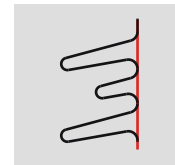




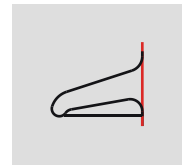
Bharat Heavy  
Electricals Limited  
Ceramic Business Unit

# Hollow Insulators

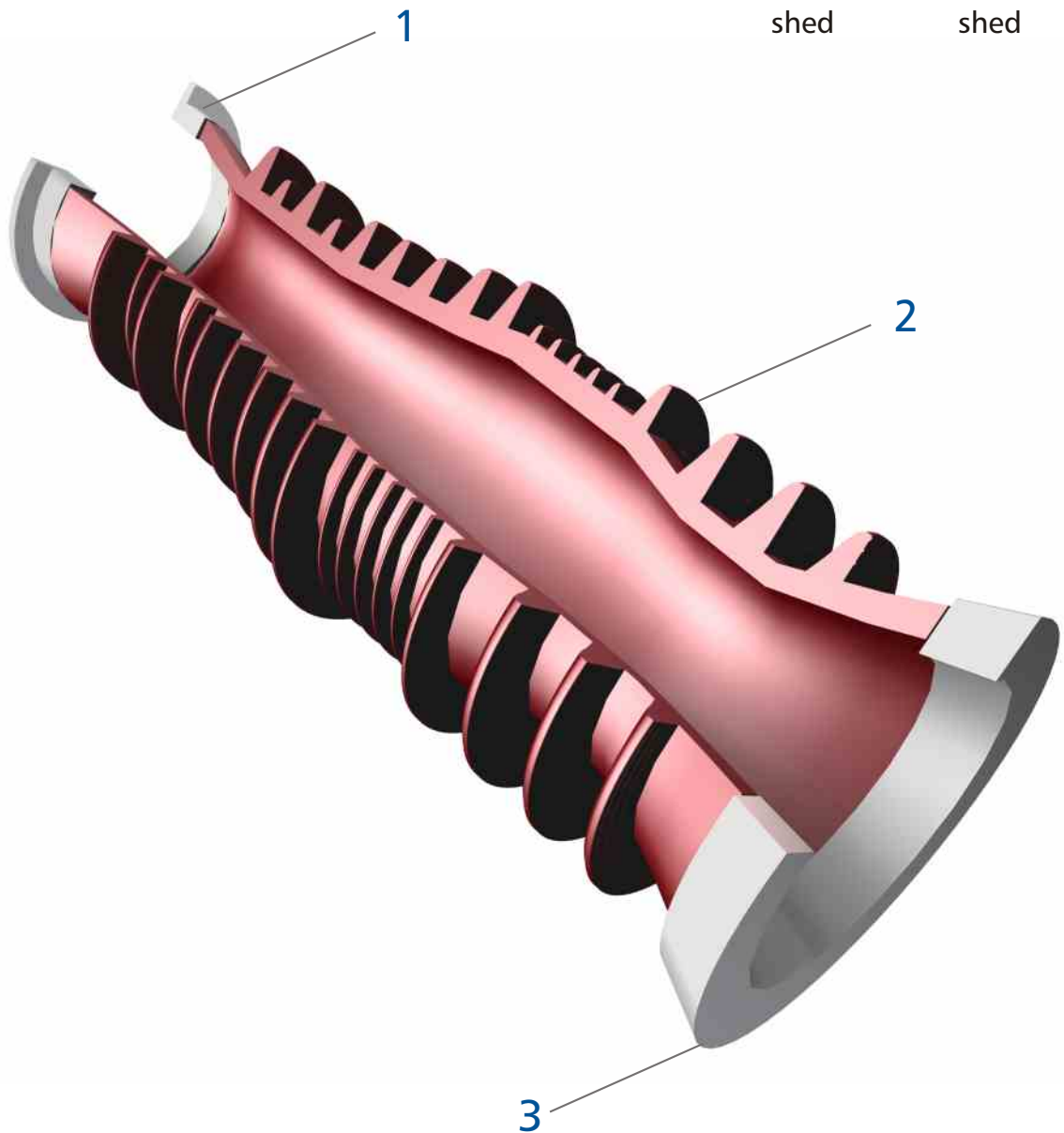
# Hollow Insulators



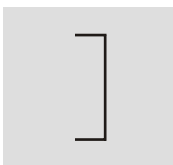
Alternate shed



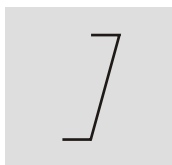
Plain shed



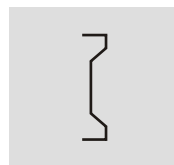
1 Flange 2 Porcelain Shell 3 Ground Collar



Straight bore



Taper bore



Bottle shaped bore

# Features

BHEL Ceramic Business Unit is a leading manufacturer of high voltage porcelain insulators, with 75 years experience in designing and manufacturing of insulators. BHEL CBU produces a most diverse range of insulators upto the highest voltages in both AC & DC systems, using the latest of technologies and state-of-art manufacturing processes.

Hollow insulators form an important component of the electrical system. BHEL manufactures all types of Hollow insulators in the range of 11 kV to 800 kV for various applications like instrument transformers, breaker chambers, surge diverters, supports for GCBs, capacitors, wall through bushings, top & bottom housings of transformer bushings and electrostatic precipitators.

Hollow insulators in BHEL are manufactured as per IS:5621 and International standards like IEC 62155.

Hollow insulators can be supplied with various types of end fixing arrangements like plain glazed ends, groged (sanded) ends, ends fitted with metallic flanges, ends with ground collars, ends with glazed/ unglazed convolutes etc.

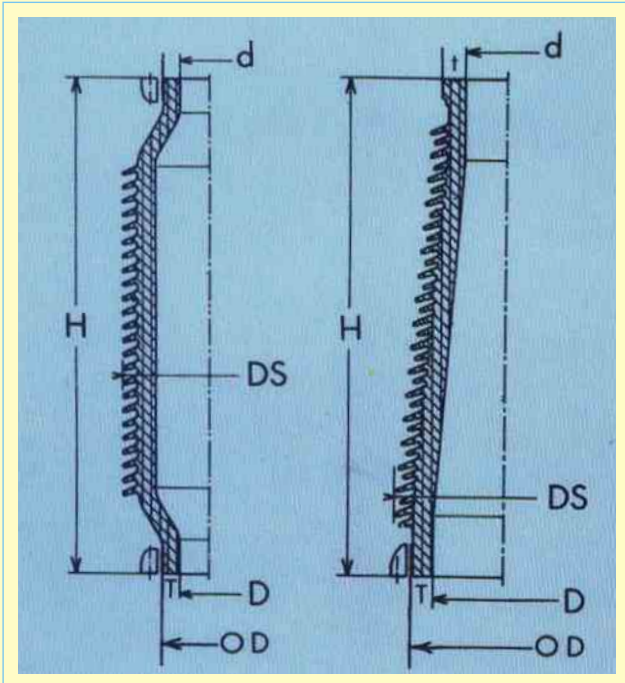
Insulators can be designed & supplied for different mechanical characteristics like cantilever strength and internal pressure strength. Depending upon the customer's requirements suitable porcelain body composition is selected to meet the functional requirements.

Tall Hollow insulators are generally manufactured with two or more joints and the parts are joined by "Epoxy".



# Types of Insulators

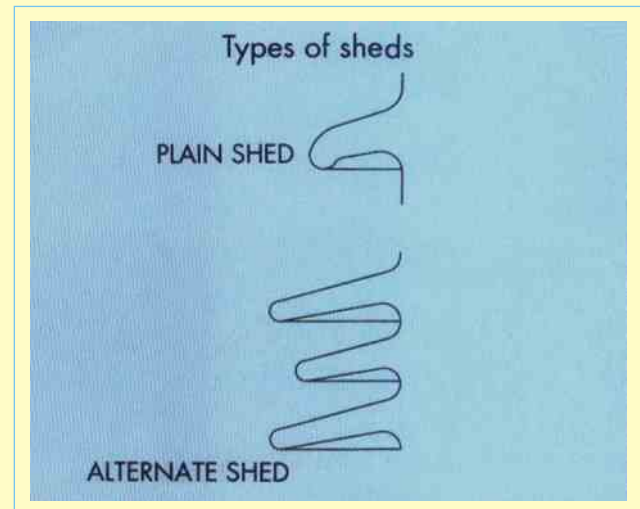
BHEL manufactures various shapes of Hollow insulators to customer's requirements.



## Ordering Information

1. Height and tolerances
2. ID of insulator at top & bottom ends
3. Lengths of parallel bore at ends
4. End fixing arrangement with collar dimensions if any
5. Details of flange, material, shape, number and sizes of holes etc.
6. Creepage distance requirement
7. Mechanical strength requirements if any
8. Specific requirements if any like shape, type of shed etc.

These insulators are designed with plain, and alternate sheds depending upon the creepage distance requirement of customers. Plain and Alternate sheds are designed to meet IEC 60815 norms.



## Manufacturing Capabilities

Total Height(H)	- Single Piece - 2300 mm -Epoxy Joint - 5500 mm
Diameters	- Min Top ID (d) - 90 mm - Max Bottom ID (D) - 530 mm - Max Shed Dia (DS) - 765 mm
Wall Thickness at Bottom (T)	- Min 0.06 Times OD
Thickness of Collar (T)	- Max 80 mm
Specific Creepage Distance	- Upto 40 mm/kV
Shape	- Cylindrical or Taper Bore or Bottle shape
kV Rating	- 11 kV To 800 kV
Application	- Power and Instrument Transformers, Surge Arresters, Capacitors, Wall Through Bushings, SF 6 Gas Circuit Breakers, Vacuum Circuit Breakers, Electrostatic Precipitator, Etc.
Testing Standard	- IS: 5621 or IEC: 62155

Note: For Specific requirements beyond the above limits contact BHEL Ceramic Business Unit

# Manufacturing Facilities

BHEL has all the necessary in house facilities for the manufacture of Hollow insulators.



Raw materials are wet ground in ball mills and the slurry is de-watered in filter presses.



Fully compacted hollow blanks (Pugs) are extruded in de-airing pugmills.



The dried blanks are turned in numerically controlled vertical lathes to the required shape (model).

# Manufacturing Facilities



The models are dried, glazed & fired in fully automated kilns where thorough vitrification is assured.



The fired porcelain shells are cut to the required size and the ends are ground.



Large hollow insulators are manufactured in two or more parts and jointed using "Epoxy".



The ground porcelain shells are fitted with, metal fittings wherever required, using suitable grade of cement. They are steam cured sufficiently to obtain the best mechanical strength.

# Quality Control

BHEL follows a well established QUALITY ASSURANCE PROGRAMME for ensuring the product quality. All raw materials are thoroughly checked for conformity to prescribed standards in our sophisticated ceramic laboratory. In-process checks are meticulously planned and carried out for ensuring defect free products. After firing, all products are subjected to visual, dimensional, electrical soundness and other routine tests as per prescribed standards. In addition, four-directional routine bend test is carried out on the jointed porcelain shells to ensure soundness of joint.



Mechanical strength tests are done on insulators fitted with metal fittings as per customer specifications. Wherever required, special quality assurance programmes can be mutually agreed upon for specific orders.



## Packing of Insulators

Hollow insulators are well packed in crates so that they withstand the handling and transportation shocks without any damage.

## **Bharat Heavy Electricals Limited**

(A Government of India undertaking)

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[www.bhel.com](http://www.bhel.com)

**Efforts are constantly being made to improve the product design and hence the products supplied may differ in minor details from that given in the catalogue.**



For enquiries please contact:

### **Bharat Heavy Electricals Limited**

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