

# steel

## compact

# Clear way forward for steel

Investments in quality and premium grades.  
Transformation to green steel.

Page 8

Chassis:  
Steel is the material  
of choice

Page 22

Hydrogen:  
Key to climate-neutral  
steel

Page 16

## Premium cut-to-length sheets

Through an organizational realignment, thyssenkrupp Steel is charting a successful future for its cut-to-length sheet products.

38



## The chemistry is right

The chemical laboratories monitor production processes, conduct material tests and ensure compliance with environmental and safety standards.

42

## Facade experts

DS Stålprofil relies on the textured surface pladur® Relief Icecrystal in the production of steel profiles for roofing and facades.

36



## Interview

CIO Dr. Michael Kranz talks with steel<sup>compact</sup> about virtual teamwork, data resources and future worlds of work.

18

## Cold shower

The digital transformation at Precision Steel in Hohenlimburg continues with the digital integration of the shower cooling area.

20

## Ultra-promising

powercore® high-quality grain oriented electrical steel will play a key role in the transition to renewable energy.

34

### Credits

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# “We will remain at your side as a strong partner.”

**A**t the end of March, the container ship “Ever Given” ran aground, blocking the world’s most important shipping lane by tonnage – the Suez Canal: a major artery of globalization. Within a short time, hundreds of ships were backed up behind the stricken vessel. If a symbol was needed of how fragile the global supply chain is, this was it. No one needed this reminder, because after more than a year of the pandemic it is clear that there are widespread disruptions affecting the interconnected global economy, including steel. The coronavirus will very likely change more than we can yet foresee. We all have to hold course in the pandemic and steer our businesses through often uncharted territory.

In addition to dealing with the consequences of the pandemic, thyssenkrupp Steel has made important decisions in recent weeks. First and foremost: Steel will remain independent. We will continue to evolve under our own steam. The process to sell the steel business has been terminated. We are currently examining the possibility of making our business more independent so that we can create even more value as a pure player. Our course is now clear, and this is an important and strong signal for our customers and our employees.

This course includes implementing major investment projects under our Strategy 20-30. We are strengthening our premium portfolio by investing in the quality and flexibility of our production network. And, as part of our transformation to climate-neutral steel production, we will also be offering all our products “in green” in the future.



**Bernhard Osburg,**  
CEO thyssenkrupp Steel Europe AG

The coronavirus pandemic has caused considerable economic damage that will continue to affect us for some time to come. We will therefore continue to restructure and work on our costs and efficiency to ensure that we achieve the goals of our Strategy 20-30. We will not waver from this.

We might not have run aground in the pandemic, but like most of the steel industry we were badly shaken, with consequences to this day: steel is currently a scarce commodity. The complex production processes for steel cannot respond to changed order structures at short notice and on a broad front at the push of a button. The supply situation is therefore still significantly impacted, although we have been gradually reducing short-time working and increasing capacities accordingly since September 2020. We aim to get supplies back to normal as soon as possible. Unfortunately this will not be the case before the summer of this year. And of course we are also dependent on reliable forecast figures from our customers.

The pandemic will continue to demand a great deal from us. However, as it moves into its second year the economy is proving more resilient than expected, with good growth prospects for this year and next. thyssenkrupp Steel will systematically pursue the forward course now embarked upon. And we will focus on the most important thing: to remain a strong partner at your side.





# All for Love

thyssenkrupp Steel is one of the world's leading flat steel producers, Kaldewei one of the most innovative suppliers of premium steel enamel bathroom solutions. So when these two companies combine their expertise, it's no wonder something special results. One example of this is the beautifully designed "Ming" washbowl, part of Kaldewei's new collection for 2021. By the way: The photo shown here was taken by megastar Bryan Adams. Under the motto "Natural Union", the Canadian rock musician and photographer wants to send out a call for more togetherness in controversial times.

More information on the Kaldewei campaign with Bryan Adams can be found under:  
[www.thyssenkrupp-steel.com/en/kaldewei](http://www.thyssenkrupp-steel.com/en/kaldewei)

# Knowledge & value

## Award winners



## Excellent management

Continuous improvement pays off: thyssenkrupp in Hohenlimburg has once again been awarded the Ludwig Erhard Prize, this time in silver. The award recognizes organizations that embrace the concept of excellence: In addition to business success and competitiveness, social responsibility also plays a role. "These days no company can stand out from the competition on the strength of its products alone. You need a holistic approach - processes, mindset, production," says Norman Baltrusch, CFO of the business unit. Baltrusch sees the rolling mill's holistic digitization strategy (see also p. 26), which builds on the strengths and skills of employees and has opened the way to new business models, as a key success factor.



**thyssenkrupp Steel – across all channels!**

Stay up to date about the latest trends in the steel sector. Follow us online! We are present on all popular social media channels.

Confirmed: Experts from RWTH Aachen University endorse thyssenkrupp's implementation of new climate strategy

## Study confirms climate plan

RWTH Aachen scientists' study confirms: concept technologically feasible, scalable and innovative. All existing steel grades can be produced in the usual quality due to retention of steel mill.

A team led by Prof. Bernd Friedrich, head of the Institute of Process Metallurgy and Metal Recycling at RWTH Aachen University (IME), has investigated thyssenkrupp Steel's plan to integrate direct reduction into an existing iron and steel mill via a new type of melting unit. The result: the plan is technologically feasible, scalable and innovative. The scientists confirm thyssenkrupp's key assumptions: the planned melting unit is suitable for melting the iron reduced in the direct reduction plant to produce a liquid product similar to pig iron for the melt shop. The "melt shop" factor is essential for thyssenkrupp Steel

in the climate transformation process. As part of its corporate strategy, the company is banking on high-quality premium grades and therefore on the established processes used in its Duisburg BOF melt shops. The study provides external confirmation of the company's blueprint for integrating direct reduction into the steel mill network. The entire grade portfolio can be produced in a climate-neutral way in the future, including all premium grades.

➤ More on page 16



## In figures

# 97%

of the water consumed by thyssenkrupp Steel in Duisburg is treated after use and fed back into the production cycle. The service water recycled up to 40 times in this way is equivalent to the annual fresh water requirement of all the households in North Rhine-Westphalia.



We are now starting on the important revamp and rebuild of our core units. The supply of all products to our customers during this period is ensured."

**Dr. Arnd Köfler,**  
Chief Technology Officer  
of thyssenkrupp Steel

➤ More on page 8





## Campaign

### #nichtkönnitemuss

Green steel is the new organic. That's one of the slogans being used by the German Steel Federation (WVS) to highlight the opportunities offered by green steel production in Germany. Climate-neutral steel production will make a significant contribution to reducing industrial CO<sub>2</sub> emissions in the future. The WVS explains what is needed in its latest information campaign #nichtkönnitemuss.

## Web

For more information on the campaign, visit:  
[www.stahl-online.de/index.php/meldung/handlungskonzept-stahl](http://www.stahl-online.de/index.php/meldung/handlungskonzept-stahl)

## The industry in brief

### Digital accelerator

In the wake of the coronavirus pandemic, 75 percent of German companies have increased their investments in digitization - according to the latest AI trend study by TCS and Bitkom Research consultant.

#### How is the current crisis affecting companies?

Accelerating the digitization of business processes

25 %

Having a positive impact on employees' use of digital technologies

39 %

Accelerating the digitization of own business model

40 %

## 3 questions for...



**Michele li Bergolis**, Team Leader Sales  
Cold Rolling Industry, Precision Steel Business Unit

### 1 What are the advantages of precidur® for direct processors?

precidur® stands for very tight thickness tolerances, homogeneous material properties and superb surface quality. This increases manufacturing reliability for the customer, which is reflected, for example, in longer tool life in stamping operations or in reduced machine downtimes. Reject rates are also reduced. Because the tolerance zone is shifted to the lower thickness range, material can also be saved – for more meters per ton.

### 2 What about cold rollers?

Intermediate annealing of the hot-rolled strip is no longer necessary as the material has rounded mill edges and a controlled microstructure. The extremely tight shape and thickness tolerances also allow higher rolling speeds and higher reduction ratios. In addition, inventories can be significantly reduced, as precidur® is available in a wide variety of grades and in batch sizes tailored to requirements.

### 3 What can your customers rely on?

Industry 4.0, which we have been putting into practice for many years, creates a high degree of transparency and flexibility. Customers can book their orders via EDI and can still change widths and thicknesses, for example, shortly before completion. Our experienced engineers support customer projects from prototype to production.

Particularly at the project stage it is important to provide sample material as quickly as possible. With our business model we are well equipped for this and so can significantly speed up start of production.

## Materials testing



### Analysis for materials

The DIN EN ISO/IEC 17025 accredited materials testing unit of thyssenkrupp Steel is one of the top addresses when it comes to testing and analyzing steels, metallic coatings, pre- and post-treatments as well as consumables and charge materials. From sample preparation and routine testing to answering the most complex questions, our interdisciplinary team of specialists including engineers, materials testers and laboratory technicians offer internal and external customers a comprehensive range of services for every requirement.

For more information on materials testing, visit:  
[www.thyssenkrupp-steel.com/materials\\_testing](http://www.thyssenkrupp-steel.com/materials_testing)

# A clear way forward

thyssenkrupp has made landmark decisions on the **future** of the **steel business**.

# Future for Steel Milestones at a glance

## Independence

**decided:** Of the competing strategies for the future of Steel, development as an independent company has won out against sale scenarios. The decision was made in February: thyssenkrupp Steel will shape its own future as this offers the biggest opportunities for value enhancement.

## Stand-alone option

**as an opportunity:** thyssenkrupp Steel is currently systematically reviewing whether the company would have more potential to create added value for itself and its customers as a pure player.

## Investment in core units:

In February approval was granted to fund the biggest investment program at Steel for 20 years. Under its Strategy 20-30 thyssenkrupp Steel will now upgrade central elements of its production network to offer its customers further optimized products and greater supply flexibility. All new-builds and revamps are to be completed by 2025.

## Containing

**coronavirus losses:** thyssenkrupp Steel needs to take action so as not to jeopardize the success of its Strategy 20-30. So the steel company is working with employee representatives to set a further milestone: Employment safeguards until 2026, but at the same time up to 750 further job cuts. In the long term this will help limit the losses caused by the coronavirus.

## Focus on green steel:

thyssenkrupp Steel is also firmly focused on climate-neutral steel production. Scientists at RWTH Aachen University have confirmed that combining direct reduction plants with an innovative melting unit is a suitable and efficient way of also offering the entire spectrum of high-quality grades in “green” – while maintaining our established process downstream from the melt shop. The first direct reduction plant is planned for 2025.

# Crucial decisions made

Joint venture, core business, sale. Developments at thyssenkrupp Steel in recent years have been more like a roller coaster ride than a clear way forward. But now a decision has been made.

**T**he journey started almost four years ago, when a joint venture with Tata Steel Europe was planned. This tie-up, which made perfect industrial sense, seemed to be all but complete in summer 2018. But ultimately the project was stopped by the European competition authorities.

After a phase with no clear strategy, last year an open process was started to find the solution that would offer steel the greatest long-term value. Consideration was given to a sale, collaborations or partnerships, or independent development. In October 2020 a non-binding offer was submitted to acquire Steel. The question was whether a sale or a continuation of the steel business as part of thyssenkrupp would offer the better prospects. Both alternatives were examined intensively. Finally a clear decision was reached: Of the competing strategies, independence offered the best conditions for creating sustainable value at Steel. As a result the sale



process was terminated in February. There is now a clear way forward for Steel. The time of uncertainty is over.

### Prospect of stand-alone position

The next step would be to position the business as an independent entity to create greater value going forward. Positioning the company as a pure player would ensure focus and transparency with clear value drivers, because steel has a great future as a high-performance material. Against this background thyssenkrupp has decided to examine the prerequisites for a stand-alone position and work through them systematically. This process is currently underway and is being carried out thoroughly and with the utmost care.

### And coronavirus?

At present, no-one can say what long-term effect the coronavirus will have on our lives. But one thing is clear: Steel has suffered substantial financial losses as a result of the pandemic. Although production continued and – much more importantly – our employees have so far come through the pandemic relatively well, the losses are there. To enable us to go on the offensive and avoid putting the implementation of our strategy at risk, thyssenkrupp and the IG Metall union have concluded a basic agreement to limit the financial losses caused by the coronavirus. It provides for a further 750 job cuts and the examination of operator models to manage operating functions more efficiently.

### Full speed ahead for implementation

These are eventful times at Steel: The fundamental decisions have been made. A clear strategy has been set out. thyssenkrupp Steel can now concentrate on working with its customers to look to the future and address the challenges ahead. There is plenty to do.



The decision for a clear way forward also sends a strong signal to our customers. Steel is back on track: we want success for thyssenkrupp Steel and can now put all our efforts into implementing our strategy.”

**Bernhard Osburg,**  
CEO of thyssenkrupp Steel

### Our Strategy 20-30

The stable basis for the way forward at Steel and how we aim to achieve it is our Strategy 20-30. It is based on market developments and customer requirements. thyssenkrupp Steel is banking firmly on future markets and profitable steel grades. In particular, the energy transition and e-mobility offer potential for increased demand for flat steel. This includes lightweight steels as well as efficient and high-quality electrical steels, for example for generators and electric motors. At the same time it remains our strategic goal to maintain our strong positions in premium surfaces, packaging steel, and high-end industrial applications.

To achieve this we need to meet the rising technical requirements of the market. These include increasing demand for thinner and wider products, a shift in coatings from electrogalvanizing to hot-dip galvanizing, and premium finishes. Our capabilities in these areas will be a key value driver under our strategy. But the conditions have to be in place if the desired portfolio effects are to be realized: So a central element of the Strategy 20-30 is improving performance in all areas of the company. This includes restructuring and the disposal of non-profitable businesses such as Heavy Plate.

The third focus area of our strategy is transformation. Primarily this means converting to climate-neutral steel production by 2050. But this process cannot be seen in isolation. It is an integral element of the Strategy 20-30, because increasingly we will always have to think “green” when carrying out portfolio measures.

# Pressing ahead with investments

The transformation of the mobility and energy sectors is well underway. Requirements are rising across industries. That's why thyssenkrupp Steel is looking to press ahead with the implementation of investments under the **Strategy 20-30**. They will create the conditions for expanding our portfolio to meet future customer requirements.

Copy Mark Stagge



**S**hortly after the approval of investment funds in February, the first contracts were awarded. They include a revamp of the casting-rolling line in Duisburg into a new continuous caster with downstream hot strip mill with new key components, the construction of a new continuous caster at the Bruckhausen plant in Duisburg, and construction of a double reversing mill at the Bochum cold rolling mill to create a new center of excellence for e-mobility.

### Investments send a clear signal

All the projects in this investment package are to be completed by early 2025. The biggest investment project for over 20 years is sending a clear signal: thyssenkrupp Steel is strengthening its focus on technology and quality leadership and aims to further cement its strong position on the European market.

The new-build and revamp work on the casting-rolling line in Duisburg to create a continuous caster and a new hot strip mill is planned to be carried out with minimum disruption to production. Numerous major components can be manufactured in advance and then installed. And some existing plant parts can be integrated into the new units. These include for example >



The interface between our upstream operations and hot strip production is a core element of our integrated production network. We are now making this area fit for the next generation. By separating and rebuilding the casting and rolling sections we can further enhance our capabilities for high-strength steels and premium finishes. By splitting off the rolling section into a separate hot strip mill we will also make our slab production more flexible.”

**Dr. Arnd Köfler,**  
Chief Technology Officer of thyssenkrupp Steel





With the biggest investment package under our Strategy 20-30, we are going on the offensive in order to maintain and strengthen our position as leader in key growth and focus segments. Our custom-

ers will require different and better products in the future: lower tolerances, increased crash safety requirements, steel for more powerful electric motors and increased surface requirements. The investments in our facilities will enable us to meet these requirements. Another important point: as part of our transformation to climate-neutral steel, we will also be able to offer the new high-quality grades in 'green' in the future."



**Bernhard Osburg,**  
CEO of thyssenkrupp Steel

› the ladle turret, which will also be used to supply liquid steel from the melt shop to the new continuous caster.

### Improvements to overall performance

The switch from the existing casting section of the casting-rolling line to the new continuous caster will be carried out from September 2023. The new hot strip mill – the biggest construction measure under the investment package – will be prepared while operations continue and will likewise be connected to the production network from late summer 2023. The hot strip mill will include proven as well as innovative and energy-efficient solutions in the new roughing train, an upgraded finishing train with a highly innovative downstream strip cooling section, and new automation and process models. Comprehensive Industry 4.0 solutions such as integrated process optimization and quality monitoring across the facilities will enhance the viability of the overall project. The reconfiguration of this area will enable thyssenkrupp Steel not only to achieve significant quality improvements but also to better utilize the capacity of its upstream melt shop by increasing casting and rolling capacities. This will further improve the overall performance of the production network, which among other things will also have positive effects on security of supply to customers.



A further unit to be built under the forthcoming measures is continuous caster 3. It will replace the existing continuous caster 1 at the Bruckhausen plant in Duisburg and will likewise provide improved surface quality. It will be built after the revamp of the casting-rolling line in 2024.

### Quality improvements throughout the process chain

The new hot strip mill in Duisburg will also supply the Bochum site, and in particular another new unit to be built there – the double reversing mill. The plant on Essener Strasse will be expanded into a center of excellence for e-mobility over the next few years. Here, too, the trend is towards ever thinner and high-silicon materials, which place increased demands on rolling technology. The new double reversing stand and a new annealing-isolating line will meet these demands and significantly enhance the site's capabilities for non grain oriented electrical steel. With its back and forth (reversing) action, the mill will be able to roll particularly thin materials. This is particularly important for sheet used in electric motors and generators because it minimizes magnetic losses. In this way thyssenkrupp Steel will exploit quality

improvements throughout the process chain in order to excel, for example, with high-strength multiphase steels or with the optimized electrical steel grades of the future.

### Decade of transformation

The coming decade will be of key importance for the European steel industry. Central customer industries are undergoing fundamental changes, and at the same time the transformation to climate-friendly steel production must be ensured. By implementing its Strategy 20-30, thyssenkrupp Steel is already creating the conditions to shape this transformation successfully in cooperation with its customers.

### Web

News on investments and strategy can be found in our newsroom: [www.thyssenkrupp-steel.com/en/newsroom/press-releases](http://www.thyssenkrupp-steel.com/en/newsroom/press-releases)

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“Steel is back on track.”

# Hydrogen for green steel

Hydrogen is the key to **climate-neutral steel**: The element replaces carbon in iron ore reduction – and so prevents CO<sub>2</sub> from entering the atmosphere. One focus of thyssenkrupp Steel is therefore on the rapid development of a supply infrastructure.

Copy Katja Marx



Europe's biggest integrated steel site is to become climate-neutral by 2050. thyssenkrupp Steel set out the route to this goal last summer. The company will soon be able to produce initial quantities of climate-neutral steel. These will increase step by step in the mid-2020s when the first direct reduction plant starts operation. Until then, the steel industry needs one thing above all: green hydrogen. In the long term thyssenkrupp Steel alone will need around 700,000 tons per year and could easily keep more than 3,000 wind turbines running to produce the green electricity required for this. How can this huge demand be met? thyssenkrupp Steel is currently looking at several options.

In the long term thyssenkrupp Steel will need around 700,000 tons of green hydrogen per year to produce climate-neutral steel.

tkH<sub>2</sub>Steel

With the tkH<sub>2</sub>Steel concept thyssenkrupp Steel will reduce its CO<sub>2</sub> emissions by 30 percent by 2030, or around 6 million tons per year.

At the same time the company will produce 3 million tons of climate-neutral steel in 2030, including all premium grades and in the usual quality.

WIR KOCHEN  
AUCH NUR MIT  
WASSERSTOFF.



“We must prepare the ground for hydrogen supply today in order to be able to produce climate-neutral steel tomorrow.”

Dr. Arnd Köfler, Chief Operating Officer thyssenkrupp Steel

One of these is the creation of a hydrogen hub in Duisburg - a major project which thyssenkrupp Steel plans to implement together with the energy company STEAG and the electrolyzer supplier thyssenkrupp Uhde Chlorine Engineers, also part of the thyssenkrupp group. An electrolyzer with a capacity of up to 500 megawatts is to be installed on the STEAG site in Duisburg. A connection to the ultra-high voltage grid will ensure that sufficient green electricity is available. The climate-neutral hydrogen will then be piped to the steel mill just three kilometers away. Conveniently, the steel mill will also take the oxygen produced during electrolysis.

### Feasibility study underway

The project, which could make Duisburg a model region for green steel, is currently being examined in a feasibility study. If the results are positive, the project will be implemented immediately afterwards. In this way thyssenkrupp Steel could significantly reduce its CO<sub>2</sub> emissions in just a few years: The planned electrolysis plant could produce up to around 75,000 tons of green hydrogen per year, enough to meet the supply requirements of the steelmaker's first direct reduction plant in full.

To obtain large quantities of hydrogen in the short and medium term, thyssenkrupp Steel has carried out a further feasibility study, this time to explore the potential of blue hydrogen. In this bridging technology hydrogen is produced from natural gas. The CO<sub>2</sub> arising in the process is not released into the atmosphere but captured and stored. The technology is therefore almost CO<sub>2</sub>-free.

The study, carried out in cooperation with the Norwegian energy company Equinor and the gas transmission grid operator OGE, comes to a positive conclusion. It is technically feasible to produce blue hydrogen on the German or Dutch North Sea coast and supply it to Germany's largest steel mill in Duisburg. The next step is to clarify the regulatory framework, including transport in existing natural gas pipelines. The

central concern of the partners is to ensure the competitiveness of the European steel industry on the world market.

### Green-blue accelerator

The production of CO<sub>2</sub>-neutral blue hydrogen offers a technically established complement to the expansion of green electricity-based electrolysis processes. Combined, the two technologies could help accelerate the development of a European hydrogen market. In particular, the rapid availability of emission-free technologies for industry will help achieve the EU's tightened 2030 climate targets.

The chances for thyssenkrupp Steel to prepare the ground quickly are good. Through thyssenkrupp Uhde Chlorine Engineers, the group has the expertise to transfer electrolysis processes to industrial scale. In addition, STEAG, Equinor and Air Liquide are on board as important supply partners. Last but not least, the Duisburg site can be connected to important gas grids – above all to the hydrogen regions in the Netherlands. In the first international hydrogen ranking carried out by the Cologne Institute for Economic Research (IW), the Ruhr metropolitan region with industrial heavyweights like thyssenkrupp Steel came out top.

### Using CO<sub>2</sub>: News from Carbon2Chem

The Carbon2Chem® project initiated by thyssenkrupp has already produced two important results: Firstly, the project partners have proved that CO<sub>2</sub> from steel mill gases can be processed into ammonia, methanol or higher alcohols with the aid of hydrogen and used in the chemical industry. Secondly, practical tests have shown that the technology used, an alkaline water electrolysis process, can operate reliably with volatile renewable energy. This is an important prerequisite for the climate-neutral processing of the CO<sub>2</sub> captured from the steel mill gases. The 2nd phase of the project will now focus on demonstrating the stability of the processes and scaling them up. The technology is also to be tested for other CO<sub>2</sub>-intensive sectors, for example cement production or waste incineration plants. Carbon2Chem® is being funded by the German Federal Ministry of Education and Research to the tune of 75 million euros.

### Web

Link to the climate strategy of thyssenkrupp Steel:  
[www.thyssenkrupp-steel.com/climate\\_strategy](http://www.thyssenkrupp-steel.com/climate_strategy)

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Without the right way of working, a computer is just a typewriter.”

Covid-19 has thrown the spotlight on the digitization of our society. Where does thyssenkrupp Steel stand on the path to the digital future? CIO Dr. Michael Kranz on virtual teamwork, data resources and future worlds of work.

Copy Katja Marx

**Dr. Kranz, Covid-19 has fundamentally changed our world of work. How much of it will remain?**

Looking at our company, the pandemic has been a catalyst for greater collaboration. We had already introduced the Microsoft Teams platform back in September 2019 to enable employees from different offices and sites to work together on projects. From March 2020, Covid-19 meant that we had to change to this new way of working really quickly. Within a period of ten days, ten times more employees had to work from home, resulting in at least ten times the number of phone calls and video conferences. It all worked pretty well, and the feared productivity losses never materialized.

**Was the cultural changeover just as easy?**

Obviously this has called for a cultural rethink. If teams are no longer working together physically, or only rarely, managers are faced with particular challenges. They have to be more attentive and actively reach out to employees to stay in dialogue. In this respect video conferences are at least better than phone calls. But it's

difficult to replace all the brief chats that used to take place in the corridor or the canteen. However, despite these challenges we have managed to shift a large part of our day-to-day and project business to the virtual world.

**Where do you see the added value of digital communication?**

Dialogue via a collaboration platform is more open and transparent because all members of a project team are involved to the same extent. That means colleagues share more relevant knowledge and can work better as a result.

**A step towards more innovation?**

Innovation mainly arises when we exchange information freely, integrate different perspectives and set clear goals. In addition, an agile approach to work can help make proper use of digital tools. Maybe it's the other way round, and it's the tool that promotes agility. Whatever the case, it takes both. In simple terms: Without the right way of working, a computer is just a typewriter.

**Speaking of agility: What exactly do you understand by that? And do you practice agility in your own work?**

Basically, agility means nothing other than working towards a goal in a self-organized way. We define project teams and agree goals to be reached by a certain date. And yes, we also apply that to our strategic work, both generally and in specific cases. Sometimes it's about the rollout of a system, other times it's the general goal of increasing customer satisfaction in a specific area. The aim of agility is to focus people on a task and a goal. That doesn't just boost productivity, it gives their work more purpose. But it's also clear that if we are to digitize our entire steel mill we must clearly define the

milestones along the way. This is my personal contribution to agility.

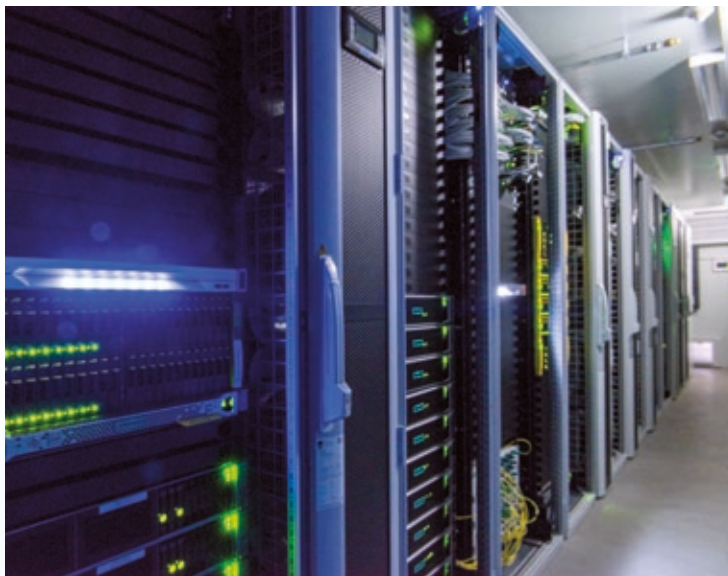
**Could you give us a brief insight into what you're working on right now?**

A central goal of our digital transformation strategy is to optimize the management of processes. One basic idea is to learn from data so that we can better predict certain things and provide targeted support to decision makers. So the question is how we manage our data resources. We have countless amounts of data – from our sensor systems, from our processes, and from external sources. As a concrete example we are working with our transportation partner on a cross-company material tracking system. In the future this will enable us to tell our customers exactly where their order is and when it will be arriving. We are also working intensively on the subject of digital twins in those areas where it makes good business sense.

**Please take a look ahead with us to the year 2030. Where do you see fundamental changes in the way we work?**

There will definitely be more digital tools to support us – at the customer interface, for collaboration, in our processes, and for decisions. Artificial Intelligence (AI) will be used in areas we cannot imagine at the moment. A digital twin can manage complex challenges better than our current systems. And of course we will be discussing what these new potential benefits will mean for us as a company, our customers and society in general. At all events the future will be exciting, and we are ready to play an active role in shaping it.

**Dr. Kranz, thank you for this interview.**



**Digital treasure:** thyssenkrupp Steel wants to use the data it collects to optimize process management.

**Web**

Link to digitization at thyssenkrupp Steel:  
[www.thyssenkrupp-steel.com/en/digital-culture](http://www.thyssenkrupp-steel.com/en/digital-culture)

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**At thyssenkrupp Steel, agility means above all self-organization. The project teams agree goals to be reached by a certain date. Intensive and continuous dialogue plays an important part in this. The picture shows an internal event from 2019.**

# Time for a cold shower

The digital transformation at Precision Steel in Hohenlimburg continues. In 2020 the **shower cooling area** where coils are cooled before transfer to the pickling line was integrated into the existing digital structure, allowing a further significant reduction in lead times for hot-rolled precision strip.

Copy Katja Marx

**S**ome work environments are better viewed from a distance – the shower cooling area at the Hohenlimburg hot-rolling mill is a case in point. Steel coils at temperatures of up to 600 degrees Celsius are deposited by forklift in the storage yard where they are cooled row-by-row with the help of conical spray jets before being transferred to the pickling line. Thanks to a “digital twin” or mathematical model of the shower cooling area, created in November 2020, it is now possible to monitor on screen when the coils have reached the required temperature. The underlying data model provides all relevant information at the click of a mouse and sends a message as soon as a coil is ready for transfer. The forklift is also integrated into the material



Very happy with the significant reduction in lead times made possible by the integration of the shower cooling area: Thomas Westermann, Head of Maintenance and Logistics at the Hohenlimburg hot-rolling mill.

tracking system in real time. The location of a specific coil in the plant can therefore be identified at all times.

## Globally unique process

Shower cooling has several advantages over the conventional air cooling process. “We have been able to reduce lead times significantly, from 72





**Head of IT Ulrich Schneppe sees the successful digital project as the next step towards a fully interconnected steel mill.**

hours on average to just five or six,” says Thomas Westermann, who as Head of Maintenance and Logistics played a key role in the introduction of the new process.

Quality defects such as corrosion pits can be avoided with the controlled cooling process. Another important feature is that in the shower cooling area and the pickling line storage area, the coils are only cooled to the extent optimal for the pickling process. The basis for this - alongside the consolidation of various process data - is a mathematical model developed in-house that lets each individual coil “know” when it has reached the optimum temperature. The globally unique process thus has two important benefits: it optimizes storage logistics and increases productivity in the manufacturing process. “Something like this only works if you have a reliable database,” explains Head of IT Ulrich Schneppe. “This is the result of many years of detailed work, it’s a bit like clearing out your cellar. But now data tracking and tracing helps us link process parameters even more precisely to material flow improve continuously in the future.”

### Closing the digital gap

This latest digital project continues the path towards a fully interconnected steelworks and creates the conditions for greater customer influence in the future. Under the motto “Rolling

as a service“, customers already have a say in what’s next on the Precision Steel rolling program. To ensure that this business model can work without large inventories, short lead times are essential. “Until now, we lacked the digital link between the rolling mill and the material tracking systems of our two pickling lines. We have significantly reduced this gap with the shower cooling area inventory management system”, explains Ulrich Schneppe. In the coming months, the the pickling line storage area will be the last area to be integrated. After that, the entire logistics process can be digitally mapped and controlled, from slab loading in Duisburg to pickling in Hohenlimburg.

### Safety benefit

The digital inventory management system has also met with a good response from employees. It enables forklift drivers to locate and deposit coils more quickly and provides information about where it’s safe to put down the load – a benefit for occupational safety. “The more you use digital tools, the more you appreciate their benefits,” says Thomas Westermann. “It starts with the optimization of logistics processes and ends with controlling, where information on material stocks, turnover rates and tied up capital can be easily retrieved”. “Clearing out the cellar” has been well worthwhile.

### Customer benefits at a glance

Faster order fulfilment thanks to shorter lead times

End-to-end quality control

Material mix-ups excluded

Improved occupational safety

Optimized controlling

### Web

Link to smart factory:  
[www.thyssenkrupp-steel.com/en/smart-factory](http://www.thyssenkrupp-steel.com/en/smart-factory)

### Contact

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+49 2334 91 3284, [ulrich.schneppe@thyssenkrupp.com](mailto:ulrich.schneppe@thyssenkrupp.com)

Photo: Nils Roscher Fotografie



**Transparency at every level: upgraded digital structure not only optimizes logistics at Hohenlimburg but also simplifies controlling processes.**

# Steel is the material for mobility

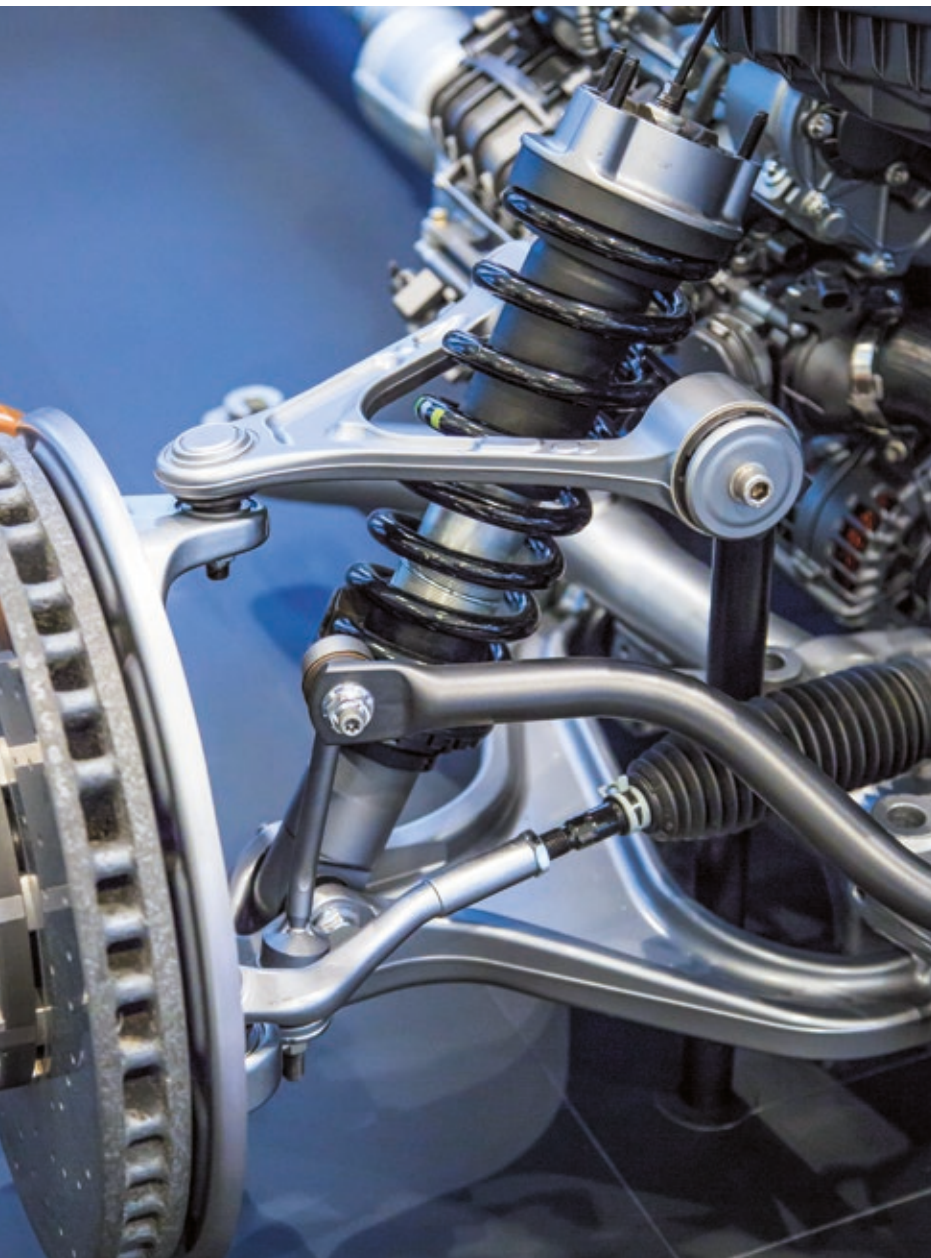
The automotive industry is undergoing a transformation. OEMs are evolving from vehicle producers to mobility service providers and facing completely new market requirements. In these changing times thyssenkrupp Steel remains a **dependable materials partner** to the vehicle sector, producing high-quality materials for the cars of the future – from chassis parts to engine/motor components to coatings. On the following pages 24 to 33 we show you examples of what innovative steel products from thyssenkrupp Steel can do for the automotive industry.



# In the chassis, steel is the material of choice

The demands made on **chassis components** have risen constantly over the past few decades, and e-mobility will speed up this rise. thyssenkrupp Steel has a wide range of new steel products to provide the best possible answer to customer requirements both now and in the future, for conventional cars and electric vehicles.

Copy Gerd Krause/Jan Ritterbach



**T**he job of the suspension system is to transfer dynamic movements and various forces to the car body. Key chassis components include control arms, subframes and stabilizers. As the link between the powertrain and the road

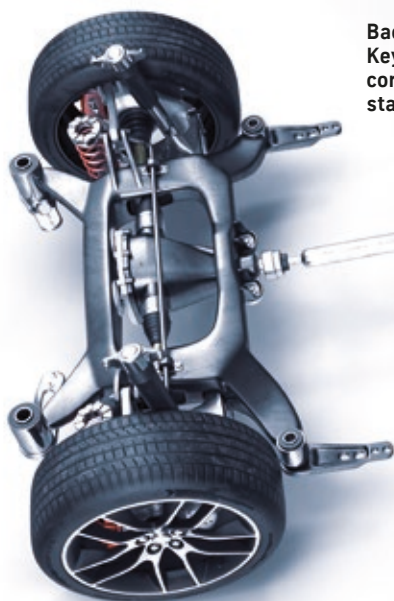
they have to ensure good road holding in every situation – in all weathers and road conditions. Chassis components are subjected to permanent vibrations and oscillations, have to cushion impacts from the road, handle load changes, and cope with potholes and curbs.

The electrification of the powertrain presents additional challenges to chassis technology. The weight of batteries – anything up to 700 kilograms – places a burden on the chassis, while their high costs place a burden on vehicle manufacturers. As the heaviest and most expensive individual component, the battery needs to be accommodated safely in the floor of the car. Economical lightweight solutions are called for that do not sacrifice safety. And there is also a need to make the best possible use of the limited packaging space in the chassis and ensure optimum fatigue strength. With no front engine, the subframes must increasingly serve as an additional crash load path.

## The right material in the right place

With its range of proven and new high-performance steels for modern chassis designs, thyssenkrupp Steel ensures the right material can always be used in the right place. The company has been supporting OEMs and component

**As a longstanding partner to the automotive industry, thyssenkrupp Steel offers customers a wide range of high-performance steels for chassis applications.**



**Backbone of the design:**  
Key chassis components include control arms, subframes and stabilizers.



### The selectrify® initiative

thyssenkrupp's selectrify® initiative – and here in particular the battery housing – is a prime example of cost-effective weight reduction in efficient, safe and climate-friendly electric cars. The scalable selectrify® battery housing consists of an enclosure with a frame, a connection profile, upper and lower support arms, underride guard and cover. At approximately the same weight, the steel design is up to 50 percent cheaper to make than comparable aluminum solutions and causes up to 50 percent fewer CO<sub>2</sub> emissions over the complete life cycle. The selectrify® battery housing proves that lightweighting, safety and fire protection can be combined – and at the same time allow high cost savings.

#### Advantages at a glance:

selectrify® steel battery housing: Up to 50% lower CO<sub>2</sub> emissions

No. 1 for fire protection

Greater safety, higher range

Up to 50% lower production costs

suppliers for decades as an expert materials supplier and can offer everything a good chassis needs: primarily hot-rolled, high-strength steel sheet that can be formed into lightweight, safe parts of increasingly complex shape so as to meet dimensional requirements for parts and assemblies. In addition thyssenkrupp Steel is driving the development of coated hot-rolled steels in thicknesses of 2-3 mm that are ideal for corrosion-critical rear axle parts.

### Wide range for individual needs

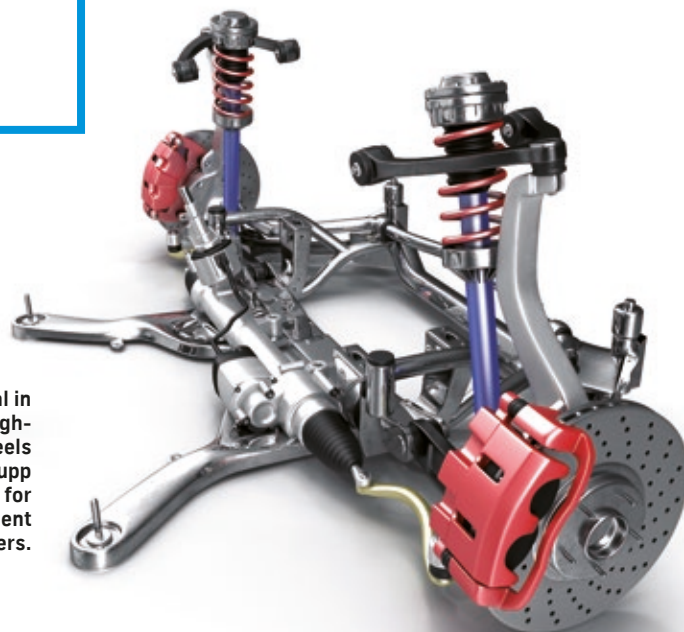
The fact is: the development of low-cost, lightweight, high-strength chassis parts must always be based on what application the customer has in mind and how they want to implement it. And of course the materials philosophy of OEMs also plays an important part. With its expert materials knowledge and decades of expertise in chassis solutions, thyssenkrupp Steel can meet all requirements. For example, various steel grades of the same strength class from thyssenkrupp Steel can be used for one part. That comes as no surprise, because strength is not the only criterion for material selection. Depending on customer requirements and part complexity, properties such as hole expansion, deep-drawing or bending capacity may be of key importance. How well a material can be cut and its suitability for welding will also play a role.

Ultimately, the differences between individual materials may be extremely fine, so a decision for or against a material will depend largely on which properties are of greatest importance to the customer. Depending on use

and requirements, for pressed chassis parts thyssenkrupp Steel offers two general material groups: multiphase steels and microalloyed steels. For tube applications, e.g. in stabilizers, manganese-boron steels are also available.

### Steel materials offer huge potential

**Multiphase steels** offer the auto industry the opportunity to utilize cost-efficient lightweighting potential. The use of higher-strength steels allows parts to be made from thinner material, which in turn makes the parts lighter. Multiphase steels are ideal for demanding shapes such as those required in chassis applications. This is because the sheet displays excellent local forming properties despite its high strength. And although this material group has been tried and tested over the years, there is no shortage of new developments – such as the bainitic steel **CH-W® 660Y760T**. This high-performance material is ideal for cold-formed parts with high hole expansion requirements such as control arms.



**The right material in the right place:** High-performance steels from thyssenkrupp Steel are ideal for OEMs and component suppliers.

› **Manganese-boron steels** score highly on two points in tubular automotive applications: they are light yet affordable. Manganese-boron steels display good processing properties and after heat treatment can achieve high strengths – ideal prerequisites for products made from precision steel tubes. Starting materials of this type from thyssenkrupp Steel – such as **tubor® 26 or tubor® 34 or precidur HLB 34** – are used in the chassis among other things for stabilizers.

## Overview of grades

thyssenkrupp brand names  
vs VDA standard

Brand	VDA 239-100/based on
precidur® HSM 315 HD – precidur® HSM 700 HD*	HR300LA – HR700LA
precidur® HBS 600 – precidur® HBS 1000 HE	HR660Y760T-CP – HR700Y950T-CP
precidur® HLB 8 – precidur® HLB 41	
perform® 420 – perform® 700	HR420LA – HR700LA
perform® 500 HD	
FB-W® 300Y450T – FB-W® 460Y580T	HR300Y450T-FB – HR440Y580T-FB
CP-W® 660Y760T CH-W® 660Y760T*	HR660Y760T-CP
tubor® 26 – tubor® 34	

\* not available in America and Japan

### New member of the steel family

In addition to working continuously to improve its proven standard and premium grades, thyssenkrupp Steel is also focused on developing new high-performance materials. **perform® 500 HD** is the first material in the new perform® HD product family aimed specifically at chassis parts or parts with complex shapes, high strength and dimensional accuracy, such as in car seats. This grade is characterized by guaranteed close mechanical tolerances and good hole expansion characteristics. At the same time, a new alloying concept ensures that forming properties are uniformly improved over the entire coil length. For processors this means lower production costs as a result of lower scrap and reduced downtimes for tool setting.

High-ductility, **microalloyed fine-grain steels** from precidur® hot-rolled precision steel strip produced in Hohenlimburg are also used for demanding chassis parts. Premium materials such as **precidur® HSM 700 HD** are particularly suitable for the manufacture of parts with complex forming geometries and open up new design options for automotive lightweighting. As an additional advantage, they offer the same extremely tight shape and thickness tolerances as cold-rolled materials, which means very high process reliability during part manufacture.

### Individual processing strategy determines choice of material

The wide-ranging strengths and fine differences between the material groups underline once again that when it comes to the chassis, the individual processing strategy is of key importance for the choice of material. Depending on the requirements profile it is perfectly possible to use different steels and different material strengths in the front and rear axles. In this respect, the versatility of sustainable steel from thyssenkrupp Steel knows virtually no bounds.

Whatever the specific requirements of the auto industry, one thing is always true: thyssenkrupp Steel drives developments in high-performance steel materials. Examples include the high-strength precidur® HD grades and the new ultrahigh-strength **bainitic steels precidur® HBS 800, HBS 900 and HBS 1000 HE**. These products achieve extremely high tensile strengths and yet can be formed and stamped by conventional means.



**Hard-wearing:**  
Chassis components  
are subjected to  
permanent vibrations,  
have to cushion  
impacts and handle  
load changes.

### Web

Link to hot strip:  
[www.thyssenkrupp-steel.com/en/hot\\_strip\\_in\\_motion](http://www.thyssenkrupp-steel.com/en/hot_strip_in_motion)

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# Connecting, supporting, holding: The right materials for perfect performance

Every chassis part makes particular demands on its material depending on its function and the stresses it is exposed to. By reference to selected components, steel<sup>compact</sup> shows how broad thyssenkrupp Steel's range is.



## Control arm – the right direction

The control arm is a moving link between the front or rear wheel and the body. In the event of a crash it may deform but it must not break. To connect the control arm to the body frame, the high-strength sheet material of the control arm is widened by flange forming. This forming process places high requirements on the material with regard to edge cracking. In general, the susceptibility of a material to edge cracking under high expansion loads is simulated in so-called hole expansion tests. The good hole expansion capacity of the material used is therefore of key importance for the cost-efficient, defect-free manufacture of highly stressed parts.

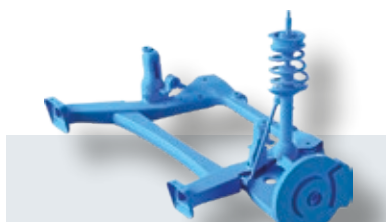
### Suitable materials:

#### Microalloyed steels

- precidur® HSM 500 HD – HSM 700 HD
- perform® 420 – perform® 700

#### Multiphase steels

- precidur® HBS 800 – HBS 1000 HE
- FB-W® 300Y450T – FB-W® 460Y580T
- CP-W® 660Y760T
- **NEW:** CH-W® 660Y760T



## Subframe – a part with many variants

Subframes are structural components that support the wheel suspensions and ensure stiffness that translates into better ride stability. Numerous parts are connected to the subframe, such as all control arms and stabilizers as well as the powertrain, chassis and body. As a result subframes are highly versatile parts that perform many tasks. For example, in addition to high stiffness they must also meet particular requirements for natural frequency and crash behavior. At the same time costs need to be kept as low as possible: OEMs and suppliers would prefer these welded components – often in many variants – to comprise as few parts and have as few welds as possible so as to minimize production expense. The good news: thyssenkrupp has a wide range of suitable steel grades to meet these requirements.

### Suitable materials:

#### Microalloyed steels

- precidur® HSM 500 – HSM 700
- precidur® HSM 500 HD – HSM 700 HD
- perform® 420 – perform® 700
- **NEW:** perform® 500 HD

#### Multiphase steels

- precidur® HBS 800 – HBS 1000 HE
- FB-W® 300Y450T – FB-W® 460Y580T
- CP-W® 660Y760T
- **NEW:** CH-W® 660Y760T



## Stabilizers – cornering without bending

Stabilizers are the chassis parts that connect the wheel suspensions of an axle with the body structure. As a suspension element, stabilizers reduce vehicle roll during cornering. So the material must be able to withstand repeated bending and torsion loads – and these requirements are rising as vehicle weights increase.

### Suitable materials:

#### Manganese boron steels

- precidur® HLB 8 – HLB 34
- tubor® 26 – tubor® 34

## Front control arm

### Microalloyed steels

precidur® HSM 500 HD – HSM 700 HD  
perform® 420 – perform® 700

### Multiphase steels

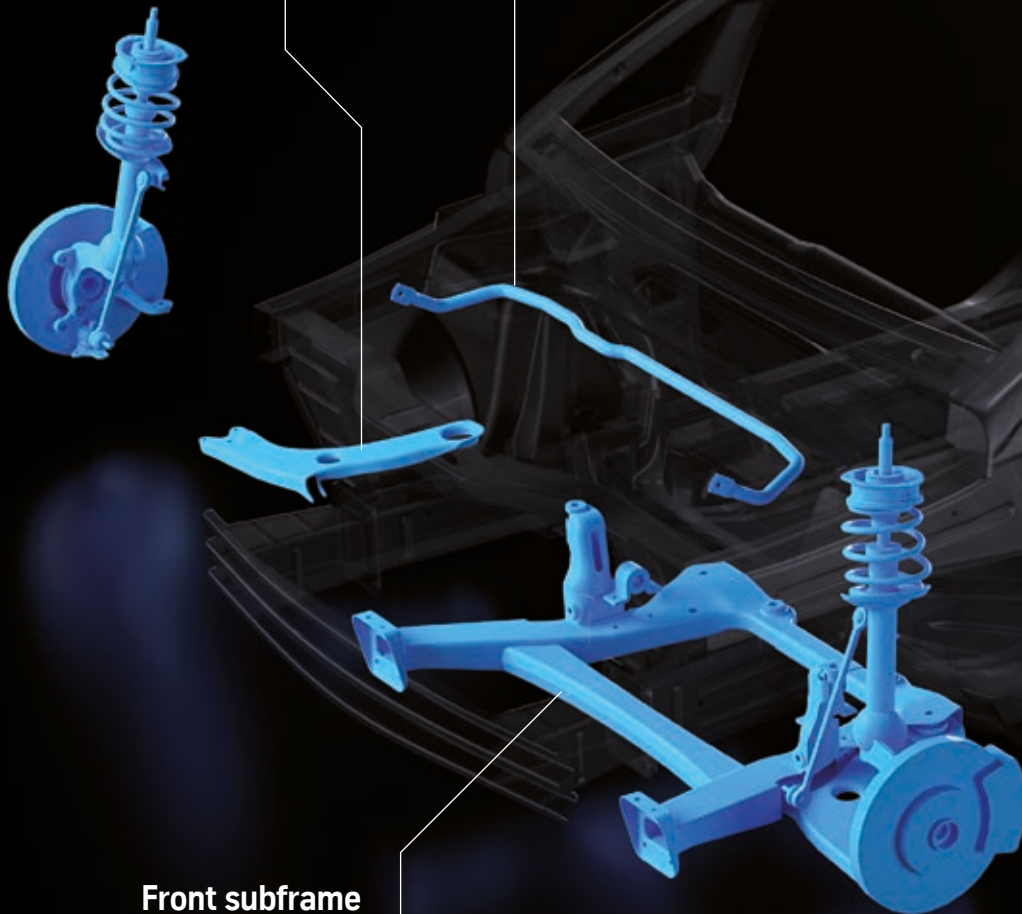
precidur® HBS 800 – HBS 1000 HE  
FB-W® 300Y450T – FB-W® 460Y580T  
CP-W® 660Y760T

**New: CH-W® 660Y760T**

## Stabilizer

### Manganese-boron steels

precidur® HLB 8 – HLB 34  
tubor® 26 – tubor® 34



## Front subframe

### Microalloyed steels

precidur® HSM 500 – HSM 700  
precidur® HSM 500 HD – HSM 700 HD  
perform® 420 – perform® 700

**New: perform® 500 HD**

### Multiphase steels

precidur® HBS 800 – HBS 1000 HE  
FB-W® 300Y450T – FB-W® 460Y580T  
CP-W® 660Y760T

**New: CH-W® 660Y760T**

## Rear subframe

### Microalloyed steels

precidur® HSM 500 – HSM 700  
precidur® HSM 500 HD – HSM 700 HD  
perform® 420 – perform® 700

**New: perform® 500 HD**

### Multiphase steels

precidur® HBS 800 – HBS 1000 HE  
FB-W® 300Y450T – FB-W® 460Y580T  
CP-W® 660Y760T

**New: CH-W® 660Y760T**

## Rear control arm

### Microalloyed steels

precidur® HSM 500 HD – HSM 700 HD  
perform® 420 – perform® 700

### Multiphase steels

precidur® HBS 800 – HBS 1000 HE  
FB-W® 300Y450T – FB-W® 460Y580T  
CP-W® 660Y760T

**New: CH-W® 660Y760T**

# The right material in the right place

When it comes to the chassis, thyssenkrupp Steel brings its full expertise to bear. Several steel grades from various material groups are available for the same part. The extensive portfolio offers the right material for every requirement.



A cover made of bondal® can significantly reduce noise emissions from the inverter.

# Better acoustics for electric motors

bondal® from thyssenkrupp Steel is a sandwich material for noise reduction in vehicle construction that has been proven for many years. The latest application tests with the innovative composite in battery vehicles also show considerable potential for optimizing the acoustics of electric motors and their power control units.



bondal® sets standards in optimizing the acoustics of electric motors.

**L**ess is more: When it comes to electric vehicles, this applies not just to emissions of harmful greenhouse gases but also to a significant reduction in noise. Electric motors are simply quieter than conventional internal combustion engines. However, this does not necessarily mean that they and their power control units are less of a nuisance to passengers and the environment. Drive-related noise emissions in electric vehicles occur primarily in a frequency band that people find particularly unpleasant.

## Quiet revolution

In an initial study, a cover made of bondal®, in this case variant CB40, has been found to reduce noise emissions from the inverter – a central component in every electric powertrain that converts direct current from the battery into alternating current for the motor and, depending on load condition, produces high-frequency sound emitted via the cover of the inverter housing. This is an unpleasant noise and represents a problem that cannot currently be satisfactorily solved with monolithic materials and without secondary noise deadening.

## Dampens structure- and air-borne sound

To optimize the acoustics of the inverter, bondal® makes use of a property of the steel-polymer-steel composite that has so far been given little attention: In addition to the structure-borne sound damping properties typical of the material, components formed from bondal® also offer air-borne sound damping properties. The latter are effective at higher frequencies above 300 hertz. Together, structure-borne and air-borne sound attenuation reduce the sound pressure level at close range by up to 20 db(A) – reducing noise to a quarter of its original level. Compared with current all-steel or all-aluminum solutions in conjunction with further noise deadening measures such as heavy-layer and spring-mass elements, bondal® is also a highly attractive alternative for weight reasons. In addition, the product offers good electromagnetic shielding and can be easily recycled.

## Web

Link to the composite bondal®:  
[www.thyssenkrupp-steel.com/composite\\_material](http://www.thyssenkrupp-steel.com/composite_material)

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# Core material for e-mobility

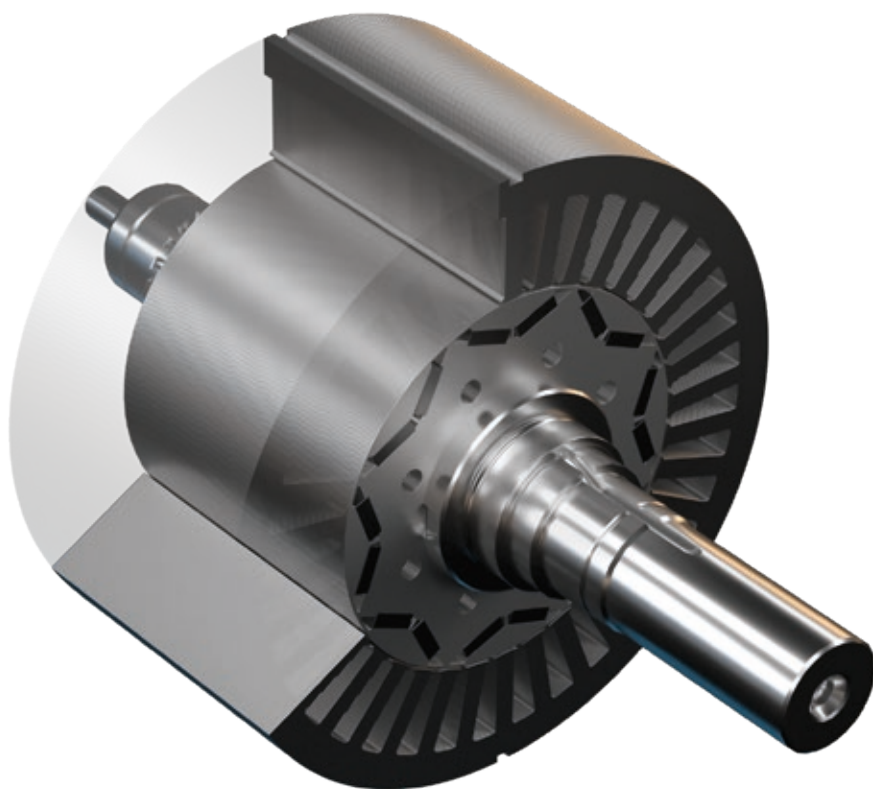
More power for electric motors: powercore® traction electrical steel from thyssenkrupp Steel is giving electric vehicles an energy-efficient boost.

**W**ithout steel, e-mobility would never get moving. In addition to applications in electricity generation and transportation, the high-performance material powercore® traction from thyssenkrupp Steel is a particularly good example of steel's usefulness in the end use of electricity. Among other things, the non grain oriented electrical steel is used as the core material in the traction motors of electric vehicles, where it can significantly enhance the performance of the motor. In both the stator and rotor the quality of the electrical steel has a decisive impact on motor efficiency:

In addition to other performance metrics such as polarization and yield strength, core loss has a significant influence on the efficiency of the motor – and thus ultimately on the range of the vehicle. The new powercore® traction grades are specifically tailored to meet these high requirements for the traction motors of electric vehicles.

## Higher efficiency, greater range

Electrical steel from the powercore® traction range has better magnetic and mechanical properties than standard grades. During its development particular importance was attached to retaining these favorable properties during processing by reducing the material's sensitivity to operations such as stamping and forming. This means the material can really play to its strengths in practical use. At just 0.20 to 0.35 mm, it is not only much thinner and thus more efficient than conventional electrical steel grades with thicknesses of 0.35 to 1.00 mm, the significantly higher alloy content also helps reduce energy losses in the motor. So using powercore® traction in the traction motor can significantly extend the range of e-vehicles. Motor speeds of up to 20,000 rpm also place demands on the strength of electrical steel that conventional grades cannot meet. By contrast, with their improved mechanical properties the new powercore® traction electrical steel grades from thyssenkrupp Steel can handle this with ease. Guaranteed!



## Web

Link to non grain oriented electrical steel:  
[www.thyssenkrupp-steel.com/non\\_grain\\_oriented\\_electrical\\_steel](http://www.thyssenkrupp-steel.com/non_grain_oriented_electrical_steel)

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 non grain oriented Electrical Steel,  
 +49 203 52 24627, [volker.kamen@thyssenkrupp.com](mailto:volker.kamen@thyssenkrupp.com)

**The quality of the electrical steel in the rotor and stator has a key impact on the efficiency of the motor.**



# Less material, more protection

Corrosion protection, paint finish, forming behavior: Coatings on outer-panel parts for car bodies have to meet a wide range of requirements. Coating specialist thyssenkrupp Steel offers customers a wide range of **hot-dip galvanized and electrogalvanized sheet**, supplying products tailored to the specific processing requirements of the automotive industry.

Copy Katja Marx

**S**teel is the number-one material for sustainable mobility: In addition to its weight reduction potential, it offers outstanding recycling properties. Modern coatings strengthen these advantages while at the same time meeting increased demands for resource-friendly, cost-efficient design.

## Higher processing efficiency

This is particularly true of the innovative zinc-magnesium coating ZM Ecoprotect®, which thyssenkrupp Steel has been supplying to OEMs in outer-panel quality for several years. “Our aim was to further improve the established hot-dip zinc coating with its good welding, bonding and anti-corrosion properties,” says Dr. Volker Smukala, Product Manager Coatings at thyssenkrupp Steel. “For this we wanted to further optimize the material properties and in particular improve press shop performance.”

Both goals were achieved: In the press shop ZM Ecoprotect® displays lower coefficients of friction and improved forming behavior. “This enhances the efficiency of the press tooling and increases the number of parts produced between cleaning,” says Volker Smukala. Compared with established hot-dip galvanized coatings, ZM Ecoprotect® also offers significantly improved corrosion protection, allowing the coating thickness to be reduced by 30 percent. Corrosion protection around cut edges and

**Flawless surface:** The FBA 8 hot-dip galvanizing line in Dortmund produces ZM Ecoprotect® coatings. The coating not only looks good, it's easy to process and protects against corrosion.

scratches is also measurably improved. Last but not least, thinner coatings reduce the use of zinc – an advantage for sustainability.

### Highly precise application

thyssenkrupp Steel's electrogalvanizing process has also proved successful for automotive panels. The metal is coated on one or both sides with zinc from a sulfate acidic electrolyte. This coating method permits highly precise application and results in particularly good forming properties – above all in combination with pre-phosphating. For large laser-brazed panels OEMs rely on this established method. This is the case for example for roof panels, where an imperceptible joint is required. In addition to ZM Ecoprotect® and electrogalvanizing, thyssenkrupp Steel offers the following coatings in O5 outer-panel quality: hot-dip galvanized and Galvannealed.

### Expanded capacities from 2022

thyssenkrupp Steel is responding to rising demand for hot-dip galvanized flat steels by expanding its capacities: A second state-of-the-art hot-dip galvanizing line – FBA 10 – will open at the Westfalenhütte site in Dortmund in 2022. In the future the plant will be able to produce both zinc-coated and zinc-magnesium coated products. In combination with the neighboring



**André Matusczyk,**  
CEO Business Unit Automotive

“Excellence in surface is the last but no less important pillar of our portfolio strategy. A producer of all vehicle surfaces in body shell quality, thyssenkrupp has always been one of the leading automotive suppliers. As part of the further expansion of our capacities, we have already started to erect hot-dip galvanizing plant 10 in Dortmund.”

FBA8 coating line, it will increase the site's annual output of hot-dip galvanized products to around one million tons. In total, thyssenkrupp will then operate ten hot-dip coating lines – nine at its German sites and one in Spain – and three electrogalvanizing lines.

### Web

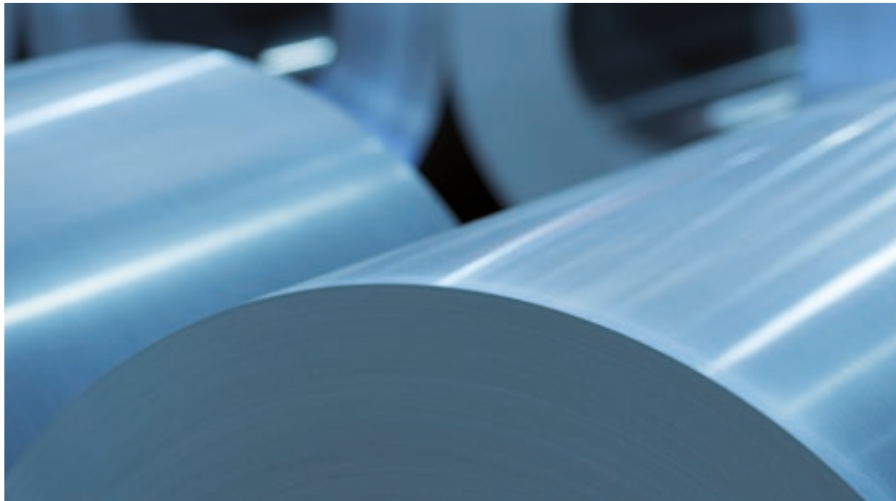
Link to galvanized flat products from thyssenkrupp Steel:  
[www.thyssenkrupp-steel.com/best\\_coating](http://www.thyssenkrupp-steel.com/best_coating)

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**FBA 10 will go into operation in 2022. It will produce 600,000 tons of hot-dip galvanized steel strip per year.**



# Ultra-thin, ultra-promising

Europe's energy companies are investing in wind and solar power more than ever before. As a result, a long-underrated material is gaining in importance: **grain oriented electrical steel**. This opens up good opportunities for thyssenkrupp Electrical Steel.

Copy Jan Ritterbach

**T**he numbers are impressive: According to a study commissioned by Handelsblatt, Europe's energy sector plans to invest around 650 billion euros over the next ten years. Most of the money will go towards building new wind and solar power capacities and the associated supply infrastructure, because huge amounts of extra green electricity will be needed.

A key role in this process will be played by high-quality grain oriented electrical steel made of iron-silicon alloy from thyssenkrupp Electrical Steel (see info box). These ultra-thin strips of powercore® steel – with top grades no thicker than 0.23 mm – are used above all in modern transformers because they permit particularly efficient energy transmission.

To appreciate why efficiency is so important, it is necessary to understand the function of

transformers: Transformers are used to step up the voltage of electricity so that it can be transported from A to B. Later they step down the voltage again so that the electricity can be used in the home. But in Germany alone, outdated and inefficient transformers result in transmission and distribution losses of two to three percent.

## Electrical steel is the way forward

For this reason, the EU is tightening the minimum efficiency requirements for transformers installed in the electricity grid as of July 2021. Specifically, the new EU Ecodesign Directive Tier 2 aims to improve the efficiency of transformers so as to reduce power transmission losses. "In the future, even more differentiated electrical steel grades will be needed for this," says Georgios Giovanakis, CEO of thyssenkrupp Electrical Steel. Under the directive, the mini-



**When it comes to transmitting energy really efficiently, grain oriented electrical steel is the ideal material – particularly in transformers.**

Under this major project, which will significantly increase the performance of Europe's power highways, electricity produced from wind energy will be transported efficiently from the north of Germany to the south.

### Megatrend with huge benefits

One thing is clear: As more and more distributed power generation plants are installed, more transformers will be needed. And as electric vehicles become more widespread and the EV charging infrastructure is expanded, the number of distribution transformers will grow. All of this will increase demand for the various grades of specialty steel manufactured by thyssenkrupp Electrical Steel in Germany, France and India. For this reason the company is planning to produce even higher-quality grades of electrical steel in the future. Georgios Giovanakis: "The transition to renewables is a megatrend that is extremely beneficial to us. We see the market for top grades growing rapidly and therefore plan to further expand our product portfolio".

mum efficiency requirement for transformers has been increased from 97.5 percent to 98.3 percent. That might not sound much, but it can make a big difference. Giovanakis: "If all the transformers in the world were fitted with more efficient materials, the energy – and therefore CO<sub>2</sub> – savings made would be the equivalent of Africa's entire energy needs."

As a leading producer of ultra-thin electrical steel, thyssenkrupp Electrical Steel now has a great opportunity to profit from the next chapter in energy supply. "With our top grades we're already well positioned and can participate in the positive trend with our premium grain oriented powercore® products". The exciting opportunities opening up in this business area are demonstrated by our current collaboration with Siemens.

thyssenkrupp Electrical Steel is supplying Germany's leading manufacturer with powercore® grain oriented electrical steel for the more than 30 high-tech transformers required for the Ultratnet project currently under construction.

### The powercore® brand

powercore® grain oriented electrical steel will play a central role in the transition to renewable energies. That's because with each voltage transformation, a certain amount of electricity is unavoidably lost as heat. Grain oriented electrical steel can massively reduce these losses. It is used for example in power and distribution transformers as well as in generators for gas-fired power plants, wind turbines and EV charging terminals. The extremely thin material gets its particular magnetic properties from the specific formation and arrangement of magnetic domains – the "grains" that give it its name. These are created during various rolling processes and heat treatments in which electrical steel is continuously processed in complex annealing operations for over a week. When all the grains are oriented in one direction, the degree of magnetization is particularly high, and efficient and resource-friendly electricity transmission and transformation is achieved.

### Web

Link to grain oriented electrical steel:  
[www.thyssenkrupp-steel.com/en/industries/energy/energy.html](http://www.thyssenkrupp-steel.com/en/industries/energy/energy.html)

### Contact

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**Georgios Giovanakis, CEO of thyssenkrupp Electrical Steel, sees grain oriented electrical steel as an important material for the transition to renewable energies**

# More than a facade

A new generation of young architects is demanding more and more from the building materials of the future – roofing and facade products included. Danish company DS Stålprofil caters to these needs – and makes its steel roofing and facade elements using **pladur® Relief Icecrystal** textured coatings from thyssenkrupp Steel.

Copy Jan Ritterbach



The wow factor for house and company facades: pladur® Relief Icecrystal creates striking visuals

A house covered in frost – in the middle of spring? The first time you see a facade of pladur® Relief Icecrystal in sunny weather, it's hard to believe your eyes. You instinctively want to reach out and touch the glistening snowflakes you seem to see on the surface. But they are not a sign of cold weather. These frost patterns are the hallmark of a special coating method for roof and facade elements, which Danish producer DS Stålprofil uses to make products with strong aesthetic appeal. "Young architects in particular love these special coatings," says Thomas Rasmussen, managing director of the company. "Not only because of their high UV resistance and corrosion protection but because they are also appealing to the eye".

## Steel profiles for progressive architecture

More and more developers and designers are now combining different building materials to create standout architecture. Interesting surfaces then become an aspect to explore – and for forward-looking design, the versatility of steel is a real advantage. "Light reflections can be requested, or special textures or an unusual surface feel," says Rasmussen. "Our customers are also excited that pladur® is a cradle-to-cradle product and CO<sub>2</sub>-free steel production will be possible in the future. Above all younger

architects see many possibilities for creating something new and sustainable with innovations in steel".

## Partners for speedy processes

For over ten years now, DS Stålprofil has been obtaining the raw materials for its products from thyssenkrupp Steel. These include the pladur® range which Rasmussen's team use for a wide range of building projects. The possibilities are virtually unlimited. "Both single-skin sheeting for facades - for example as corrugated or trapezoidal profiles - and double-skin for



Good things come in threes: pladur® Relief Icecrystal offers high UV resistance, corrosion protection, and stylish design

sandwich elements or cassette solutions. Our organic coil-coated steels are used in various ways by DS Stålprofil”, says Klaus Kottkamp, Application Consultant for thyssenkrupp Steel.

Together with Axel Pohl, Head of Sales End User Industries at thyssenkrupp Steel, Kottkamp looks back on a long and close collaboration with DS Stålprofil. Over the years a solid relationship of trust has developed between the two companies. “This can be seen for example in the fact that DS Stålprofil purchases and stocks various pladur® products in relatively large quantities,” says Klaus Kottkamp. Speed is a real competitive advantage of DS Stålprofil. The Danish company not only stocks material for each steel profile but also has a dedicated machine to process it. “Normally we can deliver just four to seven days after an order is placed,” says Rasmussen.

### Demand growth

In recent years DS Stålprofil has established itself as a manufacturer of steel profiles for roofs and facades. The company has become one of the most important players in the market for high-quality roof and facade materials, not only in Denmark but also in Germany. The founding of subsidiary DS Stahl GmbH in Sittensen in 2001 was a milestone in gaining market share in Germany. Its location between Bremen and Hamburg allows the roof and facade specialist



Young architects in particular love these special surfaces. Not just because of their high UV resistance and corrosion protection, but because they are also appealing to the eye.”

Thomas Rasmussen, Managing Director DS Stålprofil

### One of a kind

pladur® Relief Icecrystal is currently available in nine different colors. Color and texturing vary depending on light and viewing angle. pladur® Relief Icecrystal coatings are literally incomparable: minimal differences in texture make each building element one of a kind.

to serve its customers – mainly builders’ and roofing merchants – throughout Germany quickly and efficiently.

Good for DS Stålprofil: demand for carbon steel for roofs and facades continues to grow. Themes such as sustainable development, recycling, circular value chains, and fossil-free steel production have made steel increasingly attractive to decision-makers in the construction industry, the more so as companies like DS Stålprofil are able to provide complete proof of the sustainability of their products through environmental product declarations. That is why Rasmussen is optimistic about the future. He says that investments are currently being made in many areas, such as the innovation program for the construction and modernization of schools in Germany, and that steel for facade and roof renovation plays an important role in this connection. With pladur® Relief Icecrystal, DS Stålprofil has exactly the right product in its portfolio. Because kids would love their school to look cool.

### Web

To portrait DS Stålprofil:  
[www.thyssenkrupp-steel.com/en/ds-stalprofil](http://www.thyssenkrupp-steel.com/en/ds-stalprofil)

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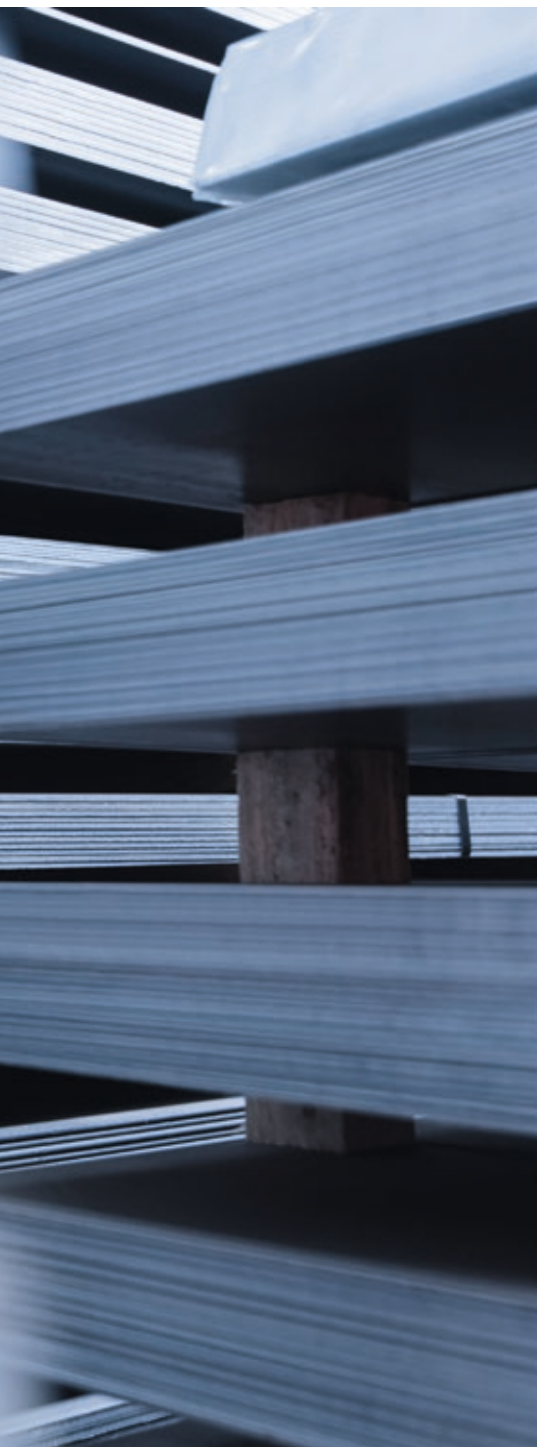


thyssenkrupp Steel is changing its marketing strategy for premium cut-to-length sheets. With immediate effect, the Industry business unit is now responsible for this key product area.

# New home for premium cut- to-length sheets

Through an organizational realignment, thyssenkrupp Steel is charting a successful future for its cut-to-length sheet products. In the future the cold-forming grades of the perform<sup>®</sup> range, the wear-resistant grades of the XAR<sup>®</sup> brand and several other special grades such as TBL will be marketed by the Industry business unit to provide even better customer support.

Copy Jan Ritterbach



**Excellence in Antwerp:** the cut-to-length line is one of very few of its kind in Europe capable of producing premium cut-to-length sheets of the very highest quality.

underlines the company's goal of providing a high-quality product portfolio backed by comprehensive materials support.

### Custom solutions

As a competent provider of premium cut-to-length sheets, thyssenkrupp Steel has modified its strategy in response to current market requirements. That includes providing even stronger support to customers in developing customized products and applications. As an experienced materials technology partner, the Industry business unit headed by CEO Jörg Paffrath will continue to apply the full range of its expertise to offering innovative and custom solutions – now also for cut-to-length sheets.

### Cutting-to-length in Antwerp

The coils are processed on our state-of-the-art cut-to-length line in Antwerp. There, in the heart of Europe, hot-rolled coils are cut into wear-resistant and high-strength sheets. The line is one of the most efficient of its kind and one of very few in Europe capable of producing premium cut-to-length sheets of the very highest quality. The location is extremely practical for transportation: As Europe's second-biggest port after Rotterdam, Antwerp has excellent logistical links to ocean shipping routes, ensuring efficient delivery of our products to customers around the world.

**G**oing forward, thyssenkrupp Steel's cut-to-length sheet customers will be able to obtain the full portfolio of hot-rolled steels from a single source – thanks to a sales restructure transferring our cut-to-length sheet products to the Industry business unit. A new team from the Industry business unit, headed by experienced sales manager Mario Klatt, is now responsible for sales and customer support.

With these measures, thyssenkrupp Steel is sending a clear signal: Wear-resistant, high-strength cut-to-length sheet remains very much part of the company and is as important as ever. The organizational integration of these products

The line in Antwerp is capable of cutting-to-length special grades for agricultural applications.



## thyssenkrupp Steel stands for reliability”

Jörg Paffrath, CEO Industry Business Unit

“Even in turbulent times, thyssenkrupp Steel stands for reliability and responsibility. A stable supply to our customers is all-important - and that naturally also applies to hot-rolled steels. This is symbolized by our new sales strategy for premium cut-to-length sheets, for which the Industry business unit is now responsible with immediate effect. Our colleagues are available to customers at all times to provide support for our products with total energy and commitment. In the future, all services will come from a single source and all products will be united under one roof to guarantee the highest level of customer satisfaction.”



## Strong when it matters

perform® is ideal for trucks and special vehicles

perform® is a portmanteau of the words performance and formability. It's the name given by thyssenkrupp Steel to microalloyed, thermomechanically rolled cold-forming steel. With its special fine-grained microstructure and high cleanliness, perform® offers particularly good formability. In addition, perform® cut-to-length sheets are extremely tough. For this reason, among others, perform® is used primarily for complex part shapes. Examples include vehicle frames, axle structures, body beams and pillars as well as special profiles. perform® is also frequently used in the production of trucks, special vehicles and on-board and mobile cranes. When it comes to material safety and cost efficiency, thyssenkrupp Steel sees itself as a competent, reliable partner to its customers. The company offers perform® steels with different yield strengths from 500 to 1,100 MPa to suit different applications.

**Among other things, perform® is extremely ductile and therefore ideally suited for cranes and crane vehicles.**





XAR® steels are wear-resistant and easy to process

## Welcome to the family

XAR® completes thyssenkrupp Steel's range of cut-to-length sheet products

Compared with other cut-to-length sheets, XAR® hot-rolled sheet is through-hardened - making the material just as hard and tough on the inside as in areas close to the surface. Due to their extreme hardness and toughness, XAR® cut-to-length sheets are used in areas exposed to heavy wear. For example, they are ideally suited for the production of tipper bodies, components of conveyors and crushers, and trucks such as cement mixers and garbage collection vehicles.

Customers benefit from the material's exceptional abrasion and wear resistance, even under extreme conditions. Another advantage of XAR® is its excellent weldability, not only in the laboratory, but also under field conditions. If required, XAR® can also be joined and processed with other materials using conventional welding equipment - something that is not normally possible with most alloyed steels. thyssenkrupp Steel offers its wear-resistant steels in hardness levels of 400 and 450 HB to suit different applications.



## We offer a complete range"

Mario Klatt, Sales Manager

"Cutting-to-length of our premium coiled sheets takes place centrally in Antwerp, Belgium. This is where our steel service center comes into its own, with facilities including a high-performance cut-to-length line capable of producing wear-resistant, high-strength cut-to-length sheets with excellent properties. In the area of high-strength CTL sheets, special mention should be made of the perform® range, which offers ideal prerequisites for press braking and bending with very small radii thanks to good cold formability, weldability and toughness properties. Then there are our wear-resistant XAR® grades. These are proven in many different applications and combine wear resistance with good processability.

The Antwerp plant is also able to cut other special grades, especially for applications in agricultural machinery. These include the TBL grade, for example. In this way thyssenkrupp Steel offers its customers a complete portfolio of premium hot-rolled steels for all requirements."

### Specialist for complex shapes

The fine-grain, boron-alloyed special structural steel TBL with its very good processing properties allows the production of very complex geometries, such as those required in agricultural machinery. These include all types of blades for soil cultivation as well as shares and shafts for plows or discs for disc harrows.

thyssenkrupp Steel is now once again offering its customers the benefits of this steel in sheets form. To elaborate the potential of TBL, a wide range of support services is available: from robust tests in wear and welding laboratories to innovative developments and advice on processing issues from our technical customer service department.



### Web

Find all information about the cut-to-length sheet portfolio online: [www.coilplate.com](http://www.coilplate.com)

### Contact

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# The chemistry is right

The chemical laboratories are vital to operations at thyssenkrupp Steel. As an accredited in-house test facility, among other things they monitor the chemical processes in production, conduct material tests and ensure compliance with environmental and safety standards. In addition the laboratory provides chemical analyses to support the entire value chain from ore delivery to the finished coil – all with the aim of further improving the performance of our equipment and products.

Copy Jan Ritterbach

**D**r. Thomas Lostak really doesn't match the typical cliché of the ambitious chemist in a white lab coat. The eloquent 37-year-old not only gives an impression of youthful agility, he's also bursting with enthusiasm about his job. "It's what I always wanted to do: working in a scientific field, developing, researching. And all in an environment where you can really make a difference. Where what you do really counts." Lostak couldn't have put it better. As team leader for Inorganic Analytics he is part of

the leadership team at the thyssenkrupp Steel chemical laboratories. Accredited in accordance with DIN ISO/IEC 17025, the laboratories with their 164 employees across the sites in Duisburg, Dortmund and Bochum are a kind of company customs authority. "Roughly speaking, we check everything that enters and leaves our plant and facilities," says Lostak.

One important aspect is checking compliance with statutory environmental and safety standards. This includes for example limits for waste gas and dust emissions or waste water quality in connection with steel production. The



The user-friendly "isiLab" app connects the chemical laboratories with internal and external customers, enabling them to obtain information about a sample in real time.



chemical laboratories also test all bought-in and incoming materials and supplies. This is extremely important as even minimal material defects can result in exorbitant financial costs – for example if the iron concentration in the supplied ore does not meet the original requirements. “As little as 0.1% poorer quality can quickly cost us millions,” says team coordinator Dr. Eckhard Pappert. He has been in overall charge of the test facility for a year and bears responsibility for the entire chemical innovation area.

### Speed is key

Just as business-critical as monitoring suppliers is the monitoring of internal product quality in the steel mill. The chemical laboratories use automated, technical analysis processes to ensure production runs as intended from the start of the value creation process. For example the control rooms are notified within a maximum of 270 seconds as to whether a heat can be used or whether refinements still need to be made. Automated process analytics also have a positive effect elsewhere, for example on the hot-dip coating line where among other things cold-rolled steel strip is coated. Eckhard Pappert: “If a zinc-aluminum-magnesium coating is requested, the coating bath must be tailored precisely to the requirements of the customer. Our system provides colleagues in the control room with all the chemical information they need in real time.” The impression of urgency is not misleading. The motto here is “speed is key!” The faster the checks work, the better the line capacity is utilized – and the greater the tonnage and sales the steel mills can deliver.

The vast dimensions of the task facing the chemical laboratories result from the many and varied requirements involved. On the one hand because thyssenkrupp Steel receives tons and tons of materials for a wide range of production processes every day, and on the other hand because the company ships large volumes of products to customers on a daily basis. In addition, technical components, lubricants, greases and oils are also constantly tested as part of preventive checks on equipment. The same applies to process media and waste water. This all adds up to an impressive number of analyses that need to be carried out: Every year the chemical laboratories analyze around 720,000 samples.

### Information via QR code

This would not be possible without a sophisticated acceptance and information system. The sample acceptance area at the laboratory control station in Duisburg resembles the baggage pick-up area at an airport, but with the difference that plant transport service employees place samples labeled with QR codes on the conveyor belts rather than bags and suitcases. Thanks to the QR code the containers find their way to the responsible laboratory automatically. And that's not the only thing the code does: it also tells the chemists what material the sample is made of, what exactly needs to be tested and other important order details. Due to the volume of materials moved around the company, the testers usually deal with composite samples, i.e. one sample, which may only comprise one gram of the material, can be used to test the quality and suitability of several tons of it. >

**Focus on precision:**  
The interdisciplinary team at the chemical laboratories leaves nothing to chance in sample analysis. Pictured here doctoral student Sarah Klaes, team coordinator Dr. Eckhard Pappert (left) and Dr. Thomas Lostak, team leader Inorganic Analytics.



The use of modern robot technology is part of everyday work at the chemical laboratories, both in applications isolated from humans and in collaboration models.

#### ➤ Boundless inventiveness

Digital technology doesn't only play an important role in the submission and allocation of samples. The chemical laboratories also work digitally when it comes to creating analyses and communicating status information or results. Of central importance here is the highly user-friendly "isiLab" app – an in-house development. It connects testers with internal and external customers, enabling the senders of samples to obtain all the information about an order in real time. The renowned specialist publication "GIT" is full of praise for the app: "The lab app used at thyssenkrupp Steel Europe offers customers the opportunity to select the desired testing plan for their sample, select and deselect individual parameters and ultimately submit an order via their smartphones. A sample label in the form of a QR code and all information for sample collection are provided directly. They can obtain status information about their order and the results via the same medium or via a web portal."

This great inventiveness is characteristic of the interdisciplinary lab team, in which chemists and chemical technicians work alongside physicists, engineers and IT specialists. One example of this is the drone for transporting samples that was put into operation under the management of Lostak and has now been in test operation for a year. Among other things, the almost two-meter-long drone transports iron ore samples from the port to the control center, covering distances of up to five kilometers in just a few minutes – a journey which would take significantly longer by car.

#### Also attractive for external customers

This spirit of innovation is evident not only up in the air, but also down on the ground. The chemical laboratories have been leading the way in the use of robotics for years, both in applications isolated from humans and in collaboration models. The use of an automated assistant that can "record" and mimic human movements via sensors is currently being tested. In the long term this could lead to the automation of some routine, day-to-day activities in the laboratory. The robot model was even awarded the German Future Prize in 2017 and is just another example how the chemical laboratories have successfully developed their operations by taking a high-tech approach.

As part of targeted attempts to raise its profile, the testing facility is also aiming to attract more external customers. As an internal service provider, the chemical laboratories already work for virtually every area of thyssenkrupp. However, Pappert and Lostak want to increase the number of customers from outside their own organization. "We are fully accredited as a labo-



**A technician from the chemical laboratories taking a cooling water sample in the field.**

ratory and offer our customers a broad portfolio of analysis services,” says Lostak.

### Ideas for the circular economy

And when it comes to winning new customers, national borders are no obstacle. A good example of this is the Dutch company Nederlandse Onttinningsfabriek (NOF) in Leeuwarden. NOF specializes in removing the tin from packaging steel and has been an important partner to the “Deutsche Gesellschaft für Weißblechrecycling” (DWR) – a German tinplate recycling company – in Düsseldorf for many years. The goal of DWR, a wholly-owned subsidiary of thyssenkrupp Rasselstein, is to recycle tinplate responsibly. In concrete terms DWR organizes the procurement and processing of tinplate packaging which thyssenkrupp Steel then uses as steel scrap in its production process. When Dr. Johannes Emundts from DWR learned that NOF was considering setting up its own laboratory to test its internal process technology, he put them in touch with the chemical laboratories. Their management team won over NOF Managing Director Arti Klaasen, resulting in a collaboration that has saved the customer both costs and time from the outset. On the one hand they have been able to optimize their processes on the basis of the analyses without needing to operate their own testing facility, and on the other hand they now have a user-friendly and reliable digital solution for registering samples and analyses in the form of the “isiLab” app.

**At the recycling center of Wilhelm Bötzel GmbH & Co. KG in Herne, tinplate waste is shredded and cleaned. The chemical laboratories, among others, are responsible for quality control.**



These aspects also contribute to achieving the mutual goal of thyssenkrupp Steel, DWR and NOF – to make an active contribution to closing the materials cycle. “In the interests of the circular economy, it is important for companies in the steel sector to establish more sustainable business models and develop more eco-friendly processes,” says NOF Managing Director Arti Klaasen. “By collaborating with the chemical laboratories at thyssenkrupp Steel we have reached an important milestone.”

It’s a similar situation at the processing center of Wilhelm Bötzel GmbH & Co. KG in Herne. The company has been collaborating successfully with DWR on closed material cycles for some time, shredding and cleaning various tinplate waste for subsequent use in the mills of thyssenkrupp Steel. To allow continuous monitoring of production quality at Bötzel the chemical laboratories have developed an efficient testing procedure which is now the standardized in-house method. Successes like these drive the lab team on. “We want to empower our customers more and more to come up with new ideas and help shape markets,” says Dr. Pappert looking forward. This confident view of the role he and his colleagues play is clear when he says with conviction: “At the chemical laboratories we no longer just monitor what other people do. We are the ones who are developing new ways forward.”



### Web

Link to the chemical laboratories:  
[www.thyssenkrupp-steel.com/chemical\\_laboratories](http://www.thyssenkrupp-steel.com/chemical_laboratories)

### Contact

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# Quality non-stop

Premium packaging steel requires seamless, meter-by-meter quality management (QM). To this end, thyssenkrupp Rasselstein has established a data-based QM system. Its success is based on three rules.

# 1

## People decide

In order to produce packaging steels of the highest cleanliness and with outstanding surface properties, the quality of the crude steel is crucial. For this reason, colleagues from Duisburg and Andernach exchange various quality parameters on a daily basis to ensure seamless monitoring and control. In addition, an integrated quality management system with state-of-the-art measuring technology monitors the production process. This ensures that relevant data and findings are immediately available to subsequent process steps. Important: In the end, people decide whether the quality is right.

# 2

## Data support

Since as far back as 1995, the plant in Andernach has been able to record and process data for statistical process control (SPC). In 2006, the systems were upgraded to store and visualize meter-related data. Since 2013, the storage, recording and evaluation of huge amounts of data has allowed a new dimension of quality tracking capable of adapting to current conditions on a daily basis thanks to rapid advances in digitization. In this way, irregularities can now be traced back at any point in the production process.

“

Every employee is trained to make the best use of the latest QM tools and deliver the best possible quality to our customers.”

**Michael Wild**, Head of Quality & Technical Support at thyssenkrupp Rasselstein.



# 3

## Machines connect

Digitization will play an even more important role in quality management in the future. Manual quality control measures, such as tensile tests or the analysis of specimen sheets in the test center, will be supplemented by digitally recorded data. The exchange of measurement data between machines not only leads to more precise results, but also supports thyssenkrupp Rasselstein in further enhancing product quality.

## Contact

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Despite all the technical support systems, in the end people decide whether the quality is right.



## Steel cast with a difference

Steel is now available in audio format – with the **podcast** “gekocht, gewalzt, veredelt”.

**G**ermans consume an average of 420 kilograms of steel per capita each year - significantly more than fruit, vegetables and meat combined. Dr.

Heike Denecke-Arnold, CEO and CTO of the Precision Steel business unit, knows why: “Many things around us in everyday life are made of steel, and we are often not aware of it. Steel is in refrigerators, cars, train tracks and beverage cans.” Sometimes massive, sometimes delicate - for the steel expert, the fascination of the material lies in its versatility. Heike Denecke-Arnold tells us more about the production and future of the material in the first episode of the new steel podcast “gekocht, gewalzt, veredelt”.

## 15 minutes of future

In the approximately 15-minute episodes of the new podcast series, experienced talk show guests discuss the many facets of the material. The focus is on meta-themes such as the mobility of the future, the path to a climate-neutral society, and the digitization of industry. The latest episode turns the spotlight on the inclusion of disabled employees and their value to the company.

## Contact

We welcome feedback, topic suggestions and criticism via email to:  
[stahl-podcast@thyssenkrupp.com](mailto:stahl-podcast@thyssenkrupp.com)



Steel

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[www.thyssenkrupp-steel.com/best\\_surface](http://www.thyssenkrupp-steel.com/best_surface)

engineering.tomorrow.together.



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