solutions

35 - 37% Energy Saving
with JM23 Bricks...

...other benefits include:

Reduced costs to bring your
furnace operation up to temperature

and

Reduced costs to maintain
your furnace temperature

PROVEN

Thermal Ceramics
Insulating Our World

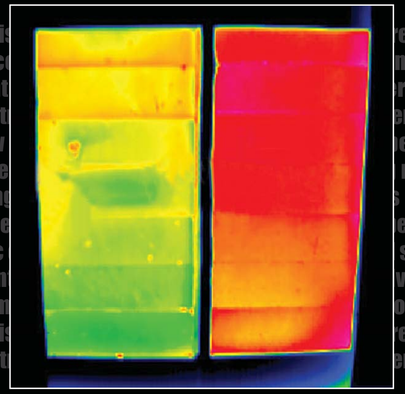
tell me more:
www.thermalceramics.com

BEWARE OF IMITATIONS
Look for the JM Brand

Morgan Crucible

Thermal Ceramics
Insulating Our World

providing real energy savings long consis… high quality anodes trouble free furnac… temperature cycles less cost excellent… less usage of energy high compressive st… providing real energy savings very low… resistant to tough, reducing atmosphere… results in less heat loss lowers operating… heat storage than denser refractories he… temperature cools fast to speed periodic… excellent thermal conductivity excellen… trouble free furnace operation containm… providing real energy savings long consis… less usage of energy high compressive st…



Infrared technology images showing temperature range
Thermal Ceramics: JM23 shown left

PROVEN

JM23 Bricks saves you energy

world leading products

JM23 Insulating Fire Bricks - offers genuine energy savings

Insulating Fire Bricks are well proven products for solving many problems of heat containment in industries as diverse as ceramic production and anodes for primary aluminium. These apparently traditional products are not all the same! The secret of providing excellent insulation at high temperature lies in the manufacturing process.

At Thermal Ceramics we make a continuous commitment to developing products which save energy. In recent times, with spiralling energy costs, this has become of even greater importance for all industries and so this leaflet has been developed, based on laboratory tests, to illustrate the large difference in performance which can be achieved when a kiln is built using IFB which may appear to be of the same grade but are very different in their characteristics.

In this test, the Thermal Ceramics JM23 IFB gave large **energy savings** compared with a competitor IFB of the same temperature grade.

The Test

- A kiln builder based in the United Kingdom made 2 identical furnaces. One was lined and insulated with our JM23 and the other was lined and insulated with Grade 23 Brand X bricks.
- Between each of the furnaces and the power source, we added two power meters to measure the energy usage and the cost of each firing.
- **Two tests were conducted:**

  Test 1
  firing at **800°C** ramped 3°C/minute and then held for 15 hours at continuous temperature.

  Test 2
  firing at **1000°C** ramped 3°C/minute and then held for 15 hours at continuous temperature.

By using Thermal Ceramics' JM23 Insulating Fire Bricks, significantly less energy is required to reach and maintain the operating temperature

Specification of the IFBs tested

JM23 Insulating Fire Brick

Classification temperature:	**1260°C**
Manufacturing process:	**Cast**
Bulk density:	**480 kg/m³**
Cold Crushing Strength:	**1.2 MPa**
Thermal conductivity at:	
600°C:	**0.15 w/mK**
800°C:	**0.17 w/mK**

Brand X: Grade 23 Insulating Fire Brick

Classification temperature:	**1260°C**
Manufacturing process:	**Cast**
Bulk density:	**520 kg/m³**
Cold Crushing Strength:	**2.0 MPa**
Thermal conductivity at:	
600°C:	**0.21 w/mK**
800°C:	**0.26 w/mK**

The Results

Firing 800°C per 15 hours

- **Kiln 1 (JM23):**

Energy used:	**11.2 kW**
with a cost of 0.12 €/kwh =	**1.34 Euro**
Energy used to achieve temperature:	**2.04 kW**
Temperature of the door:	**59°C**
Temperature on top:	**52°C**

- **Kiln 2 (Brand X: Grade 23):**

Energy used:	**17.3 kW**
with a cost of 0.12 €/kwh =	**2.08 Euro**
Energy used to achieve temperature:	**2.9 kW**
Temperature of the door:	**69°C**
Temperature on top:	**90°C**

- **Energy Saving:**
  17.3kw - 11.2kw = **6.1kW**
  JM23 IFBs are better by 35%
  resulting in:
  35% less cost when using JM23

Firing 1000°C per 15 hours

- **Kiln 1 (JM23):**

Energy used:	**16.0 kW**
with a cost of 0.12 €/kwh =	**1.91 Euro**
Energy used to achieve temperature:	**3.27 kW**
Temperature of the door:	**71°C**
Temperature on top:	**88°C**

- **Kiln 2 (Brand X: Grade 23):**

Energy used:	**25.4 kW**
with a cost of 0.12 €/kwh =	**3.02 Euro**
Energy used to achieve temperature:	**4.73 kW**
Temperature of the door:	**91°C**
Temperature on top:	**123°C**

- **Energy Saving:**
  25.4kw - 16.0kw = **9.4kw**
  JM23 IFBs are better by 37%
  resulting in:
  37% less cost when using JM23

The Evidence

- The meters of energy used at the end of the **1000°C firing**:

Kiln 1 (JM23).

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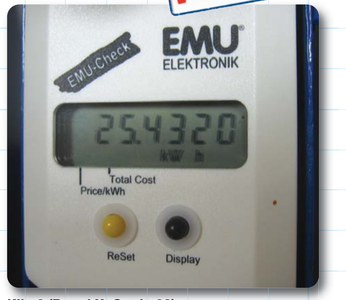
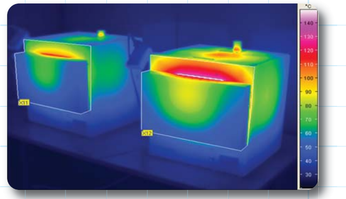


Kiln 2 (Brand X: Grade 23).



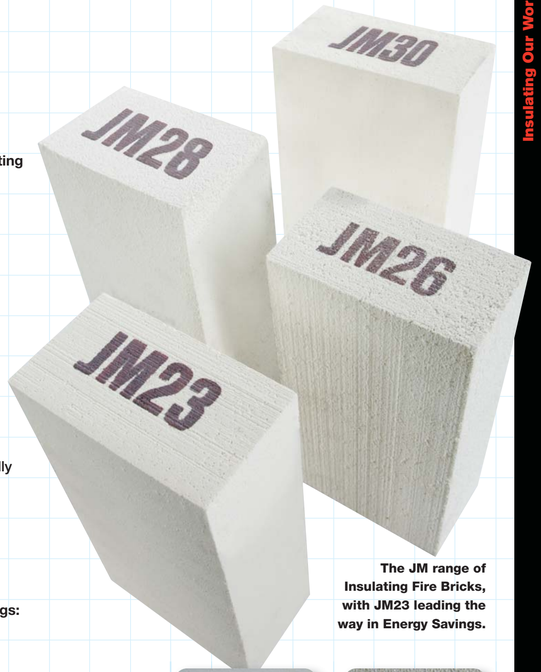
Heat from the oven doors.
JM23 on the left showing less heat.

JM23 IFB Benefits

- **Lower Thermal Conductivity than any other grade 23 Insulating Fire Brick**
- **35-37% energy savings in this comparison**
- **Lower operating costs**
- **Lower heat storage than any other brands:**
  - Heats quickly and economically to operating temperature
  - Cools fast to speed cyclical operations
- **Allows for thinner furnace linings:**
  - More useable capacity
- **Very low levels of iron and other impurities:**
  - Especially resistant to reducing atmospheric conditions

Environment Benefits

- **Energy saving nature resulting in less heat loss:**
  - Operating cost saving
  - Lower CO2 emissions
  - Better for the environment



The JM range of Insulating Fire Bricks, with JM23 leading the way in Energy Savings.

Microstructure Results (JM23 left)
the carefully controlled micro porosity of JM23 IFB confers much improved thermal conductivity compared to the much larger pore size of Brand X bricks (the difference is easily seen in the photoraphs above).

The advantage of using JM23 Insulating Fire Bricks is significant:
Energy cost savings in excess of one third

Insulating Our World