

SinterCast System 4000 Plus

The newly upgraded, fully automated System 4000 *Plus* provides a flexible, robust and accurate hardware and software platform that enables SinterCast customers to independently control CGI series production and product development. The System 4000 *Plus* is comprised of individual hardware modules that can be configured to suit the layout, process flow and production volume of any foundry, both for ladle production and pouring furnaces. In addition to the automatic feedforward correction provided by the basic System 4000, the System 4000 *Plus* also provides automatic feedback control of the initial base treatment process.

Based on the automatic input of base iron chemistry, ladle weight, iron temperature, and the historical SinterCast results, the System 4000 *Plus* calculates and adds the optimal amount of magnesium and inoculant cored wire in the initial base treatment. Automated base treatment prior to the measure-and-correct process control strategy enables foundries to reduce the variation of the base treatment process, thereby preventing operator error and improving the efficiency and productivity of the CGI series production process. The basic configuration of the System 4000 *Plus* consists of two Sampling Modules to obtain the thermal analysis samples, an Operator Control Module for data display and operator interaction, a Power Supply, two separate network-linked wirefeeders for base treatment and correction, and a Peripheral Input Module for the collection of input data such as chemistry, ladle weight and iron temperature for base treatment and post-treatment data such as pouring temperature and time. This configuration provides sampling capacity for approximately 15 ladles per hour. Additional hardware can be added to accommodate each foundry layout and production throughput.



Figure 1: System 4000 Plus base treatment and correction stations

The System 4000 *Plus* features include:

- **Accuracy:** Proven, high resolution SinterCast thermal analysis.
- **Automation:** Automatic base treatment by cored wire, based on automated input of ladle weight, temperature and historical SinterCast analysis results from previous ladles.
- **Process Control:** Automatic wirefeeding for the correction of magnesium and inoculation for each ladle.
- **User - Friendliness:** Display of magnesium, inoculant and carbon equivalent results as histogram run-charts with all information in the local language.
- **Process Database:** Collection of melting and pouring data into a single database, including all System 4000 thermal analysis results and process data for advanced traceability.
- **Consistency:** Re-useable Thermocouple Pair can perform up to 250 measurements, providing accuracy and traceability.
- **Efficiency Benchmarking:** Production results compiled every month and delivered to each customer with analysis and process improvement input from SinterCast engineers.
- **Independent Control:** Supervisor-level access to process parameters, directly at the Supervisor's desktop computer.
- **Robust:** Rugged Windows 10 IoT embedded operating system and hardware proven in the foundry environment.
- **Remote Support:** VPN access by SinterCast for technical support and maintenance.
- **Flexible:** Pallet mounted, individually floor-mounted, or wall-mounted to suit any foundry layout.



Figure 2: Larger graphical OCM display for user-friendly operator interaction



Figure 3: Re-engineered SAM with improved Thermocouple Holder

System 4000 Plus Improvements

- **OCM Display:** Larger graphical display allows increased content and layout flexibility.
- **Computing Power:** Faster, more powerful CPU with increased disk size and new Windows 10 IoT embedded operating system allows integration of SinterCast Tracking Technologies systems.
- **Re-engineered SAM:**
 - Updated ejection mechanism for a more robust and stronger Sampling Cup ejection.
 - Improved Thermocouple Holder to simplify the installation and alignment of the Thermocouple Pair.
 - Thermocouple Pair mounting and fastening improved to ensure correct and consistent location with easy removal.
 - No tools needed for replacement of complete Sampling Module.
- **Thermocouple Pair Positioning:** Laser based monitoring of the Thermocouple Pair position during sample analysis.
- **Operator Box:** SAM and Wirefeeder Operator Boxes upgraded to ethernet based communication to increase speed and flexibility of information exchange. Improved display to provide information to operators in local language.
- **Signal Lamp:** SAM and Wirefeeder Signal Lamp Assemblies with increased visibility and flexibility for colour signals and indicators.
- **Remote Access:** real-time result viewing on any internet-connected device.

System 4000 Plus Specifications

Components	Two Sampling Modules (SAM) Operator Control Module (OCM) Peripheral Input Module (PIM) Power Supply Module Two Complete Wirefeeders: <i>Base Treatment and Correction</i>
Foot-print	1,200 x 800 mm, on pallet
Max Height	1,960 mm
Weight	435 kg (pallet mounted items) 290 kg (Each Complete Wirefeeder)
Power Supply	Power Supply Module: 110–120V, 50–60Hz, 2kW max 220–240V, 50–60Hz, 2kW max Single Phase. To be specified on order Each Wirefeeder Control Cabinet: 380–440V, 4 kW max, Three Phase



Figure 4: Multiple wirefeeders for base treatment and correction