



TMS 2011

140th Annual Meeting & Exhibition

February 27 - March 3, 2011 • San Diego Convention Center
San Diego, California USA

***Pre-Show Report and Features
on Selected Exhibitors***

**“Linking Science and Technology
for Global Solutions”**

Register online at: www.tms.org/TMS2011

LEARN • NETWORK • ADVANCE



JOIN US ON THE EXHIBIT FLOOR

TMS 2011

140th Annual Meeting & Exhibition

February 27 - March 3 • San Diego Convention Center • San Diego, California



Don't miss your chance to meet over 3,500 of the world's foremost experts on metals and materials.

*Be a part of the TMS 2011 exhibition
by reserving your booth today.*

All exhibitors receive two complimentary conference registrations and listings in the print and web exhibit directories.

Contact TMS today at exhibits@tms.org
or visit www.tms.org/TMS2011
and click on the Exhibits button.



CYTEC



Cytec helps the mining industry meet complex metallurgical, economic, safety and environmental challenges. Wherever you are, Cytec can help you find new and better ways to achieve optimum productivity. As the largest supplier of mining reagents in the world, Cytec leads the industry in providing cutting-edge solutions to metal, industrial mineral and alumina processing challenges. Cytec is committed to the guiding principle of progress through technology, driving its business to develop innovations relentlessly focused on maximizing return on your mining investment. For almost a century, the mining industry has looked to Cytec for delivering breakthrough technology to all major mining segments.

- Largest full-line, full-service supplier of mining reagents
- State-of-the-art R&D facilities on three continents
- Manufacturing facilities on five continents strategically located near customers
- Global supply chain organization with a regional presence
- Commitment to safety, health and environmental issues; providing the highest level of product stewardship



TMS 2011

140th Annual Meeting & Exhibition

FLSMIDTH



FLSmidth in Alumina 2011

FLSmidth Leads in Supplying the Alumina Industry

FLSmidth embraces a rich heritage of products, brands, and expertise that have pioneered and even dominated the Alumina industry for over a century.

It all started with offering tube mills for grinding of bauxite and long rotary kilns for calcination of hydrate to alumina. FLSmidth continued to develop its pre-calcination technology, refining its expertise first in the cement industry and installing the first 4600 tpd unit in 1976 in Japan. In 1984, Hindalco, India awarded FLSmidth the first Gas Suspension Calciner (GSC) for alumina which became a tremendous success for FLSmidth. The GSC technology also became state of the art for alumina calcination in China where several units have been sold. With FLSmidth's acquisition of Dorr-Oliver, Eimco and Krebs in 2007, FLSmidth accelerated its strong lead in the industry with hi-rate thickeners, horizontal pan filters, slurry pumps and hydrocyclones to name the most significant references. FLSmidth now offers the complete bauxite handling, storage, crushing and grinding flowsheet preceding the digestion or dissolution of bauxite in hot caustic liquor, followed by the settler-washer train for recovery of alumina and caustic soda from the un-dissolved bauxite residue - red mud after digestion.



On the "white-side," FLSmidth has expanded its offerings including equipment technology from Möller for alumina handling and load-out after precipitation. FLSmidth also offers complete bauxite conveying equipment for the bauxite mine, as well as complete alumina handling and storage equipment for smelters. FLSmidth complements systems and equipment with complete and dedicated expert control systems for selected parts of the flowsheet as required. When you select FLSmidth as your partner, you bring this solid foundation and over a century of experienced support to your business. All of these technologies and services are available and supported in your local area around the globe.



FLSmidth is proud to be a sponsor and presenter at the TMS 2011 Annual Meeting. We welcome you to come join us at Booth #714 to find out more about our equipment and services. Find out more at www.flsmidth.com

$$\varepsilon_i(\varphi, \sigma) = \frac{Q(\varphi, 0) - Q(\varphi, \sigma)}{Q(\varphi, \sigma)}$$

Outotec

Outotec develops and provides technology solutions for the sustainable use of Earth's natural resources. In 2009, 76% of Outotec's orders were classified as Environmental Goods and Services according to the OECD definition. Thanks to their energy efficiency Outotec technologies are rated as BAT (Best Available Technology) and therefore they enable reducing emissions.

As the global leader of the minerals and metals processing technology, Outotec has developed innovative technologies that have totaled into over 2000 installations around the world. The company also offers innovative solutions for the industrial water treatment, sludge incineration and the utilization of alternative energy sources. Outotec's solutions include proprietary technology, feasibility studies, basic and detail engineering, process equipment, automation, project implementation and lifecycle services.

With a global network of sales and service centers, research facilities and more than 3,200 experts, Outotec generated annual sales of EUR 878 million in 2009. Outotec shares are listed on the NASDAQ OMX Helsinki.

Serving the light metals industries

Outotec serves the light metals industries including the provision of cutting-edge alumina refineries and aluminum smelters. Outotec has over 50 years experience helping customers worldwide in both segments of the aluminum process to reach their goals. What sets Outotec apart from its competition? They are there to help their customers from start to finish in terms of plant design, and they customize solutions to fit a client's specific needs. Outotec's processes and equipment have become industry standards and their references stretch back decades – a track record that has led to their current reputation as a leading innovative technology partner.

Collaboration with Outotec provides reliability and benefits by:

- Guaranteeing license to operate
- Ensuring sustainable operation with latest and best technology
- Increasing profitability with customized solutions for the customer specific needs
- Saving time and money with fast and reliable project implementation
- Including performance guarantees
- Increasing availability, maintainability and safety of operations
- Involving lifelong support, technology development and services

Outotec professionals incorporate sustainability into everything they do with the following benefits:

- More metals and other end products from raw material
- Safe working environment
- Less energy and water consumed
- Less waste and emissions
- Lower operating costs

www.outotec.com





TMS 2011

140th Annual Meeting & Exhibition

SUNSTONE

SUNSTONE Aim to Produce “Green” Carbon Anodes

Sunstone — Leading manufacturer of prebaked carbon anodes

Sunstone Development Co., Ltd (“Sunstone”) is the largest exporter of prebaked carbon anodes in China. Its main business includes manufacturing, marketing and researching of carbon products for aluminium smelters, and the equipments and engineering projects for the aluminium industries. Sunstone Development Carbon Co., Ltd (“Sunstone Carbon”), a wholly owned subsidiary of Sunstone, is specialized in producing prebaked carbon anodes of all sizes for all amperages. Currently, its capacity is 300,000 tpy with 3 modernized production lines. With the high-caliber management team, the company got certified by ISO9001:2000, OHSAS18001 and ISO14001 certificate, and was rewarded the Golden Prize for Actual Quality of Nonferrous Metal Products.

How Sunstone Makes “Green” Anodes

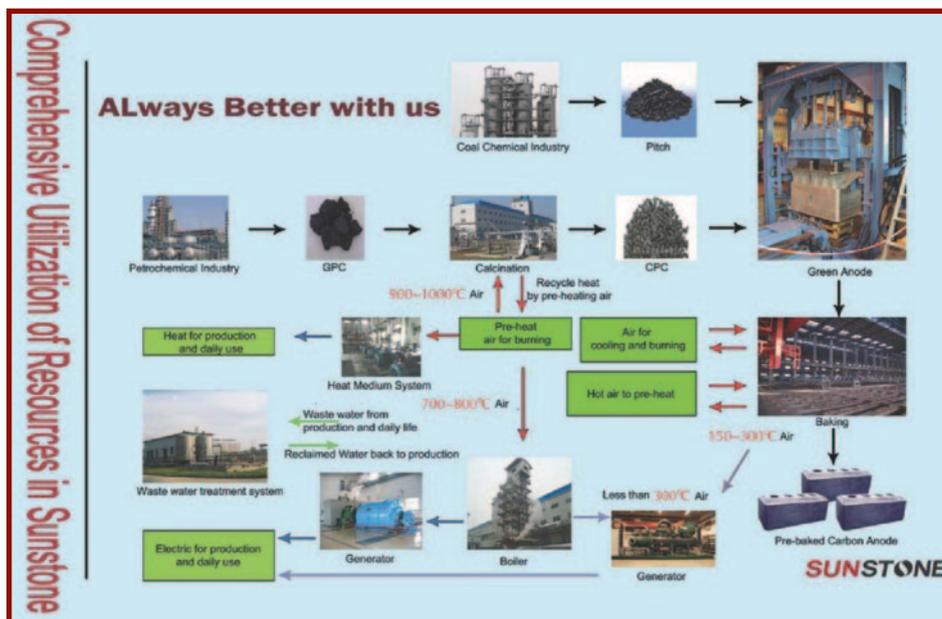
Sunstone Carbon is not only outstanding in making high-quality anodes, but also in making “green” anodes. It pays great attention to achieve the energy saving and circulation economy, so as for the compato achieve sustainable development.

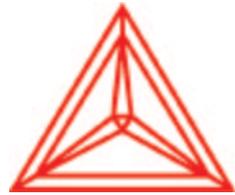
Waste Heat Generation Project

The first waste heat generation project was built for the 6 shaft calciners in the 3rd line (120,000 tpy of calcined petroleum coke). The capacity of the power station is 4.5MW, which could not only fully meet the production demand of the whole plant, but also save about 12,000MT equivalent of coal and reduce 32,000MT of CO₂ emission. Because of this successful pioneering project, Sunstone was awarded by the Chinese government as a “National Demonstrative Enterprise of Carbon Materials for Comprehensive utilization of Resources”. Presently, research on the power generation by waste heat collected from baking furnaces is in progress. Once it succeeds, it will not only bring economic benefits to the company but also introduce new possibilities of further energy saving and even less carbon emissions.

5-Year Expansion Program

By 2014, the company plans to expand its anode capacity to 1 million tons. As part of the expansion program, a cathode plant with a capacity of 20,000 tons of semi-graphitic and 20,000 tons of fully graphitized blocks each will be built too, electricity power generated by waste heat collected from a new calciner with a capacity of 400,000 tpy, which is also part of the expansion program. The new calcined unit, together with another expansion project, a coal tar pitch plant with a capacity of 150,000MT, could guarantee the supply of raw materials for the 1 million tons of prebaked carbon anodes projects. The whole expansion will be finished by 2014, by which Sunstone will become the largest anode manufacturer in the world. Sunstone will never stop.





Thermo-Calc Software

Thermo-Calc Software is a leading developer of software and databases for calculations involving computational thermodynamics and diffusion controlled simulations based on the CALPHAD method. For more than twenty five years Thermo-Calc has been licensed for use all over the world by industry, government, and universities and is now used in more than 70 countries. Thermo-Calc Software is continuously developing the software and databases to create new and better tools in order to meet the requirements of both scientists and industry. They also provide maintenance and technical support to customers and offer routine training courses.

Thermo-Calc:

Thermo-Calc is a powerful tool for performing thermodynamic calculations for multi-component systems.

The software features a large variety of thermodynamic models, databases and modules, making it possible to perform calculations on most applications involving phase equilibria, meta-stable equilibria, phase transformations, phase diagrams, and various thermodynamic properties, as well as critical assessments and data evaluations, in multi-component systems. Thermo-Calc is available in two formats: Classic which is a command line interface and can be run under different operating systems and Windows which has an easy to learn graphical user interface and runs under the Microsoft Windows environment.

Dictra:

DICTRA is a unique software package for simulations of Diffusion Controlled TRANSformations in multi-component alloys. DICTRA, coupled with Thermo-Calc, is a powerful tool for simulating a wide variety of scientific and industrial applications involving diffusion. Such applications include, but are not limited to:

- Homogenization
- Carburizing & Decarburizing
- Nitriding and carbonitriding
- Microsegregation during solidification
- Coarsening / Dissolution of precipitates
- Post weld heat treatment
- Interdiffusion between a bond coat and substrate.

Programming Interfaces:

Programming interfaces are available which enables Thermo-Calc to be called directly from in-house developed software or MatLab™. Applications include materials property calculations and materials process simulations.

Databases:

Databases for use with the software (TCC/TCW and DICTRA) and the programming interfaces contain accurate thermodynamic and diffusion data, which have been carefully evaluated and systematically assessed using the CALPHAD method. A wide variety of thermodynamic databases and mobility databases are available that contain critically-assessed data for steels/Fe-alloys, Ni-/Ti-/Al-/Mg--based alloys, solders, slags, molten salts, ceramics, super-/semi-conductors, fuel cells, nuclear materials, minerals, aqueous solutions, organic substances, among many others.

Thermo-Calc Software can also generate custom-made Thermo-Calc and/or DICTRA databases that are based on customer requirements.

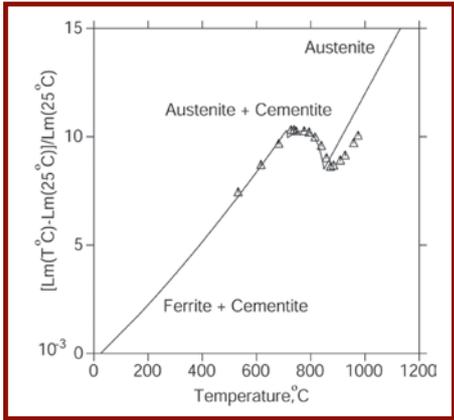
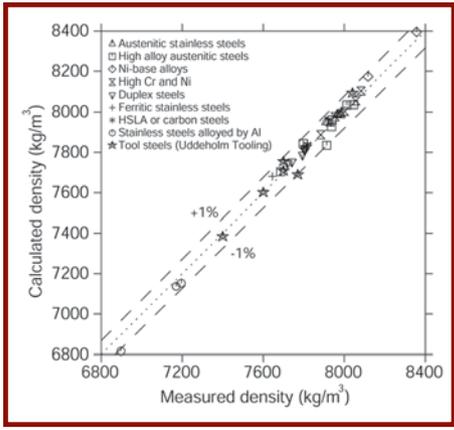
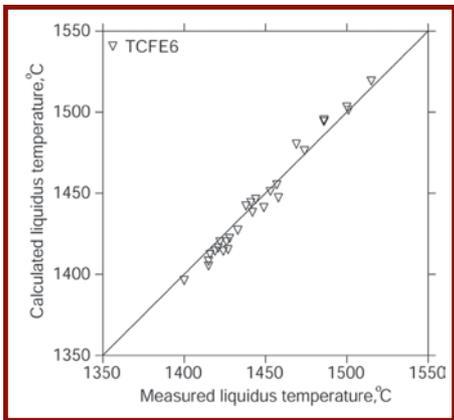
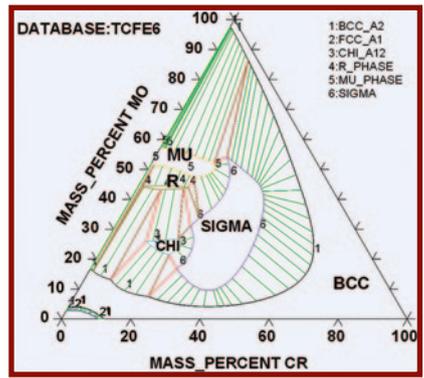
Email: Paul@thermocalc.com

Phone: +1 (724) 731 0074

Fax: +1 (724) 731 0078

http://www.thermocalc.com

TMS 2011 Exhibition: Booth 814



- Diffusion controlled phase transformation kinetics

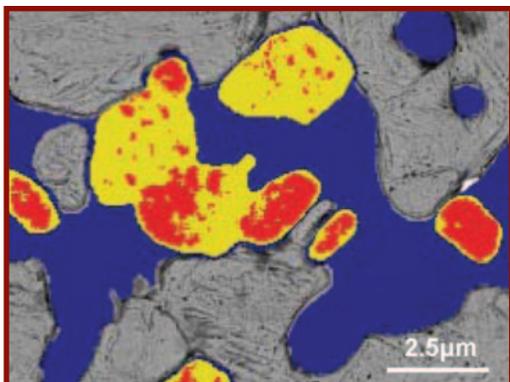


TMS 2011

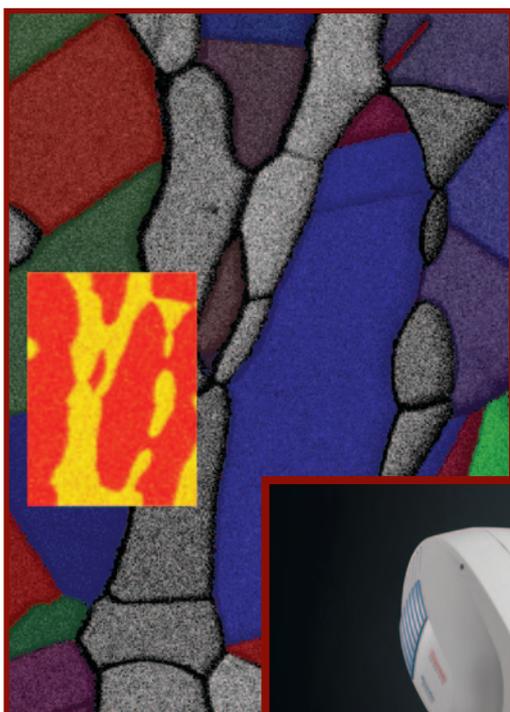
140th Annual Meeting & Exhibition

Thermo SCIENTIFIC

Part of Thermo Fisher Scientific



Thermo Fisher Scientific has more than 45 years of experience in the field of x-ray microanalysis, incorporating the innovations of Tracor Northern, KEVEX and NORAN. Thermo Scientific offers a full product line serving the microanalysis community.



With the launch of the Thermo Scientific QuasOr EBSD, Thermo Scientific becomes the first microanalysis provider to fully integrate EDS, WDS and EBSD in a single software platform; NORAN System 7. Complete integration of the software and detectors enables the user to seamlessly switch between detection modes or collect all three EDS, WDS and EBSD signals simultaneously. NORAN System 7 is built on the principles of accuracy, speed and ease of use. NORAN System 7 allows the analyst to collect concurrent EBSD, EDS and WDS data at more than 600 indexed frames per second, collect live time phase maps, and process quantitative maps in a matter of seconds. With the multi-frame software interface the operator has ready access to all aspects of the analysis without having to hunt through multiple windows or menus. The software is designed to be intuitive for new users while retaining the analytical flexibility demanded by power users. A full software site license allows users to take data back to the office to process, rather than occupy valuable microscope time.

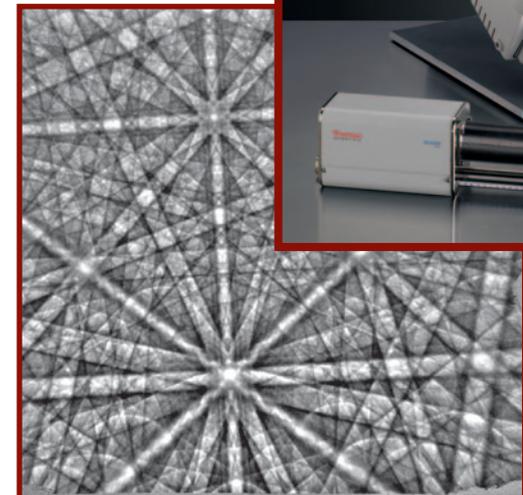
Thermo Scientific Microanalysis: The no-compromise micro analytical solution. Visit us at www.thermoscientific.com/microanalysis



Thermo Fisher Scientific Inc. (NYSE: TMO) is the world leader in serving science, enabling our customers to make the world healthier, cleaner and safer. With 2008 revenues of \$10.5 billion, we have approximately 34,000 employees and serve over 350,000 customers within pharmaceutical and biotech companies, hospitals and clinical diagnostic labs, universities, research institutions and government agencies, as well as environmental and industrial process control settings. Serving customers through two premier brands, Thermo Scientific and Fisher Scientific, we help solve analytical challenges from routine testing to complex research and discovery. Thermo Scientific offers customers a complete range of high-end analytical instruments as well as laboratory equipment, software, services, consumables and reagents to enable integrated laboratory workflow solutions. Fisher Scientific provides a complete

portfolio of laboratory equipment, chemicals, supplies and services used in healthcare, scientific research, safety and education. Together, we offer the most convenient purchasing options to customers and continuously advance our technologies to accelerate the pace of scientific discovery, enhance value for customers and fuel growth for shareholders and employees alike.

Visit www.thermofisher.com

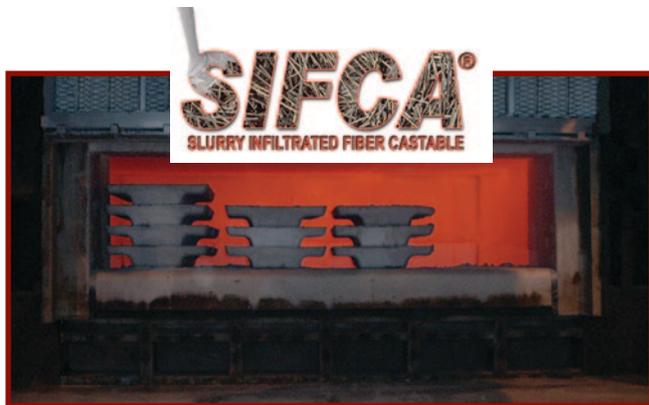


$$\epsilon_i(\phi, \sigma) = \frac{Q(\phi_i, 0) - Q(\phi_i, \sigma)}{Q(\phi_i, \sigma)}$$

0.10
0.05

Superior Products Customer Engineered For Your Demanding Applications

www.WahlRef.com
800-837-WAHL



Over the past 30 years, Wahl Refractory Solutions, LLC has become known worldwide for creating the SIFCA® family of products. SIFCA®, which stands for slurry infiltrated fiber castable, is a truly innovative refractory product that provides customers with a solution to their extreme mechanical abuse in high temperature applications. Door perimeters, skim tools and tap troughs are just a few examples. SIFCA® has evolved since its' creation into many different types of alloy wire with a variety of slurry options.

In the late 1990s, Wahl developed a precast furnace lining system, which later became known as MegaBRIX™. Today, Wahl has installed over 100 locations quickest installation, leaving the customer with successes in many different alloy environments. It has proven to be the quickest installation, leaving the customer with the best refractory properties achievable. This is possible because all the precast shapes can be pre-fired to temperatures to assure that the proper strength development happens during the water removal process. Wahl has proven that pre-cast can achieve up to 30% greater properties over cast in place using similar castable products.



In 2008, Wahl again finds the latest development in non-wetting refractories in creation of WalMaxXx™.

Never before have non-wetting castables been able to operate in temperature cycles over 2500oF like WalMaxXx™. The picture (left) is after three years in a continuously run batch furnace operating at 2150oF. WalMaxXx™ walls clean as easily as it did on day one. WalMaxXx™ creates significant fuel savings over the life of a furnace because it allows the easily cleaned refractory to conduct heat better in the melting process. It is known that reflective and conductive heats are the best ways to melt in a reverb furnace.

Wahl Refractory Solutions strives to be an innovator in the non-ferrous industry by developing cost savings solutions to the toughest operating environments. Let Wahl help you in your cast house help you. Our team of engineers is available to help with your next problem.

Contact us at Sales@WahlRef.com. Locate us at 767 State Route 19S, Fremont, OH 43420. Call us at 800-837-WAHL.

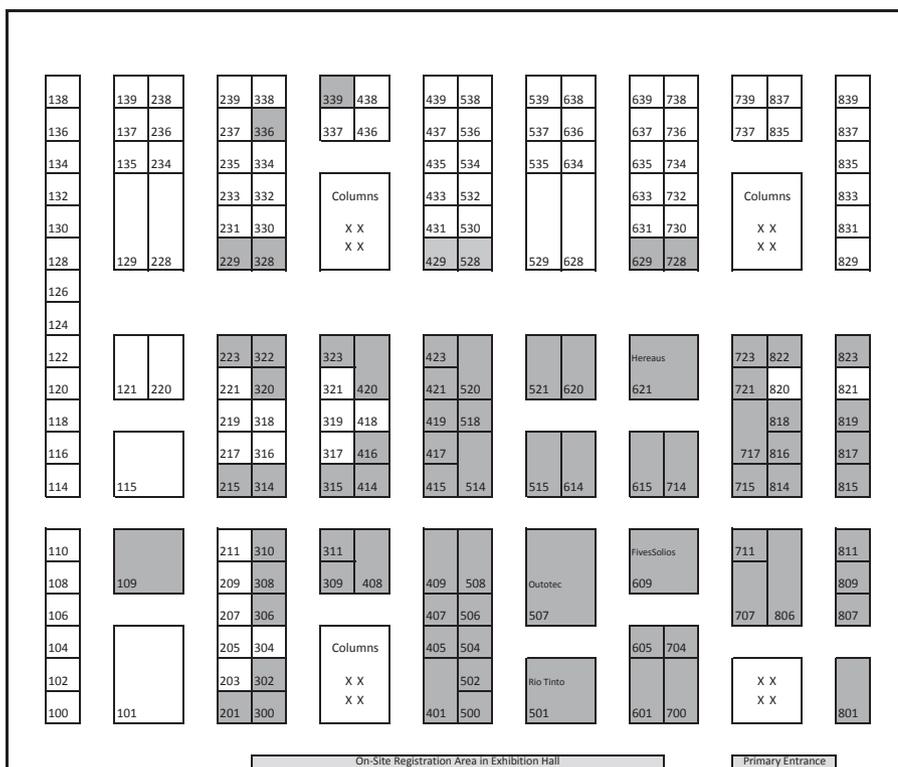


TMS 2011

140th Annual Meeting & Exhibition

Exhibitors (as of November 23, 2010)

ABB Bomem.....700	Eirich Machines, Inc.....315	Momentum Press.....416
Advanced Dynamics.....807	ELSEVIER.....704	MTI Corporation.....528
Agilent.....420	Evans Analytical Group.....311	MTS Systems, Inc.....819
Almeq Norway AS.....515	Fives Solios.....609	Nalco.....504
<i>Aluminium International Journal</i> (Giesel Verlag).....308	FLSmidth Minerals.....714	NFC.....521
<i>Aluminium International Today</i>721	Gillespie & Powers, Inc.....806	NIST.....322
<i>Aluminum Times</i>518	GLAMA.....615	NIST TIP.....320
ATR National Scientific User Facility.....405	Gouda Refractories.....415	NKM Noell Special Cranes GmbH.....707
B&P Process Equipment.....801	Harbin.....314	OKAYA (USA) Inc.....809
Beijing General Research Institute of Mining & Metallurgy.....728	Hencon.....300	Opsis.....715
Beijing Leway International Fairs.....109	Hereaus.....621	Outotec.....507
Big C.....823	Hertwich Engineering.....506	Parker Hannifin.....409
Boreal Laser.....629	Hysitron.....614	PreciMeter.....401
BUSS ChemTech.....520	Innovatherm.....429	Proto Manufacturing Inc.....215
C A Picard Intl.....711	Olympus Innov - X.....201	RHI AG.....816
Center for Advanced Energy Studies.....336	Jervis B. Webb Company.....508	Riedhammer GmbH.....605
CIMM Group.....815	John Wiley & Sons, Inc.....811	Rio Tinto Alcan.....501
Claudius Peters Projects GmbH.....419	Kempe Engineering.....514	SLM Co., LTD.....229
Colt.....302	L.P. Royer, Inc.....414	STAS.....601
Computherm.....309	<i>Light Metal Age</i>417	Stratronics Inc & Optomec Inc.....407
CSM Instruments.....310	Major.....817	Sunstone.....822
Cytec Industries Inc.....620	Metal 7.....306	Techmo Car S.p.A.....502
Dubai Aluminium.....717	Metallurgical Society of CIM (MetSoc).....723	Thermo Scientific.....423
ECL.....500	Micro Materials.....718	Thermo Scientific Niton Analyzers.....421
	Microtrac.....339	Thermo-Calc Software, Inc.....814
	Mid-Mountain Materials, Inc.....408	Viek Thermal Textiles Coating Industrial.....328



**TMS would like to
thank the following
companies for sponsoring
the TMS 2011 Annual
Meeting & Exhibition:**

- | | |
|------------------------------|----------------------------|
| Alcoa | Jervis B Webb Co. |
| B&P Process | Koch Carbon LLC |
| Bechtel Mining
and Metals | Oxbow Carbon &
Minerals |
| BP Coke | Pamas & Company |
| Carbone Savoie | SGL Carbon |
| Conoco Phillips | Skamol A/S |
| Exxon Mobil Oil | Stellar Materials Inc |
| Fives Solios | Sumitomo/SEC |
| FL Smidth | Carbon |
| Harbin Dongsheng | TCP Petcoke |
| Hatch | Thermo-Calc |
| Jacobs Consultancy | Walh Refractories |