

Material of Mobility: thyssenkrupp Steel presents versatile solutions for the most demanding automotive requirements at Blechexpo 2023

- At the Blechexpo 2023 in Stuttgart, thyssenkrupp Steel is presenting innovative and sustainable steel solutions under the theme "Unlock your green potential", including a broad portfolio of production-ready special steels for body and chassis parts
- From MBW® AS Pro for minimized hydrogen-induced cracking, to lightweight steel seat structures and electrical steel for highly efficient drives, thyssenkrupp Steel will be presenting solutions for automotive construction to visitors at its booth
- Blechexpo 2023 in Stuttgart, November 7 to 10, 2023, Hall 10, booth 10406

At the Blechexpo 2023 in Stuttgart, thyssenkrupp Steel will present, among other things, its broad "Material of Mobility" portfolio: special steels available with immediate effect for producing body and chassis parts. Under the theme "Unlock your green potential", thyssenkrupp Steel is demonstrating its commitment to the future of mobility and the development of advanced solutions to power both traditional combustion-engined vehicles and electric vehicles.

jetQ®: Innovative AHSS development for electric mobility

thyssenkrupp Steel is cooperating closely with the Japanese steelmaker JFE Steel Corporation to develop modern third-generation Advanced High Strength Steels (AHSS). The latest milestones in the collaboration are the new jetQ® 980 and jetQ® 1180 grades for geometrically complex body structure components. The two highly ductile steel grades for cold forming will help automotive customers to meet the current challenges of vehicle design – especially in electric mobility.

Building electric vehicles requires materials in the high strength range that can be easily formed. This is exactly what makes jetQ® stand out: High elongation at fracture as well as

good hole expansion capability and high resistance to edge compression failure allow for the first time more complex component geometries with high stretching and deep-drawing proportions in the forming process. In this way, jetQ® 980 and jetQ® 1180 open up new cost reduction and lightweight construction potential for customers.

MBW® AS Pro: new alloy concept minimizes hydrogen-induced cracking

With AS Pro, thyssenkrupp Steel is the first steel manufacturer worldwide to offer a new, pioneering coating for hot forming ultra-high-strength MBW® steels on the market – for maximum component safety in cars. It minimizes process-related hydrogen absorption during the annealing process in hot forming, and also ensures a more economical production process. AS Pro is applied to the strip in thyssenkrupp Steel's modern hot-dip galvanizing lines. In contrast to the standard AS coating, a specific amount of magnesium is added to the molten metal bath in addition to aluminum and silicon, and is then homogeneously distributed in both the molten metal and the coating.

Through this small modification, AS Pro ensures that significantly less diffusible hydrogen, which can penetrate the material, is formed during the annealing process. This minimizes the risk of hydrogen-induced cracking. Together with MBW® 1900, which is available with immediate effect for series production, AS Pro is the optimum combination for maximum performance in hot-formed components.

Hot-rolled lightweight steels with optimum processability

At the Blechexpo 2023, thyssenkrupp Steel will also be showcasing an extensive hot-rolled portfolio that is ideal for economical lightweight construction of high-strength chassis parts. For example, the ultra-high-strength hot-rolled multiphase steel CH-W® 700Y950T is completely new in series production. The chassis grade with a strength of almost 1,000 megapascals and optimized hole expansion offers not only a significant weight reduction but also high fatigue strength for complex chassis parts. In addition, the new steel grade offers highly convincing crash behavior, because high yield strength values combined with reserves in elongation after fracture ensure high resistance to deformation and thus high crash energy absorption.

The microalloyed HD (high ductility) perform® 315 HD to 550 HD steels are now also ready for series production. The steels feature a uniform property profile and improved elongation after fracture. Thanks to their enhanced material properties, the new microalloyed HD grades can be used in applications such as axles or wheel suspension.

Economical lightweight steel seat structures

A wide range of requirements for modern seat components can be optimally met by the use of high-strength steels from thyssenkrupp Steel: modern vehicle seats should be lightweight yet crash-proof, take up little installation space and be cost-effective to produce – all without compromising comfort. In the product portfolio from thyssenkrupp Steel, customers can choose from highly ductile close-tolerance hot strip and precision steel strip to cold-rolled high-strength multiphase steels – including best forming and joining properties.

Additionally, the potential weight savings: today, the average car seat weighs around 12.5 kilograms – simply counting the load-bearing seat structures – meaning that front and rear seat structures of a car add up to around 50 kilograms in total. A portfolio of steel grades tailored to the specific requirements of seats can help to reduce weight by up to 15 percent – and this is completely cost-neutral. At the trade fair booth, interested customers can find out more about this and the new uncoated dual-phase and complex-phase steels with strengths of 800 and 1,000 megapascals.

Micro-alloyed fine-grained structural steel precidur®

Particularly in the case of safety-relevant components, functional and design aspects are playing an increasing role alongside reliability – which demands the highest forming capacity of the basic material. This is precisely where the two newly developed precidur® HSM 380 and HSM 420HD precision steel strip grades from thyssenkrupp Hohenlimburg come in. Compared to the proven microalloyed fine-grain structural steels of the company, they offer increased forming potential with the same strength.

Individual potential customers tested the material during the development phase. Following a highly positive response, changeovers to series production with the new materials have already taken place. Since they meet all the requirements of the DIN EN 10149 and VDA 239-100 standards, they can easily replace the previous MC variants.

Electrical steel for highly efficient drives

When it comes to high performance and energy efficiency of drive motors for electric vehicles, the trend is toward high-quality and particularly thin products with a high silicon content, such as those offered by thyssenkrupp Steel under the brand name powercore® Traction. Two

brand-new electrical steel grades from the powercore® Traction product family are in the final stage of development. Shortly, they will join thyssenkrupp Steel's product range.

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At just 0.25 millimeters, the particularly thin electrical steel strips of the NO25 type have excellent magnetic properties and high mechanical strength. The new developments from thyssenkrupp Steel are additionally characterized by very low remagnetization (core) losses of 12.5 watts per kilogram and 13 watts per kilogram, respectively. This means we've been able to improve them by up to 11% compared to current reference grades.

More information about the Material of Mobility will be available at the Blechexpo 2023. The thyssenkrupp Steel team is looking forward to meeting you at **booth 10406 in Hall 10** from November 7 to 10, 2023, and to conducting exciting discussions with you.

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