

## Insulators for overhead lines



<b>Post insulators</b>	<b>Long rod insulators</b>	<b>Shackle insulators</b>
<p>They are produced for voltage levels of 12, 24 and 36 kV. Construction is performed in conformance to IEC -720 or according to the customer's request. Mainly, "TIE-TOP" type is manufactured; "CLAMP-TOP" type may also be manufactured. Insulators may be manufactured according to the bending resistance classes of 8 kN and 12.5 kN. The assembly is mainly performed using sulphur binder or cement. Manufacturing material is mass C-110 and C-120.</p>	<p>They are mainly manufactured for the voltage level of 24 kV. Construction is performed in conformance to IEC -433 or according to the customer's request. Insulators are manufactured according to the tensile load of 40 kN and 60 kN. After the ultrasonic pieces testing, the assembly is performed using cement binder, and before mechanical pieces testing is performed, pieces are put in water. Manufacturing material is mass C-120.</p>	<p>They are manufactured according to DIN or ANSI standards or according to the customer's request. Manufacturing material is mass C-110, and it is tested in conformance to IEC-383. Manufacturing material is mass C-110.</p>

## Transformer Bushings



Construction is performed in conformance to DIN, BS and ANSI standards. They comprise the following groups of insulators:

1 - 3 kV	250 - 7000 A
10 - 30 kV	250 - 4500 A
45 kV	1000 - 3150 A
24 - 36 kV	5000 - 8000 A
24 - 36 kV	12500 - 25000 A
72,5 - 125 kV	1250 - 2000 A.

Besides standard insulators, there are insulators with elongated oil part, as well as with the elongated creepage distance for the operation in polluted conditions. Manufacturing material is mass C-110. Dimension tolerances are in conformance to DIN 40680A; they are tested in conformance to IEC-137. Metalization can be done at buyer's request.

## Post Insulators



Post insulators for apparatuses and plants in conformance to IEC 273 to the voltage level of 420 kV. In this group of insulators, there is a wide range of products concerning voltage levels, strength and creepage distances. Construction is performed in conformance to IEC -273 and IEC - 815 or according to the customer's request. Voltage level range is 12-420 kV.

- insulators to 145 kV, with the height of 1500 mm are manufactured out of one piece
- insulators to 170 kV, with the height of 1700 mm are manufactured out of one or two pieces
- insulators 170-245 kV are manufactured out of two pieces
- insulators above 245 kV are manufactured out of three pieces, i.e. more pieces (so that the height of a single insulator does not exceed 1500 mm)

Maximal diameter through the shed is 300 mm, bending strength classes are 2 - 12.5 kN. Insulators are manufactured for all four zones of pollution, which corresponds to the specific creepage distances 16; 20; 25 mm/kV.

Shed parameters are determined in conformance to IEC-815. Manufacturing material is the mass C-120. Assembly is performed using sulphur binder or cement. Flanges are manufactured using malleable cast iron, hot dip galvanised (coat thickness is 85 and 100 microns) or aluminium alloys.

Insulators pass the strict control throughout all production process phases; routine ultrasonic test is performed after the cutting and routine bending test is performed after assembly.

## Hollow insulators for high voltage devices



<p><b>Insulators for capacitors</b></p> <p>Insulators for capacitors 24 - 170 kV are manufactured according to customer's drawings. They are manufactured by trimming, with normal and alternative shed and for all four pollution zones. Manufacturing material is mass C-110 and C-120.</p>	<p><b>Insulators for lightning arresters</b></p> <p>Lightning arresters: Medium-voltage 12-36 kV and high-voltage 60-170 kV are manufactured according to customer's drawings. They are manufactured by trimming to maximal dimensions of 1900 x 430 mm, with normal and alternative shed and for all four pollution zones. Manufacturing material is mass C-110 and C-120.</p>
<p><b>Insulators for circuit breakers with small quantity of oil and pneumatic circuit breakers, circuit breakers with SF6 gas</b></p> <p>Insulators for circuit breakers 72.5 - 420 kV are manufactured, and those are post insulators and chamber insulators; they are manufactured according to the customer's request. Maximal insulator length is 2 m, maximal diameter over the shed is 600 mm, shed profiles are normal or alternative. Insulators are manufactured for</p>	<p><b>Insulators for Instrument Transformers</b></p> <p>They are produced for voltage levels of 24 - 420 kV. Shed profiles are normal or alternative in 7 different performances. Insulator endings are manufactured in 7 different performances depending on assembling. Maximal insulator length is 2 m (one piece) and maximal diameter is Ø 600 mm. Manufacturing material is mass C-110 and C-120.</p>



different zones of pollution. Insulators for circuit breakers are delivered with or without flanges, according to the customer's request. Assembly is performed using portland cement or sulphur binder. Manufacturing material is mass C-120 or the special mass, whose characteristics are higher than those prescribed for C-120. Routine mechanical and ultrasonic tests are made on insulators.

