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Interface Practices Subcommittee

SCTE STANDARD

SCTE 74 2023

**Performance Specification for Braided 75 Ohm
Flexible RF Coaxial Drop Cable**

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1. Introduction

1.1. Executive Summary

This specification is intended to apply to flexible braided 75 ohm radio frequency (RF) coaxial drop cables for the broadband industry.

1.2. Scope

This specification defines the required performance with regards to electrical and mechanical properties of 75 ohm coaxial drop cables. 75 ohm coaxial cables are used to distribute radio frequency (RF), power and digital broadband signals.

1.3. Benefits

This specification defines the required performance of 75 ohm drop cables and how to test them. Standardizing the dimensions of coax cables ensures that connectors will fit cables built by different manufactures.

1.4. Intended Audience

The intended audience for this specification is manufacturers, test laboratories, and end-users.

1.5. Areas for Further Investigation or to be Added in Future Versions

Clarify definitions for standard, tri shield, and quad shield for all series of coaxial cable within this document.

2. Normative References

The following documents contain provisions which, through reference in this text, constitute provisions of this document. The editions indicated were valid at the time of subcommittee approval. All documents are subject to revision and, while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

[SCTE 09]	ANSI/SCTE 09 2016: Test Method for Cold Blend
[SCTE 10]	ANSI/SCTE 10 2014 (R2021): Test Method Flexible Coaxial Cable Impact Test
[SCTE 11]	ANSI/SCTE 11 2018: Test Method for Aerial Cable Corrosion Protection Flow
[SCTE 31]	ANSI/SCTE 31 2016: Test Method for Measuring Diameter Over Core
[SCTE 32]	ANSI/SCTE 32 2016 (R2021): Ampacity of Coaxial Telecommunications Cables
[SCTE 33]	ANSI/SCTE 33 2016: Test Method for Diameter of Drop Cable
[SCTE 44]	ANSI/SCTE 44 2018: Test Method for DC Loop Resistance

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- [SCTE 47] ANSI/SCTE 47 2007: Test Method for Coaxial Cable Attenuation
- [SCTE 48-3] SCTE 48-3 2021: Test Procedure for Measuring Shielding Effectiveness of Coaxial Cable and Connectors Using the GTEM Cell
- [SCTE 49] ANSI/SCTE 49 2011 (R2021): Test Method for Velocity of Propagation
- [SCTE 59] ANSI/SCTE 59 2018: Test Method for Drop Cable Center Conductor Bond to Dielectric
- [SCTE 61] ANSI/SCTE 61 2018: Test Method for Jacket Web Separation
- [SCTE 66] ANSI/SCTE 66 2016: Test Method for Coaxial Cable Impedance
- [SCTE 69] ANSI/SCTE 69 2007: Test Method for Moisture Inhibitor Corrosion Resistance.
- [SCTE 73] ANSI/SCTE 73 2018: Test Method for Insertion Force of Connector to Drop Cable Interface
- [SCTE 88] ANSI/SCTE 88 2012 (R2021): Test Method for Polyethylene Jacket Longitudinal Shrinkage
- [SCTE 99] ANSI/SCTE 99 2019: Test Method for Axial Pull Connector/Drop Cable
- [SCTE 108] ANSI/SCTE 108 2018: Test Method for Dielectric Strength Withstand
- [SCTE 166] ANSI/SCTE 166 2020: Flexure Method for Drop Cable Conditioning

2.2. Standards from Other Organizations

- [ASTM A641-92] ASTM A641-92: Zinc Coated (Galvanized) Carbon Steel Wire.
- [ASTM B869-96] ASTM B869-96: Standard Specification for Copper-Clad Steel Electrical Conductor for CATV Drop Wire.
- [ASTM D1248-02] ASTM D1248-02: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.
- [ASTM D 4565] ASTM D 4565: Physical and Environmental Performance Properties of Insulations and Jackets for Telecommunications Wire and Cable.
- [ASTM E8-01E1] ASTM E8-01e1: Standard Test Methods for Tension Testing of Metallic Materials.
- [IEC 62153-4-4] IEC 62153-4-4: Metallic communication cable test methods – Part 4-4: Electromagnetic compatibility (EMC) – Shielded screening attenuation, test method for measuring of the screening attenuation as up to and above 3 GHz.
- [UL 1581-1985] ANSI/UL1581-1985: Reference Standard for Electrical Wires, Cables and Flexible Cords.
- [UL 2556] UL 2556, 5th Edition, April 30, 2021 - UL Standard for Safety Wire and Cable Test Methods

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[UL 444] UL 444, 5th Edition, January 20, 2017 - UL Standard for Safety Communications Cables

2.3. Other Published Materials

No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1. SCTE References

- [SCTE 01] ANSI/SCTE 01 2021: “F” Port (Female Outdoor) Physical Dimensions
- [SCTE 03] ANSI/SCTE 03 2016: Test Method for Coaxial Cable Structural Return Loss
- [SCTE 51] ANSI/SCTE 51 2018: Test Method for Determining Drop Cable Braid Coverage
- [SCTE 78] ANSI/SCTE 78 2021: Test Method for Transfer Impedance
- [SCTE 123] ANSI/SCTE 123 2021: “F” Port (Male Outdoor) Physical Dimensions

3.2. Standards from Other Organizations

- [ASTM B1-90] ASTM B1-90: Standard Specification for Hard-Drawn Copper Wire.
- [ASTM B3-90] ASTM B3-90: Standard Specification for Soft or Annealed Copper Wire.
- [ASTM B193] ASTM B193-87: Resistivity of Electrical Conductive Materials.
- [ASTM B227] ASTM B227-88: Hard Drawn Copper Clad Steel Wire.
- [ASTM B452] ASTM B452-88: Copper Clad Steel Wire for Electronic Applications.
- [IEEE] IEEE: Standard Dictionary of Electrical and Electronic Terms.
- [JONES] Jones Dictionary: Cable Television Terminology 3rd Edition.
- [NFPA] NFPA-70-1999: Community Antenna Television and Radio Distribution Systems.
- [NEC 820] NEC Article 820: Community Antenna Television and Radio Distribution Systems.
- [NEC 830] 11. NEC Article 830: Network-Powered Broadband Communications Systems.

3.3. Other Published Materials

No informative references are applicable.

4. Compliance Notation

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5. Abbreviations and Definitions

5.1. Abbreviations

CCS	copper clad steel
dB	decibel
DC	direct current
DOJ	diameter over jacket
IACS	International Annealed Copper Standard
IM	integral messenger
LST	laminated shielding tape
MBS	minimum break strength
MBS	messenger break strength
MHz	megahertz
MPa	megapascal pressure unit
OIT	oxidative induction time
PE	polyethylene
psi	pounds per square inch
PVC	permanent virtual connection
RF	radio frequency
SCTE	Society of Cable Telecommunications Engineers
UV	ultraviolet
Vp	velocity of propagation

5.2. Definitions

Definitions of terms used in this document are provided in this section. Defined terms that have specific meanings are capitalized. When the capitalized term is used in this document, the term has the specific meaning as defined in this section.

attenuation	The decrease in magnitude of a wave as it travels through any transmitting medium, such as cable or circuitry. It is the difference between transmitted and received power.
coaxial cable	A type of cable used for broadband data and cable systems. Composed of a center conductor, insulating dielectric, conductive shield and optional protective covering. This type of cable has excellent broadband frequency characteristics, noise immunity and physical durability. Synonymous with Coax Drop Cable – In a CATV system the transmission cable from the distribution cable to a dwelling.
conductivity	The ability of a material to allow electrons to flow, measured by the current per unit of voltage applied. It is the reciprocal of resistivity.
core ovality	The difference between the minimum and maximum dimensions over the first Laminated Shield Tape.
DC resistance	The opposition a material offers to current flow, measured in ohms.
DC loop resistance	A resistance measurement of the center conductor and outer conductor when hooked in series (measured in ohms/1000 feet).
dielectric	A nonconductive insulator material between the center conductor and outer conductor of coaxial cable.
dielectric withstand	The ability of the drop cable insulation to withstand a minimum of 1000 VAC.
“F” Connector	Although a generic term, this could be any number of types or designs and typically described as “F” fitting or “F” male plug (also see SCTE 01 and SCTE 123). An “F” connector is the interface between cable and equipment.
impedance	The total opposition a circuit, cable or component offers to alternating current flow. It includes both resistance and reactance and is generally expressed in ohms and designated by the symbol Z.
insertion force	The force required to push an “F” connector onto a drop cable.
IM	Integrated Messenger for self-supporting applications.

6. Center Conductor

6.1. Material

The center conductor *shall* be copper clad steel. The applicable conductor *shall* meet the performance requirements of [ASTM B869].

Solid copper center conductor or copper clad aluminum center conductor *may* also be specified if required by the end user.

6.2. Joints

Factory joints in the center conductor for finished product *shall* be allowed. The ultimate tensile strength in the joint area when tested per [ASTM E8-01E1] *shall* be 90% of the original unspliced wire.

6.3. Dimensions

Center conductor dimensions *shall* meet the requirements of Table 1.

Table 1 - Center Conductor Dimensions

Center Conductor Dimensions			
Series	59	6	11
Inches (mm)	0.032 (0.81)	0.0403 (1.02)	0.064(1.63)

All center conductor diameter tolerances *shall* be $\pm 1\%$.

As stated in [ASTM B869], the copper clad steel (CCS) center conductor *shall* conform to a minimum tensile requirement of 120,000 psi (827 MPa) and a minimum elongation requirement of 1.0 %.

Minimum break strength (MBS) of the copper clad steel *shall* be determined by multiplying the minimum cross-sectional area by 95,000 psi (655 MPa).

6.4. Electrical

The center conductor electrical conductivity shall be 21 percent International Annealed Copper Standard (IACS) minimum. [UL 444]

Maximum direct current (DC) Resistance *shall* be measured per [SCTE 44] and *shall* meet the requirements of Table 2.

Table 2 - DC Resistance at 68 °F 20 °C

DC Resistance at 68°F20 C°			
Series	59	6	11
1000 ft (km)	49.2 (161.4)	31.1 (102.0)	12.3 (40.4)

7. Dielectric

7.1. Material

Unless otherwise specified, polyethylene materials for the dielectric *shall* meet all applicable requirements of [ASTM D1248-02] and the requirements of this document. (See section 9.1.1)

7.2. Core (Dielectric + LST)

The first outer conductor *shall* be a bonded laminated shielding tape (LST).

The LST *shall* circumferentially overlap the dielectric adequately in order to meet the shielding performance as defined.

Average Core Diameter (Dielectric + LST – SCTE 31)

Table 3 - Average Core Diameter over LST

Series	59	6	11
(inches)	0.152 ± 0.005	0.188 ± 0.005	0.288 ± 0.006
(mm)	3.86 ± 0.13	4.78 ± 0.13	7.32 ± 0.15

7.2.1. Core Ovality

Ovality **shall** be determined by subtracting the measured minimum from the measured maximum diameter over the LST in the finished product. See Table 4 for specifications.

Table 4 - Core LST Ovality

Series	59	6	11
inches (mm)	0.011 (0.28)	0.013 (0.33)	0.015 (0.38)

8. Integral messenger – Aerial

8.1. Material

Where utilized, the messenger **shall** be zinc coated (galvanized) carbon steel wire and meet Class 1 requirements of [ASTM A641-92] specification. Table 5 lists the most commonly used sizes.

Table 5 - Messenger Diameter

inches	(mm)
0.051 ± 0.002	1.30 ± 0.05
0.063 ± 0.002	1.60 ± 0.05
0.072 ± 0.002	1.83 ± 0.05
0.083 ± 0.003	2.11 ± 0.07
0.109 ± 0.004	2.77 ± 0.10

8.2. Mechanical

8.2.1. Messenger Break Strength (MBS) (See Table 6).

The messenger **shall** be one continuous length. Welds and butt splices are prohibited.

Table 6 - Messenger Minimum Break Strength (MBS)

Nominal Size	lbf	kgf
0.051	170	77.1
0.063	263	119.3
0.072	346	156.9
0.083	427	193.7
0.109	706	320.2

The MBS is calculated by multiplying the minimum cross-sectional area by the minimum tensile strength as specified in [ASTM A641-92].

9. Finished Product Test

9.1. Mechanical

The cable must be able to withstand a Cold Bend Test at -40 °F/C with PVC jacket and -67 °F (-55 °C) with PE jacket. No visible damage to the jacket is allowed, as described in [SCTE 09].

The cable must be able to withstand an impact test without damaging the jacket. Testing of outdoor rated cable to be conducted at 5 °F (-15 °C) for cables with PVC jackets and at -22 °F (-30 °C) for cables with PE jackets. Indoor cable testing to be conducted at 14 °F (-10 °C) for cables with PVC jackets and at -22 °F (-30 °C) for cables with PE jacket as described in [SCTE 10].

Jacket longitudinal shrinkage *shall* be no more than 5 percent of the length under test as specified in and tested per [SCTE 88].

9.1.1. Thermal Oxidative Stability

To ensure the desired life expectancy of the dielectric insulation, determine its oxidative induction time (OIT) before and after aging at 90°C for 14 days by measuring OIT according to [ASTM D 4565], Section 17. The test utilizes insulation removed from the completed cable and tested at 180 °C ± 0.3 °C. Care *should* be taken not to include any LST adhesive or precoat on the dielectric specimen.

The initial OIT *shall* be greater than 20 minutes.

The OIT after aging *shall* be greater than 70 percent of the initial OIT value for initial OIT values less than 143 minutes.

The OIT after aging *shall* be greater than 100 minutes for initial OIT values greater than 143 minutes.

The minimum center conductor adhesion to dielectric *shall* be measured per [SCTE 59] and meet the requirements of Table 7.

Table 7 – Minimum Center Conductor Bond to Dielectric

Series	59	6	11
Minimum lbs	5	5	15
Minimum (kg)	2.3	2.3	6.8

Cables for indoor, aerial, or below grade applications *may* contain corrosion protection materials applied between the cable jacket and cable outer conductor. Corrosion protection *shall* be tested as described in [SCTE 69].

Cables intended for aerial or indoor applications, which contain a corrosion protection material, *shall* meet the non-flowing requirement as described in [SCTE 11].

If required for reference, insertion force designed to measure the amount of linear force to install an “F” connector onto a drop cable *may* be measured as described in [SCTE 73].

Axial pull connector/cable designed to measure the amount of retention force to remove an “F” connector from a drop cable as described in [SCTE 99].

The average core diameter *shall* be determined by measuring the diameter over the LST in the finished product as described in [SCTE 31]. See Table 4 for specifications.

The diameter over jacket (DOJ) *shall* be measured as described in [SCTE 33] (See Table 8 for cable DOJ).

Table 8 – Diameter Over Jacket (DOJ)

Diameter Over Jacket (DOJ)	
Series/Construction	Inches (mm)
59 Single Tape & Braid	0.240 ± 0.008 (6.10 ± 0.200)
59 Tri-Shield	0.244 ± 0.008 (6.20 ± 0.200)
59 Quad-Shield	0.265 ± 0.008 (6.73 ± 0.200)
6 Single Tape & Braid	0.273 ± 0.008 (6.93 ± 0.200)
6 Tri-Shield	0.278 ± 0.008 (7.06 ± 0.200)
6 Quad-Shield	0.297 ± 0.008 (7.54 ± 0.200)
11 Single Tape & Braid	0.400 ± 0.010 (10.16 ± 0.250)
11 Tri-Shield	0.400 ± 0.010 (10.16 ± 0.250)
11 Quad-Shield	0.407 ± 0.010 (10.34 ± 0.250)

A six-foot sample of messenger drop cable *shall* be prepared such that six inches of the messenger is separated from the coaxial cable. The sample *shall* be placed in a chamber with a temperature of -25 °C for a minimum of two hours. The messenger *shall* then be ripped from the coaxial cable pulling both at opposite angles per [SCTE 61]. Inspect along the cable length from where it was initially separated up to where separation was stopped. Any sign of cracks or splits on either side of the web will be considered a failure.

The static minimum bend radius *shall* be determined by multiplying the overall DOJ times 5 rounded to the nearest half inch.

10. Environmental

The jacket material *shall* be tested for ultraviolet (UV) stability for 720 hours, as defined in [UL 2556], paragraph 4.2.8.5, Wire and Cable Test Methods.

11. Electrical

Velocity of Propagation (Vp) *shall* be 82 percent minimum when measured per [SCTE 49].

Impedance (Zo) *shall* be 75 ± 3 ohms per [SCTE 66].

Table 9 – Structural Return Loss (SRL)

Frequency (MHz)	Return Loss (dB)
5 - 1002	≥ 20
1002 - 1218	≥ 20
1218 - 1794	≥ 15

Frequency (MHz)	Return Loss (dB)
1794 - 2250	≥ 15
2250 - 3000	≥ 15

The maximum DC loop resistance *shall* be tested per [SCTE 44] and *shall* meet requirements of Table 10.

Table 10 – Maximum DC Loop Resistance @ 68°F (20 C°)

Series/Construction	Ohms/1000 ft. (ohms/km)
59 Single Tape & Braid	60.88 (199.7)
59 Tri-Shield	58.0 (190.3)
59 Quad-Shield	56.1 (184.1)
6 Single Tape & Braid	41.16 (135.0)
6 Tri-Shield	38.4 (126.1)
6 Quad-Shield	36.9 (121.1)
11 Single Tape & Braid	20.0 (65.6)
11 Tri-Shield	17.4 (57.1)
11 Quad-Shield	16.7 (54.8)

The maximum attenuation for all construction types *shall* be as specified in Table 11 per [SCTE 47].

Table 11 – Attenuation

Attenuation @ 68°F – 20 C°						
Series	59		6		11	
Frequency (MHz)	dB/100ft	(dB/100m)	dB/100ft	(dB/100m)	dB/100ft	(dB/100m)
5	0.86	(2.82)	0.58	(1.90)	0.38	(1.25)
55	2.05	(6.73)	1.60	(5.25)	0.96	(3.15)
211	3.80	(12.47)	3.05	(10.00)	1.90	(6.23)
250	4.10	(13.45)	3.30	(10.82)	2.05	(16.72)
270	4.22	(13.85)	3.37	(11.04)	2.13	(7.00)
300	4.45	(14.60)	3.55	(11.64)	2.25	(7.38)
330	4.66	(15.29)	3.74	(12.26)	2.35	(7.71)
350	4.80	(15.75)	3.85	(12.63)	2.42	(7.94)
400	5.10	(16.73)	4.15	(13.61)	2.60	(8.53)
450	5.40	(17.72)	4.40	(14.43)	2.75	(9.02)
500	5.7	(18.70)	4.66	(15.29)	2.90	(9.51)
550	5.95	(19.52)	4.90	(16.08)	3.04	(9.97)
600	6.2	(20.34)	5.10	(16.73)	3.18	(10.43)
750	6.97	(22.87)	5.65	(18.54)	3.65	(11.97)
870	7.57	(24.85)	6.11	(20.04)	4.06	(13.31)
1002	8.12	(26.64)	6.56	(21.49)	4.36	(14.27)
1218	8.99	(29.56)	7.26	(23.82)	4.92	(16.14)
1250	9.11	(29.89)	7.30	(23.95)	4.98	(16.34)
1350	9.47	(31.07)	7.58	(24.87)	5.21	(17.09)
1410	9.68	(31.76)	7.78	(25.52)	5.38	(17.65)
1450	9.82	(32.25)	7.85	(25.75)	5.45	(17.88)
1602	10.43	(34.22)	8.35	(27.40)	5.67	(18.60)
1675	10.59	(34.74)	8.42	(27.62)	5.95	(19.52)
1700	10.79	(35.310)	8.63	(28.30)	6.09	(19.89)
1794	11.06	(36.32)	8.96	(29.39)	6.31	(20.70)
1800	11.08	(36.41)	9.5	(31.17)	6.32	(20.73)
2000	11.67	(38.54)	9.40	(30.83)	6.37	(22.90)
2200	12.24	(40.16)	10.01	(32.83)	6.72	(22.05)
2400	12.78	(41.92)	10.57	(34.69)	7.27	(23.85)
2550	13.08	(42.91)	10.73	(35.20)	7.22	(23.69)
2700	13.56	(44.48)	11.30	(37.07)	7.79	(25.57)
2800	13.81	(45.28)	11.42	(37.46)	7.71	(25.30)
2900	14.05	(46.10)	11.77	(38.61)	7.86	(25.80)
3000	14.30	(46.90))	11.86	(38.91)	8.02	(26.3))

The cable minimum ampacity in both conductors *shall* be determined per [SCTE 32] and *shall* meet requirements of Table 12.

Table 12 – Coaxial Drop Cable Ampacity (Amperes)

Coaxial Drop Cable Ampacity (Amperes)		
Cable Series	20°C Ambient	40°C Ambient
59 Series		
Tape & Braid	6.0	4.5
Tri-shield	6.0	4.5
Quad-shield	6.0	4.5
6 Series		
Tape & Braid	7.8	5.6
Tri-shield	7.8	5.6
Quad-shield	7.8	5.6
11 Series		
Tape & Braid	12.8	9.5
Tri-shield	12.8	9.5
Quad-shield	12.8	9.5

Shielding effectiveness *shall* be determined by and meet the requirements of section 13.

The overall cable jacket integrity *shall* be subject to a spark test with a minimum 2.5 kV rms to ensure the absence of faults in the jacket during manufacturing.

The dielectric between inner conductor and outer conductor of the cable *shall* withstand without breakdown, for one minute, a voltage of 1000V RMS at a frequency of 60 Hz, or the equivalent DC voltage at 1 milliamp/100 ft. leakage detection when tested at 68° F (20 C°) per [SCTE 108].

12. Integral Messenger (IM) Jacket/Web

If an integral messenger (IM) is utilized, the following requirements apply:

The IM must separate from the cable in the web area without leaving any visible signs of splits, holes or grooves as specified in [SCTE 61].

A very small ridge of 0.015 in. protruding above the cable will be permissible after separation.

The IM must separate from the coax at -13° F (-25° C) without any damage to the coax jacket when tested per [SCTE 61].

13. Construction Performance Requirements

13.1. Single Tape & Braid

DC Loop *shall* test to the maximum specification stated in Table 11 unflexed and within a delta of 20% from the actual measurement value after flexing 10,000 cycles. [SCTE 166] *shall* be used for cable flexing.

Shielding effectiveness statistical mean *shall* measure in the range of the value stated in Table 7 when tested from 5 to 1002 MHz after flexing per [SCTE 166].

Shielding effectiveness statistical mean *shall* measure in the range of the value stated in Table 8 when tested from 1002 to 1794 MHz after flexing 10,000 cycles per [SCTE 166] and tested per [SCTE 48-3].

14. Tri Shield

DC Loop *shall* test to the maximum specification stated in Table 11 unflexed and within a delta of 20% from the actual measurement value after 10,000 flex cycles per [SCTE 48-3].

Shielding effectiveness statistical mean *shall* measure in the range of the value stated in Table 13 and Table 14 after flexing per [SCTE 166] and tested per [SCTE 48-3].

15. Quad Shield

DC Loop *shall* test to the maximum specification stated in Table 9 unflexed and within a delta of 20% from the actual measurement value after flexing. [SCTE 166] *shall* be used for cable flexing.

Shielding effectiveness statistical mean *shall* measure in the range of the value stated in Table 13 and Table 14 after flexing per [SCTE 166] and tested per [IEC 62153-4-4].

Table 13 – Shielding effectiveness statistical mean 5-1002 MHz

Shielding effectiveness statistical mean 5-1002 MHz	
Cable	Mean Shielding Effectiveness (dB)
Series 59 67% Braid	-75.0
Series 59 Tri-shield	-85.0
Series 59 Quad-shield	-95.0
Series 6 60% Braid	-75.0
Series 6 Tri-shield	-95.0
Series 6 Quad-shield	-105.0
Series 11 60% Braid	-55.0
Series 11 Tri-shield	-75.0
Series 11 Quad-shield	-85.0

Table 14 – Shielding effectiveness statistical mean 1002-1794 MHz

Cable	Mean Shielding Effectiveness (dB)
Series 59 67% Braid	-65.0
Series 59 Tri-shield	-75.0
Series 59 Quad-shield	-85.0
Series 6 60% Braid	-65.0
Series 6 Tri-shield	-75.0
Series 6 Quad-shield	-95.0
Series 11 60% Braid	-45.0
Series 11 Tri-shield	-65.0
Series 11 Quad-shield	-75.0

Table 15 – Shielding effectiveness statistical mean 1794-3000 MHz

Cable	Mean Shielding Effectiveness (dB)
Series 59 67% Braid	-55.0
Series 59 Tri-shield	-65.0
Series 59 Quad-shield	-75.0
Series 6 60% Braid	-55.0
Series 6 Tri-shield	-95.0
Series 6 Quad-shield	-85.0
Series 11 60% Braid	-40.0
Series 11 Tri-shield	-60.0
Series 11 Quad-shield	-70.0