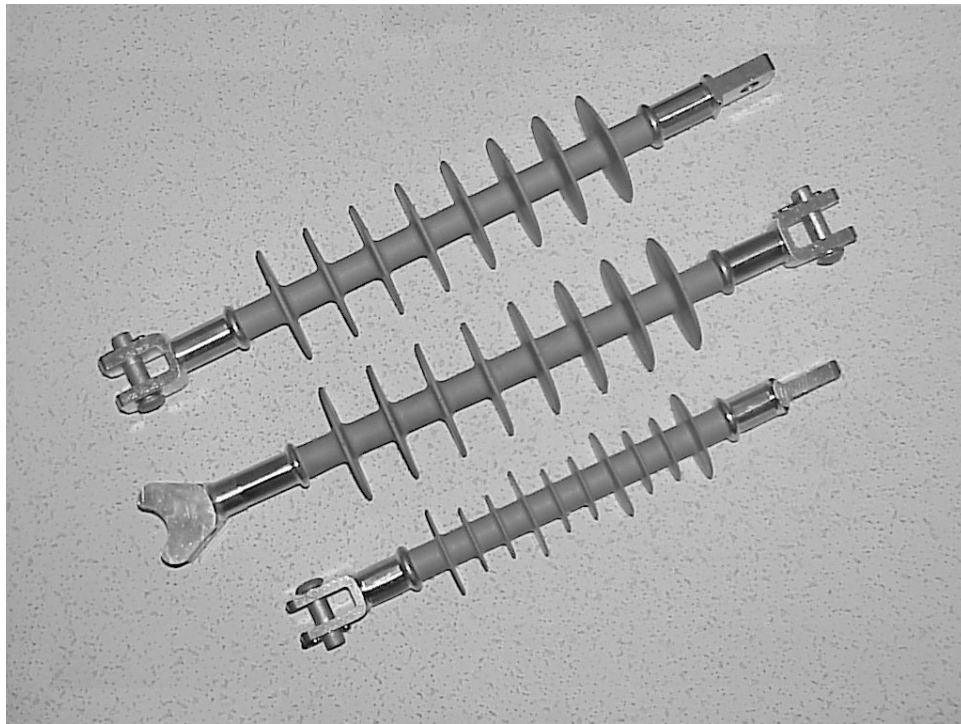




K-LINE INSULATORS LIMITED
TORONTO, ONTARIO, CANADA

Catalogue D-DS

DISTRIBUTION SILICONE INSULATORS *Deadend / Suspension* *15 kV to 69 kV*



ISO9001
SAI GLOBAL
FILE No. 000117

Distribution Silicone Insulators

Deadend / Suspension

In general Overhead Distribution Lines tend to experience a large number of outages and interruptions due to insulation failures. These failures may be from surface contamination or wetting on line insulators that result in flashovers or pole fires.

Silicone Deadend/Suspension Insulators offer the ultimate solution in improved performance. Because of its hydrophobicity, this material inherently resists water filming thereby limiting leakage currents. Insulators with reduced leakage currents, even when contaminated, require less frequent washing. The savings in such maintenance costs are added benefits of using silicone insulators.

K-LINE INSULATORS LIMITED (KLI) silicone Distribution Deadend/Suspension Insulators are manufactured and tested to world-class polymer insulator standards; CSA C411.5, ANSI C29.13, and IEC 61109.

K-LINE INSULATORS LIMITED is registered to ISO 9001 Quality Systems.

PERFORMANCE BENEFITS

The performance benefits of **KLI** Distribution Deadend/Suspension Insulators are listed below.

- Improves Reliability (by minimizing interruptions and outages due to vandalism, pole fires, and flashovers in all types of environments)
- Eliminates or Reduces Maintenance (such as washing and trouble calls) and is compatible with existing plant
- Improves Power Quality (less RI and TVI)
- Energy Efficiency (lower losses due to lower leakage currents)
- Safety (light weight for handling and installation)
- Service Life (consistent performance over its service life)
- Life Cycle Cost (savings over porcelain insulators)

APPLICATION

Distribution Deadend/Suspension Insulators are used on overhead lines operating at or below 69 kV. These insulators are used to support line conductors in suspension or deadend modes such as line terminations, angles, and tangents. These insulators can be used with bare or covered conductors.

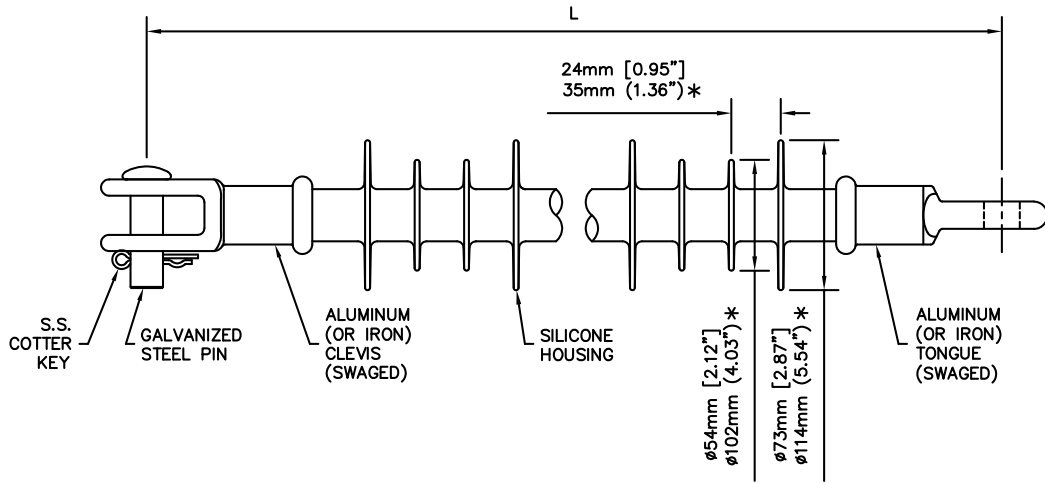
CORE ROD

The core rod of the insulator is made of a high quality, epoxy resin, ECR rod that has been specially formulated for electrical and mechanical applications. Each and every rod is subjected to an electrical test to ensure the integrity of the core rods used in the production of all insulators. **KLI**'s rod is a higher torsion strength rating than standard requirements to ensure safer installation and line operation.

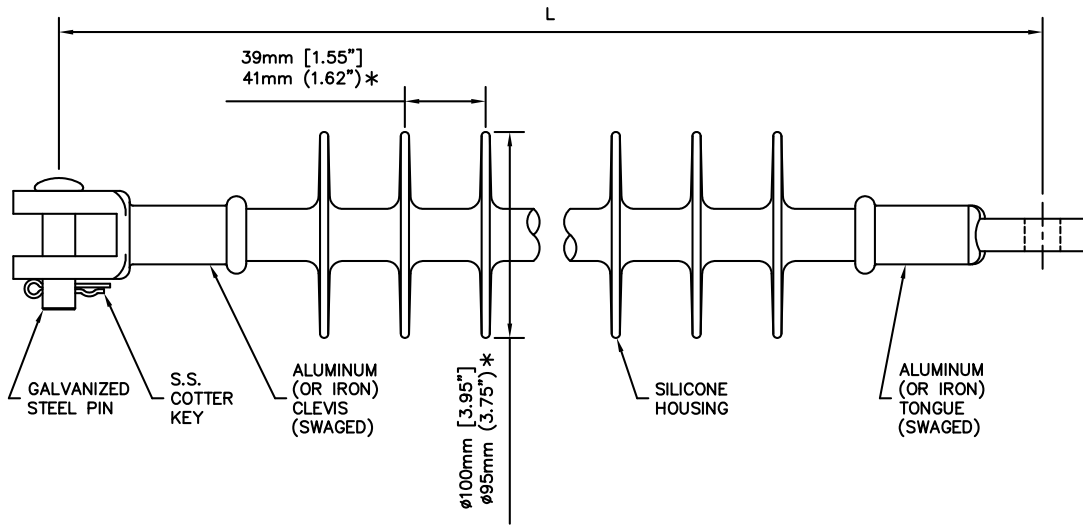
HOUSING

The housing (includes sheath and sheds) of the insulator is one piece, high temperature vulcanized, injection molded silicone rubber that is chemically bonded to the core rod. This ensures that the interface between the rubber and rod is impenetrable against moisture ingress. **KLI** uses its own proprietary silicone rubber formula in the manufacture of its insulators. The formulation has silicone rubber as the base polymer material with additives to enhance its performance in wet and contaminated environments.

DISTRIBUTION DEADEND/SUSPENSION INSULATORS



KL15ASCTM, KL28ASCTM, & KL69HC1T116 *



KL35SCTM* & KL46SCT

TECHNICAL DATA

| SPECIFICATIONS | UNIT | CATALOGUE NUMBER** | | | | | |
|--|-------------|--------------------|-------------|-------------|-------------|-------------|-------------|
| | | KL15ASCTM | KL28ASCTM | KL35SCTM | KL46SCT | KL46SCTA | KL69HC1T116 |
| Voltage Class | kV | 15 | 28 | 35 | 46 | 46 | 69 |
| CSA & ANSI Class | - | DS15 | DS28 | DS35 | DS46 | - | DS69 |
| Section Length "L" | mm (in) | 322 (12.7) | 433 (17.0) | 486 (19.1) | 574 (22.6) | 646 (25.4) | 733 (28.9) |
| Dry Arcing Distance | mm (in) | 193 (7.6) | 290 (11.4) | 348 (13.7) | 419 (16.5) | 490 (19.3) | 627 (24.7) |
| Leakage Distance | mm (in) | 384 (15.1) | 590 (23.2) | 750 (29.5) | 988 (38.9) | 1059 (41.7) | 1798 (70.8) |
| Low-Frequency Flashover | Dry | kV | 100 | 135 | 155 | 180 | 200 |
| | Wet | kV | 75 | 100 | 145 | 150 | 155 |
| Positive Critical Impulse Flashover | kV | 150 | 225 | 265 | 300 | 360 | 425 |
| Radio Influence Voltage (RIV) at 1 MHz | Test | kV | 15 | 20 | 30 | 30 | 44 |
| | Max. | µV | Below 1 | Below 1 | Below 3 | Below 3 | Below 3 |
| Specified Mechanical Load (SML) | kN (lb) | 70 (15,750) | 70 (15,750) | 70 (15,750) | 90 (20,230) | 90 (20,230) | 90 (20,230) |
| Torsional Load | N•m (ft•lb) | 83 (62) | 83 (62) | 83 (62) | 83 (62) | 83 (62) | 83 (62) |
| Approx. Weight | kg (lb) | 0.7 (1.5) | 0.8 (1.8) | 1.1 (2.5) | 1.4 (3.0) | 1.6 (3.5) | 2.2 (4.8) |
| Standard Packaging | - | 21 | 21 | 14 | 12 | 12 | 6 |

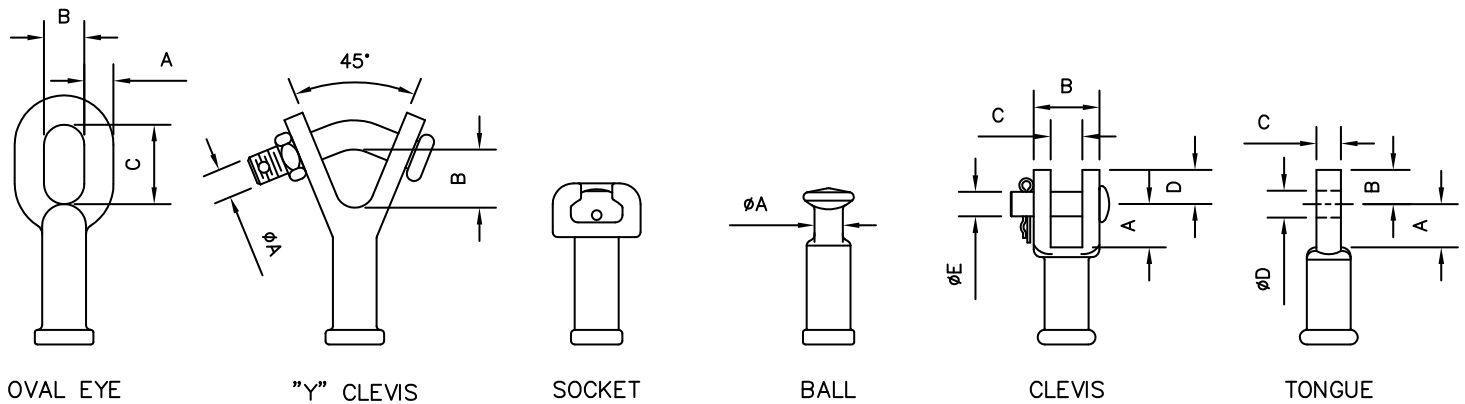
** The catalogue numbers in the above table are for "CT" clevis-tongue fittings. For other combinations of end fittings, specified mechanical strengths or material, see End Fittings Section.

END FITTINGS

There are six standard end fittings that are available on the Deadend/Suspension Insulators: Clevis, Tongue, Oval Eye, "Y" Clevis, Socket and Ball (See Below). The Clevis and Tongue fittings are made from high strength, corrosion resistant extruded aluminum or hot-dip galvanized iron or steel. While the socket, ball, thimble eye, oval eye, and "y" clevis fittings are made from hot-dip galvanized iron or steel. The end fittings are crimped on to the core rod to provide the mechanical performance. A watertight seal between the rubber and end fittings eliminates moisture ingress. This special silicone rubber to metal fittings sealing process provides total exclusion of moisture.

The end fittings of the Distribution Class Deadend/Suspension are rated for a specified mechanical strength, SML of 70 kN (15,750 lb) or 90 kN (20,230 lb).

The Clevis and Tongue end fittings are the two most common fittings used with additional adaptors and clamps. For other special end fittings please contact **KLI**.



END FITTING RATINGS AND DIMENSIONS

| End Fitting | End Fitting Designation | Material | SML kN (lbs) | Class | Dimensions (in) | | | | |
|-------------|-------------------------|------------------|-----------------|-----------|-----------------|------|------|------|------|
| | | | | | A | B | C | D | E |
| Oval Eye | E | Galvanized Iron | 90 (20,230) | - | 0.75 | 1.03 | 2.03 | - | - |
| Y-Clevis | Y | Galvanized Iron | 90 (20,230) | - | 0.75 | 1.47 | - | - | - |
| Socket | S | Galvanized Steel | 90 (20,230) | ANSI 52-5 | - | - | - | - | - |
| IEC Ball | B IEC | Galvanized Steel | 90 (20,230) | IEC 16A | 16 mm | - | - | - | - |
| ANSI Ball | B | Galvanized Steel | 90 (20,230) | ANSI 52-5 | 0.72 | - | - | - | - |
| Clevis | C_F | Galvanized Iron | 70 (15,750) | - | 1.03 | 1.36 | 0.71 | 0.81 | 0.63 |
| | C | Aluminum | 70 (15,750) | - | 1.11 | 1.38 | 0.75 | 0.88 | 0.63 |
| | | | 90 (20,230) | - | 1.11 | 1.69 | 0.81 | 0.87 | 0.63 |
| Tongue | T_F | Galvanized Iron | 70 (15,750) | - | 1.05 | 0.88 | 0.50 | 0.70 | - |
| | T | Aluminum | 70 (15,750) | - | 1.14 | 0.87 | 0.52 | 0.69 | - |
| | | | 90 (20,230) | - | 1.11 | 0.87 | 0.62 | 0.69 | - |



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