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**Aumund conveyor technology (in red) will connect the DRI plant with the melters** (Picture: thyssenkrupp Steel Europe AG)

## HOT DRI TRANSPORT

# Conveyor technology for the tkH<sub>2</sub>Steel® project in Duisburg, Germany

Two bucket apron conveyors for the transport of hot DRI will be supplied by Aumund Fördertechnik to the new thyssenkrupp Steel direct reduction plant in Duisburg, Germany. In the future hydrogen-based “green steel” production process, the two hot material conveyors will be the direct connection between the direct reduction plant and the melting furnace. Delivery of the steel plant with the Aumund conveyors is scheduled for autumn 2024.

**B**oth conveyors will be installed under the shaft furnace of the direct reduction facility, and their function is to feed the melting furnace directly with hot DRI. The direct reduction shaft furnace designed by Midrex Technologies, USA, is the core technology of the plant. “The order from thyssenkrupp Steel is not only a very important project for us, but will also

play a leading role in the transformation of green steel in Germany,” says Matthias Moritz, Sales Director Metallurgy at Aumund Fördertechnik. He continues, “Thanks to a large extent to the success of our joint projects with Midrex, we are very proud of our proven experience in conveying technology for direct reduction plants.”

**Functionality of the conveyors.** Aumund’s patented hot material conveyors are a closed system for continuous material feed. They transport the DRI in an inert atmosphere that prevents it from coming into contact with the air, thus avoiding re-oxidation.

One of the advantages of this closed mechanical system is that it uses much

less energy than pneumatic conveying. Unlike pneumatic conveying, there is no relative movement between the equipment and the material being conveyed along the conveying path. This prevents additional fines from being generated during transport.

Aumund equipment is automated. Sensors monitor the temperature and condition of the material on the conveyor. The concept of the transport system is that the inert gas protects the material from contact with the outside air and the dust remains inside the system.

**Flexibly constructed.** This conveyor system, which has been successfully used for over 20 years, is adapted to the required capacities and the situation at the installa-

tion site. Temperatures of up to 1,000°C and inclinations of up to 60 degrees are among the design features. The largest lifting height achieved so far with a bucket apron conveyor for hot direct reduced iron is 110 m and the maximum conveying capacity is 480 t/h. "Lifting height and conveyor capacity are correlated characteristics and are limited by the strength of the chains," says Frank Reddemann, Senior Manager in the Metallurgy Division. He continues: "Our chains have tensile strengths of up to 3,000 kN per chain. Aumund develops the chains for the conveying systems itself".

**Experience in plants all over the world.** The patented Aumund conveyor technology has been proven in more

than 700 plants in the iron and steel industry worldwide. For example, the first hydrogen-based plant of the Swedish company H2 Green Steel will be equipped with this Aumund technology and will produce green steel from 2025. In addition to the hot material conveyor, the plant will also have two cooling conveyors, which have a low water consumption. The little water they use can even be returned to the cycle. The waste heat can also be recovered and reused. All Aumund equipment already operates according to the ideas of green steel production: less pollutants, conservation of resources and reuse.

■ *Aumund Group*