

# **JOHNSTOWN**

Johnstown Corporation  
Johnstown, Pennsylvania

## **SMART PUMP** Case Study

Prepared by:

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

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# JOHNSTOWN

## SMART PUMP

### Introduction

Johnstown Corporation (Formerly USX) has been in operation for 99 years. They specialize in medium to large steel castings and rolling mill rolls. Production capacity at this facility is roughly 25,000 tons per year utilizing Alkyd Oil, Phenolic Urethane No-Bake and Clay Bonded core and mold technologies.

### General Foundry Information

Product Line:	<ul style="list-style-type: none"> <li>• Steel castings for automotive, industrial, naval, and power generation</li> <li>• Steel and iron rolls</li> </ul>
Casting Metal Type:	<ul style="list-style-type: none"> <li>• Steel 90% of Production</li> <li>• Iron Rolls 10% of Production</li> </ul>
Melting Facilities:	<ul style="list-style-type: none"> <li>• (1) 30 Ton Electric Arc Furnace</li> <li>• (2) 8 Ton Electric Arc Furnaces</li> <li>• (2) 4 Ton Induction Furnaces</li> <li>• (1) 25 Ton Ladle Station</li> </ul>
Sand Facilities:	<ul style="list-style-type: none"> <li>• Core Processes <ul style="list-style-type: none"> <li>Phenolic Urethane</li> <li>Alkyd Oil</li> </ul> </li> <li>• Molding Processes <ul style="list-style-type: none"> <li>Phenolic Urethane</li> <li>Alkyd Oil</li> <li>Clay Bonded Silica</li> </ul> </li> </ul>
Cleaning Facilities:	<ul style="list-style-type: none"> <li>• Hand RotoBlast (2)</li> <li>• Cleaning Booths</li> <li>• Grinding</li> <li>• Riser Burn Stations (1)</li> </ul>
Heat Treating:	<ul style="list-style-type: none"> <li>• Ovens (12)</li> <li>• Quench and Temper</li> <li>• Stress Relieve</li> <li>• Normalize</li> </ul>
Pattern Shop:	<ul style="list-style-type: none"> <li>• Wood, Styrofoam, Urethane Patterns</li> </ul>

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### Project Objective

The objective of the project was to reduce binder consumption and improve process repeatability. Additionally, high / low binder recipe capabilities and reduced mechanical problems were needed.

### 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 Control System on three of their continuous mixers. This was done in three stages with a design to give them the consistent repeatable chemical addition along with greatly improved mechanical reliability.

To accomplish this, each mixer was outfitted with the following hardware:

- SMART PUMP panel containing flowmeters, motor controllers, motors, magnetically coupled pumps, diverter valves and controllers
- Mixer controls were altered to accommodate the SMART PUMP systems
- Alarm lights and horns were mounted near the mixer

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

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## **SMART PUMP**

### **Results and Benefits**

- Reduced average chemical levels by 15%
- Reduced maintenance downtime and maintenance expenditures
- Reduced mold scrap by 80%
- Increased productivity by making the job right the first time
- Better shake out due to reduced resin levels

### **Monetary Savings/Pay Back**

The original projected time was 14 months and the actual pay back was 9 months.