METALS PROCESSING

IMPROVE **STEEL MAKING**

REXA Electraulic™ Actuation guarantees you improved efficiency of processes, extended reliability on demanding applications and low cost of ownership over time. REXA Actuators are manufactured in the USA with a globally proven installed base, and engineered to fit the demands of any steel application.

REXA Electraulic™ Technology provides the precision and durability that is crucial to the continuous operation and longevity in challenging steel mill applications. The rugged, self-contained design delivers a long service life combined with minimal maintenance, even in the most severe steel making environments.

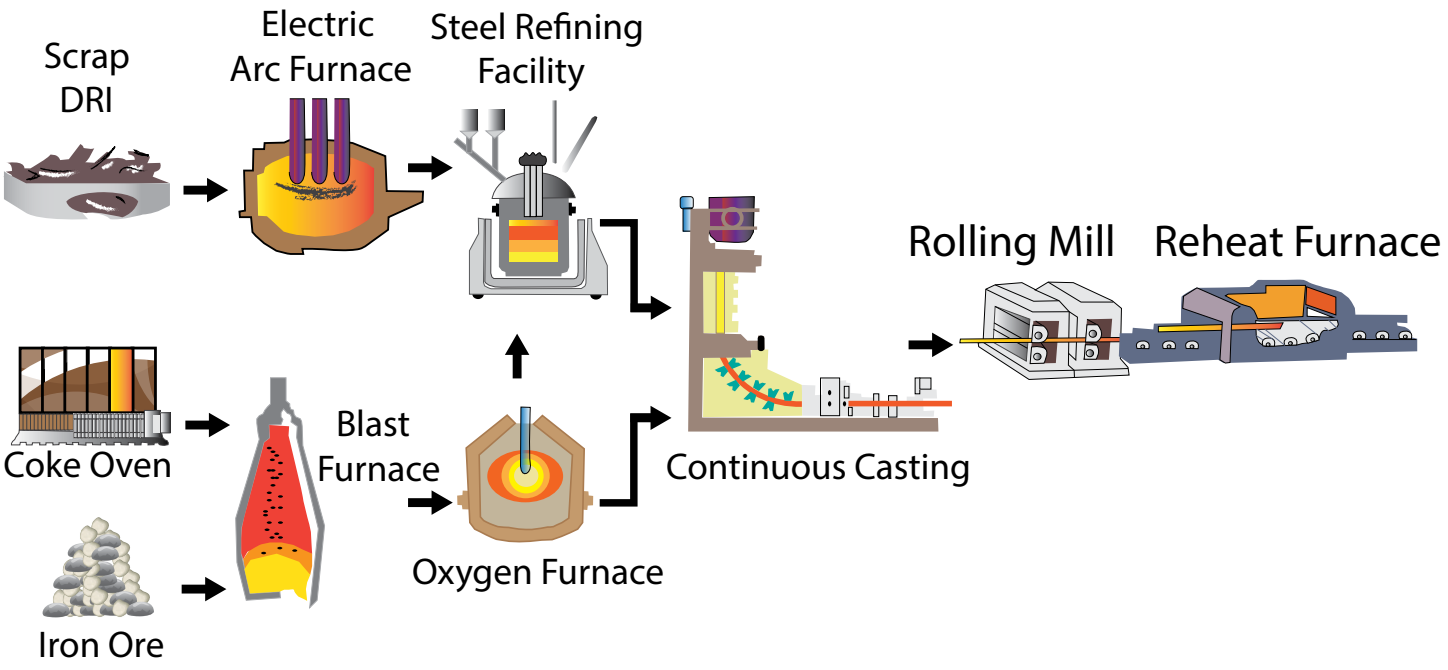
ELECTRAULIC™ ACTUATION

Steel Mill Market

Industry Demands

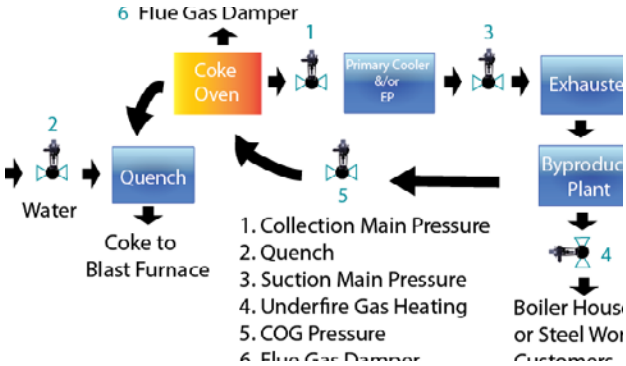
Steel is a vital component for the economies of many countries around the world, supplying automotive, construction, machinery, energy, and transportation industries. Specifically, the production of hot-rolled and cold-rolled flat steel, which is used in automobiles and consumer durable goods. Production has been strong despite lagging global demand for lower-grade construction and infrastructure steel.

The production of cold-rolled flat steel requires good quality iron ore and metallurgical coke feed materials, as well as good quality hot metal and slabs. Whether a mill uses a blast furnace or an electric arc furnace, the more control and precision they have in the process results in a higher quality end product.



Coke Ovens

Coke ovens process coal into coke that is used as a fuel source in blast furnaces. The coking process is a batch process in individual ovens. The requirements to adequately handle changing gas generation and coke oven temperature is challenging for operations to consistently and effectively produce quality coke safely. The co-product gas exiting the coke oven is tightly pressure controlled to ~14+/- 1 MMWC. Too high a pressure in the collection main may cause the gas to be diverted from the co-product plant to atmosphere. Insufficient pressure may cause air to enter the oven, ruining the coke. Air in the ovens or exhaust system can ignite, which is an unsafe condition.



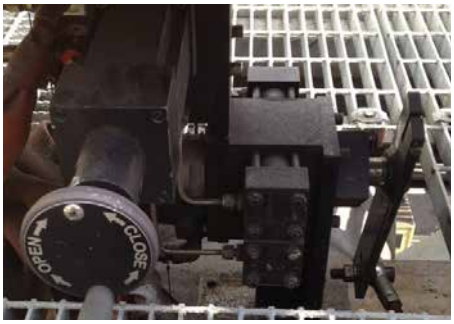
REXA Rotary or Drive Actuators have the precision (0.05%) and capability to precisely control the coke oven collection line gas pressure.

Coke Oven Gas Main Pressure Control

"The first hour of an oven charge we risk purging the oven gas because the pressure gets too high."

- Is your current system slow to respond to pressure spikes?
- Can the crossover valve position quickly and accurately during charging?

Solution: REXA can give you confidence to precisely position with minimal deadtime.



Coke Oven Underfire Gas Pressure Control

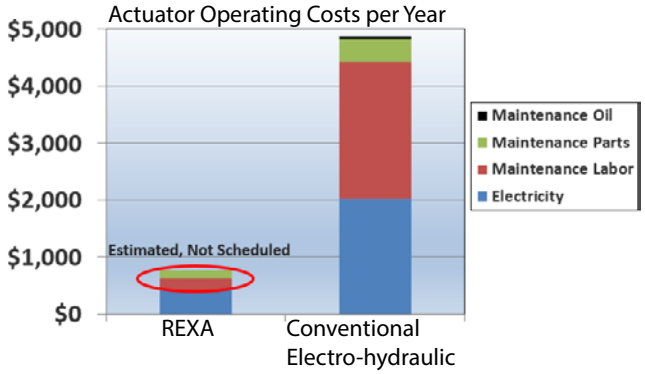
"My underfire gas valve hunts. My oven temperature continues to increase so the charge cycle time is longer than needed."

- Wish you could reliably keep the flue gas temperature stable?
- Are your current actuators fast enough without overshooting?

Solution: REXA can make your butterfly valve an accurate flow control device, eliminate hunting and reduce COG consumption.

Reduce Operating Costs

Actuator comparison on a crossover valve. The cost of constantly running motors and oil maintenance are significant.



Iron Making

Blast Furnaces

The blast furnace makes cast iron from iron ore, coke and limestone by reducing the iron and melting it into molten cast iron. Hot blast air blown into the bottom of the furnace at 1800º F and 500 mph helps the coke burn which reduces and melts the iron ore. For this continuous process the temperatures in the furnace reach 3,500ºF. Waste gases are cleaned and used for heating stoves for hot blast air and to boilers for power generation.

Blast Furnace Gas Feed To Boiler Pressure Control

"We needed to operate our turbine at a higher pressure due to the boiler not heating consistently"

- Is the BF gas pressure to the boiler stable and achieving set point?
- Can the BF operational flow changes be controlled in a stable manner?

Solution: REXA can give you confidence to precisely position the butterfly valve to provide consistent BF gas to the boiler, improving boiler operation and producing consistent electricity from the turbine.

Electric Arc Furnaces (EAFs)

The EAF Furnace uses steel scrap or DRI to charge. The process melts the steel at 1800º C. This is a batch process that has lower emissions and more flexible operations. A baghouse is an air pollution control device commonly in steel mills used to remove particulates out of hot gases from various steel making processes. The use of air dampers controls the gas pressure to optimize particulate recovery and process availability. REXA Actuators are used to precisely maintain vacuum pressure because even a slight positive pressure exists inside the bags can result in reduced cleaning efficiency.

Applications (Partial)

- Main air pressure
- Canopy pressure
- Baghouse pressure

Continuous Casting & Hot Rolling Mill

Continuous Casting

Continuous casting is a process that begins with pouring molten steel into an elevated mold. The fluid metal moves quickly through the mold in a long strand that flows horizontally via a series of rollers at a constant rate. Eventually, the metal transitions to a horizontal series of rollers where it is cut or sawed at a predetermined length. Continuous casting is an efficient production technique results in improved yield and quality when the process is in control.

Applications (Partial)

- Mold water temperature
- Secondary cooling
- Mold level

Hot Rolling Mill in Japan: 12 Years Maintenance-Free

Hot Rolling Mill

Hot rolling is a metalworking process that occurs above the recrystallization temperature of the material. After the grains deform during processing, they recrystallize, which maintains an equiaxed microstructure and prevents the metal from work hardening. The starting material is usually large pieces of metal, like semi-finished casting products, such as slabs, blooms, and billets.

Reduce Maintenance Applications (Partial)

- Laminar cooling
- Cooling water feed
- Air exhaust

"Is it frustrating to get intermittent grain size changes during cooing?

- Are your products mechanical properties wider than expected?
- Is your operation running at optimal performance to consistency produce product with tight mechanical properties and few metallurgical defects?

Solution: REXA Actuators can provide accurate and stiff positioning to reduce water temperature variation.

REXA, Inc.
4 Manley Street
W. Bridgewater, MA 02379, USA
T: +1 508.584.1199
www.rexa.com

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