

# steel making

## The Challenges

In a phrase: **Only the strong survive.** The temperature in a basic oxygen furnace or an electric arc furnace can reach 3000°F (1634°C), and around the furnace it isn't much cooler. Hot carbon particles and dust coat everything mechanical and electrical, and fall from the ceiling like black snow. Molten metal splash is a concern, and in the electric arc process high electro-magnetic fields raise havoc with electronic devices.

## Smart Solutions

All AMETEK Automation and Process Technologies mill-duty smart solutions are application driven. Whether we use standard products or special engineered solutions, you can depend on five things: accuracy and repeatability, survivability, easy installation and service. Here are a few examples in steel making:

### 1 Re-ladle and Desulfurization Hot Metal Transfer Stations

- PLS – temperature sample lance
- Series 925 – cable drive for ladle car position and tilt slag off position
- CATRAC™

### 2 BOF Scrap Charge Car Position

- Resolver-based linear cable reel sensors monitor car position
- Scrap bucket tilt controls

### 3 Furnace Tilt Control

- Mill-duty rotating cam limit switches control position
- Resolver-based remote encoder 2120 packages or programmable limit switch systems (PLS) monitor/control position
- Mill-duty Linear Displacement Transducer (LDT) for hydraulically actuated tilt
- 1746/1771 Cards for AIB PLC
- 925 Linear Cable Reel Sensors

### 4 Ladle Crane/Scrap Charge Crane Control

### 5 Lance Position and Control

- Mill-duty rotating cam limit switches position rotary skew monitoring
- Multi-turn resolver systems monitor vertical lance movement, insertion depth, and over-travel limits
- 1746/1771 Cards for AIB PLC
- 2120 Module
- Electro-thrust brakes

### 6 Ladle Transfer Car Position

- Resolver-based position cable reel sensors

### 7 EAF Furnace Cover Position

- Vertical position mill-duty Linear Displacement Transducer (LDT) with programmable limit switch (PLS)
- Rotational position resolver-based encoder/programmable limit switch system (PLS)

### 8 Electrode Position/Velocity

- Linear cable reel sensors give vertical position and velocity data
- Rotational position resolver-based encoder or programmable limit switch (PLS)
- Mill-Duty Linear Displacement Transducer (LDT) for position & velocity feedback

### 9 Oxygen Lance Resolver-Based Positioning

- 2500 PLS
- 2120 Module

### 10 AOD Furnace Tilt Controls

- Resolvers, Series 1980
- Thruster brakes

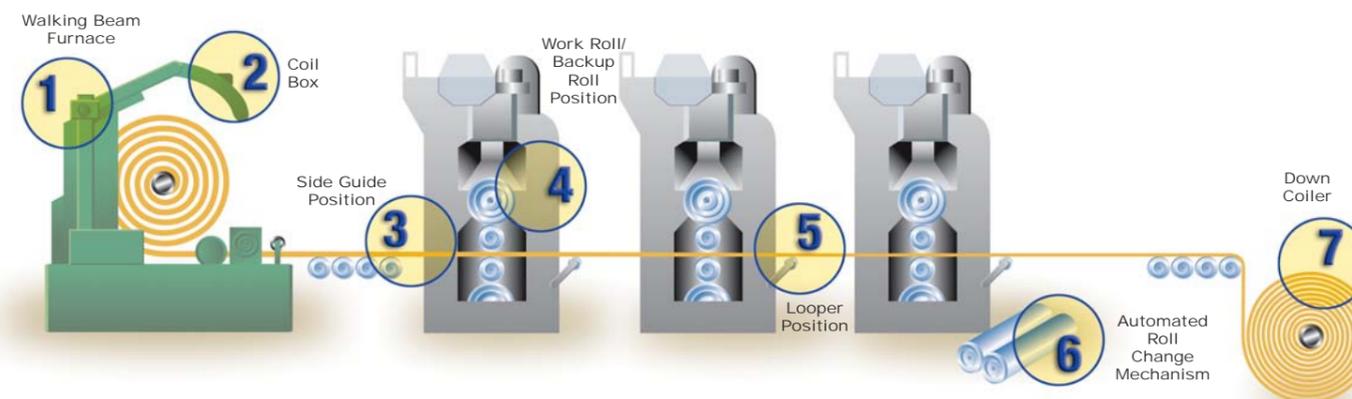
### 11 Ladle DeGasser and Metallurgical Station

- CATRAC™ – Resolver transfer cars
- Electro-thrust brakes

## More Mill-Duty Solutions

### Control Products

In this area of the mill, AMETEK Automation and Process Technologies also offers mill-duty GEMCO hydraulic, electric and electro-thrust brake systems, CATRAC™ cable and hose carriers.



## application notes

### Faster Automation

**Side Guide Automation Saves Setup Time and Improves Accuracy**

**The Challenge:** To replace encoders on roller or rail type side guides with a sensor system that is more rugged and accurate, allowing for greater reliability, control, and automation of the process

**The Solution:** Our highly accurate Resolver- or Linear Displacement Transducer (LDT)-based sensor packages in rugged mill-duty housings

These sensor packages are designed to produce reliable and accurate positioning data by reading the actual side guide position, not the drive mechanisms that actuate them. By ignoring machine backlash, we improve accuracy. The Linear Displacement Transducer's (LDT) mill-duty housing allows it to be mounted directly to the side guide itself, while protecting it from the heat, water, and mechanical damage inherent when this close to the rolling process. In addition, all of our systems are designed for easy installation and are compatible with your host computer.

Consult factory for application details.

