

Superwool® 1650SI Board

Our best-in-class 1650°C (3000°F) classification temperature low biopersistent structural insulation board designed for back-up insulation for molten metal handling equipment like steel ladle, tundish and torpedo applications.

This engineered high density, low thermal conductivity Superwool 1650SI Board provides outstanding performance to our customers:

- High-temperature capability providing **increased safety** to the employee and process
- Best-in-class insulating and thermal performance – **60% improvement** – resulting in **excellent energy savings and reduction in CO2 emissions**
- Optimum mechanical strength providing **reliability** of ladle performance

Superwool 1650SI board delivers your melting stability within the heavy-duty process of steel manufacturing application an edge to meet the demanding quality standards placed on the industry with proven reliability, superior performance, environmental benefits to reduce your emissions, and improve the safety of your employee.

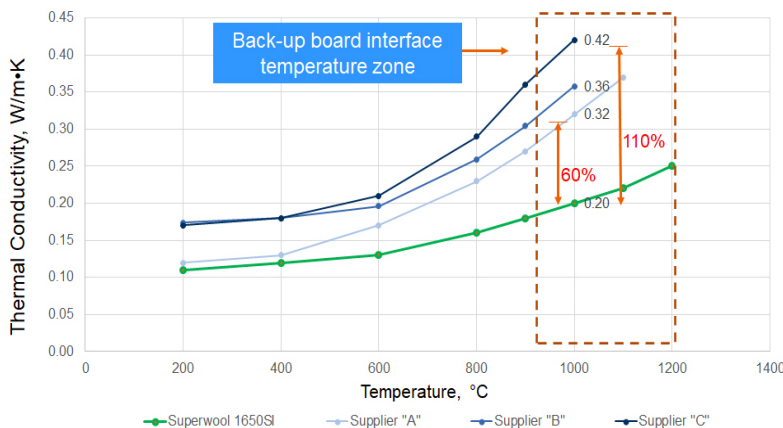


Features

- Low thermal conductivity
- Classification temperature, 1650°C (3000°F)
- High density
- Excellent strength
- Low shrinkage at elevated temperatures
- Hydrophobic
- Excellent load resistance

Thermal Conductivity Benchmarking

Comparison with leading structural insulation boards, ASTM C201

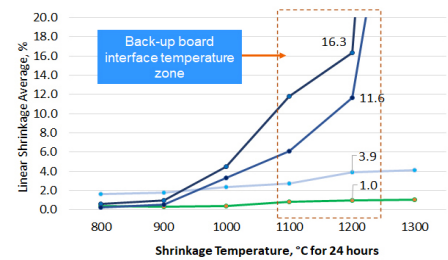


Superwool 1650SI Board is approximately 60% more insulating than nearest competition.

Key for graphs:
Supplier A: High Density Calcium Magnesium Silicate Board
Supplier B: High Density Magnesium Silicate Board
Supplier C: High Density Vermiculite Board

Linear Shrinkage

Mechanical stability is maintained at elevated temperatures



While traditional boards on the market today for these applications deteriorate with use and when exposed to higher temperatures, the Superwool 1650SI Board performs consistently with minimal shrinkage

Delivering reliable and safer lining solutions to improve energy efficiencies and increase melt hold times

Enhanced insulating performance changing the way ladle linings are designed

Superwool® I 650SI Board ensures the highest efficiency for back-up insulating systems. The main benefits include:

- Lower shell temperature and reduced thermal strain on the ladle
- Reduced heat loss (lower energy costs)
- Possible to reduce the safety lining thickness due to the enhanced insulating performance
- Extends holding time and operations
- Reduced preheating time
- Reduced skull formation
- Improved safety of people and process

When compared to alternative structural insulation products, the Superwool I 650SI Board offers a considerable reduction in cold face temperature, which results in reduced heat loss and contributes to reduced CO₂ emissions.



Thermographic image:

The in-situ performance of the Superwool I 650SI Board in a ladle application proved the thermal calculations by reducing the shell temperature by 35°C (95°F)

These features are further enhanced when the Superwool I 650SI Board is used in combination with WDS® LambdaFlex® Super Microporous. This is effectively illustrated in the table below. The **outstanding performance validates** further our products and solutions **contribution to the steel industry commitment to reduce emissions**.

	Working & Safety Lining	Insulation Thickness	Cold Face Temperature, °C	Heat Loss (kW/m ²)	Heat Loss per Year (kW-h)	Cost of Energy Lost per Year Through Lining* (0.1 €/kW.h)
Calcium Magnesium Silicate Board	178mm Mag-Carbon Firebrick 60mm Alumina 60 Firebrick	13mm	332	8.816	1624965	€ 162,497
Magnesium Silicate Board		13mm	361	10.49	1933517	€ 193,352
Superwool I 650SI Board		13mm	317	8.033	1480643	€ 148,064
Superwool I 650SI Board+ WDS LambdaFlex		13mm 5mm	261	5.49	1011917	€ 101,192

* Ex. 110MT ladle, 80m² internal surface area, 8 hours operation per day, 24 days operation per month, 1650°C steel temperature

All calculations are performed on a steady-state basis

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Thermal Ceramics is a business of Morgan Advanced Materials