

Zinc Oxide (ZnO) Element

A Highly Non-Ohmic Element Protects Electronic Devices from Lightning Surges

When making this ZnO element, zinc oxide is mixed with small amounts of several types of additive and is shaped to fit target applications before being sintered at a high temperature to become a ceramic. This ceramic element possesses superb volt-ampere characteristics and is also notable for its ability to withstand a high-current impulse.

High Lightning Surge Capacity

The ZnO element employs a composite structure in which microvaristors consisting of crystal particles of microstructure zinc oxide and the surrounding high-resistance grain boundary layers are connected both in series and in parallel. In this structure, varistor voltage is proportional to the thickness of the element while surge capacity is proportional to the area of the element, on condition that the diameter of the zinc oxide crystal particle remains consistent.



Highly Non-Ohmic Characteristics

1. Superb non-ohmic characteristics

When excessive impulse current is applied, the ZnO element protects electronic equipment and power facilities by minimizing terminal voltage.

2. High surge capacity

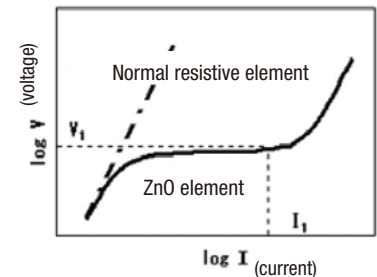
Increased homogeneity of ZnO ceramics allows for equal allotment of surge current while achieving greater insulation from creeping discharge.

3. Long service life

The ZnO element provides high stability and reliability in environments where circuit voltage is constantly charged.

4. Extensive lineup

Whether used in alternating or direct current applications, our extensive product lineup covers a wide voltage range from low to high, thus meeting varying user needs.



Pronounced Nonlinear Volt-Ampere Characteristics

The ZnO element with electrical properties has nonlinear volt-ampere characteristics that are far more pronounced than those of a normal resistive element. As such, it serves as an insulant when the applied voltage is extremely limited or as a conductor when the applied voltage is high, as in the case of a lightning surge. This attribute of the ZnO element enables it to protect equipment from lightning surges.

Take Note!

Background

Starting with the development of its P-valve lightning arrester in 1950, OTOWA Electric has to this day remained dedicated to the development of lightning protection devices. In 2005, the company established Ceraon Co., Ltd., which specializes in researching and developing ZnO elements.

Innovative or Unique Qualities

OTOWA Electric's ZnO elements are widely used in arresters and surge protection devices (SPD). Produced under strict quality control, they exhibit superb non-ohmic characteristics, high surge capacity, and excellent reliability.

Future Business Development

Taking advantage of its expertise in ceramics and powder technologies accumulated over years of ZnO element development, the company strives to provide added value through the development of new materials. These include hybrid materials that can be generated by combining zinc oxide with other substances such as resins.

Company Profile and Basic Information

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No. of employees: 274
Capitalization: 81.9 million yen
Year founded: 1946
Name of representative:
Osamu Yoshida, President

Business Overview

Development of lightning arresters and electronic devices; consulting; electrical construction; contract testing