

TMS 2008 Annual Meeting & Exhibition

Addresses Global Challenges

TMS2008
137th Annual Meeting & Exhibition

When materials scientists and engineers from 70 countries gather in Louisiana, United States, for the TMS 2008 Annual Meeting & Exhibition, the focus will be on sharing research and technology to find materials solutions to some of the world's most pressing problems. More than 2,000 papers will be presented by authors in New Orleans at the Ernest Morial Convention Center, March 9-13. Among the challenges they will address are:

- Resolving technology and techno-management issues for the production of aluminum, metal casting, steel, automotive and electronic materials;
- Stabilizing climate change and reducing greenhouse gas emissions;
- Optimizing energy utilization;
- Developing materials for high-performance applications;
- Achieving process improvement for a variety of materials under a variety of conditions; and
- Preparing future materials scientists and engineers.

Light Metals

In the light metals area, 12 symposia have been organized: Alumina and Bauxite; Aluminum Alloys - Fabrication, Characterization and Applications; Aluminum Reduction Technology; Carbon Dioxide Reduction Metallurgy; Cast Shop Technology; Characterization of Minerals, Metals and Materials; Computational Thermodynamics and Kinetics; Electrode Technology; Frontiers in Process Modeling; Magnesium Technology; Materials Informatics - Enabling Integration of Modeling and Experiments in Materials Science; and Recycling. In addition to the light metals symposia, several related discussions, lectures and short courses will take place. On Monday, March 10, lead-

ers from Alcan, Alcoa, BHP Billiton, Chalco and Hydro Aluminum will discuss approaches to climate change and reducing greenhouse gas emissions. Other offerings include the Light Metals Division luncheon at which Reiner Kopp, professor emeritus at the Institute of Metal Forming at RWTH Aachen University, will present "Innovations in Steel Production - Animations for Aluminium Technologies." A workshop on furnace systems and technology and a short course on the grain refinement of aluminium alloys are also scheduled.

Aluminium Symposia

The light metals symposia will unveil both new topics and new developments on traditional topics. Alumina and Bauxite, which covers the mining and refining of raw materials for aluminum production, will address alumina refinery design and development; alumina refinery safety and integrity; bauxite and digestion; and precipitation.

Presenting advancements in aluminum for today's marketplace, Aluminum Alloys: Fabrication, Characterization and Applications includes sessions concerning alloy characterization; alloy development; and aluminum products and applications.

Aluminum Reduction Technology focuses on the conversion of alumina to aluminum, specifically, alternative processes; anode design and operation; cell fundamentals and phenomena; environmental and plant improvements; and process control developments. Symposium organizer Martin Iffert of Trimet Aluminium AG, Germany, says the symposium will have a strong focus on sustainability and environmental aspects in the aluminium smelting process.

Providing the latest research in the melting and metal treatment of alu-

minum, Cast Shop Technology will cover sustainability and environmental issues; cast house operations and melting; cast shop safety; and casting, solidification and microstructures.

Magnesium Technology

Magnesium Technology 2008 will update developments in all aspects of magnesium production, properties and application, including primary production, alloy development, performance, and the global market.

Other Metals

Several symposia are being programmed jointly by TMS and partner organizations. Carbon Dioxide Reduction Metallurgy is sponsored by TMS, the American Iron and Steel Institute, and the Canadian Institute of Mining, Metallurgy and Petroleum. The symposium deals with green production of light metals; green production of steel; carbon sequestration; and electrochemical reduction of carbon dioxide.

TMS has also joined with the American Physical Society (APS) to present Computational Thermodynamics and Kinetics, a symposium on fundamental modeling methods and application for materials structures. Specific areas of concentration include integrated computational materials engineering; microstructure properties and evolution; phase transformations; and nanoscale systems.

Also presented in conjunction with APS, Materials Informatics: Enabling Integration of Modeling and Experiments in Materials Science will advance techniques and the application of materials informatics in regard to titanium alloys; superalloys; neural networks; and CyberDesign.

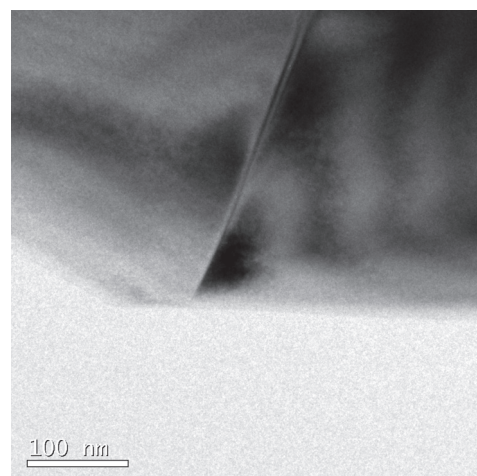
Information: <http://www.tms.org/annualmeeting.html>

ESK® Titanium Diboride – New Directions in Aluminum Production

ESK Ceramics GmbH & Co. KG of Kempten has succeeded in pushing the corrosion resistance of titanium diboride (TiB_2) materials quite literally to its limit. The innovation is based on a material with no grain boundary phase. This new development can offer long-term benefits to the aluminum-producing industry. Titanium diboride by its nature already shows high hardness and toughness, combined with heat stability, thermal conductivity and excellent corrosion resistance. The material is resistant to a range of aggressive chemicals and molten metals, such as aluminum, which also wets TiB_2 superbly. In total, these properties make TiB_2 the ideal material for a wide range of applications in the primary aluminum production sector. There is virtually no corrosion at the boundary layer. A limiting factor in the industrial use of conventional Titanium Diboride (TiB_2)

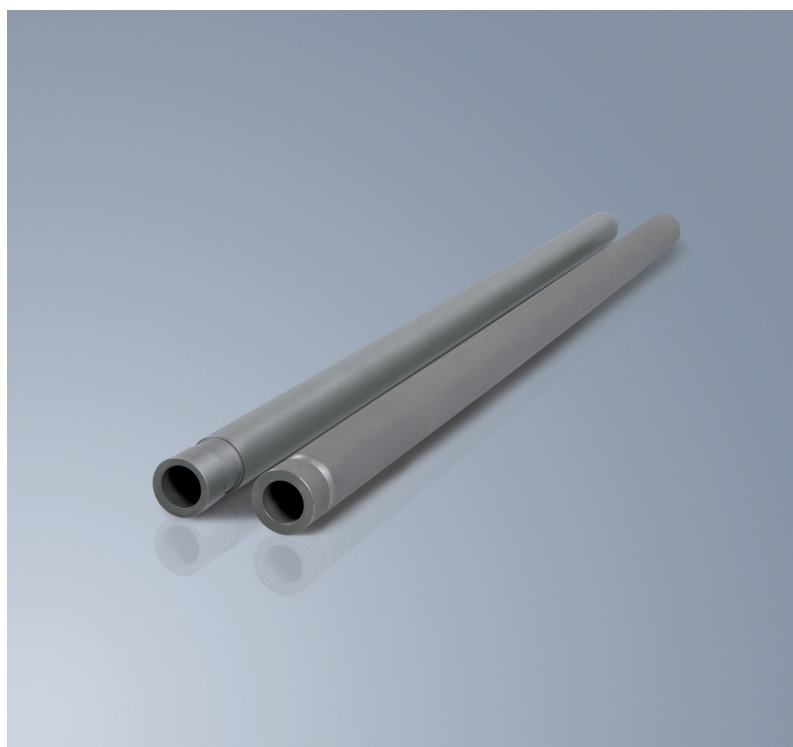
in Hall-Héroult cells is its low resistance to the flux cryolite (Na_3AlF_6), which, in the molten state, attacks the oxidic grain boundary phase of TiB_2 . This phenomenon causes grains to be dislodged from the sintered structure, resulting in corrosion of the component.

The new ESK Titanium Diboride is manufactured by a special sintering technique and, unlike its predecessor, has no grain boundary phase. The material presents almost no surfaces for attack by aggressive molten cryolite. Preliminary tests have confirmed that virtually no corrosion at all at the grain boundaries can be detected. The combination of versatility of shaping and high corrosion resistance opens the door to primary aluminum production applications that are completely novel or were hitherto unfeasible. It is now possible to produce new cathode geometries, as well as



TEM micrograph of new ESK® Titanium Diboride grade with clean grain boundaries

thermocouple sheaths for continuous temperature measurement, or to replace short-lived consumable parts with durable ESK Titanium Diboride ceramics.



ESK® Titanium Diboride thermocouple sheaths
(photos: ESK)

About ESK

ESK Ceramics GmbH & Co. KG, based in Kempten, South Germany, and with a subsidiary in Bazet (France), is one of the world's leading manufacturers of advanced products and materials for industrial applications. ESK was founded in 1922 in Kempten. Its 18 successful brands and 10 specialized materials are the basis of a portfolio that customers from all key industries worldwide have come to rely on. ESK's 15 current patents secure its technological leadership in numerous applications. To further enhance its lead, the company annually invests around 3 % of sales in R&D.

Since 2004, ESK has been a wholly owned subsidiary of Ceradyne Inc. Ceradyne is a stockmarket-listed company based in Costa Mesa, California, with over 2,200 employees at 14 sites in total. Its sales reached US\$ 662 million in 2006 (around EUR 480 million).