



PYROTEK POURABLE INSULATION 1000

FOR HIGH-TEMPERATURE APPLICATIONS

Pyrotek Pourable Insulation 1000 is an acid-free, refractory-based pourable backup insulation designed for application temperatures up to 1000°C (1832°F). The insulation contains a unique combination of refractory ingredients which create excellent insulation and chemical inertness.

Pyrotek Pourable Insulation 1000 easily mixes with clean water for pouring, evenly fills tortuous or irregularly shaped spaces and provides adequate installation setting time. PPI 1000 is resistant to molten aluminium penetration in cases where hot-facing refractories become compromised, and will help to prevent liquid metal from reaching steel weldments or other susceptible equipment components.

Another key feature, Pourable Insulation 1000 is specifically designed for fast drying, measured up to 50 percent faster than traditional pourable insulation products. This feature shortens maintenance turnaround times and speeds recommissioning of equipment for production.

COMPOSITION

Material	Approximate Percentage of Weight
Al ₂ O ₃	46%
SiO ₂	24%
CaO	21%
Fe ₂ O ₃	1%
TiO ₂	1%
Other	6%

PRODUCT SELECTION

- Pourable Insulation 1000 – standard recipe intended for most application environments, where mixing water is <30°C.
- Pourable Insulation 1000 Hot Temperature Water (HTW) – alternative recipe intended for use when available mixing water is 30-55°C.

STORAGE & SHELF LIFE

- It is recommended to use this product within one year of its original production date.
- If stored in its original, sealed packaging and in a cool, dry location, shelf life can typically be extended up to eighteen months.



PHYSICAL PROPERTIES

Property	Value
Density–g/cm ³ (lb/ft ³)	0.59–0.62 (37–39)
Maximum Service Temperature	1000°C (1832°F)
Modulus of Rupture–MPa (Psi) Fired at 450°C (842°F) Fired at 850°C (1562°F)	0.5-0.6 (72-87) 0.3-0.4 (43-58)
Cold Crushing Strength–MPa (Psi) Fired at 450°C (842°F) Fired at 850°C (1562°F)	2-3 (290-435) 1-2 (145-290)
Linear Change– Fired at 845°C (1553°F)	1.5-3%
Loss on Ignition (Solid powder mixture)	2.5%
Thermal Conductivity– (W/m·K) At 200°C (392°F) At 600°C (1112°F) At 1000°C (1832°F)	0.10-0.14 0.14-0.15 0.15-0.16
Apparent Porosity Fired at 110°C (230°F) Fired at 450°C (842°F)	63-67% 69-72%
Standard Mixing Ratio	0.7 kg (0.7L) water : 1.0kg dry refractory
Volume Filling	Using the standard mixing ratio, each 1kg (2.2lb) of dry refractory can fill 1.7L (0.06ft ³) of insulation space.
Total Pouring Time (Min.) including mixture preparation	10-15
Setting time (Min.)	45-60

AVAILABILITY

- 5 kg bag | Use 5 gallon (20 liter) bucket for mixing
- 10 kg bag | Use 8 gallon (30 liter) bucket for mixing





MIXING & POURING INSTRUCTIONS

Please closely follow these instructions to ensure proper mixing, pouring, and final material properties.

1. Prepare high energy mixing device such as drill or auger mixer, a source of clean plant water, a suitable mixing container, and a means to measure the weight (or volume) of water to be mixed.
2. Add an entire bag of powder to the chosen mixing container and gently stir to ensure ingredients are evenly distributed. **It is necessary to use an entire bag of powder for mixing, as supplied.**
3. Prepare enough clean tap water to mix powder and water in a 1.0/0.7 solids to water weight ratio (7 liters water per 10 kg powder). Water should be less than 30°C (86°F) for the standard version, and 30-55°C (86-131°F) for the HTW version.
4. Mix the powder and water for 1 minute with the high-energy mixer on high speed.
5. Scrape dry material from the sides and bottom of the container using a hand tool.
6. Mix the slurry again for 1-2 minutes with the high-energy mixer.
7. Slowly pour the mixture into the insulation space immediately after mixing, and allow to harden for 3-24 hours.

DRYING INSTRUCTIONS

After hardening for at least three hours, the insulation will contain some residual water that should be removed before commissioning, especially for molten metal applications. If applicable, assembly top plates over weldments should be left off during drying. Loose insulating covers or blankets are acceptable. The following drying procedures are applicable for most assemblies, and are separated by drying technique:

IN-FURNACE DRYING:

The following furnace schedule can be used when the entire assembly (with backup insulation) can be placed inside of a furnace for dry out. In these cases, the total drying time should be roughly 10 hours, including ramp and soaking time.

Step	Process	Furnace Temp.
1	Ramp at 5°C/min (9°F/min)	20-110°C (68-230°F)
2	Soak for 4 Hours	110°C (230°F)
3	Ramp at 5°C/min (9°F/min)	110-375°C (230-707°F)
4	Soak for 5 Hours	375°C (707°F)

IN-SITU DRYING:

For in-situ drying, a powerful heat source is required, such as an industrial gas or electric heater. During drying, the temperature of the refractory hot-face and insulation cold-face can be monitored via thermocouple or infrared thermometer.

1. Heat the assembly using gas or electric heater at 5°C/min until the hot-face temperature of the assembly reaches at least 375°C.
2. Maintain constant heat until the cold-face insulation temperature reaches 105-110°C, at which point the product can be considered dry and is ready to use.

