

Wescast (Brantford Plant)

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SO₂/N₂ Gas Blending System Case Study

Prepared by:

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SO₂/N₂ Gas Blending System

Introduction

Wecast Brantford Plant began operations in 1991. They are a high production facility specializing primarily in automotive exhaust manifolds for the OEM market. The foundry uses the Epoxy Acrylic process for their core process. Their production capacity is 7 million castings per year at an average of 10 lbs. per casting.

General Foundry Information	
Casting Metal Type:	Silicon-Molybdenum Alloy Iron
Melting Facility:	5-Induction Furnaces
Core Process:	Epoxy Acrylic
Molding Process	Green Sand
Cleaning Facility	<ul style="list-style-type: none"> • Didion drums and pneumatic wedges • Break off (gate and riser removal) • Grinding Stations

Project Objectives

Reduce PPM Employee Exposure Levels
Improve Machine Productivity
Improve Process Repeatability and Reliability

Solution

They installed the MT Systems SO₂/N₂ Blending System to provide blended SO₂/N₂ gas to the central gassing header. The system consisted of the following:

- **Vaporizing System** - Vaporizes liquid SO₂ from their SO₂ bulk storage tank into gaseous SO₂.
- **Blending System** - Blends SO₂ and N₂ gases into the specific ratio needed to optimize the curing of the cores.
- **Online Analyzer** - Analyzes gas composition in the header for verification and recording of the process.
- **Control System** - Controls the entire process, provides a quick and easy way to monitor and change the process, and provides on-line diagnostics which increases overall uptime.
- **Safety System** - Built in safety for operator and system protection.

Wecast (Brantford Plant)**SO₂/N₂ Gas Blending System****General Core Information**

Number of SO ₂ /N ₂ Blending Systems	1
Number of Core Machines	3
Typical Blow Weight	30 Lbs
Average Machine Cycle	52 Sec
Gassing Times	.8 to 1 Sec
Purge Time	12 Sec
Gassing Pressure	14.5 PSI
Purge Pressure	45 to 60 PSI
Avg. SO ₂ usage	24 Lbs/Ton of Mixed Sand

Results and Benefits

Reduction in SO ₂ core residuals by:	70%
Increased productivity by: (Overall machine cycle: Before 58 Sec. After 52 Sec.)	10.34%
Reduced purge cycle by: (Before 18 Sec. After 12 Sec.)	33%
Reduction in employee SO ₂ PPM exposure levels by: (Canadian maximum exposure limit is 2 PPM, Wecast operates below .5PPM)	70%
Flexibility over controlling the SO ₂ process	
System is designed to ASME specifications	

System Justification

Increased core machine productivity
Reduce plant air consumption due to lower purge times
Better environmental conditions due to lower core residuals and lower operator PPM exposure

NOTE: Wecast wanted to make sure we point out: This system does not replace the need for proper maintenance of equipment and core tooling. You can not tell the difference between a leaky core box using 100% SO₂ or the same core box using a 50% SO₂.