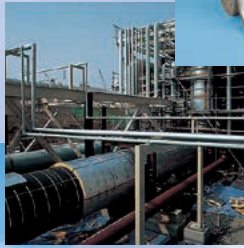
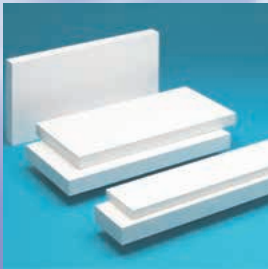
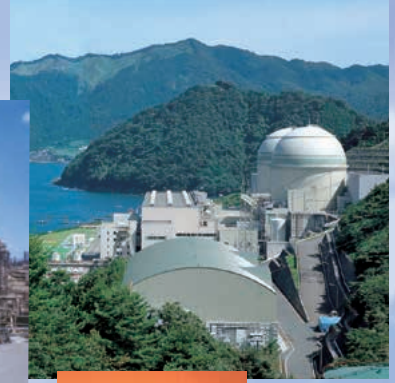


TOMBO™ BRAND

Heat and Cryogenic Insulation



NICHIAS

NICHIAS' Heat and Cryogenic Insulation Materials for the Energy-Saving Age

Established in 1896, we began its business activities mainly repairing boilers and steam pipes of foreign ships using diatomaceous earth heat insulation materials. Since then, we have developed products that have been adapted to each era.

With our unique technology we have contributed to Japan's core industries by developing a wide range of heat insulation materials and cryogenic insulation materials, such as calcium silicate heat insulation materials, rock wool, alkaline earth silicate (AES) wool, alumina fiber, rigid urethane foam, and nuclear heat insulation materials, that support from extremely low temperatures right up to ultra-high temperatures.

At the same time, we have a long tradition and a wealth of experience in the field of thermal insulation work.

This catalog is an abridged version of many of our heat and cryogenic insulation materials.

Please refer to each individual catalog for details.

*TOMBO is a registered trademark or trademark of NICHIAS Corporation.

*Names with a TM symbol are trademarks of NICHIAS Corporation.

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NICHIAS Contributes to a





Pleasant Global Environment and Energy Saving.



Plant Related Thermal Insulation Materials



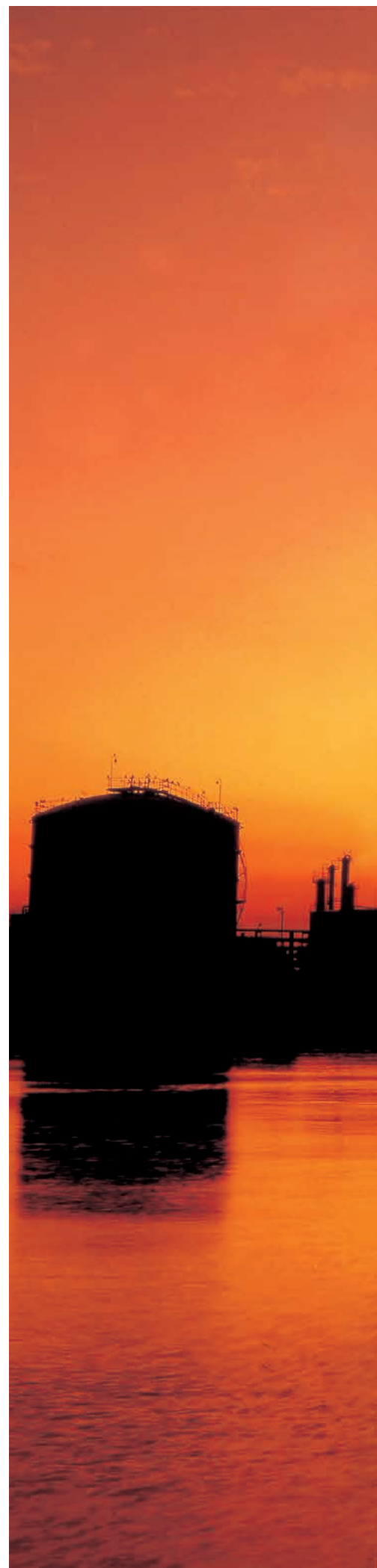
There are various plants, such as thermal power, nuclear power, petroleum refining, petrochemicals, food, district heating and cooling, and in these plants various types of thermal insulation materials are used from those for extremely low temperatures to high temperatures.

We have thermal insulation materials that support plant-related equipment in all types of industries.

Application & Products

Application	TOMBO™ No.	Product name
Heat insulation of general equipment, various boiler tanks, and flues	4900	SUPERTEMP™ Board
		MG MIGHTY ROLL™
		MG BOARD™
		MG WIRED BLANKET™
		FINEFLEX BIO™ products
Heat insulation for various pipes		MG MIGHTY COVER™
		MG MIGHTY ROLL™
		MG WIRED BLANKET™
Detachable heat insulation	4500	ENETHERMO™
Surface finish, fire resistance, and filling of joints, etc. (cement-like material)	5535-F	HEAT RESISTANT INSULATING CEMENT™ TYPE F
	5750	NOISE SUPPRESSION CEMENT™
	5810-F	FREE QUICK LAG™
Adhesive for calcium silicate heat insulation materials	9800BF	Insulation adhesive
Heat transfer cement	9817	THERMOCON™ H
	9818	THERMOCON™ R
Lagging material	8400/8401	INSULTEX™ Cloth / Tape
	8400H	INSULTEX™ Cloth H
	8250	SILTEX™ Cloth / Tape
	8982	Aluminized Cloth
	9832-B	Lagging Cloth B
	9832-W	Lagging Cloth W

*For reinforcement materials such as adhesives and sealants, please see page 20.





Furnace and High Temperature Thermal Insulation Materials



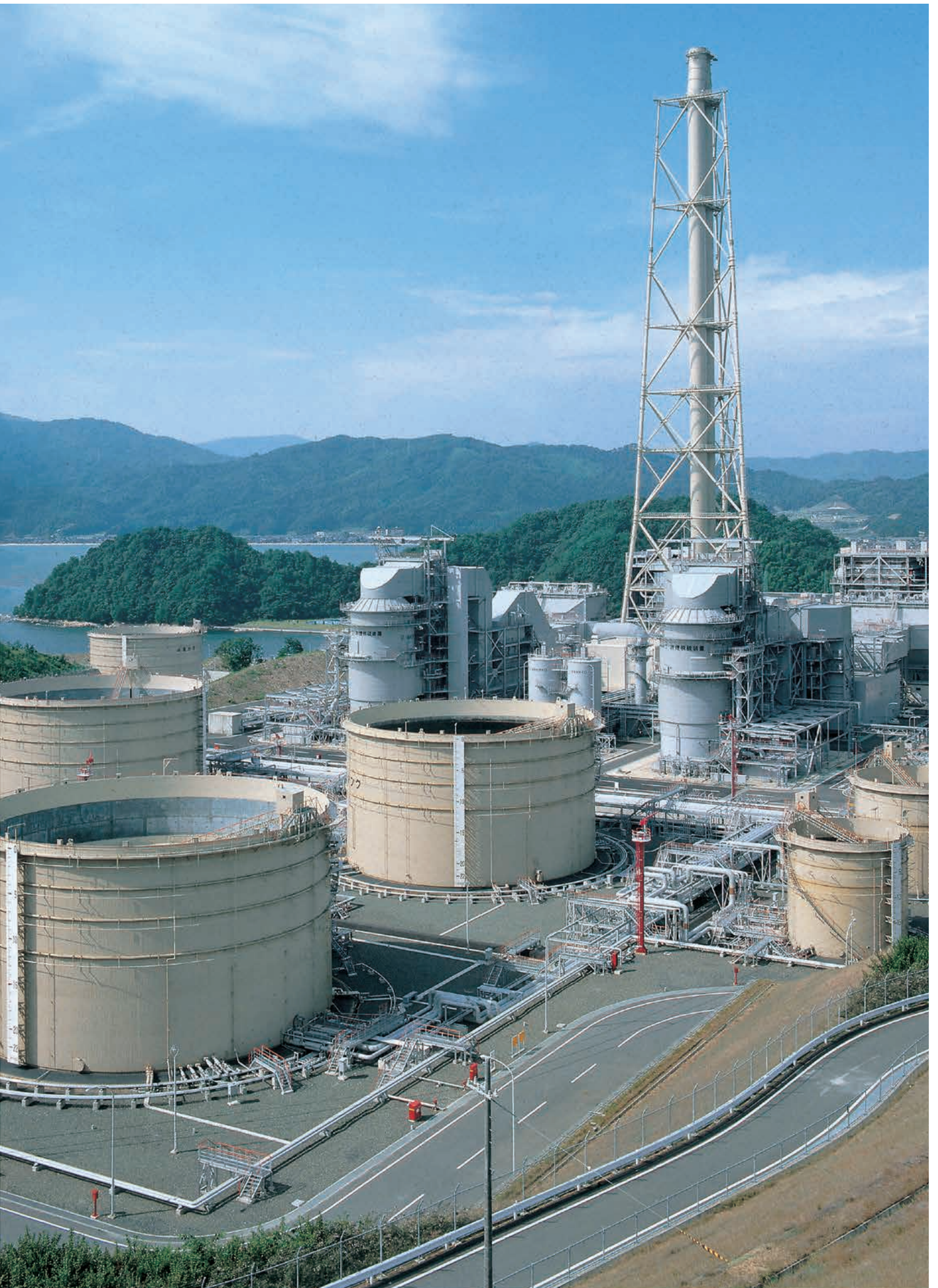
Various heating furnaces play a part in the fields of steelmaking, petroleum refinery, petrochemicals, municipal solid waste incinerators, etc. In the high temperature range, enhancing the heat insulation effect is required in order to make effective use of energy.

We have a wide range of high-temperature thermal insulation materials, the star of which is alkaline earth silicate (AES) wool, to meet various different needs.

Application & Products

Application	TOMBO™ No.	Product name
General kiln lining	5625	FINEFLEX BIO™ Board
	5615	FINEFLEX BIO™ Blanket
	5675	FINEFLEX BIO™ CAST
	5655	FINE BLOCK™
	5461	RF BOARD™
	5915-145C	TOMBO™ Castable 5915-145C
	5915-160C	TOMBO™ Castable 5915-160C
	5915-185C	TOMBO™ Castable 5915-185C
	5920-160C	TOMBO™ Castable 5920-160C
Refractory backup	4350-H	ROSLIM™ Board H
	4350-GH	ROSLIM™ Board GH
	4900	SUPERTEMP™ Board
	5615	FINEFLEX BIO™ Blanket
	5900-100F	TOMBO™ Castable 5900-100F
	5900-100C	TOMBO™ Castable 5900-100C
	5900-135C	TOMBO™ Castable 5900-135C
	5900-140C	TOMBO™ Castable 5900-140C
For the filling of doors and joints		MG BOARD™
	5605	FINEFLEX BIO™ Bulk
	5685-E	FINEFLEX BIO™ Braided Rope
	5615	FINEFLEX BIO™ Blanket
	5635	FINEFLEX BIO™ Paper
Thermal insulation material for compact electric furnaces For observation windows, burner tiles, etc.	5675	FINEFLEX BIO™ CAST
	5645	FINEFLEX BIO™ Mold
	5462	RF MOLD™





Building Facility Related Thermal Insulation Materials



In recent years, there has been remarkable growth in plumbing, sanitation, and air conditioning facilities in the field of building construction. We offer a wide variety of heat insulation materials with a focus on rock wool insulation materials, which provide excellent insulation performance and economic efficiency as thermal insulation materials for general equipment, pipes, ducts and flues in building facilities.

Application & Products

Application	TOMBO™ No.	Product name
Thermal insulation of air conditioning ducts (including smoke exhaust ducts)		MG MIGHTY ROLL™
		MG BOARD™
Thermal insulation of sanitation and air conditioning pipes For warm water pipes, warm & cold water pipes, hot water pipes, steam pipes, etc.		MG MIGHTY COVER™
		MG MIGHTY ROLL™
Thermal insulation of various equipment Valves and flanges, etc.		MG MIGHTY ROLL™
		MG BOARD™
		MG WIRED BLANKET™
Parts that pass through fire compartments		MG MIGHTY COVER™
Detachable heat insulation for valves and flanges, etc.	4500	ENETHERMO™
Thermal insulation of flue parts		MG WIRED BLANKET™
Fire prevention of kitchen exhaust ducts (for industrial and residential use)		MG MIGHTY ROLL™
		MG MIGHTY COVER™





Nuclear Power Related Thermal Insulation Materials



In the nuclear industry, thermal insulation materials must be absolutely 100% safe and reliable from the viewpoint of protection against radiation. Our nuclear power related thermal insulation materials are labelled NU, and aim to prevent stress corrosion cracking by regulating halogen components eluted from the product.

Application & Products

Application	TOMBO™ No.	Product name
Heat insulation of reactor pressure containers		Steel Insulation
Various equipment inside a reactor		Steel Insulation
Heat insulation of ISI parts		Steel Jacketed Insulation
Heat insulation of horizontal joints of turbines		
Heat insulation for general equipment, pipes, valves, etc.	NU5605	NU FINEFLEX BIO™ Bulk
	NU5615	NU FINEFLEX BIO™ Blanket
	NU5625	NU FINEFLEX BIO™ Board
Radiation (γ -ray) shielding heat insulation		Jacketed Insulation
Lagging material	NU8200-C	NU MARINETEX™ Cloth
	NU8200-T	NU MARINETEX™ Tape





Standards & Performance

	TOMBO™ No.	Product name	Maximum working temperature (°C)	Density (kg/m ³)	
Rock Wool Heat Insulation Materials		MG WIRED BLANKET™	Temperature for 10% shrinkage under heat and compression (°C) 600 or more ^{Note 2}	80, 100, 120	
		MG BOARD™		60, 80, 100, 120	
		MG MIGHTY COVER™		90	
		MG MIGHTY ROLL™		60, 80, 100	
High Performance Heat-Insulation Materials	4350-H	ROSLIM™ Board H	1000	250	
	4350-GH	ROSLIM™ Board GH	1000	250	
Calcium Silicate Heat Insulation Materials	4900	SUPERTEMP™ Board	1000	210	

Note 1: Reference $W/(m \cdot K) = 0.86 \text{ kcal} / (m \cdot h \cdot ^\circ C)$

Note 2: The temperature for 10% shrinkage under heat and compression is in accordance with JIS A 9504.

Properties		Corresponding Standard
Thermal conductivity λ [W (m·K)] ^{Note 1}	Feature	JIS
70°C 0.044 max. (Density:60-80) 70°C 0.043 max. (Density:120)	1) We have some with adhesive decorated surfaces. 2) We have some that offer water repellency. 3) Rock wool heat insulation materials	
400°C 0.029 600°C 0.035 800°C 0.044	1) Compressive strength (10% compression strain) ROSLIM Board H 0.54 MPa ROSLIM Board GH 1.02 MPa	
400°C 0.030 600°C 0.036 800°C 0.044	2) Innovative thermal insulation material with ultra-low thermal conductivity and improved strength and less dust generation	
300°C 0.076 500°C 0.110	1) Bending strength 1.0 MPa 2) Xonotlite-type, high-strength calcium silicate heat insulation material	

Standards & Performance

	TOMBO™ No.	Product name	Maximum heat resistant temperature (°C)	Properties	
				Density (kg/m ³)	Thermal conductivity λ [W (m·K)] ^{Note 1}
Alumina fiber Alkaline earth silicate (AES) wool Refractory and thermal insulation materials	5605	FINEFLEX BIO™ Bulk	1300		
	5615	FINEFLEX BIO™ Blanket	1300	100, 130, 160	
	5625	FINEFLEX BIO™ Board	1300	250	
	5655	FINE BLOCK™	1300, 1600	130, 170	
	5675	FINEFLEX BIO™ CAST	1300	400–700	
	5461	RF BOARD™	1600, 1700, 1800	200, 400, 500	

Note 1: Reference W/(m·K) = 0.86 kcal / (m·h·°C) (The value for thermal conductivity is our measured value.)

	TOMBO™ No.	Product name	Maximum Working Temperature (°C)	Properties ^{Note 3}		
				Thermal conductivity W/(m·K) at 700°C	Bending strength ^{Note 2}	Compressive strength ^{Note 2}
Castable	5915-145C	TOMBO™ Castable 5915-145C	1450	0.72	3.4 (1300°C)	11.8 (1300°C)
	5915-160C	TOMBO™ Castable 5915-160C	1600	0.81	9.8 (1500°C)	39.2 (1500°C)
	5915-185C	TOMBO™ Castable 5915-185C	1850	1.55	11.8 (1500°C)	49.0 (1500°C)
	5920-160C	TOMBO™ Castable 5920-160C	1600	1.11	21.0 (1500°C)	122 or more (1500°C)
	5900-100F	TOMBO™ Castable 5900-100F	1000	0.14	0.3 (1000°C)	0.4 (1000°C)
	5900-100C	TOMBO™ Castable 5900-100C	1050	0.21	0.7 (1000°C)	1.5 (1000°C)
	5900-135C	TOMBO™ Castable 5900-135C	1350	0.34	2.0 (1300°C)	6.9 (1300°C)
	5900-140C	TOMBO™ Castable 5900-140C	1400	0.45	4.9 (1400°C)	14.7 (1400°C)
5935-050J	TOMBO™ Castable 5935-050J	500	0.77 (300°C)	9.0 (500°C)	56.9 (500°C)	

Note 2: Bending strength and compressive strength are the values after calcination, and the value in the parenthesis () is the calcination temperature.

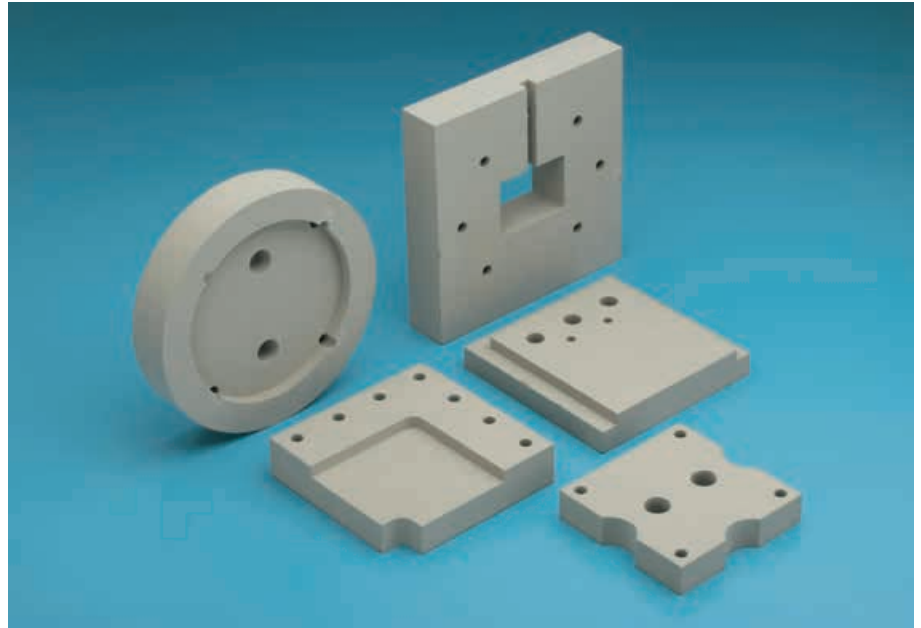
Note 3: It is our actual measurement value, and is not a standard value.

Feature		Certifications and regulations
Bulk	Alkaline earth silicate wool-based fire-resistant thermal insulation material	Non-inflammable certification NM-2860
Blanket		
Lined boards		
Blanket laminate		
Paste-form amorphous fire-resistant material		
Lined boards		

ROSLIM Board H and GH are innovative products with ultra-low thermal conductivity, improved strength, and less dust generation. By greatly improving its strength, it is now possible to process complex shapes. The handling and installation workability have also been greatly improved, making it easy to handle.



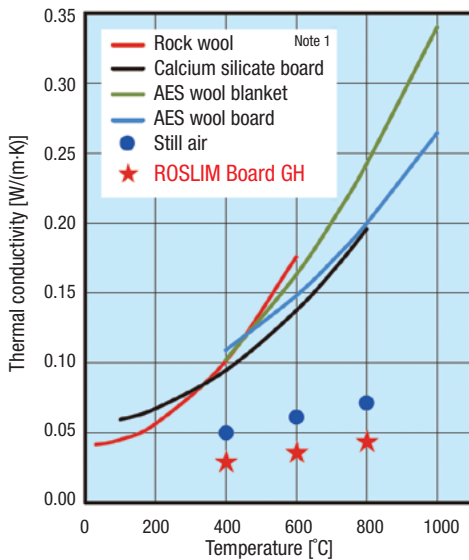
ROSLIM Board GH was awarded the Energy Conservation Center, Japan (ECCJ) Chairman's Award in the Product and Business Model Category of the 2015 Energy Conservation Grand Prize hosted by ECCJ (supported by the Ministry of Economy, Trade and Industry).



Feature

1. Excellent thermal insulation properties that far exceed conventional thermal insulation materials
2. Excellent handling
3. Excellent workability without the need for special tools

Insulation properties



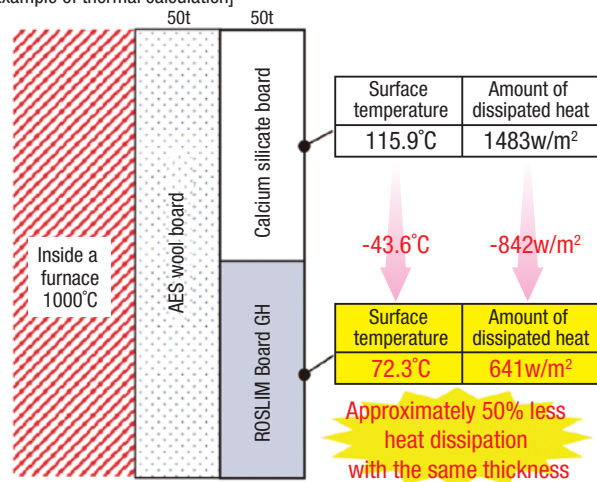
Comparison of thermal conductivity of various thermal insulation materials

Note 1: The values for rock wool, AES wool blanket, AES wool board, and ROSLIM Board GH are actual values measured by NICHIAS Corporation. The values for calcium silicate boards and still air are theoretical values.

Precautions for use

- Store the ROSLIM Board in a well-ventilated room where it is free from rain and any water leakage. Contact with water will damage the shape of the ROSLIM Board and reduce its performance significantly.

[Example of thermal calculation]



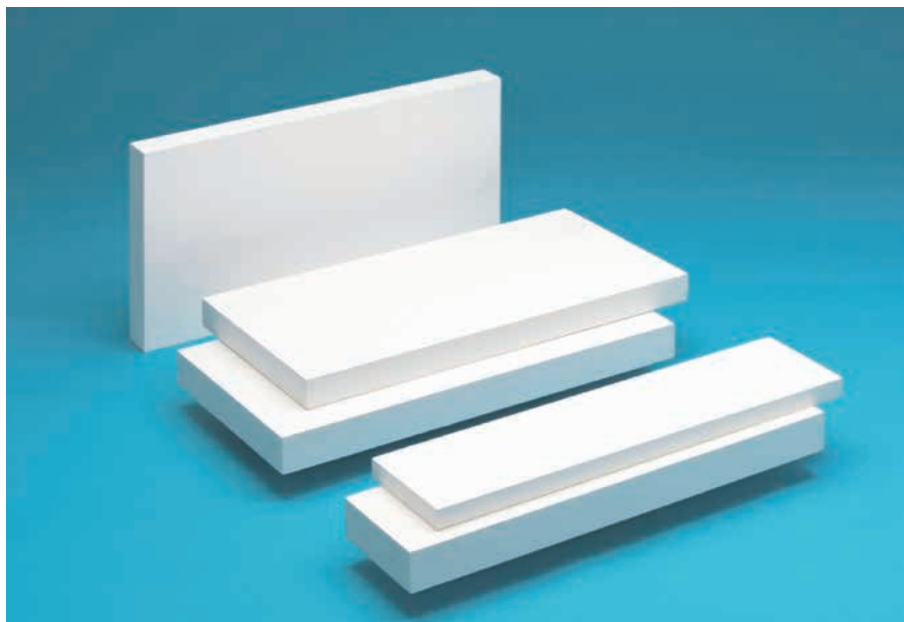
*Calculation conditions: ambient temperature = 25°C, emissivity = 0.9, wind speed = 0 m/s

*This is a calculated value and does not guarantee performance.

High Temperature & High Thermal Insulation Materials

A lightweight, high heat-resistant and high heat-insulating thermal insulation material with calcium silicate as its main component.

TOMBO™ No.4900 SUPERTEMP™ Board



It has excellent machinability and is widely used for industrial equipment applications.

Feature

1. High heat resistance
2. High thermal insulation
3. Excellent machinability

Detachable thermal insulation material

ENETHERMO is a detachable heat insulation material that is ideal for valves and flanges, and can be used repeatedly. A silicone-coated glass cloth is used for the jacket, and a glass mat is used for the thermal insulation material.

Feature

1. Detachable
2. Can be used repeatedly
3. Other materials can also be used according to operating temperature and conditions

Application

1. Thermal insulation and heat insulation of valves and flanges
2. Thermal insulation and heat insulation of heat exchangers and tanks
3. Thermal insulation of heat dissipation equipment
4. Thermal insulation and heat insulation of regularly repaired and maintained parts

TOMBO™ No.4500 ENETHERMO™



Rock wool heat insulation materials

Rock wool is inorganic spun fibers made from natural rocks and minerals bonded by organic binder.

We call our rock wool heat insulation material products MG Products.

Depending on the application, we have products that are shaped into felt, boards, pipes and so on, and are further processed with wire mesh, white screen, or aluminum craft (ALK) to make them easier to use.

Rock wool is excellent for thermal insulation, heat retention, and sound absorption, and is used for a wide number of applications in various industrial fields.

Feature

- non-combustible
- suitable for insulation
- fire protection
- sound absorption/noise reduction

MG Products



MG BOARD™

MG BOARD is suitable for general insulation purpose on the application industrial and commercial buildings.

MG BOARD can be supplied with a glued aluminum craft (ALK) on one side.

MG MIGHTY ROLL™

MG MIGHTY ROLL is flexible blanket insulation suitable for general application.

MG MIGHTY ROLL can be supplied with a glued white screen or aluminum craft (ALK) on one side.

MG WIRED BLANKET™

MG WIRED BLANKET is flexible insulation which galvanized wire mesh of hexagonal pattern is stitched by wire on one side.

MG MIGHTY COVER™

MG MIGHTY COVER is pre-formed sectional pipe insulation.

Snap-on type having split is supplied.

MG MIGHTY COVER can be supplied with a glued aluminum craft (ALK) on one side.

FINEFLEX BIO is an alkaline earth silicate (AES) wool with excellent heat resistance developed in response to increasing awareness of being more environmentally friendly. Silica, magnesia, and calcia are the main components of this product.

As a thermal insulation material, sealing material, packing material, or sound-absorption material, it can be used in a wide range of fields, such as with iron and steel, nonferrous metals, petrochemicals, and ceramics.

Feature

1. Excellent heat resistance
2. Resistant to thermal shock
3. Low thermal conductivity and excellent thermal insulation effect
4. Lightweight and excellent workability
5. Low heat accumulation and excellent energy saving effect



•TOMBO™ No.5625

FINEFLEX BIO™ Board

This is a product made by adding an inorganic and organic binder to alkaline earth silicate (AES) wool and forming it into a board by way of suction molding. It can be used as a general high-temperature thermal insulation material, kiln thermal insulation lining, backup material, etc.

•TOMBO™ No.5615

FINEFLEX BIO™ Blanket

This product is made by continuously layering alkaline earth silicate (AES) wool, forming it into a blanket-like shape, and subjecting it to needle processing.

It can be used for general high-temperature thermal insulation materials, the lining of kiln furnace ceilings and walls, as a backup material, furnace-expansion-allowance material, gas sealing material, etc.



FINEFLEX BIO Paper

•TOMBO™ No.5635

FINEFLEX BIO™ Paper

This product is made by adding an organic binder to alkaline earth silicate (AES) wool and using a paper manufacturing machine to make it into a paper form. It can be used as a gasket material for combustion equipment and warm water boilers.

•TOMBO™ No.5655

FINE BLOCK™

This is a block-shaped product in which a blanket is cut into a predetermined width, a block laminated with adhesive and a dedicated support bracket are integrated and compressed, and then the outside is fixed with a side plate and a band. It can be used for furnace walls such as heating furnaces, heat treatment furnaces, calcination furnaces, and decomposition furnaces.



FINEFLEX BIO Mold

•TOMBO™ No.5645

FINEFLEX BIO™ Mold

This is a product made by adding an inorganic and organic binder to alkaline earth silicate (AES) wool and forming it into various shapes by way of suction molding. It can be used for a wide variety of applications such as a thermal insulation material within compact electric furnaces or with burner tiles.

*For further details, please refer to each product catalog.

Other Thermal Insulation Materials and Related Products

Steel Insulation



For the metal heat insulation material, a stainless steel board is used for the casing and stainless steel stamped into a special shape is inserted in the internal space, thereby giving it thermal insulation properties through the radiation of foil. It can be attached and detached with its buckle-type fastener and reused many times. It can also be cleaned and used semi-permanently.

•Application

- Heat insulation of nuclear power equipment and pipes

TOMBO™ No.5535-F

HEAT RESISTANT INSULATING CEMENT™ TYPE F



This is a heat insulation cement containing a heat-resistant inorganic powder compound of rock wool fiber, diatomaceous earth, etc.

•Properties

- Density 500 kg/m³ or less (after drying)
- Mixing water amount (mass ratio) / Product : water = 1 : 2 to 1 : 2.5
- Packaging: paper bag 20 kg/bag

TOMBO™ No.5810-F

FREE QUICK LAG™



Quick Lag is a surface finishing cement that combines glass fiber with a hardening agent such as an inorganic powder, cement, etc.

•Properties

- Density 900 kg/m³ or less (after drying)
- Mixing water amount (mass ratio) / Product : water = 1 : 0.8 to 1 : 0.9
- Packaging: paper bag 25 kg/bag

TOMBO™ No.5750

NOISE SUPPRESSION CEMENT™



Soundproofing Hard Cement is a soundproofing cement mainly composed of mineral powder and blended with inorganic fibers and an inorganic binder as a reinforcing agent.

•Properties

- Maximum working temperature: 200°C
- Density 2000 kg/m³ (after drying)
- Mixing water amount (mass ratio) / Product : water = 1 : 0.8 to 1 : 0.2
- Packaging: paper bag 25 kg/bag

Heat-Resistant Cloth

The outer covering material (lagging material) is often used for surface finishing when installing heat insulation materials. We have a variety of heat resistant cloths available.

TOMBO™ No.8200

MARINETEX™ Cloth



MARINETEX Cloth is a thermal insulation cloth made of extra-fine glass fibers. It is flexible, stretchy, and can be easily installed even in the most complicated of places.

- Working temperature: 550°C or less

TOMBO™ No.8400/8400-H

INSULTEX™ Cloth INSULTEX™ Cloth-H



INSULTEX Cloth is a thick thermal insulation cloth made of woven glass fibers. It is heat-resistant and flexible, maintaining its strength even at high temperatures. It is suitable for applications that require a cloth that is thicker than our MARINETEX Cloth. We also have INSULTEX Cloth-H that is woven with a bulky yarn.

- Working temperature: 550°C or less

TOMBO™ No.8250

SILTEX™ Cloth



SILTEX Cloth is a cloth with high heat resistance made of high-purity silica fiber.

- Working temperature: 700°C or less, 1000°C or less

TOMBO™ No.8300-S/-SW

Fire-Proof Cloth-S Fire-Proof Cloth-SW



Our Fire-Proof Cloth is an inorganic fiber cloth dedicated to preventing sparks such as spatter and slag during welding and fusing. There is no need to worry about combustion thanks to the excellent heat resistance of the inorganic fibers.

In addition to our general-purpose Fire-Proof Cloth S, we also have Fire-Proof Cloth SW that has improved performance and fiber scattering prevention properties through the use of special resin processing.

- We have conducted the JIS A 1323 Class A Test.

Reinforcement Materials (Adhesives, Surface Treatment Agents)

Adhesives, surface treatment materials, and reinforcement materials are required to maintain the performance of heat insulation and cryogenic insulation materials for many years in hot and cold insulation work. As a leading manufacturer of heat insulation and cryogenic insulation materials, we have researched and developed products for reinforcement materials, and have accumulated many years of experience and a vast track record in doing so.

As a reinforcement material

TOMBO™ No.9832 Lagging Cloth is also available.



	TOMBO™ No.	Product name	Working Temperature (°C)	Application
Adhesive [heat insulation]	9861-FF	FF Adhesive	-1700	Adhesive between high-temperature thermal insulation wool
	9861-FC	FC Adhesive	-1400	High-temperature thermal insulation wool and adhesive for general furnace walls
	9861-FM	FM Adhesive	-600	High-temperature thermal insulation wool and adhesive for iron plates
	9861-TM	TOMBO™ Fire-Proof Mortar S-40	-1400	Adhesive between firebricks
	9800-BF	Insulation Adhesive	-1000	Adhesive materials such as calcium silicate heat insulation materials and inorganic fire-proofing covering materials
	9824	MARINE BOND™ M	-550	High temperature adhesive used for vitreous (glassy) cloth
	9825	MARINE BOND™ K-1	-250	
Silicone Sealant	9884-SG	Silicone Sealant #30 [Gray]	-40 - 120	Oxime-type silicone elastic sealant
	9884-SW	Silicone Sealant #30 [White]		
	9884-SC	Silicone Sealant #30 [Clear]		
	9884-SS	Silicone Sealant #30 [Silver]		
	9884-SH	Silicone sealant #30 for high temperatures	-55 - 250	Silicone sealant #30 high-temperature type It can be used up to 250°C.
Coating material	9840-A	ELASTNERT™ A	-40 - 85	Two-part polyurethane coating material It offers excellent flexibility, weather resistance, and seawater resistance.
	9871	Spray Coat	-1500	Spraying on the surface of FINEFLEX BIO lining improves resistance to wind speed, scale, dust, and alkali.
Heat Transfer Cement	9817	THERMOCON™ H	40 - 500	Heat transfer cement that can efficiently transfer heat from the pipe tracing to the main body (tank or pipe). THERMOCON H is an air-hardened product for high temperature applications.
	9818	THERMOCON™ R	-70 - 200	THERMOCON R is a thermosetting product.

*For further details, please refer to our "Adhesives, Surface Treatment Materials, and Reinforcement Materials" catalog.

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