

RDC-146

Name CO₂ REACTIVITY ANODE

Material type
**GRANULAR
PITCH
ELECTRODES
LINING**

Utilization
**R&D
IN-PLANT
LAB**

General description
During the electrolysis, CO₂ is formed at the bottom of the anode, where the carbon anode reacts with the oxygen from the electrolyte bath. Depending on the anode quality, a back reaction can occur between the CO₂ and the anode, which increases the net anode consumption. If a selective attack of the binder matrix occurs, carbon particles get excavated from the anode and end up in the electrolysis bath. This phenomenon is referred to as carbon dusting. It leads to a higher bath resistivity and temperature to the extent that the current efficiency may be decreased. It may also trigger spikes formation. It is of primary importance to produce anodes with a minimum CO₂ reactivity to avoid such performance problems, which have a strong influence on the smelter cost.

The measurement is conducted with the RDC-146 apparatus, where a core sample of Ø50 mm and a length of 60 mm is placed in a furnace at 960 °C with a saturated CO₂ atmosphere for 7 hours. After cooling, the sample is weighed and tumbled with steel balls using the RDC-181 apparatus, to remove any loosely bound particles. The final weight of the residual body is then measured. The following three results are reported:

- CO₂ reactivity residue: corresp. to the residual sample.
- CO₂ reactivity dust: corresp. to the removed grains.
- CO₂ reactivity loss: corresp. to the loss due to CO₂ burning.

RDC-146 is available with one or three furnaces, in which two samples per furnace can be placed simultaneously.

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| Technical information | Standard Method: | ISO 12988-1 |
| | Property: | Residue [%] |
| | | Loss [%] |
| | | Dust [%] |
| | Sample: | Core Ø50 x 60 mm |
| | Process Time: | ~ 12 hours |
| | Installation: | Floor standing under fume hood |
| | Dimensions (LxWxH): | 175 x 70 x 190 cm |
| | Weight: | 465 kg |
| | Electrical Property: | 400V 3/N/PE, 50 Hz 6 kW, 15 A |
| Fluid Property: | CO ₂ , 50 l/h, 3-7 bar | |
| Certified Reference Standard: | RDC-1146 | |
| Database Connection: | No | |

Additional Recommended Equipment:

Drilling machine (RDC-157 or RDC-179)
Saw (RDC-140 or RDC-148)
Tumbling Apparatus (RDC-181)
Drying oven (min. temperature 180 °C)
Weighing scale with an accuracy 0.1 g



RDC 1146

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| Technical information | Weight per unit: | N/A |
| | Number of tests: | 12 |

