

SinterCast Process Control - Mini-System 3000

The Mini-System 3000 is a purpose-built thermal analysis system for product development, prototyping and niche volume production. The Mini-System 3000 uses the same sampling technology and software as the fully automated System 3000, but is based on a simplified hardware platform. The Mini-System 3000 does not include an integrated wirefeeder. The foundry can source a separate wirefeeder and manually input the magnesium and inoculant wire addition results provided on the operator display screen. As with the fully automated System 3000, all analysis results and thermal analysis process parameters are available to foundry supervisors and engineers.

All product calibrations developed using the Mini-System 3000 can be directly transferred to the fully automated System 3000 to provide continuity as products evolve to series production.

Mini-System 3000 Specifications

Components	Operator Control Module (OCM) Sampling Mechanism SAM Lighthouse Operator Box
Foot-print	1,400 x 550 mm
Max Height	1,630 mm
Weight	190 kg
Power Supply	110–120V, 50–60Hz, 2kW max. 220–240V, 50–60Hz, 2kW max. Single Phase.
Sampling Rate	1 sample every 4 minutes



Figure 1: SinterCast Mini-System 3000



Figure 2: SinterCast Immersion Sampling

Consistency and Resolution

The patented SinterCast Sampling Cup is fabricated from stamped and drawn steel sheet. In comparison to conventional thermal analysis sand cups, the design of the thin-wall immersion sampler ensures a constant sample volume, prevents oxidation of the iron during pour-in filling, provides a more uniform solidification profile and yields a more accurate measurement of undercooling because of the elimination of chill-solidification. The thermal analysis is obtained from two high-accuracy thermocouples that are contained within a protective tube in the Sampling Cup and reused up to 250 times. These design advantages ensure

consistency and are a key element of successful CGI production: the stable CGI window is so small that it is essential that all measured differences in the thermal analysis can be attributed to changes in the solidification behaviour of the iron rather than to variation in the sampling conditions. The walls of the Sampling Cup are coated with a reactive coating that consumes active magnesium in order to simulate the fading of magnesium in the ladle. This patented Mg-fade simulation allows SinterCast's customers to safely target the low end of the 0-20% Nodularity window in order to minimise the risk of porosity defects and to optimise material properties and machinability, while safely avoiding flake graphite formation. SinterCast has successfully used steel Sampling Cups and re-useable thermocouples since 1999.

SinterCast

— Supermetal CGI —

SinterCast Process Control - Manual Wirefeeder



Figure 3: SinterCast Manual Wirefeeder

Manual Wirefeeder Specifications

Dimensions (LxWxH)	Cabinet 600 x 340 x 1,000 mm Head 790 x 570 x 780 mm
Weight	Cabinet 70 kg Head 196 kg
Power Supply	380–415V, 3kW max. Three phase Dry oiled compressed air 5–10 bar

The Mini-System 3000 calculates the amounts of magnesium and inoculant required to correct the iron to the calibrated start-cast coordinates and displays these results on the OCM screen at the conclusion of every analysis. The required length of magnesium and inoculant wire can be manually entered on the wirefeeder control panel and thereafter the start button is pressed to activate feeding of the magnesium and inoculant wires in sequence. All wirefeeding parameters are configurable for optimum wire recovery and reproducibility, depending on the ladle size and shape. The Manual Wirefeeder provides full fault detection to ensure the corrections are conducted without error.