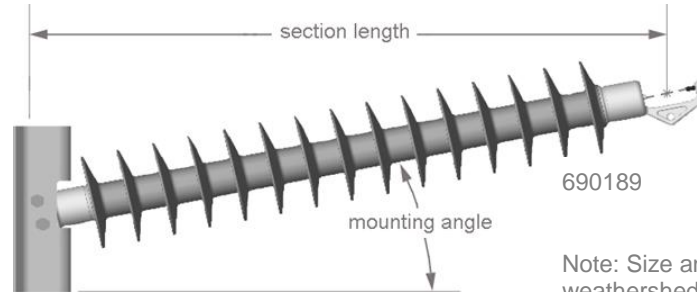


Insulator, Horizontal Line Post, Polymer, For 115 kV Nominal Systems



1. Scope

This standard applies to polymer, horizontal line post insulators used to construct 115 kV transmission lines. Insulators have a trunnion end fitting.

This standard applies to the Seattle City Light (SCL) stock numbers listed in Table 2.

2. Application

Horizontal line post insulators are used on wood or steel poles to support transmission conductors. Table 2 gives the application for each of the stock numbers.

Table 2. Horizontal Line Post Insulator Applications

Stock No.	Application
012830	115 kV, nominal, steel poles, no base
013307	115 kV, nominal, steel poles, flat base
690189	115 kV, nominal, wood poles, curved base

In 2008, stock number 012830 was used with SCL-fabricated bases to re-insulate the 115 kV north to Bothell line. If an insulator on the 115 kV north to Bothell line becomes damaged, re-use the existing base with the new insulator. If a base is required, SCL's shop will need to be contacted to fabricate a base.

3. Industry Standards

Insulators shall meet the applicable requirements of the following national standards:

ANSI C29.1-1988 (R2002) Test Methods for Electrical Power Insulators

ANSI C29.7-1996 (R2002) Wet Process Porcelain Insulators – High Voltage Line Post Type

ANSI C29.11-1989 (R1996) Tests for Composite Suspension Insulators for Overhead Transmission Lines

ASTM A153-1982 Zinc Coating (Hot Dip) on Iron and Steel Hardware

4. Requirements

4.1 Common Requirements

Ultimate mechanical strength ratings shall be based on fully assembled insulators; insulators with base and end fittings attached.

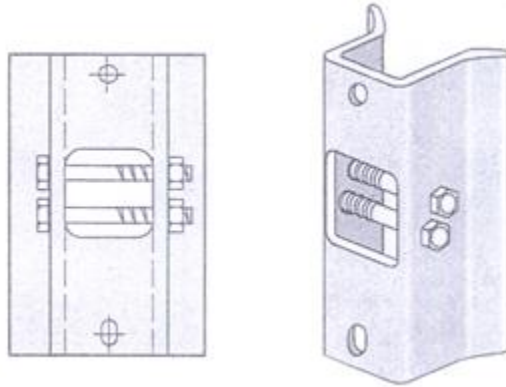
Table 4.1. Common Requirements

60 Hz dry flashover	325 kV rms, minimum
60 Hz wet flashover	295 kV rms, minimum
Positive critical impulse flashover	505 kV crest, minimum
Horizontal coupling length	46 in (plus 3, minus 2)
Mounting angle	12 degrees
Leakage	82 in, minimum
Strike/dry arc distance	33 in, minimum
Ultimate mechanical strength in cantilever	3,790 lb, minimum As defined by ANSI C29.1-1988 (R2002) and ANSI C29.7-1996 (R2002), section 8
Maximum design cantilever (MDC)	1,515 lb, minimum Where MDC is defined as 40% of the ultimate mechanical strength in cantilever
Ultimate mechanical strength in tension	5,000 lb, minimum At 0%, MDC shall be as defined by ANSI C29.1-1988 (R2002), section 5
End fitting type (line end)	Horizontal trunnion (clamp top) Similar to ANSI C29.7-1996 (R2002), figure 11, with one supplemental hole capable of accepting a 3/4-inch diameter Y-clevis and carrying the full design load of the insulator. Trunnion bolt shall be at least 2 inches long and include a hot dip galvanized jam nut.
Weathershed/sheath material	Silicon rubber; to qualify as silicon type, weathershed/sheath material must be composed of at least 33% silicon by weight; "EP/silicon alloys" do not qualify.
Weathershed/sheath material color	Gray

4.2 Stock No. 690189 Requirements, Bendable Curved Base

Base type (structure end)	Steel or aluminum gain channel (a.k.a. bendable)
Base mounting bolt holes	Two holes spaced 12 inches vertically from one hole or slot, designed to accommodate 3/4-inch nominal diameter fasteners.

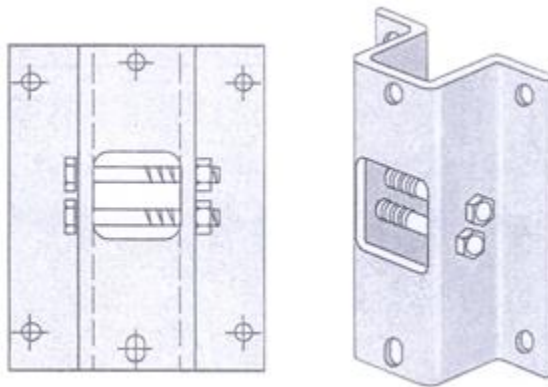
Figure 4.2. Bendable Curved Base



4.3 Stock No. 013307 Requirements, Bendable Flat Base

Base type (structure end)	Steel or aluminum formed channel (a.k.a. bendable)
Base mounting bolt holes	Two holes spaced 12 in vertically from one hole or slot. Four holes or slots in rectangular pattern spaced 10 in vertically and 8 in horizontally. Holes shall be designed to accommodate 3/4-in nominal diameter fasteners.

Figure 4.3. Bendable Flat Base



4.4 Stock No. 012830 Requirements

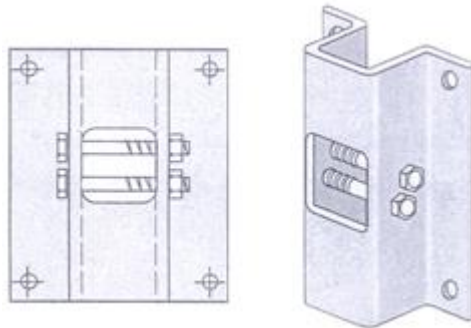
Insulator shall be furnished without a base.
 Insulator shall be furnished with sets of mounting fasteners.

4.5 Flat Base Requirements – No Stock Number

Base shall be fabricated by SCL shop according to L2-SN251-28 W/ELT.

Base type (structure end)	Steel or aluminum formed channel (A.K.A. bendable)
Base mounting bolt holes	Four holes or slots in rectangular pattern spaced 13 in vertically and 8 in horizontally, designed to accommodate 3/4-in nominal diameter fasteners.

Figure 4.5. Bendable Flat Base



5. Notice of Changes

Manufacturer shall provide Seattle City Light reasonable notice of anticipated insulator design changes. This includes, but is not limited to, changes in polymer formulation, dimensions, electrical characteristics, mechanical characteristics, or accessories.

6. Marking

Insulators shall be clearly and indelibly marked with the manufacturer's name or symbol, the year of manufacture, and the maximum design cantilever (MDC). Load ratings shall be stated in units of pounds. Labeling shall be in English.

7. Packaging

Insulators shall be packaged in wood crates to protect against physical damage that could occur during shipping, handling, or long-term outside storage. If slatted crates are used, each insulator shall be sealed in plastic. If sealed crates are used, plastic is not required.

Insulator weathersheds shall not bear any load due to its own weight or that of insulators or crates above or below it.

Crates shall be secured to pallets for handling by forklift. Pallets shall not exceed 4 ft in height or 1,000 lb in weight. Crates shall be marked with the manufacturer's name or symbol, catalog number, SCL stock number, and purchase order number.

Number of insulators per crate: 16 maximum.

8. Issuance

Stock Unit: EA

9. Approved Manufacturers

Stock No.	NGK-Locke	MacLean Power Systems
012830	L2-SN251-2 W/ELT (without base)	–
013307	L2-SN211-28 W/ELT	H212044VX06
690189	L2-SN251-23 W/ELT	H2 90 20 035 MX SS 018

10. References

Diop, Aida; SCL Standards Engineer and subject matter expert for 6901.55
(aida.diop@seattle.gov)

Shipek, John; SCL Standards Engineer and subject matter expert and originator of
6901.55 (john.shipek@seattle.gov)

Shop Drawing for Catalog No. L2-SN251-28 W/ELT; dated 8/1/2008; NGK-Locke