115 kV, 1000 KCMIL, 1/C, XLPE INSULATED CABLE

1. Scope

This material standard covers the detailed requirements for 115 kV, 1000 kcmil, cross-linked polyethylene (XLPE), single conductor cable used for the transmission of electric energy.

Industry designation: **1/C**

This material standard applies to the following Seattle City Light Stock Number:

Stock Number	**012799**
Size	1000 kcmil

Cable joint and termination requirements are outside the scope of this Material Standard.

Commission testing requirements of installed cable prior to energization are outside the scope of this Material Standard.

2. Application

Cable is intended for use on a nominal 115 kV, three-phase, grounded, wye-connected power system.

	System Characteristics and Design Criteria	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Frequency	60 Hz	SCL
Operating voltage, ph-ph		
Nominal	115 kV	SCL
Maximum	121 kV	SCL
Basic Impulse Voltage (BIL)	550 kV crest	SCL
Fault current		
Symmetrical	35 kA	SCL
Duration	30 cycles	SCL
Location	wet	SCL

2. Application, continued

Seattle City Light assumes responsibility for determining the normal ampacity rating of cable.

3. General Requirements

This detailed material standard is to be used in conjunction with the latest revision of Seattle City Light Material Standard 6050.00, "High Voltage, XLPE Insulated Cable – General."

4. Industry Standards

Cable shall meet the requirements of the following industry standards:

AEIC CS9-2006 – Specification for Extruded Insulation Power Cables and Their Accessories Rated Above 46kV through 345 Kvac

ICEA S-108-720-2004 – Standard for Extruded Insulation Power Cables Rated Above 46 through 345 kV

Refer to Material Standard 6050.00 to obtain the appropriate revision date for other referenced industry standards.

5. Construction

5.1 General

Unless indicated otherwise, all values cited below should be consistent with industry standards - they are repeated here for the convenience of the reader. Values or requirements different from industry standards are identified with the symbol ▲. In some situations, the ▲ symbol offers warning that special requirements are located in Material Standard 6050.00.

standards coordinator	*standards supervisor*	*unit director*
John Shipek	John Barnett	Pamela S. Johnson

5. Construction, continued

5.2 Conductor

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Diameter		
minimum	1.095 in	ICEA S-108-720, Section 2.5
nominal	1.117 in	ASTM B8
maximum	1.139 in	ICEA S-108-720, Section 2.5
Metal	copper	ASTM B49
Stranding type	concentric-lay	ASTM B8
Class	B	ASTM B8
Stranding subtype	compressed	ASTM B8
Number of strands	61	ASTM B8, Table 1
Temper	soft drawn, annealed prior to stranding	ASTM B3
Lay, outer layer	left hand	ASTM B8, Section 5.5.1
Sealant for stranded conductors	not required or desired	ICEA S-108-720, Section 2.2

5.3 Conductor Shield (Stress Control Layer)

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Thickness, minimum point	20 mil	ICEA S-108-720, Part 3, Table 3.1
Material	formulated with acetylene black ▲	SCL and AEIC CS9, Section 2.2.2

5.4 Insulation

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Material	crosslinked polyethylene (XLPE) with no mineral fillers	ICEA S-108-720, Section 4.1
Approved material formulations	specified in general Material Standard	SCL 6050.00
Thickness		
minimum	760 mil	SCL
nominal	800 mil	ICEA S-108-720, Appendix F, Table F-1
maximum	840 mil	SCL
Basic Impulse Level (BIL)	550 kV crest	ICEA S-108-720, Section 4.3, Table 4-6

5.5 Extruded Insulation Shield

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Material	discharge-free (thermosetting material)	SCL
Thickness		
minimum point	40 mil	ICEA S-108-720, Section 5.2, Table 5-1
maximum point	100 mil	ICEA S-108-720, Section 5.2, Table 5-1

5. Construction, continued

5.6 Metallic Shield/Sheath

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Metal and type	welded corrugated copper or laminated copper foil longitudinally folded and bonded to the jacket	ICEA S-108-720, Part 6
Radial moisture barrier	required ▲	ICEA S-108-720, Section 6.4
Water blocking components for metallic shield	required ▲	ICEA S-108-720, Section 6.5

5.7 Jacket (Non-Metallic Covering)

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Material	linear low density polyethylene (LLDPE)	ICEA S-108-720, Section 7.1.1
Color	black	ICEA S-108-720, Section 7.1.1
Thickness		
minimum point	100 mil	ICEA S-108-720, Section 7.2.1, Table 7-5
maximum point	160 mil	ICEA S-108-720, Section 7.2.1, Table 7-5
Semi-conducting coating	required	AEIC CS9, Section 2.6.3
Maximum diameter over jacket	3.70 in ▲	SCL preference

5.8 Assembly and Identification

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Center strand identification	not required	ICEA S-108-720, Section 8.1.1
Sequential length marking	required ▲	ICEA S-108-720, Section 8.1.2

6. Packaging

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Reel type	steel fluted	WC 26, Section 2.1.2
Flange diameter, maximum	as specified on purchase order	SCL preference
Outside width, maximum	as specified on purchase order	SCL preference
Drum diameter, minimum	as specified on purchase order	SCL preference
Length per reel, +1.5, -0%	as specified on purchase order	SCL preference

7. Issuance

	Requirements	Reference
Stock Number	**012799**	SCL
Size	1000 kcmil	various
Stock Unit	FT	SCL

8. Approved Manufacturers

Brugg Cables, LLC

General Cable / SILEC

J-Power Systems (JPS)

Prysmian

Southwire Company/Forte Power Systems

9. References

Cunningham, Bob; SCL Engineer, subject matter expert (bob.cunningham@seattle.gov)

IEC 60840; *Power Cables with Extruded Insulation and Their Accessories for Rated Voltages above 30 kV (Um = 36 kV) up to 150 kV (Um = 170 kV) - Test Methods and Requirements;* International Electrotechnical Commission; April 2004 (Edition 3)

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