

ALUMINIUM OXIDE (Al_2O_3) MOISTURE SENSOR

The aluminium oxide (Al_2O_3) sensor provides accurate determination of dew point, ppm, or relative humidity in most industrial gases. The aluminium oxide sensor is, by function, a capacitor. The sensor is capable of measuring ppm and dew point measurements in most industrial gas streams. The electronics are mounted internally and process the signal from the sensor and display the readings on the front display panel.

ALUMINIUM OXIDE MOISTURE SENSOR THEORY

An aluminium probe is chemically treated to form a thin porous coating of aluminium oxide. The aluminium oxide is then coated with a thin, permeable layer of gold. The gold layer and the aluminium probe form the anode and cathode.

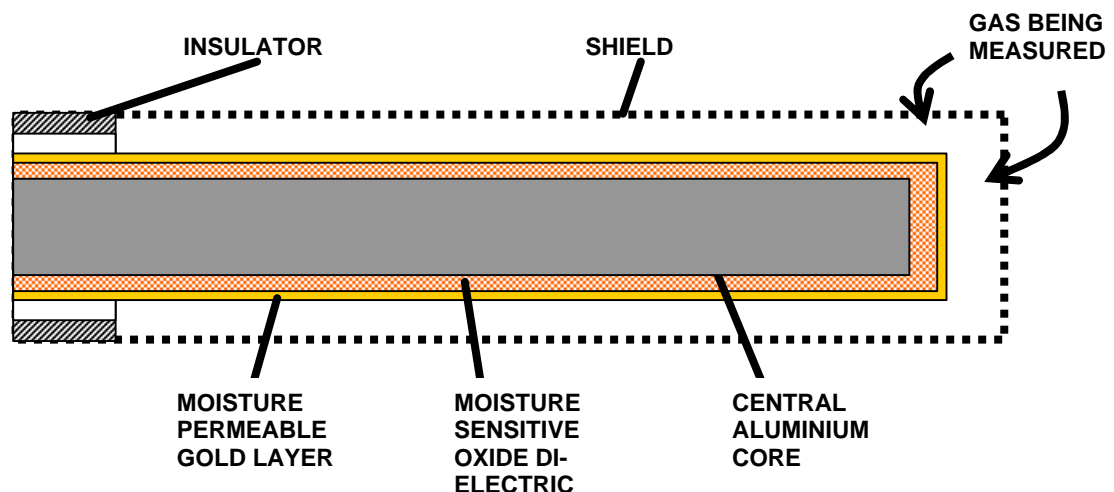


Figure 1. Cross-section of aluminium oxide sensor.

The gold layer is permeable to moisture and conductive. This forms the second electrode of a capacitor.

The pores in the aluminum oxide layer absorb moisture from the gas stream in amounts directly proportional to the moisture content of the gas stream.

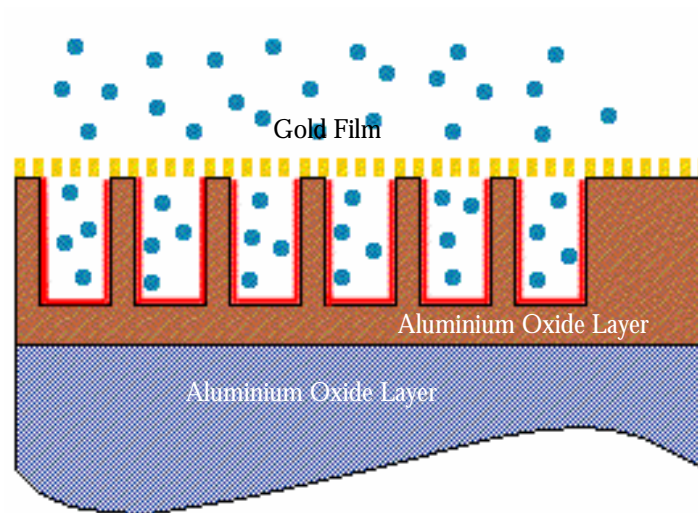


Figure 2. Close-up view of aluminium oxide sensor.

The absorption of water molecules changes the capacitance of the sensor. The capacitance of the sensor is measured which is then converted to the moisture value.

The radius of the pores in aluminium oxide layer make the sensor specific to water molecules.

Uses

The aluminium oxide sensor is suitable for use on virtually any application where moisture measurements are required.

The applications for the moisture analysers fall into two industrial areas:

Gas Producers for ensuring product quality

Gas Users to ensure reliability of inert gas blankets.

Typical industries are Semiconductor, Metal Treatment, and Plastics.

Systech Instruments Ltd
17 Thame Park Business Centre,
Thame
OXON
UK
OX9 3XA

www.systech.co.uk
email advice@systech.co.uk
Fax +44 1844 217 220
Tel +44 1844 216 838