



Materials Processing Institute

The Materials Processing Institute is an Open-Access Technology Centre serving organisations which work with materials, materials processing or energy. The Institute specialises in challenging processes, particularly those involving high temperatures, hostile environments and high specification materials.



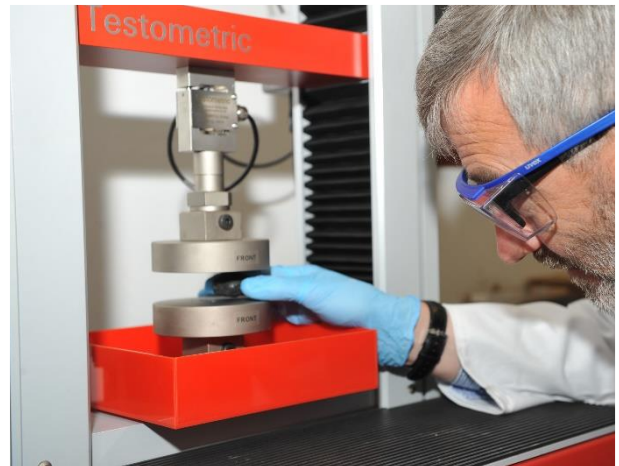
Sintering Operations

Proven Raw Materials Research Capability

Pre-treatment & Agglomeration

The Institute provides raw materials research to develop and refine pre-treatment and agglomeration technologies.

This research supports the development of efficient material upgrading processes, providing best value in the processing methods for ores, raw materials and process reverts.



Tensile/Compression Testing

The Benefits of Pre-Treatment & Agglomeration Process Research

- Evaluation of a wide range of material blends matched to sinter plant operations
- Optimisation of ore and material blends
- Support in defining sinter and pellet plant operating process controls
- Treatment of raw materials to improve physical or chemical properties
- Environmental impact evaluation
- Re-use and processing of residual materials
- Raw material and product characterisation for strength, degradation, reducibility, porosity and morphology

An Extensive Range of Equipment

The Institute has a long established evaluation capability to test and develop ore composites and agglomerates at pilot scale.

The range of equipment available at the Institute to support this is comprehensive and tests that the Institute carries out meet relevant ISO testing and industry standards.



Flow Factor Testing

Agglomeration Process	Equipment	Operational Function
Quality Evaluation	Pilot Sinter Box	Evaluation of sintering process performance and emissions
	Flow Factor Tester	Consolidation and shearing investigations
	Shatter Test Rig	Evaluation of material breakdown in handling systems and measure of fracture resilience
	Compression Test Rig	Measurement of compressive strength

Analysis	XRF	X-ray fluorescence
	LECO Elemental Analyser	CHNS determination in carbonaceous materials
	TGA	Thermo-gravimetric analysis for reactivity/kinetics under different atmospheres
	EDXA	Energy Dispersive X-Ray Analysis for elemental composition of minerals/inclusions in particle matrices
	SEM	Scanning electron microscopy for sub-micron structural analysis
	Optical Microscopy	Petrographic analysis of phases/inclusions in polished sections

Raw Materials Preparation	Briquetting Press	Lab-scale production of briquettes by roll-forming
	Pelletising Disc	Lab-scale production of pellets by pan-forming
	Magnetic Separator	Lab-scale separation of solids by means of permanent magnets
	Compression Tester	Measurement of compressive strength
	Crushing, Grinding, Mixing & Sieving Equipment	

Ancillary Equipment	Drying Oven/Furnace	A range of sizes and suitable for different operating temperatures
	Jaw Crusher	Sample preparation for testing

ISO Standard	Description of ISO Standard
ISO 4695:2007	Iron ore reducibility
ISO 46961:1996	Low temperature disintegration
ISO 4696-2:2007	Static low temperature reduction
ISO 4698:2007	Determination of relative free-swelling index
ISO 7215:2007	Determination of reducibility of iron ores
ISO 7992:2007	Determination of reduction properties of iron ores under load
ISO 3087:2011	Determination of moisture content
ISO 3852:2007	Determination of bulk density
ISO 3271:2007	Determination of tumble and abrasion indices

Additional Tests
Advanced softening and melting (ASAM)
High temperature softening and melting (HTSM)
Differential thermal analysis (DTA)
Magnetite content by Satmagan

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