Bath Temperature
Cathode Voltage Drop

C-V-Therm™

Combined Sensor
For Primary Aluminium
Introduction...

The measurement of the cathode lining voltage drop (CVD) is a well-established method of monitoring cathode condition in many aluminium smelters. Current methods include the use of an iron rod strategically placed in the cell to measure voltage drop. The use of an iron rod is generally regarded as cumbersome, labour intensive and often gives poor accuracy and reliability of measurement.

Heraeus Electro-Nite, the market leader in molten media sensor technology, has developed a quick, easy and reliable method of measuring cryolite bath temperature and cathode lining voltage drop in a single combined sensor.

Measuring Technique...

Based upon the well-established Positherm®-Al technology, the C-V-Therm® consists of a Positherm®-Al temperature sensor with a thin molybdenum wire attached, to provide a bath contact with the Al metal pad. Dedicated measuring and display instrumentation, Digitance C-V-Therm, includes data storage and infra-red transfer capabilities. The electrical circuit through the cathode lining is completed by a cable connection from the measuring instrument to the cell busbar. The measuring technique is a simple 2-stage process, completed in about 15 seconds. In the first stage a sensor is connected to the Digitance C-V-Therm and immersed into the cryolite bath. The bath temperature is determined after about 12 seconds via visual and audible signals. The second stage of the measurement cycle consists of immersing the sensor into the metal pad for a further 3 seconds to determine voltage drop across the cathode lining. Bath temperature, pot number and cathode voltage drop are sequentially displayed on the instrument.

* Patent Pending
Instrument Features...

Digilance C-V-Therm is a hand held, battery operated, temperature and CVD measuring device for use with C-V-Therm and Positherm®-Al sensors in primary aluminium reduction cells. Temperature and CVD measurements are logged together with a pot number, date and time of dip. Up to 500 measurements can be stored in the instrument memory.

Digilance C-V-Therm comes equipped with a serial infrared interface and PC software package, to enable data to be rapidly and reliably transferred from the instrument to a PC, with little or no risk of human errors. The software program also provides access to reviewing and modifying measurement parameters set in the Digilance C-V-Therm. Housed in a robust aluminium case, the precision electronics are protected from the most demanding and adverse environmental conditions encountered in the molten metals industry.

Applications

- Indication of cathode condition and performance
- Assists optimisation of cell voltage
- Highlights cathode lining abnormalities such as sludge build up
- Comparison of different cathode types, suppliers etc.
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