

compact steel

Issue 03/2016

the thyssenkrupp steel magazine
thyssenkrupp-steel.com

White goods show their true colors

How we implemented an innovative design for washing machines in collaboration with BSH Hausgeräte

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thyssenkrupp



Everything is better when working together

engineering. tomorrow. **together.**

We are dedicating this issue to 'together', the third part of our slogan. For us, it means thinking and working collaboratively both within the Group and, in particular, with our customers.



22 Robert Schlögl (left) and Reinhold Achatz explain how to use renewables to solve a well-known problem.



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It's a familiar shape, but bears a special trait: It is an extremely high-strength specialty steel for Jäkel, the blade manufacturer.



Andreas Goss reflects on... Connectivity!

The digital transformation offers the industry major opportunities, but it also harbors serious risks. It brings us an efficiency increase, quality assurance, and new business opportunities, but it also aids new competitors and shakes up established models. Industry 4.0 changes the rules of how to do business. And above all, it changes how we work together with our customers.

If we manage to set up a consistent and reliable exchange of business, administrative, and technical information between ourselves, our customers, and suppliers while connecting them in an intelligent way, we will reap huge benefits in terms of quality and productivity. Imagine this: In the future you can flexibly determine the quantity, material properties and manufacturing time of your products.

Digitization is a hot topic of discussion everywhere at a diversified industrial company like thyssenkrupp. The production network of the Steel division is particularly complex, which is why we are investigating how we can further improve our value chains and customer links using digital applications. We are creating more and more data spaces in which we can become more closely connected. There is no 'master plan' in the traditional sense. The transformation requires a greater trial-and-error mindset. We are ready to head down this path in order to leverage the opportunities of digitization.

The process takes more than courage. Above all we need to be ready to reinvent ourselves. We need the right spirit to think beyond organizational boundaries and work together. We need to set our minds to quickly developing prototypes and constantly trying new ideas, together with our customers. This is an aspect that we are working on intensively, together with you in keeping with our slogan engineering.tomorrow.together.

Sincerely,
Andreas J. Goss
CEO thyssenkrupp Steel Europe AG

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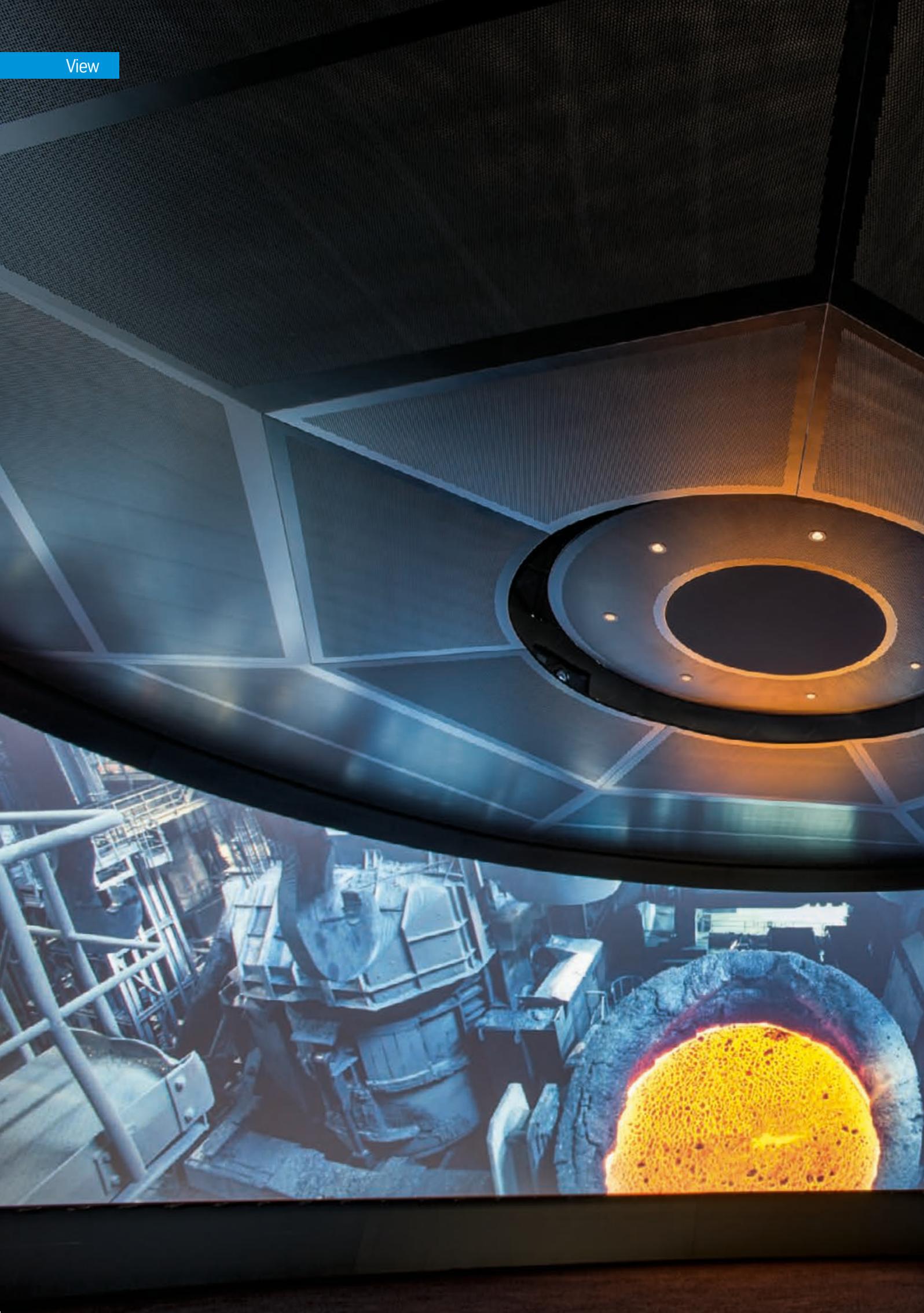


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Our expertise

What happens when you cross snack experts with tinsplate specialists? Ultra-light cans for peanuts.

View





Wide-screen cinema: New ways of looking at steel as a high-tech material

For everything you ever wanted to know about steel, you can now visit the newly designed visitor center in Duisburg, Germany. The 'Stahl hoch zehn' [Steel to the power of ten] experience center offers eventful, entertaining, and fascinating information on a 300-degree screen, so the allusion to the Woody Allen movie title is not very far-fetched after all. The extraordinary panorama look enables viewers to see steel manufacturing and the people who are responsible for it in a different light.

You will also learn more about where this high-tech material is used. Visitors to the center will discover many fascinating exhibits, like an original torch from the 1972 Munich Olympic Games or a luge sled used by the German European champions Eggert and Benecken. The oldest piece on display is a meteorite that is a good 4.6 billion years old. It slammed into the Earth 4,500 thousand years ago, and you can also see it in Duisburg. So, what do a meteorite, thyssenkrupp, and steel have in common? Stop by and find out for yourself!

The new variety

A product range with so many options – thyssenkrupp's dual-phase steels can be used in many ways.

Many criteria must be met if a company wants to be successful in the automotive industry, such as being environmentally friendly, conserving raw materials and keeping costs low at all times. Yet demands placed on safety and comfort are rising. But it is not difficult to design lighter vehicles and make them affordable, as the Product Management area in thyssenkrupp's Steel division has oriented its product range for cold-rolled dual-phase steels more toward the needs of customers and added new grades.

New grades that for example can absorb more energy in the event of a crash, and display improved deformation resistance, or possess enhanced cold-rolling properties. In this way steel is giving customers more freedom in designing their components. The portfolio includes the full spectrum of the upper-range manufacturing classes (500–1,200 MPa), attractive characteristics for crash-relevant components, and new freedoms in the cold rolling of high-strength structural components. Everything is available worldwide in the recognized VDA standard.

Our project engineers in Customer Service and the specialists from Materials Development and Application Technology already offer our customers extensive support in selecting materials in order to ensure processing runs smoothly during production. This allows potential to be leveraged in the best possible way.

For more information:
www.thyssenkrupp-steel.com/dual-phase-steel/

Electric vehicles that are easy to drive

One of the greatest challenges in automobile engineering is weight reduction, even for electric vehicles. Together with its partners, thyssenkrupp Precision Steel has now developed an ultra-lightweight tubular structure using high-strength HBS 800 that reduces the weight of the chassis subframe by one-third. Conventional manufacturing methods can be used in making the innovative tubular structure. In addition, the quantity of offcuts is also reduced and production times are shortened. The chassis components are used on the Asian markets.

10 million

metric tons of coated steel from one facility: The hot-dip galvanizing line in Bochum (or FBA 7 for short) celebrated a special date in history this past October. It has been producing hot-dip galvanized steel strip on state-of-the-art equipment for 25 years.

ProWeld performs the calculations for welding

thyssenkrupp has released a free new web-based tool for heavy plate customers. They can use it to determine the key data for welding fine-grain structural steel. ProWeld, the new tool, offers users support in calculating the carbon equivalent values, cooling times, and minimum preheating temperatures. These and other data are required to optimally exploit the potential of modern specialty structural steels. Customers only need to register online in order to use ProWeld. Follow the link on the website: www.thyssenkrupp-steel.com/heavyplate.

Photos: thyssenkrupp Steel Europe Photography (2), Javier BERNAL REVERT, PR



Eiji Hayashida (worldsteel, left) hands the Steelie Award to thyssenkrupp CEO Heinrich Hiesinger.

thyssenkrupp receives Steelie award

worldsteel has presented the coveted Steelie Award to thyssenkrupp's Steel division in two categories. Group CEO Heinrich Hiesinger accepted the award for environmental performance assessment in product development processes. The jury praised the division's consistent and holistic approach to incorporating a lifecycle assessment for the development of each product. The second prize was for the website. ■

When two people share ideas, it makes a third person happy

Automobile manufacturers and their suppliers in Germany and Japan will greatly benefit from the transfer of knowledge between thyssenkrupp's Steel division and JFE Steel Corporation. The agreement between the Japanese company and Steel includes the exchange of innovative technology licenses for forming processes and provides the basis for long-term cooperation in terms of technology. It includes the CP-F technology from JFE for forming closed sections and the T³ technology from thyssenkrupp, which enables ready-to-fit hollow sections to be manufactured directly from individual sheets. It opens up options for customers to use different technologies. ■

The A to Z of material analysis

thyssenkrupp's Steel division examines solid, liquid, and gaseous materials in its ultramodern laboratories to determine their complex chemical compositions.

Did you know that thyssenkrupp's Steel division maintains a number of Technology and Innovation labs in which nearly 60,000 analyses are performed every month? Employees there examine the compositions of a variety of materials ranging from mineralogical raw materials and metals to coatings and recycled materials. Our lab technicians investigate water, air, and soil samples through routine testing or comprehensive systems analyses to determine the ecological or economic benefits of these products that are so vital to our daily lives. For example, water is both an essential operating resource in manufacturing our products and an indispensable product in maintaining our own lives. One of the most important tasks of our chemists is to regularly analyze drinking, boiler, dump, and waste water. The composition of coal, natural gas, and the gases from coking plants and blast furna-

ces is analyzed to optimize the operational processes and reduce our carbon footprint. In the lubricants lab we investigate which oils and greases are best suited for reducing abrasion or protecting materials from corrosion. The chemists and their analyses enable production processes that are as environmentally friendly as possible and extremely efficient and allow for further processing of by-products or disposal of waste products. We naturally use state-of-the-art scientific methods to investigate our products at every stage of the manufacturing process. We have quickened the pace of our monitoring of metallurgical processes: It only takes us 200 seconds to proceed from the preparatory work to the analysis.

To find out more:
www.thyssenkrupp-steel.com/qualitymanagement



60,000 analyses every month in the labs of thyssenkrupp. Things can get pretty colorful, too.

Precision Steel 4.0

The Initiative Deutschland Digital (IDD) presented its first award for projects that break new ground in the digital transformation process. The precision strip specialist from thyssenkrupp was honored with a Digital Economy Award for digital innovations in Industry 4.0 in the Customer Experience category.



White goods show their true colors

engineering. tomorrow. together.

This is thyssenkrupp's brand promise. For us 'together' means that we support our customers in their work, develop new products with them, and act as a reliable partner.

Text: Judy Born Photos: Noshe



80 percent of the appliances manufactured in Nauen are sent abroad. For the most part, they are white goods.



Working for success
(l. to r.): Axel Pohl
(thyssenkrupp), Robert
Winter (BSH Purchasing),
Sascha Haas, Holger
Letz, Christian Grebe (all
from BSH Nauen), and
Michael Schulte-Zweckel
(thyssenkrupp).

“It’s great that these appliances are rolling off the line thanks to the motivation of everyone involved.”

— Sascha Haas, Head of Local R&D/BSH Nauen

When Constructa introduced its first washing machine onto the market in the summer of 1951, Konrad Adenauer was the Chancellor of West Germany and Theodor Heuss was the President. In East Germany, Wilhelm Pieck, Otto Grotewohl, and Walter Ulbricht were in power. It was the year that marked Germany’s economic boom, which first expressed itself through a consumer push for household appliances. With its front-facing ‘porthole,’ Constructa’s washing machine was the first front loader on the market. Back then, the company proudly advertised how a Constructa washing machine rolled off the line every 50 seconds, and it was sold to a new customer at the same pace. The ad included the claim in the typical sonorous sing-song cadence of the time: “Millions of other people won’t rest until they own one, too.”

Fast-forward 65 years: The Constructa brand now belongs to BSH Hausgeräte GmbH, one of the industry’s leading manufacturers. All developments pay careful attention to the specific needs of consumers, which range from economical use of resources and ease of use to intelligent design features. It takes continuous research and development work to constantly adapt to changing customer needs.

BSH has operated a special laundry technology center in Berlin for all of the company’s brands since 2011. There, developers work on country-specific designs for textile care appliances that implement new features, work efficiently, and save natural resources, in addition to quality management and global IT operations. Martina Wöbkemeier, Head of Materials Technology in Berlin, explains, “Consumers prefer to wash more at lower temperatures in Asia and the U.S. And for India, we sell appliances that include a special laundry program for saris.” In addition, people in Asia demand appliances that work silently. “Building space is limited so appliances are located in living spaces. It means the vibrations cannot be transferred outward.” The expert calls this high-quality sound design. In terms of

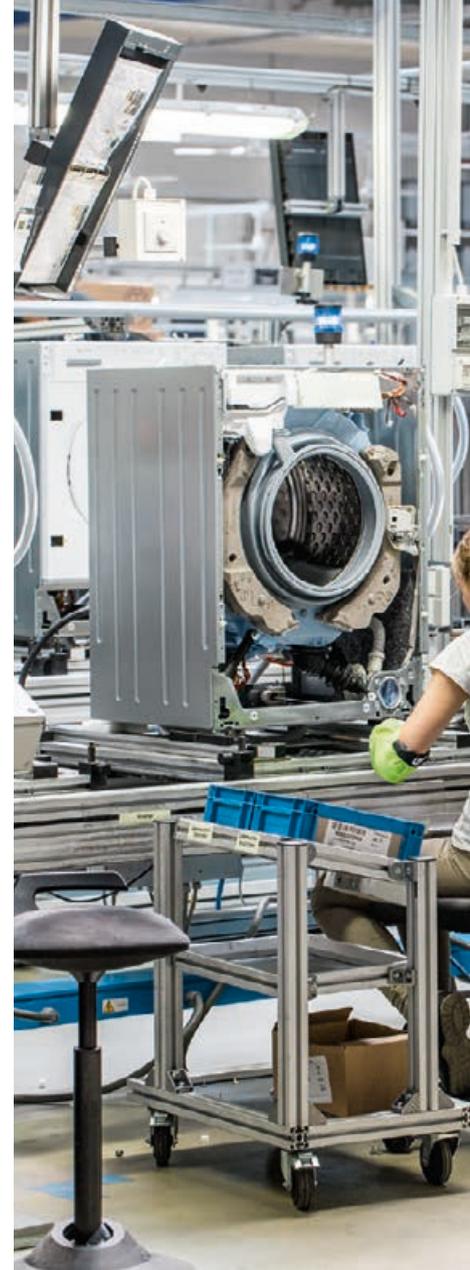
visual appearance, these products have long been termed ‘white goods,’ because refrigerators, washing machines, and dryers are predominately white.

Robert Winter is in charge of global steel purchasing at BSH and also makes sure that all locations have the specific materials they need. “Of course, there are also high-quality stainless-steel appliances, products with a laminated stainless steel design, and special metallic-look designs,” he adds. Axel Pohl, who is in charge of all of thyssenkrupp Steel’s organic coil-coated pladur® products and sales to the appliances industry agrees. “For years, our two companies have been closely cooperating on R&D projects. We are no longer just an important partner for white-painted products. We are also the point of first contact when it comes to high-quality and premium niche products.” The introduction of the new Constructa special models marks yet another expansion of the BSH Hausgeräte family of products. Last year the ‘Classic 65’ was launched in an exclusive design. This year there are four limited-edition



Harald Pietsch

works as a materials technician in BSH’s technology center in Berlin. As a surface specialist, he was part of the development of pladur® Aesthetic Print.



Washing, drying, researching: Washing machines and dryers are developed at the BSH Hausgeräte technology center in Berlin for use around the world.



A tour of the facilities (from left): An employee shows Michael Schulte-Zweckel (thyssenkrupp) and Christian Grebe (BSH) the latest design.



'Deluxe 100' models available in an array of colors. The retro look of the washing machines features a front panel in sunny orange, turquoise, or grayish brown. There is also a model with a black and white floral design. The special attraction is the fact that consumers can color in the flowers with permanent markers, making their own unique design.

It will be several years before BSH's location in Nauen, Germany, will be manufacturing the first washing machines with this coating. Knowledge, passion, and dedicated employees are needed before an idea can be transformed into products. This also requires the right material from thyssenkrupp, which is called pladur® Aesthetic Print. One thing is an absolute must in a household appliance: "It needs to have an absolutely perfect surface," states Robert Winter. The business ties to the Duisburg-based steel company stretch back to the early 1990s. Both companies have been successfully cooperating throughout this



A brief history of BSH Hausgeräte GmbH

The company was founded as a joint venture by Siemens AG and Robert Bosch GmbH in 1967, and since 2015, it has belonged to the Bosch Group entirely. BSH is the leading manufacturer in Europe and ranks second in the world, posting sales of €12.6 billion and employing more than 56,000 employees. BSH Hausgeräte has 80 companies in nearly 50 different countries.

The company's portfolio includes the Cooking and Baking, Refrigerating and Freezing, Dishwashing, and Washing and Drying areas and small household appliances (mixers, vacuums, etc.). Its main brands are: Bosch, Siemens, Gaggenau, and Neff. The Local Hero brands are: Thermador, Coldex, Pitsos, Ufesa, Balay, Profilo, Zelmer, and Constructa. And the Label brands are Junker and Viva.

The company headquarters is located in Munich, Germany. Dr. Karsten Ottenberg from Hamburg, Germany, has been CEO of BSH Hausgeräte GmbH since 2013. There are more than 800 employees from 28 different countries researching and developing laundry care products for all BSH brands at the technology center in Berlin.

The washing machine plant in Nauen exports 80 percent of the appliances it manufactures to South Africa, India, Indonesia, and the U.S. The limited-edition Constructa models are manufactured exclusively at this location and sold through the Sales department in Germany to retailers.

“People have shortcomings”

Harmony in a group is a stroke of luck. **Valentin Nowotny** explains how it can be influenced positively and why hierarchies are no longer right for agile companies.

Interview: Judy Born

Mr. Nowotny, how do conflicts actually arise?

People don't always act logically, and they have their shortcomings. They are apt to forget things, or act inconsistently or on emotions. They are guided by personal interests that affect their professional judgment. Conflicts arise if this goes unchecked. However, 90 percent of these situations can be stopped or avoided entirely with a little psychology and effective methods. The other ten percent requires more specific measures.

What does it mean for companies?

It is becoming more important for them to set up a support culture as companies steer away from hierarchies and become more agile. In traditional structures, these offerings are applied more like patches, I would say. And they are usually only used when the situation has become stuck in a rut.

Speaking of which, when are hierarchies helpful and when aren't they?

Looking at the positive aspect of hierarchies, they can resolve conflicts because there is always someone who has to be responsible for the decision. Often, conflicts arise when people have the same standing and fight for the same resources. Hierarchies organize things, and they enable organizational charts to be made, which is very important in many companies.

But are they still necessary?

No. Employees' needs have changed. From their supervisors, they now require mutual support, intensive exchange of information, and cooperation when developing solutions. However, it's not like someone has to say what is right and wrong. Nowadays we need knowledge workers, and people need to know their contribution to knowledge advancement at every stage of the value chain. It's crazy to think we need one person to make the final decision.

How far along do you think thyssenkrupp is?

I think the image ad on the thyssenkrupp website is interesting because it says, more or less: We don't have an answer to everything, but together, we can find one. It's an example of a modern

company that says the individual cannot know everything. In a company with a hierarchical structure, they would always maintain that the rest will perform the actions that the higher-ups have decided.

What would be good for employees?

It's not good to point a finger at one person in times of difficulties and conflicts. It's best to make changes across the board and for everyone. You ask yourself, how can we change the company to adapt to the people, and not the other way around? Management has to help employees attain success in their jobs. There should be a give-and-take. People should be allowed to develop themselves. I believe it's vital for a modern company to foster team building skills based on psychological methods.

When would be the right time for teams and employees to adjust?

If you want the company to become more agile in a traditional structure, you can offer project-based work. Hierarchies are not decisive in these situations. Employees who have the skill sets and can make contributions do. The problem is that people work without guidance and are left to their own devices in these projects. This gives rise to potential for conflicts. The project leader is in charge of cooperation, but they cannot always work on the right balance of interpersonal interests. Their focus is directed at the project's success, and they are part of the team and biased.

What would be the best way to go about it?

A team that needs to work on a long-term goal needs to develop as a group, with a direction that is provided by an external force, not someone from the company. There are a vast array of instruments and methods to help people learn more about themselves in a group setting. It works quite well in training at the management level, but it should be extended to employees in a team, too. It would be a means to proactively take measures before a team encounters trouble.



Valentin Nowotny is a cofounder of dvct - Deutscher Verband für Coaching und Training e.V. and a psychologist and author ('Agile Unternehmen – nur was sich bewegt, kann sich verbessern').



time – especially on developments related to the introduction of the coil-coating process.

The criteria for the material are demanding. It needs to be corrosion-resistant and formable. The paint coating must not crack during forming or lose brilliance or its tactile properties. “It needs to look like it did on the first day, even ten years later,” explains Harald Pitsch, who works in the Berlin technology center as a materials technician and keeps close tabs on the surfaces. “The material is subjected to enormous pressures when it is formed,” says Michael Schulte-Zweckel, Head of the Sales team for the appliances industry at Steel. “No matter whether it’s a refrigerator door or a front loading washing machine.” Furthermore, the sheet needs to be easy to process. Sascha Haas adds, “Minimal machine downtimes and rejects are also important aspects.” Mr. Haas is Head of Research and Development in the textile care plant in Nauen, and he is a staunch supporter of implementing and using the pladur® Aesthetic Print product. Mr. Haas explains, “It’s a great pleasure for us to be able to manufacture appliances with a unique look. The development of this innovation is in part due to the dedication of our employees.”

In addition to the Product and Design department and Materials Technology, Christian Grebe, Manufacturing Planning Designer, and his team from Nauen also work for BSH there. “In the beginning, it was definitely a challenge to apply Colaminat to the machine. But now we are extremely pleased with the product and cannot complain in the least,” states Mr. Grebe. Alfred Bierhoff closely followed the introduction of the product at thyssenkrupp’s steel manufacturer over many years. “The first prototypes were available in 2010,” explains the technical customer service

Approximately 80 percent of the appliances manufactured in Nauen are exported (above).

Customizing with Constructa: Sascha Haas is proud to manufacture the special models in Nauen.

associate from Siegen-Kreuztal, Germany. “You must never give up and you need to continually show customers new possibilities. My job is to recognize difficulties and find solutions.” Teamwork is decisive here: in interactions with the customer, the supplier, and with one another. Mr. Bierhoff adds, “Mutual trust, which is a product of long years of cooperation, has helped greatly. Of course, we have had tricky situations, which makes it all the more important to stay in close touch.”

The critical stage was achieved around two years ago, and gave rise to a partnership with another company: a thermal sublimation printing company. The color and design are produced in the material by the thermal sublimation method. It enables a high level of color saturation and definition, and it is an important feature of pladur® Aesthetic Print. There needed to be a massive transfer of know-how from all involved for this project to be successful. Together, it was possible to develop a premium product that can be used for washing machines and other appliances. The ‘Classic 65’ was the first limited-edition model available, which was a recipient of the 2016 Red Dot Award for product design. And it is already sold out.



Martina Wöbkemeier

is Head of Materials Technology in Berlin and has always been interested in ideas for new product and development options.

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Cutting-edge invention

thyssenkrupp developed a patented specialty steel for Jäkel, a manufacturer of blades for machinery.

Text: Dagmar Haas-Pilwat
Photos: Julia Unkel

Riding and push lawn mowers need the right blades if they are to work properly. Shredders, feed mixers, and presses used in modern agricultural settings also cannot do without sophisticated cutting tools. Based in Diemelstadt, Germany, Jäkel is one of the leaders in Europe for high-quality blades.

All production tools for the various cutting products are developed and manufactured in the in-house tool shop. The company processes 6,000 metric tons of steel annually, which it uses to manufacture nearly 2.8 million parts. The majority of them used to be made of wear-resistant spring steel, which is susceptible to breaking, or very tough boron steel, which does not hold an edge well. However, this year, a pioneering innovation proved its mettle in the fields and meadows of Germany and abroad. The family-owned and run company developed JADU-H1, a specialty steel, together with the thyssenkrupp Steel division. Frank Jäkel explains, “We wanted a hybrid product that combines the properties of spring and boron steels.” He has run the company at his brother’s side since 2001. It had to be a steel that could hold an edge and remain sharp as long as possible without breaking immediately after hitting stone. “It was a tremendous challenge that we mastered together,” states Christian

“It’s admirable how such a large global company would work on a development for a specialized business.”

Udo and Frank Jäkel, Managing Directors and owners of Jäkel GmbH & Co. KG



No blade left uncut by this blade – farming equipment for hay and grain harvesting with blades from Jäkel.

Sohrab, Head of Sales of Specialty Products for Steel’s Business Unit Industry at thyssenkrupp. An analysis was performed to design a basic concept to show how a steel with these properties could look like.

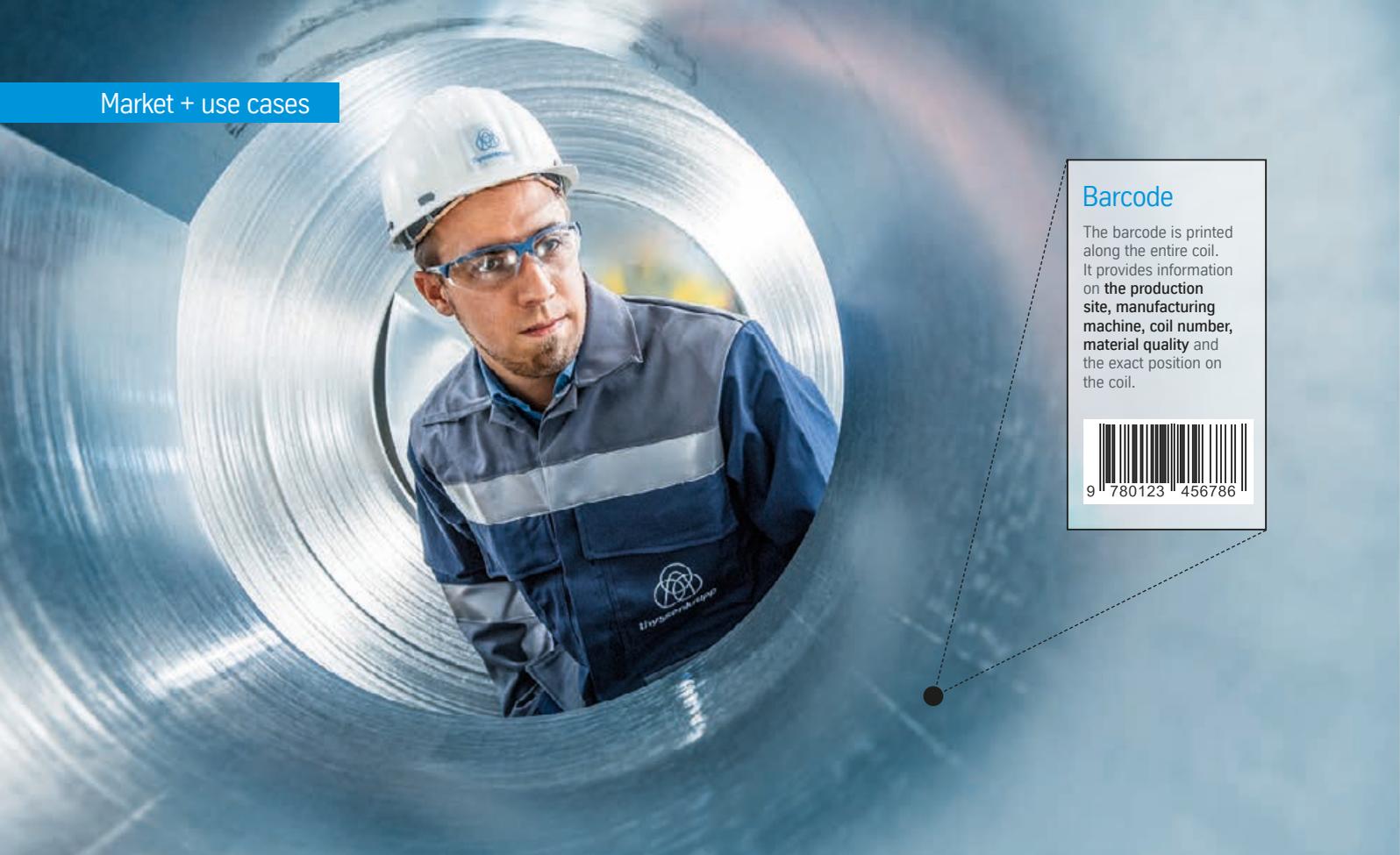
Next came the precision strip specialists from Precision Steel after trial runs at the Dortmund testing facility. They sent the required 30 metric tons of steel for the first batch. “We made adjustments until our partner thyssenkrupp Stahlkontor in Krefeld could process the sheets on the hot-strip line,” recounts Sohrab. “Cutting to length was very demanding for us,” explains Andreas Beil, the man in charge. “The new property – particularly tough, yet wear-resistant – required many changes to the manufacturing parameters.” It was the only way to attain a consistent level of quality while producing a steel that was ready for production. “In particular, our risk was having the JADU-H1 be too brittle. The market is unforgiving,” explains Jäkel. All efforts, from the manufacture of the molten metal to cutting to length of the finished material, were carried out together until a solution was found. The Jäkel brothers pointed out that this is not always a given. They genuinely admired how a large steel company could dedicate time and effort to a special request from a specialized business and drive innovation in the process. Together, they managed to do the impossible by developing JADU-H1: an affordable specialty steel. 30,000 blades have been sold this year, and customers have given “very positive” feedback after completing the first harvest of the season, according to the Jäkel brothers.

This successful venture makes spirits soar high: “Now we can further optimize and expand our newly patented steel,” boast Frank and Udo Jäkel. That’s why the ‘H’ in the product’s name is followed by a ‘1.’

Lined up for inspection (from left): Frank Jäkel, Christian Sohrab (thyssenkrupp Business Unit Industry), Udo Jäkel, Andreas Beil (thyssenkrupp Stahlkontor).

Contact: Christian Sohrab, Business Unit Industry, +49 203 524 0482, christian.sohrab@thyssenkrupp.com





Barcode

The barcode is printed along the entire coil. It provides information on the **production site, manufacturing machine, coil number, material quality** and the exact position on the coil.



End-to-end coil information

Cloud computing, Internet of Things, smart factory – all wrapped up into Industry 4.0.

Companies cannot survive nowadays without connectivity along the value chain. It is a hot topic in every industry, and the steel industry is no different. And for those who have not jumped on the bandwagon, it's high time to do so. A company's future success rides on it.

thyssenkrupp's Steel division is undergoing a digital transformation. It has an impact on every department and will change the manufacturing and delivery processes. Even customers are more accepting of it and want to start connecting with Steel in order to benefit from the synergies. Thorsten Grünendick

The **barcode** will soon be a means to track quality data about each meter of the product.

from Quality Management at Steel states, "Today we know more about our coils than ever before." The barcode, which is printed continuously over the entire length of the coil, makes it possible for steel manufacturers to provide important additional information on the product in order to track the quality of the product meter-by-meter. He adds, "The technology is a quantum leap. We can provide processing companies with information on the production site, manufacturing machine, coil number, and the exact position on the coil."

The objective is to provide additional quality information with the coil. "This information can help our customers. It's a means to connect individual coil sections with our quality data and detect the exact position." thyssenkrupp is one of five steel manufacturers that are cooperating on this digital solution. These

companies have banded together under Eurofer, the European steel association, to develop the new technology into a European standard. This will ensure that all barcodes can be scanned by one type of barcode reading system, regardless of the steel manufacturer.

thyssenkrupp has already performed a successful first trial run and delivered the coded coils to several customers. Grünendick explains, "The customers were able to read the barcodes with their scanning devices. It proved accurate to the meter."

This translates into greater reliability on the manufacturing line for customers. They can track defects more precisely, saving a great deal of time in the process. —jb

Thorsten Grünendick, Quality Management, +49 203 522 4678, thorsten.gruenendick@thyssenkrupp.com

Introducing the new team!

thyssenkrupp's Steel division has reshuffled the cards in Sales. The **Business Units (BUs)** are focusing specifically on the needs of their customers, respective markets, and structures.



1
Dr. Heike Denecke-Arnold
CEO BU Precision Steel

thyssenkrupp Hohenlimburg GmbH now operates as the Business Unit Precision Steel. Dr. Heike Denecke-Arnold is CEO of this unit. She was previously in charge of the Functional Department Sales Strategy/Planning at thyssenkrupp Steel Europe AG.

2
André Matusczyk
CEO BU Automotive

The Sales Automotive department is now operated as Business Unit Automotive. André Matusczyk is its new CEO. He previously worked for many years in the international automotive industry, helping him gain both excellent materials expertise and market knowledge.

3
Dr. Jens Overrath
CEO BU Electrical Steel

thyssenkrupp Electrical Steel GmbH is now operated as the Business Unit Electrical Steel. CEO Dr. Jens Overrath previously held the position of Managing Director at thyssenkrupp Hohenlimburg GmbH.

4
Volker Senger
CEO BU Heavy Plate

The Heavy Plate Unit has been operating as the Business Unit Heavy Plate since October. CEO Volker Senger contributes his knowledge and experience of the industry to the heavy plate business at thyssenkrupp.

5
Dr. Peter Biele
CEO BU Packaging Steel

Dr. Peter Biele, previously the Managing Director of thyssenkrupp Electrical Steel, is now CEO of the Business Unit Packaging Steel, thyssenkrupp's tinplate specialists. Previous Managing Director Dr. Ulrich Roeske has entered into retirement.

6
Bernhard Osburg
Head of Sales Steering

The new functional unit Sales Steering is headed by Bernhard Osburg, who was previously in charge of Sales Automotive. Sales Steering bundles and coordinates the sales activities of the business units.

7
Jörg Paffrath
CEO BU Industry

The Sales Industry unit headed by Jörg Paffrath is now being operated as the Business Unit Industry. Jörg Paffrath contributes his many years of experience in this area as CEO of the business unit.

Staying in shape

thyssenkrupp now also delivers custom shaped blanks thanks to cooperation between the steelmaking and service operations.

New service campaign launched at thyssenkrupp: The Group is expanding its offering for hot forming companies. In Duisburg, it is now possible to order manganese-boron steel for hot forming in the form of custom shaped blanks instead of coil. The customer then only needs to press them into the component they need. Matthias Berens, Product Manager at Steel, explains, "It's an attractive option for both car manufacturers and component suppliers. There's now a great need for this service. It means our customers have one less processing step and no extra costs for disposal of the scrap produced when cutting the blanks."



Dieter Smits (thyssenkrupp Schulte, left) and Matthias Berens (Steel) are coworkers. And now, even business partners.

For this, the Steel experts at thyssenkrupp are working together with supply chain specialists thyssenkrupp Schulte. "There must never be any break in the supply chain," says Dieter Smits from thyssenkrupp Schulte.

He works in the service department of the Essen-based company and is in charge of timely, reliable delivery of the shaped blanks. "Our specialty is supply chain management, which is why we have the right network and IT

support to back it up." When discussing the organizational workflow, Matthias Berens explains: "We at Steel deliver flat steel as coil. Our service experts at thyssenkrupp Schulte coordinate custom blanking and all subsequent steps in the logistics chain right down to delivery of the shaped blanks to our customers. We recycle the scrap, or rather the remainder of the cuts, so our customers don't have to deal with it."

Combining these competences within the Group gives thyssenkrupp's automobile customers an additional service and fast and transparent handling of deliveries. —jb

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Very qualified and specialized: Processing companies such as WISCO Tailored Blanks GmbH cut the blanks for thyssenkrupp to the right shape.



Enjoyment comes in a can



Did you know...? When you hold a can of ültje peanuts in your hand, you are holding a product from thyssenkrupp's Steel division.

The singing „ültje man“ first appeared on German TV in a 1989 commercial and went on to become a marketing icon for an entire generation, making the ültje brand a household name. When people talk about peanuts, 90 percent of Germans think of ültje.

When a product is immediately associated with the company's name, it means that the company did something right over the years. By the way, 'ültje' means peanut in the East Frisian Low German dialect. Alfred Russell registered his company, Russell AG, in Emden, which has grown to become the largest city in East Frisia, in 1867. However, it was not until 1949 that the company roasted and sold peanuts. They were initially sold in vacuum-sealed glass jars. Gradually, by 1970, they started to be packaged in cans. Now, ültje is the market leader in the nut snacks segment and sells a variety of nuts in a variety of flavors. They are flavored with spices, roasted, or left unprocessed. Customers can find the majority of these products in cans made of tinfoil from thyssenkrupp. Marketing Manager Oliver Krück says, "The ültje can is a typical symbol of our brand. It's sturdy and stands for freshness because the sensi-

tive nuts are protected from oxygen and light." The company, which moved its registered office to Schwerte, Germany, in 2000, sources its cans from Auxiliar, a manufacturer in Spain.

From Spain to the table

The steel comes from Andernach, Germany, where trucks are loaded with coils nearly every day to transport the tin- and chrome-plated material to the Murcia, Spain manufacturing site. There, the coils are slit, coated, and printed. The tinfoil experts from thyssenkrupp supply approximately 25,000 metric tons of material per made of tinfoil from year to Auxiliar Conservera S.A., who in addition to cans for peanuts manufacture many types of packaging for European producers, such as

cans for fruit, vegetables, and seafood as well as olive oil canisters. Auxiliar uses very mild grades for the oil products, but for nut cans with a easy-open lid, for example, it relies on higher-strength, double-reduced grades. thyssenkrupp ensures a continual supply of the required types of steel via a materials warehouse that was set up especially at Auxiliar. The trust placed in the cooperation with the medium-sized Spanish company has grown over the decades. Miguel Valdivia, Customer Service Consultant at Packaging Steel, says, "We know each other well. It's an innovative company with which we enjoy testing our newest developments and advancing our improvements together." ültje also needs to continue to develop the company in new directions, pursuing innovations including kettle roasted nuts with a thin chili or hot pepper flavored batter, or offering customers the option to design a customized packaging sleeve – for the cans of nuts, of course.

—jb



The variety of ültje products: Every month, nine to ten million Germans reach for a handful frequently.

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Making use of steel mill gas

thyssenkrupp launched the Carbon2Chem® project to research ways to economically utilize CO₂ and contribute to climate protection and the energy transition.

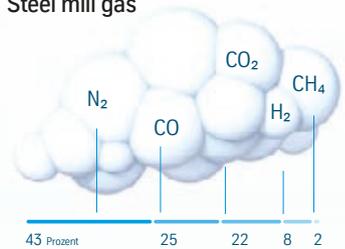
1

Integrated steel mill

In the past, the gases from the steelmaking process were only used to generate electricity and heat for the manufacturing process. Steel mill gases contain hydrogen, nitrogen, and carbon, among other substances – these can be used to produce numerous chemical products, thanks to Carbon2Chem®.

Integrated steel mill

Steel mill gas



Steel mill gas

All molecules in steel mill gas, including the CO, it also contains, can be used as raw materials.

2

Power plant

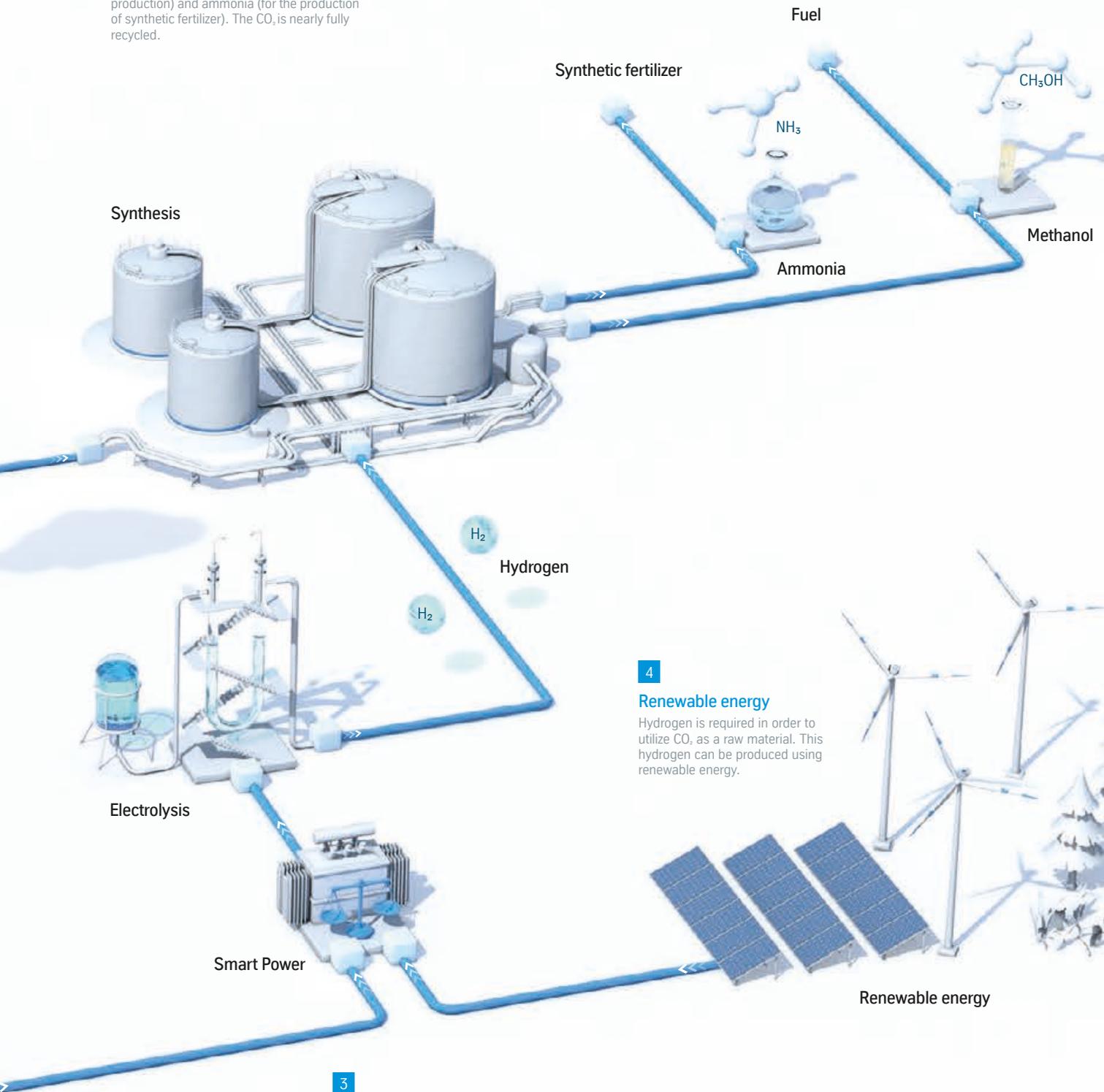
The concept of the integrated steel mill means using one part of the steel mill gases for generating electricity and heat for the manufacturing process. The remainder will soon be diverted to the chemical production process.

Power plant

5

Chemical products

The gases from the steelmaking process can be converted into methanol (for fuel production) and ammonia (for the production of synthetic fertilizer). The CO₂ is nearly fully recycled.



3

Pretty smart

The chemical production process is provided with an uninterrupted supply of power using a load-balancing module, with priority given to renewable energy sources. If none are available, electricity is supplied by a power plant.

4

Renewable energy

Hydrogen is required in order to utilize CO₂ as a raw material. This hydrogen can be produced using renewable energy.



The right chemistry means a lot to Robert Schlögl (left) and Reinhold Achatz.



“We need to recycle carbon”

The plans made by [Robert Schlögl](#), Director of the Max Planck Institute for Chemical Energy Conversion, and [Reinhold Achatz](#), Head of Technology at thyssenkrupp, call for implementing the energy transition with Carbon2Chem®.

Interview: Judy Born

Photos: Catrin Moritz

Half of the problems in the energy equation can be resolved by reductions, but we still need solutions for the other half.

— Robert Schlögl

What is the Carbon2Chem® project about?

Achatz: The long-term goal is to use the gases from the steelmaking process as a raw material for producing chemicals such as ammonia and methanol, instead of using the gases in power plants to generate electricity. This way, we can sustainably reduce our CO₂ emissions. Renewable energies can then be used to generate the additional hydrogen that we would need for this. Carbon2Chem® converts the carbon from the steel mill gases into energy, rather than releasing it as CO₂ into the atmosphere.

Schlögl: There is a completely new approach. As a rule we try to reduce CO₂ emissions by lowering the amount created. However, this is no longer possible in steelmaking. In Germany, we're already working with the lowest amount of carbon possible. The situation is similar in other industries, such as glass and cement manufacturing and limestone calcination, as well. Carbon is also indispensable here, so there'll always be a significant quantity of CO₂ sources.

Can Carbon2Chem® be adapted for use in other areas?

Schlögl: Sure. That was our plan from the very beginning. It would have been very shortsighted of us to have limited it to one application, especially with the tremendous amount of research that is necessary. We're developing a kit with which you can create modules to implement the energy transition. That's our goal. And thyssenkrupp is really a pioneer here in its efforts as the first business to cooperate with scientists.

Achatz: This presents an opportunity for all 17 project partners who are involved in the Carbon2Chem® project. We're not looking at a

single answer. Ultimately it should be possible to mix and match all technology modules. The initial application in steelmaking can definitely be used in other variations several hundred times over – such as in the cement industry, an area in which thyssenkrupp is also involved.

Let's address renewable energies. How do you plan to use them?

Achatz: All technologies that are developed as part of the Carbon2Chem® project will be required in implementing the energy transition. If we want to use all the renewable energy generated, we need to be able to store it, or increase the flexibility of consumers. Because you can't decide or make long-term predictions about when the wind will blow or the sun will shine.

Schlögl: And we need a solution for this, too. It's only one of many building blocks. We need to take a systematic approach and consider all options through to the end to see what consequences the results will have for the next building block. Many of the ideas are far from new, but we're trying them for the first time and seeing whether they work in unison. It doesn't help if we reduce harmful emissions at one point only to emit them elsewhere. Or worse yet, produce new ones.

Achatz: That's why, we want to use Carbon2Chem® to recycle carbon from the steel-making process rather than releasing it into the atmosphere.

So you're also developing options to store energy?

Achatz: Exactly. It is one of the many building blocks in the Carbon2Chem® solution. The main problem with renewable energies is not the amount of energy, but rather the way it is distributed over time, which is not in line with consumption.

Schlögl: We don't have a surplus of energy right now because the grid simply cannot store the surplus. At present if more solar or wind power is generated than consumed, some of the solar panels or wind turbines are simply switched off.

Then you don't necessarily need a surplus of energy to generate the required quantity of hydrogen?

Schlögl: No, you can build wind farms and solar power plants that generate energy solely for this purpose. But at the moment we're not pursuing that avenue for economic reasons. It's relatively difficult to set up the necessary systemic

17

partners from industry, business, and research are working on implementing and funding the Carbon2Chem® project. The German Ministry for Education and Research is providing €60 million in funding for the project.



Robert Schlögl (left) and Reinhold Achatz joined us for the interview at thyssenkrupp in Essen.





processes in the areas where we could build the relevant power plants.

So how are things looking now?

Achatz: We had the groundbreaking ceremony for our Duisburg technology center on 2 November. Together with our partners, we will work with real steel mill gases on the periphery of the mill within a year's time. The teams will spend anywhere between a few weeks to several months there. Otherwise, our partners will be researching at their respective companies.

Schlögl: Carbon2Chem® can be divided up into several sub-areas. We have of course defined interim goals, which is an essential aspect of long-term projects. It puts us in the position to adapt to changes in the world as necessary.

Achatz: We at thyssenkrupp need to keep moving in this direction and remain agile in all of our developments. It's the only way to reposition ourselves as it becomes necessary.

What benefits does this project hold for thyssenkrupp AG and, more specifically, the Steel division?

Achatz: We need to create the basic condi- ➔



We need to store the energy generated by renewable sources if we want to use it, too.

— Reinhold Achatz

► tions to keep steel production in Germany. The challenges lie in our competition, such as China, and the EU climate targets. We need to find a way to produce steel in Europe efficiently without emitting high levels of CO₂.

Schlögl: Low CO₂ emissions are the key. We're recycling the carbon and offering it as chemicals for further processing. These chemicals can also be used by other companies for their purposes, so they don't need to use carbon to produce them themselves.

Achatz: And there's more. We want to use the Carbon2Chem® technologies for other areas, too, by opening them up to a global market through our Industrial Solutions Business Area. Selling these systems will allow many other companies to save CO₂ and use the methods to recycle carbon. We hope that the multiplier effect will be substantial.

You mean that thyssenkrupp will partner with the chemical and energy industry?

Achatz: We already are, but it will strengthen the partnership. We have been building a lot of the chemical and power plants in Germany, as well as the rest of the world, for some time. We are already pumping energy and heat back into

People

Prof. Robert Schlögl

is founding director of the **Max Planck Institute for Chemical Energy Conversion** in Mülheim an der Ruhr, Germany. He has held an honorary professorship at Duisburg–Essen University since 2013, and has headed the Fritz Haber Institute of the Max Planck Society since 1994. He also teaches at the Technical and Humboldt Universities of Berlin.

Dr. Reinhold Achatz

has headed the **Technology, Innovation and Sustainability** directorate of thyssenkrupp AG since 2012. Previously, Dr. Achatz held the same position at Siemens AG, where he began his career as a software engineer in 1980. He is a member of numerous organizations and institutes, such as the German Council of Science.

the grid, even if it's only regionally. There are plans in place to increase these efforts. We are definitely supporting the energy transition.

Schlögl: Consider it for a minute. Who else is in a position to tackle and implement the energy transition, if not industry? As scientists, we can deliver the tools, but only industry can restore order to the global carbon cycle.

Achatz: Sustainability has long been an important goal for thyssenkrupp – in terms of being economical, environmentally friendly and socially responsible. Of course, there are harmful technologies, but there are also technologies that help us. With Carbon2Chem® we are clearly focusing on the latter. And it's not enough to just have one technology. We need the combination of several different technologies working in unison. There's no other way of approaching the energy transition than viewing it as a whole so that a solution can be found.

Is it at all possible?

Achatz: It has to be. Not just for us in industry, but also for society. We've taken a two-track approach at thyssenkrupp for this very reason. On the one hand, we have the Global Energy Efficiency Program (GEEP), which was developed to reduce harmful emissions. On the other hand, we have projects such as Carbon2Chem®, with which we can take the first steps toward recycling carbon. That's not a contradiction because as we said we cannot solve the issue with just one method.

Schlögl: In general, you can say that half of the problems in the energy equation can be resolved by implementing savings measures, but we still need solutions for the other half. That's already posing huge challenges for us to tackle in the next ten years.

2017

January



2017 UPAKOVKA
24–27 Jan., Moscow, Russia

The 25th annual international trade fair for packaging machines, materials, and equipment will be held in Moscow next year. The Packaging Steel Business Unit from thyssenkrupp will be in attendance as a partner of the steel packaging manufacturers of Russia and Eastern Europe in Moscow.

2017 BAU
16–21 Jan., Munich, Germany

thyssenkrupp's Steel division will be in attendance at the international trade fair for architecture, materials, and systems. The division will present its innovative solutions from the Color area as a co-exhibitor at the German Steel Federation's booth. Attractive and functional surfaces that are part of the pladur® brand will be in the spotlight, as it offers a variety of options for facade design with its wide product range.



May

2017 METPACK
2–6 May, Essen, Germany

Once every three years, the metal packaging industry meets in the German city of Essen for the METPACK trade fair. Whether the sector is food and drink, cosmetics, pharmaceuticals, or confectionery, the demands on products and their packaging and presentation are continually growing, and for this reason, the interest in innovative technologies and materials is large. The Packaging Steel Business Unit will be in attendance at the international trade fair as an innovative partner of the steel packaging manufacturers.



2017 CWIEME
20–22 Jun., Berlin, Germany

CWIEME is considered the leading international trade fair for coil winding, isolation, and electrical manufacturing. Representatives from the transformer, electric motor, and energy generation industries from around Europe meet here every year. The Industry and Electrical Steel Business Units will be in attendance to present their innovations.

June



Marcus van Marwick, Head of Brand & Customer Communications, is responsible for all publications and events geared towards customers and business partners.
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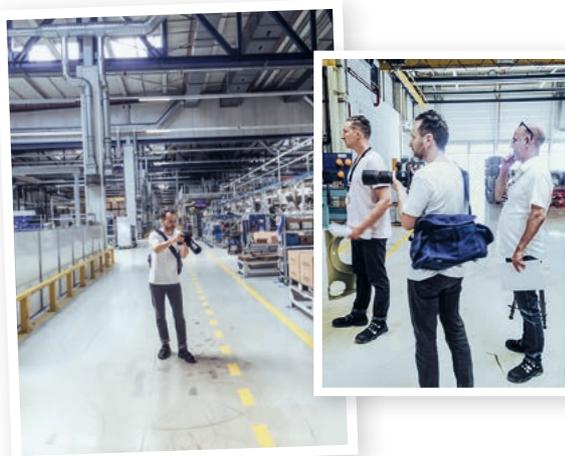
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compact^{steel} near you

We developed our cover story for compact^{steel} at the BSH Hausgeräte production facility in Nauen, Germany. The creative team worked feverishly to shed the right light on the respective protagonists. We also watched how washing machines were manufactured, from the production of the housing to the shipment of the finished product. An astonishing fact: Some laundry cycles last longer than it takes to manufacture the machine.



Photos: PR (4), CS (2)

How old is the Statue of Liberty?

One of the most famous ladies in the world celebrated her birthday on 28 October. If you know how many years she has been watching over the New York Harbor, write us!

One winner of an iPad mini3 will be chosen at random from all the correct entries.

Enter the competition online at www.thyssenkrupp-steel.com/challenge or e-mail your answer to compact.tkse@thyssenkrupp.com with Competition in the subject line. All entries must be submitted by 20 January 2017. The winner will be chosen at random from the correct entries. The entrant is not required to pay a fee or perform a service to participate. Employees of thyssenkrupp steel Europe AG and their dependents are not eligible. The judges' decision is final. Note: Your personal data will be used for the purposes of the competition only.