

RDC-143

NameTHERMAL CONDUCTIVITY

Material type

GRANULAR
PITCH
ELECTRODES
LINING

Utilization

R&D
IN-PLANT
LAB

General description

The thermal conductivity of an electrode is an important property in predicting its thermal shock behavior. A low thermal conductivity leads to a large temperature difference within the carbon block, which can trigger cracking. For anodes and cathodes used in the aluminium industry, thermal conductivity is also an important property for the thermal balance of the cell. A high anode thermal conductivity increases the temperature of the anode head and potentially the air burning.

The measurement is conducted with the RDC-143 apparatus, where a sample with a height of 20 mm is clamped between two heads, one heated at 60°C and the other cooled to 20°C. The method is based on a comparative measurement: once the thermal equilibrium is reached, the obtained temperature is measured and compared to the one obtained on a reference material with a known conductivity to determine the electrode thermal conductivity.

Levels from approximately 2 W/mK up to more than 180 W/mK can be measured with this equipment if correct reference materials are used and if the sample's diameter is adapted (30 mm or 50 mm). The sample preparation must be made with the RDC-140 or the RDC-149 apparatus to ensure adequate parallelism of the sample's surfaces.

Technical information

Standard Method:	ISO 12987
Property:	Thermal Conductivity [W/mK]
Sample:	Core Ø50 mm or Ø30 mm x 20 mm
Process Time:	~ 10 minutes
Installation:	Draft-free workbench
Dimensions (LxWxH):	88 x 54 x 79 cm
Weight:	102 kg
Electrical Property:	230 V 1/N/PE, 50 Hz 1.30 kW, 6 A
Certified Reference Material:	RDC-1143
Database Connection:	Yes
Consumable:	Distilled water

Additional Recommended Equipment:
Drilling machine (RDC-157 or RDC-179)
Saw (RDC-140 or RDC-149)
Drying oven (min. temperature 180°C)



RDC 1143

Technical information

Weight per unit:	N/A
Number of tests:	N/A

