

Jennifer Schulz (Product Development) with her colleagues Andreas Martin (Team Leader FBA 6, left) and Arne Schreiber (Product Management), inspecting coated material in FBA 6.

Protective melt

thyssenkrupp Steel is expanding its production capacities for **zinc-magnesium products** by adding new melt pots to the hot-dip galvanizing line (FBA) 6. The **solar industry** in particular stands to benefit from this, because it requires high-quality coated steels for robust and long-lasting **supporting structures**.

Text Jan Ritterbach



Power squared: the two new melting furnaces in FBA 6 give thyssenkrupp Steel new possibilities in the coating of steel for the solar industry.

Twenty metric tons in weight, seven meters high and with enough space inside for 85 blocks of zinc-magnesium, each weighing 2,000 kilograms, stacked next to and on top of one another: the two new melt pots and melting furnaces of the hot-dip galvanizing line (FBA) 6 in Ferndorf in Germany's Siegerland region are huge systems for an equally huge growth market. It is about renewable energies and the European solar industry in particular. This is because the constantly growing number of photovoltaic (PV) surfaces in the open air require robust and corrosion-resistant supporting structures that are able to withstand different weather conditions effectively – and over very long periods of time: the average service life of a solar installation today is between 20 and 25 years.

Application thickness is reduced

Steel is increasingly establishing itself as the preferred material for economical and robust PV substructures – especially when it is coated with zinc-magnesium (ZM). Take for example ZM Ecoprotect® Solar from thyssenkrupp Steel, which offers a number of different advantages over conventional galvanizing. "Thanks to the additional magnesium, the thickness of the coating can be significantly reduced while offering the same level of corrosion protection, and even better protection on the cut edges and drilled holes," says Jennifer Schulz from Product Development for Surfaces at thyssenkrupp Steel. This makes the coating ideal for durable outdoor steel structures – and in greater demand than ever before in the context of the energy transition. FBA 5 in Eichen, which produces a broad portfolio of ZM-coated steels for

various industrial applications, is working flat out and is already no longer able to meet customer demand on its own.

New pots for more capacity

Since 2022, thyssenkrupp Steel has thus been investing millions of euros to gradually upgrade its production site in the Siegerland region. In addition to the new melt changing system, investments have been made in a new double chemcoater to improve the surface quality of the steel strips (see steel compact 2/23) and in the modernization and expansion of logistics areas. In one of the two new twin furnaces installed below the mill floor level, up to 170 metric tons of zinc-magnesium are liquefied at over 450 °C within just a few days. The resulting molten metal is then transported via a mobile pipeline to the hot-dip galvanizing line, where it serves as a bath for the starting material ordered by the customer. Passing the steel strip through the alloy creates particularly resistant and durable protective layers on the surfaces, which protect the material from corrosive atmospheres. All test runs were successful, making it clear that ZM coatings can also be produced on FBA 6 in proven thyssenkrupp quality.

Specialist institutes confirm performance

The excellent properties of ZM Ecoprotect® Solar are confirmed by the building regulations approval from the German Institute for Construction Technology (DIBt) and tests by the Karlsruhe Technologies Institute (KTI) – both of which are neutral bodies. For this purpose, cyclic corrosion tests – among other procedures – were carried out on the coated steels to demonstrate the good corrosion resistance of the coatings. Surface expert Jennifer Schulz also emphasizes the

improved processing properties of the ZM coatings: "ZM-coated steels are excellently formable and particularly suitable for roll forming. Their surface is harder than that of zinc coatings, which means significantly less abrasion is generated in the die, and this in turn reduces wear on the tooling."

Looking to the future, further optimizations are planned for solar customers: In light of the recent investments in FBA 6, thyssenkrupp Steel will continuously expand the number of layer thicknesses and dimensions available in its ZM portfolio in 2024. This also applies to a wider assortment of ZM Ecoprotect® as CO₂-reduced ZM-coated bluemint® steel.

Three advantages of ZM Ecoprotect® Solar

How system manufacturers, profilers and system operators stand to benefit

Corrosion-resistant

Increased corrosion protection compared to conventional hot-dip galvanizing

Extremely weather-resistant

25-year warranty

Approved by the DIBt (German Institute for Construction Technology)

Reliable process

Extremely good formability

Less abrasion on the tooling

Economical alternative to batch galvanizing

Sustainable

Husbanding of resources by cutting down the use of zinc

100% recyclable

CO₂ savings possible with bluemint® Steel

Web

More about ZM Ecoprotect® Solar: <https://www.thyssenkrupp-steel.com/en/solar>

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