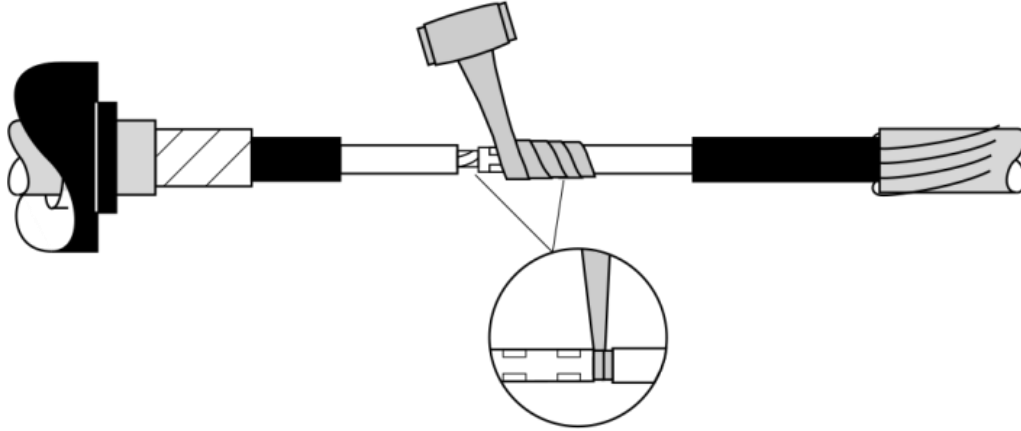


Splice Kits, Cable, Heat-Shrink, Straight, 150 kV BIL



1. Scope

This standard covers the requirements for 150 kV BIL, straight, single conductor (1/C), heat-shrink, cable splice kits. Primary cable splices are also known as cable joints or Raychems.

This standard applies to the following Seattle City Light (SCL) stock numbers:

Stock No.	Item	Conductor Size Range (AWG/kcmil)
687506	Splice kit, extra long repair	#1–250
687507	Splice kit	#1–250
687508	Splice kit	350–500
687510	Splice kit	#1–250
687514	Splice kit	350–500
687516	Splice kit	750–1000

Note: Stock numbers 687510, 687514, and 687516 include an external grounding/shield interrupting kit.

2. Application

Heat-shrink splices are used to permanently join two medium voltage cables. Cable may be insulated with TRXLPE, EPR, or EAM and shielded with tape, flat strap, or round wire/CN.

With the use of shim kits, cables of two different conductor sizes can be joined as long as they fall within the same kit range.

The current and temperature rating of a properly installed cable splice is equal to or greater than that of the cable for which it is designed.

John Shipek

John Shipek

Darnell Cola

Heat-shrink type joints consist of one or more expanded polymeric extruded tubes or molded parts that undergo thermally activated recovery when heated to an appropriate temperature.

Heat-shrink cable splice kits contain everything needed to make up a splice except the connector. While tapered connectors are preferred, non-tapered or secondary connectors may be used as long as they are no sharper than an "H" style connector and the stress relief mastic (SRM) successfully smooths them out.

For general application information, see Table 4b. For cable-specific application information, see SCL 0535.21, "Heat Shrink Splices, Straight."

The industry-popular Raychem Corporation was purchased by Tyco Electronics (now TE Connectivity) in 1999. For this reason, heat-shrink splices are sometimes still referred to as Raychems.

3. Industry Standards

Heat-shrink cable splice kits shall meet the applicable requirements of the following industry standard:

IEEE 404-2012; IEEE Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2.5 kV to 500 kV

4. Requirements

Heat-shrink cable splices shall meet the electrical requirements of Table 4a.

Table 4a. Cable Splice Electrical Requirements

Voltage class	25 kV
Voltage rating (ph-g), grounded systems	14.4 kV rms
Voltage rating (ph-ph)	25 kV rms
Basic impulse insulation level (BIL)	150 kV crest
Withstand voltage, 15 minute	105 kV DC

Specific splices shall be designed for use with the cables described in Table 4b.

Table 4b. Splice-to-Cable Cross Reference

Stock No.	Conductor Size Range (AWG/kcmil)	Cable Construction	Insulation overall diameter range (in)	Jacket overall diameter, maximum (in)
687506	#1–250	Concentric neutral	0.90–1.20	1.55
687507	#1–250	"	0.90–1.20	1.55
687508	350–500	"	1.20–1.50	1.95
687510	#1–250	Tape, wire, flat strap shielded	0.90–1.20	1.50
687514	350–500	"	1.20–1.50	1.95
687516	750–1000	"	1.50–1.80	2.40

Each heat-shrink cable splice kit will typically include items as shown in Table 4c (quantities of some components may vary with kit size).

Table 4c. Heat-Shrink Splice Kit Components (Typical)

		
Adhesive-Backed Copper Strips	Red/Black Triple Layer Tube	Instructions
		
Stress Relief Mastic (SRM)	Ground Braid	Spring Clamp (approx. 2)
		
Red Sealant Strips	Steel Retention Clips (approx. 2)	Shielding Mesh
		
Stainless Steel Channels	Black/Green Wraparound Sleeve	Stress Control Tube
		
Silicone Grease Packet	Aluminum Deflectors	Compression Connector

Heat-shrink splice kits, Stock Nos. 687510, 687514, and 687516 shall each include an appropriately sized external grounding/shield interrupting kit. See Table 4d and Table 4e (quantities of some components may vary with kit size).

Table 4d. External Grounding/Shield interrupting Kit Details

Stock No.	Insulation O.D. Range (in)	Ground Braid (AWG)
687510	0.30-1.25	#8
687514	1.00-2.15	#6
687516	1.55-3.40	#4

Table 4e. External Grounding/Shield Interrupting Kit Components



Red sealant strips



Solder blocked ground braid



Adhesive-backed copper strips



Spring clamp



Installation instructions

5. Testing

Heat-shrink cable splices shall be tested according to the requirements of IEEE 404, sections 7 and 8.

Test results shall be provided upon request.

6. Design Changes

Manufacturer shall inform Seattle City Light in writing of all design changes that could affect the understood or published capabilities of the product.

7. Marking

Heat-shrink cable splice kit components shall be marked according to the requirements of IEEE 404, Section 6.1. This shall include but not be limited to:

- Company name or logo
- Part identification
- Date of manufacture (month and year)
- "Use before" date and storage conditions, if applicable
- Maximum phase-to-phase or phase-to-ground voltage rating
- Cable insulation diameter range

8. Packaging

Heat-shrink cable splice kits shall be individually packaged to prevent damage during shipping, handling, and inside storage.

Each individual package shall constitute a complete kit. See Section 4.

Individual packages shall be legibly marked with:

- Manufacturer identification
- Product description
- Seattle City Light stock number

Each shipping container shall be legibly marked with the following information:

- Manufacturer identification
- Product description
- Seattle City Light purchase order number

9. Issuance

Stock unit: EA

10. Approved Manufacturer

Name: TE Connectivity

Product Description: In-Line Splice for 1/C Shielded Cable

Stock No.	Item	Catalog No.
687506	Splice kit, extra long repair	HVS-2511E-RJ
687507	Splice kit	HVS-2511E-J
687508	Splice kit	HVS-2512E-J
687510	Splice kit	HVS-2521S w/ HVS-EG-1
687514	Splice kit	HVS-2522S w/ HVS-EG-2
687516	Splice kit	HVS-2523S w/ HVS-EG-2

11. References

SCL Construction Standard 0535.21; "Heat Shrink Splices, Straight"

12. Sources

4-1773455-0 E361; Tyco Electronics Energy Division, Energy Ready Reference Guide, Generation Distribution Transmission, Raychem Cable Accessories, ALR Photocontrols, AMP Connectors; March 2012

Kephart, Bob; SCL Associate Electrical Engineer and co-originator of SCL Material Standard 6873.16 (bob.kephart@Seattle.gov)

PCN 941169-000; Installation Instructions, Tyco Electronics, HVS-2510E-J, 25 kV Class, Splice for 1/C Jacketed and Unjacketed Concentric Neutral Power Cables; June 29, 2010

PCN 625799-000; Installation Instructions, Tyco Electronics, HVS-2520S Series, 25 kV Class, Splice for Extruded Dielectric (Poly/EPR) Power Cables: Metallic Tape, Wire Shield, UniShield, or Lead Sheath Cables; June 17, 2010

SCL Material Standard 6871.3 (canceled); Splices, "15-kV through 69-kV, Heat Shrinkable"

Shipek, John, SCL Standards Supervisor, co-originator, and subject matter expert for 6873.16 (john.shipek@Seattle.gov)