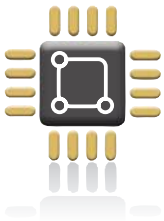
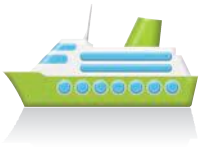
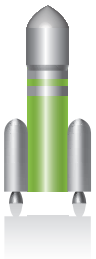
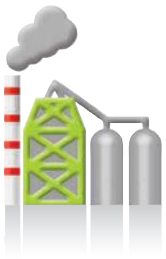
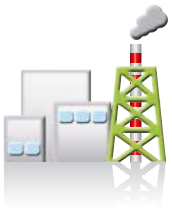
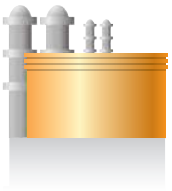


# TOMBO™ BRAND Products

## You can find us anywhere!

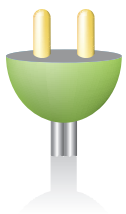











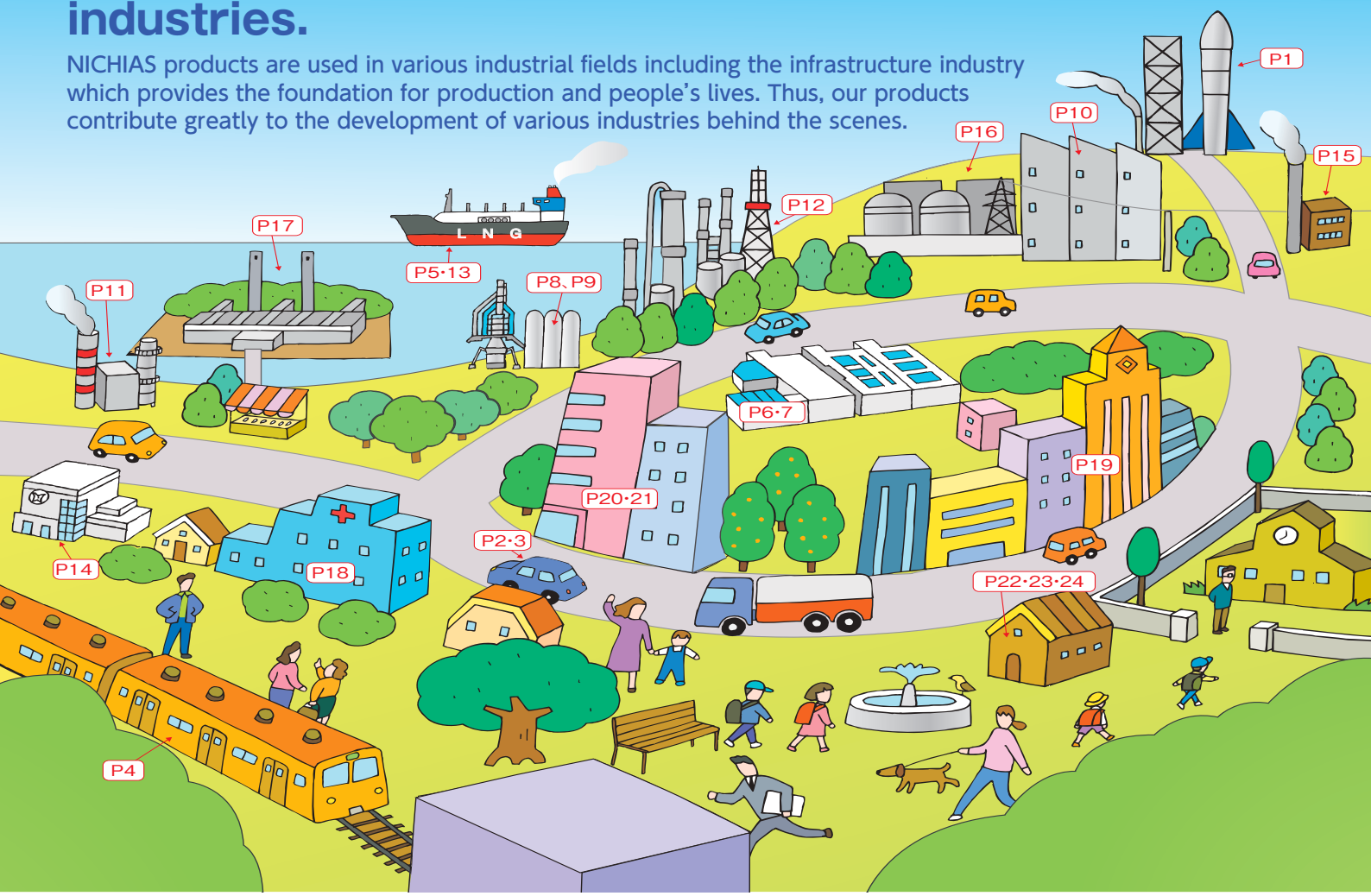


NICHIAS

LDC

# Based on our Insulation and Protection Technologies, we provide products and services to a wide range of industries.

NICHIAS products are used in various industrial fields including the infrastructure industry which provides the foundation for production and people's lives. Thus, our products contribute greatly to the development of various industries behind the scenes.






### About the NICHIAS corporate mark, the dragonfly

In ancient times, the dragonfly was a symbol of Japan itself. NICHIAS decided on the dragonfly trademark to reflect its vision of an exemplary Japanese company. The trademark was officially registered in 1923. At that time, the dragonfly in the trademark was perched on the ground, but now it is flying towards the sky, mirroring our hopes for the future.

## A Foamed heat insulation material ①

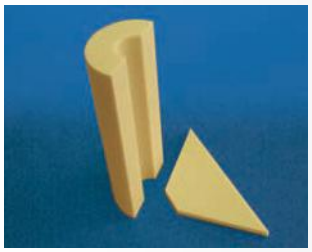
### FOAMNERT™ Solution

A solution of heat insulation material (PIF) applied by spraying and foaming, for heat and cold insulation of the exterior walls of rockets, which can reach extremely high temperatures, and of fuel tanks for liquid fuel, which can be at very low temperatures. This product was jointly developed with MITSUBISHI HEAVY INDUSTRIES, LTD. The main constituent is resin, and the product becomes fire resistant and lightweight after application.

## B Foamed heat insulation material ②

### FOAMNERT™ Processed Producty

Heat insulation material made of PIF, which is foamed and processed into blocks, and used to insulate the liquid fuel tank piping, which becomes extremely cold. This product is made of resin and is flame resistant and lightweight.



## C Fluoropolymer hose

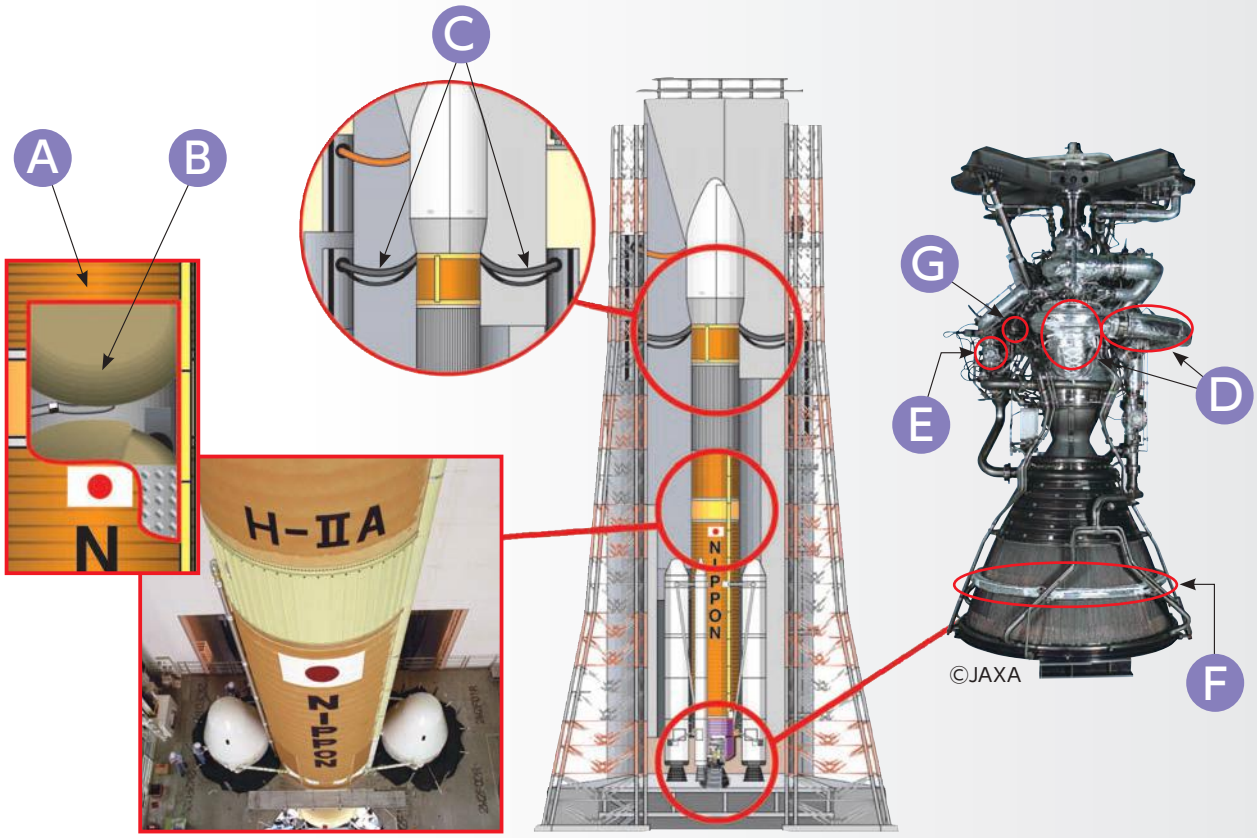
### NAFLON™ PFA High Pressure Hose

A fluoropolymer hose used for equipment control lines. The outside of the NAFLON (PFA) hose is reinforced with stainless steel wire braiding to increase pressure resistance.

## D Reusable flexible heat insulation material

### ENETHERMO™

Reusable heat insulation material for covering valves at the lower part of the engine. Since it uses glass fiber as the main constituent and has high water resistance and flexibility, it can be attached to equipment with a complex shape.

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## E Fluoropolymer processed parts

### NAFLON™ PTFE Cutting Parts

A fluoropolymer processed part used to seal joints in the liquid fuel piping of the rocket engine. These parts are made of fluoropolymer material (PTFE) and can be processed into various shapes according to the application.

## F Heat-resistant cloth

### RUBILON™ Cloth

Heat-resistant cloth for ultrahigh temperatures used as a base material for heat insulation of the nozzle skirt of a rocket engine. The main constituent is alumina fibers that have excellent strength and flexibility in an ultrahigh temperature zone, with high elasticity.

## G Hollow metal rings

### Metal O-Seal

Metal gaskets used to seal joints in the liquid fuel piping of the rocket engine. Metal tubes are formed into an O-ring shape, and the ends are welded together. These provide stable sealing performance in a wide range, from high pressure to vacuum conditions.

### A Cylinder head gaskets
**METAKOTE™**

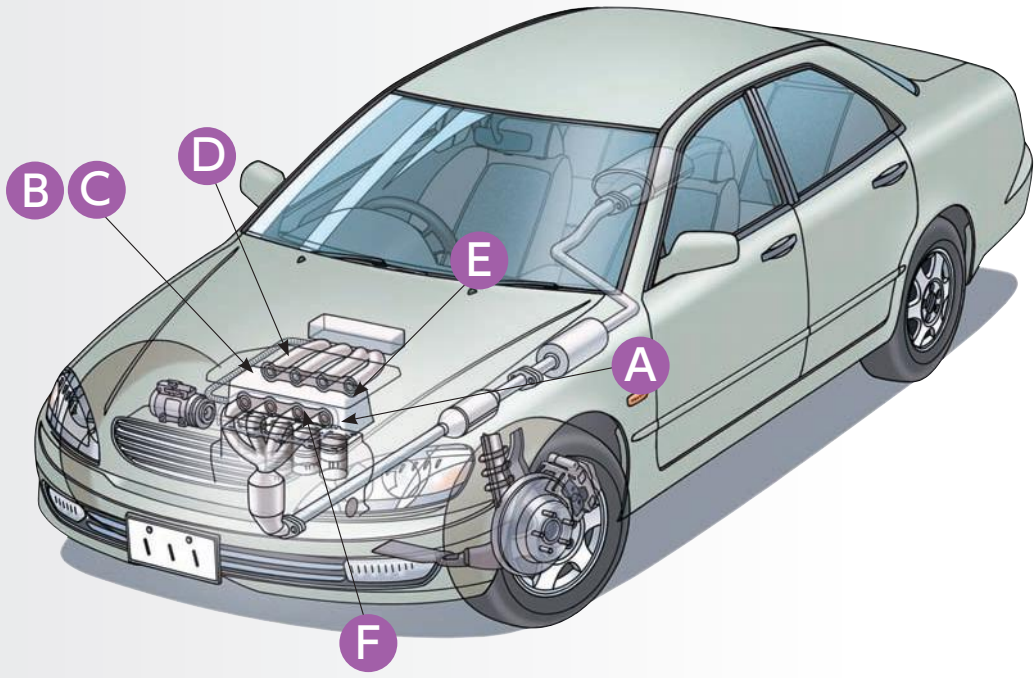
This metal gasket is sandwiched between the cylinder head, which is the heart of an engine, and the engine block in order to seal off combustion gas, coolant, and lubrication oil. The gasket material is stainless steel sheet coated with high-heat-resistant rubber. It contains no environmentally hazardous substances and has excellent sealing performance and endurance.

### B Tube-shaped insulators
**N-Flex Tube**
**N-Flex Tube HI**

Heat insulation tubes with excellent elasticity and flexibility. Ideal for covering cables and rubber hoses in the engine compartment to protect them from heat damage. They can be combined with heat insulation paper, aluminum foil, glass cloth, etc., according to the application and can be used under a wide range of conditions.

### C Heat insulation materials
**INSULTEX™ Tube-T**

These heat insulation tubes are made of tubular braided glass yarn for excellent heat insulation performance and flexibility. They are used to cover high-temperature pipes, such as EGR pipes and oil tubes, to protect peripheral parts from heat damage.

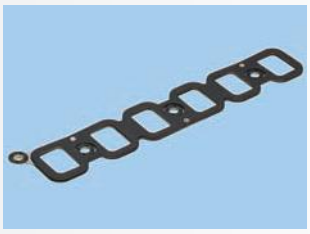



### D Ultra-lightweight sound insulation cover
**AIRTONE™**

Sound insulating cover featuring lightweight design and excellent acoustic performance using unique nonwoven cloth sheathing.

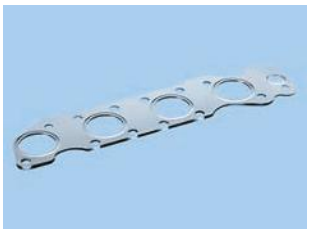
### E Intake manifold gasket
**METAFOAM™ Vibration Floating Gasket**

This gasket is used at the air intake of an engine, providing not only a sealing function, but also insulation against engine vibration. The gasket material is metal plate coated with foam rubber.



### F Exhaust manifold gasket
**Metal Gasket**

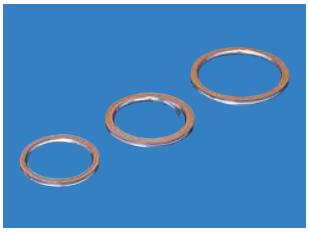
An engine exhaust gasket that provides excellent sealing performance for high-temperature combustion gas. It is structured with layers of stainless steel sheets.



*Exhaust manifolds send the combustion gas discharged from each cylinder to the exhaust pipes.

### G Exhaust pipe gasket
**CR VORTEX™ Gasket**

A spiral gasket for exhaust pipes, made with alternating layers of thin stainless steel sheet and soft paper. Its excellent heat resistance and conformity prevents exhaust gas from leaking.

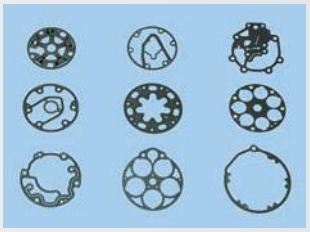


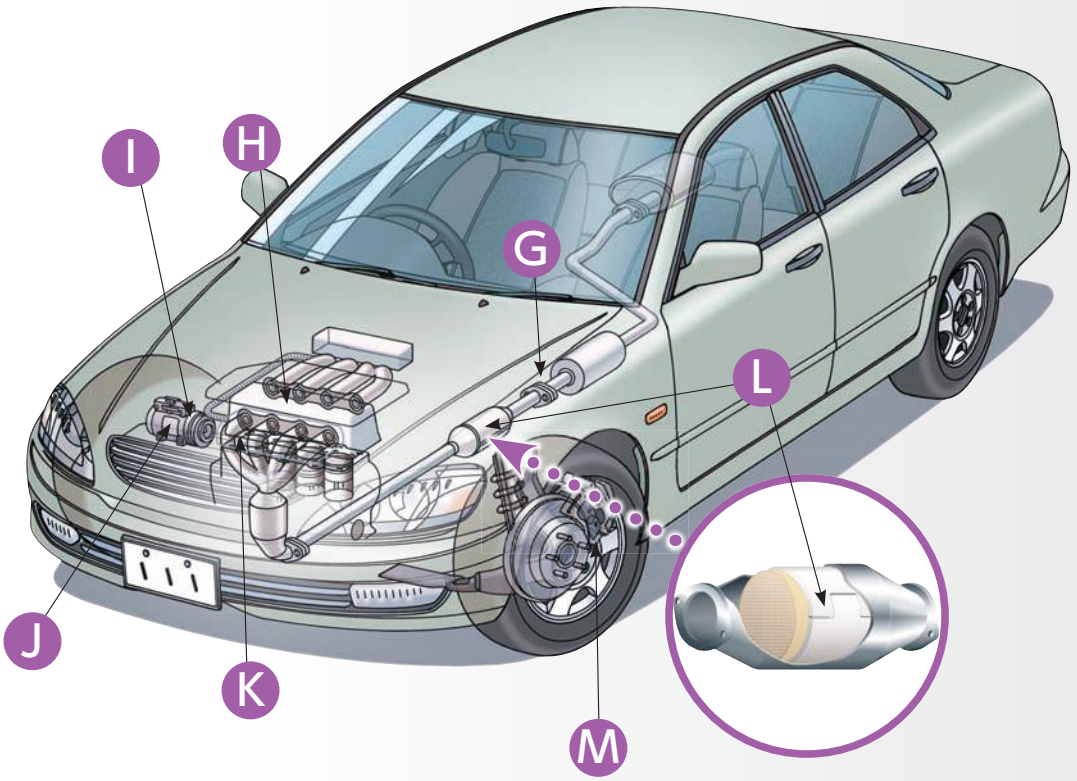
### H Water jacket spacer
**Water Jacket Spacer**

This product is inserted into the water jacket of an engine. It controls the flow of the coolant, evens out the temperature of the cylinder wall, and reduces friction between the piston and the cylinder. The spacer is made of resin, which improves fuel consumption.

### I Gasket for compressor
**METAKOTE™**

High-performance gasket with excellent resistance to cooling medium and refrigerator oil, used in compressors for air conditioners. The gasket material is metal sheet coated with specially formulated NBR.






### J Sliding materials
**EXCELIDE™**

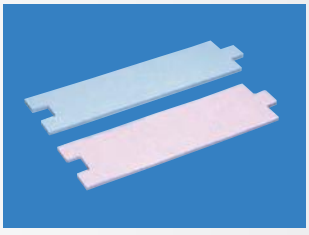
These sliding parts, made of multifunctional resin, are used in equipment such as compressors, ATs and ABSs. Because of their high heat resistance and superior friction- and wear-resistant properties, they are mainly used in parts (such as between a piston and cylinder) where both sliding and sealing performance is required.

### K Heat insulator
**INSULCOVER™**

A metal cover that insulates against heat from exhaust parts such as the exhaust manifold. The combination of high-performance heat insulation materials and heat-resistant damping materials makes it extremely effective against noise and vibration.

### L Catalytic converter support mats
**ECOFLEX™**

This buffer material protects the catalyst support used to clean the exhaust gas, and the exhaust pipes from vibration. It is made of super-heat-resistant alumina fiber and offers excellent retention and endurance.



### M Brake shim material
**METAPLUS™ Multi-Layer Shim**

An anti-squeal brake shim attached to the pad of a disc brake. The shim is made of laminated layers of rubber, metal and special adhesive to deliver an excellent vibration damping effect, along with high heat resistance and compression resistance properties.

*ECOFLEX is a trademark or registered mark of Saffil Ltd.

### A Rockwool insulation material
**MG BOARD™**

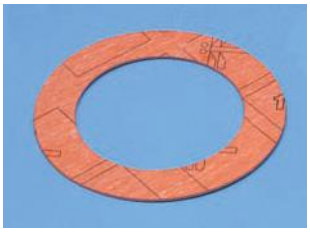
Rockwool heat insulation material for steel sheet ducts and various types of equipment. It is used in the ceiling and under the floor to block radiant heat and equipment-generated heat, thus protecting the temperature environment in the train.

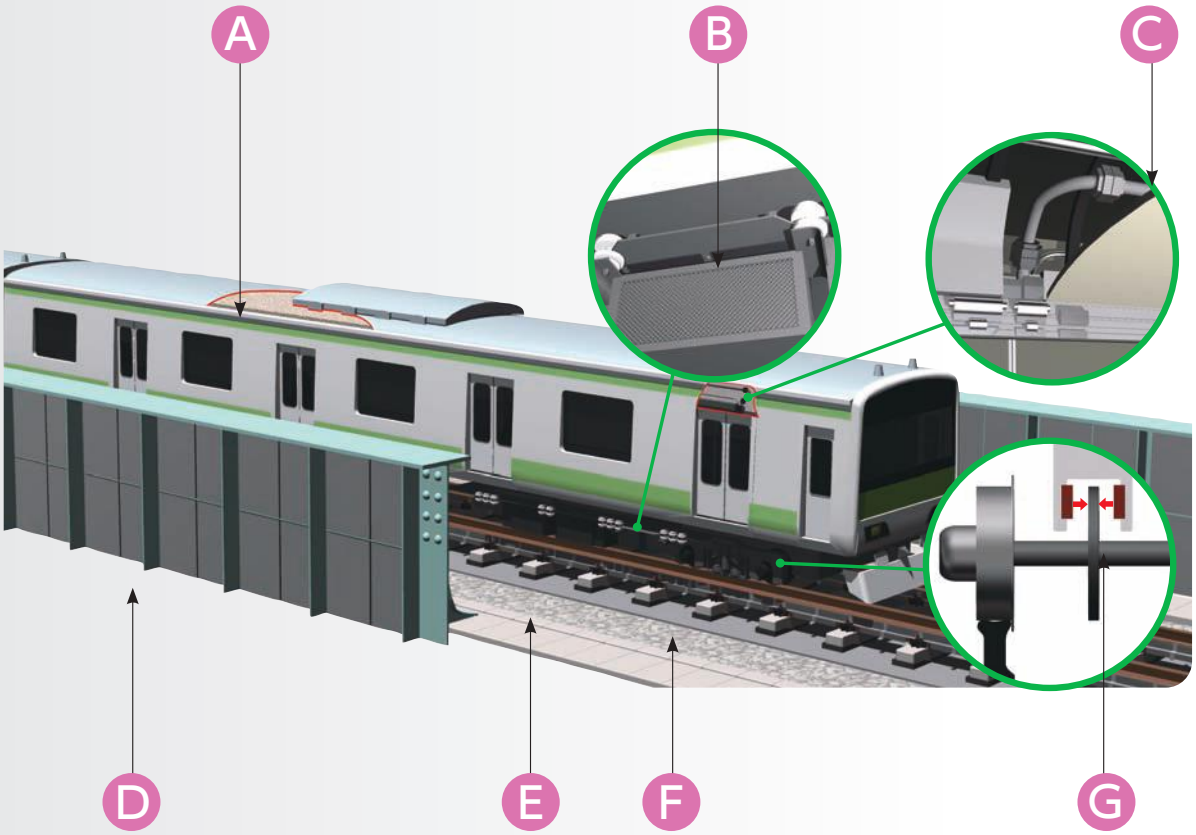
### B High-strength thermal insulation board
**HEMISUL™**

A high-strength thermal insulation board used for hot presses and other industrial machines, and for electrical insulation in trains. It is also installed under the cars to protect the car's floor against direct transmission of heat generated during acceleration/deceleration.

### C General-purpose joint sheet
**CLINSIL™-Brown**

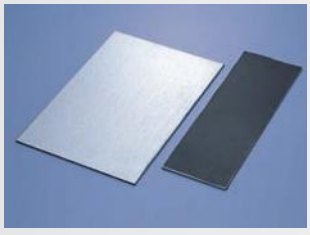
This is a non-asbestos joint sheet used for piping flanges, valves and other ancillary equipment. Doors of train cars are opened/closed using compressed air. This sheet is used to prevent air leakage in the joints of piping that delivers the compressed air.





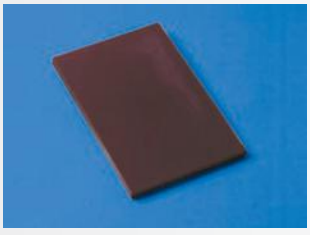

### D Magnetic composite damping material
**MAGDAMPA™**

Magnetic composite damping material used to prevent the generation of noise from railroad and road bridges. Since it uses magnetic rubber, this material can be directly attached to a bridge surface that emits noise, thus effectively reducing noise.



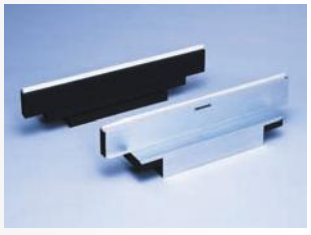
### E Fluoropolymer sliding bearing material
**NAFLON™ SLIDING PAD™**

Self-lubricating fluoropolymer sliding bearing material that serves as a damper for reducing the expansion/retraction or vibration of structures such as bridges and buildings. It is used to damp vibrations generated from a running train by reducing the friction between the damping rubber in a vibration damping crosstie supporting the rails and the vibration damping box.



### F Noise insulation material for rails
**Rail METALAMINE™**

This noise insulation material is directly installed on a rail to reduce the noise (rolling sound) that is generated by a moving train. The use of a vibration damping steel board (METALAMINE) for the casing can efficiently restrain noise (currently under joint development with the Railway Technical Research Institute).



### G Ceramic fiber
**FINEFLEX™1300 Bulk Fiber**

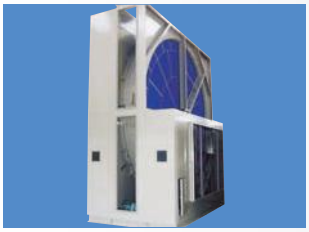
Ceramic fiber heat insulation material used to mix a friction material in composite materials or brake pad reinforcing materials. Due to its ability to improve the friction characteristics, it is an important constituent of brake pads for trains.

### A Glass cloth
**MARINETEX™**

Noncombustible lagging cloth that is wound around heat pipes on ships. This product is approved as noncombustible for ships.

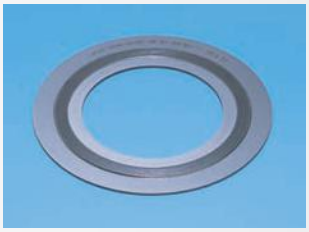
### B Concentrator for low concentrations of organic solvents
**SOLVENTCLEAN™**

This unit concentrates the low concentrations of organic solvents discharged in ship painting processes. By combining SOLVENTCLEAN with the treatment equipment of various systems, air containing VOCs can be efficiently processed into clean air.



### C Spiral gasket
**GRASEAL™ VORTEX™ Gasket**

A semi-metallic gasket used to seal various devices and piping joints in engine, boilers and other equipment. Using GRASEAL tape, this gasket delivers excellent sealing performance, from high-temperature conditions such as steam to low-temperature conditions such as LNG.

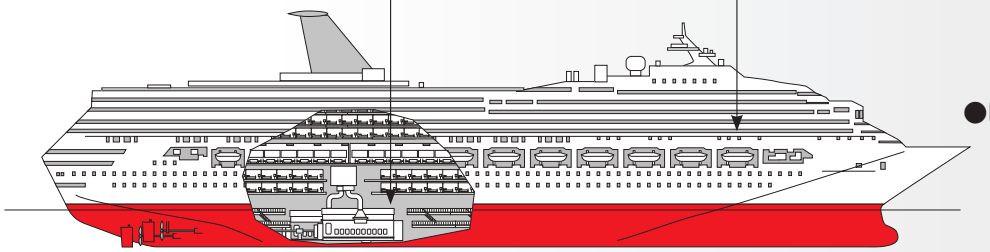


### D Joint sheets for ships
**CLINSIL™-Yellow**

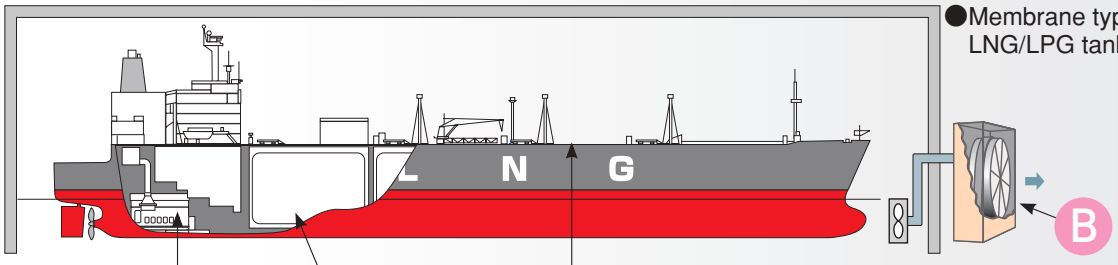
These non-asbestos joint sheets were developed as a sealing material for piping flanges and other equipment on ships. They are mainly used for low-pressure piping in accommodation spaces and near equipment.

A C D H
Heat insulation and acoustic absorption of engine rooms and boilers; sealing and bearing of piping

C D
Sealing of cabin piping, etc.



●Passenger vessel




●Membrane type LNG/LPG tanker

A C D H
Heat insulation and acoustic absorption of engine rooms and boilers; sealing and bearing of piping

G
Cold insulation of tanks

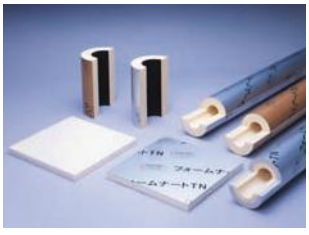
C D E F
Thermal insulation and cold insulation of shipboard piping equipment

●**Thermal insulation work**
Installation on partition bulkheads, decks, piping, and other equipment.

●**Cold insulation work**
Installation of Foamnert TN Series, etc., on piping and tanks using cryogenic adhesive.

### E Non-Freon-based rigid urethane foam
**FOAMNERT™ TN Series**

Carbon dioxide urethane foam heat insulation materials used for the piping and tanks of LNG/LPG terminals, ships, petrochemical plants, etc. These materials contain absolutely no Freon, yet retain almost the same heat insulation and mechanical properties as conventional products; thus they are widely used for membrane type LNG/LPG tankers.



### F Heat insulation material for cryogenic piping
**FOAMNERT™ Support**

Support for LNG/LPG and other cryogenic fluid piping. Since high-density urethane foam is used as the base material, this heat insulation support material for piping provides excellent mechanical strength, heat insulation, and weather resistance for structural members.

### G Non-Freon rigid urethane foam for LNG tankers
**FOAMNERT™ GR**

This is a cold and heat insulation material for tanks on membrane type LNG ships that transport liquid natural gas (LNG, −162°C) at super-low temperatures. This product is made of environment-friendly glass fiber reinforced rigid urethane foam that uses absolutely no Freon and has been approved as insulation material by GTT in France.

### H Piping support
**NAFLON™ U Bolt**

This piping support, which uses PTEE with filler on the sliding surfaces, allows smooth extension and contraction of piping caused by temperature changes on a ship. Its many features include abrasion resistance, weather resistance, nonfreezing, chemical resistance, and self-lubrication.

## A Heat-resistant perfluoroelastomer

### Rubber O-ring BLAZER NEXT™

Rubber O-ring BLAZER NEXT is a sealing material used for semiconductor and FPD heat treatment equipment and for equipment, piping, and valves in various industrial fields. With excellent heat and chemical resistance as well as low gas emissions at high temperatures, it is used to seal oxygen gas inlet ports in diffusion furnaces and for wafers carrying inlet and outlet ports. It is also perfect for sealing heat treatment equipment used in processes such as oxidation, diffusion, ion implantation, and thin film forming.

## B Tubes for chemical transport

### NAFLON™ PFA-HG Tubing
### NAFLON™ PFA-NE Tubing

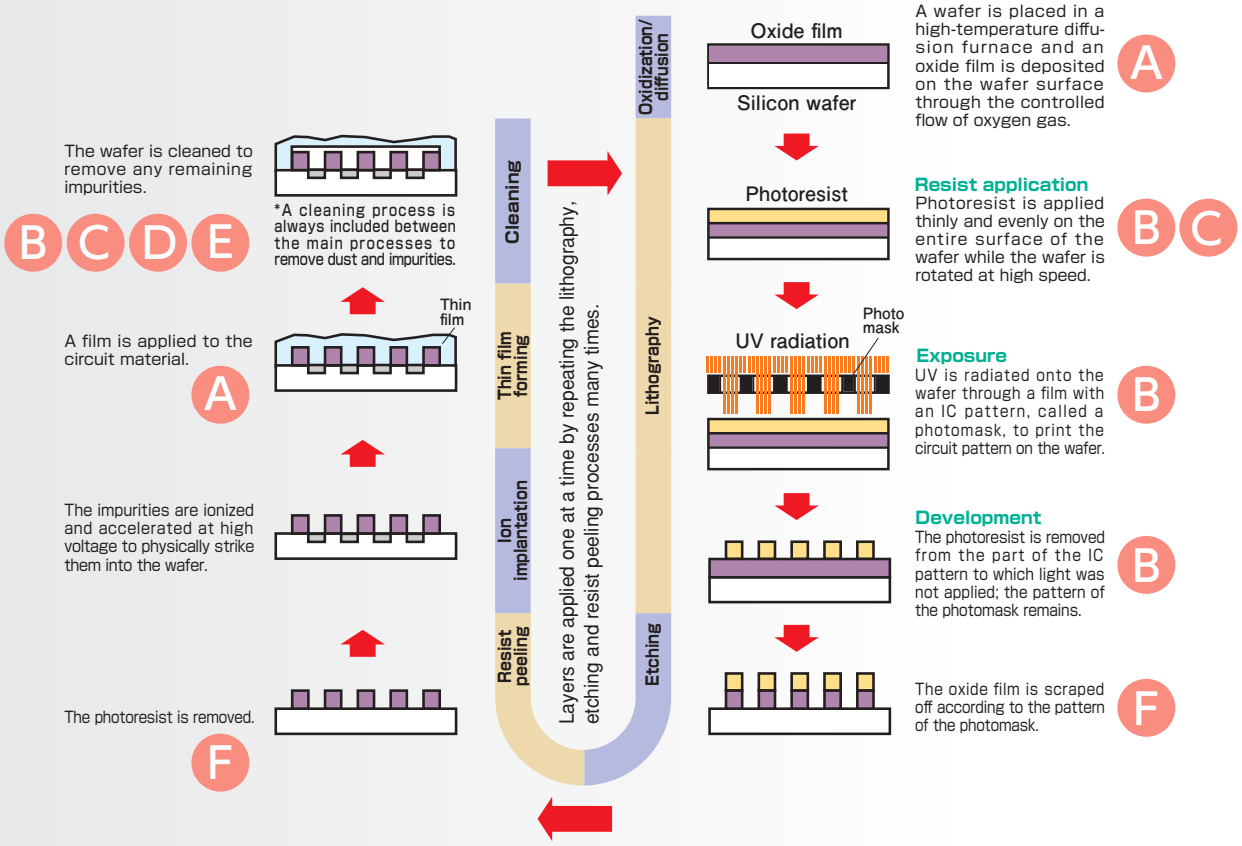
PFA-HG tubes have excellent chemical and heat resistance. They also feature a high level of cleanliness due to the minimal generation of eluted ions, as well as a smooth inner surface that prevents buildup of chemical residues. PFA-NE tubes are HG tubes with the addition of a striped conductive layer around the circumference, providing antistatic properties on the tube outer surface.

## C Perfluoroelastomer

### Rubber O-ring Perfluoro PFK

Rubber O-rings for wet processes, used for semiconductor and FPD cleaning equipment, coaters and developers (coating, development equipment), wet etching systems, filters, and other applications. With high chemical resistance and low metal elution to chemical liquids, these O-rings are commonly used as sealing materials in chemical liquid lines.

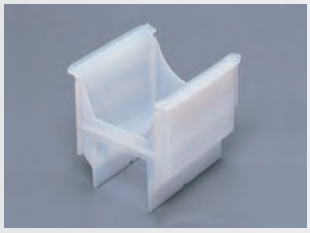
## 6 Semiconductor Production Process




## D Jig for wafer cleaning

### NAFLON™ PFA Wafer Carrier

Carrier for wafer treatment and transportation in cleaning equipment for semiconductor production.



## E Fluoropolymer chemical tank

### NAFLON™ PTFE Sink

Chemical solution tank used for cleaning wafers in cleaning equipment for semiconductor and FPD production. Since the tank is made with PTFE, it is perfect for storing high-purity chemicals and waste liquids.

## F Perfluoroelastomer

### Rubber O-ring Perfluoro PFW

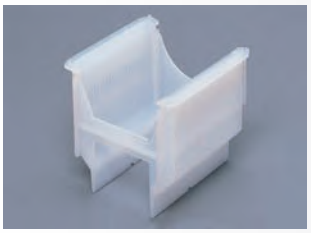
Rubber O-rings for dry processes, used for plasma etching systems and plasma CVD systems in semiconductor and FPD production. With excellent plasma resistance, these O-rings are used as sealing materials in plasma treatment equipment.

### B Fluoropolymer tubing
## NAFLON™ PFA-HG Tubing

These tubes are used to transport high-purity chemicals and gases in various production systems and equipment in semiconductor and FPD production facilities. The tubes feed the chemicals from the tank to the point of use.

### C Jig for wafer cleaning
## NAFLON™ PFA Wafer Carrier

Carrier for wafer treatment and transportation in cleaning equipment for semiconductor production.



### D Fluoropolymer chemical tank
## NAFLON™ PTFE Sink

A chemical solution tank for cleaning wafers in semiconductor and FPD production.
Since it is made with PTFE, the tank is perfect for storing high-purity chemicals and waste liquids.

### E Perfluoroelastomer
## Rubber O-ring Perfluoro PF

Rubber O-rings for wet processes, used in cleaning equipment, coaters and developers (coating, development equipment), wet etching systems, filters, and other applications. With high chemical resistance and low metal elution to chemical liquids, these O-rings are used as sealing materials for chemicals such as acidic, alkaline, and organic solvents.

### A Fluoropolymer chemical tanks
## NAFLON™ Tank Lining

Fluoropolymer-lined tanks for storing chemicals used in semiconductor production. The contact surface inside the tank is covered with fluoropolymer to maintain the purity of the chemical.

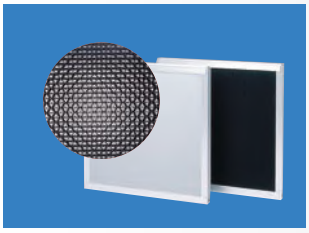



### F Detachable jacket heater for pipe heating and insulation
## ENETHERMO™ PH

Detachable jacket type heater for heating and heat retention of semiconductor production equipment and pipes. It is used to prevent process gas from liquefying or exhaust gas from generating deposits.

### G Chemical filter for low concentration gas removal

Filters to remove minute amounts of chemical contamination in semiconductor production processes. Three types of filters are available for removing ammonia, acidic, and organic gases.



### H Pure water system for airborne molecular contaminant removal
## HONEYCOMB WASHER™

This unit provides both humidification and the removal of water-soluble gases ($SO_x$ and ammonia). It is used for air conditioners for clean environments such as cleanrooms. Pure water is dripped from the top of the oblique honeycomb, creating a film of water on the honeycomb surface. When air passes through the water film, humidification and the removal of airborne chemicals are performed simultaneously.

### I Concentrator for low concentrations of organic solvents
## SOLVENTCLEAN™

This unit concentrates the low concentrations of organic solvents discharged from semiconductor production equipment, TFT-LCD production. By combining SOLVENTCLEAN with the treatment equipment of various systems, air containing VOCs can be cleaned efficiently.

### A Castable refractory
**TOMBO™ Fire-resistant Caster**

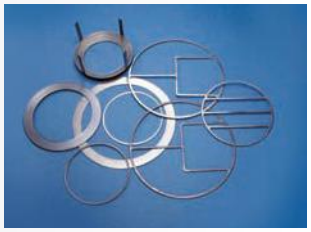
Castable refractory used as fire-proofing material for the outlets of coke ovens and backup material for refractory bricks. As its heat conductivity is low, with less thermal loss, it is also used for the ceilings, walls, and floors of furnaces.

### B Rubber gasket
**Rubber molded products**

Rubber gaskets used for sealing, vibration control, and insulation in blast furnaces and equipment. They are also used for hopper parts that alternately pour constant amounts of coke and iron ore.

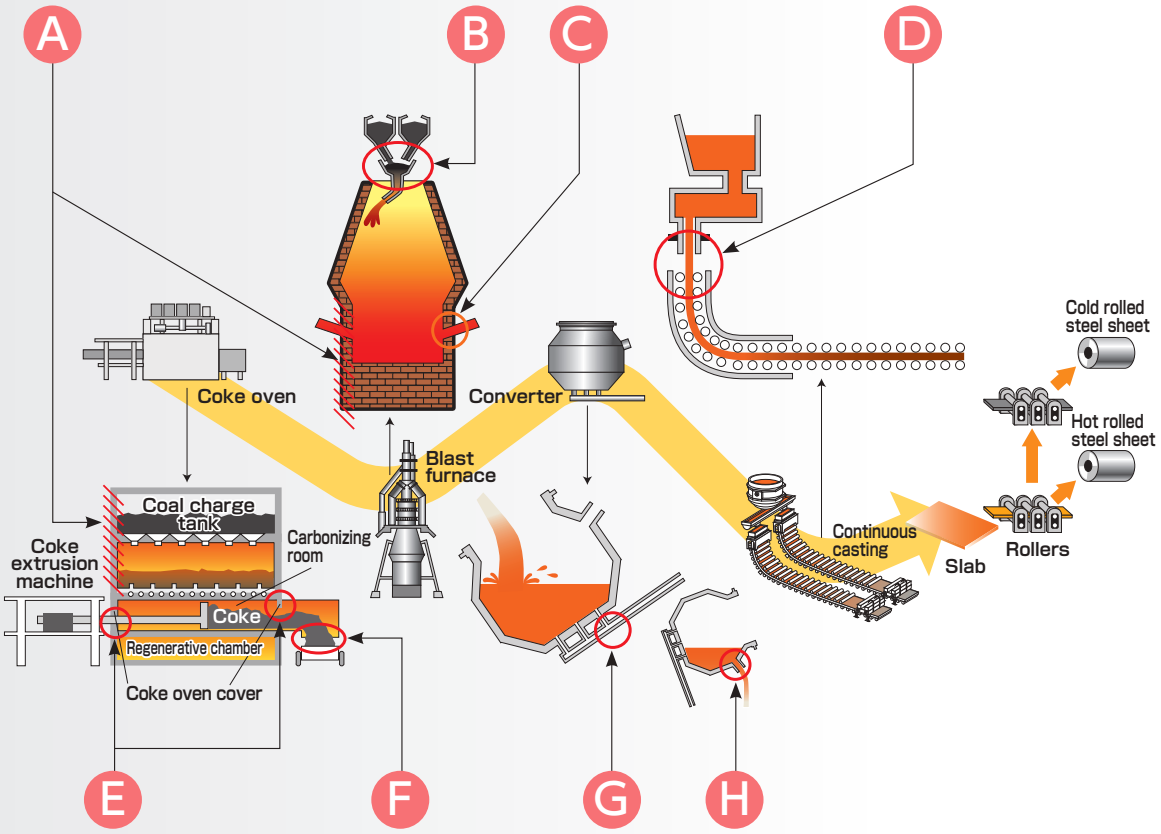
### C Metal jacketed gasket
**NA Metal Jacketed Gasket (1841 Series)**

These gaskets are covered with thin metal jackets and are used for high-temperature flanges, such as in blast furnaces, hot-blast stove, and heat exchangers, to prevent hot air from leaking to the outside.



### D Ceramic fiber heat insulation material
**FINEFLEX™ Blanket**

Ceramic fiber heat insulation material used on the ceilings and furnace walls of kilns. The blanket protects peripheral fire-resistant materials and seals heat inside the furnace.




### E High-temperature packing
**NA Square Braided Packing**

Square packing made of braided ceramic fiber used for the doors, walls, and covers of furnaces. It is also used as the door frame packing on coke ovens since it has excellent heat resistance.

### F Silica cloth
**SILTEX™ Cloth**

Silica cloth is used as a curtain for heat insulation and fire prevention. It is suitable heat insulation material in high-temperature areas where glass cloth cannot be used.

### G Spiral gasket
**NAFLON™ VORTEX™ Gasket (9090 Series)**

A spiral gasket used for the piping that blows oxygen onto pig iron in a converter. Since it has excellent chemical resistance (PTFE) and corrosion resistance (metal materials), it is ideal for use in corrosive fluid lines and oxygen lines, as well as in areas where air tightness is required.

### H Ceramic fiber molded products
**FINFLEX™ Molded Shapes**

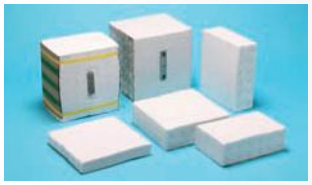
Alumina-silicate fiber heat insulation materials used to line furnaces and as heat insulation materials for various types of equipment. These products can be molded into various shapes, and hardness and density can be adjusted as well. They are used as heat insulation materials in special shapes for molten aluminum outlet ports, plug covers, etc.

### A Castable refractory
## TOMBO™ Fire-resistant Caster

Castable refractory used as fire-proofing material for the outlets of coke ovens and backup material for refractory bricks. As its heat conductivity is low, with less thermal loss, it is also used for the ceilings, walls, and floors of furnaces.

### B Ceramic fiber heat insulation materials
## FINEBLOCK™

Heat insulation material used to line existing furnace walls. Ceramic fiber blankets are cut to a specified width, and bonded, laminated, and joined with a special bracket. It is easy to install on the ceiling and walls of a furnace and has excellent stability at high temperatures; thus it is used for steel heating furnaces and heat treating furnaces.

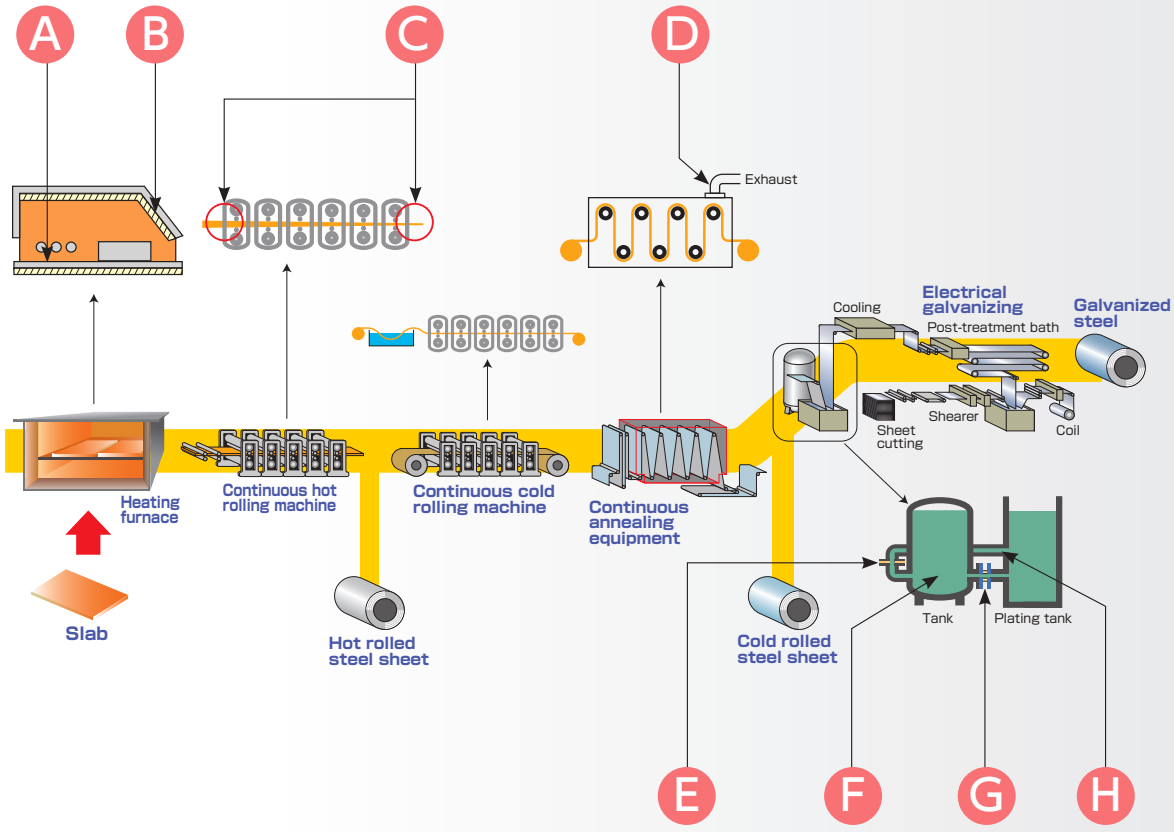


### C Silica cloth
## SILTEX™ Cloth

Silica cloth is used as a curtain for heat insulation and fire prevention. Suitable as heat insulation material in high-temperature areas where glass cloth cannot be used.

### D Cloth Gasket
## Manhole Gasket

These cloth gaskets are used for manholes and large-diameter flanges for low-pressure steam, exhaust gas, hot blasts, etc. They are suitable for large-diameter distorted flanges to which high seating stress cannot be applied, and are also suitable for use in high-temperature, low-pressure conditions, such as for sealing the exhaust gas port of a furnace.




### E Rubber gasket
## EBILON™ Gasket (PTFE Jacketed)

A rubber molded gasket jacketed with PTFE film, used for points with less tightening force such as PVC piping and glass lining piping. The use of PTFE makes this suitable pipe sealing material for tanks including plating tanks.

### F Fluoropolymer sheet lining
## PFA Adhesion Lining Tank

Lining material used for large-diameter tanks, reactor tanks, towers, etc., because of its excellent resistance to heat and chemicals. Suitable as lining material for tanks that store or treat plating solution and acid.

### G Fluoropolymer universal expansion joint
## NAFLON™ Bellows

A fluoropolymer universal expansion joint used to absorb expansion and contraction, caused by temperature difference or aging in the piping of various industrial devices. Since it has excellent chemical resistance, heat resistance and purity, it is used as a bellows joint on piping exposed to corrosive fluids such as plating solution or acid.

### H Fluoropolymer hose
## NAFLON™ PTFE Pliable Hose

A fluoropolymer hose used to transport high-temperature and high-pressure gas, steam, oil, etc. High chemical resistance, heat resistance and purity make this product ideal for use as a hose to transport corrosive fluids such as plating solution or acid.

10

Aluminum Production Process

## A Cloth gasket
### Manhole Gasket

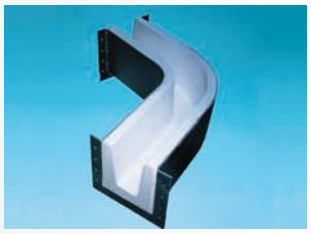
These gaskets are made of cloth to which a rubber compound is applied, woven into a manhole shape and then embossed. They are used to seal distorted flanges and furnace cover flanges to which high seating stress cannot be applied. Type selection is made according to temperature, shape of sealed parts, required strength, etc.

## B Wear-resistant, high-density castable
### TOMCAST™

This product provides higher density than ordinary castables. Because it is highly resistant to wear and allows high-density molding to provide high resistance to corrosion by molten metal or slag, it is used for the inner lining of a melting furnace, the bottom of a ladle, and the surfaces of a gutter on which molten metal flows.

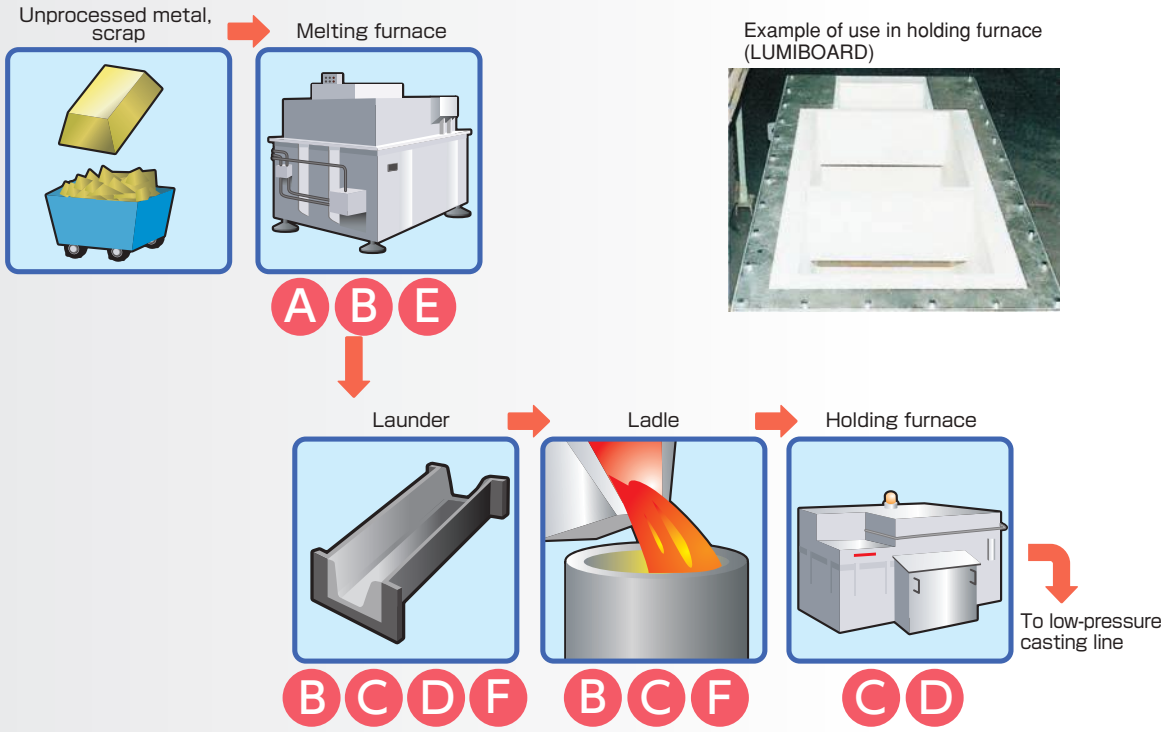

## C Molded shapes for molten aluminum vessel
### LUMISUL™-LD

One-piece parts molded and sintered to various shapes for use as the inner lining of molten metal vessels that come into direct contact with molten aluminum alloys. Due to excellent non-wettability and corrosion resistance, as well as ease of removal of adhered metal, they are used for launders, bath units for holding furnaces, transfer pipes, etc.



## D Board type heat insulation materials for transfer, casting and holding
### LUMIBOARD™

Zonolite-based calcium silicate boards with excellent heat resistance. Because of their low heat conductivity and superior workability, these boards are formed into launders, floats and other parts that come into direct contact with molten aluminum alloys.




## E Packing for high temperatures
### NA Square Braided Packing BH, WH

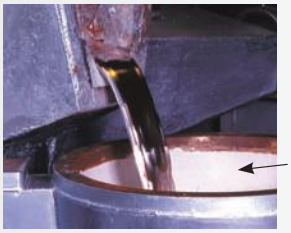
Both types of packing are made of high-density braid ceramic fiber reinforced with metal wires. Type BH is impregnated with a graphite-based material; type WH with a titanium-based material. The packing is used in furnace covers to seal the furnace. Type selection is made according to temperature, shape of sealed parts, etc.

NA Square Braided Packing BH

NA Square Braided Packing WH

## F Ceramic fiber based fibrous castable
### LUMICAST™

Fibrous unshaped refractory material used for the inner lining of molten metal vessels that come into direct contact with molten aluminum alloys. Due to its excellent non-wettability and corrosion resistance as well as low heat conductivity and high resistance to thermal shock, this material is used for the inner lining of ladles, molten metal vessels and gutters as well as for backup materials.



LUMICAST

## G Ceramic fiber molded products
### FINEFLEX™ Molded Products

These products are made of a mixture of bulk ceramic fiber “FINEFLEX” and a small amount of binder, which is molded into various shapes. The material is used as auxiliary material for molten aluminum vessels.

## H Calcium silicate thermal insulation material
### KEICAL ACE SUPER SILICA™

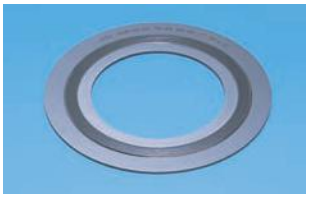
Super lightweight heat insulation material that can withstand temperatures of up to 1000°C. It is used as auxiliary material for molten aluminum vessels.

KEICAL ACE SUPER SILICA is a trademark of NIPPON KEICAL Ltd.

### A Spiral wound gasket for high temperatures

**GRASEAL™ VORTEX™ Gasket**

A spiral gasket with expanded graphite tape filler, used for flanges, valves, and other equipment in high-temperature alkali line piping.



### C PTFE sheet gasket with filler

**CLINSIL™-Clean**

Fluoropolymer gaskets are suitable for various corrosive fluids and organic solvents. They can be used in applications with almost all chemicals, including for sealing strong bleaching acid.

### D Anti-corrosion use packing

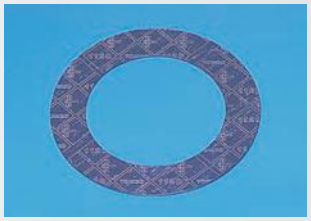
**NAFLON™ Fiber Packing-T**

Packing for rotary equipment, used for the rotating shafts of various pumps and agitators. Since it is made of fluoropolymer and comes in white, it can be used for almost all chemicals and is suitable for sealing strong bleaching acid.

### E Joint sheets for high temperatures

**CLINSIL™-Top**

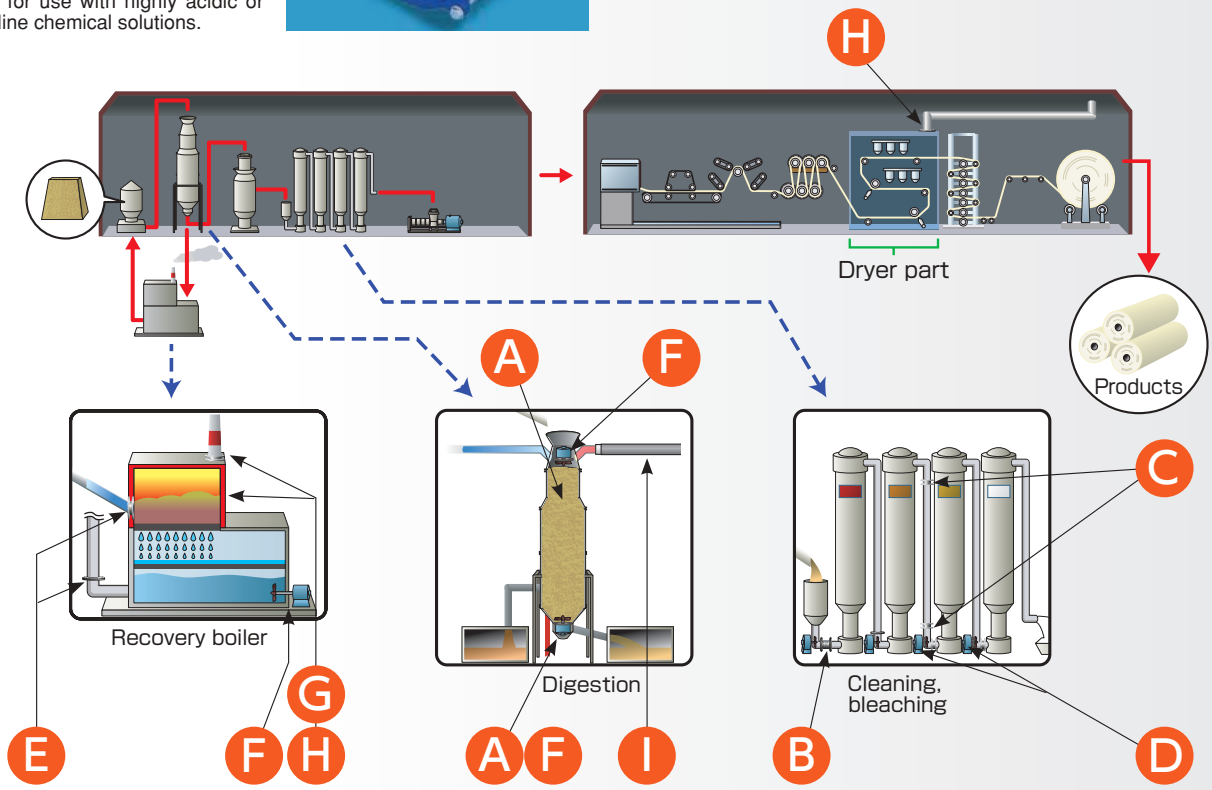
Black sheet gasket used for various piping flanges, valves, and other equipment. With its excellent acid and alkali resistance, it can also be used for flanges in alkali line piping (up to 100°C) from boilers.



### B Fluoropolymer universal expansion joint

**NAFLON™ Bellows**

Fluoropolymer universal expansion joint used to absorb thermal expansion and contraction of piping. Excellent chemical and heat resistance make this product suitable for use with highly acidic or alkaline chemical solutions.




### F Anti-corrosion use packing

**NAFLON™ Carbon Fiber Packing**

This is packing for rotary equipment, used for the rotating shafts of various pumps and agitators. Suitable for sealing pumps and agitator shafts in black, green and white liquid lines.

### G Castable refractory

**CR-130, CR-140 Series**

Castable refractory to protect steel sheets and refractory bricks inside boilers from acidic gas and heat. It has excellent high-temperature and fire resistance, is easily worked by spraying and troweling, and can be used for furnace walls of various shapes.

### H Cloth gasket

**Manhole Gasket**

This gasket is used at points where a certain amount of leakage is permitted, such as low-pressure steam and exhaust gas blasts. It is suitable for applications in high-temperature, low-pressure conditions including ducts for hot air and exhaust, large-diameter flanges and other areas to which high seating pressure cannot be applied.

### I Degraded insulation resuscitation method

**é-AIM™ (eco-Advanced Insulation Method)**

A method of restoring thermal insulation performance by winding insulation material over the degraded insulation material without removing it.

### A Graphite Gasket
**GRASEAL™ Gasket (MI-A)**

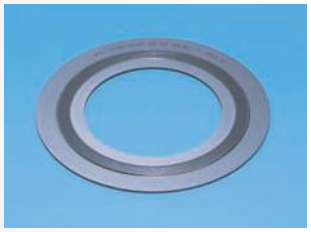
This is an expanded graphite gasket used in various industries for piping flanges, heat exchangers, valve bonnets, etc. With excellent heat and chemical resistance, it is suitable for high-temperature and low-pressure conditions such as for refined plastics materials.

### B Calcium silicate thermal insulation material
**KEICAL ACE SUPER SILICA™**

Calcium silicate heat insulation material used for various types of piping and ducts. Since it is easy to install, and has high mechanical strength and water resistance, it is used as heat insulation material at high temperatures, up to a high heat resistance of 1000°C.

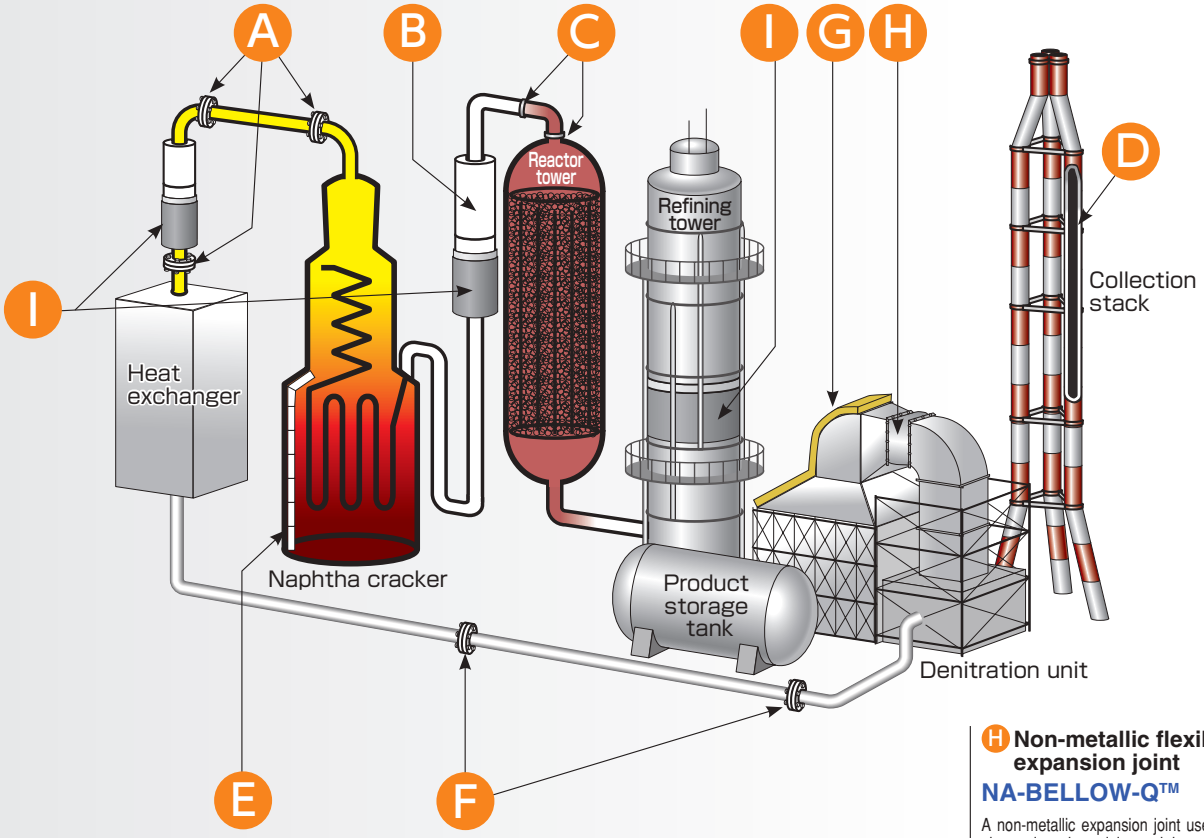
### C Spiral wound gasket
**GRASEAL™ VORTEX™ Gasket**

A spiral gasket with expanded graphite tape filler, used for flanges, valves, and other equipment in various types of piping. Suitable for use with high-temperature, high-pressure steam and naphtha, and low-temperature fluids such as liquefied ethylene.



### D Castable refractory for stack lining
**TOMSTACK™ SG50**

Castable refractory made of magnetic material, used for the inside of stacks and ducts. The material has high resistance to acid and water and protects steel stacks from acidic gas and heat.




### H Non-metallic flexible expansion joint
**NA-BELLOW-Q™**

A non-metallic expansion joint used in smoke airways in various piping and duct systems. This product absorbs the expansion and contraction movements of such as large-diameter duct piping due to thermal expansion or vibration.

### E Ceramic fiber heat insulation material
**FINEBLOCK™**

Heat insulation material used to line existing furnace walls. Ceramic fiber blankets are cut to a specified width, and bonded, laminated, and joined with a special bracket. It is easy to install on the ceiling and walls of a furnace and has excellent stability at high temperatures; thus it is used for steel heating furnaces and heat treating furnaces.

### F PTFE sheet gasket with filler
**CLINSIL™-Clean**

A fluoropolymer gasket used for petroleum, petrochemical products, organic solvents, hot oil, heat media gas, steam, etc. It is highly resistant to chemicals and can be used in both acidic and alkaline environments.

### G Rockwool heat insulation material
**MG WIRED BLANKET™**

Rockwool heat insulation material used for equipment and tanks in various industries and in the ducts of air conditioning systems. Thanks to its excellent workability, it can be easily applied to complex areas and curved surfaces.

### I Degraded insulation resuscitation method
**é-AIM (eco-Advanced Insulation Method)**

A method of restoring thermal insulation performance by winding insulation material over the degraded insulation material without removing it.

### A Non-Freon-based rigid urethane foam

**FOAMNERT™ TN Series**

These carbon dioxide urethane foam heat insulation materials are used for the piping and tanks of LNG/LPG terminals, ships, petrochemical plants, etc. They contain absolutely no Freon, but retain almost the same heat insulation and mechanical properties as conventional products; thus they are widely used for membrane type LNG/LPG carriers.
Note: The FOAMNERT Cover TN is a JIS-certified product.

### B Heat insulation material for cryogenic piping

**FOAMNERT™ Support**

Support for LNG/LPG and other cryogenic fluid piping. Since high-density urethane foam is used as the base material, this heat insulation support material for piping provides excellent mechanical strength, heat insulation, and weather resistance for structural members.

### C Lightweight heat insulation concrete for liquid containment dikes

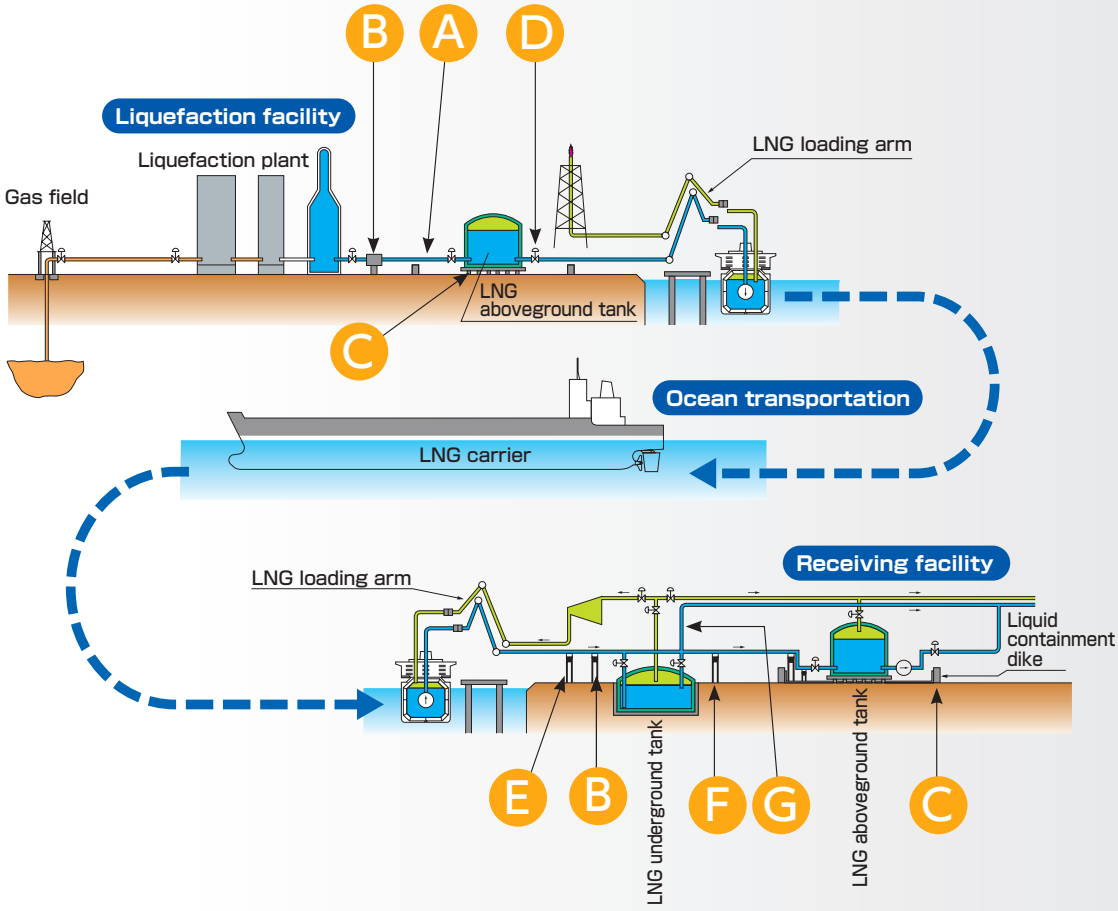
**LIGHTON™**

Lightweight heat insulation concrete for the liquid containment dikes used on LNG/LPG facility.
The insulation concrete is made of foamed obsidian as the principal material and is used as heat insulation material for the bottom part of aboveground tanks and liquid containment dikes.

### D Spiral gasket for low-temperature piping

**GRASEAL™ VORTEX™ Gasket L**

A spiral gasket with expanded graphite filler, used to seal the piping of low-temperature lines for LNG, liquefied air, etc. It is suitable for sealing low-temperature fluids, as in LNG piping.




### E Fire-resistant and cold-resistant covering material

**MANDSEAL™**

This is a fire-resistant and cold-resistant material used for equipment support stands in petroleum processing, petrochemical plants, and power plants, and for exposed pillars and beams of tall steel structures. It is applied by spraying and troweling, and prevents the spread of fire.

### F Fluoropolymer sliding bearing material

**NAFLON™ Sliding Pad**

Fluoropolymer sliding bearing material used in bridge structures, passages connecting buildings, and in piping. It smoothes out the movement of the support material of piping and stands, and facilitates displacement due to expansion and/or contraction.

### G Non-Freon-based rigid urethane foam

**FOAMNERT™ TN Series**

Carbon dioxide urethane foam heat insulation material used for tanks in LNG/LPG terminals, ships, petrochemical plants, etc. The material contains absolutely no Freon, but retains almost the same heat insulation and mechanical properties as conventional products; thus it is widely used on membrane type LNG/LPG carriers.

### ●Cold insulation work

Installing cryogenic insulation material in piping and tanks

### ●Disaster prevention work

Heat insulation of dikes using lightweight heat insulation concrete; covering piping racks, etc., using fire-resistant and cold-resistant covering materials

### A Fluoropolymer pliable hose

## NAFLON™ PTFE Pliable Hose

This product consists of a PTFE pliable hose reinforced with a wire braid around the outer surface. It can withstand high-temperature, high-pressure environments and is used for hoses for transferring materials from a delivery vehicle to a storage tank.

### B Fluoropolymer chemical tank lining

## NAFLON™ Tank Lining

This lining provides excellent heat and chemical resistance. It is also a highly pure material since additives such as plasticizer or thermal stabilizer are not used in the molding process.

### C Packing for use in food equipment

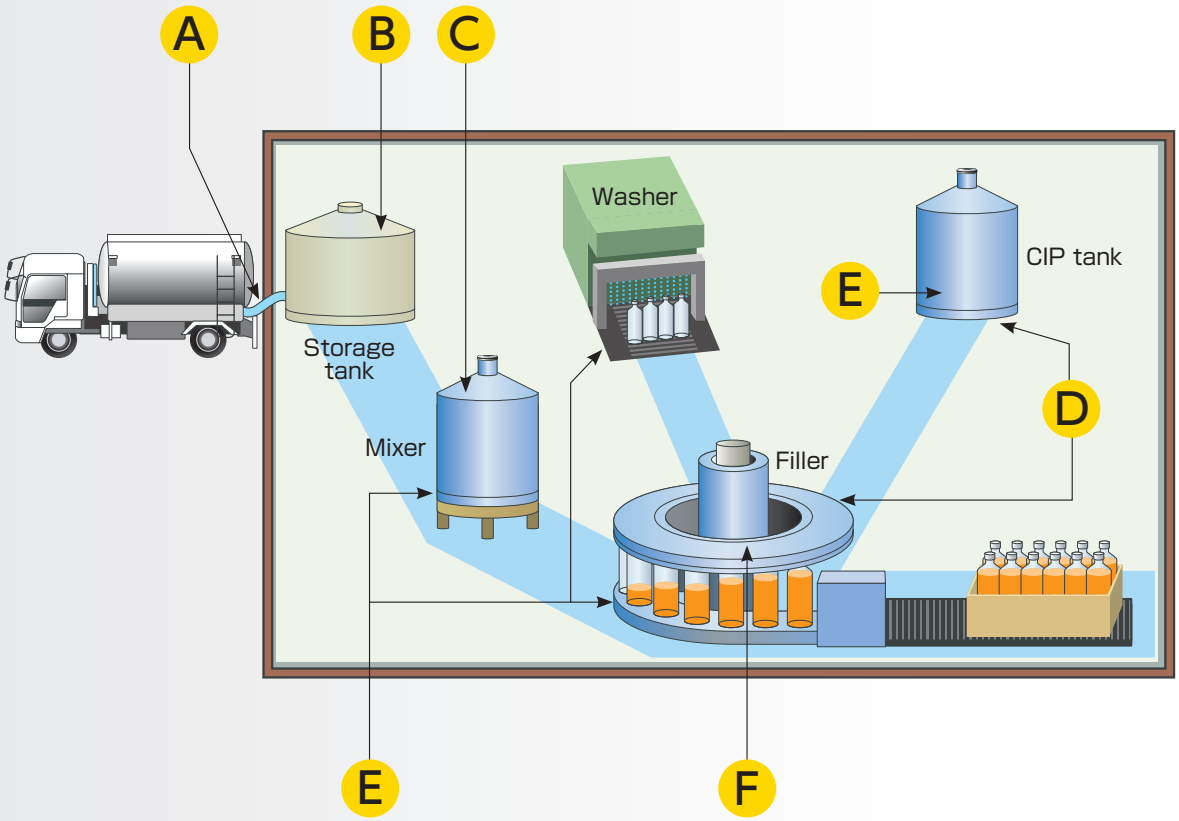
## NAFLON™ Fiber Packing-G

This gland packing consists of PTFE stretch-reinforced fiber braided into a square cross section that is impregnated with PTFE dispersion, and then given a special washing treatment. It conforms to the Japanese Food Sanitation Act, and is used for agitator shafts and pumps in food manufacturing plants.

### D Fluoropolymer hose

## NAFLON™ Straight Hose for Sanitary Applications

The CIP washing system (automatic washing system using acidic or alkaline liquid that allows safe and easy operation without the need for disassembly of production equipment) is used in beverage filling lines. The fluoropolymer hose, which has high resistance to chemicals, is used for the hoses for feeding the washing liquid from the CIP tank.




### E Sanitary Use Gasket

## SANICLEAN™ Gasket

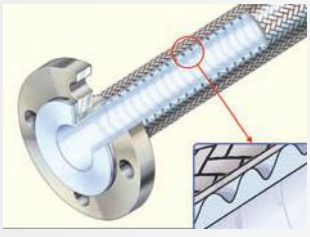
A sanitary-use rubber gasket with the added protection of PTFE film. Since the surfaces that come into contact with liquid are entirely covered with PTFE, the gasket is highly resistant to chemicals and contaminants. Thanks to the anti-flavoring properties, which are stronger than those of rubber, washing time when changing flavors* can be reduced. This gasket is mainly used in product filling lines.

*Changes in produced items in production lines such as product filling lin es that are shared by multiple types of beverage.

### F Pliable hose with smooth inside surface

## NAFLON™ PTFE-SPL Pressure Hose

This hose is made from a NAFLON BT tube with a spiral formed on the outside. Due to its smooth inside surface, stagnation of liquid is minimized. In addition, its small bending radius allows installation in confined spaces.



## Utility lines

**Equipment that provides energy source for machines**

### Reusable flexible heat insulation material

## ENETHERMO™

Mainly made of glass fiber. Due to its excellent waterproofing performance and flexibility, this reusable insulation material can be applied to complex-shaped equipment. The detachable material allows easy maintenance while achieving energy saving in the plant. It is mainly used as insulation material for valves in utility lines.

## Plant interior

### Functional decorative calcium silicate board (antibacterial type)

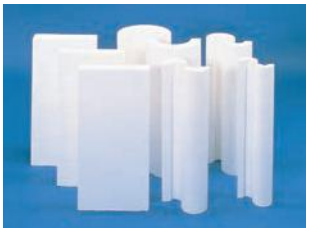
## ASLUX™ 200K

The base material of this nonflammable board is a calcium silicate panel, the surface of which undergoes a special treatment and sanding, and then is coated with antibacterial acrylic urethane resin. Because this is an antibacterial type board, it is used for the inner walls in food plants where antibacterial properties are required.

## A Calcium silicate thermal insulation material

### KEICAL ACE SUPER SILICA™

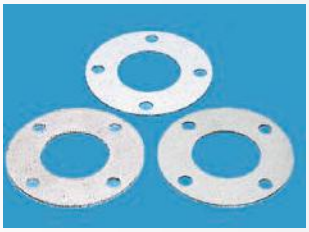
Calcium silicate heat insulation material used for various piping and ducts. Since it is easy to install, and has high mechanical strength and water resistance, it is used as backup material inside the main units of furnaces.



## B Cloth gasket

### Manhole Gasket

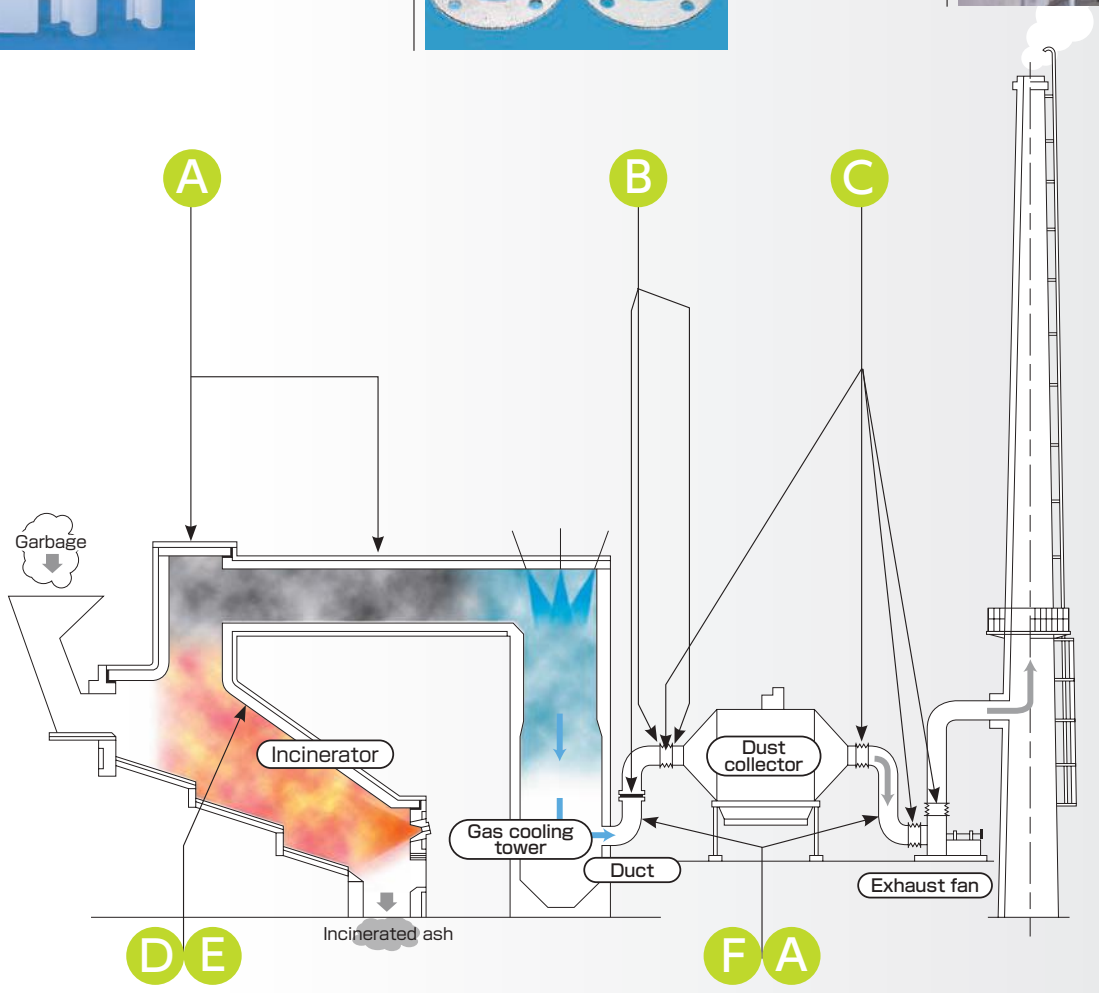
Cloth gaskets used for manholes and large-diameter flanges for low-pressure steam, exhaust gas, hot blasts, etc. They are suitable for large-diameter distorted flanges to which high seating stress cannot be applied, and are also suitable for applications in high-temperature, low-pressure conditions, such as in the exhaust gas port of a furnace.



## C Non-metallic flexible expansion joint

### NA-Bellow-Q™

A non-metallic expansion joint used for smoke airways in various piping and duct systems. This product absorbs the expansion and contraction movement of such as large-diameter duct piping caused by thermal expansion or vibration.






## D Refractory lining work

Refractory lining work on furnaces using unshaped refractory and refractory bricks

## D Thermal insulation work

Installing thermal insulation material to piping and ducts using rockwool heat insulation material and calcium silicate heat insulation material

## E Castable refractory

### TOMBO™ Fire-resistant Caster

Castable refractory lining used as backup material for refractory bricks and fire-resistant material for the outlet of coke ovens. Heat conductivity is low, with less thermal loss; thus this material is used for the ceilings, walls, and floors of furnaces.

## F Rockwool insulation material

### MG BOARD™

Rockwool heat insulation material used for thermal insulation and noise reduction in ducts and as a backup for ceramic fiber furnace materials. It is also used for acoustic insulation and heat insulation of boilers, ducts, dust collectors, etc.

### A Heat insulation material for nuclear power plants

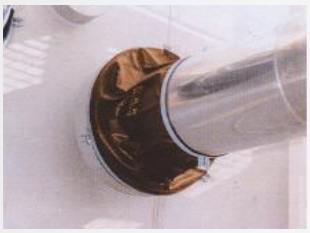
**Metallic Heat Insulation**

Metallic hot insulation material used for the pressure container of nuclear reactors, in recirculation equipment, and every kind of equipment and piping. There is no risk of corrosion since it is made of thin stainless steel sheet. The mechanical strength is excellent and it can be attached and detached quickly and easily, to reduce exposure when working.

### B Building penetration part sealing material

**NU BELLOW-Q™ RNU-1015, RNU1025**

A flexible expansion joint made of special rubber material, used to seal the clearance between the pipes penetrating buildings, walls and floors, and the pipe holes in a nuclear power plant. This joint has excellent nuclear radiation resistance, heat resistance, and flexibility, and is used as sealing material against radiation contaminated air, steam generated in an accident, smoke and water generated in a fire, etc.



### C Calcium silicate heat insulation material

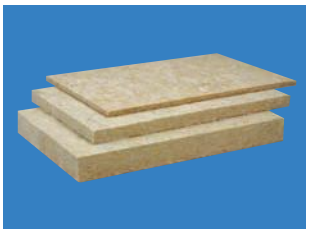
**NU KEICAL ACE SUPER SILICA™**

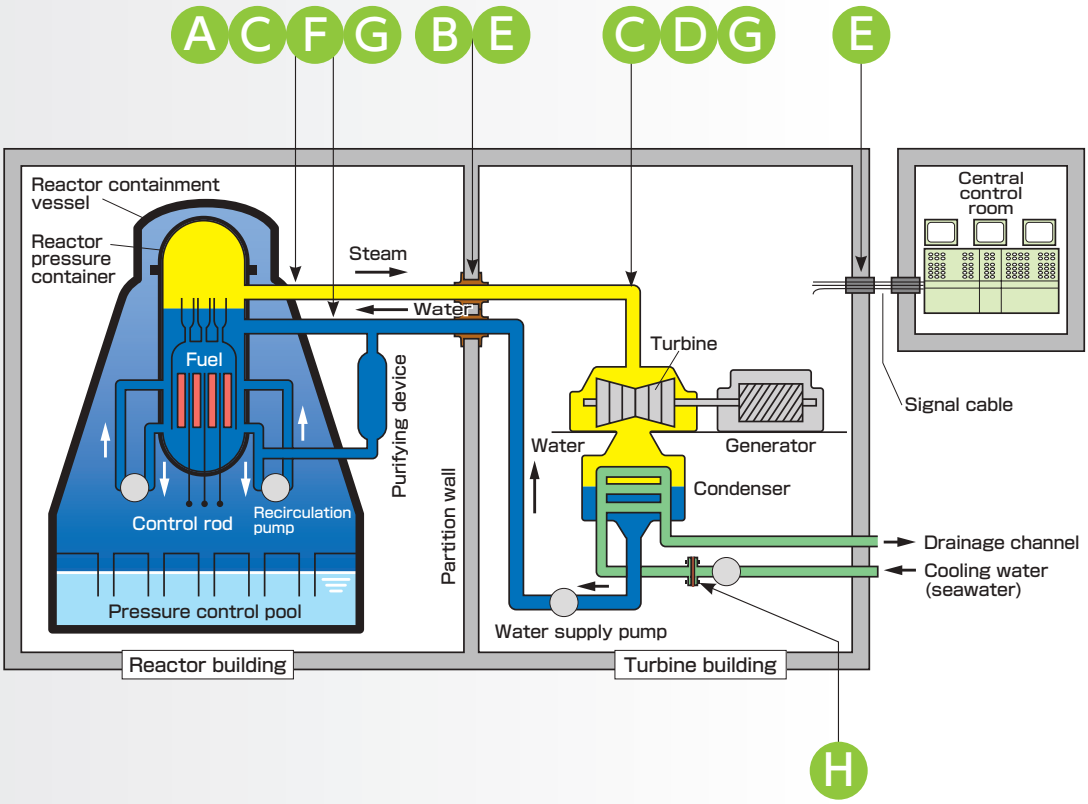
Calcium silicate heat insulation material used for various piping and duct systems. Since it is easy to install, and has high mechanical strength and water resistance, it is used as heat insulation material at high temperatures, up to a high heat resistance of 1000°C.

### D Rockwool insulation material

**NU MG FELT™**

Rockwool insulation material used for piping and equipment. It is made by melting and fiberizing a mixture of slag and highly heat-resistant ore composed mostly of limestone and silicic acid, adding binder to it, and then forming it into a felt-like material.

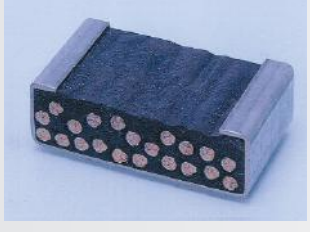





### E Wall penetration part sealing material

**PENESEAL™ CT-18**

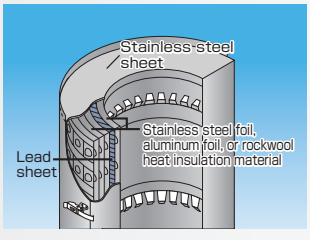
Sealing material used on walls and floors through which piping and cabling pass. It has excellent air tightness, water tightness and radiation resistance.



### F Heat insulation material for nuclear power plant equipment

**Metallic Heat Insulation with Lead**

Used as heat insulation material for applications requiring radiation shielding performance as in equipment and piping inside the reactor containment vessel. Lead sheets are combined with the metal heat insulation material.




### G Reusable flexible heat insulation material

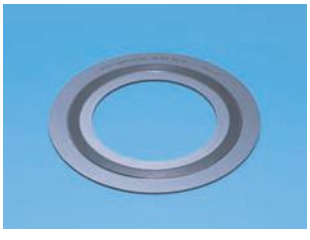
**NU ENETHERMO™ K**

Reusable heat insulation material for the insulation of piping, valves, flanges, etc. It is suitable for areas where the insulation material must be removed during plant inspection. A waterproof type is also available for outdoor use.

### H Spiral wound gasket

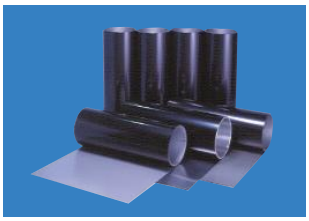
**NU GRASEAL™ VORTEX™ Gasket**

A spiral gasket with expanded graphite tape filler, used for pressure vessels, heat exchangers, valves, and other equipment in a nuclear power plant. Suitable for the high-temperature and high-pressure conditions of the nuclear power plant; the amount of soluble chlorine, fluorine and sulfur is controlled to meet the requirements for use in nuclear power plants.



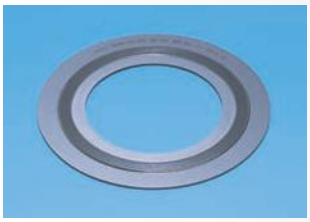
## A High damping sheet
### METALAMINE™

A pipe acoustic insulation exterior sheet used on the smoke paths, airways, electric dust collectors, etc. of a thermal power plant. It has excellent acoustic insulation effects due to its multi-layer structure of metal and rubber. It is easy to work with and durable as an exterior sheet for piping, reducing the noise and vibration generated by smoke paths and airways.



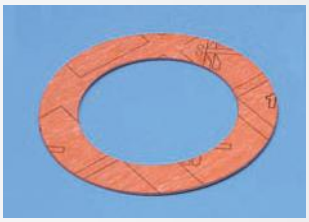
## B Spiral wound gasket
### GRASEAL™ VORTEX™ Gasket

A spiral gasket with expanded graphite tape filler, used for piping flanges, valves and other equipment in a thermal power plant. This gasket is suitable for high-temperature, high-pressure steam or fluid such as heavy oil or naphtha as well as for low-temperature fluid such as LNG.



## C General-purpose joint sheet
### CLINSIL™-Brown

Non-asbestos joint sheet used as sealing material for piping flanges, valves and equipment. It is used for gaskets to prevent leakage of low-temperature, low-pressure water, oil, other fluids, and air.

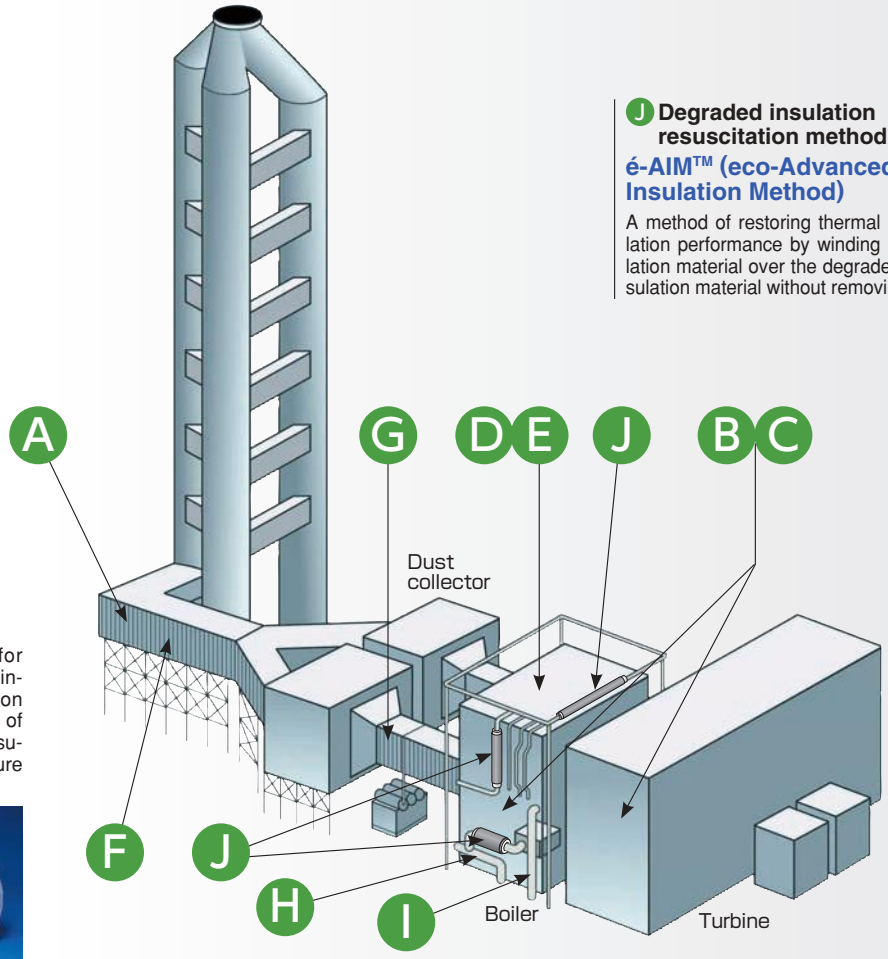


## D Castable refractory
### TOMBO™ Fire-resistant Caster

This castable refractory lining is used as backup material for refractory bricks and fire-resistant material for the outlets of coke ovens. Its heat conductivity is low, with less thermal loss, thus it is used for the walls, ceilings, and floors of furnaces.

## J Degraded insulation resuscitation method
### é-AIM™ (eco-Advanced Insulation Method)

A method of restoring thermal insulation performance by winding insulation material over the degraded insulation material without removing it.




## E Ceramic fiber
### FINEFLEX™ Blanket

Ceramic fiber material used for general high-temperature heat insulation and as a heat insulation material on the ceiling and walls of kilns. It is also used as heat insulation material on high-temperature exhaust ducts.

## F Rockwool insulation material
### MG BOARD™

Rockwool heat insulation material is used for thermal insulation, noise reduction in ducts, and as backup material for ceramic fiber furnaces. It is also used for acoustic insulation and heat insulation of boilers, ducts, dust collectors, etc.

## G Non-metallic flexible expansion joint
### NA-BELLOW-Q™

A non-metallic expansion joint used for smoke airways in various piping and duct systems. This product absorbs the expansion and contraction movement of such as large-diameter duct piping caused by thermal expansion or vibration.

## H Calcium silicate thermal insulation material
### KEICAL ACE SUPER SILICA™

Calcium silicate heat insulation material used for various piping and ducts. Since it is easy to install, and has high mechanical strength and water resistance, it is used as heat insulation material at high temperatures, up to a high heat resistance of 1000°C.

## I Reusable flexible heat insulation material
### ENETHERMO™

Reusable heat insulation material with excellent heat insulating properties, used for valves, flanges, turbines, pumps, boilers, etc. A waterproof type is also available for outdoor use.

### A Stack lining material
**CAPOSTACK™ Super**

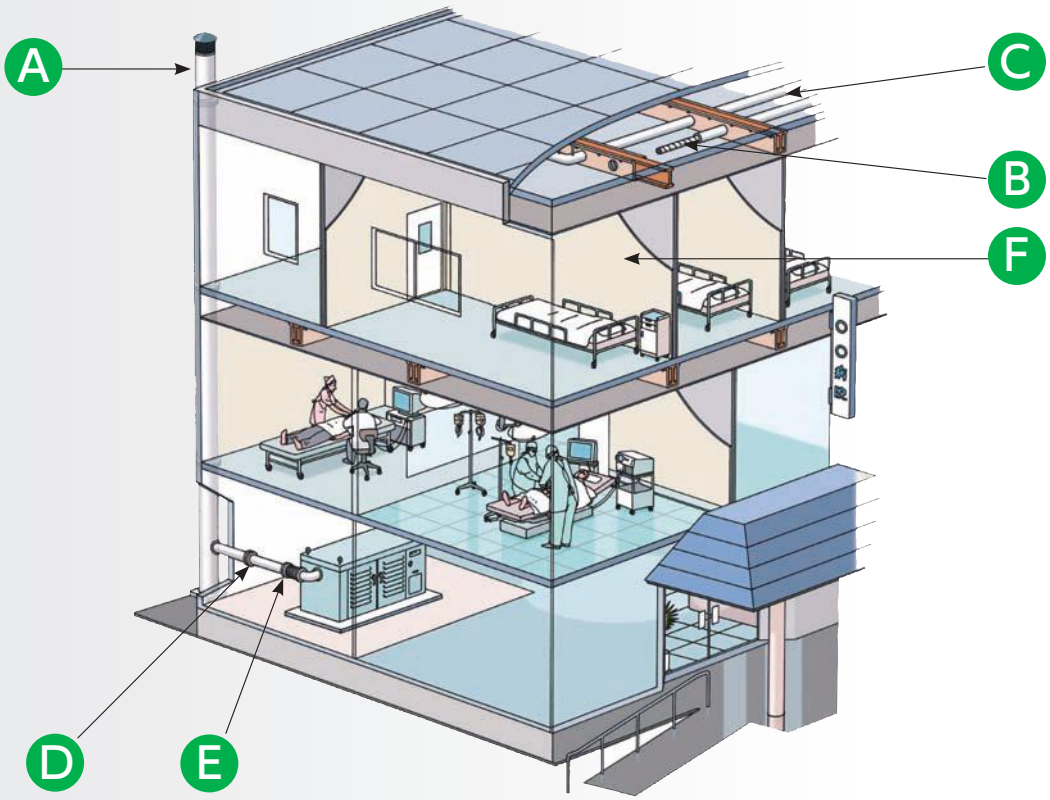
Chimney lining material used for general boilers, private power generators and general buildings. This material has excellent resistance to heat and abrasion, and the inner surface that comes into contact with the exhaust gas is very dense and strong; thus it is suitable for exhaust from water or heating boilers and engines for private power generators.

### B Heat insulation material for piping
**MG MIGHTY COVER™**

Rockwool heat insulation material used for heat retention and thermal insulation in various facilities, for piping and in compartment-penetrating parts of buildings. Installation is easy with a split and snap-on method.

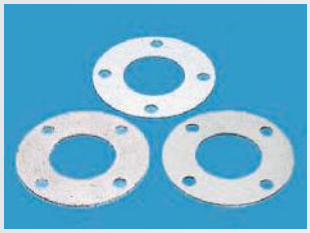
### C Wrap-type fireproofing materials
**MAKIBEE™**

Wrap-type fireproofing material made of heat-resistant rockwool to cover beams and columns of steel structure buildings. Advantages include environmental friendliness, reliable quality, and easy installation.




### D Cloth gasket
**Manhole Gasket**

Cloth gaskets used for manholes and large-diameter flanges for low-pressure steam, exhaust gas, hot blasts, etc. They are suitable for large-diameter distorted flanges to which high seating stress cannot be applied, and are also suitable for applications in high-temperature, low-pressure conditions, such as exhaust from private power generators and boilers.



### E Non-metallic flexible expansion joint
**NA-Bellow-Q™**

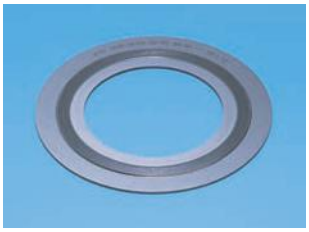
This is a non-metallic expansion joint used for smoke airways in piping and duct systems. This product absorbs the expansion and contraction movements of such as large-diameter duct piping caused by thermal expansion or vibration.

### F Decorated calcium silicate boards
**ASLUX™ Series**

Decorative boards made of calcium silicate panels, used as interior materials in office buildings, plants, medical and welfare facilities, cleanrooms, apartment buildings, etc. They have excellent water resistance, chemical resistance, and dimensional stability, and are suitable for the walls and ceilings of hospitals, cleanrooms, etc.

### A Spiral wound gasket
**GRASEAL™ VORTEX™ Gasket**

A spiral gasket with expanded graphite tape filler, used for flanges, piping, and other equipment in buildings. This gasket provides excellent sealing performance for a long period of time under severe conditions such as high temperature and high pressure.

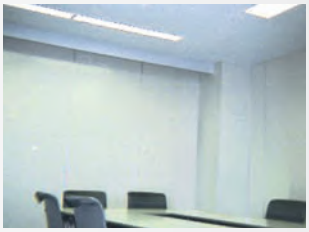


### B Wrap-type fireproofing materials
**MAKIBEE™**

Wrap-type fireproofing materials made of rockwool to cover beams and columns of steel structure buildings. Advantages include environmental friendliness, reliable quality, and easy installation.

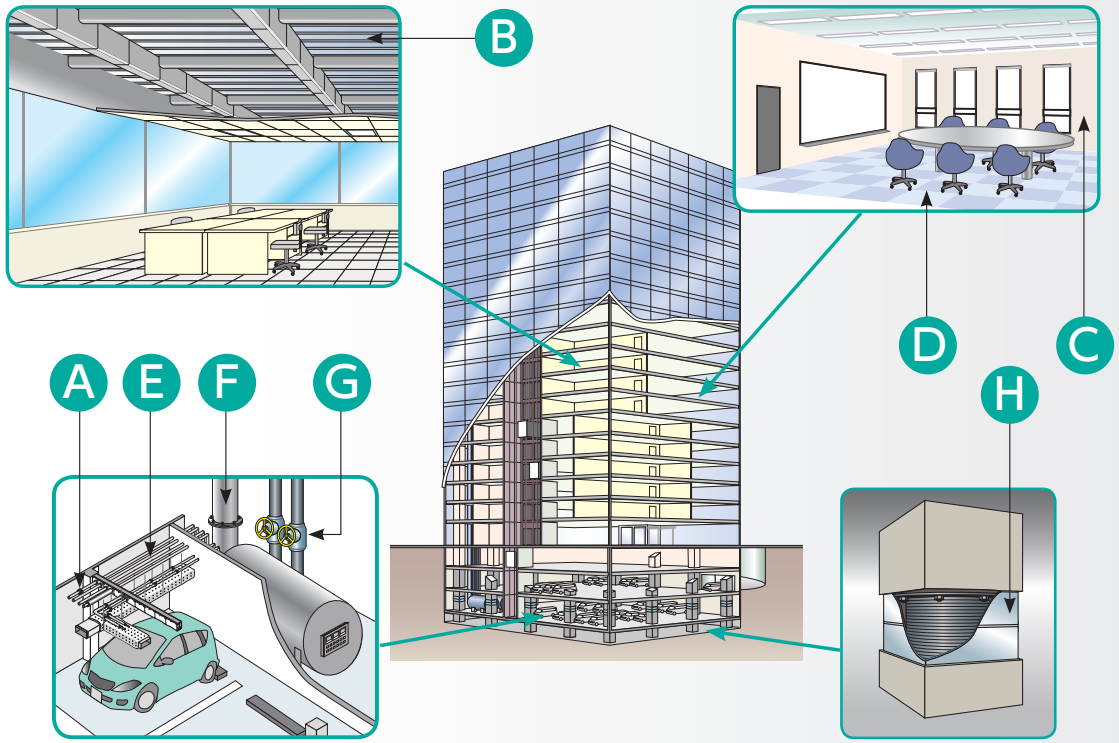
### C Decorated calcium silicate boards
**ASLUX™ series**

Interior decorative boards made of calcium silicate panels, used for walls of offices, meeting rooms, hallways, etc. and interiors of water facilities such as toilets and hot-water service rooms. These products have excellent incombustibility, water resistance, staining resistance, dimensional stability, etc.



### D Raised Access Floor
**NICHIAS™ OMEGA FLOOR™**

Raised access floor for the two-layer floor structure employed in offices in intelligent buildings. High-strength concrete panels using a unique reinforcing bar structure and laths provide excellent walking comfort and durability.




### E Rockwool heat insulation material
**MG MIGHTY COVER™**

Rockwool heat insulation material is formed into cylinders and used for heat retention and thermal insulation of piping in various building facilities and compartment-penetrating parts of buildings. The material is lightweight, has excellent heat insulation and workability and delivers superior heat resistance and fireproofing performances.

### F Stack lining material
**CAPOSTACK™ Super**

Lining material for round stacks, made of an inner lining layer and a heat insulation layer, used for exhaust stacks of private power generators and hot water and heating boilers. This is a product with excellent durability and heat resistance.

### G Reusable flexible heat insulation material
**ENETHERMO™**

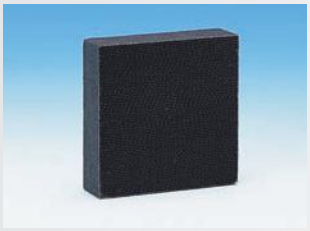
Reusable and flexible heat insulation material made of glass fiber and used for thermal insulation of piping valves, flanges, and equipment such as pumps and boilers. It can be used repeatedly without the need for attachment or disassembly.

### H Seismic isolation device fireproof covering material
**MENSIN GUARD™-S**

Fireproof covering material used to protect the multi-layer rubber part of the seismic isolation device that reduces shaking of buildings during an earthquake. The fireproofing panel is divided into two layers, to follow the deformation of the multi-layer rubber. This product also has excellent shock resistance.

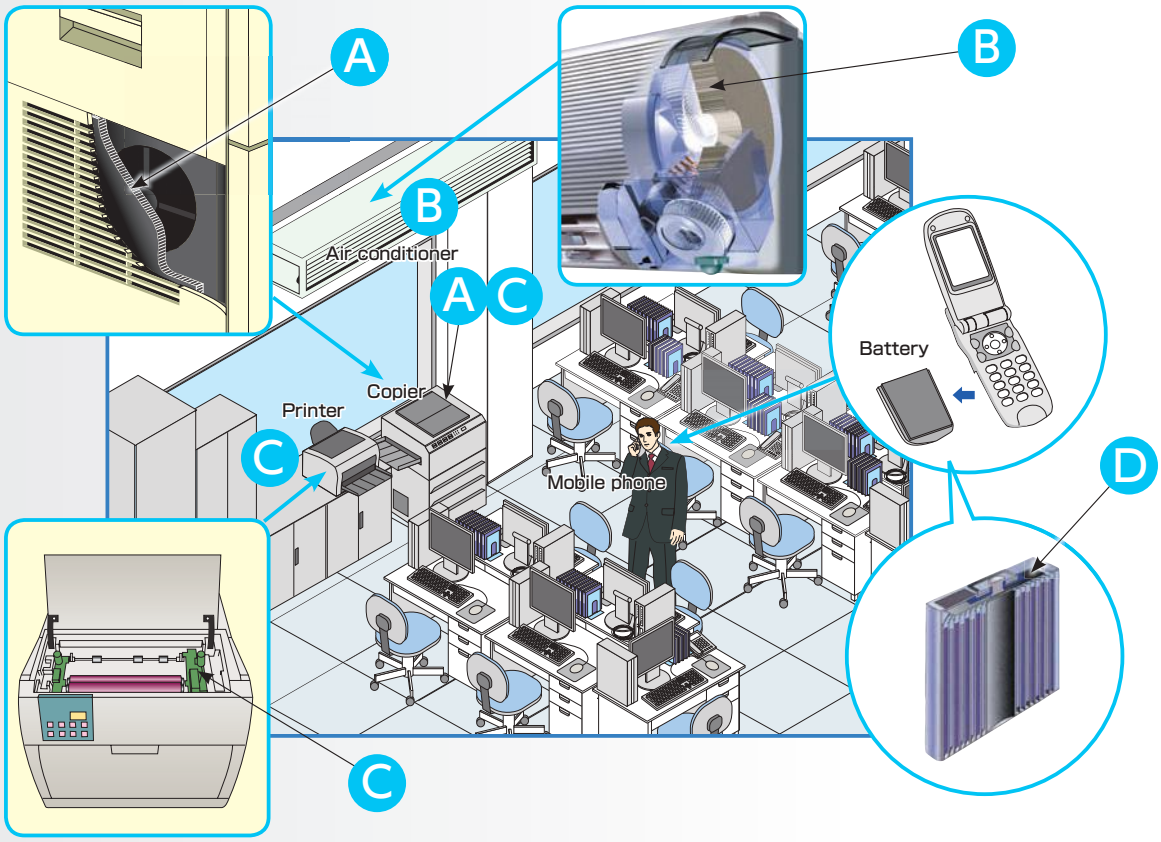
### A Ozone removal filter
**HONEYCLE™-ZV, ZA**

A catalyst type ozone removal filter used for equipment that generates ozone such as copiers and printers, air purification systems, etc. This filter has an ozone decomposing catalyst in a honeycomb carrier and is suitable for areas in which ozone or volatile organic compound is generated, for example where copiers are placed.



### B Chip seal
**EXCELIDE™**

Sealing material used for air conditioners. Air conditioners compress and liquefy chlorofluorocarbon as a cooling medium and remove heat and lower the temperature by vaporizing it. This material seals in the chlorofluorocarbon.




### C No-lubrication bearing
**EXCELIDE™**

Sliding fluoropolymer materials used for compressors in air conditioners, various pumps, and valve bearings. Since these materials have excellent heat resistance, self-lubrication, and low friction characteristics, they are used for sliding parts in copiers and printers.

### D Electrical insulation material
**Injection Molded Products**

These are electrical insulation materials used for the battery packs of mobile phones. The packing insulates the positive and negative poles in a lithium battery so that they do not come into contact with each other. Fluoropolymer (PFA) is used due to its excellent electrical insulation.

## A Electrical insulation gasket kit

Mainly used to prevent electrical corrosion connecting parts that are made of different types of metals, in piping and equipment. This can be handled in the same manner as general piping work.

### Electrical Insulation Bolt

Insulating washers, metal washers, and nuts are set to a bolt covered with fluoropolymer, which offers excellent electrical insulation, weather resistance, and corrosion resistance.

### Electrical Insulation Gasket

A gasket with an elastic core covered with fluoropolymer film, with excellent electrical insulating and corrosion resistance properties.

## B Wrap-type fireproofing materials

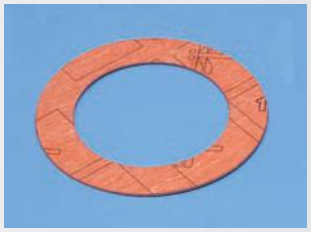
### MAKIBEE™

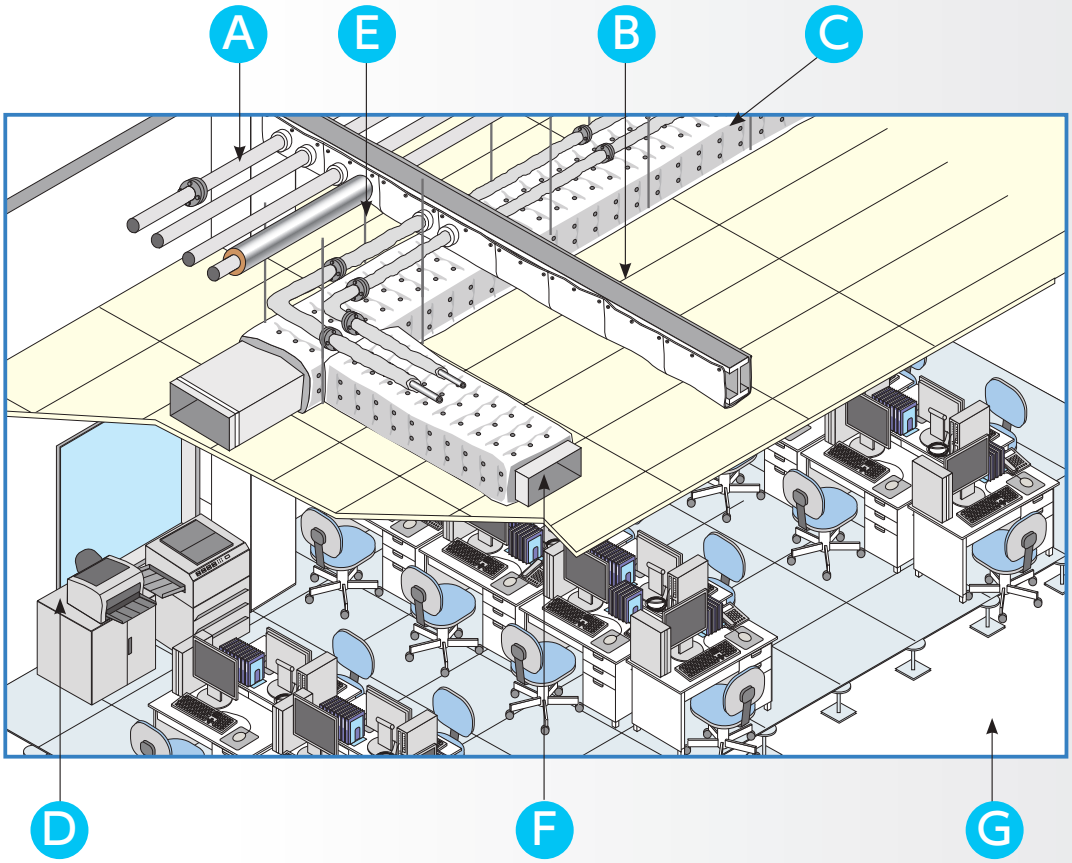
Wrap-type fireproofing materials made of rockwool to cover beams and columns of steel structure buildings. Advantages include environmental friendliness, reliable quality, and easy installation.

## C General-purpose joint sheet

### CLINSIL™-Brown

Non-asbestos joint sheets used as sealing materials for the flanges and valves of various types of piping and equipment. Suitable for the stainless steel flanges of buildings and offices, and also used to seal piping flanges.



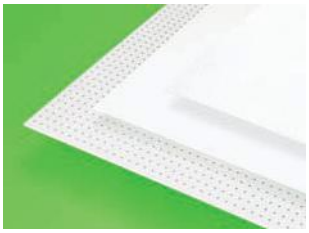





## D Interior incombustible materials

### ECOLUX™

An environment-conscious product that has acquired the Eco-Mark certificate for the first time as a calcium silicate board. It can be used on the inside walls and ceilings of buildings including stores, factories, houses, apartments and hospitals, on the walls and ceilings of kitchens and toilet that are subjected to water, as well as on the walls and ceilings of parking garages.



## E Heat insulation materials for piping

### MG MIGHTY COVER™

Rockwool heat insulation materials used for heat retention and thermal insulation in various facilities, piping and compartment-penetrating parts of buildings. Installation is easy with a split and snap-on method.

## F Building facility related heat insulation materials

### MG MIGHTY ROLL™

Rockwool thermal insulation material used for heat retention and thermal insulation of ducts in air conditioning systems, fireproofing of kitchen ducts, etc. This material is lightweight with good workability. ALK and ALGC, with excellent water resistance and air tightness on the surface, serves as a moisture-proof layer and contributes to its superior condensation-proofing properties, which makes it suitable for building ducts.

## G Raised Access Floor

### NICHIAS™ OMEGA FLOOR™

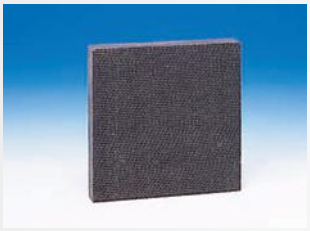
Raised access floor for the two-layer floor structure employed in offices in intelligent buildings. High-strength concrete panels using a unique reinforcing bar structure and laths provide excellent walking comfort and durability.

### A Eaves and soffit board
**ECOLUX™ Eaves Soffit Board**

A calcium silicate board used on eaves. This is an incombustible material for protecting the eaves of houses, which easily catch fire. It has acquired the Eco-Mark certificate for the first time as a calcium silicate board.

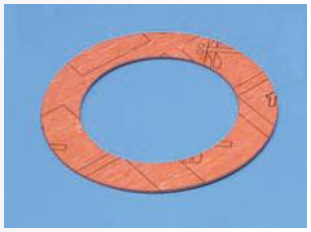
### B Catalyst type odor removal filter for high performance
**HONEYCLE™ CR**

A high-performance deodorizing filter suitable for removing general refrigerator, automobile, and garbage odors. The manganese-based catalyst filter exhibits excellent performance in removing corrosion odors.



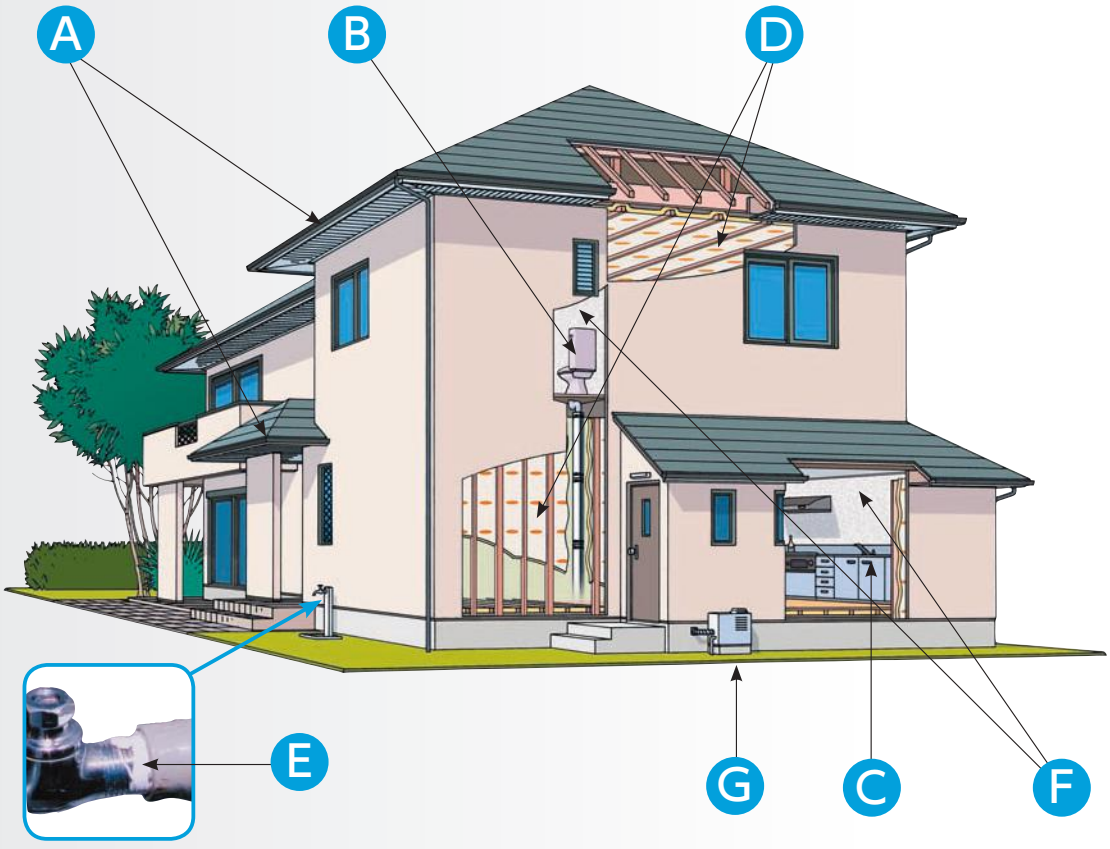
### C General-purpose joint sheet
**CLINSIL™-Brown**

A joint sheet for water faucets such as taps in kitchens and bathrooms. It is used as a gasket for preventing cold or hot water leakage.



### D Rockwool heat insulation material for housing
**HOMEMAT™**

Heat insulation material used for ceilings, walls, and floors in houses. It restrains the heat coming in/out of houses, thus reducing the energy loss of the building.




### E PTFE unsintered tape
**NAFLON™ Seal Tape**

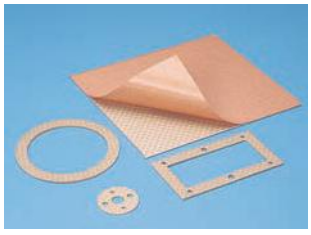
Fluoropolymer seal tape used for piping thread joints in water, steam, oil, chemical, and solvent piping. The tape sealing material is wound around the grooves of the threads to prevent liquid from leaking.

### F Decorative calcium silicate boards
**ASLUX™ Series**

A decorative calcium silicate board used for kitchen panels and water systems in dwelling spaces. Because this board is incombustible and easy to clean, it is ideal for the walls of kitchens and bathrooms.

### G High-temperature gas sealing material
**NEOTHERM™, FINEFLEX™ 1300Paper**

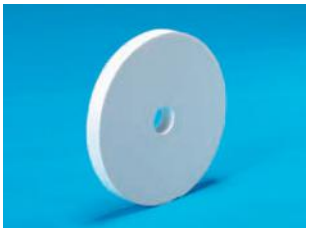
Thermal sealing material used in combustion equipment, gaskets of hot-water boilers, etc. This is a sheet type heat insulation material to seal off combustion gas coming out of heat exchangers, inspection ports, and exhaust ports of gas hot water boilers.



### A Desiccant rotor for dehumidifier

**HONEYCLE™ GX**

A desiccant device with a honeycomb structure supported by Zeolite (an absorption material) is used for the rotor part of the desiccant. This is an energy saving product with excellent absorption ability even at low temperatures and low humidity, enabling dehumidification with less energy.



### B Combustion gas sealing material

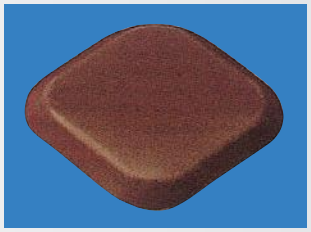
**FINEFLEX™ 1300 Paper-T**

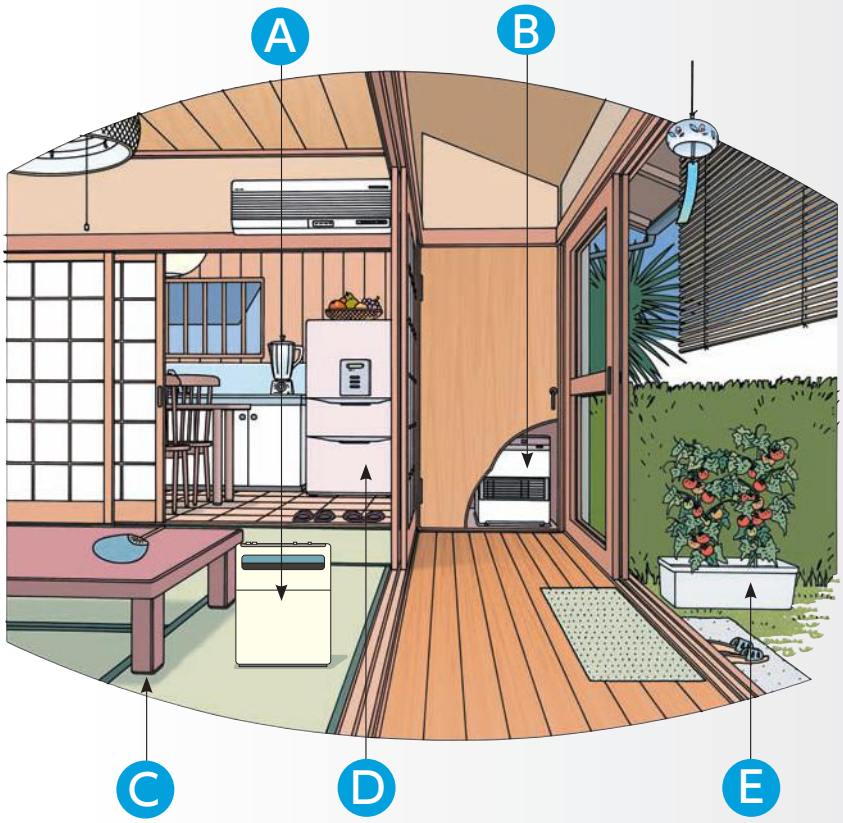
Sealing material used for high-temperature gas, used as a sealant in combustion equipment, fireproofing devices, and the joint filters of furnaces. It is also used between the combustion parts of fan heaters to prevent gas from leaking.

### C Furniture sliding material

**KAGUSUBEERU™**

Sliding material that enables furniture to be moved easily. Fluoropolymer is used for the sliding part.

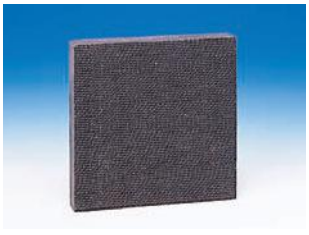





### D Catalyst type odor removal filter for high performance

**HONEYCLE™ CR**

A high-performance filter suitable for removing refrigerator, automobile, garbage and other general odors. The manganese-based catalyst filter exhibits excellent performance in removing corrosive odors.



### E Lightweight planter soil

**Sakhalin Peat Moss**

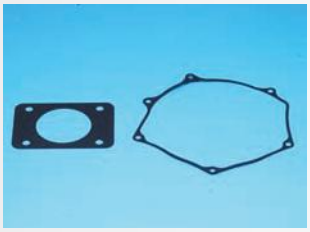
Culture soil material mixed with rockwool, used for home gardening and agriculture.

### A Rubber coated metal gasket
**METAKOTE™**

Gasket material for air conditioner outdoor units and refrigerator compressors. It consists of a metal sheet coated with rubber and fits well with complex-shaped parts. It is used to prevent leakage of high-temperature, high-pressure refrigerant from a compressor.

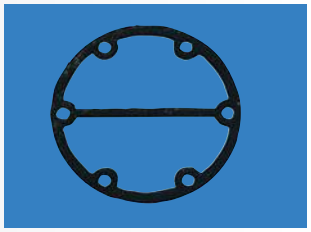
### B Foamed rubber coated metal gasket
**METAFOAM™**

Gasket material for air conditioner outdoor units and refrigerator compressors. The use of foam rubber allows this material to fit well with complex-shaped parts. It is used to prevent leakage of high-temperature, high-pressure refrigerant from a compressor.



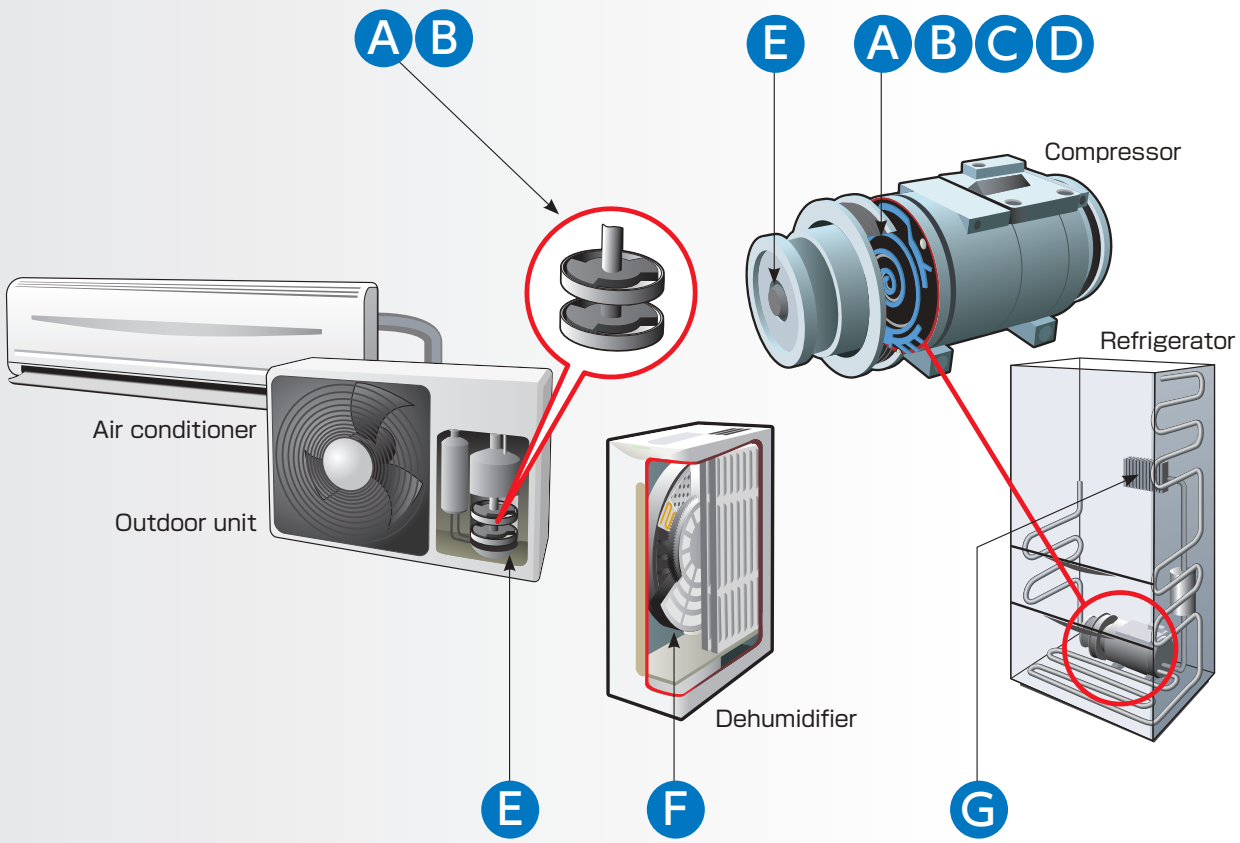
### C Gasket for flanges
**CLINSIL™-NF**

Gasket material for refrigerator freezer compressors. It contains synthetic rubber and fits well with complex-shaped parts. It is used to prevent leakage of high-temperature, high-pressure refrigerant from a compressor.



### D Chip seal
**EXCELIDE™**

Sealing material used for air conditioners. Air conditioners compress and liquefy chlorofluorocarbon as a cooling medium and remove heat and lower the temperature by vaporizing it. This material seals in the chlorofluorocarbon.

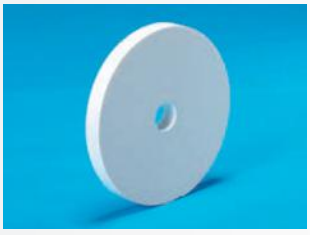



### E Rubber gasket
**Rubber O-Ring**

Gaskets for air conditioner outdoor units and refrigerator compressors. Suitable for thin piping such as union joints. These gaskets are used to prevent leakage of high-temperature, high-pressure refrigerant from a compressor.

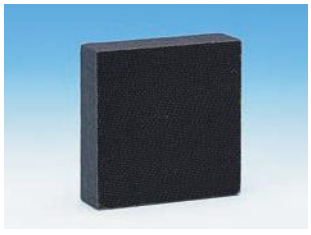
### F Rotor for desiccant
**HONEYCLE™ GX**

This is a honeycomb-structured dehumidifying element supported by Zeolite (dehumidifying material). It is used for dehumidifier rotors. Because of its excellent adsorption performance at low temperature and low humidity, it allows dehumidification at low energy.



### G Catalyst type odor removal filter for high performance
**HONEYCLE™ CR**

A high-performance filter suitable for removing refrigerator, automobile, garbage and other general odors. Since it has a catalyst function to clean odors, it is used for deodorizing filters installed in refrigerators.

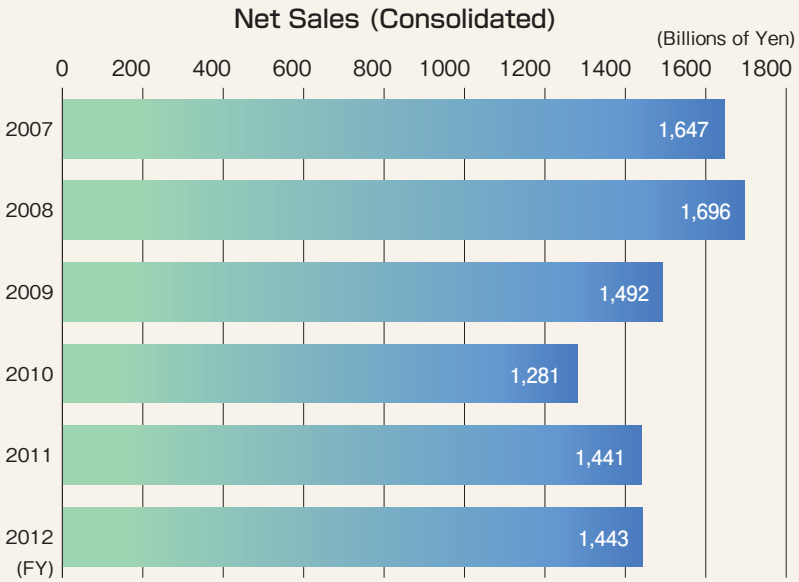


# Corporate Data

| | |
|---|---|
| Name of company | NICHIAS Corporation |
| Founded | April 9, 1896 |
| President | Kunihiko Yano |
| Head Office | 1-26, Shibadaimon 1-chome, Minato-ku, Tokyo 105-8555, Japan |
| Capital | 9,283.57 million yen (as of March 2012) |
| Employees (Consolidated) | 4,563 (as of March 2012) |

**●Factories**
Tsurumi Factory
Ohji Factory
Hashima Factory
Fukuroi Factory
Yuki Factory

**●Laboratories**
Hamamatsu Research Laboratory
Tsurumi Research Laboratory




## ■Network

### ●Overseas

**Indonesia**

**PT. NICHIAS ROCKWOOL INDONESIA**
Manufacture of insulation materials, sealing materials and automotive parts

**PT. NICHIAS METALWORKS INDONESIA**
Manufacture of metal parts for building materials and sealing materials

**PT. NICHIAS SUNIJAYA**
Sale of fluoropolymer products, insulation materials, sealing materials and automotive parts

**Malaysia**

**NICHIAS FGS SDN. BHD.**
Manufacture and sale of fluoropolymer products, sealing materials, automotive parts and building materials
Sale of insulation materials

**NT RUBBER-SEALS SDN. BHD.**
Manufacture of sealing materials

**Singapore**

**NICHIAS SINGAPORE PTE. LTD.**
Sale of fluoropolymer products, insulation materials and sealing materials

**Vietnam**

**NICHIAS HAIPHONG CO., LTD.**
Manufacture of honeycomb filters, sealing materials and fluoropolymer products

**NICHIAS VIETNAM CO., LTD.**
Manufacture of automotive parts

**Thailand**

**NICHIAS (THAILAND) CO., LTD.**
Manufacture and sale of sealing materials
Sale of fluoropolymer products, insulation materials and automotive parts

**THAI-NICHIAS ENGINEERING CO., LTD.**
Engineering and construction of insulation materials

**China**

**SUZHOU NICHIAS INDUSTRIAL PRODUCTS CO., LTD.**
Manufacture of fluoropolymer products and automotive parts

**SUZHOU NICHIAS SEAL MATERIAL CO., LTD.**
Manufacture of sealing materials

**NICHIAS (SHANGHAI) TRADING CO., LTD.**
Sale of fluoropolymer products, insulation materials, sealing materials and building materials

**SHANGHAI XINGSHENG GASKET CO., LTD.**
Manufacture of automotive parts

**SHANGHAI GOYU AUTOPARTS CO., LTD.**
Manufacture of automotive parts

**India**

**NICHIAS INDUSTRIAL PRODUCTS PVT. LTD.**
Manufacture of automotive parts

**Czech Republic**

**NICHIAS CZECH s.r.o.**
Manufacture of automotive parts

### ●Domestic

**FUKUSHIMA NICHIAS CORPORATION**
Manufacture of fluoropolymer products and insulation materials

**KUMAMOTO NICHIAS CORPORATION**
Manufacture of fluoropolymer products

**TOKYO MATERIALS CORPORATION**
Sale of fluoropolymer products

**NICHIAS CERATECH CORPORATION**
Manufacture and sale of insulation materials and building materials

**KOKUBU INDUSTRIAL CO., LTD.**
Manufacture of insulation materials and automotive parts

**TATSUTA KOGYO CO., LTD.**
Manufacture of insulation materials, automotive parts and building materials

**OHTA KASEI CORPORATION**
Manufacture of insulation materials

**SAKAI NICHIAS CORPORATION**
Manufacture of insulation materials

**NICHIAS MECHATECHNO CORPORATION**
Manufacture of sealing materials and fluoropolymer products

**NICHIAS KANTO SALES CORPORATION**
Sale of sealing materials, insulation materials and fluoropolymer products

**AKITSU INDUSTRIES CORPORATION**
Processing and sale of sealing materials and fluoropolymer products

**NICHIAS SEALTECH CORPORATION**
Manufacture of sealing materials

**TOZETU CO., LTD.**
Manufacture of sealing materials

**METAKOTE INDUSTRY CORPORATION**
Manufacture of automotive parts

**NIPPON ROCKWOOL CORPORATION**
Sale of building materials and agricultural products

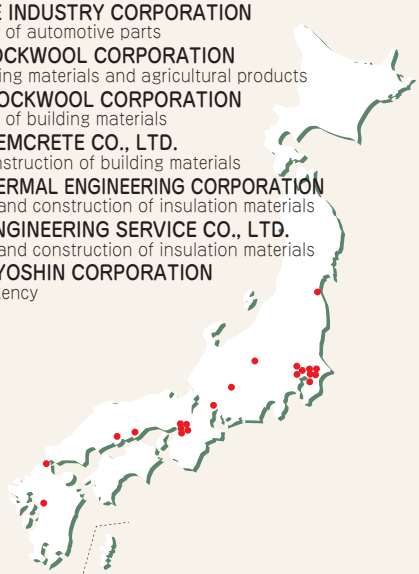
**KIMITSU ROCKWOOL CORPORATION**
Manufacture of building materials

**NICHIAS CEMCRETE CO., LTD.**
Sale and construction of building materials

**NIPPON THERMAL ENGINEERING CORPORATION**
Engineering and construction of insulation materials

**NICHIAS ENGINEERING SERVICE CO., LTD.**
Engineering and construction of insulation materials

**NICHIAS KYOSHIN CORPORATION**
Insurance agency



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## Overseas Construction Companies

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## 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
**SHANGHAI GOYU AUTO PARTS CO., LTD.**
上海五友汽车零部件有限公司

**India**
**NICHIAS INDUSTRIAL PRODUCTS PVT. LTD.**

**Czech**
**NICHIAS Czech s.r.o.**