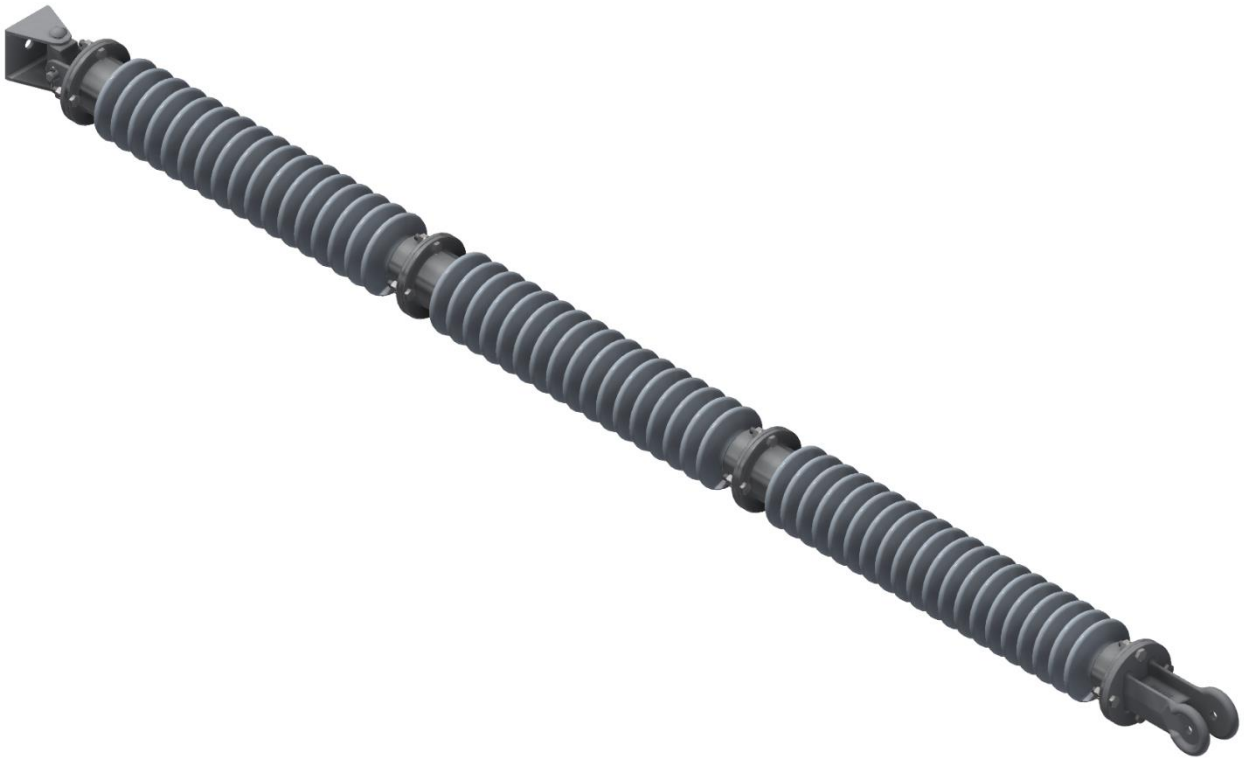


LAPP Insulators: An Industry Leader

LAPP Strut Insulators offer transmission engineers an important design tool for use in building compact overhead lines or upgrading existing lines to higher voltages. Unlike suspension insulators that are designed for tension only, struts are rigid assemblies which can take both tension and compression loads. Struts are not designed for cantilever loading. They can be used to hold conductors away from supporting transmission towers in unique ways. Controlling the position of the conductor allows for smaller structures and shorter cross arms, so lines can be built on narrower rights-of-way.

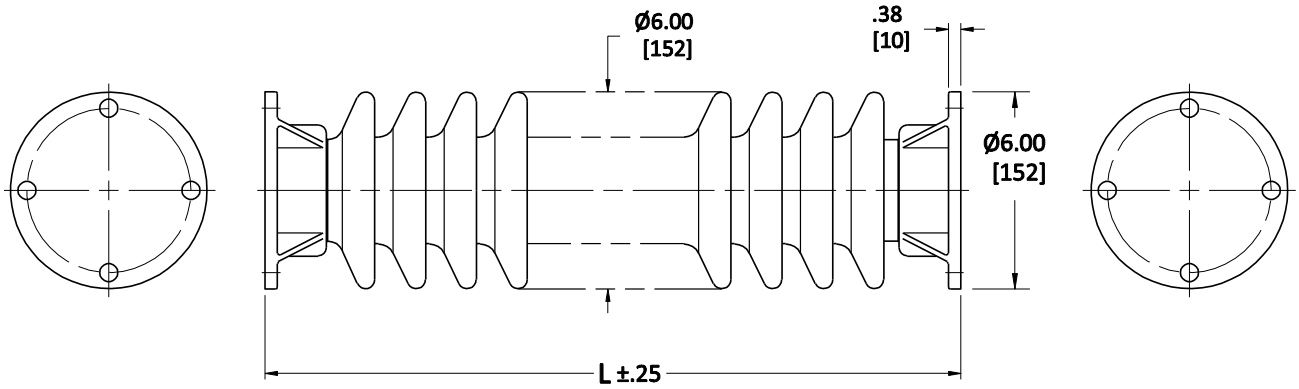
- **Variety of Lengths**
  Different lengths can be combined and bolted together to provide assemblies with electrical ratings equivalent to strings of standard 5 ¾ inch x 10 inch suspension insulators.
  - Caps cemented on each end have five-inch bolt circles to fasten units together or to mount to clamps or adapters

- **Variety of Fittings**
  While strut insulators have high tension and compression ratings, they do not have appreciable strength in bending. Therefore, installations must provide flexible attachments at each end. Clevis or eye adapters are available for attaching strut insulators to structures. These fittings are galvanized ferrous castings.
  - Aluminum clamps are used to bolt flexible jumpers to strut insulator assemblies
  - Strut insulators can be provided with cemented-on end caps for special applications

- **Compact Line Insulation**
  Transmission lines with voltage ratings up to and including 500 kV have been built using strut insulators to position conductors. These designs offer several advantages over conventional construction.
  - Wind loads are taken through the strut instead of through the cross arm when conductors are positioned by means of horizontal struts; reduces the overturning moment and permits smaller, slimmer structures
  - Cross arms are shorter and lighter
  - Smaller structures provide a less obtrusive appearance, helping to gain acceptance for overhead construction in areas of sensitive public opinion
  - Narrower, lighter structures will fit on a smaller right-of-way than is required for a conventional line of equivalent voltage rating

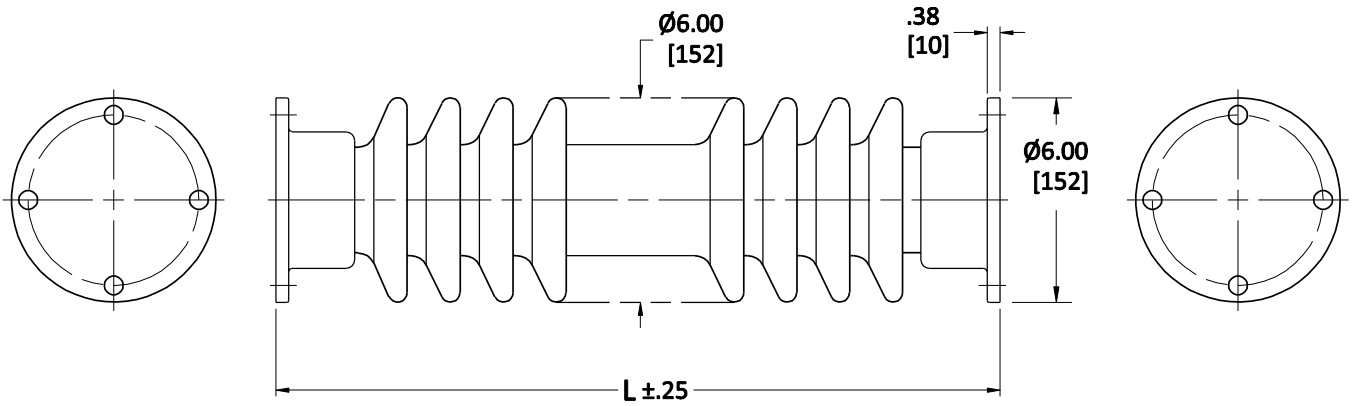
- **Upgrading of Existing Lines to Higher Voltages; Economical Approach**
  Older transmission lines with vertical suspension strings can often be converted to higher voltage through the use of strut insulators. To increase the insulation level, additional suspension insulators are added to the vertical string and a strut with electrical characteristics equivalent to the new string length is positioned between the structure and conductor. The strut may be mounted either horizontally or at a slight angle.
  - Upgrading of existing lines to higher voltages remains the most economical way of increasing transmission capability; makes use of the same structure, the same right-of-way, and frequently, the same conductor

- **Jumper Control**
  Strut insulators provide the ideal control insulators for long jumpers at dead-end towers or substations. Suspension strings have proved inadequate for this service—especially at higher voltages—because under light tension loads the loose hardware joints in these assemblies are prone to corrosion. This results in arcing in the joints and troublesome radio and television interference.
  - Strut insulators eliminate loose hardware since they are completely bolted assemblies
  - Strut insulators reduce noise
  - Can be mounted either vertically or horizontally to support jumper conductors



Characteristics

Catalog Number **(Light Gray-ANSI 70)**	**56013A**	**60103B**	**56443B**	**71790A**	**59068A**
Catalog Number **(Dark Gray)**	**56013B**	**60103C**	**56443C**	**71790B**	**59068B**
Catalog Number **(Brown)**	**56013**	**60103**	**56443**	**71790**	**59068**
Dimensions					
"L", Length, in. [mm]	19.5 [495]	25.5 [648]	30.5 [775]	33.5 [851]	36.5 [927]
Leakage Distance, in. [mm]	35 [889]	50 [1270]	60 [1524]	73 [1854]	80 [2032]
Dry Arcing Distance, in. [mm]	16.5 [419]	22.5 [572]	27.5 [699]	30.5 [775]	33.5 [851]
Mechanical Values					
Compression Strength, lbs. [kN]	15000 [66.7]	15000 [66.7]	15000 [66.7]	15000 [66.7]	15000 [66.7]
Tension Strength, lbs. [kN]	15000 [66.7]	15000 [66.7]	15000 [66.7]	15000 [66.7]	15000 [66.7]



Characteristics

Catalog Number **(Light Gray-ANSI 70)**	**80248A**	**80249A**	**57760A**	**57538A**	**75055H**
Catalog Number **(Dark Gray)**	**80248B**	**80249B**	**57760B**	**57538A**	**75055G**
Catalog Number **(Brown)**	**80248**	**80249**	**57760**	**57538**	**75055**
Dimensions					
"L", Length, in. [mm]	20.25 [514]	26.25 [667]	31.19 [792]	34.19 [868]	37.19 [945]
Leakage Distance, in. [mm]	35 [889]	50 [1270]	60 [1524]	72.5 [1841]	80 [2032]
Dry Arcing Distance, in. [mm]	16.5 [419]	22.5 [572]	27.5 [699]	30.5 [774]	33.5 [851]
Mechanical Values					
Compression Strength, lbs. [kN]	25000 [111.2]	25000 [111.2]	25000 [111.2]	25000 [111.2]	25000 [111.2]
Tension Strength, lbs. [kN]	25000 [111.2]	25000 [111.2]	25000 [111.2]	25000 [111.2]	25000 [111.2]

Electrical Equivalent Strut Insulator Selector				
Number of 5 ½" x 10" Suspensions	Standard Strength		High Strength	
	Strut Combination	Total Length, in.	Strut Combination	Total Length, in.
2	1—56013	19.5	1—80248	20.25
3	1—60103	25.5	1—80249	26.25
4	1—56443	30.5	1—57760	31.19
5	1—71790	33.5	1—57538	34.19
5.5	1—59068	36.5	1—75055	37.19
6	1—56013, 1—060103	45	1—80248, 1—80249	46.50
7	2—60103	51	2—80249	52.50
8	1—60103, 1—56443	56	1—80249, 1—57760	57.44
9	2—56443	61	2—57760	62.38
10	2—71790	67	2—57538	68.38
11	2—59068	73	2—75055	74.38
12	2—56443, 1-56013	80.5	1—80248, 2—57760	82.63
13	2—71790, 1-56013	86.5	1—80248, 2—57538	88.63
14	3—56443	91.5	3—57760	93.57
15*	2—59068, 1-60103	98.5	1—80249, 2—75055	100.63
16*	2—059068, 1-56443	103.5	2—75055, 1-57760	105.57
17*	3—59068	109.5	3—75055	111.57
18*	3—56443, 1-60103	117	3—57760, 1-80249	119.82

* Use in vertical position only.