1/2009

livingmetals

EXCELLENCE IN POWDER METALLURGY

plansee GROUP

Plansee Seminar 2009:
Largest powder metallurgy conference in Reutte

GTP: World class powder supplier

Sustainable collaboration with customers

World's largest cylinder for hot isostatic press delivered

Reutte is again host to PM world

Dear readers,

During the last week in May, the Plansee Group's headquarters in Reutte, Austria will play host to a major event in the powder metallurgy calendar – the Plansee Seminar. The exciting event program will include 250 speeches and poster presentations from prestigious industry and research experts. Despite the current difficult economic situation facing many businesses, high numbers of people have registered for the seminar.

To ensure success in times of economic uncertainty, it is important that businesses develop innovative solutions that will help them stand out and give them a competitive edge in the long term. And the Plansee Seminar can help businesses achieve this, by sharing previously unpublished scientific and industrial research from the fields of powder metallurgically produced high-performance materials.

The Plansee Group itself is also making use of the current opportunities available. We are aligning our businesses more strongly to meet the needs of our customers from different industries (page 12) and are also working hard to develop new solutions and applications for powder metallurgically produced high-performance materials (page 14). And, with substantial investments in machinery such as the world's biggest and most efficient rolling mill for refractory metals (page 5), we are also positioning ourselves as an attractive long-term supplier for our customers.

We hope you enjoy reading this edition of Living Metals.

Dénes Széchényi
Editor

chance

CONTENT

IMPRINT

Produced and distributed:

Plansee Holding Aktiengesellschaft
6600 Reutte, Austria
www.plansee-group.com

Editor: Dénes Széchényi
Photos: Plansee Group

Design and production:
Markenwerke AG, Stuttgart
www.markenwerke.com

Honorary ring for Hilde Schwarzkopf

In January, Hilde Schwarzkopf was awarded the Tyrol honorary ring, the state's most prestigious accolade for high achievement.

Photo: Andreas Fischer/Tyrol state

Hilde Schwarzkopf at the awards ceremony.

When presenting Hilde Schwarzkopf with her award, state governor Günther Platter explained the significance of her accomplishments, and the fact that she has helped Plansee to become one of the state's leading companies. "The state of Tyrol would like to present Hilde Schwarzkopf with this award in honor of her work. Despite bringing up four children alone following the death of her husband in 1978, she took on the challenge of leading the Plansee Group. Since then, she has successfully navigated the group through good and bad times and has helped make the company what it is today." Platter also acknowledged Hilde Schwarzkopf's personal contribution to cultural and social activities, especially through her work with the Paul Schwarzkopf Foundation which supports young people in their education and training.

The Tyrol honorary ring is a special state award which is given to people in recognition of their great achievements. Only a very select few people receive the award.

MAC wins prestigious award

MAC, an integrated coolant set for dry machining aluminum wheel rims, recently won a MaschinenMarkt (MM) Award at the AMB metal processing tradeshow in Stuttgart, Germany.

The MAC coolant set is directly built into the machining tool, and uses ice-cold air to cool the insert and work piece. The air is cooled to minus temperatures through a physical effect known as the Joule Thomson effect.

Unlike conventional cooling tools, the MAC requires no coolant and therefore the chips need not be cleaned before recycling. This considerably reduces the machining costs for each wheel rim.

Michael Steiner (left), in charge of developing Ceratizit's new MAC coolant set, celebrates being presented with the MM Award by MM editor in chief Ken Fouhy.

Revolutionary coating

At the end of last year, Ceratizit won the prestigious Austrian Nano award for its extremely hard and wear-resistant nano coating.

Ceratizit employee Martin Kathrein accepts his certificate for the Nano Award from Austrian secretary of state Christa Kranzl (part of BMVIT, the federal ministry for transport, innovation and technology).

The wear-resistant coating is marketed as HyperCoat-P. Its outstanding properties mean that Ceratizit can offer its customers tailor-made coating solutions, particularly for complex cutting tasks. The coating is manufactured using a physical vapor disposition (PVD) process.

Plansee Japan strengthens its market presence

The Esashi plant is Plansee's production backbone in Japan.

With effect from March 1, 2009, the Japanese companies of Plansee High Performance Materials (HPM) have merged. The new company goes by the name of Plansee Japan and employs 250 people in sales and production.

"This will help us to position ourselves as a strong partner in the Japanese market and to even better align our organization towards the customer needs. Our sales organization is spread up between High Performance Materials in general and spare parts for the semiconductor industry," comments Plansee HPM Executive Director Bernhard Schretter.

Effective March 1, the manufacturing company Vacs Precision, which is headquartered in Esashi, was merged with the two sales companies Japan Vacs Metal with offices in Tokyo, Tohuku, Kansal and Fukuoka and Plansee Japan with offices in Tokyo and Osaka. The newly formed companies headquarter is in Tokyo. All current sales offices will remain open. Representative directors are Masashi Tsuchiya and Peter Aldrian.

Ceratizit strengthens Horb site

CERATIZIT is bringing together its German production and sales activities at its site in Horb. In particular, customers from the wear protection industry will benefit from quicker delivery and improved customer service.

As part of a plan to realign its European activities, Ceratizit's site at Horb will now focus on developing, producing and marketing wear protection products. As well as tools for wood machining, the site will also manufacture hard metal products for the stamping, automotive, plastic, paper and textile industries. Ceratizit is currently investing around 10 million euros in expanding its production and office facilities at Horb.

Under construction: The Ceratizit competence centre for wear protection solutions.

New presentation space for the Plansee Group

The new presentation foyer at the Plansee Group's headquarters in Reutte.

A new presentation foyer has recently been set up at the Plansee Group's headquarters in Reutte. As of now, visitors can take an exciting trip into the world of powder metallurgy – and discover how a sputter target is made, learn about the stages involved in producing tungsten powder, and find out which industries products manufactured by the Plansee Group are used in. The presentation will focus on materials and technologies used to manufacture powder metallurgy products, and the markets these products are used in.

Launch of hot rolling mill a success

In mid-December 2008, the Plansee High Performance Materials (HPM) division launched the world's largest hot rolling mill for refractory metals. This important investment enables flat products, such as ribbons, semiconductor base plates, and sputter targets, to be manufactured more quickly and to a higher standard.

In addition, the mill provides additional production capacity and greater flexibility. On the day of the launch in Reutte, Austria, the mill processed one molybdenum sheet to demonstrate the process. The mill will start mass-producing products in spring, and in the meantime, thorough testing will be carried out.

Bigger and faster: The first Molybdenum sheet is processed.

Increased sales activities in South America

From now on, Plansee South America Ltda will manage all sales activities of the two divisions Plansee High Performance Materials (HPM) and Global Tungsten & Powders (GTP) across South America. Located in Sao Paulo, Brazil, the company will initially concentrate on Argentina, Chile, Columbia, Venezuela and Peru.

REACH statement now available online

The Plansee Group has put provisions in place to meet the requirements of the EU REACH regulation.

The regulation states that all chemical substances produced or brought into the EU in quantities of one ton or more must be registered at the European Chemicals Agency.

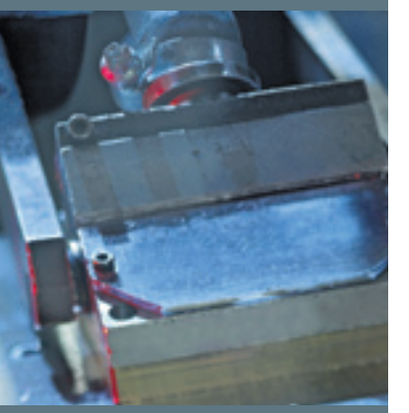
The Plansee Group's statement of their REACH activities, along with an overview of the pre-registered substances is available online at **www.plansee.com** or **www.ceratizit.com** in the section called Quality and environment.

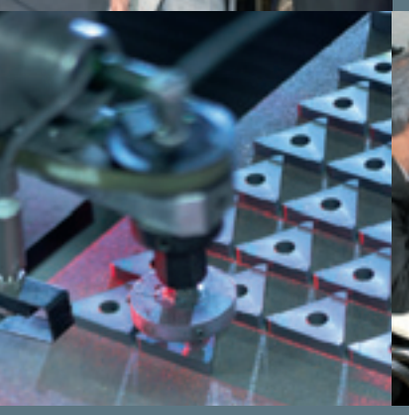
Expert advice and assistance provided onsite: WNT Turkey

WNT is continuing to grow. On 1 September 2008, it opened a new sales subsidiary in Istanbul, Turkey. WNT sells cutting tools made by Plansee's Ceratizit division to small and medium-sized businesses.

The WNT sales structure has proven successful in 13 European countries. Experienced application engineers carry out site visits to offer their expert advice and assistance, while WNT can guarantee delivery of 41,000 precision cutting tools within 24 hours.

17 PLANSEE SEMINAR 2009





International Conference on
High Performance P/M Materials
Reutte/Austria
25 – 29 May 2009

Largest powder metallurgy conference

The 17th Plansee Seminar, the world's largest conference on powder metallurgical high-performance refractory metals and hard materials, will take place during the last week in May in Reutte, Austria. The provisional program for the seminar is now available. 500 industry and research experts from 40 nations are expected to attend.

Over 250 scientists and users have submitted oral and poster presentations for the seminar – the content of which is based on both theory and their own practical experiences. Most of the contributions are the result of cooperation between universities, scientific institutions and manufacturers. Each theme will be introduced by a talk from a prestigious industry or research expert. The Plansee Seminar's introductory talk about innovation will be given by Professor Hans-Jörg Bullinger, President of Germany's Fraunhofer Gesellschaft.

Key topic areas for the Plansee Seminar

The event will cover a range of topics relating to refractory metals, including energy technology (materials and components for fusion research, heat sinks for high-performance detectors, switch contacts), IT and communications (components for ion implementation, heat sinks, sputter targets for flat-screens), lighting technology etc.

In the area of hard metals, the focus will be on both cutting and wear part tools, concentrating particularly on the use of new and improved materials (types of fine-grained materials, materials with gradients, new binder metals), wear protection coating for tools made of hard metal, etc.

The seminar program for both types of materials will include discussions on powder metallurgical process technologies, including advances in powder production, pressing, sintering and molding. Subjects under discussion will include direct electric current sintering (spark plasma sintering), which is ideal for setting fine structures, or laser sintering as efficient ways of producing prototypes.

The latest developments in metallography and testing methods will be presented, e.g. the developments in analysis technologies and the use of scanning electron microscopes to get a visual interpretation of a structure's crystallites. New approaches to modeling material synthesis and material and component behavior will also be discussed in a separate workshop.

17TH PLANSEE SEMINAR

- 25 to 29 May 2009 in Reutte/Austria
- Largest conference on powder metallurgically manufactured refractory and hard metals
- Provisional program available at www.plansee-group.com
- 500 scientists and users from industry and academia expected

REGISTRATION

Participants who register before April 3 pay 980 euros for the full five-day program:

- Entry to all oral and poster presentations
- Comprehensive seminar documentation (as printed hand outs at the event and on CD-ROM afterwards)
- Bus transfer from/to Munich or Innsbruck
- Catering
- Evening program with Tyrolean night and gala dinner.

Students will receive a discount. More information and registration at www.plansee-group.com

The Plansee Seminar over the years

The Plansee Seminar was founded in 1952 by Paul Schwarzkopf, and since then, the regular event in Reutte, Austria has been attracting leading industry and research experts from the powder metallurgy world. The event gives them the ideal opportunity to discuss the latest developments in technologies, materials and new applications for powder metallurgical high-performance materials. Growing demands for efficient and cost-effective powder metallurgically produced products, as well as further developments in competitor materials groups and process technologies and shortages in resources mean that there are constant new issues to address.

One thing that has remained constant throughout the years is the aim of the Plansee Seminar: for people from the entire powder metallurgy value chain – from raw materials suppliers to end customers – to exchange experiences and ideas that will aid and advance development within the area of powder metallurgically produced refractory metals and hard metals.

Since 1952, the world of powder metallurgy and tool technologies has advanced dramatically: with developments in mathematical formulas for describing the way materials act, analysis methods for chemicals and metals, computer-assisted modeling of material behavior and manufacturing processes, new pressing and sintering methods, installation engineering, testing and control technologies, and automatic gathering and processing of process data.

A chronological overview of these key developments can be found in the proceedings of the previous 16 Plansee Seminars, along with contributions from the thousands of participants over the years. From the proceedings, it is clear that the content of the Plansee Seminars has changed over the years: in the 50s and 60s, the seminars focused on power metallurgy within a particular industry, such as nuclear power or aerospace/aviation, whereas more recently, the seminars have covered the more general topic of the ever-increasing areas of application for refractory and hard metals.

All the research presented at the 17th Plansee Seminar will not have been published before. Participants can expect world-class science and excellent networking opportunities.

International Conference on

Preliminary program of the Plansee Seminar

The preliminary program of the 17th Plansee Seminar is now available at **www.plansee-group.com**.You will find a highly interesting program of more than 250 contributions. Novel results covering the full range of the technology and application of P/M refractory metals and hard materials will be presented in form of lectures or posters. As in the past Seminars, parallel sessions have been avoided. The preliminary program will be updated regularly on the Internet up to the final program to be posted in early May.

PLENARY LECTURES (INVITED)

THE MIRACLE OF INNOVATION – TURBULENT TIMES REQUIRE CREATIVE MINDS
Hans-Jörg Bullinger, Fraunhofer Gesellschaft, München, Germany

GLOBAL TRENDS IN P/M HARD MATERIALS
Henk van den Berg, Kennametal Technologies GmbH, Essen, Germany

GLOBAL TRENDS IN P/M FERROUS MATERIALS
W. Brian James, Hoeganaes Corp., Cinnaminson, USA

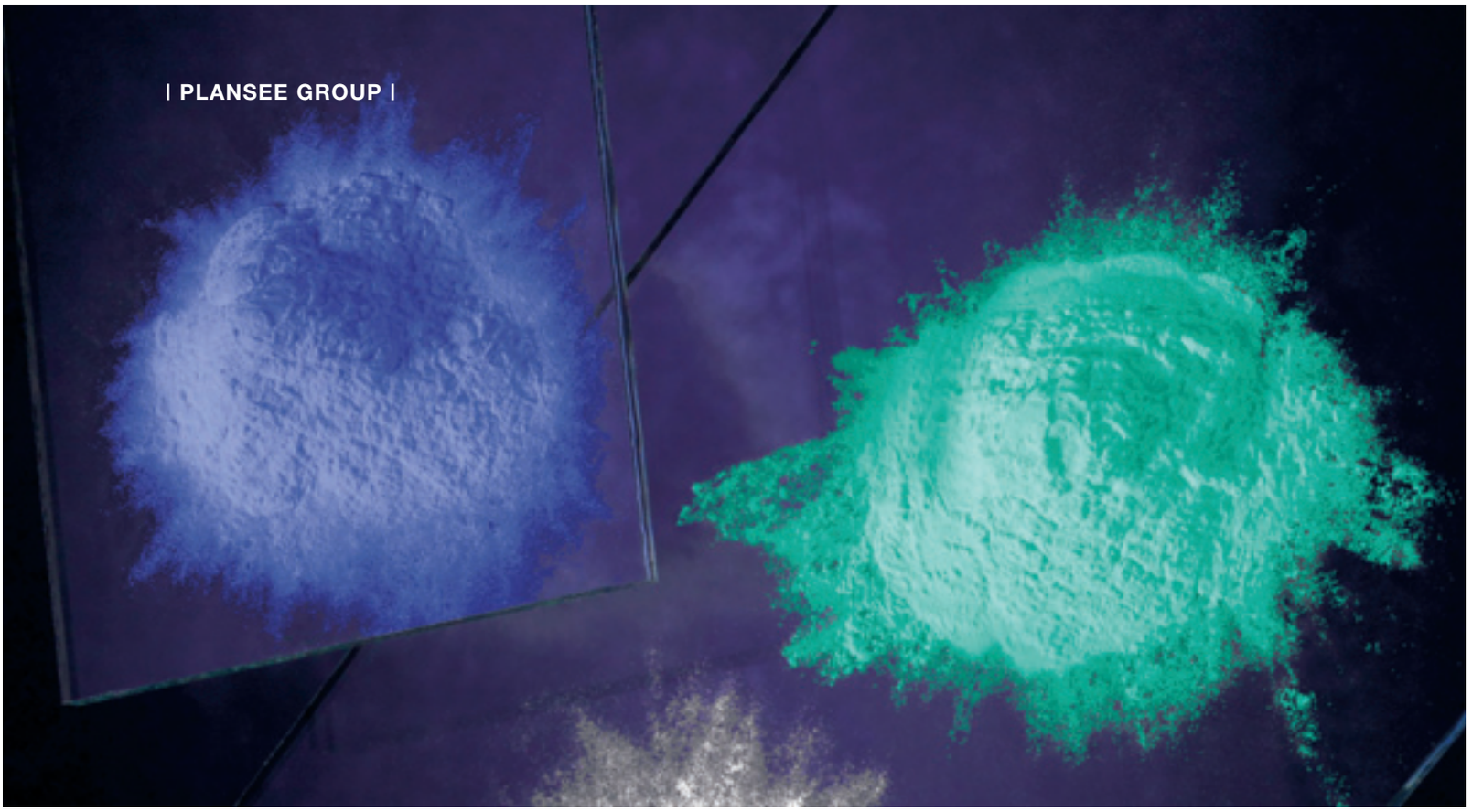
GLOBAL TRENDS IN P/M REFRACTORY METALS
Gerhard Leichtfried, Plansee SE, Reutte, Austria

GRAIN SIZE EVOLUTION AND GRAIN SIZE DISTRIBUTIONS IN SINTERED MATERIAL
Randall German, San Diego State University, USA

MULTIFUNCTIONAL TOOLS AND HIGH PERFORMANCE CUTTING MATERIALS
Klaus Christoffel, Sandvik GmbH, Düsseldorf, Germany

TABLE OF CONTENTS:

High Performance P/M Materials



World class powder supplier

Since it became part of the Plansee Group, the Global Tungsten & Powders (GTP) division has positioned itself as a leading supplier of tungsten, molybdenum and phosphor powder worldwide. Other, more complex products are marketed jointly with one of the Plansee Group's other divisions, Plansee High Performance Materials (HPM).

raw material

Expertise in all stages of tungsten processing

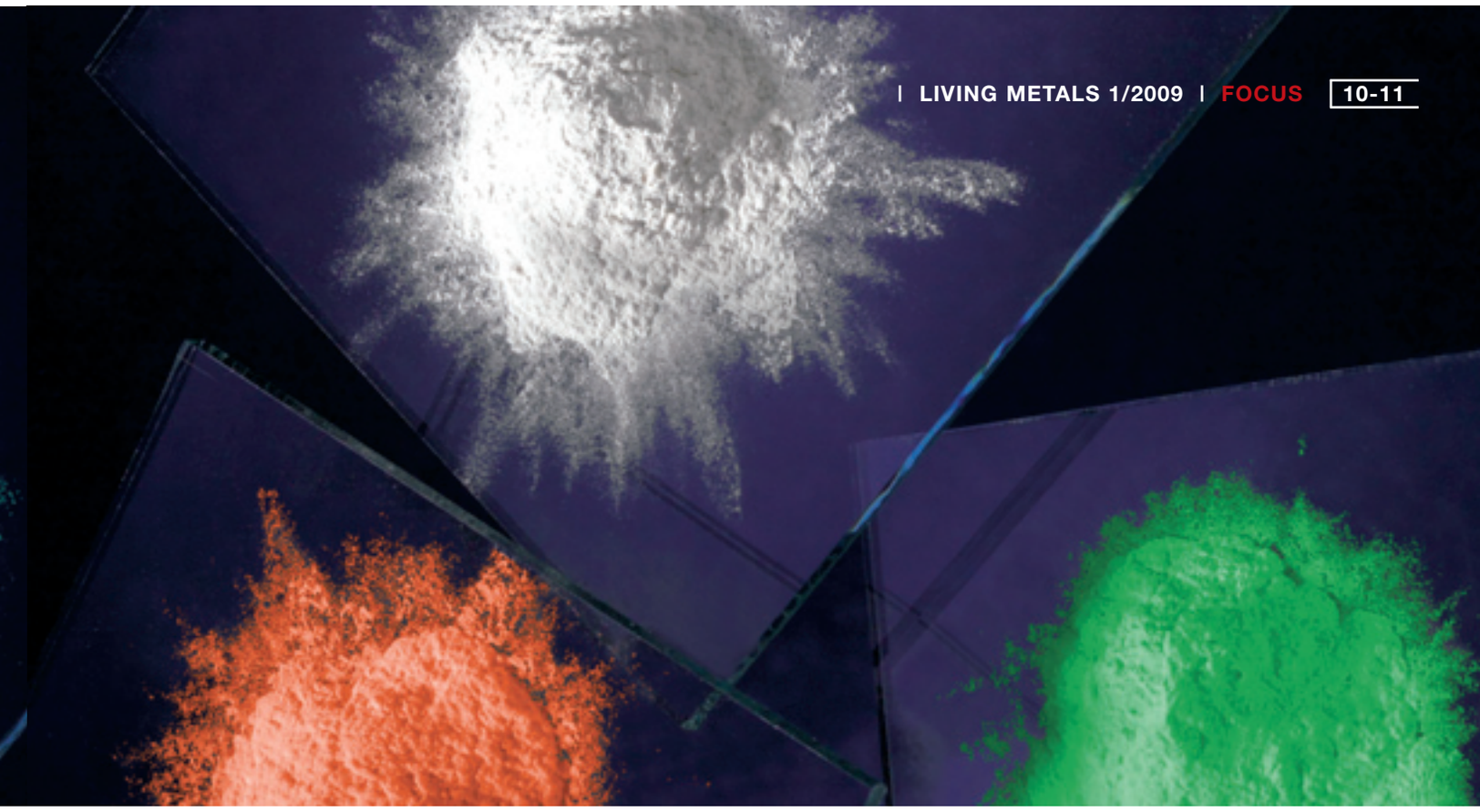
GTP covers the entire tungsten value chain, from ore to finished product. Its main focus is producing ammonium paratungstate (APT) and ready-to-use metal powder, but GTP also manufactures sintered semi-finished parts and finished components from high-performance materials like tungsten and molybdenum. GTP also makes extensive use of hard metal recycling. GTP is the only major manufacturer of tungsten powder in the western hemisphere, supplying leading hard metal manufacturers across Europe and the USA.

A leading supplier of phosphor coatings

The unique properties of phosphor powder make it ideal for coatings. For example, it is used for the backlights of keypads on mobile electronic devices, watches, vehicle instrument panels, billboards and architectural lighting. GTP is a leading global supplier of phosphor coatings, and holds a number of important patents.

A dedicated R&D team

Complete vertical integration and high levels of technical expertise mean that GTP can offer its customers



tailor-made products that meet their exact requirements. GTP has a 70-strong R&D team comprising scientists, engineers and technicians. Its many patents are a sign of its commitment to constantly developing and enhancing its products and processes.

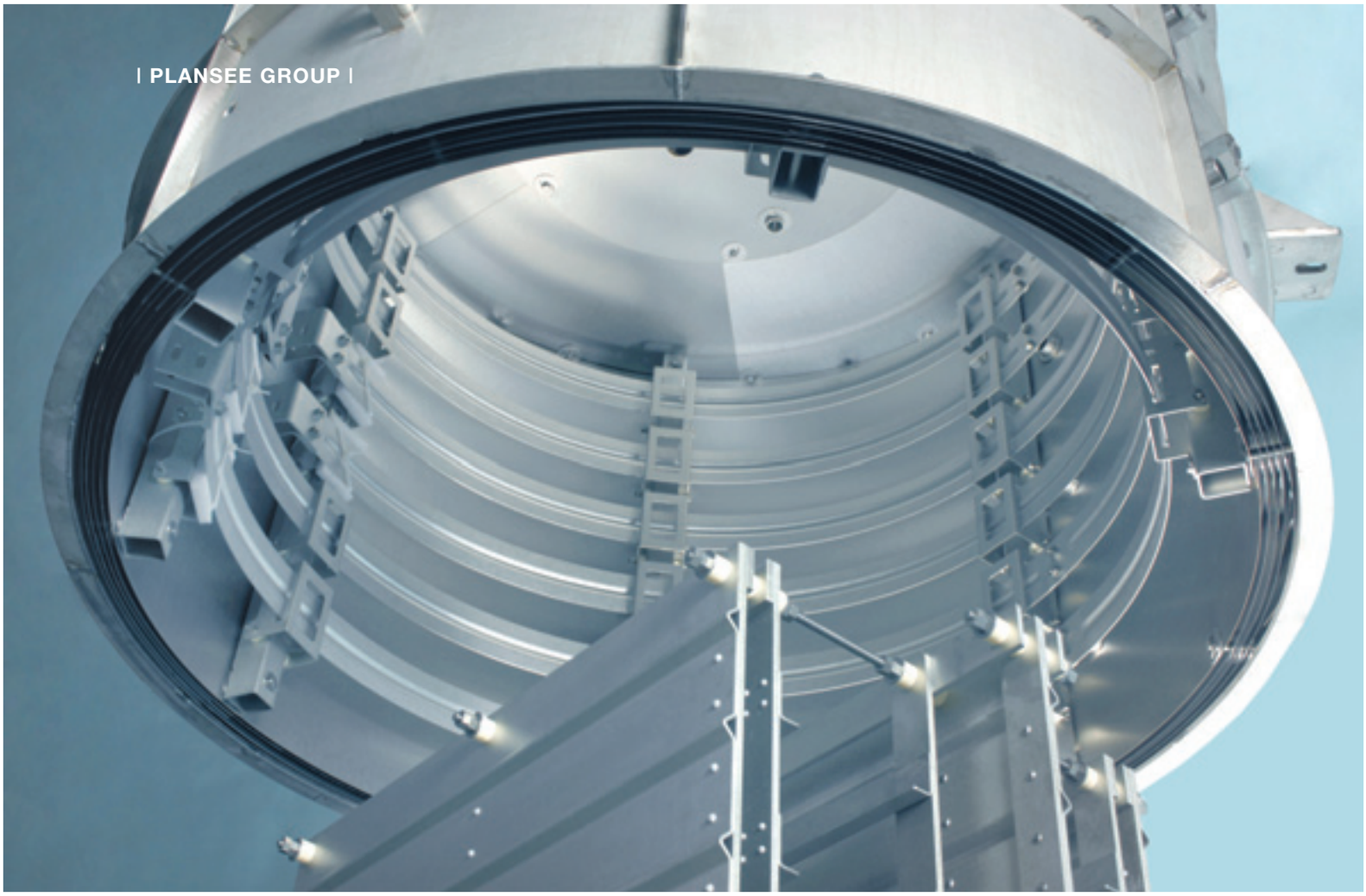
Sales cooperation for more complex products

GTP markets products made from refractory metals and composite materials through Plansee HPM's global sales network. Together, GTP and Plansee HPM are among the world's leading suppliers of powder metallurgical semi-finished parts and finished products. This means many benefits for their customers:

Benefits for the customers:

- Local technical sales contacts: Plansee HPM and GTP have a global sales network comprising 30 sales offices in 20 countries across the world.
- A financially stable supplier for the long term: as divisions of the Plansee Group, Plansee HPM and GTP enjoy long-term financial stability. They cover the entire tungsten value chain, from manufacturing powder to completing the finished components.
- Flexibility: with production sites in the USA, Europe and Asia, Plansee HPM and GTP have the flexibility to respond to their customers' exact production requirements, making them a highly reliable supplier.
- R+D expertise: Plansee HPM and GTP combine their expertise in developing new products and enhancing existing ones, giving their customers access to the world's leading R&D team for refractory metals and composite materials.

GTP and Plansee HPM both have their own distinct brand identities. However, they also work together to market refractory metal and composite material products. For this sales cooperation, the Plansee sales team looks after customer enquiries, technical support, customer services, marketing and customer visits. GTP manufactures products and delivers them directly to its customers.



Sustainable collaboration

The current economic crisis means values such as security, trust and a long-term outlook are more important than ever. And it is precisely because of these values that Plansee has enjoyed such productive relationships with its customers.

Let's take the example of lighting technology. Plansee first began supplying components for vehicle headlights in 1922. Back then, the company produced parts for bulbs, and today, it continues to supply components for modern xenon and LED lights. In the field of medical technology, the company's development of rotating anodes can be traced directly to its decades of collaboration with the world's leading medical device manufacturers. Today, rotating anodes made of high-performance composites are produced using the latest technologies, and can absorb, store and divert temperatures of over 2,000 degrees centigrade within fractions of a second.

The common factor behind each of these success stories is Plansee's exceptional loyalty towards its customers and their results, as well as a high level of commitment to product development, production and logistics. The following principles shape every one of Plansee's activities:

Development partnerships. We see ourselves as an active development partner that drives and inspires our customers. Plansee always employs its extensive industrial and applications expertise so as to develop tailored materials and innovative products that help its customers succeed in their markets.

Supply security. We are well aware that our customers' success depends on reliable supplies. Guaranteeing supply security is a key priority at Plansee, and this is something we achieve through long-term contracts with raw material providers, internal powder production, and complete in-house manufacturing facilities.

Investing in the future. For over 85 years, a far-sighted investment policy has formed a central plank of Plansee's activities, with profits continually reinvested into the company to ensure future success. During the last three years alone, we have spent over 400 million euros on product development, expanding capacities and training staff. As such, Plansee has everything in place to be an attractive partner for its customers long into the future,

experience

offering innovative products, efficient production processes and value-creation flexibility.

Environmental protection. Our commitment to the environment is documented in our environmental report. We ensure our production is as environmentally friendly as possible by closely monitoring materials use, energy consumption, and emissions, as well as actively recycling wherever possible. Further details can be found in the Plansee environmental report, available online.

Technological advances. Our global research centers are in constant competition to generate the best ideas. Working closely with customers and external research institutions, we develop materials solutions for advanced fields such as energy generation, medical technology, electronics and transport.

Solid roots. Founded in 1921, Plansee remains a privately-run business, now with its third generation of management. The company has built up decades of expertise in each of its specialist industries. Its customers benefit from personal and expert customer services, stability and continuity.

CASE STUDY

High pressure, high speed, high precision

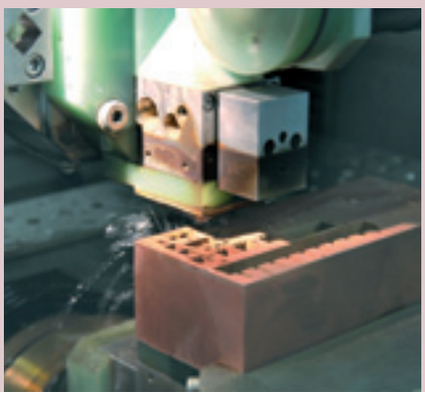
For over 20 years, Ceratizit has worked closely with German stamp technology experts Leicht + Müller. Both parties have complete faith in one another, and work together to continually meet the latest customer demands, while making themselves stand out from the competition.

Ceratizit manufactures carbide erosion blocks and formed parts. These are then used by their customers to make die inserts and punches via spark erosion (EDM and wire erosion) and grinding.

These stamped parts and tools are used in the automotive electrics, telecommunications, and household appliance industries, to name but a few. They can be found almost everywhere in everyday life – as metal furniture fittings, chains for power saws, and plug-in contacts for computers, mobile phones and household electrical appliances.

Hans-Peter Schmid, head of the tool and die industry segment at Ceratizit, comments: “Our carbide is employed in the most demanding stamping processes around. As such, our carbide solutions are constantly developed to meet the highest demands in terms of tool precision and life-span.”

In a business that is characterized by tight deadlines and stiff competition, Ceratizit represents a reliable partner for its customers. The company guarantees speedy deliveries, an extensive range, and dependable, consistent product quality.



Wire erosion at Leicht + Müller is applied to cut dies from carbide blocks from Ceratizit.

Protective sheets for glass-melting tanks

Corrosion-resistant molybdenum sheets help glass-melting tanks last longer, and improve glass quality.

INVITATION

Plansee invites you to join them at the 85th glass technology conference in Amberg, Germany on May 19, 2009. The conference will consist of a workshop and several talks about the current issues affecting the glass industry today. Innovations for glass-melting electrodes as well as further developments for SIBOR® and furnace components will also be presented. The event will be opened with a traditional welcome reception.

For more information, visit www.hvg-dgg.de/en/home.html or www.plansee.com.

Protective molybdenum sheets significantly reduce costly disruptions to the production process and time-consuming repairs – something product manager Heike Larcher knows to be one of the largest cost drivers in glass production. As a result, those who use protective sheets will see a quick return on their investment.

Heike Larcher explains: "Even when melting normal glass, the high temperatures can seriously corrode the refractory bricks used to build the furnace." And these bricks are put under even greater strain when used to manufacture opal and pharmaceutical glass, as melting these products requires much higher temperatures.

Molybdenum is much more corrosion-resistant than refractory bricks to many kinds of melted glass. As a result, it can be used to protect the bricks from corrosion in particularly vulnerable areas. This extra reinforcement enables the bricks to keep their original size and shape for longer, which in turn leads to a higher quality of glass, and a longer life for the tank.

Because the molybdenum sheets must be built into the glass-melting tank when it is cold (i.e. before it is fired up for the first time), it is important to protect against oxidation as the tank slowly heats up. For this, Plansee has developed the SIBOR® coating for molybdenum – this guarantees complete protection against oxidization during this critical warm-up phase.

Additional protection against corrosion is offered by a special component used to protect the vulnerable corners of the throat. Plansee has now presented this solution to the public for the first time. The protective part reduces the danger of the melted glass getting behind the molybdenum plates.

interview

Long-term protection for the throat

With a rich history of almost 400 years, German company Heinz-Glas specializes in manufacturing and decorating glass bottles for perfumes and cosmetics. To guarantee long-term success, it uses the latest production techniques, delivers exceptionally high-quality products, takes a flexible and up-to-date approach, has several innovations, and makes significant investments. Oliver Fröba, head of the glass-melting tank technology division at Heinz-Glas talks about the "Achilles heel" of their production process, and how they are safeguarding against this for the future.

The throat (left) is the Achilles heel of the glass production. Together with Plansee Oliver Fröba from Heinz-Glas has developed a protective solution.

Living Metals: What challenges are you faced with when manufacturing glass?
Oliver Fröba: The types of glass we manufacture, such as opal glass, are mostly used by the cosmetics industry to create high-quality, stylish packaging. However, an attractive design often makes for a more expensive production process. The melted glass which is used to produce opal glass is extremely corrosive, which shortens the life of the tank.

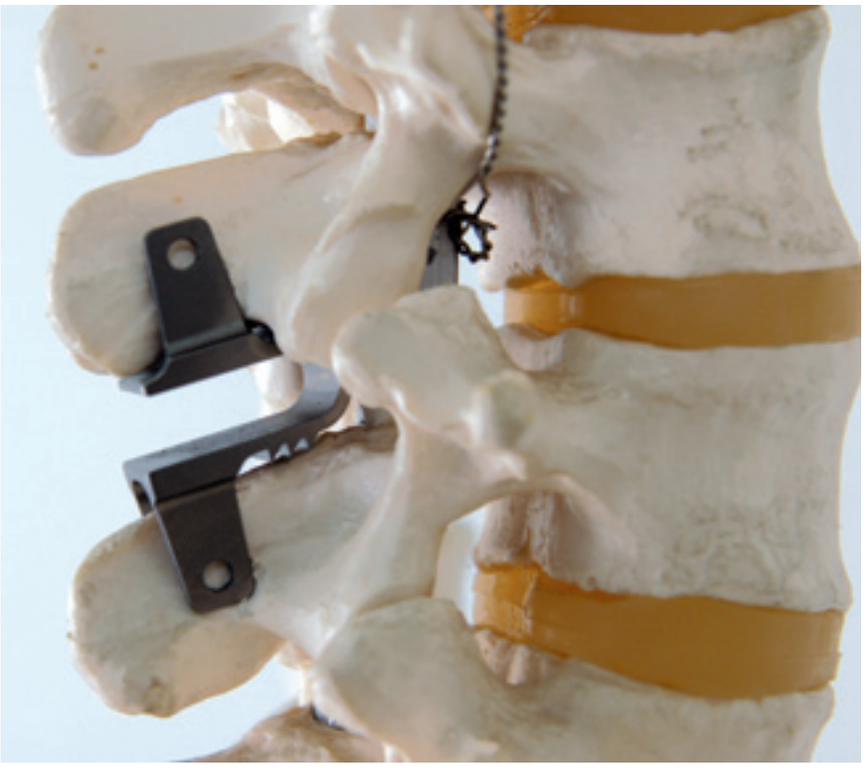
What are the main problems?
As well as the tank, the throat is also corroded. It is what you would call the "Achilles heel" of our production process, requiring costly repairs or even completely new parts. In the worst case scenario, if the tank were to break down, liquid glass with a temperature of over 1000°C would flow out – this would obviously have detrimental effects on the surrounding area, and could even cause the plant to burn down.

What measures have you taken to lengthen the life of the tank?
Working closely with Plansee, we have equipped the tank's throat with corrosion-resistant molybdenum. Initial trials have shown that this will significantly increase the tank's life. We intend to equip our new glass-melting tanks – especially those used for opal glass production – with protective molybdenum sheets in the future. |

Oxidation-resistant rods with quick delivery times

From now on, Plansee HPM will be able to supply SIBOR®-coated glass-melting electrodes faster than before.

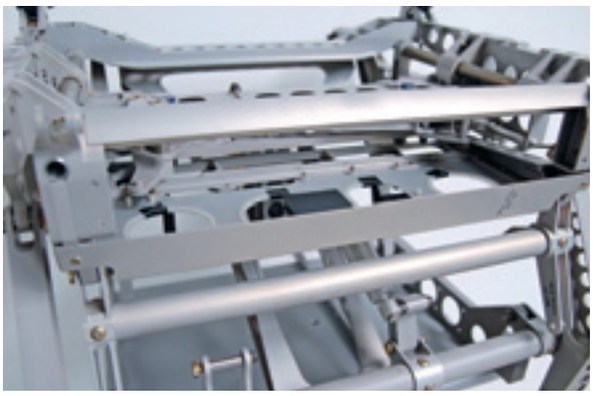
The SIBOR® (silicon and boron) coated glass-melting electrodes are now guaranteed to be oxidation resistant and are available from stock in all standard shapes and sizes. The material structure of the electrodes has been specially enhanced to make it creep resistant, which means it doesn't bow. They also have a forged surface with hard forging skin, which is finished to high dimensional accuracy, bringing additional functional benefits. |



Cutting for medical technologies: Zrinski manufactures titanium implants with Ceratizit tools.

Titanium machining made easy

Whether manufacturing spine implants and bone plates out of titanium, or aircraft seats out of aluminum, Croatian firm Zrinski Tehnologija knows it can rely on carbide tools from Ceratizit to machine high-quality, long-lasting products.



Demanding cutting task: Titanium machining of business class seats modules of leading aircraft manufacturers.

When designing and manufacturing high-quality special products for industries such as medical technology, aircraft and mechanical engineering, precision and quality are key.

The choice of tooling partner is therefore vital. Ceratizit provides a wide range of tooling solutions, from drills to high-speed tools, as well as offering fast delivery times – stocks are always refilled quickly, while tools for testing are provided in a minimum of time.

As their applications are hugely varied, the cutting tool engineers at Zrinski Tehnologija value Ceratizit's expertise in a number of different fields. Head of production at Zrinski, Željko Domislović comments: "The materials we machine place a number of different requirements on our tools. Ceratizit offers exceptionally efficient tools for aluminum machining, while we have always been delighted with the tools used for cutting titanium. When machining a titanium work piece, our Ceratizit solution allows us to machine 130 parts per cutting edge, more than double the number offered by other products. What's more, a significantly higher spindle revolution rate is also achieved."

medical expert

An oval all-rounder for stylish aluminum rim design

Aluminum rims form a key part of contemporary vehicle styling, attraction attention and offering an individual twist. Almost every car produced today is fitted with aluminum rims as standard, while the variety of designs and features is constantly increasing. Ceratizit has developed OvalFlex, a modular machining tool that meets manufacturers' requirements in terms of flexibility, productivity and process security.

automotive

Alloy wheels are primarily found on cars, with production characterized by smaller order sizes with great design variety. One of the biggest challenges facing manufacturers is finding technology that will enable them to meet customer design requests.

During the production process, the unfinished aluminum rims are carried by conveyor belt to the CNC machine, where, thanks to OvalFlex technology, they are rotated at a rate of around 2,000 rpm. OvalFlex was designed exclusively for machining alloy wheels, and its oval form is different from the round shape of conventional turning tools. As such, the tool takes up less space and can enter deeper into the rim, while maintaining height and stability. This increases cost efficiency, as the superior stability allows for greater depths and rates of cut.

A further advantage of OvalFlex is its modular form. A range of tool heads can be mounted on the shanks, while the angles of the heads are also variable. This system is a major benefit to aluminum rim manufacturers, as it means they require fewer specialist tools and can reduce their tool stocks.

Ceratizit has also designed new cutting inserts for the OvalFlex system. The X32 is larger than standard inserts and is extremely stable, while its top faces mean it can be positioned with greater precision. The insert also offers superior balancing of lateral cutting forces, and the top face design means it is better protected against drawing cuts.

Well protected against storms and salt

A skin made of stainless steel is used to protect the upper towers of Stonecutters Bridge in Hong Kong. The steel is cut using a tool specially developed by Ceratizit.

The 1.5-kilometer highway bridge comprises six driving lanes, and is a key gateway to Hong Kong's city centre. To protect the bridge against the local saline air and strong gale-force winds, the top 120 meters of the 300-meter-high upper towers have a stainless steel skin.

Because it is tough and tends to stick together, stainless steel is much more difficult to machine than machining steel. This is why Ceratizit has developed a special cutting insert for a strip-edge milling cutter. The tool achieves good clamping, has a shorter tool overhang, shorter corner radius and shorter cutting-edge radius, which help reduce vibration and lower cutting forces.

Switch contacts that are quicker to fit

Plansee Powertech's new design for its switch contacts makes maintaining switching chambers at power transmission and distribution plants a much quicker process.

Switch contacts protect power transmission and distribution plants against any major damage when a storm occurs. However, it can often take maintenance teams up to a day after frequent or heavy lightning to repair a switching chamber.

Plansee Powertech's completely new switch-contact design makes fitting them to or removing them from the switching chamber much quicker. As a result, repair work takes less than an hour, leading to significant cost reductions for the customer.

Plansee manufactures world's largest HIP cylinder

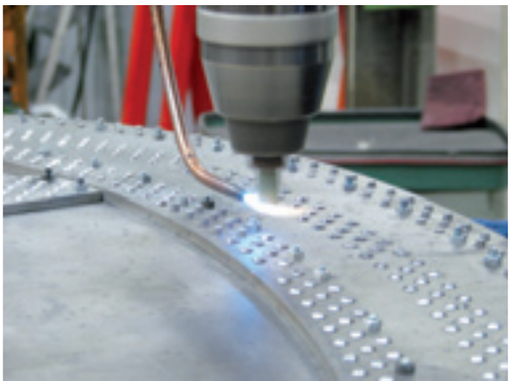
The furnace construction department of Plansee Metall GmbH has manufactured a cylinder for the world's largest hot isostatic press (HIP) for its customer Avure Technologies AB in Sweden, the global leader in high-pressure presses.

The cylinder is made entirely of a doped molybdenum material. This advanced material enables the furnace of this press to operate at temperatures of 1,350 degrees Celsius and a pressure of 1,180 bar. The HIP press is due to start operation in Japan by 2010.

The cylinder that Plansee Metall manufactured for the press is about 5 metres long and measures more than 2.2 metres in diameter. It required about 40,000 rivets to assemble. Ulf Odebo, business unit director isostatic presses at Avure Technologies, comments: "Constructing such a huge HIP press was a step into uncharted territory. The doped molybdenum cylinder, which is the innermost part of a complex heater/thermal barrier assembly, is a key element of the press, and it was therefore vital that we chose a manufacturer who we could completely trust – and who had consistently proved themselves to be a reliable partner through years of working together successfully."

Wolfgang Köck, managing director production at Plansee Metall, says: "Manufacturing the HIP molybdenum cylinder was a real challenge. This major step forward in furnace design required us to draw on all our experience of engineering and construction, as well as our expertise in manufacturing and processing refractory metals. A key factor for the high quality of the finished product is the fact that we were able to handle and thus control the entire manufacturing process, from the powder through to the finished molybdenum cylinder."

Manufacturing this cylinder required the use of Plansee's full range of refractory metals processing technologies: laser and water-jet cutting, tooling, hot working such as spinning, bending and rolling as well as joining using doped molybdenum rivets and flame spraying. |



Plastic injection molding made easy

From now on, Plansee will supply ready-to-use hot runner nozzles for plastic injection molding on order. "By investing in the appropriate processing technology, we can provide finished parts as well as semi-finished ones, meaning we can provide our customers with a one-stop shop for quality products," says head of market segment Michael Androsch.

Plastic injection molding places high demands on the nozzle materials used in terms of heat conductivity, strength and chemical resistance. Plansee's finished parts made from molybdenum and tungsten alloys are ideal for these requirements. |

17 | PLANSEE SEMINAR 2009

The Plansee Seminar 2009

International Conference on
High Performance P/M Materials
Reutte/Austria
25 – 29 May 2009

World's largest conference on powder metallurgical high performance materials

- 25 – 29 May 2009 in Reutte/Austria
- Provisional program and registration at **www.plansee-group.com**
- 250 oral and poster contributions
- 500 industry and research experts from 40 nations expected

Register before April 3 and pay 980 euros for the full five-day program

- entry to all oral and poster presentations
- comprehensive seminar documentation (proceedings on site, CD-ROM)
- catering, transfers, attractive evening program

Phone +43 5672 600 2800 · Fax +43 5672 600 62800 · plansee.seminar@plansee.com · www.plansee-group.com

Excellence in powder metallurgy

plansee GROUP