- Ca, Li and Mg fluxes
- Alumina
- Anode cokes

• D8 ENDEAVOR Aluminum

Controlling the aluminum production is a crucial while demanding X-ray diffraction (XRD) analytical task. Firstly, due to the harsh environment in a smelter, where the XRD instrument needs to be located. And secondly, due to the enormous sample throughput required to successively probe hundreds of smelter cells permanently. The D8 ENDEAVOR addresses these challenges with technological innovations reducing measurement times and expanding analysis capabilities.

Applying Bruker AXS' latest LYNXEYE XE detector technology, the measurement time per probe necessary for a full XRD pattern TOPAS analysis can be reduced to less than 90 sec. Calibration-free the content of mineral phases included, but are not limited to, chiolite, fluorite, villaumite and the various modifications of cryolite are determined to an accuracy well below 1% absolute. Our

push-button alubath application package provides control parameters such as Bath Ratio and excess AlF_3. Simultaneously to the XRD measurement the D8 ENDEAVOR records the X-ray fluorescence signal to specify the total calcium content in the probe.

More complex bath compositions containing Li and Mg besides Ca can easily be handled by our practical software. The incomparable XRD data quality in terms of overall background level and peak-to-background ratio provides the base for this analysis.

Last but not least the quality of anodes used in electrolytic smelting can be easily characterized by XRD data collected with the D8 ENDEAVOR using the Scherrer equation for the determination of the crystallite size according to ASTM.
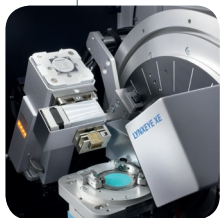
Innovation with Integrity
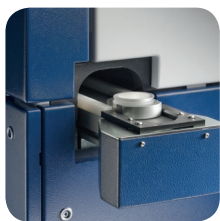
XRD

Plug'n analyze　　On-site ready　　Dust

LYNXEYE XE detector
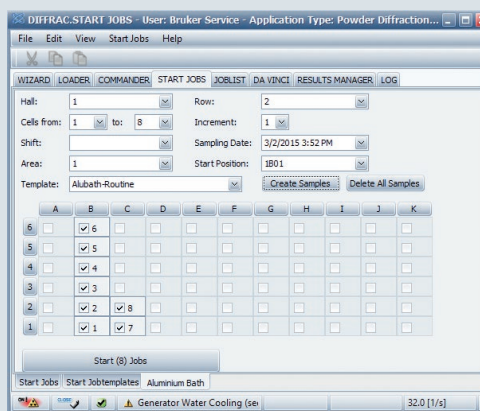

Automation interface

Ca-channel

Features

- Ca channel for XRF analysis
- Energy dispersive LYNXEYE XE detector with integrated Kβ-filtering, resulting in an intensity gain of 65%
- Dynamic Beam Optimization (Variable divergence slit, motorized anti-scatter screen)
  - Improved quantification due to low and flat background without fluorescence or white-beam residues
- Environmental options
  - Harsh Environment - Extended operation conditions for dust and high operational temperatures at highest power (3 kW)
- Automation
  - Two ports for either a conveyor belt or a robot interface
  - Sample magazine with 66 positions
  - Pre-loading measurement position to increase sample throughput
  - Push button and Touch screen operation
  - Dedicated alubath loader interface to easily setup large numbers of measurement jobs
- Software
  - DIFFRAC.EVA for minerals identification, semi-quantitative analysis, or crystallite size determination by the Scherrer method
  - DIFFRAC.DQUANT for calibration based quantification using the Ca-channel; smart calibrations, sequences
  - TOPAS BBQ fully automated Rietveld quantitative analysis and LC analysis according to ASTM D 5187
  - Results Manager with SPC charts
  - Customer specific application support and training

For more information please refer to Application Note AN 380, "Quantitative XRD phase analysis in Minerals & Mining: Aluminum bath", DOC-A88-EXS020.

Dedicated graphical user interface allows to setup large batches of samples fast and intuitive. It can be customized according to the layout of the smelter halls and the probing schedule of the customer.