Texas Steel

Texas Steel, Inc.
Fort Worth, Texas

Smart Pump
Case Study

Prepared by:
      MT Systems, Inc.
      110 E. Williams Street
      Danville, IL 61832
      Phone: (217) 446-4646

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Introduction

Texas Steel has been in the foundry business since 1927. Products include steel castings weighing from 300 pounds to over 20,000 pounds in carbon, alloy and stainless steels. They serve all segments of the steel castings market. Production is currently about 55 tons per day of finished castings. The latest technologies are used throughout the plant.

General Foundry Information

Product Line:	Parts for construction equipment, valve bodies, mining equipment parts, railroad castings, oil field products and miscellaneous parts
Casting Metal Type:	- Carbon Steel - Alloy Steel - Stainless Steel
Melting Facilities:	Electric Arc Furnaces (1) 6 ½ Ton (1) 13 Ton
Sand Facilities:	- Phenolic Urethane Molds and Cores - Seven Continuous Mixers 30 Ton/Hr Sand Reclamation System
Cleaning Facilities:	Table Blast
Inspection Facilities:	- G-Ray - Magnetically Particle - Penetrant - Ultrasonic
Heat Treating	- Quench & Temper - Stress Relieve Furnaces
Machining Facilities	- Complete CNC Layout Equipment - Complete Machine Shop Facilities

Project Objective

The objective was to reduce binder consumption on molding sand mixer and obtain a more consistent sand mix.

Original Problems

- Continuous maintenance problems with existing chemical addition system
- Inaccurate and inconsistent chemical additions
- Addition of extra chemical to compensate for pumping fluctuations
- Resin and labor costs associated with daily calibrations of pumping system
- Scrap molds due to fluctuations in chemical delivery

Solution

They installed the MT Systems SMART PUMP Resin Control System. The basis for the design was to give them the repeatability and reliability over chemical percentages and ratios with the objective of reducing resin levels.

To accomplish the above goals, each miser was outfitted with the following hardware:

- SMART PUMP panel containing flowmeters, motor controllers, motors, magnetically coupled pumps, diverter valves and controllers
- Mixer electrical controls were altered to accommodate the SMART PUMP systems.
- Alarms were mounted at mixer

Their production flow is as follows:

The operator begins filling a mold with the high/low binder switch in the high setting. Once the face of the pattern is covered he switches to the low setting. When the mold is filled, he turns off the mixer and switches back to the high setting.

If for any reason the chemical level can not reach the set point and the SMART PUMP is unable to compensate, the system alarms and turns on alarm lights or shuts the system down. The system fully compensates for line restrictions, chemical viscosity changes, pump wear and operating pressure changes.

Results and Benefits

- Reduced binder 15% from 1.2% to 1.02%
- Reduced maintenance downtime and maintenance expenditures
- More consistency in tensile strengths
- Increased productivity by making the job right the first time
- Less need to check calibration of chemicals

Monetary Savings/Pay Back

Even though pay back and justification was not projected or computed, it is evident that the Smart Pump systems have provided Texas Steel with a cost competitive advantage in the market place.