

Thermal Insulation Materials excellent in non-wettability and durability

Thermal Insulation Materials For Molten Aluminum

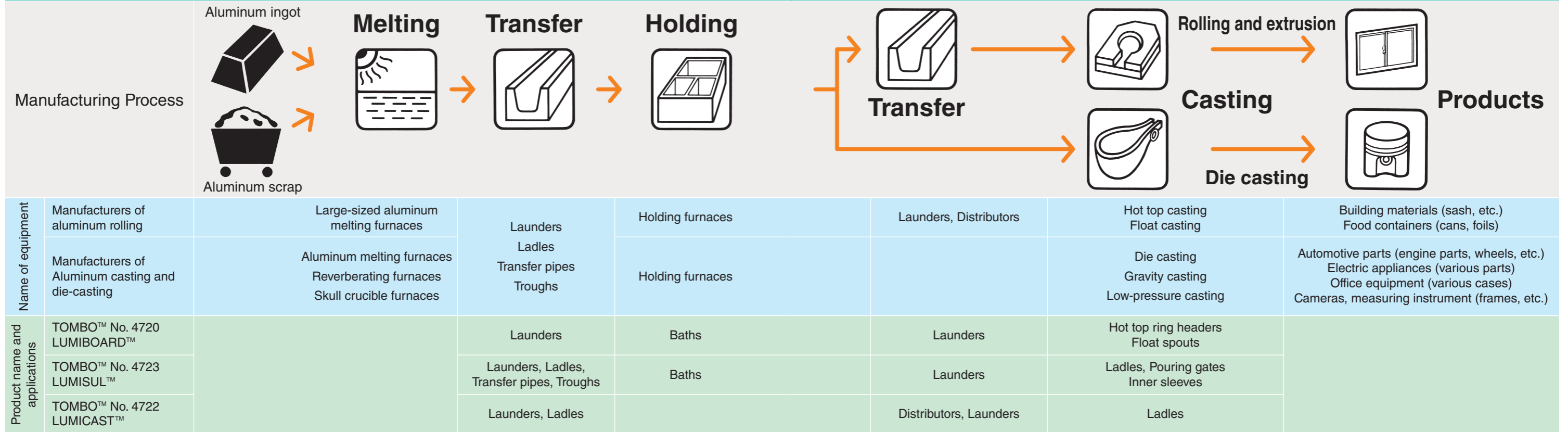


NICHIAS

NICHIAS Thermal Insulation Materials For Molten Aluminum

·TOMBO is a registered trademark or a trademark of NICHIAS Corporation.
·Names with a TM symbol are registered trademark or trademark of NICHIAS Corporation.

Manufacturing process of aluminum products and examples of how NICHIAS thermal insulation materials are used.



Aluminum is formed and processed into various shapes by processes of melting, transfer, holding to casting, etc. Insulation products manufactured by NICHIAS for molten aluminum are excellent in non-wetting and low erosion performance, and durability. They are used as machined or cast components that come directly into contact with molten aluminum in every stage of processing. They contribute to improvement of product quality and yield, efficiency of casting work, and energy savings by reducing fuel consumption.

- TOMBO No. 4720 LUMIBOARD Calcium silicate boards
- TOMBO No. 4723 LUMISUL Formed products
- TOMBO No. 4722 LUMICAST Fibrous castables

Most suitable products can be selected from the products of different forms and advantages according to the application and the purpose.

Products, Physical Properties, and Applications

Products	TOMBO No. 4720 LUMIBOARD	TOMBO No. 4723 LUMISUL	TOMBO No. 4722 LUMICAST
Properties			
Form	Board	Formed shapes in single piece	Putty
Advantages	Lightweight, high mechanical strength, excellent in thermal insulation and machinability	Seamless, formed and sintered shapes in single piece. High mechanical strength Suitable for complicated and large-sized shapes	Castable material Lightweight, Excellent in thermal insulation, Suitable for on-site application of the inner lining material of the vessel in irregular shapes
Erosion resistance	◎	◎	○
Non-wettability	◎	◎	○
Thermal insulation property	◎	○	◎
Machinability	◎	○	n/a
Formability	n/a	◎	○
Mechanical strength	○	○	n/a
Installation method	• Machining, bonding, and screwing	• Installation of formed shapes	• Inner lining by troweling or applying lumps. Needs drying by heating
Applications	• Inner lining material of the bath for holding furnaces • Floats, spouts • Hot top ring headers • Hunter tips • Other machined shapes	• Launders • Bath for holding furnaces • Transfer pipes • Inner sleeves • Troughs • Other formed shapes	• Ladles • Distributors • Launders • Vessels • Other lined applications

Contents

- Products, Physical Properties and Applications3
- TOMBO™ No. 4720 LUMIBOARD™ 4, 5
- TOMBO™ No. 4723 LUMISUL™ 6, 7
- TOMBO™ No. 4722 LUMICAST™ 8, 9
- Related products/Accessories
- TOMBO™ No. 5615/5615-LT FINEFLEX BIO™ Blanket/LT Blanket 10

- TOMBO™ No. 5635 FINEFLEX BIO™ Paper 11
- TOMBO™ No. 5645 FINEFLEX BIO™ Mold 12
- TOMBO™ No. 6760-A VERMOFLEX™-A 13
- TOMBO™ No. 9820 LUMIBOND™ 13
- TOMBO™ No. 4350-GH ROSLIM™ Board GH 14

⚠ Cautions for product selection

1. The information and recommendations in this catalog do not assure that the products can be used in contact with all aluminum alloys.
2. The products listed in this catalog are not suitable for use in contact with flux.
3. Please pay attention to the use of molten aluminum alloys that generally consist of activated metals such as Magnesium, Strontium and Sodium (1% by weight and over). In this case, please consult us prior to use.

Precautions for handling products

⚠ CAUTION

- Please observe the following cautions in order to maintain the intrinsic functions of the products and also to ensure that these products are used safely.
- Do not use a product for any other purpose than the ones described in the catalog and specification.
 - Store products indoor at ordinary temperature and humidity, and strictly avoid to get wet.
 - Check the precautions for occupational health with the SDS.
 - For disposal, follow local regulations.

GE2012F_E

Note: ◎: Excellent ○: Good

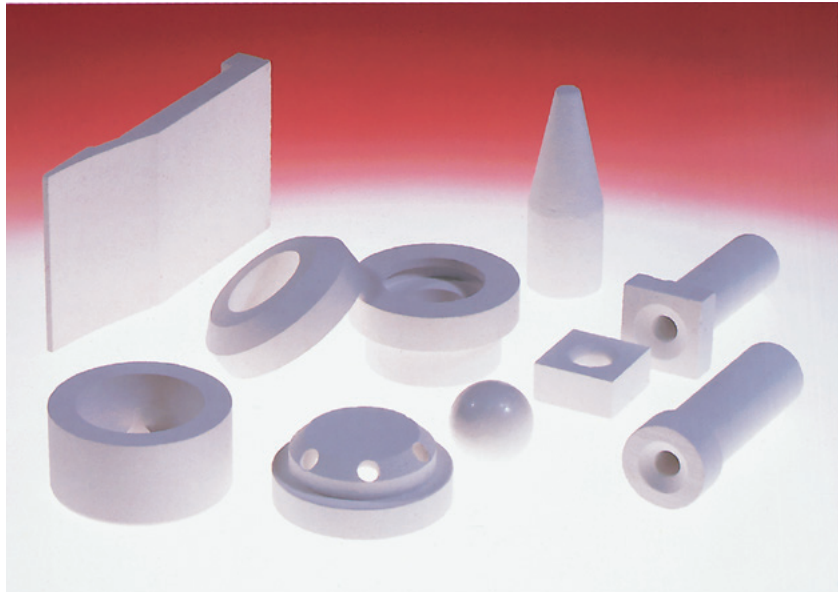
Non wettable thermal insulation boards

TOMBO™ No. 4720

LUMIBOARD™

LUMIBOARD is a xonolite-based calcium silicate board with excellent heat resistance. It is excellent in machinability and is most suitable as thermal insulation material for transfer, casting, and holding processes where the insulation material is in direct contact with molten aluminum alloy such as launders, spouts, floats, hot top ring headers, and holding furnaces for die-casting.

There are two products, L14Z is for standard applications and L100 L100S are reinforced with special fiber for use in casting parts such as hot top ring headers, etc.



Advantages

● **Low thermal conductivity, Low heat capacity**

Molten aluminum can be transferred with minimal reduction in temperature when LUMIBOARD is used in the launders between the melting and holding furnace and the die-cast machine. When LUMIBOARD is used for the lining of the holding furnace, energy savings can be achieved by raising temperature in a shorter time than conventional castables.

● **Excellent machinability**

LUMIBOARD can be machined in a variety of shapes such as floats, spouts, hot top ring headers, etc. due to its excellent machinability.

● **Easy to remove solidified metal**

LUMIBOARD is non wettable with molten aluminum so it is easy to remove solidified metal.

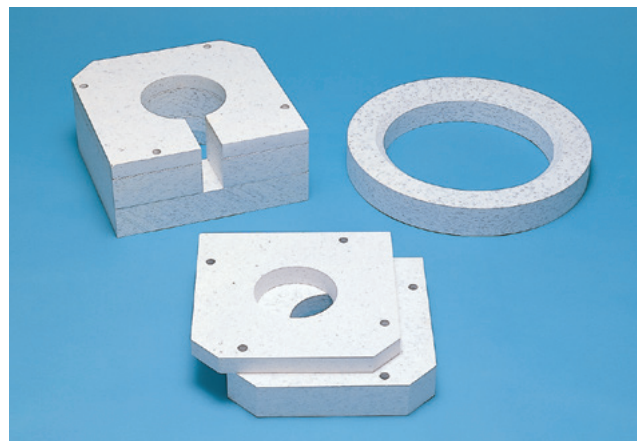
Applications

● **L14Z**

Launders, Baths for holding furnaces, Floats, Spouts, etc.

● **L100, L100S**

Hot top ring headers, Floats, Spouts, etc.



Standard dimensions

Description	Products	L14Z										
		12.7	19.1	25.4	28.5	31.8	38.1	44.5	50.8	63.5	76.2	101.6
Thickness (mm)												
Width × Length (mm)		1260 × 1275										
		1260 × 2550										
Unit weight (kg/ea)*1	1275	17.1	25.7	34.1	38.3	42.7	51.2	59.8	68.2	85.4	102.4	136.6
	2550	34.3	51.5	68.6	76.9	85.8	102.8	120.1	137.1	171.4	205.7	274.2
Surface finish		Sanded on both faces									Not sanded	

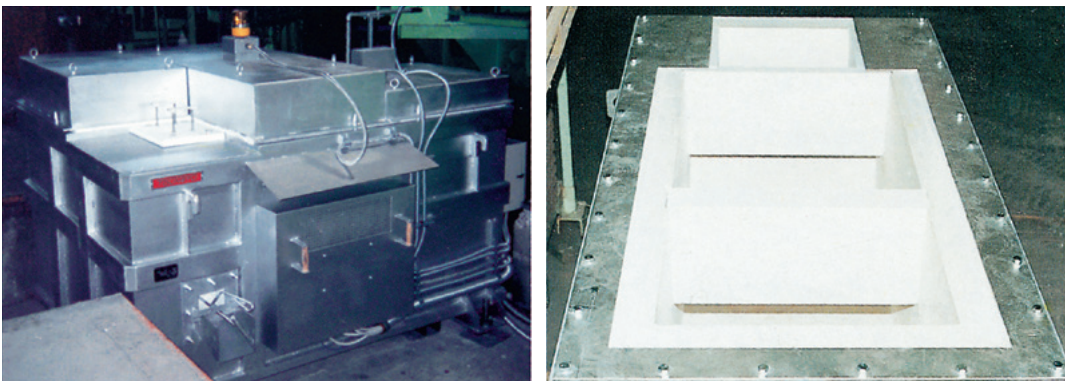
*1: Reference value

Physical properties

		L14Z		L100		L100S	
Properties		Standard		Fiber reinforced type		Increased in reinforcing fiber	
Maximum service temperature (°C)		1000		1000		1000	
Bulk density (kg/m ³)		830		830		830	
Hardness (Durometer D scale)		65		67		67	
Moisture content (%)		0.6		0.6		0.6	
Bending strength (MPa)	In normal ambient temperatures	9.7		11.0		11.3	
	After heating at 750°C× 24hrs	7.7		7.1		7.1	
Compressive stress (MPa)	At 5.0% compaction	10.8		12.4		12.1	
Linear heat shrinkage (%)		Length	Thickness	Length	Thickness	Length	Thickness
	After heating at 750°C× 24hrs	0.4	1.1	0.4	1.1	0.4	1.1
	After heating at 1000°C× 24hrs	0.8	3.7	0.5	2.0	0.5	2.4
Weight loss on ignition (%)	After heating at 750°C× 3hrs	4.6		6.1		7.3	
Thermal expansion (×10 ⁻⁶ /°C)	Initial heating	3.4		3.5		3.4	
	From second heating onward	6.6		6.5		6.4	
Thermal conductivity (W/(m·K))	at 300°C	0.19		0.18		0.18	
	at 500°C	0.19		0.18		0.18	
	at 700°C	0.19		0.18		0.19	

*The above figures are actual values measured by NICHIAS and not specification values.

Example of application for holding furnace



Cautions for drying and preheating

- As products are shipped from the factory in dry condition, moisture absorption during storage and water absorption from the joint filling sealant during installation could cause cracks when LUMIBOARD is in contact with molten aluminum. Please dry LUMIBOARD with an electric furnace, heater, or by putting the LUMIBOARD in the furnace prior to use.
- Please dry LUMIBOARD L100 L100S at a temperature under 250°C to prevent the reinforcing fiber from burning away.
- Please dry formed products for the bath of the holding furnace at approximately 150°C prior to raising temperature. Please raise temperature at a speed of 25°C per hour as a guideline and keep the temperature at each of the following points (200 °C, 400°C and 600°C) for 6 to 12 hours.

L100												L100S*2				
12.7	19.1	25.4	28.5	31.8	38.1	44.5	50.8	63.5	76.2	101.6	25.4	38.1	50.8	76.2		
1260 × 1275																
1260 × 2550																
15.9	23.8	31.7	35.6	39.7	47.6	55.5	63.4	79.2	95.1	126.8	31.7	47.6	63.4	95.1		
31.8	47.9	63.7	71.4	79.7	95.5	111.5	127.3	159.1	191.0	254.6	63.7	95.5	127.3	191.0		
Sanded on both faces									Not sanded			Sanded on both faces				Not sanded

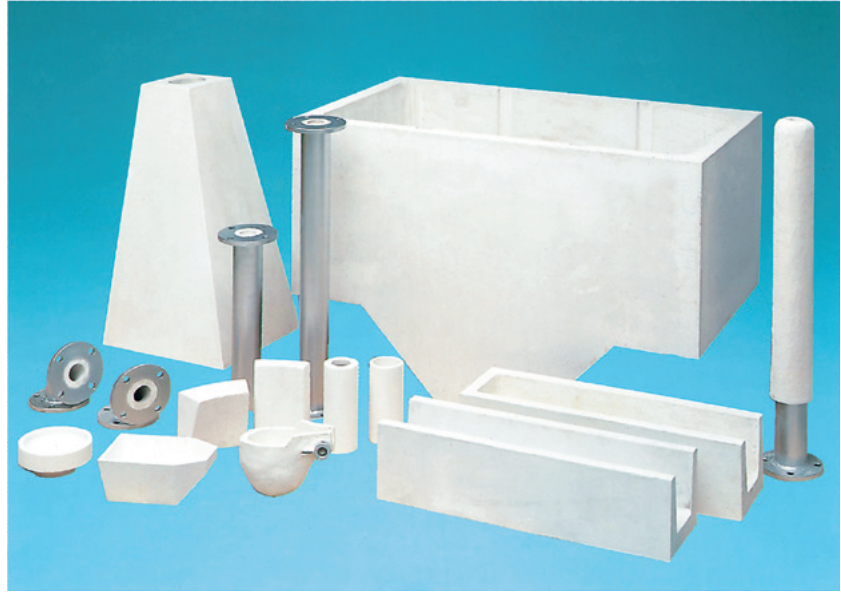
*2: Please contact us for dimensions not listed in this catalog.

Molded shapes for molten aluminum vessel

TOMBO™ No. 4723

LUMISUL™

LUMISUL is molded and sintered shapes for use in the inner lining of the molten aluminum vessel where LUMISUL is in direct contact with molten aluminum. LUMISUL is excellent in non wettability, mechanical strength, thermal insulation and machinability. We have a proprietary molding technology that allows us to respond to requests for various shapes.

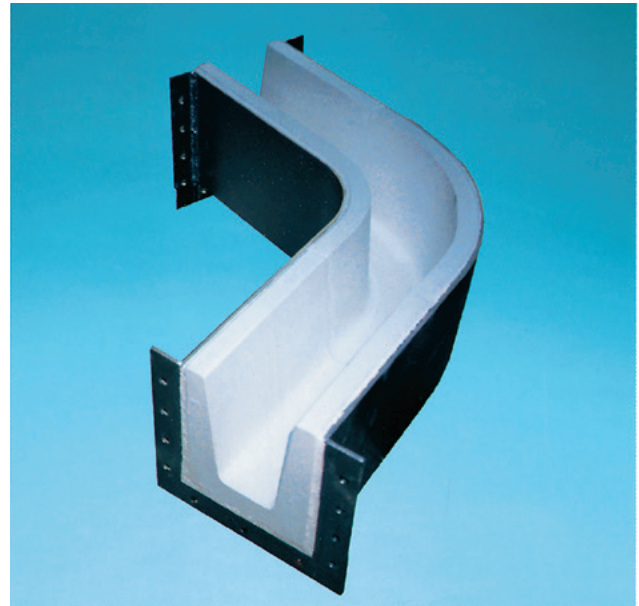


Advantages

- **Excellent in non wettability and inertness to erosion (erosion resistance)**
LUMISUL is excellent in non wettability and inertness to erosion (erosion resistance) to molten aluminum.
- **Excellent in thermal insulation**
Since LUMISUL is lighter in weight and lower in thermal conductivity than conventional refractory products, temperature drop during the transfer of molten aluminum can be reduced.
- **Sintered product**
Since LUMISUL is thoroughly factory-sintered, it contains almost no moisture, which is harmful to molten aluminum, and is excellent in thermostability.
- **Ease of handling**
Machining is not needed and product is easy to handle since LUMISUL is a formed product.
- **Ease of machining**
Machining is easy if needed.

Applications

- Launders, Baths for holding furnace, Inner sleeves, Transfer pipes, Troughs, Pouring gates, Ladles, Stokes and various molded shapes

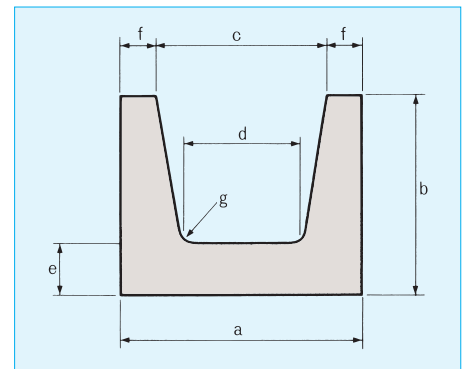


Laundry

Standard dimensions (Launders)

Product type	Standard dimensions (mm)							Length	Unit weight (kg)
	a	b	c	d	e	f	g		
LS-4	194	233	134	90	40	30	R15	800	26
LS-5	220	200	150	120	50	35	R20		26
LS-6	280	150	180	150	50	50	R15		28
LS-7	175	105	115	95	35	30	R15		12
LS-8	104	101	64	54	26	20	R15		7
LS-11	280	240	200	160	50	40	R30		37
LS-13	320	300	240	210	60	40	R40		47

* Please contact us for other shapes and dimensions.



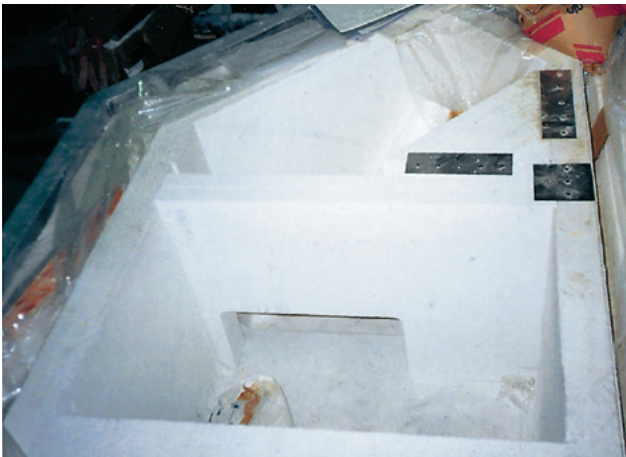
Physical properties

Products	LD	A41	FS-6	AK	AD	AG	AC
Properties	General-type			High density-type			
	Standard	Thermal shock resistance		Standard	Heat storage	High heat resistance	Non-wettability
Applications	Launders		Launders Substoke	Transfer pipes	Bath partition	Tap hole	Hoppers
Main raw material	Wollastonite	Wollastonite Amorphous silica	Amorphous silica	Chamotte	Silica carbide	Alumina	Zircon
Maximum service temperature (°C)	1000	1000	1000	1550	1200	1600	1600
Bulk density (g/cm ³)	1.35	1.35	1.80	2.35	2.60	2.90	3.00
Bending strength (MPa)	4	3	7.5	14	14	15	17
Compressive strength (MPa)	10	6	35	60	63	80	100
Coefficient of thermal expansion (×10 ⁻⁶ /°C)	7	4	1	5	3	7	5
Thermal conductivity (W/(m·K))	0.34 (700°C)	0.36 (700°C)	0.84 (700°C)	1.9 (500°C)	11.0 (500°C)	3.1 (500°C)	2.7 (500°C)

*The above figures are actual values measured by NICHIAS and not specification values.

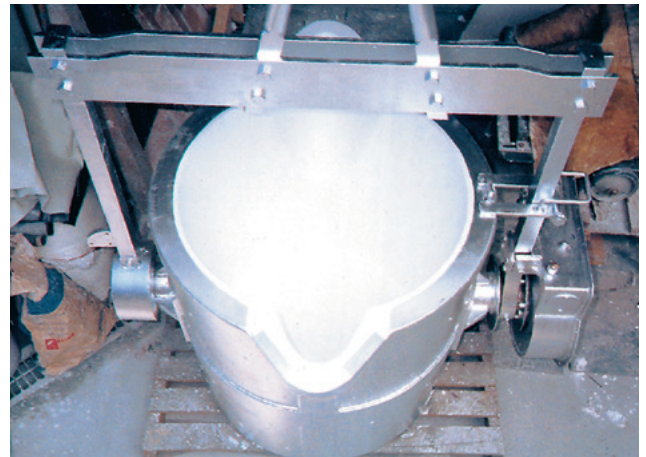
Baths for holding furnace

Various molded shapes of LUMISUL that can contain up to 2 metric tons of molten aluminum are available.



Bath

Ladle



Ladle

Cautions for handing the products

- The minimum thickness of LUMISUL is 20mm.
- Please dry and preheat because there is a possibility of moisture absorption during storage.
[Standard pre-heating conditions] Rate of temperature increase: 25°C per hour
Keep the temperature: 700°C for 5hours
- Please do not use in direct contact with flux.

Inorganic fiber irregular shaped insulation

TOMBO™ No. 4722

LUMICAST™

LUMICAST is inorganic fiber irregular shaped insulation material used as a lining for casting vessels and launders, etc. where LUMICAST is in direct contact with molten aluminum alloys.

Non-wettability is enhanced by our original production method.

Application to various shaped is easy. LUMICAST forms an even and seamless lining with excellence properties.



Advantages

- **Non-wettability, erosion resistance**

With AES wool as the main component, non-wettability is specifically enhanced. LUMICAST performs well in erosion resistance.

- **Low thermal conductivity, low thermal capacity**

Since LUMICAST is a fibrous putty, it is lightweight and excellent in thermal insulation. The temperature drop of molten aluminum is drastically reduced when LUMICAST is applied to various casting vessels and launders, etc.

- **Flexible putty form**

LUMICAST can allow seamless construction without formwork to fit vessels such as ladles and launders since it is fibrous insulation material in putty form.

- **High thermal shock resistance**

LUMICAST linings minimize the potential for cracks in the lining during use due to its high thermal shock resistance and minute expansibility (or residual expansibility) after drying. It is useful in preventing the leakage of molten aluminum and suitable for use as a back-up insulation material.

- **Improvement in work environment**

LUMICAST does not release dust during the application due to its putty form and does not adversely affect the work environment.

- **Minimize inclusion**

It is lighter than molten aluminum alloy and contains less coarse shot (non-fibrous particles), so inclusions in the product can be minimize.

Alkaline earth silicate(AES) wools consist of amorphous fibers, which are produced by melting a combination of CaO-, MgO-, and SiO₂. AES wool of NICHIAS is called FINEFLEX BIO. The Max. heatproof temperature of FINFLEX BIO is up to 1300°C. FINFLEX BIO is exonerated from carcinogen classification because of low pulmonary biopersistence under criteria listed in Note Q of REGULATION(EC) No.1272/2008 (CLP regulation).

Applications

- Ladles, distributors, casting vessels, launders, feeder head, linings for various vessels, back-up insulation material and repairing material.

Packaging

- Packed in plastic bag and in can
- Net weight: LUMICAST A 15kg/can
LUMICAST R 20kg/can

Physical properties

		LUMICAST A	LUMICAST R
Type of inorganic fiber		AES wool	Alumina fiber
Maximum service temperature (°C)		1000	1000
Color		Pale yellowish-white	White
Bulk density (kg/m ³)	Putty form	1400	1800
	After drying at 110°C	830	1300
Bending strength (MPa)	After drying at 110°C	1.1	4.2
	After heating at 700°C× 3hrs	1.4	4.1
Linear heat shrinkage (%)	After heating at 700°C× 3hrs	+0.2 (residual expansibility)	0
Coefficient of thermal expansion (×10 ⁻⁶ /°C)		5.6	6.1
Thermal conductivity (W/(m·K))	at 300°C	0.17	0.27
	at 500°C	0.19	0.3
	at 700°C	0.20	0.34
Coverage (kg/m ³)		1400	1740
Chemical composition (%)	Al ₂ O ₃	50	55
	SiO ₂	39	18
	CaO+MgO	4	21
Expiration date for use (rough standard)		3 months	6 months

*The above figures are actual values measured by NICHIAS and not specification values.

*Please do not use in direct contact with flux.

*If water and LUMICAST separate after mixing please mix again.

*Expiration date for use is when stores unopened in a cool, dark room indoors at 4°C or above.

Construction method

[Application procedures]

- Apply LUMICAST by compression to the surface taking care not to make any air spaces or voids. Finish the surface evenly with a metal trowel.
- Apply LUMICAST to steel vessels like ladles directly, V-anchor or chain-links shall be welded if necessary.
- To evaporate water, preliminary drying and heating are necessary before use.
Acute drying and heating may cause cracks on the surface or blisters.
- Use tough refractory products such as bricks on the surfaces that contact molten aluminum.
- If water and LUMICAST separate after mixing, please mix again.

[Drying conditions]

● Standard drying conditions

	Conditions	Thickness		
		20mm	50mm	100mm
Preliminary drying	1) Blow drying	24hr		
	2) Drying at 100 to 110°C	24hrs	48hrs	72hrs
	3) Drying at 150 to 200°C	12hrs	24hrs	48hrs
Heated air drying	Drying at 500~600°C	6hrs	12hrs	24hrs

* Please conduct the preliminary drying in the order of above 1),2) and 3).

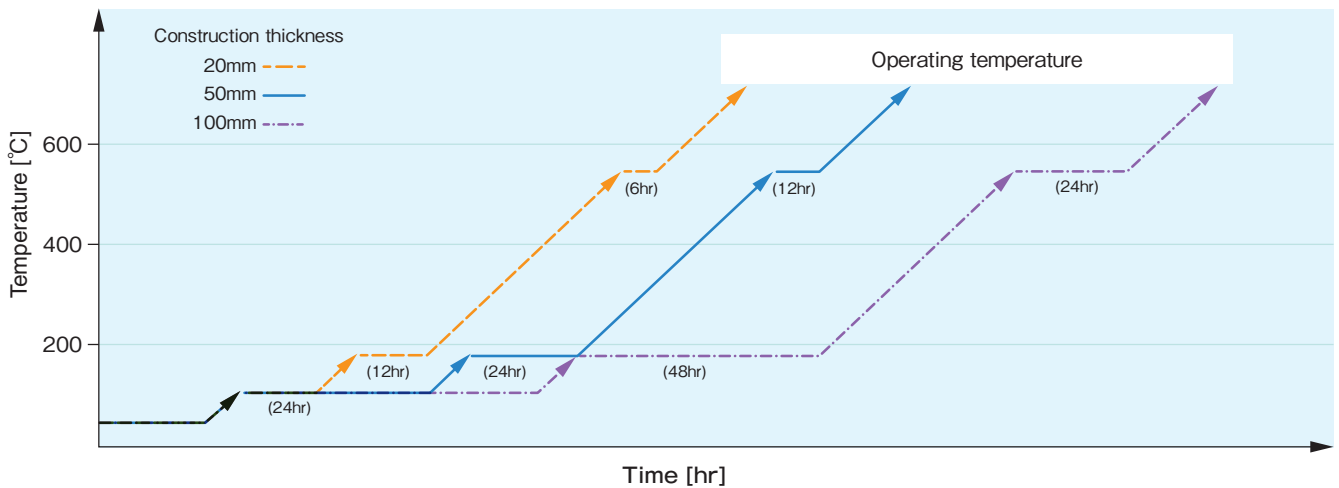
* The following equipment is recommended as standard.

Blow drying: Electric fan (Item No.1 in the above table)

Preliminary drying: Over charcoal fire or warm air (in the above table 2) and 3))

Heated air drying: kerosene or gas burner

● Heating Process



The conditions described above are for example only, and the construction environment may affect the required heating. Preliminary tests are recommended.

**TOMBO™ No. 5615/5615-LT
FINEFLEX BIO™ Blanket
LT Blanket**

FINEFLEX BIO Blanket is made by continuously laminating silica-magnesia-calcia based alkaline earth silicate (AES) wool, molding it into a blanket, and needle-punch processing it.

Applications

- General insulating material
- Lining material and backup material for insulating the ceilings and walls of kilns
- Expansion joint filling material for interior parts of kilns

Quality Characteristics

Item	TOMBO No. 5615	TOMBO No. 5615-LT	
Color	White		
Max. heatproof temp. (°C)	1300	1200	
Average fiber diameter (μm)	4		
Chemical composition (wt%)	SiO ₂	76	62
	CaO+MgO	22	37
	Other	2	1
Linear heat shrinkage (%)	1100°C ×8hr	1.1	0.5
	1200°C ×8hr	1.7	0.9
	1300°C ×8hr	2.0	—

*The above figures are actual measurements made by NICHIAS and not specification values.

*Max. heatproof temp. is the temperature at which contraction is 4% or less after 8 hours of heating.

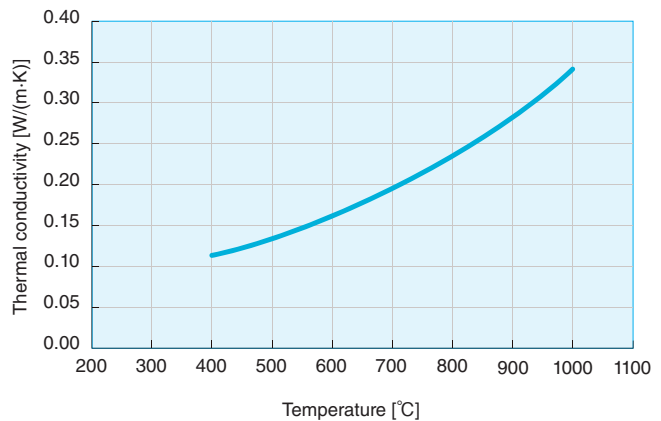


Standard Dimensions

TOMBO No.	Type	Thickness (mm)	Width × length (mm)
5615	# 100	12.5	600 × 1200
	# 130	25	600 × 3600
	# 160	50	600 × 7200
5615-LT	# 96	13	610 × 14640
	# 128	25	610 × 7320
		50	610 × 3660

* Please contact us for inquiries about other sizes.

Thermal conductivity



Thermal conductivity of FINEFLEX BIO Blanket (130kg/m³)

* The following figures are actual measurements made by NICHIAS and not specification values.

TOMBO™ No. 5635-A/5635-R/5635-M
FINEFLEX BIO™ Paper

FINEFLEX BIO Paper A is comprised of FINEFLEX BIO Bulk to which organic binder has been added, while FINEFLEX BIO Paper R and M are comprised of FINEFLEX BIO Bulk and amorphous inorganic fiber to which organic binder has been added, each type being made into paper form by a paper making machine.

Features

- FINEFLEX BIO Paper A
A general-purpose product that can withstand high temperatures
- FINEFLEX BIO Paper R
A product that has excellent tensile strength, flexibility, and cushioning
- FINEFLEX BIO Paper M
A product that emits few odors during baking

Applications

- General-purpose insulating material
- Lining material and backup material for insulating ceilings and walls of kilns
- Expansion joint filling material for interior parts of kilns
- Insulating material for gas powered hot water heaters
- Insulating material for combustion equipment



Standard Dimensions

Thickness (mm)	Width × length (mm)
1.0	600 × 1200
2.0	
3.0	
4.0	

* Please contact us for inquiries about other sizes.

Quality Characteristics

Item	TOMBO No. 5635-A	TOMBO No. 5635-R	TOMBO No. 5635-M
Features	High heatresistance type	Excellent flexibility	Low odor type
Color	White	White - light brown	
Density (kg/m ³)	250		240
Max. heatproof temp. (°C)	1300	800	1000
Tensile strength (N/25mm)	1.0mm: 23	1.0mm: 34	1.0mm: 17
	2.0mm: 39	2.0mm: 66	2.0mm: 37
	3.0mm: 58	3.0mm: 100	3.0mm: 49
	4.0mm: 78	4.0mm: 135	4.0mm: 74
Ignition loss (%) (600°C × 0.5hr)	4	7	2

* The above figures are actual measurements made by Nichias and not standard values.

* Binders may dissipate after heating, reducing the shape retention of the product.

TOMBO™ No. 5645
FINEFLEX BIO™ Mold

FINEFLEX BIO Mold is a product made by adding organic and inorganic binders to FINEFLEX BIO Bulk and molding it into various shapes by suction molding.

TOMBO No.5645-M is a low odor type to which small amounts of organic binder are added. TOMBO No.5645-A is a general-purpose type with excellent workability.

Features

- Exhibits an excellent thermal insulating effect due to its light weight and low thermal conductivity.
- Can be vacuum molded into a variety of shapes and thickness.
- Easy to process by grinding, cutting, etc.

Applications

- Standard high-temperature insulating material
- Internal insulation for compact electric furnaces
- Aluminum tap holes and stopper covers
- Other thermal insulation materials and backup materials

Quality Characteristics

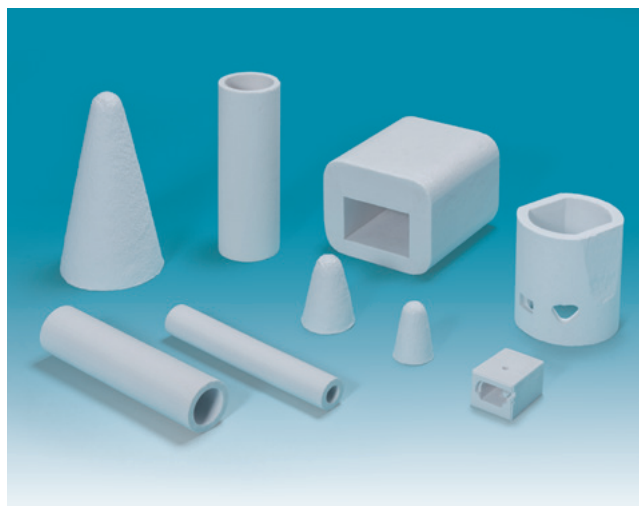
Item	TOMBO No. 5645-M	TOMBO No. 5645-A
Features	Low odor type	Excellent workability
Color	White	
Density (kg/m ³)	250	
Max. heatproof temp. (°C)	1300	
Normal usage temperature (°C)	1000	
Ignition loss (%)	0.7	4.0
Chemical composition	SiO ₂ , CaO, MgO, Other	

* The above figures are actual measurements made by NICHIAS and not specification values.

* Please ask us about shapes.

* Depending on usage environment, deformation or cracking may occur at temperatures over 1100°C.

Please inform us of your usage conditions when ordering.



Dimensions of the cup, tap out cones for the molten aluminum tap hole and plug covers

Cup No.	Inner diameter × height × thickness (mm)	Internal radius of top
37-111	φ37 × 70 ^H × 8 ^t	11
40-032	40 × 70 × 10	15
40-125	40 × 85 × 7	6
42-047	42 × 62 × 7	17
42-094	42 × 89 × 8	11
46-076	46 × 69 × 8	13
53-090	53 × 88.5 × 7	13.5
61-133	61 × 116 × 6	15
80-029	80 × 90 × 7	17
85-005	85 × 88 × 5	19

* Please contact us for shapes and dimensions other than the above.

Alkaline earth silicate (AES) wool

Product name	Maximum service temperature (°C)	Bulk density (kg/m ³)	Description	Standard content or dimensions
TOMBO No. 5605 FINEFLEX BIO Bulk	1300	—	Silica-magnesia-calcia-based alkaline earth silicate (AES) wool gathered like cotton-wool. It is excellent in flexibility and thermal shock resistance.	10kg net content
TOMBO No. 5625 FINEFLEX BIO Board		250	Product made by adding organic and inorganic binders to FINEFLEX BIO Bulk and molding it into board shape.	25, 50mm × 600mm × 900mm

* Please refer to FINEFLEX BIO catalog for details.

TOMBO™ No. 6760-A
VERMOFLEX™ -A

VERMOFLEX is a heat-expandable and fire-resistant sheet made of a mixture of ceramic fiber and heat-expandable and inorganic material with a small amount of both organic and inorganic binders through the paper making process. VERMOFLEX expands approximately four times in thickness when heated.
(Heated in non load-bearing condition)

Physical Properties

Properties	Unit	VERMOFLEX-A
Maximum service temperatures	°C	800
Bulk density	kg/m ³	500
Room temperature 850°C×30min (after expansion)		100
Expansion ratio	%	Approximately
850°C×30min (after expansion)		300
Temperature at which expansion starts	°C	400
Temperature at which outstanding expansion occurs	°C	540
Ignition loss	%	16
850°C×30min (after expansion)		
Thermal conductivity	W/(m·K)	0.05
25°C (before expansion) 800°C (after expansion)		0.15

* These figures are test results and should not be used for specification purposes.



Before expansion



After expansion

Advantages

- Stable expandability
- Excellent in handling
- Easy to cut with a cutter
- Excellent in thermal insulation
- High thermal shock resistance

Applications

- Heat sealing materials
- Thermal buffer

TOMBO™ No. 9820
LUMIBOND™

LUMIBOND is a sodium silicate based adhesive with high heat resistant aggregates evenly distributed. It is excellent in heat resistance (800°C) and in permeation resistance against molten aluminum.

Physical properties

Properties	Description
Appearance	White putty
Maximum service temperature (°C)	800
Bulk density (Putty)	2.1
Nonvolatile matter (%)	70
Required amount of LUMIBOND (kg/m ³)	1~2

* The above figures are actual values measured by NICHIAS and not specification values.

- Standard packaging 25kg, 5kg



Applications

- Bonding LUMIBOARD to LUMIBOARD or LUMISUL to LUMISUL.
- Bonding LUMIBOARD or LUMISUL to thermal insulation materials such as SUPERTEMP Board, etc.
- Bonding LUMIBOARD to steel plates.

Surface treatment materials

Product name	Advantages	Standard content
ZIRCOAT BN-A	ZIRCOAT BN-A is a ceramic and erosion resistant coating to protect various refractories and metal dies that are in direct contact with molten aluminum from erosion.	2kg

TOMBO™ No. 4350-GH
ROSLIM™ Board GH

ROSLIM Board GH is a revolutionary product with extremely low thermal conductivity properties and reduced brittleness and dust emission characteristics. With its greatly improved strength, it can be processed into complicated shapes that were previously unattainable. Its handling characteristics and attachment workability have also been greatly improved, making it easy to work with.

Advantages

- Excellent thermal insulation property that surpasses that of still air
- Excellent handling property
- Excellent processing property that eliminates the need for special tools

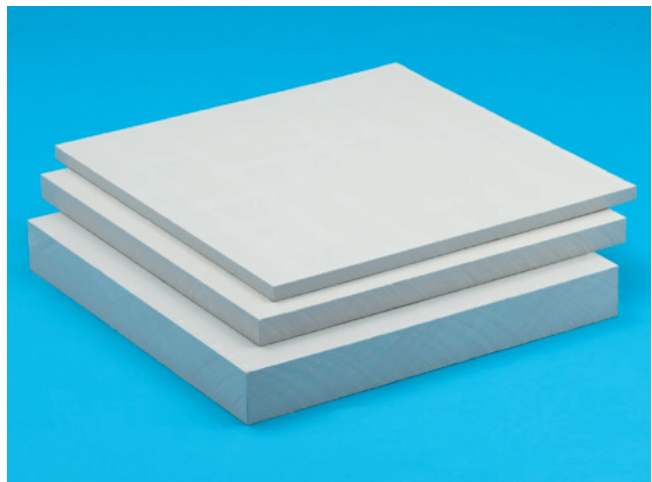
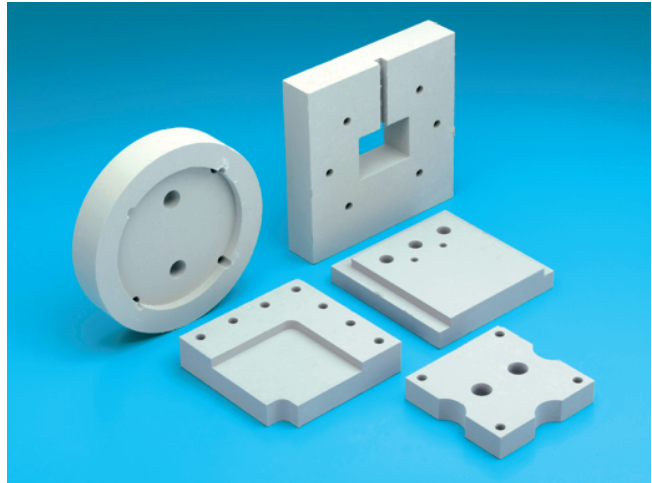
Applications

- Insulating material for industrial furnaces (backup material)
- Insulating material for combustion equipment
- Insulating material for melting and holding furnaces

Physical properties

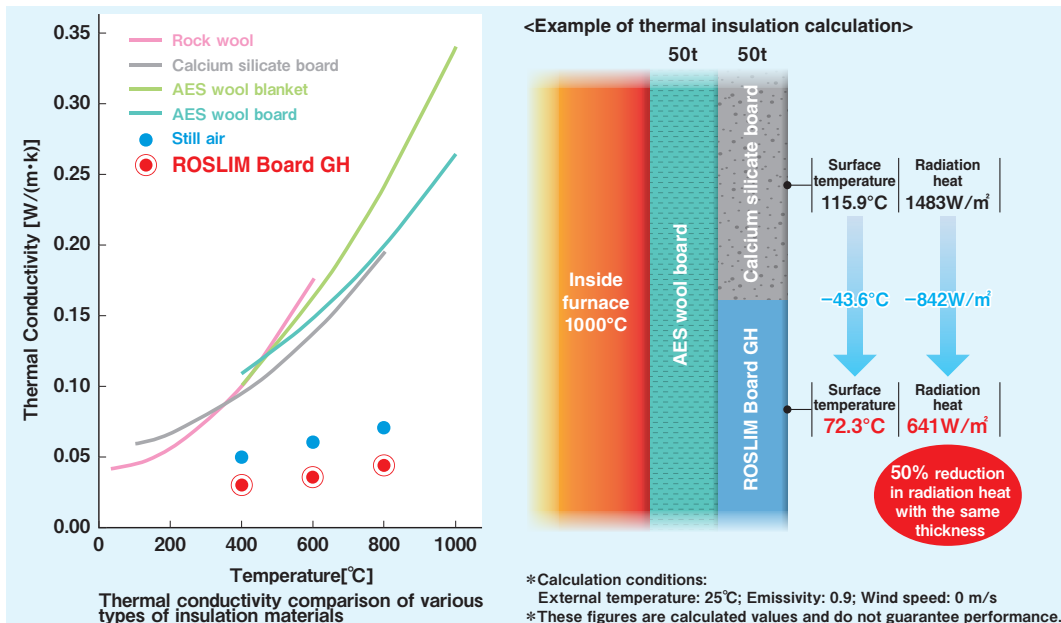
Maximum service temperature	(°C)	1000
Bulk density	(kg/m³)	250
Thermal conductivity (W/(m·K))	at 400°C	0.030
	at 600°C	0.036
	at 800°C	0.044
Compressive strength (at 10% compaction)	(MPa)	1.02
Linear heat shrinkage (%)	at 800°C×24hr	0.6
	at 1000°C×24hr	1.1

* The above figures are actual values measured by NICHIAS and not specification values.



We accept orders for processing into a variety of shapes.

Thermal Insulation Characteristics



*The above figures are actual values measured by NICHIAS and not specification values. The figures of calcium silicate board and still air are theoretical values.



Head Office

6-1, Hatchobori 1-chome, Chuo-ku, Tokyo 104-8555, Japan
International Marketing and Sales Group
 Phone: 81-3-4413-1132 Fax: 81-3-3552-6108
 Web Site: <https://www.nichias.co.jp/>

Overseas Sales Companies

Indonesia

PT. NICHIAS SUNIJAYA

Sequis Tower Level 19 Suite 1&2,
 Jl. Jend Sudirman Kav. 71, Jakarta 12190, Indonesia
 Phone: +62-21- 2277-6101 Fax: +62-21- 2793-8033

Malaysia

NICHIAS SOUTHEAST ASIA SDN. BHD.

Suite A1102, 11th Floor, West Wing, Wisma Consplant 2,
 No. 7, Jalan SS 16/1, 47500 Subang Jaya, Selangor Darul Ehsan, Malaysia.
 Phone: +60-3-5636-4067 Fax: +60-3-5636-4078

Singapore

NICHIAS SINGAPORE PTE. LTD.

25 International Business Park, #01-15/17 German Centre,
 Singapore 609916
 Phone: +65-6571-0830/0838 Fax: +65-6265-7681

Vietnam

NICHIAS VIETNAM CO., LTD

Room 709, Elite Business Center, 7th Floor Diamond Flower Building,
 48 Le Van Luong Street, Nhan Chinh Ward, Thanh Xuan District,
 Hanoi, Vietnam
 Phone: + 84-24-6664-3136 Fax: + 84-24-6666-8168

Thailand

NICHIAS (THAILAND) CO., LTD.

85 Moo 1, Wellgrow Industrial Estate T. Homsin, A. Bangpakong
 Chachoengsao 24180, Thailand
 Phone: +66-38-570-600 Fax: +66-38-570-601

THAI NICHIAS INTERNATIONAL CO., LTD.

Unit 1107, 11th Floor, AIA Capital Center
 89 Ratchadaphisek Road, Dindaeng, Dindaeng, Bangkok 10400 Thailand
 Phone: +66-2-001-2060 Fax: +66-2-001-2062

China

NICHIAS (SHANGHAI) TRADING CO., LTD.

霓佳斯（上海）贸易有限公司
 Room 1701, THE PLACE, Tower A, No. 100 Zun Yi Road,
 Changning District, Shanghai, P.R.China Postcode 200051
 中国上海市长宁区遵义路100号虹桥南丰城A栋1701室 邮编200051
 Phone: +86-21-6236-1783 Fax: +86-21-6236-1781

NICHIAS (SHANGHAI) TRADING CO., LTD. Guangzhou Branch

霓佳斯（上海）贸易有限公司 广州分公司
 17F-G, Gold Sun Building, No.109 Tiyu West Road, Guangzhou,
 Guang Dong Province, 510620, P.R.China
 中国广东省广州市天河区体育西路109号高盛大厦17楼G室 邮编 510620
 Phone: +86-20-3879-1640 Fax: +86-20-3879-1647

NICHIAS (SHANGHAI) AUTOPARTS TRADING CO., LTD.

霓佳斯（上海）汽车零部件贸易有限公司
 Room 1702, THE PLACE, Tower A, No. 100 Zun Yi Road,
 Changning District, Shanghai, P.R.China Postcode 200051
 中国上海市长宁区遵义路100号虹桥南丰城A栋1702室 邮编200051
 Phone: +86-21-6236-2668 Fax: +86-21-6236-2667

Overseas Construction Companies

Malaysia

NICHIAS SOUTHEAST ASIA SDN. BHD.

Suite A1102, 11th Floor, West Wing, Wisma Consplant 2,
 No. 7, Jalan SS 16/1, 47500 Subang Jaya, Selangor Darul Ehsan, Malaysia.
 Phone: +60-3-5636-4067 Fax: +60-3-5636-4078

Thailand

THAI-NICHIAS ENGINEERING CO., LTD.

45 Huaypong-Nongbon Road, Huaypong, Muang Rayong,
 Rayong Province 21150, Thailand
 Phone: +66-38-682-242 Fax: +66-38-691-156

Overseas Factories

Indonesia

PT. NICHIAS ROCKWOOL INDONESIA

PT. NICHIAS METALWORKS INDONESIA

Malaysia

NICHIAS FGS SDN. BHD.

NT RUBBER-SEALS SDN. BHD.

Vietnam

NICHIAS HAIPHONG CO., LTD.

China

SUZHOU NICHIAS INDUSTRIAL PRODUCTS CO., LTD.

(苏州霓佳斯工业制品有限公司)

SUZHOU NICHIAS SEAL MATERIAL CO., LTD.

(苏州霓佳斯密封材料有限公司)

SHANGHAI XINGSHENG GASKET CO., LTD.

(上海兴盛密封垫有限公司)

SUZHOU SHUANGYOU AUTOPARTS CO., LTD.

(苏州双友汽车零部件有限公司)

India

NICHIAS INDUSTRIAL PRODUCTS PRIVATE LTD.

Czech

NICHIAS AUTOPARTS EUROPE a.s.

Mexico

NAX MFG, S.A.DE C.V.

⚠ Cautions

- The products included in this catalog are intended for common use, including those presented in the catalog. If you intend to use any of the products in a way that requires extremely high quality and reliability such that any possible defect may directly affect the safety of human lives, please make sure to consult with our company in advance and take necessary measures at your responsibility.
- Because the stated material values may vary according to actual usage environments or circumstances, please consider such figures as indications for reference.
- The content of the catalog explains the features of the products when they are used alone. When actually using the products, please start using them after testing them under the actual usage environment.
- The content of the explanation of the products may be modified without any advance notice, and the production of the product may also be discontinued without advance notice. Please obtain the latest version of the catalog, and confirm the content thereof. The date of issuance of this catalog is printed on this page.
- The standards, accreditation and provisions of laws included in the catalog may not conform with the latest version thereof.
- We strictly prohibit any acts of infringement upon our rights that are protected by the Copyright Act with regard to information included in the catalog, through the production of copies or imitations, misappropriation or unauthorized reprinting.
- Please be informed that, in the case where any problem involving a third party's industrial property right arises due to the use of any product included in the catalog, our company shall not be responsible for any problems other than the problems arising strictly due to reasons related to only such products.
- Please be aware that our company will not bear any responsibility for the following damage related to our products:
 - Damage arising due to natural disasters or accidents occurring for reasons that are not attributable to our company;
 - Damage arising due to remodeling, repairing or other acts by a third party;
 - Damage arising due to the willful intent or negligence of the customer or the user, or due to the improper use or use under abnormal conditions of the products;
 - Damage arising due to the failure to carry out regular checkups and appropriate repairs, maintenance and part replacements, considering various conditions, such as the usage conditions, usage environment and usage period, etc., of the product;
 - Indirect damage (including any operational damage, lost profits, opportunity losses, etc.) arising due to the use of or inability to use our company's product;
 - Damage arising due to a situation which was unforeseeable under the technical standards at the time of the shipment of our company's product; or
 - Damage arising due to reasons that are not attributable to our company.