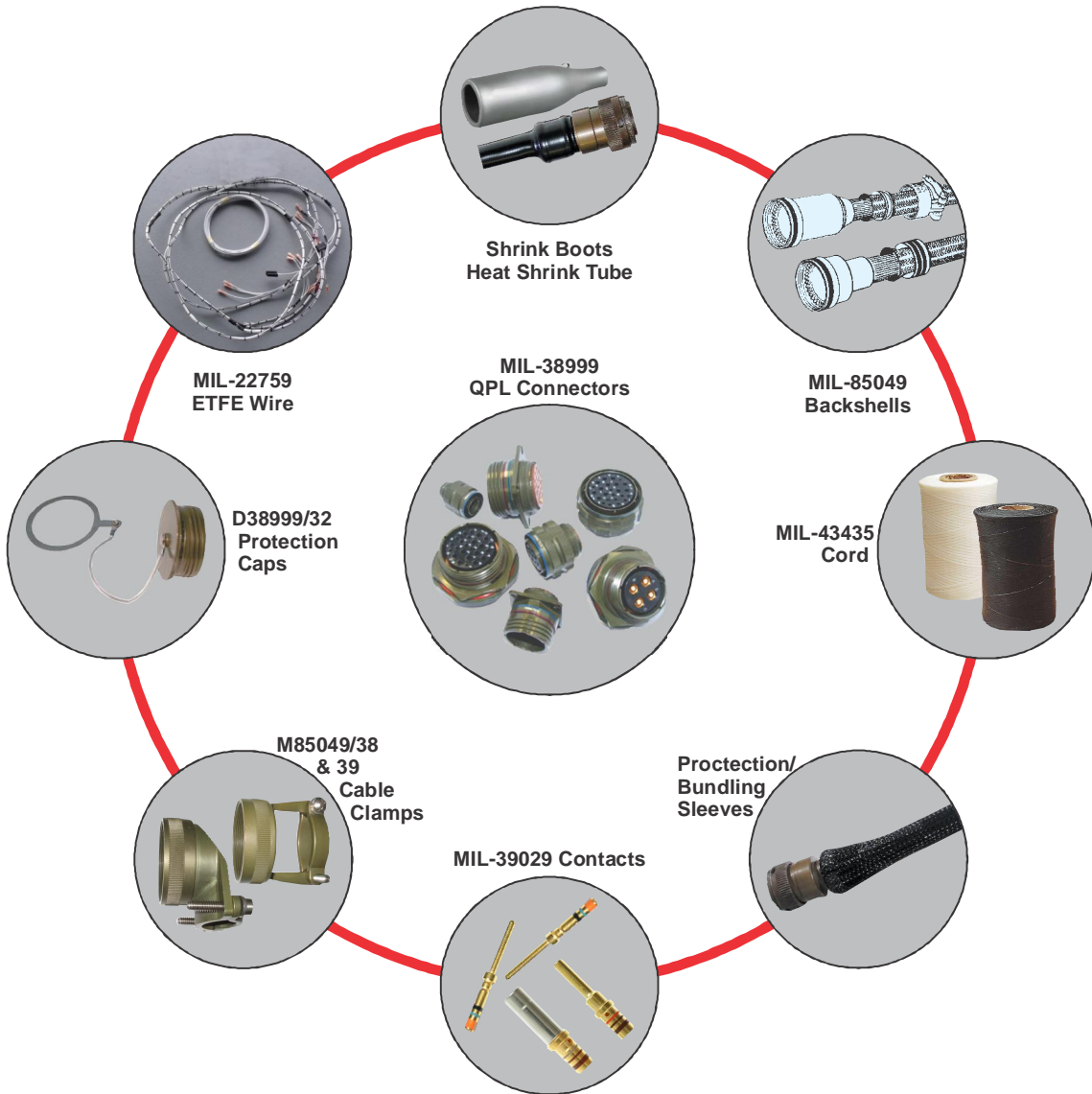
- 100% tested for voltage, insulation resistance and continuity
- Temperature range upto 200°C.
- Complex harnesses with Micro-D, MIL38999 or any other MIL connectors
- MIL-38999 multi-branch harnesses



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## MIL-Conformant Materials Used in our MIL-38999 Cable Harnesses



**Harness Example**

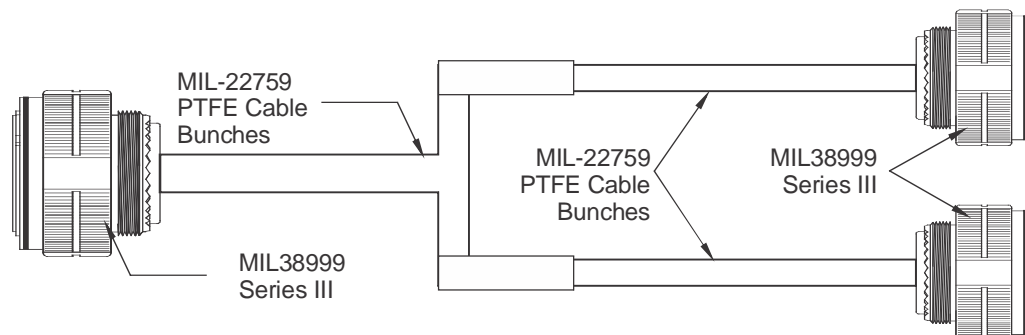
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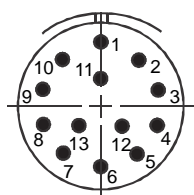
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## MIL38999 ~ MIL38999 Plug Cable Sets (Multiple Branches)

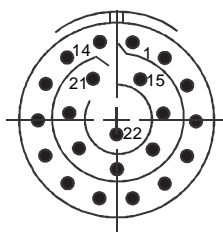


Our Part Number	Length Inches(cm)	Wires	Connector 1 Type Size	Connector 2 Type Size	Connector 3 Type Size	Cable Colour	AWG
MID-D30326WC35-D30326WB35-D30326WB35-18I-P24W-2-00	18 (46)	11x2	Plug C35	Plug B35	Plug B35	White	24
MID- D30326WC35-D30326WB35-D30326WB35-36I-P24W-2-00	36 (92)	11x2	Plug C35	Plug B35	Plug B35	White	24
MID- D30326WC35-D30326WB35-D30326WB35-18I-P24R-2-00	18 (46)	11x2	Plug C35	Plug B35	Plug B35	10 Rep	24
MID- D30326WC35-D30326WB35-D30326WB35-36I-P24R-2-00	36 (92)	11x2	Plug C35	Plug B35	Plug B35	10 Rep	24
MID- D30326WE35-D30326WC35-D30326WC35-18I-P24W-2-00	18 (46)	22x2	Plug E35	Plug C35	Plug C35	White	24
MID- D30326WE35-D30326WC35-D30326WC35-36I-P24W-2-00	36 (92)	22x2	Plug E35	Plug C35	Plug C35	White	24
MID- D30326WE35-D30326WC35-D30326WC35-18I-P24R-2-00	18 (46)	22x2	Plug E35	Plug C35	Plug C35	10 Rep	24
MID- D30326WE35-D30326WC35-D30326WC35-36I-P24R-2-00	36 (92)	22x2	Plug E35	Plug C35	Plug C35	10 Rep	24

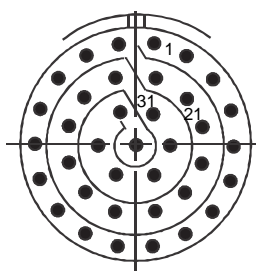
**Note:** Custom designs as per customer asked lengths, different number of contacts, other MIL-22579 wires, wire colors, insert patterns, connector combinations and other customizations possible on request.



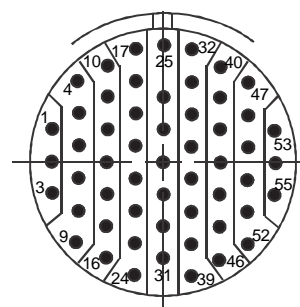
B35, Shell Size 11  
15 Contacts



C35, Shell Size 13  
22 Contacts



D35, Shell Size 15  
37 Contacts



E35, Shell Size 17  
55 Contacts

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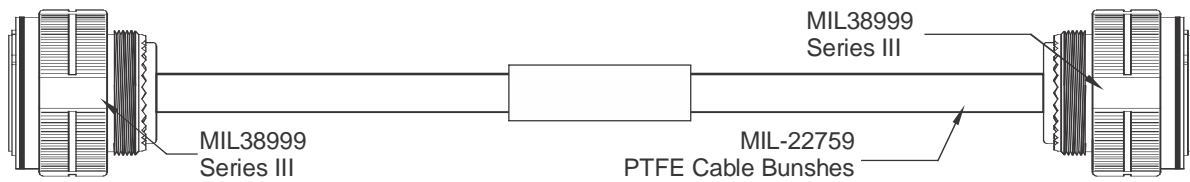
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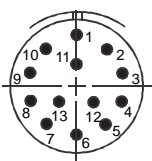


## MIL38999 ~ MIL38999 Plug Cable Sets (1 Branch)

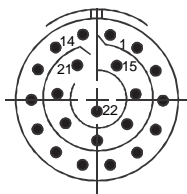


Our Part Number	Length Inches(cm)	Wires	Connector 1	Connector 2	Size	Cable Type	Cable Colour	AWG
MID- D30326WB35-D30326WB35-18I-P24W-1-00	18 (46)	13	D38999 Plug	D38999 Plug	B35	PTFE	White	24
MID- D30326WB35-D30326WB35-36I-P24W-1-00	36 (92)	13	D38999 Plug	D38999 Plug	B35	PTFE	White	24
MID- D30326WB35-D30326WB35-18I-P24R-1-00	18 (46)	13	D38999 Plug	D38999 Plug	B35	PTFE	10 repeat	24
MID- D30326WB35-D30326WB35-36I-P24R-1-00	36 (92)	13	D38999 Plug	D38999 Plug	B35	PTFE	10 repeat	24
MID- D30326WC35-D30326WC35-18I-P24W-1-00	18 (46)	22	D38999 Plug	D38999 Plug	C35	PTFE	White	24
MID- D30326WC35-D30326WC35-36I-P24W-1-00	36 (92)	22	D38999 Plug	D38999 Plug	C35	PTFE	White	24
MID- D30326WC35-30326WC35-18I-P24R-1-00	18 (46)	22	D38999 Plug	D38999 Plug	C35	PTFE	10 repeat	24
MID- D30326WC35-D30326WC35-36I-P24R-1-00	36 (92)	22	D38999 Plug	D38999 Plug	C35	PTFE	10 repeat	24
MID- D30326WD3035-D30326WD3035-18I-P24W-1-00	18 (46)	37	D38999 Plug	D38999 Plug	D35	PTFE	White	24
MID- D30326WD3035-D30326WD3035-36I-P24W-1-00	36 (92)	37	D38999 Plug	D38999 Plug	D35	PTFE	White	24
MID- D30326WD3035-D30326WD3035-18I-P24R-1-00	18 (46)	37	D38999 Plug	D38999 Plug	D35	PTFE	10 repeat	24
MID- D30326WD3035-D30326WD3035-36I-P24R-1-00	36 (92)	37	D38999 Plug	D38999 Plug	D35	PTFE	10 repeat	24
MID- D30326WE35-D30326WE35-18I-P24W-1-00	18 (46)	55	D38999 Plug	D38999 Plug	E35	PTFE	White	24
MID- D30326WE35-D30326WE35-36I-P24W-1-00	36 (92)	55	D38999 Plug	D38999 Plug	E35	PTFE	White	24
MID- D30326WE35-D30326WE35-18I-P24R-1-00	18 (46)	55	D38999 Plug	D38999 Plug	E35	PTFE	10 repeat	24
MID- D30326WE35-D30326WE35-36I-P24R-1-00	36 (92)	55	D38999 Plug	D38999 Plug	E35	PTFE	10 repeat	24

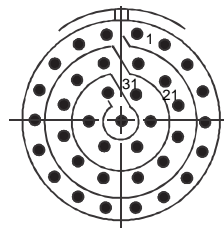
**Note:** Custom designs as per customer asked lengths, different number of contacts, other MIL-22579 wires, wire colors, insert patterns, connector combinations and other customizations possible on request.



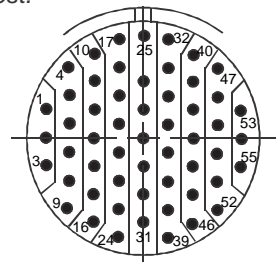
B35, Shell Size 11  
15 Contacts



C35, Shell Size 13  
22 Contacts



D35, Shell Size 15  
37 Contacts



E35, Shell Size 17  
55 Contacts

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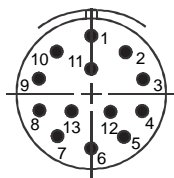
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## Ordering Codes Description

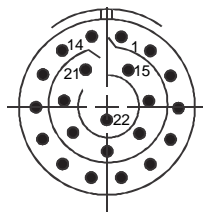
(Connector 1) (Connector 2) (Length) (Cable)  
 MID - □□□□□ - □□□□□ - □□ - □□□ - □ - □□  
**A 1 2 B C A 1 2 B C L U G H I J K K**

	<b>A</b>	Connector Type Code	Micro-D MIL83513 = M ; MIL38999 Series III = D3 ; Open = O ; D-Sub MIL24308 = DS
<b>Codes for D-Sub</b>	<b>1</b>	Connector Plug/Socket	Receptacle = 04 ; Plug = 03
	<b>2</b>		N.A for D-Sub
	<b>B</b>	Connector No. of Contacts	9 = A ; 15 = B ; 25 = D ; 37 = F ; 50 = G
	<b>C</b>	Connector Plating	Cadmium with Yellow Chromate = C
<b>Codes for Micro-D</b>	<b>1</b>	Connector Plug/Socket	Socket = 04 ; Pin = 03
	<b>2</b>		N.A for Micro-D
	<b>B</b>	Connector No. of Contacts	9 = A ; 15 = B ; 21 = C ; 25 = D ; 31 = E ; 37 = F ; 51 = G ; 100 = H
	<b>C</b>	Connector Plating	Nickel = N ; Cadmium = C ; Passivated Steel = P
<b>Codes for MIL38999</b>	<b>1</b>	Connector Plug/Socket	Socket = 04 ; Pin = 03
	<b>2</b>	M38999 Shell Type	Wall Mount = 20 ; Jamnut Receptacle = 24 ; Plug = 26
	<b>B</b>	M38999 Class (materials)	Al Shell, electroless Nickel = F ; Al Shell, olive drab Cd over electroless Ni = W
	<b>C</b>	M38999 shell size & arrangement	B35 = Size 11, 13 contacts ; C35 = Size 13, 22 contacts ; D35 = Size 15, 37 contacts ; E35 = Size 17, 55 contacts (refer to MIL38999 specifications for details)
	<b>LU</b>	Cable Length & Unit of Measure	Inch = I ; Centimeter = C ; meter = M ; Feet = F 18 Inch = 18I ; 40 cm = 40C ; 2 meter = 2M
	<b>G</b>	Cable Type	PTFE MIL22579 = P ; ETFE MIL22579 = E
	<b>H</b>	Cable AWG	AWG24 = 24 ; AWG26 = 26 ; AWG28 = 28 ; AWG30=30
	<b>I</b>	Cable Color	White = W ; 10 Color Repeat = R
	<b>J</b>	No. of Branches	1 Branch = 1 ; 2 Branches = 2 and so on
	<b>KK</b>	Internal customization	Used for Internal Purpose ; Default = 00

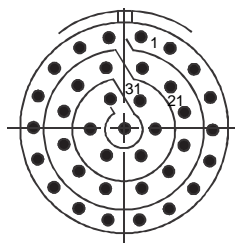
## MIL38999 Series III – Selected Shell Sizes and Insert Arrangements



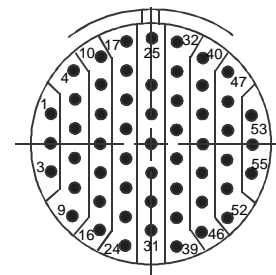
B35, Shell Size 11  
15 Contacts



C35, Shell Size 13  
22 Contacts



D35, Shell Size 15  
37 Contacts



E35, Shell Size 17  
55 Contacts

- Contacts are suitable for AWG24 wire
- MIL-38999 plugs, jamnut receptacles, wall mounted receptacles possible
- For full details like shell dimensions etc, refer to MIL-DTL-38999 Series III Specifications
- We normally use aluminium shell with olive drab cadmium over electroless nickel plating

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## MIL-22759 Extruded-PTFE (ETFE) Cable - Technical Data



Construction	
Conductor	: Silver Plated Copper (SPC)
Insulation	: ETFE
Temperature rating	: -65 / +150°C
Voltage	: 600VAC
Test Voltage	: 3400VAC

### Colour code:

● Black	: 00	● Green	: 55
● Brown	: 11	● Blue	: 66
● Red	: 22	● Violet	: 77
● Orange	: 33	● Grey	: 88
● Yellow	: 44	○ White	: 99

Type	Size		Conductor			Finished Wire			
	AWG	mm <sup>2</sup>	Stranding	Wire Ø mm	DC Res @ 20°C (Ω/km)	Core Ømm	Tolerance	Weight Kg/Km	Amps @40°C
M-ZLA 2619	26	0.155	19 x 0.10	0.48	147	0.81	±0.05	1.9	6
M-ZLA 2419	24	0.241	19 x 0.13	0.60	93.1	0.91	+0.06 -0.05	2.8	9
M-ZLA 2219	22	0.382	19 x 0.16	0.76	57.4	1.09	+0.06 -0.05	4.2	12
M-ZLA 2019	20	0.597	19 x 0.20	0.96	35.1	1.30	+0.06 -0.05	6.4	16

Physical & Mechanical	Test Method	Conditions	Value
Operating temperature	IEC 60216	20000 hrs	155°C
Elongation at break	ASTM D638		300%
Flexural modulus	ASTM D790		1380 MPa
Hardness	ASTM D2240		67 D
Radiation resistance	IEC 60544		10 E5 Gy
Temperature range			-100 to 155°C
Tensile strength at break	ASTM D638		45 Mpa
Water absorption	ASTM D570	25°C	< 0.01%
Dielectric constant	ASTM D150	0.1 kHz / 10 MHz	2.6 / 2.6
Dissipation factor	ASTM D150	1.2 kHz / 10 MHz	0.001 / 0.004
Volume resistivity	ASTM D257		10 E16 ohms-cm
Combustion corrosivity	DIN 57472-813		pH 2.6 / 2700uS/cm
Flammability	UL 94	1.6mm	V-0
Oxygen index	ASTM D2863		31%
Smoke index	Def Stan 61-12 Pt 18/2	per m wire	1
Temperature index	NES 715		290°C
Toxicity index	Def Stan 61-12 Pt 18/2	per m wire	5
Acid, Fuels, Oils Resistance			Excellent

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## Specifications for MIL Cable Harness (D38999-D38999)

Serial Number	Length Inches(cm)	Wires	Contacts	Connector 1	Connector 2	Size	Cable Type	Cable Colour	AWG
1	18 (46)	7	Pin, Size 22D	D38999 Plug	D38999 Plug	6-7	ETFE	White	24

### Harness Construction

Cable is QPL'ed as per MIL -22759  
 Connectors are QPL'ed as per MIL-38999 Series III  
 Connectors are of reputed make like Aero Inc, Glenair, Deutsch or Equivalent  
 Harness have Strain Relief, QPL'ed as per MIL-85049/38  
 Harness have Protection Caps, QPL'ed as per D38999/32  
 Harness have Backshells, QPL'ed as per MIL-85049/20 or MIL-85049/88  
 Harness have heat shrink conforming to MIL-23053/4  
 All items are offered as a set  
 Harness is 100% tested for Pin-Pin high-Voltage isolation and test report with leakage current submitted for each pin-pin test

### Connector Specifications MIL-38999 Series III

QPL as per MIL-DTL-38999 Series III : QPL listed  
 Shell Material : Aluminium Alloy  
 Shell Plating : Olive drab cadmium  
 Insulator : Thermoplastic or thermoset  
 Contacts : Copper Alloy  
 Contacts Plating : Gold over Nickel plated  
 Endurance : 500 mating / unmating operations  
 Shock : 300G for 3 ms in 3 axes  
 Vibration : Per MIL-38999  
 Temperature Range : -65 to +200°C  
 Insulation Resistance : >5000 MΩ (at 500Vdc)  
 Salt Spray : 500 hours  
 Withstanding Voltage (sea level) : > 1800 V  
 Current ( as per shell size) : Size 22D :5A; Size 20 :7.5A; Size 16 :13A; Size 12 :23A; Size 8 :46A

### Cable Specifications

Size AWG	Conductor			Finished Wire	
	Stranding	Wire Ø mm	DC Res @ (Ohms / km)	Ø mm	Amps
26	19 x 0.10	0.48	147	0.81	6
24	19 x 0.13	0.60	93.1	0.91	9
22	19 x 0.16	0.76	57.4	1.09	12
20	19 x 0.20	0.96	35.1	1.30	16

Conductor : Silver Plated Copper (SPC)  
 Insulation : ETFE  
 Temperature rating : -65 / +150°C  
 Voltage : 600VAC  
 Test voltage : 3400VAC  
 Hardness : 67 D, ASTM D2240  
 Radiation resistance : 10 E5 Gy, IEC 60544  
 Tensile strength at break : 45 Mpa, ASTM D638  
 Water absorption : < 0.01%, ASTM D570  
 Volume resistivity : 10 E16 ohms-cm, ASTM D257  
 Flammability : UL 94V-O, 1.6mm  
 Acid, Fuels, Oils Resistance : Excellent

### **Backshell Specifications MIL85049/20- or MIL-85049/88**

QPL Listing	: QPL listed as per MIL-85049/20 or MIL-85049/88
Shell Material	: Aluminium Alloy
Shell Plating	: Olive drab cadmium
Endurance	: 500 mating / unmating operations
Temperature Range	: -65 to +200°C

### **Strain Relief Specifications MIL85049/38**

QPL Listing	: QPL listed as per MIL-85049/38
Shell Material	: Aluminium Alloy
Shell Plating	: Olive drab cadmium
Locking	: Self-Locking with screws
Temperature Range	: -65 to +200°C

### **Protection Cap Specifications**

QPL Listing	: QPL listed as per D38999/32
Shell Material	: Aluminium Alloy
Shell Plating	: Olive drab cadmium
Mounting	: Chain and Circular Eyelet
Temperature Range	: -65 to +200°C

### **Heat Shrink Tube Specifications**

MIL Specs	: Conforms to MIL-23053/4
Flame Retardent	: Yes
Type	: Dual Walled
Temperature Range	: -55 to +110°C