



**PERFORMANCE BASED STANDARD FOR
ELECTRIC UTILITY EXTRUDED
DIELECTRIC SHIELDED POWER CABLES
RATED 5 THROUGH 46 KV**

ANSI/ICEA S-113-684-2016

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INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

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ICEA S-113-684-2016**

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FOREWORD

This Standards Publication for Utility Shielded Power Cables Rated 5 to 46 kV (ICEA S-113-684) was developed by the Insulated Cable Engineers Association Inc. (ICEA).

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Requests for interpretation of this Standard must be submitted in writing to the Insulated Cable Engineers Association, Inc., www.icea.net. An official written interpretation will be provided. Suggestions for improvements gained in the use of this Standard will be welcomed by the Association.

The ICEA expresses thanks to the Association of Edison Illuminating Companies for providing the basis for some of the material included herein through their participation in the Utility Power Cable Standards Technical Advisory Committee (UPCSTAC), and to the Institute of Electrical and Electronics Engineers, Insulated Conductors Committee, Task Group 2-14 Balloting Group for providing user input to this Standard.

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TABLE OF CONTENTS

Part 1 GENERAL	1
1.1 SCOPE	1
1.2 GENERAL INFORMATION	1
1.3 INFORMATION TO BE SUPPLIED BY PURCHASER	1
1.3.1 Characteristics of Systems on which Cable is to be Used	2
1.3.2 Quantities and Description of Cable.....	2
1.4 INFORMATION TO BE SUPPLIED BY MANUFACTURER	2
1.5 DEFINITIONS AND SYMBOLS	3
 Part 2 CONDUCTOR	 6
2.0 GENERAL	6
2.1 PHYSICAL AND ELECTRICAL PROPERTIES	6
2.1.1 Copper Conductors.....	6
2.1.2 Aluminum Conductors	6
2.2 OPTIONAL WATER BLOCKING COMPONENTS FOR STRANDED CONDUCTORS	7
2.3 CONDUCTOR SIZE UNITS	7
2.4 CONDUCTOR DC RESISTANCE PER UNIT LENGTH	7
2.4.1 Direct Measurement of dc Resistance Per Unit Length	7
2.5 CONDUCTOR DIAMETER	7
 Part 3 CONDUCTOR SHIELD (STRESS CONTROL LAYER)	 14
3.1 MATERIAL	14
3.2 EXTRUDED SHIELD THICKNESS	14
3.2.1 Reduced Extruded Shield Thickness	14
3.3 PROTRUSIONS AND CONVOLUTIONS	14
3.4 VOIDS	14
3.5 PHYSICAL REQUIREMENTS	14
3.6 ELECTRICAL REQUIREMENTS	15
3.6.1 Extruded Semiconducting Material.....	15
3.6.2 Extruded Nonconducting Material	15
3.6.3 Semiconducting Tape	15
3.7 CROSSLINKED (THERMOSET) REQUIREMENTS	15
 Part 4 INSULATION	 16
4.1 MATERIAL	16
4.2 INSULATION THICKNESS	16
4.2.1 Selection of Proper Thickness.....	17
4.2.2 Insulation Eccentricity	18
4.3 INSULATION REQUIREMENTS	18
4.3.1 Physical and Aging Requirements	18
4.3.2 Electrical Requirements.....	19
4.3.2.1 Partial-Discharge Extinction Level - Discharge-free designs only.....	19
4.3.2.2 Discharge (Corona) Resistance - Discharge-resistant designs only.....	19
4.3.2.3 Voltage Tests.....	19
4.3.2.4 Insulation Resistance Test.....	19
4.3.2.5 Accelerated Water Absorption	20
4.3.2.6 Dielectric Constant and Dissipation Factor	20
4.3.3 Voids, Ambers, Gels, Agglomerates and Contaminants as Applicable	20
4.3.4 Shrinkback - Unfilled Insulations Only.....	20
 Part 5 INSULATION SHIELD	 21

5.1 MATERIAL	21
5.2 THICKNESS REQUIREMENTS	21
5.3 PROTRUSIONS	21
5.4 SEMICONDUCTING TAPE	21
5.5 INSULATION SHIELD REQUIREMENTS	21
5.5.1 Removability	21
5.5.1.1 Removability for DISCHARGE-FREE Cable Designs Only.....	21
5.5.1.2 Removability for DISCHARGE-RESISTANT Cable Designs Only.....	21
5.5.2 Voids.....	22
5.5.2.1 Voids for DISCHARGE-FREE Cable Designs Only.....	22
5.5.2.2 Voids for DISCHARGE- RESISTANT Cable Designs Only.....	22
5.5.3 Physical Requirements	22
5.5.4 Electrical Requirements.....	22
5.5.5 Crosslinked (Thermoset) Requirements	22
Part 6 METALLIC SHIELDING	23
6.1 GENERAL	23
6.2 SHIELDS	23
6.2.1 Helically Applied Tape Shield	23
6.2.2 Wire Shield.....	23
6.2.3 Combination of Tape and Wire Shield	23
6.2.4 Longitudinally Applied Corrugated Tape Shield.....	24
6.2.5 Braid Shields	24
6.3 SHEATHS	24
6.3.1 Lead Sheath.....	24
6.3.2 Smooth Aluminum Sheath.....	24
6.3.3 Continuously Corrugated Sheath	24
6.4 CONCENTRIC NEUTRAL	24
6.4.1 Cross-sectional Area.....	25
6.4.2 Lay Length.....	25
6.4.3 Concentric Wires.....	25
6.4.3.1 Minimum Size and Number.....	25
6.4.3.2 Contrahelical Wire	25
6.4.3.3 Diameter and Area	25
6.4.4 Flat Straps	25
6.5 RADIAL MOISTURE BARRIER	25
6.6 OPTIONAL WATER BLOCKING COMPONENTS	26
Part 7 JACKET	29
7.1 MATERIAL	29
7.1.1 Unfilled Jackets	29
7.1.2 Filled Jackets.....	30
7.1.3 High Heat Deformation Resistant Jacket (Optional).....	30
7.1.4 Oil Resistance (Optional).....	30
7.1.5 Semiconducting Properties (Optional)	31
7.1.6 Sunlight Resistance for Jacket Materials Other Than Black and All Filled Jackets	31
7.1.7 Low Smoke Halogen Free Jacket (Optional)	31
7.1.8 Vertical Tray Cable Flame Test Requirement (Optional)	32
7.2 JACKET APPLICATION AND THICKNESS	32
7.2.1 Thickness of Jacket Over Metallic Shield.....	32
7.2.1.1 Extruded-To-Fill Jacket	32
7.2.1.2 Overlaying Jacket.....	32
7.2.2 Thickness of Jacket Over Metallic Sheath	33
7.3 JACKET IRREGULARITY INSPECTION	34
7.3.1 Nonconducting Jackets.....	34

7.3.2 Semiconducting Jackets 34

Part 8 CABLE ASSEMBLIES AND IDENTIFICATION..... 35

8.1 MULTIPLEX CABLE ASSEMBLIES 35

8.2 CABLE IDENTIFICATION 35

8.2.1 Jacketed Cable 35

8.2.2 Optional Jacket Stripes 35

8.2.3 Optional Center Strand Identification 35

8.2.4 Optional Sequential Length Marking 35

Part 9 PRODUCTION TESTS AND TEST METHODS 36

9.1 TESTING 36

9.2 SAMPLING FREQUENCY 36

9.3 CONDUCTOR TEST METHODS 36

9.3.1 Method for DC Resistance Determination 36

9.3.2 Diameter Determination 36

9.4 TEST SAMPLES AND SPECIMENS FOR PHYSICAL AND AGING TESTS 36

9.4.1 General 36

9.4.2 Measurement of Thickness 36

9.4.2.1 Micrometer Measurements 37

9.4.2.2 Optical Measuring Device Measurements 37

9.4.3 Number of Test Specimens 37

9.4.4 Size of Specimens 37

9.4.5 Preparation of Specimens of Insulation and Jacket 38

9.4.6 Specimen for Aging Test 38

9.4.7 Calculation of Area of Test Specimens 38

9.4.8 Unaged Test Procedures 38

9.4.8.1 Test Temperature 38

9.4.8.2 Type of Testing Machine 39

9.4.8.3 Tensile Strength Test 39

9.4.8.4 Elongation Test 39

9.4.9 Aging Tests 39

9.4.9.1 Aging Test Specimens 39

9.4.9.2 Air Oven Test 40

9.4.9.3 Oil Immersion Test 40

9.4.10 Hot Creep Test 40

9.4.11 Solvent Extraction 40

9.4.12 Wafer Boil Test for Conductor and Insulation Shields 40

9.4.13 Amber, Agglomerate, Gel, Contaminant, Protrusion, Convolution and Void Test 40

9.4.13.1 Sample Preparation 40

9.4.13.2 Examination 41

9.4.13.3 Resampling for Amber, Agglomerate, Gel, Contaminant, Protrusion, Convolution and Void Test 41

9.4.13.4 Protrusion and Convolution Measurement Procedure 41

9.4.14 Internal Irregularity Test Procedure for Unfilled Insulation Only 42

9.4.14.1 Sample Preparation 42

9.4.14.2 Detection of Irregularities 42

9.4.14.3 Resampling for Internal Irregularity Test 42

9.4.15 Physical Tests for Semiconducting Material Intended for Extrusion 43

9.4.15.1 Test Sample 43

9.4.15.2 Test Specimens 43

9.4.15.3 Elongation 43

9.4.16 Retests for Physical and Aging Properties 43

9.4.17 Retests for Thickness 43

9.5 DIMENSIONAL MEASUREMENTS OF THE METALLIC SHIELD..... 43

 9.5.1 Tape Shield 43

 9.5.2 Wire and Braid Shield 43

 9.5.3 Lead Sheath 44

 9.5.4 Flat Straps 44

9.6 DIAMETER MEASUREMENT OF INSULATION 44

9.7 TESTS FOR JACKETS 44

 9.7.1 Heat Shock..... 44

 9.7.2 Heat Distortion 45

 9.7.3 Cold Bend..... 45

9.8 VOLUME RESISTIVITY 45

 9.8.1 Semiconducting Conductor Shield (Stress Control) only 45

 9.8.2 Insulation Shield..... 46

 9.8.3 Test Equipment 46

 9.8.4 Test Procedure..... 46

 9.8.4.1 Two-electrode Method 46

 9.8.4.2 Four-electrode Method..... 46

 9.8.4.3 Measurement..... 47

 9.8.5 Semiconducting Jacket Radial Resistivity Test 47

 9.8.5.1 Sample Preparation..... 47

 9.8.5.2 Test Equipment Setup..... 48

 9.8.5.3 Calculation 48

9.9 ADHESION (INSULATION SHIELD REMOVABILITY) TEST 49

9.10 SHRINKBACK TEST PROCEDURE 49

 9.10.1 Sample Preparation 49

 9.10.2 Test Procedure..... 49

 9.10.3 Pass/Fail Criteria and Procedure 49

9.11 RETESTS ON SAMPLES..... 49

9.12 AC VOLTAGE TEST 50

 9.12.1 General..... 50

 9.12.2 AC Voltage Test..... 50

9.13 PARTIAL-DISCHARGE TEST PROCEDURE 50

9.14 METHOD FOR DETERMINING DIELECTRIC CONSTANT AND DIELECTRIC STRENGTH OF EXTRUDED NONCONDUCTING POLYMERIC STRESS CONTROL LAYERS..... 50

9.15 WATER CONTENT..... 50

 9.15.1 Water Under the Jacket..... 51

 9.15.2 Water in the Conductor 51

 9.15.3 Water Expulsion Procedure..... 51

 9.15.4 Presence of Water Test..... 51

9.16 PRODUCTION TEST SAMPLING PLANS 52

Part 10 QUALIFICATION TESTS 55

10.0 GENERAL 55

10.1 CORE MATERIAL QUALIFICATION TESTS 55

 10.1.1 Conductor Shield (Cable with unblocked conductors) and Insulation Qualification 56

 10.1.2 Insulation Shield and Conductor Shield Qualification..... 56

 10.1.3 High Voltage Time Test (HVTT) Procedure 58

 10.1.4 Impulse Test Procedure..... 59

 10.1.5 Cyclic Aging..... 59

 10.1.5.1 Cable Length 59

 10.1.5.2 Sample Preparation..... 59

 10.1.5.3 Conduit..... 59

 10.1.5.4 Load Cycle..... 60

 10.1.6 Accelerated Water Treeing Test (AWTT) Procedure 60

10.1.6.1	General	60
10.1.6.2	Quantity of Cable To Be Aged	60
10.1.6.3	Aging Time.....	60
10.1.6.4	Conduit Fixture	60
10.1.6.4.1	Structures Above Conduit Fixtures	61
10.1.6.4.2	Conduit Fixture Dimensions	61
10.1.6.5	Water	61
10.1.6.6	Ambient Temperature	61
10.1.6.7	Test Procedure	61
10.1.6.8	Water pH.....	63
10.1.6.9	Samples prior to Breakdown Testing.....	63
10.1.6.10	High Voltage Time Test Requirements	63
10.1.6.11	Impulse Test Requirements.....	63
10.1.6.12	Retesting.....	63
10.1.7	Qualification Test Electrical Measurements.....	64
10.1.8	Qualification Test Physical Measurements	64
10.2	THERMOMECHANICAL QUALIFICATION TEST - Optional	64
10.2.1	Scope	64
10.2.2	Procedure.....	64
10.2.2.1	Fixture	64
10.2.2.2	Load Cycling.....	64
10.2.2.3	Electrical Measurements.....	65
10.2.2.4	Physical Measurements Before and After the Thermomechanical Design Test.....	65
10.3	JACKET MATERIAL QUALIFICATION TESTS	67
10.3.1	Environmental Stress Cracking Test.....	67
10.3.1.1	Test Specimen.....	67
10.3.1.2	Test Procedure	67
10.3.2	Absorption Coefficient Test.....	67
10.3.3	Brittleness Test	67
10.3.4	Sunlight Resistance (filled and unfilled non black jackets).....	67
10.3.4.1	Test Samples.....	67
10.3.4.2	Test Procedure	67
10.3.5	Low Smoke Halogen Free Jacket Testing	68
10.3.5.1	Smoke Density Test	68
10.3.5.2	Acid Gas Equivalent.....	68
10.3.5.3	Halogen Content	68
10.3.6	Vertical Tray Cable Flame Test.....	68
10.3.7	Sunlight Resistance Extruded Red Stripe For Jackets.....	68
10.3.7.1	Test Samples.....	68
10.3.7.2	Test Procedure	68
10.4	CV EXTRUSION QUALIFICATION TEST	68
10.4.1	Thermal Conditioning.....	69
10.4.2	Dissipation Factor Verification	69
10.4.3	AC Withstand Verification	69
10.5	DUCT PULLING QUALIFICATION TEST	69
10.5.1	Scope	69
10.5.2	Test Cable	70
10.5.3	Procedure.....	70
10.5.4	Acceptance Criteria.....	71
10.6	OTHER QUALIFICATION TESTS	71
10.6.1	Insulation Resistance.....	72
10.6.2	Accelerated Water Absorption Tests.....	72
10.6.3	Resistance Stability Test	72
10.6.4	Brittleness Temperature for Semiconducting Shields	72

10.6.5	Dry Electrical Test for High Temperature Insulation Only	72
10.6.5.1	Test Samples.....	72
10.6.5.2	Test Procedure	72
10.6.5.3	Electrical Measurements.....	72
10.6.6	Dissipation Factor Characterization Test	73
10.6.6.1	Test Samples.....	73
10.6.6.2	Thermal Conditioning	73
10.6.6.3	Dissipation Factor Testing.....	73
10.6.7	Dielectric Constant and Voltage Withstand for Nonconducting Stress Control Layers.....	74
10.6.8	Discharge Resistance Test For Discharge Resistant Insulation Only	74
10.6.8.1	Test Specimens.....	74
10.6.8.2	Test Environment	74
10.6.8.3	Test Electrodes.....	74
Part 11	APPENDICES	75
APPENDIX A	NEMA, ICEA, IEEE, ASTM AND ANSI STANDARDS (Normative)	75
A1	NEMA PUBLICATIONS	75
A2	ICEA PUBLICATIONS	75
A3	IEEE AND ANSI STANDARDS	75
A4	ASTM STANDARDS.....	75
APPENDIX B	EMERGENCY OVERLOADS (Normative).....	78
APPENDIX C	PROCEDURE FOR DETERMINING THICKNESS REQUIREMENTS OF THE INSULATION SHIELD, LEAD SHEATH AND JACKET (Normative)	79
APPENDIX D	CABLE COMPONENT FUNCTION (Informative)	81
D1	CONDUCTOR.....	81
D1.1	Function	81
D1.2	Material	81
D2	CONDUCTOR SHIELD	81
D2.1	Function	81
D2.1.1	Nonconducting.....	81
D2.1.2	Semiconducting.....	81
D2.2	Voltage Stress	81
D3	INSULATION.....	82
D4	INSULATION SHIELD	82
D4.1	Semiconducting Shield.....	83
D4.2	Metallic Shield	83
D5	JACKETS	83
APPENDIX E	HANDLING AND INSTALLATION PARAMETERS (Informative).....	85
E1	INSTALLATION TEMPERATURES	85
E2	RECOMMENDED MINIMUM BENDING RADIUS	85
E2.1	Tape Shield.....	85
E2.2	Wire, Flat Strap and Braid Shield	85
E2.3	Sheath.....	85
E3	DRUM DIAMETERS OF REELS	85
E4	MAXIMUM TENSION AND SIDEWALL BEARING PRESSURES	85
E5	TESTS DURING AND AFTER INSTALLATION	86
E5.1	During Installation.....	86
E5.2	After Installation	86
E5.3	In Service.....	86
APPENDIX F	TRADITIONAL INSULATION WALL THICKNESS (Informative)	88
APPENDIX G	ADDITIONAL CONDUCTOR INFORMATION (Informative)	90
APPENDIX H	SPECIFICATION FOR ALLOY LEAD SHEATHS (Informative).....	93
H1	PURPOSE.....	93

H2 MATERIALS..... 93
 H3 REQUIREMENTS 93
 H4 LEAD SHEATH THICKNESS WITHOUT JACKETS 94
APPENDIX I REDUCED NEUTRAL DESIGNS (Informative)..... 95
APPENDIX J STRESS CALCULATION FOR CABLES WITH A NONCONDUCTING
CONDUCTOR SHIELD (Informative) 99
APPENDIX K CABLE QUALIFICATION FOR SUBMERGED APPLICATIONS
(Informative)..... 100

LIST OF TABLES

Table 2-1 Weight Increment Factors 8
Table 2-2 Schedule for Establishing Maximum Direct Current Resistance
Per Unit Length of Completed Cable Conductors listed in Table 2-3 8
Table 2-3 Nominal Direct Current Resistance in Ohms Per 1000 Feet at 25 °C
of Solid and Concentric Lay Stranded Conductor..... 9
Table 2-3 (Metric) Nominal Direct Current Resistance in Milliohms Per Meter at 25 °C
of Solid and Concentric Lay Stranded Conductor..... 10
Table 2-4 Nominal Diameters for Copper and Aluminum Conductors 11
Table 2-4 (Metric) Nominal Diameters for Copper and Aluminum Conductors 12
Table 2-5 Factors for Determining Nominal Resistance of Stranded Conductors
Per 1000 Feet at 25 °C 13
Table 3-1 Extruded Conductor Shield Requirements 15
Table 4-1 Conductor Maximum Rated Temperatures..... 16
Table 4-2 Conductor Sizes, Insulation Eccentricity, Maximum Stress
and Test Voltages 17
Table 4-3 Insulation Physical Requirements 18
Table 4-4 BIL Values..... 19
Table 4-5 Shrinkback Test Requirements 20
Table 5-1 Extruded Insulation Shield Requirements 22
Table 6-1 Lead Sheath Thickness for Cables With an Overall Jacket..... 26
Table 6-2 Concentric Neutral Wire Size 27
Table 6-3 Full Neutral Concentric Copper Conductor 27
Table 6-4 One-third Neutral Concentric Copper Conductor 28
Table 7-1 Unfilled Jackets..... 29
Table 7-2 Filled Jackets 30
Table 7-3 High Heat Resistant Jackets 30
Table 7-4 Oil Resistance Type A..... 31
Table 7-5 Oil Resistance Type B..... 31
Table 7-6 Halogen Free Requirements 32
Table 7-7 Extruded-To-Fill Jacket Thickness and Test Voltage for Flat Strap and
Wire Shield Cables 33
Table 7-8 Overlaying Jacket Thickness and Test Voltage for Shielded Cables 33
Table 7-9 Jacket Thickness and Test Voltage for Sheathed Cables 34
Table 9-1 Test Specimens for Physical and Aging Tests..... 37
Table 9-2 Bending Requirements for Heat Shock Test 45
Table 9-3 Bending Requirements for Cold Bend Test..... 45
Table 9-4 Summary of Production Tests and Sampling Frequency Requirements..... 52
Table 9-5 Plan E 54
Table 9-6 Plan F..... 54
Table 10-1 Minimum ac Withstand Values 63
Table 10-2 Maximum Temperature Gradient for Thermal Aging..... 66
Table 10-3 Generic Groupings of Cable Components..... 66

Table 10-4 AC Withstand Voltage Requirements 15-35 kV Rated Cables 69

Table D-1 Jacket Function 84

Table E-1 DC Field Test Voltages..... 87

Table F-1 Traditional Insulation Thickness from ICEA S-94-649, Test Voltages and
Conductor Sizes 88

Table G-1 Solid Aluminum and Copper Conductors 90

Table G-2 Concentric Stranded Class B Aluminum and Copper Conductors..... 91

Table G-3 Concentric Stranded Class C and D Aluminum and Copper Conductors 92

Table H-1 Chemical Requirements for Alloy Lead Sheaths 93

Table H-2 Lead Sheath Thickness for Cable Without an Overall Jacket 94

Table I-1 One-sixth Neutral Concentric Conductor for Copper Center Conductor 95

Table I-2 One-eighth Neutral Concentric Conductor for Copper Center Conductor 95

Table I-3 One-twelfth Neutral Concentric Conductor for Copper Center Conductor 96

Table I-4 One-sixth Neutral Concentric Conductor for Aluminum Center Conductor 96

Table I-5 One-eighth Neutral Concentric Conductor for Aluminum Center Conductor ... 97

Table I-6 One-twelfth Neutral Concentric Conductor for Aluminum Center Conductor... 97

LIST OF FIGURES

Figure 9-1 Procedure to Measure Protrusions 41

Figure 9-2 Procedure to Measure Convolutions 42

Figure 9-3 Sample Preparation for Radial Resistivity Measurement of
Semi-conducting Jackets 47

Figure 9-4 Circuit for Radial Resistivity Measurement of Semi-Conducting Jackets 48

Figure 10-1 Conduit Fixture 61

Figure D-1 Conductor Shielding 82

Figure D-2 Stress Distribution..... 83

Part 1 GENERAL

1.1 SCOPE

This standard provides the basis for designing non-traditional shielded power cables that will be rated 5 to 46 kV and be used for the transmission and distribution of electrical energy. These non-traditional cables will normally have overall diameters that are less than the diameters of what are considered traditional shielded power cables as specified in ICEA Standards S-94-649 and S-97-682. This standard is not intended to promote standardization of cable component thicknesses or dimensions. The smaller overall diameters are accomplished by reducing the wall thicknesses of the various polymer and metallic layers of the cable. As the polymer layer thicknesses are reduced, the electrical stress in the cable may increase. Manufacturers will design their cables based on what they have determined to be the maximum acceptable electrical stress levels that will not adversely affect their cable's performance. Since performance based designs can vary from manufacturer to manufacturer, the user of this standard must evaluate non-traditional cable designs very carefully. Additionally, the user of this standard must consider the impact performance based cable designs will have on cable accessories.

Note: See Appendix K for cable insulations qualification requirements or cable design features appropriate for submerged applications.

1.2 GENERAL INFORMATION

This publication is so arranged to allow selection from two design concepts, one known as "DISCHARGE-FREE" and the other as "DISCHARGE-RESISTANT", as well as allowing for selection of those individual components (such as conductors, insulation type and thickness, metallic shield type, jackets, etc.) as required for specific installation and service conditions.

Parts 2 to 7 cover the major components of cables:

- Part 2 - Conductor
- Part 3 - Conductor Shield
- Part 4 - Insulation
- Part 5 - Insulation Shield
- Part 6 - Metallic Shielding
- Part 7 - Jacket

Each of these parts designates the material characteristics, performance characteristics, dimensions, and tests applicable to the particular component and, as applicable, to the design concept.

Part 8 covers the assembly and identification of cables.

Part 9 covers production test procedures applicable to cable component materials and to completed cables.

Part 10 covers qualification test procedures.

Part 11 contains appendices of pertinent information.

U.S. customary units, except for temperature and electrical stress, are specified throughout this standard. Approximate International System of Units (SI) equivalents are included for information only.

1.3 INFORMATION TO BE SUPPLIED BY PURCHASER

When requesting proposals from cable manufacturers, the prospective purchaser should describe the cable desired by reference to pertinent provisions of these standards. To help avoid misunderstandings and possible misapplication of the cables, the purchaser should also furnish the following information: