



Improve productivity with Tek-Trol's advanced automation and controls for Steel from exploration and minerals processing to manufacture steel.

STEEL PLANT

Instruments for Steel Plant



STEEL PLANT PROCESS CONTROL

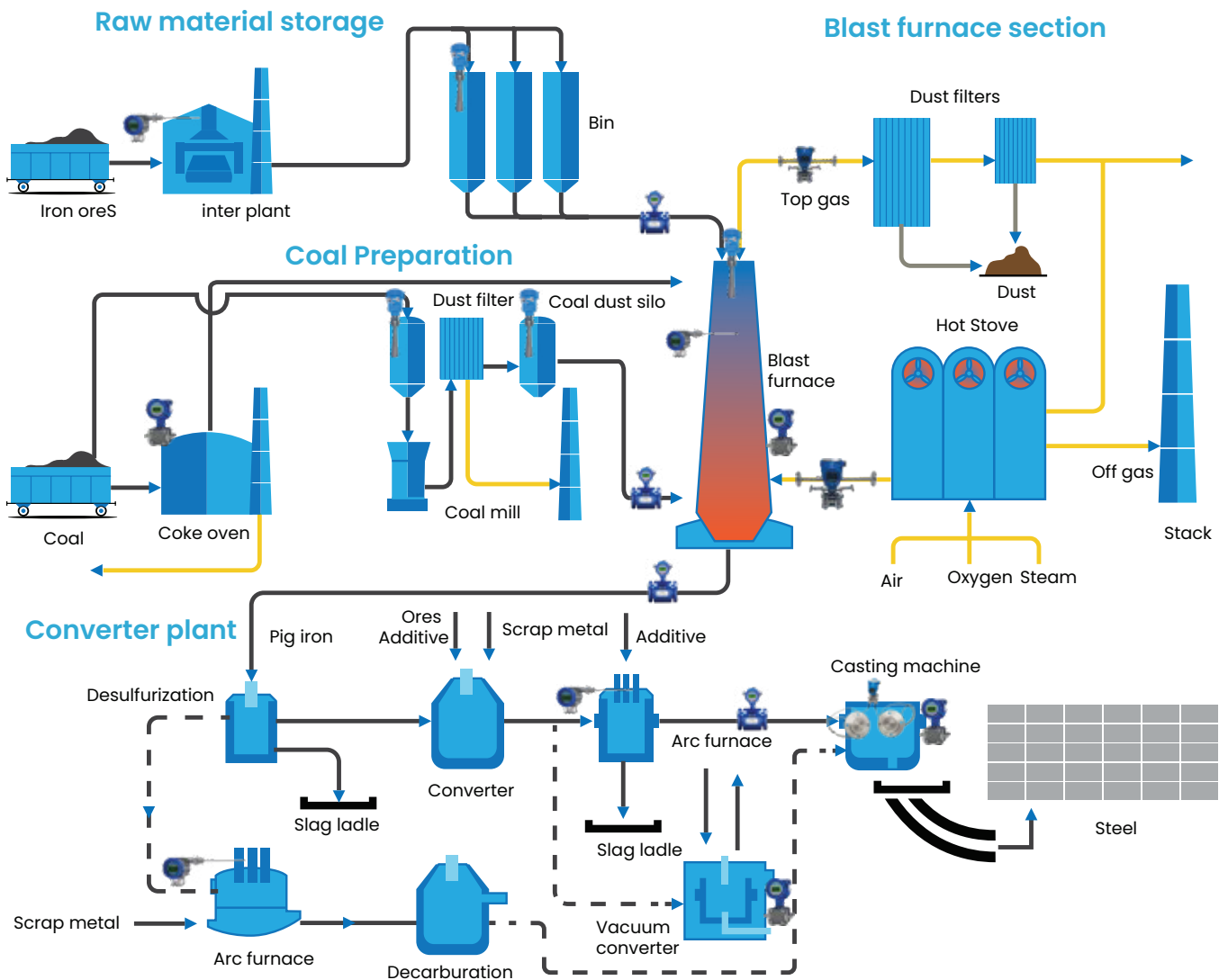




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INTRODUCTION STEEL PLANT

The steel production plant or metal industries process has numerous process and operational challenges in maintaining measurement accuracy, reliability, and asset uptime. Along with these challenges, safety and availability are the main priorities for steel plant operators. All these challenges affect the quality of the product. Robust measurement instrumentation is required to improve quality and safety in steel production. Tek-Trol's robust instruments ensure a long service life and provide reliable data along with environment-friendly operations. Our products are available for every aspect of these industries, whether exploring and processing expensive metals and coal, distributing bulk solids, or safety-critical utility applications in steel manufacture. Our highly reliable and cost-effective solution helps increase plant uptimes, meet high safety requirements, and enhance productivity.



COST SAVING INSTRUMENTS FOR STEEL PLANT / METAL

FLOW MEASUREMENT

Tek-Flux 1400A Electromagnetic flow meter
Tek-DP 1610D Integral Orifice Assemblies

TEMPERATURE MEASUREMENT

Tek-Temp 2100A Explosion-Proof Temperature Transmitter

PRESSURE MEASUREMENT

Tek-Bar 3110B Explosion-Proof Piezo Differential Pressure Transmitter
Tek-Bar 3120B Explosion-Proof Piezo Pressure Transmitter

LEVEL MEASUREMENT

Tek-Wave 4300C Free Space Radar Level Transmitter
Tek-Hydra 4500A-D Differential Pressure Level Transmitter

RAW MATERIAL STORAGE AND COKE PREPARATION

The raw material storage is stored raw materials such as iron ore, coal, and limestone produced from mines. Mined ore is transported through conveyor systems to sizeable above ground or underground silos and stored there until used in production. Tek-Trol's reliable Non-Contact Radar Level Measurement System is used to determine the contents of the silos. This raw material is pass to the sinter plant for further process

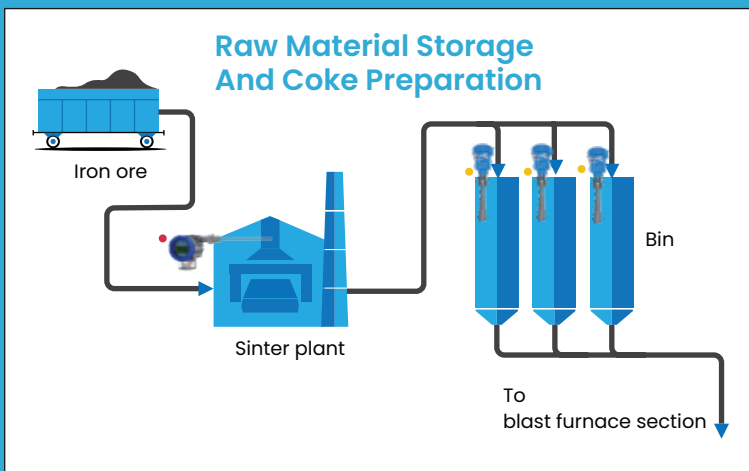
Sinter is an essential process in the feed for the blast furnace process . In this process, a mixture of iron ore fines, fluxes, and different ferrous waste materials such as blast furnace flue dust and oily mill scale combine into a form suitable for use in a blast furnace. After sintering, the hot material is cooled down at a temperature of 150 °C in the sintering cooler. The sintering belt's feed rate is controlled to ensure that the material is thrown off at the end of the sintering belt. The thickness of the material on the sintering belt has to be continuously and accurately measured by Tek-Trol's Non-Contact Radar Level Transmitter to achieve adequate cooling and Tek-Trol's Explosion-Proof Temperature Transmitter monitored the temperature of the sintering process.

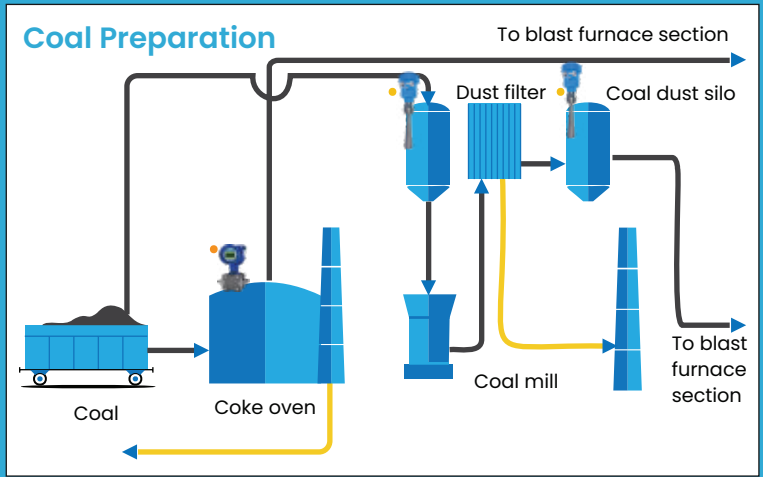
- ### Temperature Measurement

Tek-Temp 2100A Explosion-Proof Temperature Transmitter

- ### Level Measurement

Tek-Wave 4300C Free Space Radar Level Transmitter



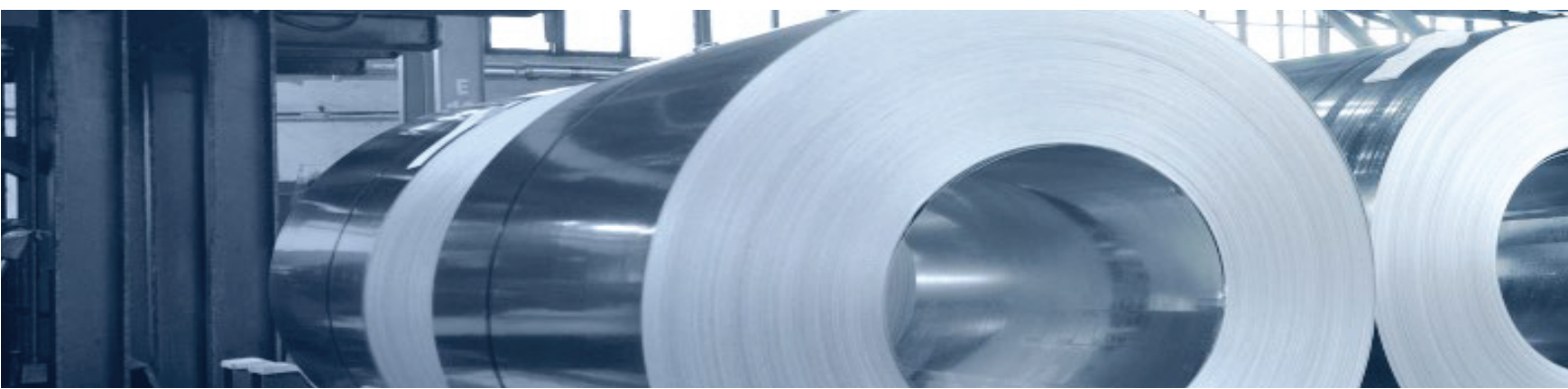


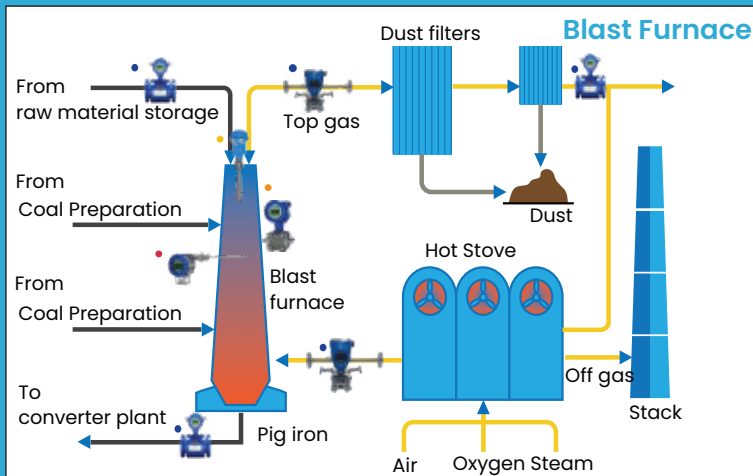
COAL PREPARATION

In the coke plant, the coal is delivered by train. Conveyor belts transport the coal to be stored in silos that are as tall as 50m. The level of these silos is measured by Tek-Trol's highly reliable Free Space Radar Level Transmitter. The coal is then transferred from the silos through the conveyor belt to mixing and grinding plants to convert it into coke by heating the prepared coal mixture batch, in the absence of air, at temperature 1,000 to 1,300 °C for a period of 16 to 30 hours. When the coal is heated, the gaseous components are released. One of the things the coking plants use the gas released for is to create energy. The slaked and finished coal is loaded into trains. Tek-Trol's Explosion-Proof Piezo Pressure Transmitter individually regulates the pressures in each of the separate ovens of a coking plant to achieve a high-quality coke. These trains fill the coke bunkers with the finished, partially still warm coke is transported directly to be fired in blast furnaces. As a reducing agent, coke has a significant impact on the cost-effectiveness of the process and the quality of the final product.

- **Pressure Measurement**

Tek-Bar 3120B Explosion-Proof Piezo Pressure Transmitter





BLAST FURNACE

A blast furnace is a metallurgical furnace used to produce molten iron, which is a combination of iron ore, limestone, and coke. During the blast furnace process, sinter, or pellets, and ore, coke, and lime, bind the ore's unwanted constituents in the slag and reduce the melting temperature of the iron. They are fed from the blast furnace's top, while hot compressed air is introduced from the nozzle in the lower part. Auxiliary reducing agents or fuels such as coal, fuel oil, natural gas, or other sources can also be injected from the furnace's bottom. The iron is then refined with scrap and other additives in a basic oxygen furnace to produce liquid steel. The highly accurate Tek-Trol's Non-contact Radar Level transmitter is used to measure the blast furnace level, which ensures an optimal distribution of the burden and coke layers.

The monitoring of fuel pressure and temperature and the blast furnace gas pressure are of utmost importance to provide normalized consumption and operating data for the process controls. Tek-Trol's Explosion-Proof Piezo Differential Pressure Transmitter and Explosion-Proof Temperature Transmitter is used to monitor blast furnace pressure and temperature. Tek-Trol's Electromagnetic Flow Meter and Integral Orifice Assemblies are used to measure clean, safe, and reliable flow measurement in the blast furnace process.

- **Flow Measurement**

Tek-Flow 1400A Electromagnetic Flow Meter
Tek-DP 1610D Integral Orifice Assemblies

- **Pressure Measurement**

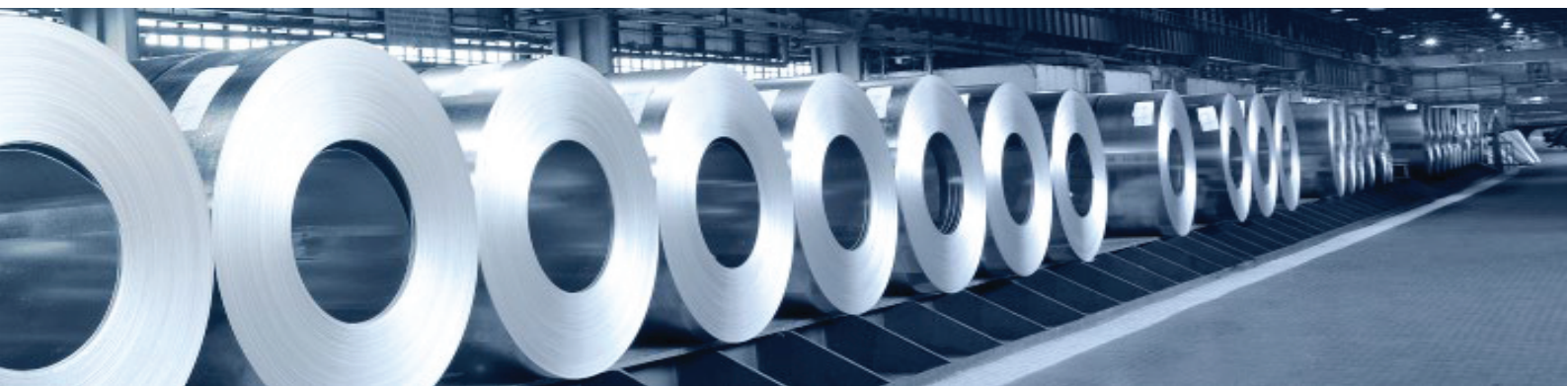
Tek-Bar 3110B Explosion-Proof Piezo Differential Pressure Transmitter

- **Level Measurement**

Tek-Wave 4300C Free Space Radar Level Transmitter

- **Temperature Measurement**

Tek-Temp 2100A Explosion-Proof Temperature Transmitter

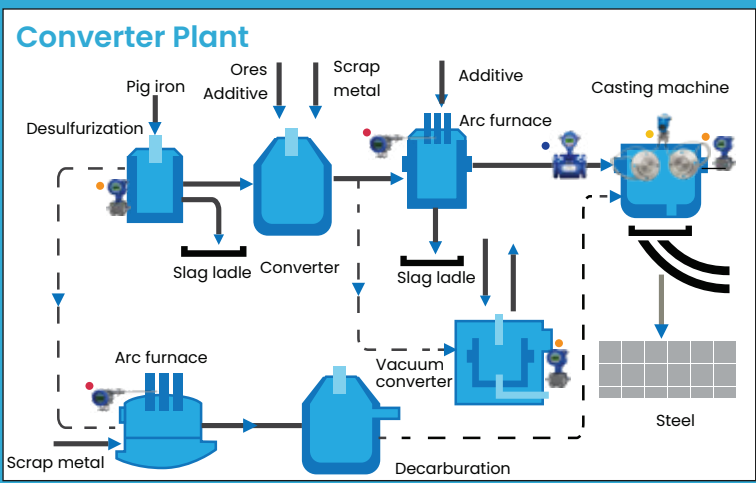


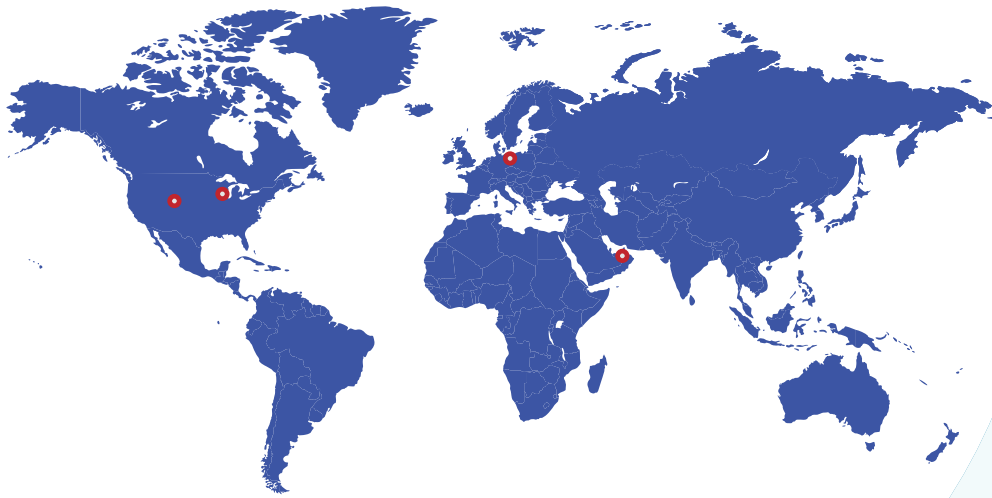
CONVERTER PLANT

The molten iron from the blast furnace is converted into molten steel in this process. The molten iron contains large quantities of impurities (carbon, silicon, phosphorus, etc.). These scrap-based steels are recovered in the electric arc furnace. It is transferred into the converter, where impurities are oxidised and removed by bursts of oxygen from both the top and bottom. Tek-Trol's Explosion-Proof Piezo Differential Pressure Transmitter and Orifice Flow Meter monitor the pressure and flow values, and Tek-Trol's Temperature Transmitter has recorded the temperature.

Ladle furnaces in steel plants are used as secondary metallurgy for the treatment of liquid steel. The melt is further desulphurised and calibrated to produce the steel as per the customer requirement. In the casting process, the liquid steel flows from the ladle through the distributor into the moulds. The steel-filled ladle is suspended in a rotatable tower that can hold two ladles. Both thermal and pressure control methods are used to detect local escape of liquid steel or for penetration detection in the casting operation. The pressure of liquid steel is measure by Tek-Trol's Explosion-Proof Piezo Differential Pressure Transmitter. It is essential to detect the temperature in the casting mould to prevent penetration and determine cracks development. For this purpose, Tek-Trol's Explosion-Proof Temperature Transmitter is used to measure mould temperature. The flow of liquid steel is measure by Tek-Trol's Electromagnetic Flow Meter and the level of casting machine is measure by Tek-Trol's Differential Pressure Level Transmitter.

- **Flow Measurement**
Tek-Flow 1400A Electromagnetic Flow Meter
Tek-DP 1610D Integral Orifice Assemblies
- **Level Measurement**
Tek-Hydra 4500A-D Differential Pressure Level Transmitter
- **Pressure Measurement**
Tek-Bar 3110B Explosion-Proof Piezo Differential Pressure Transmitter
- **Temperature Measurement**
Tek-Temp 2100A Explosion-Proof Temperature Transmitter





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