



**EXTRUDED CROSS-LINKED FLUOROPOLYMER  
INSULATED WIRES AND CABLES ON  
TIN-PLATED COPPER CONDUCTOR,  
LOW FREQUENCY, 600V, -100 TO +150 °C  
ESCC Detail Specification No. 3901/011**

**ISSUE 1  
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**space components  
coordination group**

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**DOCUMENTATION CHANGE NOTICE**

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		This Issue supersedes Issue 1 and incorporates the changes agreed in the following DCR's:-		
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		Para. 4.2.4	: Title amended	23791
		Para. 4.3.1	: Wording amended	23791
		Para. 4.5.5	: Wording amended	23791
		Para. 4.8.18	: Original paragraph deleted and Para. 4.8.19 renumbered to 4.8.18	23791
		Para. 4.8.19	: New paragraph added	23791

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**1. GENERAL****1.1 SCOPE**

This specification details the ratings, physical and electrical characteristics, test and inspection data for Extruded Cross-linked Fluoropolymer Insulated Wires and Cables on Tin-plated Copper Conductor, Low Frequency, 600V, -100 to +150 °C. It shall be read in conjunction with ESA/SCC Generic Specification No. 3901, the requirements of which are supplemented herein.

**1.2 TYPE VARIANTS**

Variants of the basic types of wires and cables specified herein, which are also covered by this specification, are listed in Table 1(a).

**1.3 MAXIMUM RATINGS**

The maximum ratings, applicable to the finished wires and cables specified herein, which shall not be exceeded at any time during use or storage in controlled space environment, are scheduled in Table 1(b).

**1.4 PARAMETER DERATING INFORMATION**

The derating information applicable to the finished wires and cables specified herein is as follows:

- The maximum current for each wire used in a bundle shall be:-

$$I_{Bmax} = I_{max} \times \frac{29 - n}{28} \quad (\text{for } 1 < n < 15)$$

$$I_{Bmax} = \frac{I_{max}}{2} \quad (\text{for } n > 15)$$

where n = number of wires in the bundle;

- The temperature derating information is shown in Figure 1 with maximum current  $I_{max}$  for a single wire.
- The derating factors contained herein indicate maximum stress values and do not preclude further derating.

**1.5 PHYSICAL CHARACTERISTICS**

The physical characteristics of the finished wires and cables specified herein are shown in Figures 2(a), 2(b) and 2(c) and their dimensions in Table 1(a).

**1.6 FUNCTIONAL DIAGRAM**

Not applicable.



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**TABLE 1(a) - TYPE VARIANTS**

VARIANT No.	SHIELDED	UN-SHIELDED	No. OF CORES	WIRE CODE ISO	STRANDING No. OF STRANDS x DIAMETER (mm)	CONDUCTOR CHARACTERISTICS			SHIELD STRAND Ø (mm)	CORE MAX Ø (mm)	FINISHED WIRE OR CABLE CHARACTERISTICS	
						MAX Ø (mm)	NOM SECT. (mm <sup>2</sup> )	MAX OHMIC RESISTANCE (Ω/Km)			MAX Ø (mm)	MAX WEIGHT (Kg/Km)
01		X	1	001	19 x 0.10	0.53	0.15	160	-	-	0.86	2.10
02		X	1	002	19 x 0.12	0.66	0.25	98	-	-	0.99	2.97
03		X	1	004	19 x 0.15	0.79	0.40	64	-	-	1.14	4.30
04		X	1	006	19 x 0.20	1.04	0.60	35	-	-	1.37	6.63
05		X	1	010	19 x 0.25	1.29	1.00	22	-	-	1.63	9.89
06		X	1	012	19 x 0.30	1.55	1.20	15	-	-	1.90	13.29
07		X	1	020	37 x 0.25	1.82	2.00	11	-	-	2.29	19.60
08		X	1	030	37 x 0.32	2.28	3.00	7	-	-	2.74	30.30
09		X	2	001	19 x 0.10	0.53	0.15	160	-	0.86	1.78	4.20
10		X	2	002	19 x 0.12	0.66	0.25	98	-	0.99	1.98	5.95
11		X	2	004	19 x 0.15	0.79	0.40	64	-	1.14	2.28	8.63
12		X	2	006	19 x 0.20	1.04	0.60	35	-	1.37	2.74	13.49
13		X	2	010	19 x 0.25	1.29	1.00	22	-	1.63	3.26	20.29
14		X	2	012	19 x 0.30	1.55	1.20	15	-	1.90	3.80	27.38
15		X	2	020	37 x 0.25	1.82	2.00	11	-	2.29	4.58	39.19
16		X	2	030	37 x 0.32	2.28	3.00	7	-	2.74	5.48	60.60
17		X	3	001	19 x 0.10	0.53	0.15	160	-	0.86	1.86	6.30





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**TABLE 1(a) - TYPE VARIANTS (CONTINUED)**

VARIANT No.	SHIELDED	UN-SHIELDED	No. OF CORES	WIRE CODE ISO	STRANDING No. OF STRANDS x DIAMETER (mm)	CONDUCTOR CHARACTERISTICS			SHIELD STRAND Ø (mm)	CORE MAX Ø (mm)	FINISHED WIRE OR CABLE CHARACTERISTICS	
						MAX Ø (mm)	NOM SECT. (mm <sup>2</sup> )	MAX OHMIC RESISTANCE (Ω/Km)			MAX Ø (mm)	MAX WEIGHT (Kg/Km)
18		X	3	002	19 x 0.12	0.66	0.25	98	-	0.99	2.14	9.08
19		X	3	004	19 x 0.15	0.79	0.40	64	-	1.14	2.46	12.61
20		X	3	006	19 x 0.20	1.04	0.60	35	-	1.37	2.95	20.24
21		X	3	010	19 x 0.25	1.29	1.00	22	-	1.63	3.52	30.41
22		X	3	012	19 x 0.30	1.55	1.20	15	-	1.90	4.10	41.02
23		X	3	020	37 x 0.25	1.82	2.00	11	-	2.29	4.95	58.71
24		X	3	030	37 x 0.32	2.28	3.00	7	-	2.74	5.92	90.88
25		X	4	001	19 x 0.10	0.53	0.15	160	-	0.86	2.07	8.40
26		X	4	002	19 x 0.12	0.66	0.25	98	-	0.99	2.39	12.10
27		X	4	004	19 x 0.15	0.79	0.40	64	-	1.14	2.75	17.40
28		X	4	006	19 x 0.20	1.04	0.60	35	-	1.37	3.30	26.52
29		X	4	010	19 x 0.25	1.29	1.00	22	-	1.63	3.93	40.54
30		X	4	012	19 x 0.30	1.55	1.20	15	-	1.90	4.55	59.75
31		X	4	020	37 x 0.25	1.82	2.00	11	-	2.29	5.52	78.28
32		X	4	030	37 x 0.32	2.28	3.00	7	-	2.74	6.60	121.17



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**TABLE 1(a) - TYPE VARIANTS (CONTINUED)**

VARIANT No.	SHIELDED	UN-SHIELDED	No. OF CORES	WIRE CODE ISO	STRANDING No. OF STRANDS x DIAMETER (mm)	CONDUCTOR CHARACTERISTICS			SHIELD STRAND Ø (mm)	CORE MAX Ø (mm)	FINISHED WIRE OR CABLE CHARACTERISTICS	
						MAX Ø (mm)	NOM SECT. (mm <sup>2</sup> )	MAX OHMIC RESISTANCE (Ω/Km)			MAX Ø (mm)	MAX WEIGHT (Kg/Km)
33	X		1	001	19 x 0.10	0.53	0.15	160	0.10	0.86	1.76	6.85
34	X		1	002	19 x 0.12	0.66	0.25	98	0.10	0.99	1.89	8.18
35	X		1	004	19 x 0.15	0.79	0.40	64	0.10	1.14	2.03	10.27
36	X		1	006	19 x 0.20	1.04	0.60	35	0.10	1.37	2.26	13.62
37	X		1	010	19 x 0.25	1.29	1.00	22	0.10	1.63	2.52	18.17
38	X		1	012	19 x 0.30	1.55	1.20	15	0.10	1.90	2.73	22.63
39	X		1	020	37 x 0.25	1.82	2.00	11	0.10	2.29	3.17	30.43
40	X		1	030	37 x 0.32	2.28	3.00	7	0.10	2.74	3.65	43.30
41	X		2	001	19 x 0.10	0.53	0.15	160	0.10	0.86	2.59	11.33
42	X		2	002	19 x 0.12	0.66	0.25	98	0.10	0.99	2.87	13.80
43	X		2	004	19 x 0.15	0.79	0.40	64	0.10	1.14	3.17	17.71
44	X		2	006	19 x 0.20	1.04	0.60	35	0.10	1.37	3.59	24.11
45	X		2	010	19 x 0.25	1.29	1.00	22	0.10	1.63	4.14	32.80
46	X		2	012	19 x 0.30	1.55	1.20	15	0.10	1.90	4.56	41.40
47	X		2	020	37 x 0.25	1.82	2.00	11	0.10	2.29	5.46	56.25
48	X		2	030	37 x 0.32	2.28	3.00	7	0.10	2.74	6.43	81.00



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**TABLE 1(a) - TYPE VARIANTS (CONTINUED)**

VARIANT No.	SHIELDED	UN-SHIELDED	No. OF CORES	WIRE CODE ISO	STRANDING No. OF STRANDS x DIAMETER (mm)	CONDUCTOR CHARACTERISTICS			SHIELD STRAND Ø (mm)	CORE MAX Ø (mm)	FINISHED WIRE OR CABLE CHARACTERISTICS	
						MAX Ø (mm)	NOM SECT. (mm <sup>2</sup> )	MAX OHMIC RESISTANCE (Ω/Km)			MAX Ø (mm)	MAX WEIGHT (Kg/Km)
49	x		3	001	19 x 0.10	0.53	0.15	160	0.10	0.86	2.72	14.40
50	x		3	002	19 x 0.12	0.66	0.25	98	0.10	0.99	3.01	17.72
51	x		3	004	19 x 0.15	0.79	0.40	64	0.10	1.14	3.35	23.06
52	x		3	006	19 x 0.20	1.04	0.60	35	0.10	1.37	3.81	32.38
53	x		3	010	19 x 0.25	1.29	1.00	22	0.10	1.63	4.40	44.73
54	x		3	012	19 x 0.30	1.55	1.20	15	0.10	1.90	4.85	57.08
55	x		3	020	37 x 0.25	1.82	2.00	11	0.10	2.29	5.82	78.34
56	x		3	030	37 x 0.32	2.28	3.00	7	0.10	2.74	6.86	114.39
57	x		4	001	19 x 0.10	0.53	0.15	160	0.10	0.86	2.95	17.43
58	x		4	002	19 x 0.12	0.66	0.25	98	0.10	0.99	3.27	22.32
59	x		4	004	19 x 0.15	0.79	0.40	64	0.10	1.14	3.65	29.14
60	x		4	006	19 x 0.20	1.04	0.60	35	0.10	1.37	4.16	40.58
61	x		4	010	19 x 0.25	1.29	1.00	22	0.10	1.63	4.80	56.70
62	x		4	012	19 x 0.30	1.55	1.20	15	0.10	1.90	5.31	78.50
63	x		4	020	37 x 0.25	1.82	2.00	11	0.10	2.29	6.40	100.00
64	x		4	030	37 x 0.32	2.28	3.00	7	0.10	2.74	7.57	147.00



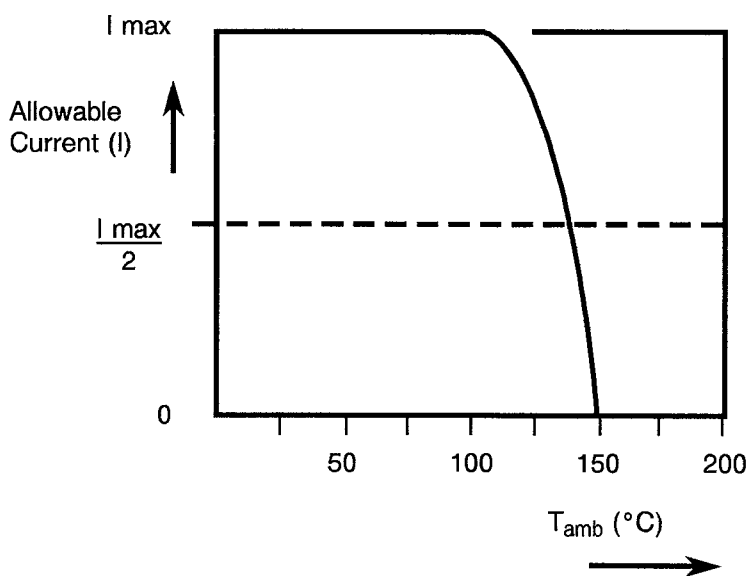
**TABLE 1(b) - MAXIMUM RATINGS**

No.	CHARACTERISTICS	SYMBOL	MAXIMUM RATINGS	UNIT	REMARKS
1	Voltage	$V_p$	600	Vrms	
2	Maximum Current (Note 1)	$I_{max}$	2.5 3.5 5.0 7.5 10.0 13.0 17.0 23.0	A	For nom. sect. 0.15mm <sup>2</sup> 0.25 0.40 0.60 1.00 1.20 2.00 3.00
3	Operating Temperature Range	$T_{amb}$	- 100 to + 150	°C	
4	Storage Temperature Range	$T_{stg}$	- 100 to + 150	°C	

**NOTES**

- The above specified current will generate a temperature rise of approximately 50°C above ambient temperature in a vacuum environment. Precautions shall be taken to prevent the total temperature of the wire (ambient plus rise) exceeding the continuous operating temperature of the wire.

**FIGURE 1 - PARAMETER DERATING INFORMATION**



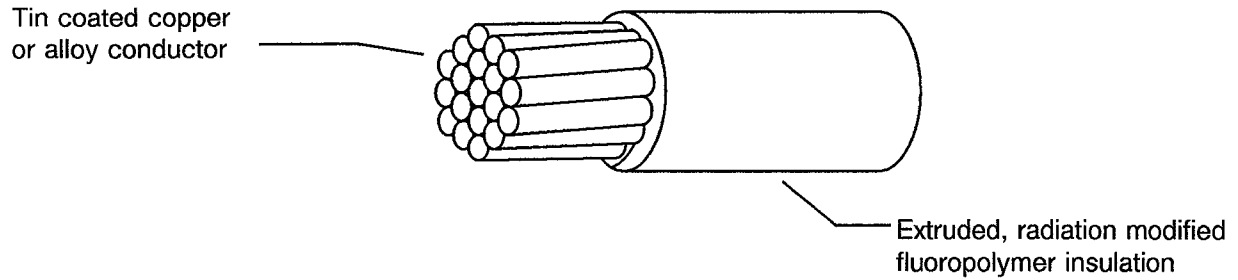
Allowable Current versus Temperature



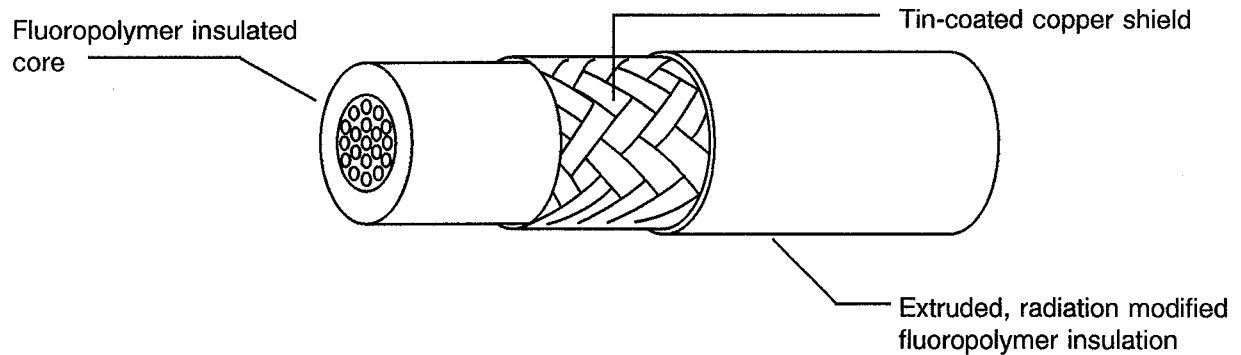
**FIGURE 2 - PHYSICAL CHARACTERISTICS**

Dimensions are given in Table 1(a)

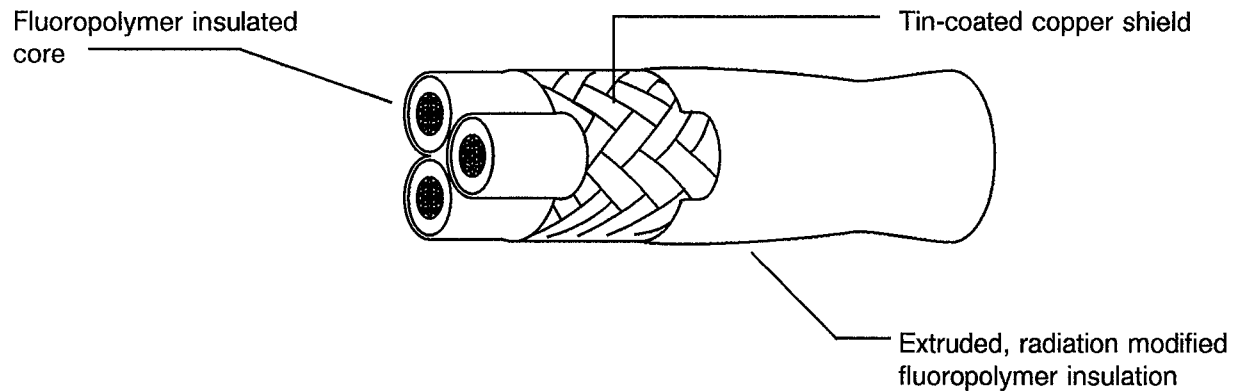
**FIGURE 2(a) - FINISHED WIRES**



**FIGURE 2(b) - SHIELDED AND JACKETED CABLES**



**FIGURE 2(c) - SHIELDED AND JACKETED CABLES**



**2. APPLICABLE DOCUMENTS**

The following documents form part of this specification and shall be read in conjunction with it:

- (a) ESA/SCC Generic Specification No. 3901, "Wires and Cables, Electrical, 600V, Low Frequency",
- (b) ASTM-B33, "Tinned Soft or Annealed Copper Wires for Electrical Purposes"
- (c) MIL-F-14256, "Flux, Soldering, Liquid (Rosin Base)",
- (d) MIL-STD-681, "Identification Coding and Application of Hook-up and Lead Wire".
- (e) ISO 2635, "Conductors for General Purpose Aircraft Electrical Cables and Aerospace Applications - Dimensions and Characteristics".

**3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS**

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESA/SCC Basic Specification No. 21300 and ESA/SCC Generic Specification No. 3901 shall apply.

**4. REQUIREMENTS****4.1 GENERAL**

The complete requirements for procurement of the finished wires and cables specified herein are stated in this specification and ESA/SCC Generic Specification No. 3901. Deviations from the Generic Specification, applicable to this specification only, are listed in Para 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESA/SCC requirements and do not affect the components' reliability, are listed in the Appendices attached to this specification.

**4.2 DEVIATIONS FROM GENERIC SPECIFICATION****4.2.1 Deviations from Special In-process Controls**

None.

**4.2.2 Deviations from Final Production Tests (Chart II)**

None.

**4.2.3 Deviations from Burn-in and Electrical Measurements (Chart III)**

Not applicable.

**4.2.4 Deviations from Qualification Tests (Chart IV)**

None.

**4.2.5 Deviations from Lot Acceptance Tests (Chart V)**

None.

**4.3 MECHANICAL REQUIREMENTS****4.3.1 Dimension Check**

The dimensions of the finished wires and cables specified herein shall be checked; they shall conform to those shown in Table 1(a), Figure 2 and Para 4.4 of this specification (see below for the list of parameters to be checked).

**LIST OF PARAMETERS TO BE CHECKED**

PARAMETER	TABLE 1(a)	FIGURE 2	PARA 4.4
<b><u>COMPOSITION</u></b>			
Number of conductors	X		
Gauge	X		
Shielding	X		
Jacket		X	
<b><u>CONDUCTOR</u></b>			
Nature			X
Outer diameter	X		
Number of strands	X		
Strand diameter	X		
Length of lay			X
Plating thickness			X
<b><u>INSULATION</u></b>			
Composition		X	X
Thickness			X
Concentricity			X
Outer diameter	X		
Core identification			X
<b><u>SHIELDING</u></b>			
Number of strands	X		
Type of shielding			X
Strand diameter	X		
Shield strand adhesion			X
Shielding lay			X
Shield coverage			X
<b><u>JACKET</u></b>			
Composition		X	X
Thickness			X
Concentricity			X
Outer diameter	X		
Colour			X

**4.3.2 Weight**

The maximum weight of the finished wires and cables specified herein shall be as specified in Table 1(a).



#### 4.4 MATERIALS AND FINISHES

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the wires and cables specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

##### 4.4.1 Conductor

###### 4.4.1.1 Material Characteristics

All strands used in the manufacture of the conductors shall be tin plated soft or annealed high conductivity copper. On all copper conductors, any strand shall show a 10% minimum elongation at break and a 220N/mm<sup>2</sup> minimum tensile strength.

###### 4.4.1.2 Stranding

The conductors shall be constructed of concentrically laid strands to produce a smooth and uniform conductor of circular cross-section and free from any high strands or other surface irregularities.

The length of the left-hand lay of the external layer shall not be less than 8, nor more than 16, times the maximum conductor diameter specified in Table 1(a).

###### 4.4.1.3 Tin Coating Characteristics

###### (a) Continuity

The tin coating of the conductor strands shall be continuous. It shall not exhibit visible black spots after testing in accordance with the methods outlined in ASTM-B33. The test shall be performed on 3 specimens taken before applying the insulation.

###### (b) Adhesion

The tin coating shall adhere firmly to the surface of the copper and not exhibit visible detachment when tested in accordance with ASTM-B33. This test shall be performed on 3 specimens taken before application of the insulation.

###### (c) Tin Thickness

The tin coating shall have an average thickness of not less than 0.7 microns and shall be sufficient to warrant good solderability as defined in Para 9.25 of ESA/SCC Generic Specification No. 3901.

##### 4.4.2 Insulation

###### 4.4.2.1 Material

The insulating material shall be a flame-retarded radiation cross-linked ethylene-tetrafluoroethylene copolymer with additives necessary for processing, performance and colour identification.

###### 4.4.2.2 Construction

The wire insulation shall consist of a single wall extrusion of polymer directly onto the conductor and of a 0.10 to 0.165 mm wall thickness depending upon the conductor size detailed in Table 1(a). The insulation shall have an even wall thickness and shall be concentric with the conductor, having a concentricity value (% ratio of minimum to maximum wall thickness) of 70% minimum.





#### 4.4.2.3 Insulation colour

The insulation shall be extruded in a range of 11 colours in accordance with MIL-STD-681.

#### 4.4.3 Assembly

##### 4.4.3.1 Construction

A multicore cable shall be constructed by assembling the cores in a right-hand concentric lay. The length of lay shall not be less than 10, nor more than 14, times the maximum multicore assembly diameter as detailed in Table 1(a).

#### 4.4.4 Shield

##### 4.4.4.1 Material

The shield shall be constructed from tin-coated, soft or annealed high-conductivity copper. Any strand shall show a 10% minimum elongation at break.

##### 4.4.4.2 Construction

The shield shall be made of closely woven round strands and provide not less than 85% coverage, 'K' being calculated by the following formula:-

$$K = (2F - F^2) 100,$$

where:-

$$K = \% \text{ coverage,}$$

$$F = \frac{n.d.P}{\sin a}$$

where:-

n = number of strands per carrier,

d = strand diameter,

P = picks per millimetre,

a = angle of braid in relation to cable axis,

$$\text{tg } a = \frac{2(D + 2d)P}{C}$$

where:-

D = diameter of cable under shield,

C = number of carriers.

##### 4.4.4.3 Tin Coating Characteristics

The tin coating characteristics of the shield wires shall conform to those of the conductor as specified in Para. 4.4.1.3.

#### 4.4.5 Jacket

The jacket material shall be an extruded flame-retarded radiation cross-linked ethylene-tetrafluoroethylene copolymer with additives necessary for processing, performance and colour identification.

The jacket shall have an even wall thickness of 0.125 mm minimum. The jacket shall be extruded in a range of 11 colours in accordance with MIL-STD-681.



#### 4.5 MARKING

##### 4.5.1 General

The marking of all spools of finished wires and cables delivered to this specification shall be in accordance with the requirements of ESA/SCC Basic Specification No. 21700. Each spool shall be marked in respect of:-

- (a) The SCC Component Number.
- (b) Characteristics.
- (c) Traceability Information.
- (d) Additional Markings.

##### 4.5.2 The SCC Component Number

Each spool shall bear the SCC Component Number which shall be constituted and marked as follows:-

Detail Specification Number \_\_\_\_\_ 390101101B  
Type Variant (see Table 1(a)) \_\_\_\_\_  
Testing Level \_\_\_\_\_

##### 4.5.3 Characteristics

The characteristics shall show the length(s) of finished wire or cable wound on each spool and shall be marked as follows:-

Length in metres (see Note) \_\_\_\_\_ 100m  
Symbol for metres \_\_\_\_\_

**NOTE:**

Whenever the length is less than 100 metres, insert a zero in the first block (example: 075 m). If more than one length of finished wire or cable is wound on a spool, the characteristics of each length shall be marked as above.

##### 4.5.4 Traceability Information

Each spool shall be marked in respect of traceability information in accordance with the requirements of ESA/SCC Basic Specification No. 21700.

##### 4.5.5 Additional Marking

Each spool shall bear the cable Manufacturer's Quality Control Inspector's stamp or initials.

#### 4.6 ELECTRICAL MEASUREMENTS

##### 4.6.1 Electrical Measurements at Room Temperature

The parameters to be measured at room temperature are scheduled in Table 2. The measurements shall be performed at  $T_{amb} = +22 \pm 3$  °C.

##### 4.6.2 Electrical Measurements at High and Low Temperatures

Not applicable.

##### 4.6.3 Circuits for Electrical Measurements

Not applicable.

**4.7 BURN-IN TESTS**

Not applicable.

**4.8 ENVIRONMENTAL AND ENDURANCE TESTS****4.8.1 Mechanical Properties of Conductor**

As detailed in Para. 4.4.1.1 of this Specification.

**4.8.2 Accelerated Ageing**

Ageing Temperature  $+200 \pm 5$  °C.

The mandrel diameter and appropriate weight used for accelerated age testing of the finished wires is given in Table A.

**NOTES**

1. For shielded cables, a change in the shield's aspect shall not be cause for rejection.

**TABLE A - MANDREL DIAMETERS AND LOADS FOR FINISHED WIRES**

Wire Size (mm <sup>2</sup> )	Mandrel Diameter (mm)	Weight (kg)
0.15	10.0	0.060
0.25	10.0	0.115
0.40	13.0	0.170
0.60	13.0	0.230
1.00	13.0	0.230
1.20	20.0	0.340
2.00	25.0	0.450
3.00	38.0	0.680

**4.8.3 Wrap Test at Ambient Temperature**

The mandrel diameters and applied loads for wrap testing of finished wires are given in Table A. The mandrel diameters and applied loads for screened and jacketed cables are given in Table B.

**4.8.4 Voltage Test**

No particular conditions are applicable.

**4.8.5 Shrinkage**

The shrinkage temperature shall be  $+200 \pm 5$  °C

**4.8.6 Blocking**

The blocking temperature shall be  $+200 \pm 5$  °C.

**4.8.7 Cold Bend Test**

The mandrel diameters and loads shall be as specified in Table C.

**TABLE B - MANDREL DIAMETERS AND LOADS FOR SHIELDED  
AND JACKETED CABLES**

Cable Size (mm <sup>2</sup> )	Number of Cores	Mandrel Diameter (mm)	Load (kg)
0.15	1	19	0.06
	2	25	0.12
	3	25	0.18
	4	32	0.24
0.25	1	19	0.12
	2	25	0.23
	3	25	0.35
	4	32	0.40
0.40	1	19	0.17
	2	32	0.34
	3	32	0.51
	4	44	0.68
0.60	1	25	0.23
	2	32	0.46
	3	44	0.69
	4	44	0.92
1.00	1	25	0.23
	2	44	0.46
	3	44	0.69
	4	57	0.92
1.20	1	25	0.34
	2	44	0.68
	3	44	1.02
	4	57	1.36
2.00	1	32	0.45
	2	57	0.68
	3	57	1.35
	4	57	1.80
3.00	1	32	0.68
	2	57	1.36
	3	76	2.04
	4	76	2.72

**TABLE C - MANDREL DIAMETERS AND LOADS FOR  
FINISHED WIRES OR CORES**

Wire Size (mm <sup>2</sup> )	Mandrel Diameter (mm)	Weight (kg)
0.15	12.5	0.23
0.25	12.5	0.45
0.40	20.0	0.45
0.60	20.0	0.45
1.00	25.4	0.45
1.20	25.4	0.45
2.00	38.1	1.30
3.00	50.8	1.36

**4.8.8 Cut-through Resistance**

The mean load measured during the required tests shall not be less than the relevant value specified below:-

Wire Size (mm <sup>2</sup> )	0.15	0.25	0.40	0.60	1.00	1.20	2.00	3.00
Cut-through Load (kg)	5	5	7	7	8	8	10	10

**4.8.9 Notch Resistance**

The depth of notch shall be one third of the nominal wall thickness.

**4.8.10 Flammability**

No particular conditions are applicable.

**4.8.11 Resistance to Fluids**

No particular conditions are applicable.

**4.8.12 Surface Resistance**

No particular conditions are applicable.

**4.8.13 Abrasion Resistance**

The weight to be applied to the needle is specified below:-

Wire Size (mm <sup>2</sup> )	0.15	0.25	0.40	0.60	1.00	1.20	2.00	3.00
Scrape Abrasion (kg)	0.4	0.4	0.5	0.7	0.7	0.7	1.0	1.0

**4.8.14 Soldering**

No particular conditions are applicable.

**4.8.15 Solderability (applicable to the shield only)**

RMA type flux according to MIL-F-14256 shall be used.

**4.8.16 Radiation Resistance**

No particular conditions are applicable.

**4.8.17 Overload Resistance**

No particular conditions are applicable.

**4.8.18 Long-term Ageing Test**

The long-term ageing temperature shall be + 150°C. For shielded cables, a change in the shield's aspect shall not be cause for rejection.

**4.8.19 Anthony and Brown Test**

Not applicable.

**TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE**

No.	CHARACTERISTICS	SPEC. AND/OR TEST METHOD	TEST CONDITION	LIMITS	UNIT
1	Conductor Resistance	ESA/SCC No. 3901, Section 9	Para 9.5	Table 1(a)	Ω/Km
2	Spark Test	ESA/SCC No. 3901, Section 9	Para 9.6	Insulation : 3 Jacket : 1.5	kV
3	Voltage Test	ESA/SCC No. 3901, Section 9	Para 9.7	Para 9.7	kV
4	Insulation Resistance	ESA/SCC No. 3901, Section 9	Para 9.8	Insulation : 750 Jacket : 300	MΩ.Km
5	Surface Resistance	ESA/SCC No. 3901, Section 9	Para 9.22	: 125	MΩ.mm

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**APPENDIX 'A'**

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**AGREED DEVIATIONS FOR RAYCHEM (G.B.)**

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS
Para. 4.2.2	<p>"Stripping Capability" may be performed using the test methods specified below:-</p> <p>The stripping of the wire insulation shall be conducted using a mechanical wire stripper with preset precision die blades designed for wires conforming to MIL-W-22759. The following procedure shall be used to assess the wire's strippability:-</p> <ul style="list-style-type: none"><li>(a) The appropriate set of die blades are selected and correctly positioned in the hand held tool.</li><li>(b) The wire is positioned on the appropriately sized die and 25mm of the insulation is stripped.</li></ul> <p>The insulation must strip on the first application of the hand tool without difficulty.</p> <p>Stripping of the cable jacket shall be conducted with a hand held tool to make a shallow notch in the jacket at a distance of 50mm from the cable end. The cable is then gently flexed to propagate the notch through the jacket wall and the excess jacket material is then removed by hand with a firm pulling and twisting action.</p> <p>Alternatively, thermal strippers can be used for both the wire insulation and the cable jacket. In keeping with industrial hygiene practices, avoid inhalation of smoke or fumes arising from the thermal strippers.</p> <p><u>N.B.</u> The criteria specified in ESA/SCC Generic Specification No. 3901 Para. 9.9 remain unchanged.</p>