



OUTOTEC EMAL ALUMINUM SMELTER COMPLEX

**Emirates Aluminium (EMAL),
Al Taweelah, Abu Dhabi, U.A.E.**

Outotec green anode plant technology

In 2007 Outotec was awarded the contract on EPC basis by Emirates Aluminium (EMAL), owned 50/50 by DUBAL and MUBADALA, to supply and construct the green anode plant and butt crushing at the EMAL Greenfield Aluminum Smelter at Al Taweelah, Abu Dhabi, U.A.E..

Green anode plant and butt crushing

Emirates Aluminium (EMAL) has constructed a world class primary aluminum smelter of 750,000 tpy capacity in its first phase at Al Taweelah in the Khalifa Port and Industrial Zone (Kizad) of Abu Dhabi, United Arab Emirates. The 1st Phase comprises two potlines with 756 reduction cells, an on-site 2,000 MW power plant, an anode manufacturing plant, and a multi-product casthouse. The plant is designed for capacity duplication, making Emirates Aluminium (EMAL) the world's most productive and highest efficient single-site aluminum smelter complex.

For the green anode plant about 15,000 m³ of equipment and materials have been shipped out of Germany, Czechia, India, Ireland, Thailand, USA and other countries beside local supplies out of the GCC countries. On turnkey basis, Outotec has constructed about 3,900 tons of steel structures, over 2,400 tons of machinery and has run more than 175 km of electrical cables. At the peak of activities, more than 900 staff worked on the construction site of the green anode plant, led by more than 50 of Outotec's own supervisors.

HIGHLIGHTS OF THE GREEN ANODE PLANT AND BUTT CRUSHING FACILITY

The new green anode plant is designed for high throughput rate, with two parallel production lines and common facilities for coke and pitch storage, carbon scrap crushing and storage, and HTM system.

Production results at Emirates Aluminium (EMAL)

- Continuous production above rated capacity (2 x 50 t/h)
- Variation of anode height less than +/- 2 mm
- Consistent green anode density > 1.63 g/cm³

Technology benchmarks achieved at Emirates Aluminium (EMAL)

- High output capacity paste plant
- Vertical mill for fine grinding
- RTO (Regenerative Thermal Oxidization) for the pitch fume treatment
- Cooling of hot carbon scrap from rodding shop
- New system for green scrap cooling and re-processing
- On-line particle size control of grains and fines fractions



One of the two tandem anode vibrating compactors



Vertical mill for coke grinding

Outotec provides leading technologies and services for the sustainable use of Earth's natural resources. As the global leader in minerals and metals processing technology, we have developed many breakthrough technologies over the decades for our customers in metals and mining industry. We also provide innovative solutions for industrial water treatment, the utilization of alternative energy sources and the chemical industry. Outotec shares are listed on NASDAQ OMX Helsinki. www.outotec.com