

# Iron Ore Sintering Research

Sintering is the most widely used agglomeration process for preparing iron ore fines for blast furnace applications. We are using our expertise in iron ore sintering and evaluation of blast furnace burdens to assist industry to maximise the value of their resources, optimise product quality and reduce their environmental footprint

## Industry Challenges

The gradual depletion of the world's high-grade hematitic ores has led to increased reliance on alternative iron ore resources containing increased levels of fines, gangue minerals and combined water. The build-up of these components over time presents numerous challenges for blast furnace operation.

In modern blast furnaces, iron ore sinter can constitute more than 70% of the furnace burden. Maintaining the quality of sinter feed is becoming increasingly important in order to lower energy consumption, reduce gaseous and solid emissions, reduce slag volume, and produce high-quality hot metal with low impurity levels.

## CSIRO expertise, facilities and services

Together with industry, CSIRO has been conducting research on iron ore sintering and evaluation of blast furnace burdens at both laboratory and pilot-scale to optimise existing products and practices as well as develop new products and processes.

### Iron ore sintering

- Effect of ore characteristics
- Effect of processing conditions
- Techno-economic performance of iron ore fines
- Emission analysis and mitigation
- Iron-bearing waste recycling

### Evaluation of blast furnace burdens

- Standard ISO tests
- Softening and melting tests
- Blast furnace burden design and optimisation
- Evaluation and development of ISO standards



CSIRO pilot-scale pot-grate facility to simulate the sintering process occurring on sinter strands

## Research Facilities

- Pilot-scale granulation and sintering facilities
- Laboratory-scale sintering facilities, including rapid heating infra-red and electrical resistance furnaces
- Softening and melting test rig
- ISO TI, RI, RDI and DI test rigs
- High temperature viscometer
- Multiple phase equilibrium (MPE) thermodynamic package
- High temperature visualisation system
- High Temperature TGA – DSC
- Pilot and laboratory scale Eirich high intensive mixers
- Gasmeter CEM II continuous emission measurement system

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## AT CSIRO WE SHAPE THE FUTURE

We do this by using science to solve real issues. Our research makes a difference to industry, people and the planet.

## FOR FURTHER INFORMATION MINERAL RESOURCES

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