

Press release – 09.06.2021

## TISCO trusts Fives with entry to high permeability silicon steel market

China's leading stainless steel producer, Taiyuan Iron and Steel (Group) Co. (TISCO), has entrusted Fives with the design and supply of **two new silicon steel lines** for very demanding applications.

TISCO decided to invest in the production of grain-oriented (GO) silicon steel grades with high permeability (HiB) to meet local market demands for electric generators and transformers. Having partnered with Fives for more than 25 years on contracts, TISCO trusted Fives to deliver on this highly challenging project.

### Decarburizing & coating and flattening & coating lines

Fives was chosen to design, supply and commission two complete lines, namely: decarburizing and coating line (DCL) and flattening and coating line (FCL), each with 80,000 tons of annual capacity. The lines will process steel with less than 3.5% of silicon content, with strip thickness between 0.15-0.5 mm at the full strip width of 1,280 mm.

The project, which is scheduled for completion in the second half of 2021, includes:

- Engineering and project management to enable TISCO to set up its own silicon production process
- Complete terminal equipment, comprising entry and exit coil handling sections, accumulators and strip transportation
- Annealing furnaces, which are key process equipment for both the DCL and FCL
- A longitudinal inductor for the thermal section of the DCL
- Surface treatment, including a degreasing section and a magnesium circulation system for DCL, and cleaning & pickling sections for FCL

### High permeability silicon steel

Silicon steel (also known as electrical steel) production allows to obtain specific magnetic properties, resulting in low power loss per cycle, low core loss, and high permeability. This product is suitable for various electrical applications, such as the production of transformers, generators, inductors, motors and electric cars. It is **extremely challenging to produce**.

The production process requires a number of different technologies to follow stringent thermal process requirements. The thermal section proposed by Fives features:

- Strip handling process design to avoid strip surface defect
- The best available technology for furnace atmosphere management, including proprietary seal gates and analysis systems for high H<sub>2</sub> and wet/dry atmospheres in order to reach the required properties of silicon steels
- The proprietary AdvanTek® combustion system, which is best-in-class for environmental performance
- Induction heating technology to reach higher temperatures to boost strip performance capabilities.

This contract marks the continuation of a long-running, strong relationship between Fives and TISCO. In recent years, Fives has delivered to TISCO seven DMS 20Hi cold rolling mills and nine processing lines for both stainless and silicon steels.

## About Fives

As an industrial engineering Group with a heritage of over 200 years, Fives designs and supplies machines, process equipment and production lines for the world's largest industrial players in various sectors such as steel, aerospace and special machining, aluminium, automotive and manufacturing industries, cement, energy, logistics and glass.

In the steel industry, Fives offers process expertise, ground-breaking technologies and digital tools, supporting steel manufacturers ability to achieve the ultimate in performance excellence, including:

- Customer strategic development support
- Digital tools: automatic strip processing line control, real-time quality management technology, and more
- Ultra-low NOx reheating furnaces
- Advanced cold rolling mills for stainless, silicon and carbon giga steels
- Complete strip processing lines for carbon (including AHSS and UHSS), stainless and silicon steel
- Unique transverse flux and longitudinal induction heating technologies
- A full range of services: process optimization, upgrades, modernization, training and maintenance assistance

In 2019, Fives achieved €1,999 million of sales and employed close to 8,600 people in about 30 countries.

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