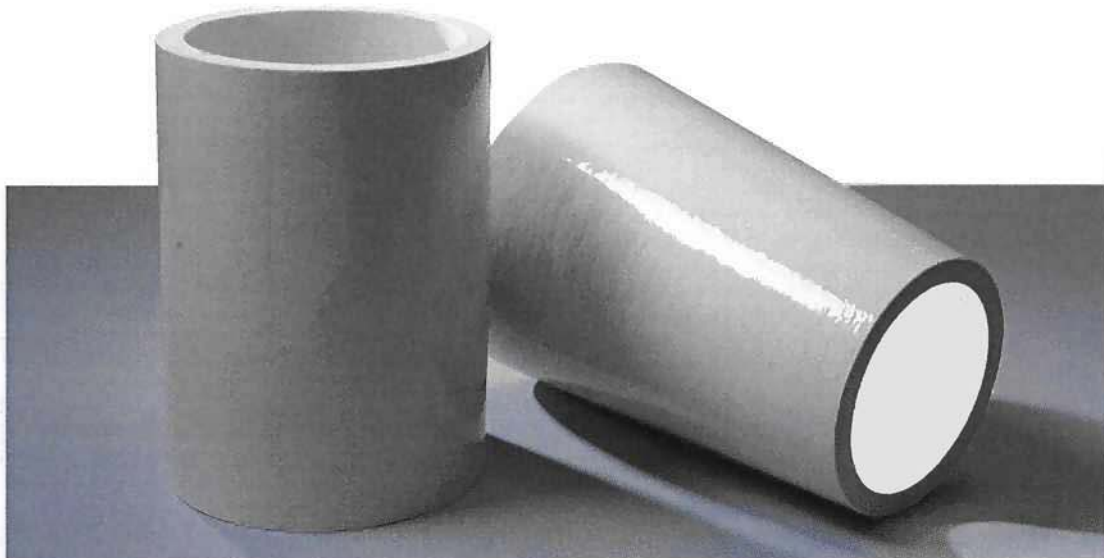


Insulators for Electrostatic Dust Precipitators



● Electrostatic precipitators are used successfully for the removal of dust from flue gases. The precipitators are usually designed for service at DC-voltages of 50-150kV, and are installed directly into polluted gas flows.

At temperatures below 150°C, traditional electrical porcelain ensures satisfactory operation provided the support insulators are kept clean.

In flue gases conductive particles may precipitate (settle) on the insulator surface. Leakage currents may then start flowing along the surface, causing local heating of the insulator.

The resistivity of traditional electrical porcelain is very high at room temperatures, but falls rapidly with increasing temperatures. Above 150°C a strong DC-field will therefore result in a leakage current in the material. This will lead to further temperature rise, and eventually the breakdown of the insulator.

Some precipitators shall operate at temperatures in the region of 150-400°C.

We have developed a material 51A especially for heavy-duty performance in demanding operating environments such as for electrostatic precipitators(ESP). The material is excellent for use at high temperatures in direct-current applications because of high volume resistivity and high content of aluminium oxide. Compared to normal electric porcelain the 51A material reduces strongly the ionic migration at high temperatures and DC stress.

The 51A body is an aluminium oxide porcelain (alumina-silicate material), typically according to C610-IEC 60672 standard.

The white glaze has the same properties as the 51A body material, i.e. no difference in volume resistivity.

The 51A material has since many years been used by well known companies in the ESP-industry world wide.

Typical technical features are:

- High resistivity at elevated temperatures, i.e. very good insulating ability at high temperatures and direct-current reduces the possibility for electric breakdown caused by leakage current through the material.
- High resistance to thermal shock and low thermal expansion to resist cracking.
- Excellent mechanical strength and impact strength reduces failure due to mechanical stress.
- Glazed surface reduces the deposit of dirt and dust.
- Suitable for electrostatic dust precipitators working continuously in temperatures up to 400°C under DC stress.

Our special material 51A is used in the manufacture of Support Bushings as well as for Feed through Bushings, Rapper Insulators and Post Insulators that require stable and safe performance in ESP applications.

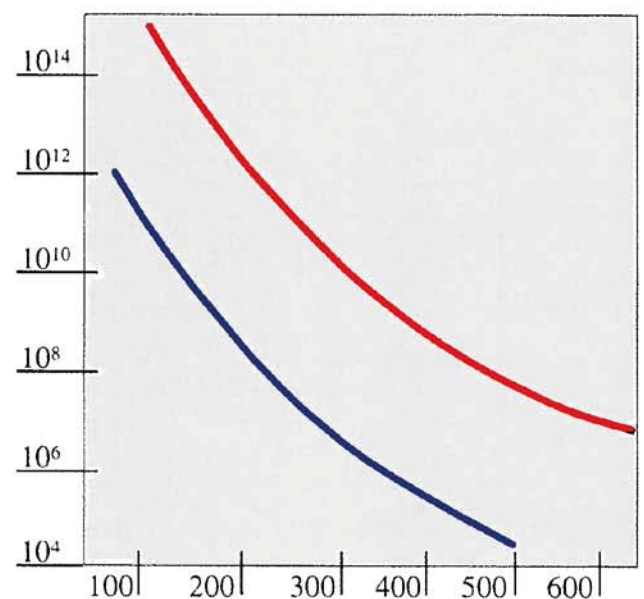
Technical specifications

| Property | Unit | 11A Material | 51A Material |
|--------------------------|----------------------------------|------------------|----------------------|
| Open Porosity | Volume % | 0 | 0 |
| Bulk Density | g/cm ³ | 2,4 | 2,7 |
| Bending Strengt | N/mm ² | 95 | 160 |
| Linear Thermal Expansion | 10 ⁻⁶ K ⁻¹ | | |
| 20-300°C (70-600° F) | | 5,3 | 5,7 |
| 20-600°C (70-1100° F) | | 6,1 | 6,0 |
| Volume Resistivity | Ohm cm | | |
| 20°C (70° F) | | 10 ¹³ | 10 ¹⁶ |
| 200°C (400° F) | | 10 ⁸ | 5 x 10 ¹¹ |
| 300°C (600° F) | | 10 ⁶ | 5 x 10 ⁹ |
| 400°C (750° F) | | 10 ⁵ | 4 x 10 ⁸ |
| 500°C (1030° F) | | 10 ⁴ | 3 x 10 ⁷ |

In the table, the properties of 51A are compared with those of ordinary electrical porcelain 11A. These results have been obtained from measurements on 10 mm diam. specimen. The resistivity values for 51A have, however, been confirmed by measurements on support insulators.



Volume resistivity of porcelain as a function of temperature



-----11A

-----51 A