HIGH TEMPERATURE INSULATION

Certified by:

HYSIL
Calcium Silicate Insulation

calderys

CALDERYS

Calderys is a leading global provider for industries operating in high temperature conditions. We specialize in thermal protection for industrial equipment with a wide range of refractory products, and advanced solutions to enhance steel casting, metallurgical fluxes and molding processes.

In 2023, Calderys joined forces with HarbisonWalker International, (now HWI, a member of Calderys), one of the largest suppliers of refractory products and services in the United States.

Together, we form a high-growth, customer-centric provider with a comprehensive offering and a truly global reach. Drawing on over 160 years of combined experience, we support our customers in their energy transition needs. We count 4,500 employees in over 30 countries.

Our international network of experts ensures an end-to-end offer with tailored services. We are constantly developing innovative products and techniques in order to **optimize costs and performance,** combining world-class Research & Development and technical experts, as well as responsive supply chain and sales departments.

Our global structure allows us to design the customized solutions of today while **anticipating the industries' needs of tomorrow.** Calderys pays particular attention to the industry's impact on the environment and has a sustainability program articulated around three pillars: supporting our customers in their energy transition needs, improving our environmental footprint and being committed to people and local communities.

Health and safety is an integral part of how we do business. The same attention to detail that helps us provide personalized products and solutions is also applied to our rigorous health and safety criteria. Our activities require the highest level of professionalism to carry out our projects. To guarantee the strictest standards, Calderys employs a number of safety, occupational health and environmental protocols across all its entities worldwide — applicable to both our own employees as well as subcontractors and temporary workers.

HYSIL, A LEGACY OF FIVE DECADES OF THERMAL SAVINGS DRIVEN BY SUSTAINABILITY

In July 2020, Calderys acquired HYSIL, a prominent Indian manufacturer specializing in calcium silicate thermal insulation, with the goal of expanding its range of High Temperature solutions. HYSIL offers a superior product known as preformed, high temperature, abuse-resistant pipe and block insulation, which boasts exceptional structural strength. This strategic acquisition broadens the existing product portfolio and empowers Calderys to provide a comprehensive range of solutions to our valued customers.

HYSIL is composed of Hydrous Calcium Silicate and is designed for use in systems operating at high temperatures. As an inorganic, non-combustible, and eco-friendly material, it adheres to the stringent physical and thermal property requirements outlined in IS 8154, IS 9428, BS - 3958 Part -II, and ASTM C 533. HYSIL operates its own advanced manufacturing facility in Dharuhera, Haryana, ensuring consistent quality and reliable supply to meet market demands.

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KEY BENEFITS

HYSIL has passed multiple rigorous tests and is also certified by reputed international agencies.

High efficiency

Recyclable

Energy saving

Zero maintenance

Its key advantages include:

- Maximizing energy efficiency by reducing thermal losses, resulting in substantial energy savings (Superior thermal performance observed between 150°C to 1050°C).
- Maintaining insulation integrity by preventing binders from burning out, ensuring long-term insulation effectiveness.
- Reducing drying shrinkage while retaining exceptional thermal stability.
- Providing a durable solution with a lifespan of up to 20 years, avoiding the need for frequent replacements.
- Emitting no harmful gasses or smoke during initial combustion.
- Exhibiting outstanding resistance to mechanical vibrations, ensuring reliable performance even in challenging conditions.
- Demonstrating exceptional load-bearing capacity.
- Excluding asbestos fibers, amiantus, and other potentially hazardous materials.
- Delivering exceptional workability, facilitating effortless handling and application.

APPLICATIONS

FERTILIZERS, REFINERIES & PETROCHEMICALS

Reformers, Heaters, Reactors, Gas Crackers, Steam Lines, Hot Oil Lines, Lime Kilns.

IRON & STEEL INDUSTRY, DRI AND PELLET PLANTS

Blast Furnace Stoves, Bustle Mains, Bypass stack to Chimneys, Roof & Regenerators of Coke Oven Batteries, Vertical Lime Kilns, Reheating Furnace, Sinter plant, CPP & WHRS - Steam Lines, Dust Settling Chamber & After Burning Chamber of DRI, Side Walls & Roof Junction of Pellet Plants.

CEMENT PLANTS

Preheater Cyclones, Precalciners, Riser Ducts, Raw Meal Chutes, Gas Ducts, Kiln Firing Hood, Grate Cooler, Tertiary Air Duct, HAG, CPP & WHRS- Boilers and Steam lines.

POWER PLANTS

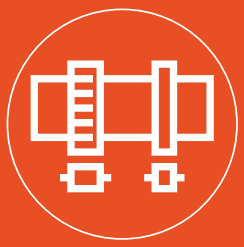
Boilers, Turbines, Steam lines, Chimneys.

ALUMINUM

Smelter Pots, Holding Furnaces, Alumina Calciners, CPP & WHRS - Boiler and Steam Lines.

FURNACES

Heat Treatment, Reheating, Continuous Galvanizing Lines, Annealing.



GLASS & CERAMIC

Tunnel Kilns, Melting Furnaces, Regenerators, Annealing Lehrs.

SUGAR INDUSTRIES

Boiler & Steam Lines.

FOOD INDUSTRIES

Hot Oil Lines, Ovens.

PASSIVE FIRE PROTECTION AND STRUCTURAL USE

Protection Kitchen Ducts, Data Centers & E- houses, Cabinets, Fire Resistant doors.

HYSIL PREFORMED RIGID SHAPES

HYSIL PIPE SECTIONS

HALF ROUND

- *Available for pipe sizes ½'' to 16''*
- *Standard length: 450/600 mm*
- *Thickness: 25, 40, 50, 65 & 75 mm*

CURVED SEGMENTS

- *Available for pipe sizes 8" to 24"*
- *Standard length: 600 mm*
- *Thickness: 25, 40, 50, 65 & 75 mm*

BEVELLED LAGS

- *Available for pipe sizes 24" & above*
- *Standard length: 600 mm*
- *Thickness: 25, 40, 50, 65 & 75 mm*

Special sizes and thickness are available upon request

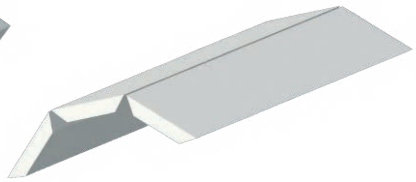
TECHNICAL SPECIFICATIONS

No.	Property	H-800 Grade
		Typical Values
1	Temperature (max)	800°C
2	Average bulk density (dry)	250 kg/m³
3	Flexural strength (min)	350 kN/m²
4*	Compressive strength, reduction in thickness not to exceed under a load of: • 415 kN/m² (dry) • 170 kN/m² after 18 hrs immersion in water	 1.8% 2%
5	Heat resistance, under soaking • Liner reheating shrinkage (max) - 12 hrs • Loss in mass (max) • Compressive strength, reduction in thickness not to exceed under a load of 345 kN/m² (max)	 1.5% at 800°C 12% 1.7%
6**	Thermal conductivity at mean temperature (max) • 200°C • 300°C • 400°C	 0.065 W/mk 0.072 W/mk 0.092 W/mk
7	Moisture contents, by weight (max)	5%
8	Alkalinity	9.5 pH

*Testing shall be carried out on Flat Blocks in case of Pipe Sections.
**Tested in accordance with BS-874 Cold Face 40°C. Also as per IS 9490, water calorimeter apparatus. HYSIL products exceed the performance requirements of IS 9428 / 8154, as well as BS 3958 Part II & ASTM C-533. The values quoted are from laboratory tests on typical samples and represent averages. They should not be used as maxima or minima in specifications.

NEW

HYSIL NANO AND NATURESHIELD PIPE SECTIONS



HALF ROUND

- *Available for pipe sizes ½'' to 16''*
- *Standard length: 450/600 mm*
- *Thickness: 25, 40, 50, 65 & 75 mm*

CURVED SEGMENTS

- *Available for pipe sizes 8" to 24"*
- *Standard length: 600 mm*
- *Thickness: 25, 40, 50, 65 & 75 mm*

BEVELLED LAGS

- *Available for pipe sizes 24" & above*
- *Standard length: 600 mm*
- *Thickness: 25, 40, 50, 65 & 75 mm*

Special sizes and thickness are available upon request

Nano and Natureshield grades are also available in block form upon special request

TECHNICAL SPECIFICATIONS

No.	Property	H-800 Nano Grade	H-800 Natureshield
		Typical Values	
1	Temperature (max)	800°C	800°C
2	Average bulk density (dry)	250 kg/m³	250 kg/m³
3	Flexural strength (min)	350 kN/m²	350 kN/m²
4*	Compressive strength, reduction in thickness not to exceed under a load of: • 415 kN/m² (dry) • 170 kN/m² after 18 hrs immersion in water	1.8% 2%	1.8% 2%
5**	Water Absorption of thermal insulation, moisture gain % by weight	30	
6***	Leachable Chloride Content (ppm)	35	35
7	Heat resistance, under soaking • Liner reheating shrinkage (max) - 12 hrs • Loss in mass (max) • Compressive strength, reduction in thickness not to exceed under a load of 345 kN/m² (max)	1.5% at 800°C 12% 1.7%	1.5% at 800°C 12% 1.7%
8****	Thermal conductivity at mean temperature (max) • 200°C • 300°C • 400°C	0.065 W/mk 0.072 W/mk 0.092 W/mk	0.065 W/mk 0.072 W/mk 0.092 W/mk
9	Moisture contents, by weight (max)	5%	5%
10	Alkalinity	9.5 pH	9.5 pH

*Testing shall be carried out on Flat Blocks in case of Pipe Sections.

**Tested in accordance with ASTM C 1763

***Tested in accordance with ASTM C 871

****Tested in accordance with BS-874 Cold Face 40°C. Also as per IS 9490, water calorimeter apparatus. HYSIL products exceed the performance requirements of IS 9428 / 8154, as well as BS 3958 Part II & ASTM C-533. The values quoted are from laboratory tests on typical samples and represent averages. They should not be used as maxima or minima in specifications.

HYSIL BLOCKS

Sizes	
Standard Size (in mm)	*Thickness (in mm) 25, 40, 50, 65, 75 &100*
1000 x 500 *900 x 600* *600 x 150* *450 x 150*	*Special sizes and thickness are available upon request*

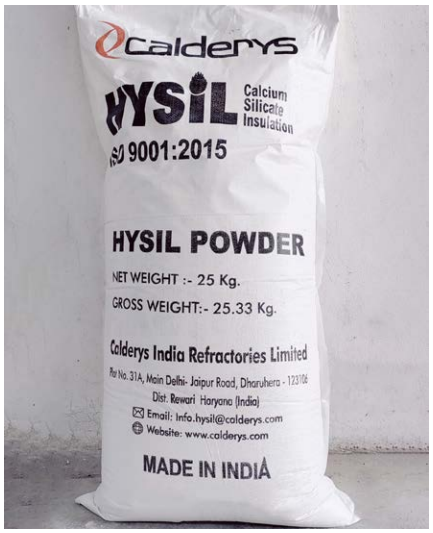
TECHNICAL SPECIFICATIONS

No.	Property	H-800 Grade	H-1000 Grade	H-1100 Grade
		Typical Values		
1	Temperature (max)	800°C	950°C	1050°C
2	Average bulk density (dry)	250 kg/m³	250 kg/m³	280 kg/m³
3	Flexural strength (min)	350 kN/m²	380 kN/m²	650 kN/m²
4	Compress strength, reduction in thickness not to exceed under a load of: • 415 kN/m² (dry) • 170 kN/m² after 18 hrs immersion in water	 1.8% 2%	 1.7% 1.9%	 1.6% 1.7%
5	Heat resistance, under soaking • Liner reheating shrinkage (max) - 12 hrs • Loss in mass (max) • Compressive strength, reduction in thickness not to exceed under a load of 345 kN/m² (max)	 1.5% at 800°C 12% 1.7%	 1.8% at 950°C 10% 1.8%	 1.3% at 1050°C 9.2% 1.5%
6*	Thermal conductivity at mean temperature (max) • 200°C • 300°C • 400°C • 500°C • 550°C	 0.065 W/mk 0.072 W/mk 0.092 W/mk - -	 - 0.074 W/mk 0.094 W/mk 0.114 W/mk -	 - 0.071 W/mk 0.084 W/mk 0.102 W/mk 0.109 W/mk
7	Moisture contents, by weight (max)	5%	5%	5%
8	Alkalinity	9.5 pH	9.5 pH	9.5 pH

*Tested in accordance with BS-874 Cold Face 40°C. Also as per IS 9490, water calorimeter apparatus. HYSIL products exceed the performance requirements of IS 9428 / 8154, as well as BS 3958 Part II & ASTM C-533. The values quoted are from laboratory tests on typical samples and represent averages. They should not be used as maxima or minima in specifications.

NEW

HYSIL POWDER



TECHNICAL SPECIFICATIONS

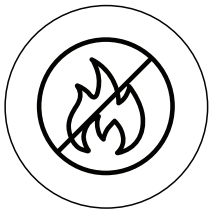
No.	Property	H-800 Grade	H-1000 Grade
		Typical Values	
1	Max. service temperature	800ºC	950ºC
2	Dry Covering Capacity, 1cm in thickness per 100kg of dry Cement, m² (Min.)	22	17
3	*Compressive Strength, at 5% deformation, kg/cm² (Min.)	3.6	5.2
4	Volume Change (shrinkage) upon Drying,% (Max.)	20	26
5	Linear Shrinkage (length) after heat soaking at 800ºC/3Hrs.,% (Max.)	2.5	2.5
6	**Thermal Conductivity at mean temperature, W/mK (max) 100ºC 200ºC 300ºC 400ºC	 0.06 0.08 0.10 -	 0.10 0.12 0.14 0.18

*Testing shall be carried out on Flat Blocks made out of Hysil powder.

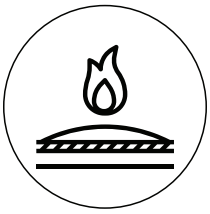
**Tested in accordance with BS-874 Cold Face 40°C. Also as per IS 9490, water calorimeter apparatus. HYSIL products exceed the performance requirements of IS 9428 / 8154, as well as BS 3958 Part II & ASTM C-533. The values quoted are from laboratory tests on typical samples and represent averages. They should not be used as maxima or minima in specifications.

FIRE SAFETY

When tested in accordance with BS-476 Part 4, HYSIL is non-combustible. HYSIL is also classified as Class One when tested for surface spread of flame (large scale) as per BS-476 part 7.

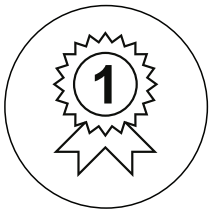


Non-combustible



Fire-resistant

No harmful fumes emission

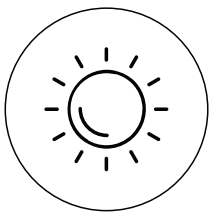


Class One

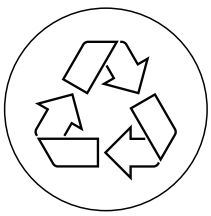
ECO-FRIENDLY

HYSIL's green products are completely safe to use. Each product is manufactured in an environmentally conscious manner.

Zero ozone depletion potential



Zero global warming potential



Biodegradable property

QUALITY MANAGEMENT

Calderys has earned a worldwide reputation for producing consistent high-quality products. A quality management system that adds value is what we strive for.

Accurately identifying and anticipating customers' present and future demands, along with our diligent post-sale monitoring of product performance and customer satisfaction.

Efficiently managing value-adding processes, including setting and monitoring operational targets based on data analysis from processes and the market.

Developing product properties based on customer needs and specific applications.

Maintaining essential support processes to fulfill product demands seamlessly.

Continuously improving the effectiveness of quality management to drive ongoing enhancements.

For sales enquiry, contact any of the below

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HYSIL
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