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Gasket



NIPPON VALQUA INDUSTRIES, LTD.

<http://www.valqua.co.jp>



VALQUA GASKET

As a total sealing manufacturer, NIPPON VALQUA INDUSTRIES (VALQUA) has been focusing on the development of highly reliable sealing products that can be adapted to every industry, such as chemical, energy and other industries. We would like to take this opportunity to introduce our wide product lineup of gasket products.

Registered trademarks

The below are our registered trademarks in Japan.

Indicators of registered trademarks have been omitted within this catalogue.

- CLEANTIGHT
- CORDSEAL
- TRYPACK
- NONASUPER
- VALQUA
- VALQUATEX
- VALQUAFOIL
- VALQUALON
- VALFLON
- BRIGHTHYPER
- BLACKTIGHT
- BLACKHYPER
- WHITETIGHT
- WHITEHYPER
- UNIVERSALHYPER
- VALQUA
- VALQUA(mark)

INDEX

Gasket Selection Criteria

- ▼Precautions for Safe Handling 1
- ▼Representative Product in Each Operating Temperature ... 2
- ▼Gasket Selection Example with Respect to Fluid, Temperature and Pressure 3

Soft Gasket

- ▼High Performance Non-asbestos Sheet Gasket ... 7

High Performance Non-asbestos Sheet Gasket
VALQUA No. UF300 / GF300 / SF300 / MF300

- ▼Compressed Non-asbestos Fiber Sheet Gasket ... 10

Compressed Non-asbestos Fiber Sheet Gasket
VALQUA No.6500 / 6500AC / 6502 / 6503 / 6503AC

- ▼Fluorocarbon Resin Sheet Gasket 15

VALFLON Sheet Gasket
VALQUA No.7020 / 7026 / 7010-EX / 7010 / 7GP61 / 7GP61S / 7GP66 / 7GP66S

- ▼Fluorocarbon Resin Gasket 17

CORDSEAL <Soft>
VALQUA No.7GS66A / 7GS62A / 7GS64N

- ▼Fluorocarbon Resin Envelope Gasket 19

VALFLON Envelope Gasket
VALQUA No.N7030 / N7031 / N7035

- ▼Expanded Graphite Sheet Gasket 23

VALQUAFOIL Gasket
VALQUA No.VF-30 / VF-35E

Paste

- ▼Gasket Paste 26

VALQUA No.5 / 5M / 6 / 6M / SEALP / PSVO

Semi-Metallic Gasket

- ▼Spiral Wound Gasket 27

VALQUATIGHT Gasket
VALQUA No.8590 Series / 6590 Series / 6590VC Series / 7590 Series / M590L Series / M590 Series

NONASUPER
VALQUA No.8590TN

- ▼Metal Jacketed Gasket 32

VALQUA No.N510 / N520 Series / N530 / N570 / N580 / N6510 / N6520 / N6580

Metal Gasket

- ▼Metallic Flat Gasket 35

Metal Serrated Gasket
VALQUA No.540 Series / 6560 Series / 560 Series / 6540H Series / 6540HP Series

- ▼Ring Joint Gasket 37

VALQUA No.550 Series

- ▼Metal C-ring Gasket with Spring 39

TRYPACK
VALQUA No.3645 / 3645LS Series

- ▼Metal Hollow O-ring Gasket 41

VALQUA No.3640 / 3641 Series

Rubber-coated Fabric / Rubber Sheet Gasket

- ▼Rubber Coated Fabric Gasket 43

VALQUATEX Gasket
VALQUA No.N214 / N314

- ▼Rubber Sheet Gasket 43

Synthetic Rubber Sheet Gasket
VALQUA No.2010 (NBR / CR / EPDM) / 4010 / 5010

Textile Products

- ▼Flame-Resistant Carbonized Fiber Textile 44

VALQUA No.101C / 105C / 112C

- ▼Heat-Resistant Glass Fiber Textile 45

VALQUA No.101G / 102G / 105G / 105GF / 112G / 112GA / 112GC

- ▼Ceramic Fiber Textile 46

VALQUA No.101S / 102SF / 102S / 105S / 105SN / 112S / 112SN

Related Product

- ▼Gasket Cutter 47

- ▼Product No. Index 48

High Performance Non-asbestos Sheet

Compressed Non-asbestos Fiber Sheet

Fluorocarbon Resin Gasket

Expanded Graphite Sheet

Gasket Paste

VALQUATIGHT

Metal Semi-metal

VALQUATEX / Rubber Sheet

Textile Products

Gasket Cutter

Precautions for Safe Handling

The product characteristics, selection examples and other information listed in this catalog are representative of the performance of each product.

Since the equipment used and its applications, the actual usage conditions and others are different depending on the usage location, it is recommended to conduct a confirmation test under the actual operating condition before use.

Please contact us for more information on special applications.

How to Use the Product Safely

Please make sure to follow these instructions to use the product appropriately.

- Do not use the product for anything other than its intended use.
- When installing the product on piping, equipment etc., please refer to the instructions for each product before performing the work.
- If you are processing the product, please make sure to use a sharp cutting device.
- Please refrain from reusing the product after its initial use since it is not recommended.
- If you are storing the product, please store the product in a package to maintain the performance of the product.

Precautions When Handling VALFLON (fluorocarbon resin products)

- This product was not designed or manufactured for the purpose of use in medical devices which would be transplanted into the human body, or come into contact with bodily fluids or body tissues. Please contact us in advance if you would like to use the product in this type of application.
- If you will be heating the product to temperatures over 200°C, please make sure to thoroughly discharge and ventilate the area and not to breathe in the dissolved gas.
- When disposing the product, please follow the "Waste Management and Public Cleaning Law" and never incinerate the product.

*Please refer to MSDS (Material Safety Data Sheet) for precautions related to industrial safety and health.

Specific Products

Specific controls are required for products that fall under the following categories. Please let us know if you are ordering any of these products.

- Components that are used in nuclear power plants and other related equipment that require special controls
- Components that require a certification to be used for gas equipment by the Japan Gas Appliances Inspection Association (JIA)
- Components that comprise medical equipment and may cause bodily harm if a problem occurs
- Components that require compliance with the Food Sanitation Act (Act No. 233 of 1947)
- Safety components specified as "major overhaul set forth in Article 49(2) of the Road Transport Vehicle Act" under Article 3 of the Enforcement Regulations for Road Transport Vehicle Act
- Components that require specific controls due to their application in aerospace and defense

Recommended Tightening Stress

For low pressure gas seals, there are times when appropriate sealability cannot be obtained by the bolt load found by m and y specified in Appendix G to JIS B 8265.

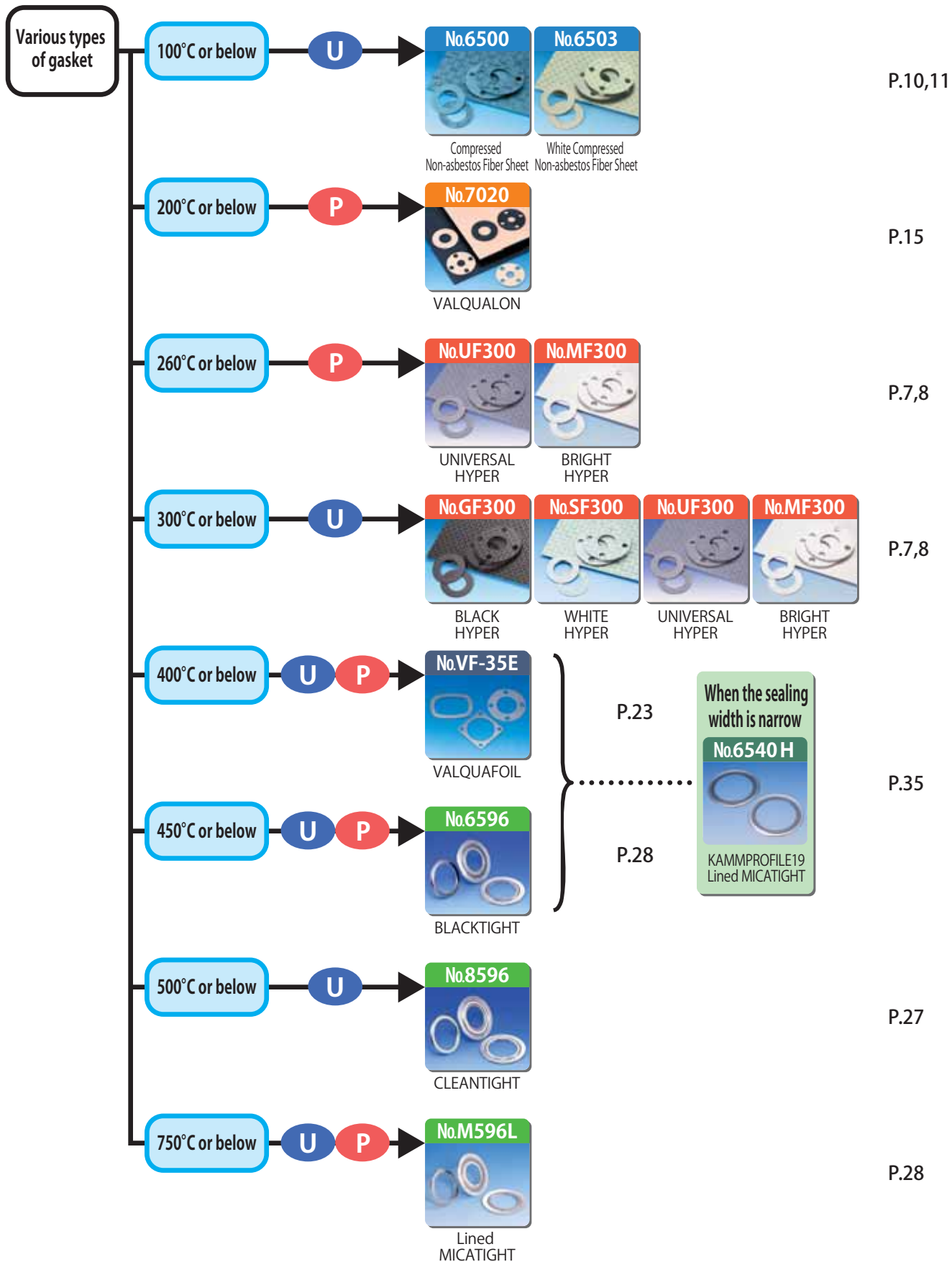
For minimum tightening stress, the recommended tightening stress that applies to the projected area (total contact cross section) of the gasket is recommended. For minimum tightening force, please use the tightening force (W_{m1} and W_{m2}) calculated from Appendix G to JIS B 8265 or the tightening force calculated from the recommended tightening stress and the total contact cross section, whichever has the greater tightening force.

Representative Product in Each Operating Temperature

U Utility Application: For utility facilities pipes handling water, oil, water vapor, etc.

P Process Application: Application for fluid, with consideration of a wide range of fluid suitability

Please refer to the contents after page 3 for details.



■ Selection Procedure ■

Based on the sealing-target fluid and design conditions (pressure, temperature), please confirm the applicable category from the selection chart, and verify the recommended gasket and usable gaskets in its category.

Fluids are categorized as below.

- | | |
|--|-----------------------------------|
| ① Water, hot water, water vapor | ⑥ Exhaust gas |
| ② Crude oil, alcohol, animal and vegetable oils, heat transfer oil | ⑦ Inflammable gas |
| ③ General solvent, weak acid, weak alkali | ⑧ Toxic gas |
| ④ Strong acid, strong alkali | ⑨ Oxygen |
| ⑤ Air, nitrogen gas, inert gas | ⑩ Extremely low temperature fluid |

■ Note ■

- The selection list shown below indicates the usable temperature and pressure range of each gasket with respect to various fluids, and it does not indicate the maximum usable temperature and pressure for each gasket.
- The recommended gasket is a representative gasket for each fluid, temperature and pressure condition, and not all of the other usable gaskets are listed.
- There are cases where a recommended gasket and usable gasket are different; therefore, please contact us for more information.
- The temperature for each pressure shall be: from -30°C to the stated temperature for ① to ⑨, and from the stated temperature to -30°C for ⑩.

① Water, Hot Water, Steam

Point of View: There is no hardening with High Performance Non-asbestos Sheet Gaskets, and they are easy to use.

Point : The Economical Compressed Non-asbestos Fiber Sheet hardens at a temperature of 100°C or above; therefore, attention is needed for tightening control.

Temperature (°C)	Pressure (MPa)	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recom-mended	Others
50	0.5	2010 Synthetic Rubber Sheet Gasket	6500	43	10
300	0.5	GF300 High Performance Non-asbestos Sheet Gasket	SF300 (For white) MF300 (For white)	7	8
260	2.8		SF300 (For white), MF300 (For white), 6502 (Up to 2MPa)		
200	3.5				
100	3.0	6500 Compressed Non-asbestos Fiber Sheet Gasket	6503 (For white), 6500A (For Stainless Flange) 6503AC (For Stainless Flange)	10	10, 11
600	10.7	M596L Spiral Wound Gasket	550	28	37
450	16.9	6596 Spiral Wound Gasket	8596		27
600	20	550 Ring Joint Gasket	—	37	—

② Crude oil, Alcohol, Animal & vegetable oil, Heat transfer oil, etc.

Point of View : Except for some fluids, fluid suitability is not a concern.

Point : The Economical Compressed Non-asbestos Fiber Sheet hardens at a temperature of 100°C or above; therefore, attention is needed for tightening control.

Temperature (°C)	Pressure (MPa) 0 0.5 1 2 5 10 20 30	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
300	0.5	GF300 High Performance Non-asbestos Sheet Gasket	SF300 (For white) MF300 (For white)	7	8
260	2.8				
200	3.0		SF300 (For white) MF300 (For white), 7020 (Up to 1.5MPa)		8, 15
100	3.0	6500 Compressed Non-asbestos Fiber Sheet Gasket	6503 (For white), 6502	10	10, 11
600 ⁽¹⁾	10.7	M596L Spiral Wound Gasket	550	28	37
450 ⁽¹⁾	16.9	6596 Spiral Wound Gasket	8596L		29
600	20	550 Ring Joint Gasket	—	37	—

Note (1) Excluding HTS. Please let us know if you are using HTS.

③ General solvent, Weak acid, Weak alkali, etc.

Point of View : PTFE-based and graphite-based gaskets with excellent chemical resistance are mainly selected.

Point : The High Performance Non-asbestos Sheet Gasket can be used even at 260°C.

Temperature (°C)	Pressure (MPa) 0 0.5 1 2 5 10 20 30	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
260	1.2	GF300 High Performance Non-asbestos Sheet Gasket	SF300 (For white) MF300 (For white), UF300	7	7, 8
50	2.0				
100	2.0	N7030 (S) VALFLON Envelope Gasket	N7030 (N) (Up to 1.5MPa)	19	19
200	1.5	7020 Fluorocarbon Resin Sheet Gasket	7026	15	15
100	4.0				
450	16.9	6596 Spiral Wound Gasket	M596L	28	29

④ Strong Acid, Strong Alkali

Point of View : PTFE-based gaskets with excellent chemical resistance are mainly selected.

Point : UF300 can be used for both high temperature strong acid and strong alkali.

Temperature (°C)	Pressure (MPa) 0 0.5 1 2 5 10 20 30	Recommended Gasket (VALQUA No.)		Other Usable Gasket (VALQUA No.)	Page	
		Acid	Alkali		Recommended	Others
260	1.2	UF300 High Performance Non-asbestos Sheet Gasket		MF300 (For white)	7	8
50	2.0					
200	1.5	7020 Fluorocarbon Resin Sheet Gasket	7026 Fluorocarbon Resin Sheet Gasket	—	15	—
100	4.0					
300	8.5	7596 Spiral Wound Gasket		6596	28	28
150	20					

⑤ Air, Nitrogen Gas, Inert Gas, etc.

Point of View: A Sheet Gasket is selected for utility pipes, and a Spiral Wound Gasket is selected for handling high pressure.

Temperature (°C)	Pressure (MPa)	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
260	1.2	GF300 High Performance Non-asbestos Sheet Gasket	SF300 (For white), UF300 , MF300 (For white)	7	7, 8
50	2.0				
100	1.0	6502 Compressed Non-asbestos Fiber Sheet Gasket	6503 (For white), 6500 , N7030	10	11, 10, 19
750	2.9	M596L Spiral Wound Gasket	—	28	—
450	16.9	6596 Spiral Wound Gasket	M596L , 8596L	28	28, 29

⑥ Exhaust Gas

Point of View: A Sheet Gasket and Semi-Metallic Gasket are used separately depending on the leakage allowance.

Point : A Rubber-coated Fabric Gasket can be used in areas where micro-pressure and a few leaks are acceptable.

Temperature (°C)	Pressure (MPa)	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
800	0.05	N314 Rubber Coated Fabric Gasket	N520	43	32
300	0.1	N214 Rubber Coated Fabric	N314 , N520	43	43, 32
260	1.2	GF300 High Performance Non-asbestos Sheet Gasket	SF300 (For white), UF300 , MF300 (For white)	7	7, 8
50	2.0				
100	1.0	6502 Compressed Non-asbestos Fiber Sheet Gasket	6503 (For white), 6500	10	11, 10
816	0.35	N520 Metal Jacketed Gasket	M596L (Up to 750°C)	32	28
35	5.17				

⑦ Inflammable Gas

Point of View: Gaskets with high gas sealing performance are mainly selected.

Point : A PTFE-based Sheet Gasket that is high in gas sealing performance or a Spiral Wound Gasket is recommended.

Temperature (°C)	Pressure (MPa)	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
260	1.0	GF300 High Performance Non-asbestos Sheet Gasket	SF300 (For white), UF300 , MF300 (For white)	7	8
100	2.5	7020 Fluorocarbon Resin Sheet Gasket	—	15	—
450	6.7	6596 Spiral Wound Gasket	8596L	28	29

⑧ Toxic Gas

Point of View: Gaskets with high gas sealing performance are mainly selected.

Point : When considering reaction products, a PTFE-based Gasket is selected.

Temperature (°C)	Pressure (MPa)	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
100	2.5	7020 Fluorocarbon Resin Sheet Gasket	7026	15	15
450	6.7	6596 Spiral Wound Gasket	8596L	28	29
300	8.5	7596 Spiral Wound Gasket	8596L , 6540H	28	29, 35

⑨ Oxygen

Point of View : Gaskets using fluoro-resin, which is a non-combustible resin, are selected.

Point : If paste is used, the new VALFLON paste is recommended when the temperature is 100°C or below.

Temperature (°C)	Pressure (MPa)	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
200	1.0	SF300 High Performance Non-asbestos Sheet Gasket	UF300, MF300, 7596	8	8, 28
-200 ~ -30	1.0	7020 Fluorocarbon Resin Sheet Gasket	SF300 (For white), UF300, MF300 (For white), 7596	15	8, 28
-30 ~ 100	2.5		—		
300	8.5	7596 Spiral Wound Gasket	540	28	35
-200 ~ -30	10		—		

⑩ Extremely low temperature fluid

Point of View : Expanded graphite that does not become brittle material even at extremely low temperatures is selected.

Point : The High Performance Non-asbestos Sheet Gasket can be used up to about -200°C.

Temperature (°C)	Pressure (MPa)	Recommended Gasket (VALQUA No.)	Other Usable Gasket (VALQUA No.)	Page	
				Recommended	Others
-200	1.0	MF300 High Performance Non-asbestos Sheet Gasket	VF-35E, 7020	8	23, 15
-240	2.0	VF-35E Expanded Graphite Sheet Gasket	6596VC, 7596	23	28
-270	10	6596VC Spiral Wound Gasket	7596 (Up to -260°C)	28	

■ Other Items that Shall be Considered When Making a Selection ■

Gasket tightening stress

Gasket dimensions

Combination of gasket and flange face

Flange face surface roughness

Precautions for various gaskets

■ Fluids that Require Attention When Making a Selection ■

Oxygen and gas susceptible to burning Gaskets using flammable materials shall be avoided, and the PTFE filler Spiral Wound Gasket, PTFE-based Gasket, Copper-made Jacket Gasket and Metallic Flat Gasket are recommended.

Polymerizable monomers There are occasions when polymerizable monomer such as a styrene monomer and vinyl chloride monomer cannot use the Compressed Non-asbestos Fiber Sheet or PTFE-based Gasket. Please select the Spiral Wound Gasket with inner and outer rings and the Metallic Gasket.

Fluids that include slurry Soft gaskets could get damaged or leak due to erosion. Please select the Spiral Wound Gasket with inner and outer rings and the Metallic Gasket.

Heat transfer oil The Compressed Non-asbestos Fiber Sheet could leak due to a deteriorated rubber binder. Furthermore, due to its high permeability, the Spiral Wound Gasket with inorganic paper filler could leak if used for years. Please select the Sheet Gasket with expanded graphite or Spiral Wound Gasket with expanded graphite filler. Please note that HTS cannot be used since it reacts with expanded graphite. Please contact us for more information.

Radioactive Fluid PTFE is not recommended since it is sensitive to radiation. Expanded graphite has 1x10⁶Gy radiation resistance. Please confirm the radiation level and make a selection.

High Performance
Non-asbestos Sheet Gasket

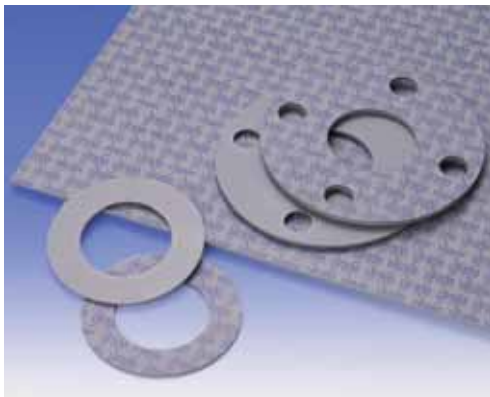
High Performance Non-asbestos Sheet

VALQUA No. **UF300/GF300/SF300/MF300**

High Performance Non-asbestos Sheet Gasket

The product is superior in its creep relaxation characteristics as compared to the Compressed Non-asbestos Fiber Sheet. These gaskets are easy to handle and do not harden easily with excellent chemical resistance and heat resistance because they use PTFE as binders. Since these gaskets do not contain any rubber, deterioration with age and hardening does not occur and retightening is possible. Furthermore, this gasket does not easily stick to flanges.

UNIVERSALHYPER



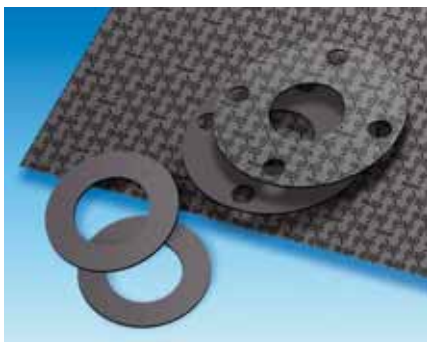
VALQUA No. **UF300**

Features

This is a Sheet Gasket that can be used for the widest variety of fluids, and different applications are not required for acid or alkali fluids. It is effective for promoting gasket integration at a plant where both alkali and acid lines exist. This is a product that possesses high-temperature reliability equal to that of other High-performance Non-asbestos Sheet Gaskets (GF300, for example), thereby possessing both chemical resistance and high-temperature reliability.

Suitable fluids	Water, seawater, hot water, steam, air, acid (includes strong acid), alkali (includes strong alkali), salt aqueous solution, oils, alcohol, aliphatic solvent and its vapor, and various types of gas, etc.
Unsuitable fluids	Polymerizable monomer, toxic gas
Applications	Joint sections of cover flanges and nozzles and the like for pipe flanges, valve bonnets, towers & tanks, ovens, pressure vessels and heat exchangers used in various factories including power stations, oil refineries, steel plants and shipyards
Main component	PTFE, silicon carbide
Color / Print	Gray / Blue

BLACKHYPER



VALQUA No. **GF300** (食)

Features

This is a general-purpose type Gasket that is ideal for utility lines using steam and oil.

Unsuitable fluids

Oxidizing acid, substance susceptible to burn such as oxygen, polymerizable monomer, strong alkali, toxic gas

Applications

Joint sections of cover flanges and nozzles and the like for pipe flanges, valve bonnets, towers & tanks, ovens, pressure vessels and heat exchangers used in various factories including power stations, oil refineries, steel plants and shipyards

Main component

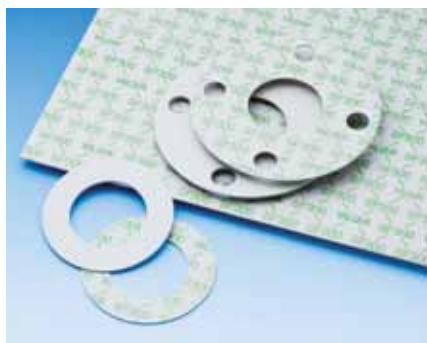
PTFE, silica, graphite

Color / Print

Dark gray / Black

(食) Conforms to the Food Sanitation Act and standards for food and additives

WHITEHYPER



VALQUA No. **SF300** (食)

Features	WHITEHYPER can provide the same performance as No.GF300 and because it has no black material it is good for using when white lines are preferable and has a wide range of other applications.
Unsuitable fluids	Polymerizable monomer and toxic gas
Applications	Joint sections of cover flanges and nozzles and the like for pipe flanges, valve bonnets, towers & tanks, ovens, pressure vessels and heat exchangers used in various factories including power stations, oil refineries, steel plants and shipyards
Main component	PTFE, silica
Color / Print	Off-white / Green

BRIGHTHYPER



VALQUA No. **MF300** (食)

Features	This gasket has more excellent chemical resistance than GF300 and SF300, and it can be used for both acid and alkaline applications. This product is solid white; thus, it is ideal for lines incompatible with contamination. The product has long-term stability at high temperatures, similar to other high performance non-asbestos sheets.
Unsuitable fluids	Polymerizable monomer and toxic gas
Applications	Joint sections of cover flanges and nozzles and the like for pipe flanges, valve bonnets, towers & tanks, ovens, pressure vessels and heat exchangers used in various factories including power stations, oil refineries, steel plants and shipyards
Main component	PTFE, alumina
Color / Print	White / None

Design data

Allowable ranges

VALQUA No.	Temperature (°C)	Pressure (MPa)
UF300/GF300 SF300/MF300	-200~300	3.5

Remark Temperature and pressure classifications show individual service limits.

Dimensions

VALQUA No.	Thickness (mm)	Size (mm)
UF300	1.0	1270×1270
	1.5, 2.0, 3.0	1500×1500
GF300	1.0, 1.5	1270×1270
	2.0, 3.0	1500×1500
SF300	1.5	1000×1000
	2.0, 3.0	1270×1270
MF300	1.5, 3.0	1270×1270

Design Criteria

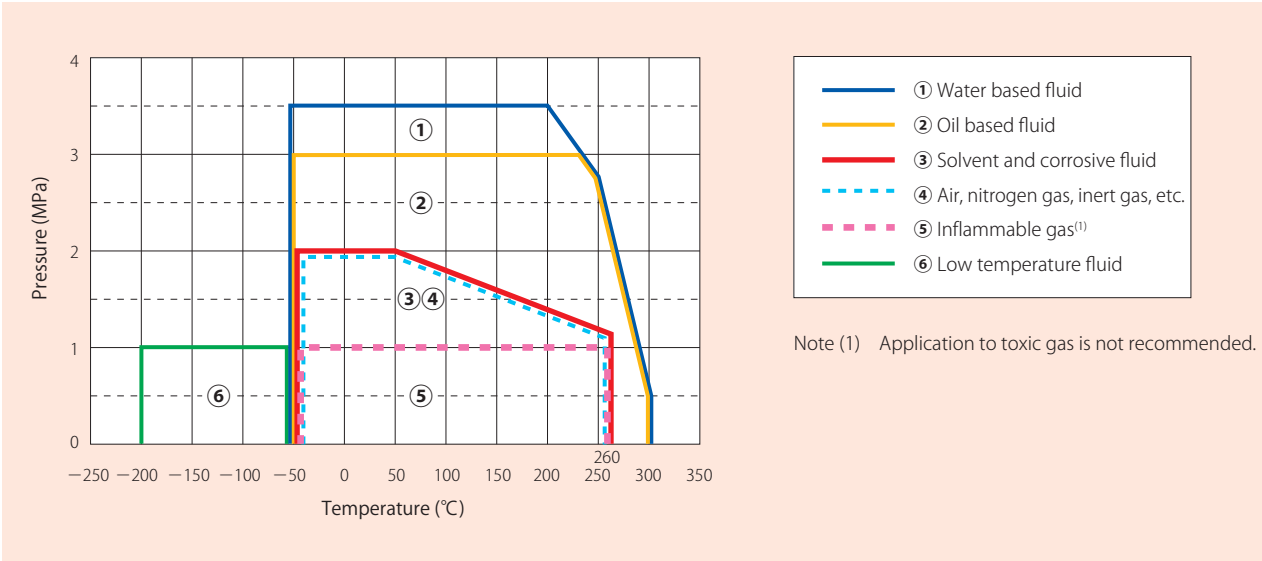
The values for Compressed Non-asbestos Fiber Sheets defined in Appendix G to JIS B 8265 can be applied to m and y values of High Performance Non-asbestos Sheets.

VALQUA No.	Thickness (mm)	Gasket factor "m"	Minimum design seating stress "y" (N/mm ²)	Recommended tightening stress (MPa) ⁽¹⁾	
				Liquid	Gas
UF300/GF300 SF300/MF300	3.0	2.00	11.0	25.5	35.0
	1.5	2.75	25.5		
	1.0	3.50	44.8		

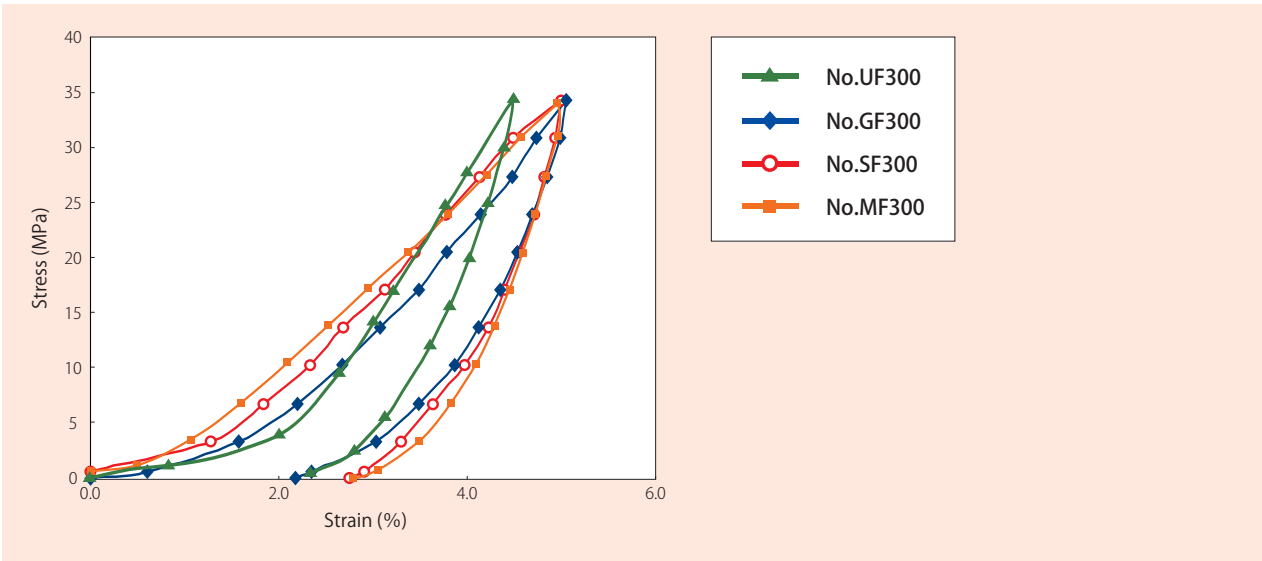
Note (1) The recommended tightening stress is the pressure required under standard conditions without consideration to the endforce due to internal fluid. It is the stress on the contact area of the gasket.

(食) Conforms to the Food Sanitation Act and standards for food and additives

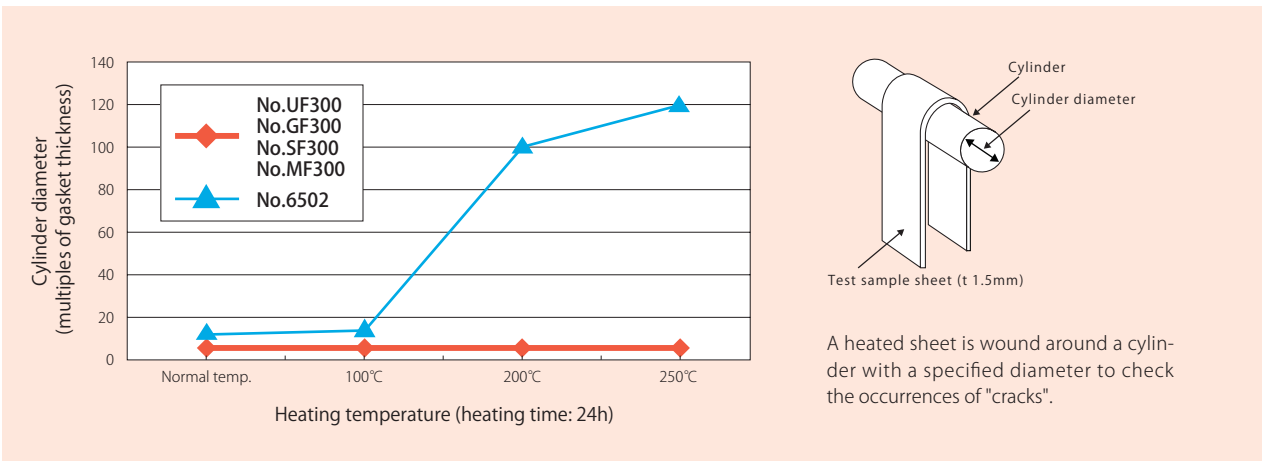
■ Allowable ranges per fluid ■



■ Stress strain Characteristics of High-performance Non-asbestos Sheet (Dimension of test piece: JIS 10K 25A t=1.5mm)



■ Comparison of high temperature hardening properties ■



Compressed Non-asbestos Fiber Sheets are sheet type gasket materials, where a special rubber binder and a small amount of filler material are mixed with organic and inorganic fibers, and rolled and vulcanized.

Compressed Non-asbestos Fiber Sheet for general use



VALQUA No. **6500**

Features	These products are suitable for use as general-purpose Gaskets for pipe flanges in general utility lines, such as water and oil and equipment in various industries. The adaptability of these sheets to water apparatus according to JIS S 3200-7 has been confirmed.
Unsuitable fluids	Strong oxidizing acid, strong alkali, various solvents, inflammable gas, gas susceptible to burning, toxic gas, etc.
Applications	Joint areas of steam lines, pipe flanges, valve bonnets and other equipment used in oil refineries and chemical industries
Main component	NBR, aramid fiber, mineral wool, inorganic fillers
Color / Print	Blue / Black

Anti-corrosion Compressed Non-asbestos Fiber Sheet



VALQUA No. **6500AC**

Features	With reduced amounts of leachable chloride, these Compressed Fiber Sheets have corrosion suppression effect when stainless steel flanges are used for water or water solutions. Surface finishing reduces sticking to the flange.
Unsuitable fluids	Strong acid, strong alkali, various solvents, inflammable gas, gas susceptible to burn and toxic gas
Applications	Stainless steel pipe flanges, valve bonnets and joints of various equipment that require corrosion resistance in various industries
Main component	NBR, aramid fiber, mineral wool, inorganic fillers
Color / Print	Blue / Orange

BLACKSUPER



VALQUA No. **6502**

Features	Excellent heat resistance when compared with 6500. It may be used for a wide variety of purposes.
Unsuitable fluids	Strong acid, strong alkali, various solvents, inflammable gas, gas susceptible to burn and toxic gas NBR, aramid fiber, carbon fiber, mineral wool, inorganic fillers
Applications	Joint areas of steam lines, pipe flanges, valve bonnets and other equipment used in oil refineries and chemical industries
Main component	NBR, aramid fiber, carbon fiber, mineral wool, inorganic fillers
Color / Print	Gray / Black

White Compressed Non-asbestos Fiber Sheet


 VALQUA No. **6503**

Features	Since black components are removed in the Compressed Fiber Sheet, these gaskets are suitable to be used for applications where inclusion of black foreign substances into the fluid should be avoided.
Unsuitable fluids	Strong acid, strong alkali, various solvents, inflammable gas, gas susceptible to burn and toxic gas
Applications	Applications should be avoided in which black foreign substances are included into process fluids, such as in petrochemical industry
Main component	NBR, aramid fiber, mineral wool, inorganic fillers
Color / Print	White / Green

Anti-corrosion white Compressed Non-asbestos Fiber Sheet


 VALQUA No. **6503AC**

Features	With reduced amount of leachable chloride, these white Compressed Fiber Sheets have corrosion suppression effect on stainless steel flanges. Surface finishing reduces sticking to the flange.
Unsuitable fluids	Strong acid, strong alkali, various solvents, inflammable gas, gas susceptible to burn and toxic gas
Applications	Pipe flanges, valve bonnets and other equipment used in various industries requiring corrosion resistance for white applications
Main component	NBR, aramid fiber, mineral wool, inorganic fillers
Color / Print	White / Orange

Design data

Allowable ranges

VALQUA No.	Temperature (°C) ⁽¹⁾	Pressure (MPa)		
		Water based	Oil based ⁽²⁾	Gas
6500/6500AC	-50~183	3.0	3.0	1.0
6502/6503/6503AC	-50~214	3.0	3.0	1.0

Notes (1) For service conditions exceeding 100°C, please refer to the precautions listed on page 12.

(2) Regarding oil gas, solvent and corrosive fluid, separate consultation is required.

Remark Temperature and pressure classifications show individual service limits.

Dimensions

VALQUA No.	Thickness (mm)	Size (mm)
6500/6502/6503	0.4 (6500 only) 0.5, 0.8, 1.0	1270×1270
		1270×3810
		2540×3810
		3048×3810
6500AC/6503AC	1.5, 2.0, 3.0	1270×1270
		1270×3810
		2540×3810

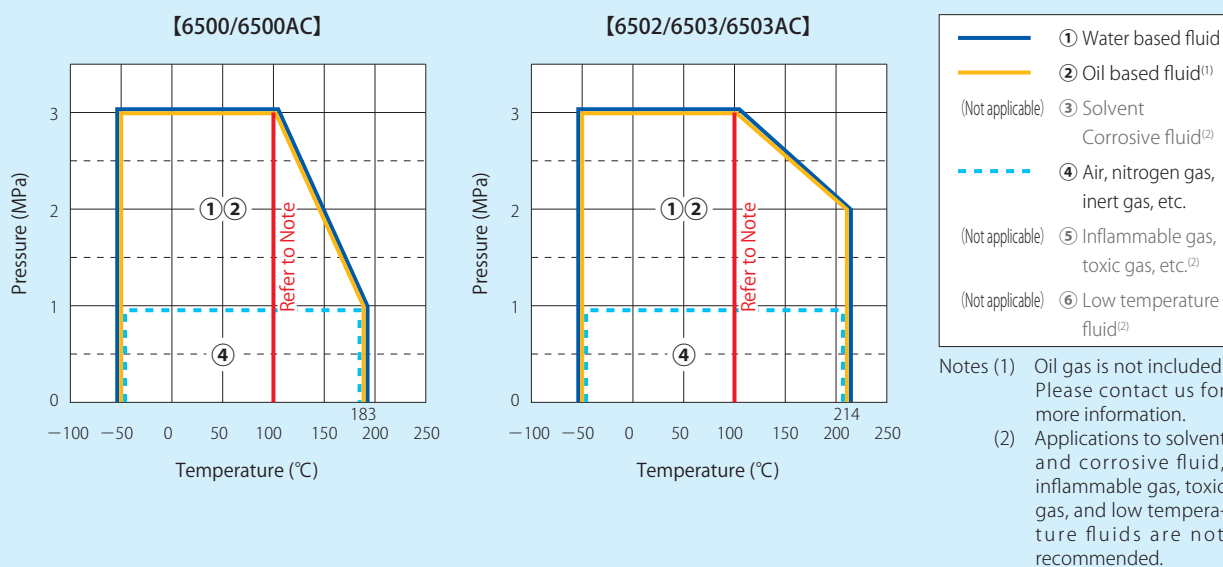
Design Criteria

The values defined in Appendix G to JIS B 8265 can be applied to the m and y values of the Compressed Non-asbestos Fiber Sheet.

VALQUA No.	Thickness (mm)	Gasket factor "m"	Minimum design seating stress "y" (N/mm ²)	Recommended tightening stress (MPa) ⁽¹⁾	
				Liquid	Gas
6500/6500AC	3.0	2.00	11.0	25.5	40.0
6502	1.5	2.75	25.5		
6503/6503AC	1.0	3.50	44.8		

Note (1) The recommended tightening stress is the pressure required under standard conditions without consideration to the endforce due to internal fluid. It is the stress on the contact area of the gasket.

■ Allowable ranges per fluid ■

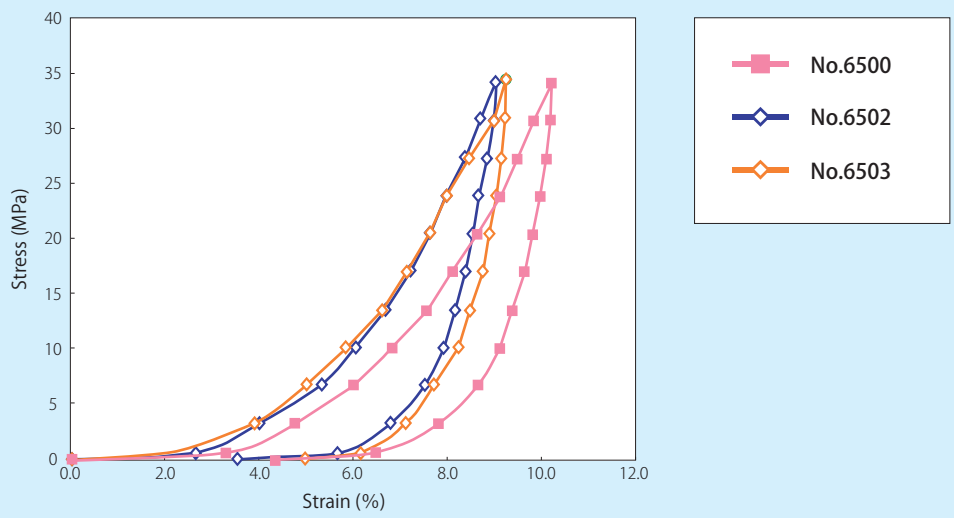


▼ **Note**

If No. 6500, No. 6500AC, No. 6502, No. 6503 or No. 6503AC are used at a temperature of 100°C or above, there is a possibility that the gasket could harden and crack; therefore, please follow the precautions listed below when using the product.

- ① Gasket thickness should be 1.5 mm or less.
- ② Gasket paste (SEALPASTE etc.) should be used.
- ③ Tightening stress should be 30 MPa or higher.
- ④ These gaskets should be used in places unlikely to bear piping load, or in places that may be easily replaced.
- ⑤ Whenever possible, use ring gaskets. Full face gaskets have more surface area, requiring additional compressive load on the gasket.

■ Stress strain Characteristics of Compressed Non-asbestos Fiber Sheet (Dimension of test piece: JIS 10K 25A t=1.5mm) ■



■ Comparison of physical properties ■

Item	High Performance Non-asbestos Sheet								Compressed Non-asbestos Fiber Sheet					
	No.UF300		No.GF300		No.SF300		No.MF300		No.6500		No.6502		No.6503	
Thickness (mm)	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0

Physical Properties

Tensile strength (CD) (MPa)	12.0	14.6	12.4	10.9	16.0	15.8	12.0	14.1	17.0	15.3	13.1	12.5	19.2	18.1
Compressibility (34.3MPa) (%)	4	4	5	4	5	6	5	4	10	10	9	10	9	6
Recovery (34.3MPa) (%)	49	46	53	54	42	50	32	36	57	55	67	64	60	61
Flexibility (MD) ⁽¹⁾	<2	<2	<2	<2	<2	<2	<2	<2	9	9	11	12	10	10
Density (kg/m ³)	2576	2557	2315	2262	2319	2280	2910	2839	1810	1813	1761	1759	1803	1857

Oil resistance < IRM903 OIL 150°C×5h >

Tensile strength loss (%)	0.6	0.2	1.0	7.6	3.8	5.1	1.5	5.9	16.7	6.3	9.2	9.6	13.0	0.0
Thickness increase (%)	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.2	2.2	1.2	1.3	1.0	2.1	0.6
Weight increase (%)	0.4	0.2	0.5	0.6	0.5	0.7	1.1	1.4	3.9	3.2	4.4	3.0	4.2	1.7

Fuel oil resistance < JIS Fuel oil B RT×5h >

Thickness increase (%)	0.0	0.3	0.4	0.3	0.4	0.1	0.2	0.5	5.6	2.8	4.3	2.6	5.4	2.3
Weight increase (%)	1.0	1.2	0.9	1.2	0.9	1.3	0.9	1.8	5.6	4.0	6.7	6.0	7.0	3.2

Creep relaxation < JIS R 3453 Tightening stress 20.6MPa >

100°C×22h	20.3	44.5	16.2	37.0	16.1	42.7	16.9	30.2	27.5	47.0	23.5	37.8	27.3	45.0
200°C×22h	44.7	71.9	35.3	65.8	40.5	68.8	35.8	55.0	52.0	78.8	41.1	65.5	43.6	60.5

Sealability < JIS 10K50A, Internal pressure He1.0MPa, Tightening stress 25.5MPa, Thickness 1.5mm >

With paste	(Pa·m ³ /s)	1.7×10 ⁻⁴ or below	1.7×10 ⁻⁴ or below	1.7×10 ⁻⁴ or below	1.7×10 ⁻⁴ or below	1.4×10 ⁻³	1.9×10 ⁻⁴	1.2×10 ⁻³
	(atm·cc/min.)	0.1 or below	0.1 or below	0.1 or below	0.1 or below	0.83	0.11	0.74
Without paste	(Pa·m ³ /s)	—	—	—	—	1.7×10 ⁻⁴ or below	1.7×10 ⁻⁴ or below	1.7×10 ⁻⁴ or below
	(atm·cc/min.)	—	—	—	—	0.1 or below	0.1 or below	0.1 or below

Note (1) Flexibility is in accordance with JIS R 3453 6. 2. 5. Please refer to "Comparison of high temperature hardening properties" listed on page 9.

Remark All the above physical properties are measurement examples, and not regulatory values.

■ Notes to be observed in design and usage ■

The following summarizes the points to be observed in the design, storage and installation, in order to ensure proper use of the Sheet Gasket. If used under conditions exceeding 100°C, Compressed Non-asbestos Fiber Sheet Gasket that use rubber may break due to hardening.

▼ Notes to be observed in design

1. Determine the number and size of bolts and gasket dimensions to provide gaskets with sufficient tightening stress, and also check the flange construction and bolt arrangement to ensure uniform distribution of the tightening stress.
2. Surface finish of the flange shall be about 6.3 Ra (reference : 25 S). Excessive smooth finish may cause slippage on the gasket, leading to crush.
3. Determine the construction, material and dimensions so as to prevent warpage or bowing of the flange at the time of application of internal pressure.
4. Consideration shall be given in design to prevent application of excessive thermal stress or repetitive bending stress on the joints.
5. Piping design shall not allow accumulation of drain or scale at the flange sections.
6. Consideration shall be given to prevent transmission of vibration to the joints.

▼ Notes to be observed in storage

1. Store these joint sheets in a cool and dark place not subject to direct sunshine, fresh air or ozone.
2. Storage selected shall be in a clean environment, free from dust as well as from high temperature & high humidity and corrosive atmosphere.
3. If hanged on nails or the like, gaskets may suffer breakage or permanent deformation, so that, as far as practicable, they should be put in a can or wrapped in a polyethylene bag and stored in a paper box.
4. Large sized gaskets shall be put between larger plates without rolling and placed horizontal for storage.

▼ Notes to be observed before installation

1. Ensure perpendicularity of the flange and the pipe.
2. Ensure the shaft alignment of the mating flanges.
3. Check for any deformation of flanges.

4. When changing only gaskets for the existing equipment or at a piping joint, clean the junctions and check for any damage, and repair if required.
5. Remove the rust at the flange surface, and repair any dents and dings.
6. Pay attention not to give damage to the gaskets during storage up to installation, or during installation work.

▼ Notes to be observed during installation work

1. When installing gas seals, refer to the following "Counter measures against permeation leakage".
2. Install the gaskets in a clean environment so as to prevent entry of foreign substances between the gaskets and the flanges.
3. Flange bolts shall be gradually tightened each time, and repeat this process 4 to 5 times, so as to finally ensure uniform tightening.
4. When tightening, pay attention to prevent the occurrence of crush.
5. In particular, when using gaskets of 150 Lb, 1B or smaller, or those of smaller gasket width, care shall be given as gasket stress is likely to be excessive.
6. At the time of load up or restarting, check for any loose bolts.
7. If retightening of gaskets that have already once experienced leakage fails in preventing leakage, replace them with new ones.
8. Please note that the Compressed Non-asbestos Fiber Sheet may harden if used in an environment at a temperature of over 100°C, and caution is required. Please refer to the precautions listed on page 12 and perform the appropriate initial tightening control to avoid retightening after being used at a high temperature. If retightening is necessary, it should be performed within 24 hours from the start of the heating operation, while material hardening is not significant yet.

■ Countermeasures against permeation leakage ■

Since permeation leakage also occurs in Sheet Gasket as in the case of conventional asbestos joints, the following points shall be observed for gas seals:

▼ For High Performance Non-asbestos Sheet (No.UF300/GF300/SF300/MF300)

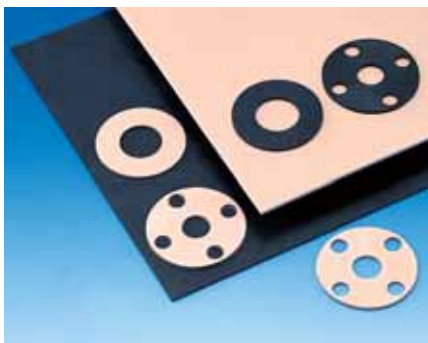
1. Apply gasket paste to the contact surface of the gasket and the flange and on the cut surface of the inner diameter of gasket.
2. Maintain the tightening stress to be around 35 MPa. Also use ring gaskets instead of full-face gaskets, so as to ensure proper tightening stress.
3. Use gaskets with a minimum thickness as much as possible (1.5 mm or less).
4. When using gasket paste, please use "NEW VALFLON Paste". Specifically, No. 6 and No. 6M are not recommended due to their poor compatibility with the High-performance Non-asbestos Sheet Gasket.

▼ In the Case of a Compressed Non-asbestos Fiber Sheet (No.6500/6500AC/6502/6503/6503AC)

1. Apply gasket paste on the cut surface of the gasket inner diameter side. Application of gasket paste on the contact surface between the gasket and the flange is likely to cause crush, so that attention is required in tightening, which will also minimize the amount of gasket paste.
2. Please keep the tightening stress at around 40MPa. Also use ring gaskets instead of full-face gaskets, so as to ensure proper tightening stress.
3. Use gaskets with a minimum thickness as much as possible (1.5 mm or less).

These are sheet gaskets made of VALFLON (PTFE) with excellent chemical resistant and non-stick properties. (VALFLON is a registered trademark in Japan for its fluorocarbon resin products of NIPPON VALQUA.)

VALQUALON Gasket / Black VALQUALON Gasket



VALQUA No. 7020 (食)

Features	In order to improve the cold flow (creep phenomenon), which is a weakness of PTFE, inorganic filler material is mixed into these gaskets. Provided with heat resistance, chemicals resistance, and anti-cold flow property, they are suited for lines handling various chemicals (high concentrated hot sulfuric acid, hot nitric acid, etc.).
Unsuitable fluids	Highly concentrated alkali such as sodium hydroxide, hydrofluoric acid, polymerizable monomer, etc.
Main component	PTFE, silica
Color	Beige

VALQUA No. 7026 (食)

Features	Similar to other companion products, No.7020, No.7026 gaskets have excellent heat resistance, chemicals resistance, and anti-cold flow properties, so that they are suited for lines handling various chemicals.
Unsuitable fluids	Oxidizing acids such as highly concentrated hot sulfuric acid and hot nitric acid, polymerizable monomer, etc.
Main component	PTFE, carbon
Color	Black

New VALFLON Gasket / VALFLON Gasket



▲No.7010

VALQUA No. 7010-EX (食)

Features	No.7010-EX gaskets are made of "NEW VALFLON" material that has improved creep phenomenon, while maintaining the PTFE's excellent heat resistance, chemicals resistance, and non-stick properties. Thus, they have a long service life for heat cycles, contributing to extending the operating life of gaskets.
Unsuitable fluids	Polymerizable monomer, etc.
Main component	PTFE
Color	White

VALQUA No. 7010 (食)

Features	These gaskets are made by punching virgin PTFE sheet. As these gaskets are liable to cause cold flow, the gaskets should be installed in grooves or tongue and groove flanges in principle.
Main component	PTFE
Color	White

VALFON Soft Sheet



VALQUA No. 7GP61 (Sheet) / 7GP66 (Gasket) VALQUA No. 7GP61S (Sheet) / 7GP66S (Gasket) (食)

Features	These highly flexible sheets have a specially made mesh construction, while taking advantage of the PTFE's excellent chemicals resistance and heat resistance properties.
Main component	PTFE
Color	White

(食) Conforms to the Food Sanitation Act and standards for food and additives

Design data

Allowable ranges

VALQUA No.	Temperature (°C)	Pressure (MPa)
7020 7026	-200~200	4.0
7010 ⁽¹⁾ 7010-EX	-50~100 -50~150	1.0
7GP66/7GP66S	-240~260	2.0

Note(1) For No.7010, grooved flanges should be used in principle.
 Remark Temperature and pressure show individual service limits.

Dimensions

VALQUA No.	Nominal thickness (mm)	Size (mm)
7020	1.0, 1.5	1000×1000
	2.0, 3.0	1270×1270
7026	1.5, 2.0, 3.0	1270×1270
7010	1.0, 1.5, 2.0, 3.0	Max. OD 1300
7010-EX	1.5, 3.0	Max. OD 1100
7GP61/7GP61S	0.5, 1.0, 1.5	1500×1500
7GP66/7GP66S	2.0, 3.0	Max. OD 1450

Design Criteria

VALQUA No.	Thickness (mm)	Gasket factor "m"	Minimum design seating stress "y" (N/mm ²)	Recommended tightening stress (MPa) ⁽¹⁾	
				Liquid	Gas
7020 7026	1.0	3.5	24.5	20.0	24.5
	1.5	3.2	22.5		
	2.0	3.0	19.6		
	3.0	2.5			
7010 ⁽²⁾ 7010-EX	1.0, 1.5	3.0	19.6	10.0	15.0
	2.0	2.5	14.7		
	3.0	2.0			
7GP66/7GP66S	0.5~3.0	2.5	19.6	20.0	24.5

Notes (1) The recommended tightening stress is the pressure required under standard conditions without consideration to the endforce due to internal fluid. It is the stress on the contact area of the gasket.

(2) For No.7010, grooved flanges should be used in principle.

Remark The m, y values of VALFLON Gaskets are the same as those of fluororesin gaskets specified in JIS B 2206. However, the values listed for No. 7010, No. 7010-EX, No. 7GP66 and No. 7GP66S are our recommendations.

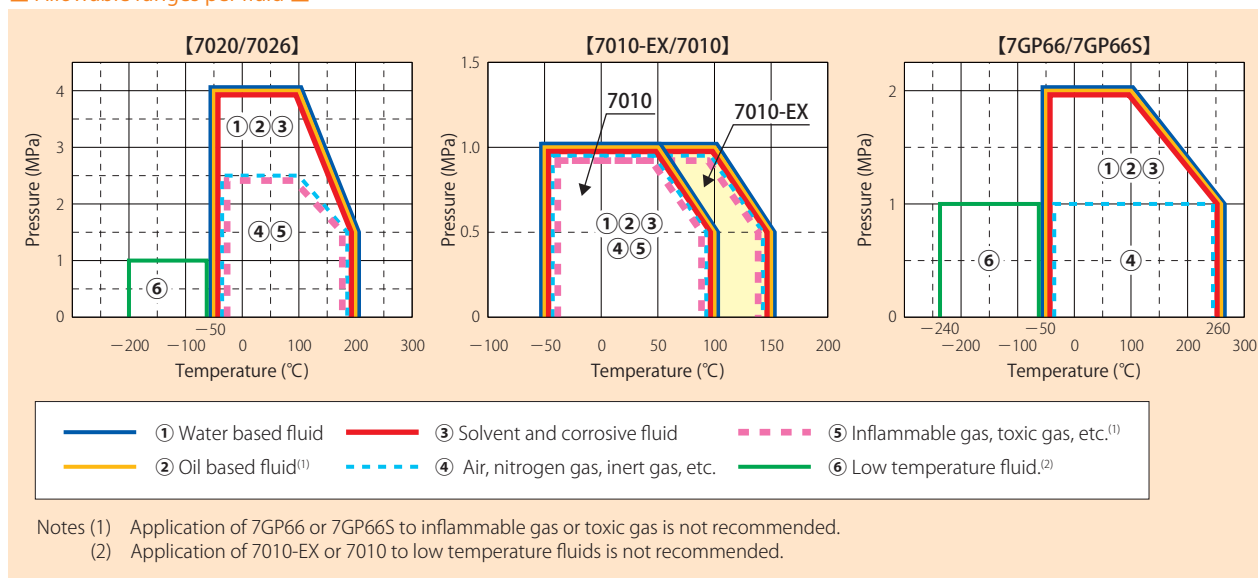
Characteristic Values of VALFLON Gaskets

Items	7020		7026		7010-EX		7010		7GP66		Remark	
Thickness (mm)	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	—	
Tensile strength (MPa)	15.6	15.8	24.2	23.2	26.4	24.2	30.2	27.3	24.0	18.4	JIS R 3453	
Compressibility (34.3MPa)	4	5	4	5	20	12	19	12	69	71		
Recovery (34.3MPa)	69	54	67	63	63	48	51	64	15	16		
Density (kg/m ³)	2330	2300	2070	2070	2210	2200	2170	2180	620	670	—	
Creep relaxation (20.6MPa)(%)	100°C×22h	37.2	55.0	42.8	60.8	63.7	79.6	75.9	88.4	51.9	68.3	JIS R 3453
	200°C×22h	66.7	81.0	79.3	85.5	86.0	90.8	92.4	97.3	59.3	75.3	
Sealability ⁽¹⁾ (Pa·m ³ /s) Without paste	1.7×10 ⁻⁴ or below		1.7×10 ⁻⁴ or below		1.7×10 ⁻⁴ or below		1.7×10 ⁻⁴ or below		2.8×10 ⁻⁴		—	

Note (1) Sealability test criteria: JIS 10K50A, Internal pressure He 1.0MPa, Tightening stress 25.5Mpa, Thickness 1.5mm

Remark The above values are measurements, and not regulatory values.

Allowable ranges per fluid





CORDSEAL <Soft> is a marshmallow shaped free-size sealing material, which has been modified to be flexible and very tough, while maintaining the PTFE's excellent chemical resistance and heat resistance properties. Three types with different cross sections are available: oval type, flat type, round type.

CORDSEAL <Soft> [oval type]

VALQUA No. **7GS66A**

String shaped product with an oval cross section [string type] and adhesive to improve workability.



Cross section

Standard dimensions

Nominal size <Width> (mm)	Thickness (mm)	Length (m)
3	1.5	30
6	3.0	15
9	4.0	8
12	5.0	5
16	6.0	
20		

CORDSEAL <Soft> [tape type]

VALQUA No. **7GS62A**

Adhesive belt shaped product (1 to 3 mm thick) with a flat cross section [tape type].



Cross section

Standard dimensions

Nominal size <Width> (mm)	Thickness (mm)	Length (m)
20, 30, 50	1.0	15
	2.0	5
	3.0	

CORDSEAL <Soft> [rope type]

VALQUA No. **7GS64N**

Non-adhesive rope shaped products with a round cross section [rope type]. (食)



Cross section

Standard dimensions

Nominal size <Width> (mm)	Length (m)
2	40
4	20
6	10
8	7
10	5
12	

Allowable ranges

Temperature (°C)	-240~260	
Pressure (MPa)	Gas	2.0
	Liquid	5.0

Remark Temperature and pressure show individual service limits.

Selection guidelines

- ▼The smaller the cross section size, the higher the sealing pressure, in so far as the flange surface is in good condition.
- ▼The widths after tightening of CORDSEAL <Soft> No.7GS66A and No.7GS64N will be about 1.5 to 2.5 times the nominal dimension. Thus, select the products with a width about one half or less than the contact width of the gaskets to be used. The following table provides a measure showing the relationship between the flange nominal dimension and the nominal dimension of the CORDSEAL <Soft> No.7GS66A:

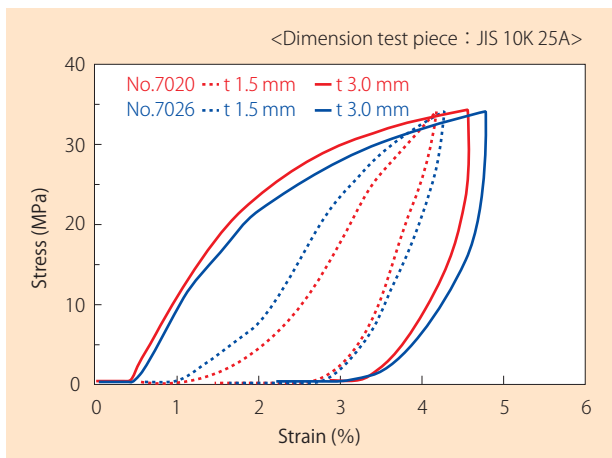
Flange nominal Dimension	~500A	500~1000A	1000~1500A	1500A~
Nominal dimension of CORDSEAL <Soft>	3~9	6~12	9~12	12~20

Applications

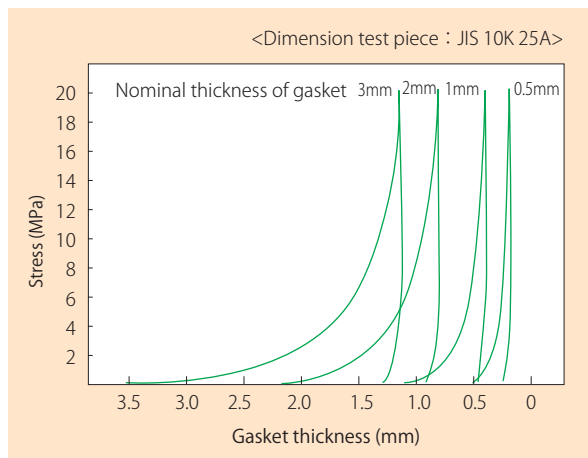
- ▼Gaskets for large diameter equipment which is liable to have rough finished flange surface, increased strain, or insufficient tightening force.
- ▼Gaskets for towers, tanks, ovens, heat exchangers and pressure vessels adopting FRP, glass lining, resin lining, rubber lining, ceramics or impervious graphite.
- ▼Gaskets for duct flanges and pipe flanges.
- ▼Gland packing for valves.

(食) Conforms to the Food Sanitation Act and standards for food and additives

■ Stress strain characteristics of VALQUALON (No.7020/7026) ■



■ Stress strain characteristics of VALFLON Soft Sheet (No.7GP66) ■



■ Notes to be observed in design and usage ■

▼ Notes to be observed in design

- Determine the number and size of bolts, and gasket dimensions to provide gaskets with sufficient tightening stress. Also, check the flange construction and bolt arrangement to ensure uniform distribution of tightening stress.
- Being liable to suffer cold flow, these gaskets have to be used in locations permitting tightening control including periodic retightening. Since the gaskets are composed mainly of thermoplastic PTFE, retightening shall not be performed under hot temperature conditions, but under cold temperature conditions after initial heating. For No.7010, grooved flanges should be used in principle.
- Determine the construction, material and dimensions so as to prevent warpage or bowing of the flange at the time of application of internal pressure.
- Consideration shall be given in design to prevent application of excessive thermal stress or repetitive bending stress on the joints.
- Piping design shall not allow accumulation of drain or scale at the flange section.
- Consideration shall be given to prevent transmission of vibration to the joints.

▼ Notes to be observed in storage

- Store these products in a cool and dark place not subject to direct sunshine.
- Storage selected shall be in a clean environment, free from dust as well as from high temperatures & high humidity and corrosive atmosphere.
- If hanged on nails or the like, gaskets may suffer breakage or permanent deformation, so that, as far as practicable, they should be put in a can or wrapped in a polyethylene bag and stored in a paper box.
- Large sized gaskets shall be put between larger plates without rolling and placed horizontally for storage.

▼ Notes to be observed before installation

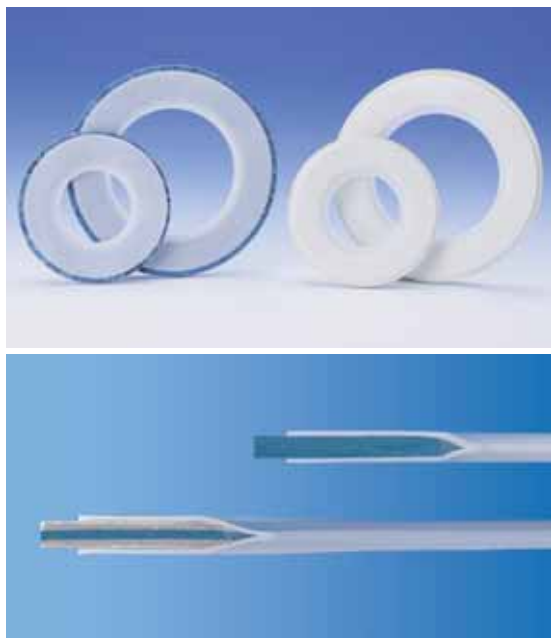
- Check the perpendicularity of the flange and the pipe.
- Ensure the shaft alignment of the mating flanges.
- Check for any deformation of flanges.
- When changing only gaskets for the existing equipment or at a piping joint, clean the connecting section and check for any damage, and repair if required.
- Take off the rust at the flange surface, and repair any dents and dings.
- Pay attention not to damage the gaskets during storage or during installation work.
- Dimensions of this product may change after fabrication due to the characteristics of the raw material.

▼ Notes to be observed during installation work

- Install the gaskets in a clean environment so as to prevent entry of foreign matters between the gaskets and the flanges.
- If gasket paste is to be used, apply a minimum amount of "NEW VALFLON Paste" uniformly. Also care shall be exercised after application of paste, to prevent adhesion of dust and the like.
- Flange bolts shall be gradually tightened each time, and repeat this process 4 to 5 times, so as to finally ensure uniform tightening.
- When tightening, pay attention to prevent the occurrence of crush.
- At the time of load up or restarting, be sure to carry out retightening. Special attention is necessary, especially when using gaskets of 150Lb1B or smaller, or those with a smaller diameter or smaller gasket width, since gasket's tightening stress is likely to be excessive.
- If retightening of gaskets that have already once experienced leakage, fails in preventing leakage, replace them with new ones.

This is a VALFLON (PTFE) envelope gasket using the Compressed Non-asbestos Fiber Sheet or Expanded Graphite Sheet as core material.

Three types, N type, S type and H type are available based on the construction of the core and additionally three types of envelope configuration are also available.



VALFLON Envelope Gasket [Core: N Type]

VALQUA No. **N7030 (N) / N7031 (N) / N7035 (N)**

General use Envelope Gasket using Compressed Non-Asbestos Fiber Sheet in the core.

VALFLON Envelope Gasket [Core: S Type]

VALQUA No. **N7030 (S) / N7031 (S) / N7035 (S)**

High temperature and high pressure use an Envelope Gasket for preventing the flow of a PTFE jacket, where Felt Sheets are attached on both sides of the Compressed Non-asbestos Fiber Sheet to form the core.

VALFLON Envelope Gasket [Core: H Type]

VALQUA No. **N7030 (H) / N7031 (H) / N7035 (H)**

This is an envelope Gasket that can be used under conditions with higher temperatures, where Felt Sheets are attached on both sides of an Expanded Graphite Sheet with a stainless steel sheet to form the core.

Types

VALQUA No.	N type	S type	H type
N7030 Series	<p>VALFLON (PTFE) jacket</p> <p>Compressed Non-asbestos Fiber Sheet</p>	<p>VALFLON (PTFE) jacket</p> <p>Non-asbestos fiber felt</p> <p>Compressed Non-asbestos Fiber Sheet</p>	<p>VALFLON (PTFE) jacket</p> <p>Non-asbestos fiber felt</p> <p>Expanded Graphite Sheet</p> <p>Thin stainless steel</p>
N7031 Series⁽¹⁾	<p>VALFLON (PTFE) jacket</p> <p>Compressed Non-asbestos Fiber Sheet</p>	<p>VALFLON (PTFE) jacket</p> <p>Non-asbestos fiber felt</p> <p>Compressed Non-asbestos Fiber Sheet</p>	<p>VALFLON (PTFE) jacket</p> <p>Non-asbestos fiber felt</p> <p>Expanded Graphite Sheet</p> <p>Thin stainless steel</p>
N7035 Series	<p>VALFLON (PTFE) jacket</p> <p>Compressed Non-asbestos Fiber Sheet</p>	<p>VALFLON (PTFE) jacket</p> <p>Non-asbestos fiber felt</p> <p>Compressed Non-asbestos Fiber Sheet</p>	<p>VALFLON (PTFE) jacket</p> <p>Non-asbestos fiber felt</p> <p>Expanded Graphite Sheet</p> <p>Thin stainless steel</p>

Note (1) No.N7031 Series has a PTFE outer cover with one lap joint.

Remark As special purpose VALFLON Envelope Gaskets, products for monomers, for radiation resistance use, and for outer edge welded type are also available. Further information is available on request.

Design data

Allowable ranges

VALQUA No.	Temperature (°C)	Pressure (MPa)
N7030 (N)	-100~150 ⁽¹⁾	1.5
N7031 (N)		
N7035 (N)		
N7030 (S)	-100~200 ⁽¹⁾	2.0
N7031 (S)		
N7035 (S)		
N7030 (H)	-100~260	3.0
N7031 (H)		
N7035 (H)		

Note (1) If the service temperature exceeds 120°C, be sure to tighten uniformly the gaskets so as not to apply piping stress on these gaskets. For applications subject to frequent thermal variations or pressure changes, or for places where maintenance is difficult to carry out, WHITETIGHT (No.7590 Series) is recommended.

Remark Temperature and pressure show individual service limits.

Dimensions

VALQUA No.	Nominal thickness (mm)	Size (mm)
N7030 (N)	1.6, 2.8, 3.8	1000
N7031 (N)		300~3000
N7035 (N)		1000
N7030 (S)	2.9, 3.2, 5.4	1000
N7031 (S)		300~3000
N7035 (S)		1000
N7030 (H)	4.0, 4.5, 5.6	950
N7031 (H)		300~3000 ⁽¹⁾
N7035 (H)		950

Notes (1) The standard thickness is 4.5mm for those that exceed the 950mm size of No.N7031 (H). Since it requires special fabrication, please contact us for more information.

(2) Since an Expanded Graphite Sheet is used for an H type, the product cannot be folded when it is shipped.

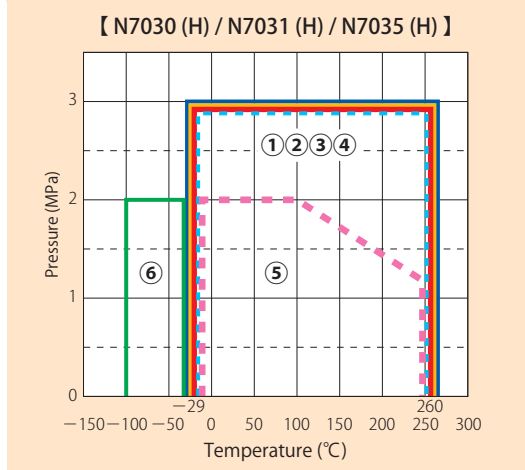
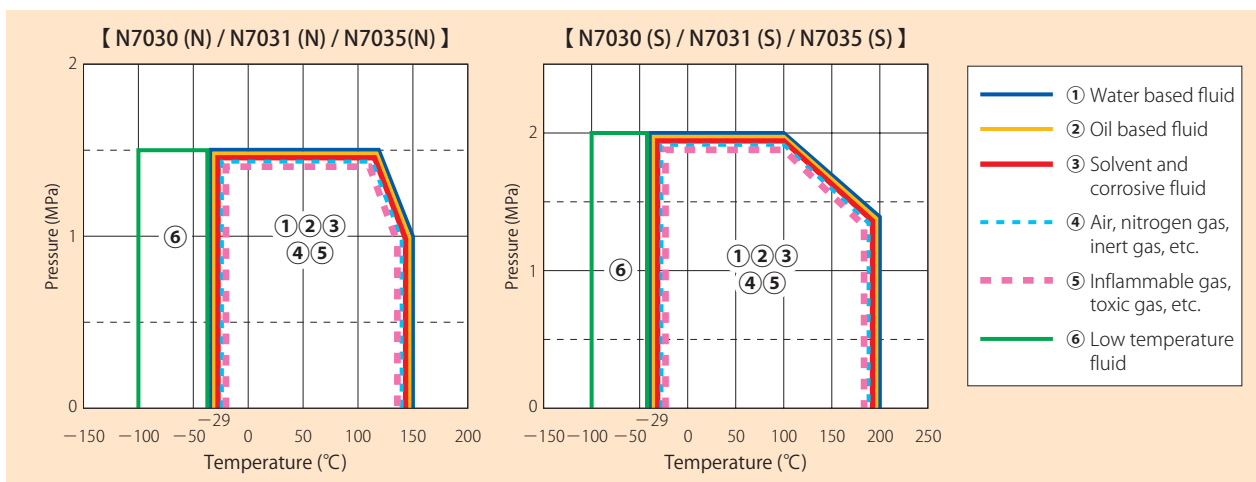
Design Criteria

VALQUA No.	Gasket factor "m"	Minimum design seating stress "y" (N/mm ²)	Recommended tightening stress (MPa) ⁽¹⁾	
			Liquid	Gas
N7030 Series	3.5	14.7	15.0	20.0
N7031 Series	4.0	19.6	20.0	24.5
N7035 Series	3.5	14.7	15.0	20.0

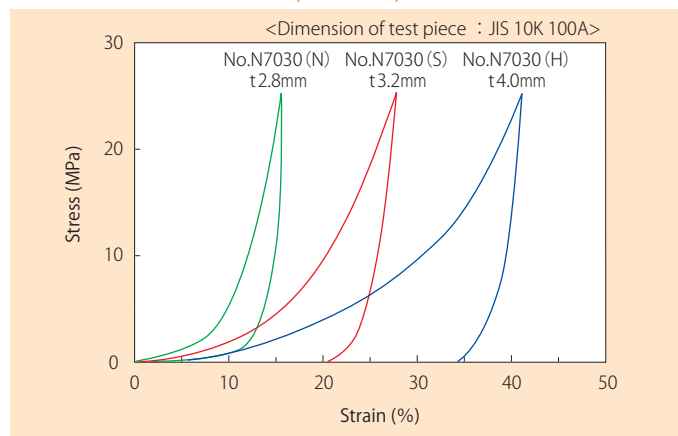
Note (1) The recommended tightening stress is the pressure required under standard conditions without consideration to the endforce due to internal fluid. It is the stress on the contact area of the gasket.

Remark The m, y values are the same as those of fluororesin gaskets specified in JIS B 2206.

Allowable ranges per fluid



Stress strain characteristics (No.N7030)



■ Notes to be observed in design and usage ■

▼ Notes to be observed in design

- Determine the number and size of bolts and gasket dimensions to provide gaskets with sufficient tightening stress, and also design the construction so as to ensure uniform distribution of tightening stress.
- Determine the construction, material and dimensions so that the flange is not likely to cause rotation.
- Consideration shall be given in design to prevent application of excessive thermal stress or piping stress on the joints.
- Piping design shall not allow accumulation of drain or scale at the flange section.
- Consideration shall be given to prevent transmission of vibration to the joints.
- Although the likelihood of occurrence of cold flow in the VALFLON (PTFE) has been reduced by adopting flexible core materials, prolonged operation or heat cycles may cause bolts to be loosened. Therefore, these gaskets have to be used in locations permitting periodic checks of loose bolts and also allowing, appropriate tightening force to be applied.
- When installing these gaskets onto titanium flanges, check to see if fluids to be handled contain chlorine ions, as even a trace amount of chlorine ions may cause crevice corrosion to develop on the titanium surface in contact with the gaskets. To prevent the occurrence of this crevice corrosion, titanium-palladium alloy is recommended.
- The inner diameter of VALQUA No.N7035 Series has a square shape, which serves to eliminate accumulation of liquids, if the gaskets are properly sized to meet the flange inner diameter. For further details, please contact us, as gaskets can be sized to meet the flange inner diameter.
- Even when resin, glass or hard rubber lined flanges comply with JIS flange standards, their inner diameter or the outer diameter in contact with the gaskets are different from the standards. It is therefore necessary to determine the gasket dimensions in conformity with the size of each flange. Further information is available on request. Also products are available on request, where the joint sheet has a core made of corrugated metallic sheet.

▼ Notes to be observed in storage

- Store these products in a cool and dark place not subject to direct sunshine.
- Storage selected shall be in a clean environment, free from dust as well as from high temperatures & high humidity and corrosive atmosphere.
- If hanged on nails or the like, gaskets may suffer breakage or permanent deformation, so that, as far as practicable, they should be put in a can or wrapped in a polyethylene bag and stored in a paper box.
- Large sized gaskets should be put between larger plates without rolling and placed horizontally for storage.
- If Non-asbestos Felt Sheet becomes wet due to aqueous liquids, its crush strength will decrease. It is therefore necessary to keep it dry in a polyethylene bag and also do not tighten when it is wet.

▼ Notes to be observed before installation

- Check perpendicularity of the flange and the pipe.
- Ensure the shaft alignment of the mating flanges.
- Check for any deformation of flanges.
- When changing only gaskets for the existing equipment or at a piping joint, clean the connecting section and check for any damage, and repair if required.
- Take off the rust at the flange surface, and repair any dents and dings.
- Pay attention not to damage the gaskets during storage or during installation work.

▼ Notes to be observed during installation work

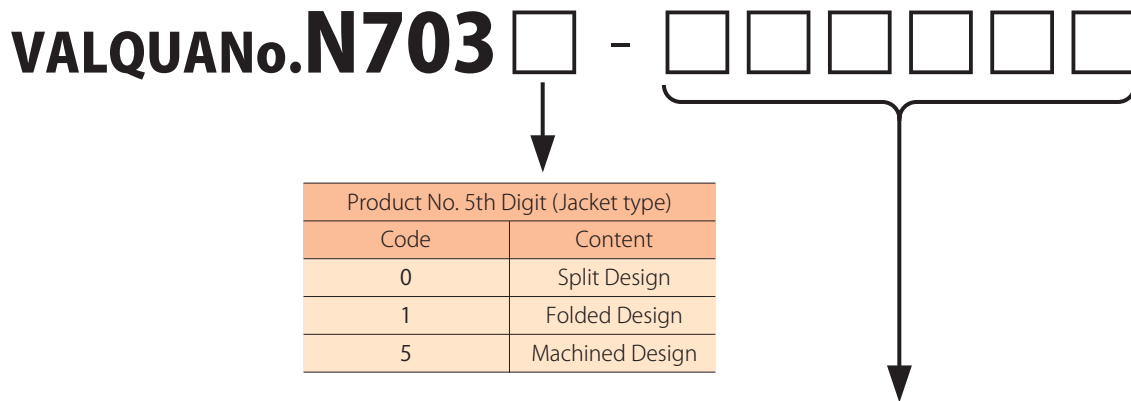
- Install the gaskets in a clean environment so as to prevent entry of foreign matters between the gaskets and the flanges.
- If gasket paste is to be used, apply a minimum amount of "NEW VALFLON Paste" uniformly. Also care should be exercised after the application of paste, to prevent adhesion of dust and the like.
- Flange bolts shall be gradually tightened each time, and repeat this process 4 to 5 times, so as to finally ensure uniform tightening.
- As the VALFLON (PTFE) outer cover is slippery, crush may occur, if an excessive torque has been applied at the time of tightening or if it is not uniformly tightened. This is particularly applicable in the case of smaller diameter ones, and care should be exercised in tightening so as not to apply gasket stress exceeding 49.0 MPa.
- A small gap between flanges present at the time of gasket replacement would cause the VALFLON (PTFE) outer cover to touch the outside diameter of the raised face or the flange inside, and fold over. Tightening in this condition may cause leakage. In order to prevent such fold over of the VALFLON (PTFE) outer cover, a gasket-outer edge welded type (ODS type) is available. Further information is available on request.
- At the time of tightening gaskets, air contained in the core material may be discharged, so please be careful not to mistake this discharge for leakage when a leakage test is performed using soap water. Our recommendation is to check leakage sometime after tightening the gaskets.
- Insufficient tightening force may lead to the permeation of soap water for airtightness test or rain water, causing the Non-Asbestos Felt Sheet to soften and squeeze out from the gaskets. In such a case, gasket stress decreases, which may result in leakage.
- At the time of load up or restarting, be sure to carry out retightening.
- If retightening of gaskets that have already once experienced leakage, fails in preventing leakage, replace them with new ones.

Ordering Information

Please specify the following to place an order for these products:

1. Product number	4. Nominal pressure, Nominal diameter	7. Thickness
2. Shape	5. Operating temperature, Fluid	
3. Presence of special specification	6. Quantity	

Please refer to the following guide if necessary:



1st Piping		2nd Jacket material		3rd Inner structure		4th Outside welding type		5th Shape		6th Insert material	
Code	Content	Code	Content	Code	Content	Code	Content	Code	Content	Code	Content
S	General piping	5	PTFE	S	No.6500 + Non-asbestos Felt Sheet	Z	No welding	Z	Raised Face <Standard size>	Z	Standard <No.6500>
T	VALFLON lined piping	1	PFA	N	Insert material usually (No.6500)	P	Complete all outside welding ⁽²⁾	A	Raised Face <Non-Standard Size>	A	No.6502
G	Glass lined piping	4	FEP	H	Flexible Graphite Sheet with a metallic reinforcement plate + Non-asbestos Felt Sheet	W	All outside welding (General use)	B	Flat Face <Envelope fitting inside bolt circle>	B	No.6503
				R	Metal ⁽¹⁾ + No.6500 + Non-asbestos Felt	R	All side spot welding	E	Flat Face <Full covered with envelope>	H	Expanded Graphite Sheet with a metallic reinforcement plate
				X	Others	S	Partial side spot welding	X	Others	X	Others ⁽³⁾
						K	Simple welding				

- Notes (1) Please specify the metal shape and the material of the core material.
 (2) Only VALFLON Lining (No. N7035-T5NP) has all-around complete fusion.
 (3) Using a rubber sheet is not generally recommended for core material since it would cause damage to the PTFE jacket.

Example of Description

High temperature use (H) : N703 - HH

A multi-layer structure using the Expanded Graphite Sheet with a metallic reinforcement plate: N703 - RH

Making use of the characteristics of the pure graphite sealing material VALQUAFOIL, these gaskets are excellent in heat and chemicals resistance as well as radiation resistance, and are applicable to wide temperature ranges from cryogenic to high temperatures.

("VALQUAFOIL" is a registered trademark in Japan for its Expanded graphite of NIPPON VALQUA.)



VALQUAFOIL Gasket

VALQUA No. **VF-30**

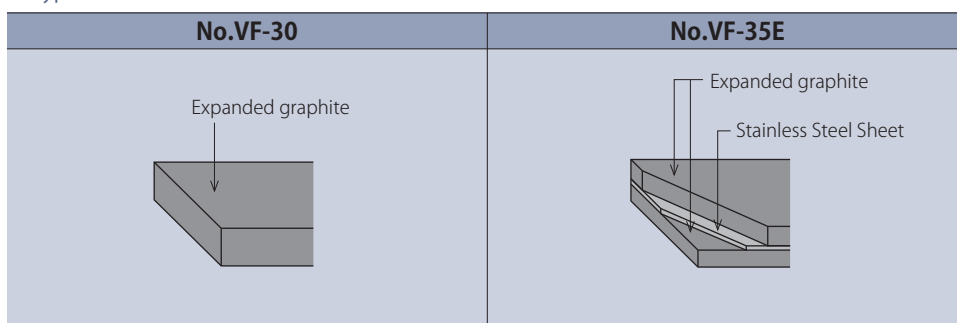
No.VF-30 Gasket is made by forming VALQUAFOIL into sheet, which is then punched into a specified flat shape.

VALQUAFOIL Gasket

VALQUA No. **VF-35E**

This gasket is made by attaching VALQUAFOIL Sheets on both sides of a thin stainless steel sheet (0.05 mm thick), which is then punched into a specified flat shape.

■ Type ■



Remark In addition to the above, VALQUAFOIL Gathered Tape (No.VF-50), VALQUAFOIL Flat Tape with Adhesive (No.VF-60), and VALQUAFOIL Gathered Tape with Adhesive (No.VF-70) are also available. Further information on these products is available upon request.

Design data

■ Allowable ranges ■

VALQUA No.	Temperature (°C)	Pressure (MPa)
VF-30	-240~400	2.0
VF-35E		5.0

Remarks 1. Temperature and pressure show individual service limits.
2. Not applicable to oxidizing acids such as hot, concentrated sulfuric acid and concentrated nitric acid.

■ Dimensions ■

VALQUA No.	Thickness ⁽¹⁾ (mm)	Size (mm)
VF-30	0.4, 0.8, 1.0, 1.2, 1.6, 3.0	1000×1000
VF-35E	0.8, 1.6, 3.0	

Note (1) These products are available as gasket processed products.

■ Design Criteria ■

VALQUA No.	Gasket factor "m"	Minimum design seating stress "y" ⁽¹⁾ (N/mm ²)	Recommended tightening stress (MPa) ⁽²⁾	
			Liquid	Gas
VF-30	2.0	26.0	26.0	40.0
VF-35E		29.4	30.0	

Notes (1) In accordance with the description in JPI-7R-70-88.

(2) The recommended tightening stress is the pressures required under standard conditions without consideration to the endforce due to internal fluid. It is stress on the contact area of the gasket.

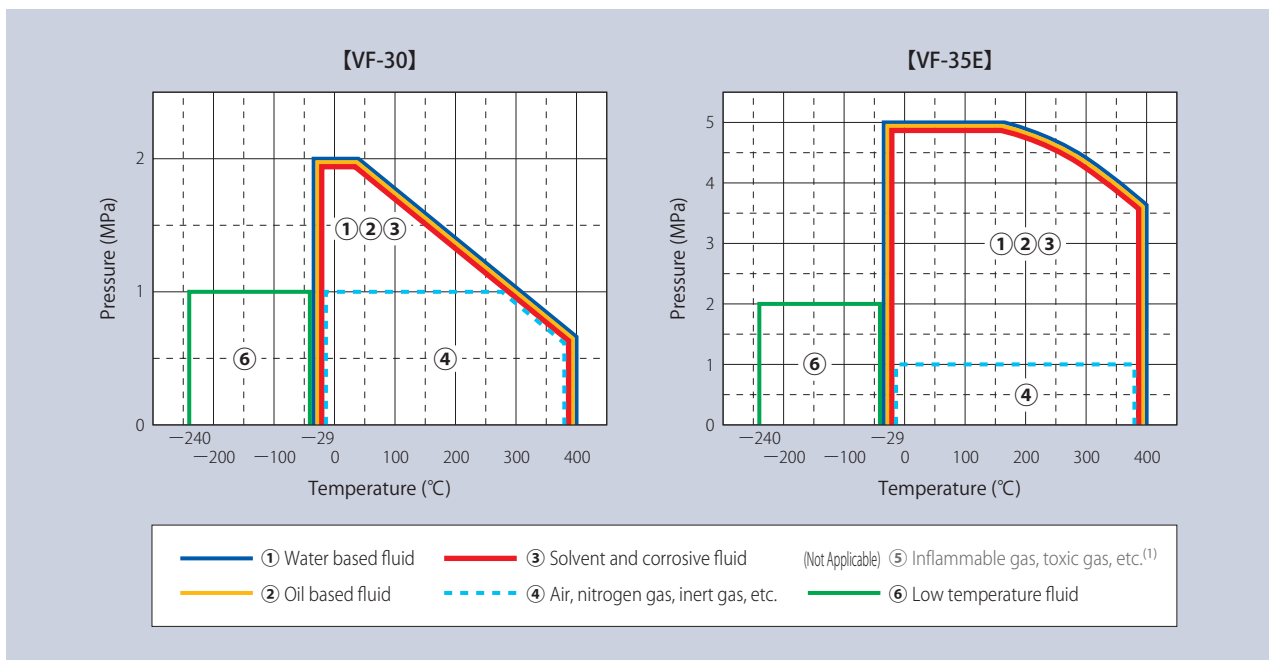
■ Characteristic Values of VALQUAFOIL Gaskets ■

Item		VF-30		VF-35E ⁽¹⁾		Remark
Thickness (mm)		1.6	3.0	1.6	3.0	—
Tensile strength (MPa) (%)		3.8	3.8	15.6	10.3	JIS R 3453
Compressibility (34.3MPa) (%)		45	43	42	42	
Recovery (34.3MPa) (%)		11	12	12	13	
Density (kg/m ³)		1067	1054	1216	1143	—
Creep relaxation (20.6MPa) (%)	100°C × 22h (%)	7.3	12.4	9.5	9.2	JIS R 3453
	200°C × 22h (%)	10.7	14.4	10.2	16.4	

Note (1) These characteristic values of No.VF-35E correspond to those incorporating a thin stainless steel sheet.

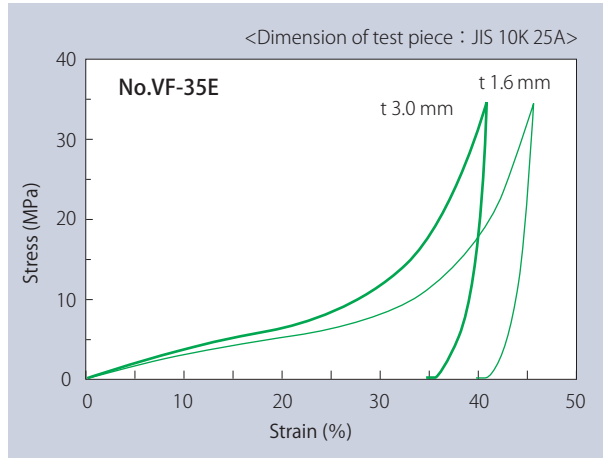
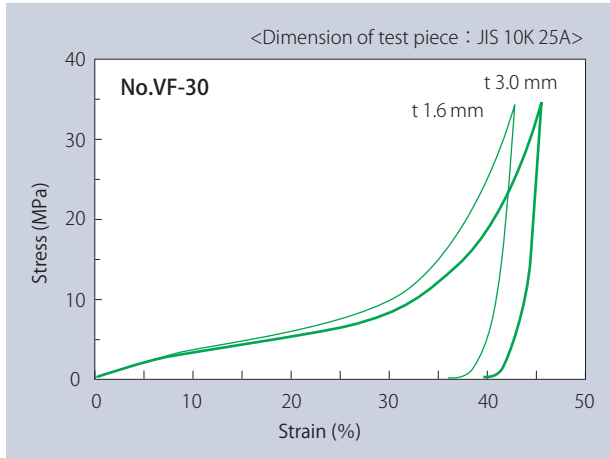
Remark The above values are measurements, and not regulatory values.

■ Allowable ranges per fluid ■



Note (1) Application to inflammable gas or toxic gas is not recommended.

■ Stress strain characteristics ■



■ Notes to be observed in design and usage ■

▼ Notes to be observed in design

- Determine the flange construction and bolt arrangement to ensure uniform distribution of tightening stress to prevent warpage or bowing of the flange.
- Be careful about the pipe length, as the compressibility will change.
- Consideration shall be given in design to prevent application of excessive thermal stress or repetitive bending stress, or the transmission of vibration to the joints.
- Piping design shall not allow accumulation of drain or scale at the flange section.

▼ Notes to be observed in storage

- Handle these products with care, as their sheet surface is liable to be damaged.
- Store these products in a cool and dark place not subject to direct sunshine.
- Storage selected shall be in a clean environment, free from dust as well as from high temperature & high humidity and corrosive atmosphere.
- If hanged on nails or the like, gaskets may suffer breakage or permanent deformation, so that they should be put between larger plates and placed horizontal for storage.

▼ Notes to be observed before installation

- Check perpendicularity of the flange and the pipe.
- Ensure the shaft alignment of the mating flanges.
- When changing only gaskets for existing equipment or at a piping joint, clean the connecting section and check for any deformation of flanges, damage, rust, and repair if required.
- Pay special attention not to damage the gaskets during transportation or during installation work.

▼ Notes to be observed during installation work

- When installing gas seals, refer to the following "Countermeasures against permeation leakage".
- Install the gaskets in a clean environment so as to prevent entry of foreign matters between the gaskets and the flanges.
- Flange bolts shall be gradually tightened each time, and repeat this process 4 to 5 times, so as to ensure complete uniform tightening.
- When tightening, pay attention to prevent the occurrence of crush. In particular, when using gaskets of 150 Lb, 1B or smaller, or those of smaller gasket width, care should be given as gasket stress is likely to be excessive.
- At the time of load up or restarting, be sure to carry out retightening.
- If retightening of gaskets that have once experienced leakage failed in preventing leakage, replace them with new ones.
- Since the allowance of tightening stress is low, please pay special attention to crushing if using smaller diameter gaskets where high tightening stress is applied.

▼ Countermeasures against permeation leakage

- Since permeation leakage is prone to occur in VALQUAFOIL gasket, the following points shall be observed for gas seals:
 1. Apply gasket paste on the cut surface of the gasket inner diameter side. Applying gasket paste on the gasket surface that contacts the flange would be likely to cause crushing; therefore, special attention is required when tightening, and please apply a minimum amount of gasket paste.
 2. Maintain the tightening stress to be around 35 MPa. Also use ring gaskets instead of full-face gaskets, so as to ensure proper tightening stress.
 3. As much as possible, use gaskets with a minimum thickness (1.5 mm or less).







Gasket Paste is an agent employed to enhance the sealing effect of gasket contact surfaces and to facilitate peeling off gaskets when disassembling joints. Select an optimum type among a variety of products.

Product name	Description	Color	Applicable fluids	Allowable temp. range (°C)	Mode of packing
Gasket Paste No.5	Black paste containing special oil-soluble adhesive compounded with fine particles of graphite.	Black	Water based fluids such as steam, hot water, water, seawater, acid, alkali, salt solutions and alcohol	- 200 ~ 200	2.5kg polyethylene container
Gasket Paste No.5M	White paste containing special oil-soluble adhesive compounded with fine particles of mica.	Pale yellow	Water based fluids such as steam, hot water, water, seawater, acid, alkali and salt solutions, where white paste is specially required	- 200 ~ 200	2.5kg polyethylene container
Gasket Paste No.6	Black paste containing special water-soluble adhesive, which have high oil and solvent resistance, compounded with fine particles of graphite.	Black	Hydrocarbon based fluids such as petroleum based oil, oil gas, solvent, solvent vapor, animal & vegetable oil, LNG and general gases	- 200 ~ 900	2.5kg polyethylene container
Gasket Paste No.6M	Paste containing a water-soluble adhesive having high oil and solvent resistance, mixed with fine mica particles.	Pale yellow	Hydrocarbon based fluids such as petroleum based oil, oil gas, solvent, solvent vapor, animal & vegetable oil, LNG and general gases, where white paste is specially required	- 200 ~ 900	2.5kg polyethylene container
SEALPASTE No.SEALP	Light brown paste containing a special non-drying oil adhesive, compounded with inorganic filler material and a small amount of solvent.	Light brown	When handling water, air and hydrocarbons such as gasoline, kerosene, lubricating oil, natural gas, LPG, refrigerants, hydrogen sulfide, ethylene, butane, and ethane, and also where the prevention of crevice corrosion on the flange surface is required.	- 50 ~ 300	800g metallic container with brush
NEW VALFLON Paste No.PSVO	It is a fluororesin powder that is water-dispersed using surfactant agents.	White	When handling highly corrosive fluids such as strong acids, alkalis, or halogens and when handling oxygen where noncombustible materials are required.	- 200 ~ 300 (O2 gas 100°C)	100g metallic tube
					1 kg polyethylene container

Note

Excessive application of gasket paste on the contact surface between the gasket and the flange would cause the gasket to slide when tightened and be likely to cause crushing. Therefore, when applying the gasket paste on the contact surface between the gasket and the flange, please apply a thin and uniform coating of the paste.

Spiral Wound Gaskets use inorganic paper, VALQUAFOIL (expanded graphite) and VALFLON (PTFE) tapes as filler materials, and they exhibit good elasticity by means of a V-shaped hoop. These gaskets are suitable at joints for pipe flanges, heat exchangers, towers & tanks, valve bonnets and other equipment that handle high temperature & high pressure fluids used in various industries including oil refining, chemical, power, gas and shipbuilding.

Name	Filler material	Basic type	With outer ring	With innerr ring	With inner & outer ring
					
CLEANTIGHT	Inorganic paper	No.8590	No.8591	No.8592	No.8596
BLACKTIGHT	VALQUAFOIL tape	No.6590	No.6591 ⁽¹⁾	No.6592	No.6596
WHITETIGHT	VALFLON tape	No.7590	No.7591 ⁽¹⁾	No.7592	No.7596
Lined Mica Filler Spiral Wound Gaskets	Mica + VALQUAFOIL tape	No.M590L	No.M591L	No.M592L	No.M596L
Mica Filler Spiral Wound Gaskets	Mica	No.M590	No.M591	No.M592	No.M596

Note (1) Since No.6591 and No.7591 may cause radial buckling in the inner diameter side depending on service conditions, employ gaskets with inner & outer rings as much as possible.

CLEANTIGHT



VALQUA No. 8590 Series

Features

This is a Spiral Wound Gasket using inorganic paper. The product is more economical compared to other products in which VALQUAFOIL or VALFLON is used.

- ▶ It has high heat resistance.
- ▶ Products that comply with nuclear power specifications are also available.

Applications

The product is suited for general-purpose products of utility lines that handle high temperature and high-pressure fluids.

NONASUPER



VALQUA No. 8590TN

Features

NONASUPER is made by winding hoops (SUS304) around the periphery of 3.2mm thick basic Spiral Wound Gaskets.

The product can be used with the same level of tightening force as that of a Compressed Non-asbestos Fiber Sheet.

- ▶ The maximum service temperature is 450°C.

Applications

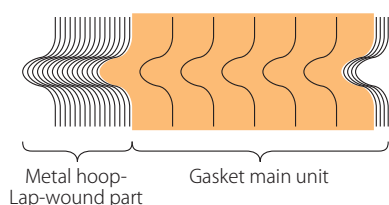
The product is suited for utility lines that handle high temperature fluids.

Dimensions

JIS 10K, JPI Class 150, Max 200A
<Thickness> 3.2mm

Composition

Hoop : SUS304 Filler material: Inorganic paper



■ Dimensions ■

VALQUA No.	Thickness (mm)	Pressure rating
8590TN	3.2	JIS 10K
		JPI Class 150

■ Design data ■

VALQUA No.	Recommended tightening stress ⁽¹⁾ (MPa)
8590TN	30.0

Note (1) The tightening stress corresponds to the projected area of the gasket main body only, and does not include the metal strip lap-wound section.

BLACKTIGHT / BLACKTIGHT for Extremely Low Temperature



▲6590 Series

VALQUA No. 6590 Series

Features

This is a Spiral Wound Gasket using VALQUAFOIL (expanded graphite) as filler material.

- ▶ Excellent air tightness that significantly improves sealing performance for gas and vacuums.
- ▶ Responds well to heat and pressure cycles, which reduces the frequency of retightening.
- ▶ They also have excellent radiation resistance (products complying with nuclear power specifications are available).
- ▶ They exhibit excellent sealing properties at very low temperatures. (No.6596VC type has been developed for cryogenic use. Further information is available upon request.)

Applications

These gaskets are particularly suited for handling high temperatures and high-pressure steam, heat transfer oil (except HTS). They are also suitable for extremely low temperature fluids.

VALQUA No. 6590VC Series

Features

This is a gasket for extremely low temperature application, and it has high sealability even at a low gasket stress by making the 6590 series more flexible.

- ▶ This product has excellent sealability under extremely low temperature conditions such as LNG.
- ▶ A process that can seal even under low gasket stress is used.

Applications

It is suitable for applications with extremely low temperature fluids such as LNG, liquid nitrogen and liquid hydrogen or those requiring a sealing property at low tightening stress.

WHITETIGHT



VALQUA No. 7590 Series

Features

Using VALFLON (PTFE) tape having excellent chemicals resistance as filler material, these Spiral Wound Gaskets are more effective than other filler materials in sealing corrosive fluids and air tightness, thus are suitable as gas and vacuum seals.

- ▶ Together with excellent corrosion resistance and a suitable selection of hoop materials, they can be applied to almost all fields of fluid applications.
- ▶ Excellent air tightness significantly improves sealing performance against gas and vacuums.

Applications

Particularly suitable as gaskets for corrosive fluid seals and oxygen as well as for gas and vacuum seals.

Lined Mica Filler Spiral Wound Gaskets / Mica Filler Spiral Wound Gaskets



▲M590 Series

VALQUA No. M590L Series

Features

This is a Spiral Wound Gasket made of expanded graphite filler and cloth-less mica filler made by a special manufacturing process, and it has excellent sealability and significantly improved heat resistance due to an anti-oxidation effect on expanded graphite by the mica filler.

- ▶ Maximum service temperature is 750°C.

Applications

For super-high temperature

VALQUA No. M590 Series

Features

This is a Spiral Wound Gasket using a clothless mica filler. The product minimizes strength deterioration due to heating.

Applications

For HTS (Oxidizer: a mixture of sodium nitrate, potassium nitrate and sodium nitrate) used as a high-temperature heat transfer oil

Ordering Information

Please specify the following to place an order for these products:

1. Product number	4. Presence of special specification	7. Quantity
2. Material	5. Nominal pressure, Nominal diameter	
3. Shape	6. Operating temperature, Fluid	

VALQUA No.					
Classification	Types	BLACKTIGHT	WHITETIGHT	CLEANTIGHT	Mica filler products
	Filler material	VALQUAFOIL tape	VALFLON tape	Non-Asbestos	Mica tape
Basic type		6590	7590	8590	M590
With outer ring		6591	7591	8591	M591
With inner ring		6592	7592	8592	M592
With inner & outer ring		6596	7596	8596	M596

Thickness ⁽¹⁾	
Nominal thickness	Code
1.6 mm	P
3.2 mm	T
4.5 mm	V
4.8 mm	M
6.4 mm	W
Others	X

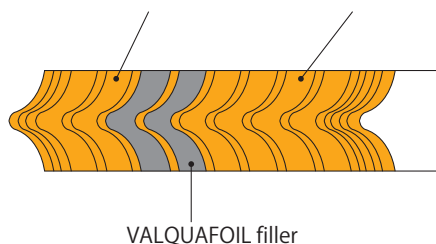
Supplementary information	
Content	Code
Graphite tape line added	L ⁽²⁾
Graphite tape line added with special requirements	S ⁽²⁾
Cryogenic Temperature service	C ⁽³⁾
Others	—

Note (1) Mica filler products are available in 4.5mm, 4.8mm and 6.4mm.

Notes (2) Available in CLEANTIGHT and Mica filler products.
(3) Applicable only to BLACKTIGHT.

▼ Spiral wound gaskets with lines

Non-asbestos inorganic filler or Mica filler



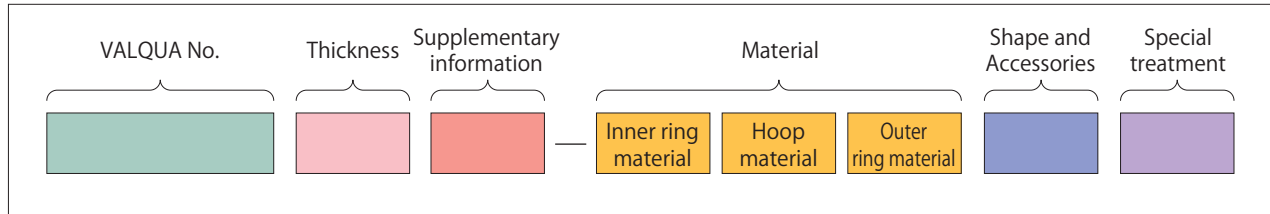
By winding VALQUAFOIL filler in the middle of inorganic fillers, these spiral Wound Gaskets have enhanced gas sealability with increased compatibility with flanges. Further, the inner filler and outer filler shuts off the oxygen supply, inhibiting the oxidation of VALQUAFOIL under oxidizing conditions and makes it possible to be used in high temperatures. Available in CLEANTIGHT or Mica filler products.

▼ Need for an Inner Ring

An inner ring has the function of maintaining the tightening force by preventing the gasket's main body from deforming toward the internal diameter. If installing into a non-groove flange that has no restraint on the internal diameter side, please use a product with an inner ring under the following conditions.

Classification	Type	No-inner ring type	With inner ring type
Rating		Class 600, 40K or lower	Class 900, 63K or higher vacuum
Dimensions		24B or lower	26B or higher
Filler material			VALFLON (PTFE), VALQUAFOIL (expanded graphite)
Fluid			Oxygen, toxic fluid, other highly hazardous fluid

Please refer to the following guide if necessary:



Material					
Inner ring material		Hoop material		Outer ring material	
Content	Code	Content	Code	Content	Code
SUS304	E	SUS304	E	SUS304	E
SUS304L	L	SUS304L	L	SUS304L	L
SUS310S	O	SUS310S	O	SUS310S	O
SUS316	G	SUS316	G	SUS316	G
SUS316L	H	SUS316L	H	SUS316L	H
SUS317L	Q	SUS317L	Q	SUS317L	Q
SUS321	J	SUS321	J	SUS321	J
SUS347	K	SUS347	K	SUS347	K
SUS410	R	SUS410	R	SUS410	R
SUS430	U	SUS430	U	SUS430	U
Monel 400	M	Monel 400	M	Monel 400	M
Nickel 201	N	Nickel 201	N	Nickel 201	N
Titanium TP340	T	Titanium TR270	T	Titanium TP340	T
Incoloy 800	W	Incoloy 800	W	Incoloy 800	W
Inconel 600	Y	Inconel 600	Y	Inconel 600	Y
Aluminum	A	Aluminum	A	Aluminum	A
Low CS	S	Hastelloy C276	V	Low CS	S
Hastelloy C276	V	Copper	C	Hastelloy C276	V
Others	X	Others	X	Others	X
Not applicable	Z			Not applicable	Z

Shape and Accessories		Special treatment	
Content	Code	Content	Code
Basic model	Z	Without Special treatment	Z
Basic model + Handle	B	Nuclear application	E
Basic model + Rib(s) heat exchanger application	Y	Pitting corrosion preventive finish	C
Basic model + Hanger	H	Degreased	B
Irregular shape without accessories	E	Other special treatment (Also includes combinations for the above special treatments)	X
Other special shapes	X		

▼ Combination of special treatments and each product

VALQUA No.	Names	Nuclear application (Code E)	Pitting corrosion-preventive finish (Code C)	Degreased (Code B)
6590 Series	BLACKTIGHT	○	Standard	○
7590 Series	WHITETIGHT	×	×	○
8590 Series	CLEANTIGHT	○	○	○
M590 Series	Mica filler products	×	○	○

○ Available
× Unavailable

Design data

Allowable ranges

VALQUA No.	Temperature (°C)	Pressure (MPa)
8590 Series	-200~500 ⁽¹⁾	30.0
6590 Series	-270~450	
7590 Series	-260~300	
M590L Series	-200~750	30.0
M590 Series		

Note (1) Temperatures of 500 to 600°C may be allowed depending on service conditions. In the case of using No.8590 Series for temperatures exceeding 500°C, the following should be observed:

- ① Adequate tightening shall be performed initially. Further information is available upon request.
- ② Their sealing property is equal to that of spiral wound gaskets that use asbestos fillers. For applications requiring higher airtightness, No.8590L Series are recommended.

Remarks 1. Temperature and pressure show individual service limits.
2. The above temperature ranges vary depending on the material used for the hoops and the inner & centering rings.

Dimensions

For standard pipe flanges

For JIS pipe flanges = 10K, 16K, 20K, 30K, 40K, 63K

For JPI and ANSI pipe flanges

= Class150, 300, 400, 600, 900, 1500, 2500

Gaskets complying with other standards such as ASME and MSS are also available.

For non-standard pipe flanges

VALQUA No.	Gasket Thickness (mm)	Manufacturing Ranges(mm) of the Main Part Internal Diameter
8590 Series	6.4mm (W)	300~3400 ⁽¹⁾
6590 Series	4.5mm (V)	10~3000
7590 Series	3.2mm (T)	10~1500
	1.6mm (P) ⁽²⁾	10~150
M590L Series	6.4mm (W)	300~2500
M590 Series	4.5mm (V)	10~2500

Notes (1) The outer diameter of the outer ring can be up to 3500.

(2) The products with a gasket thickness of 1.6mm can be made only if it is the basic type and its hoop is made of SUS316.

Remarks 1. () indicates thickness classifications.
2. The manufacturing ranges are round type gaskets.

Design Criteria

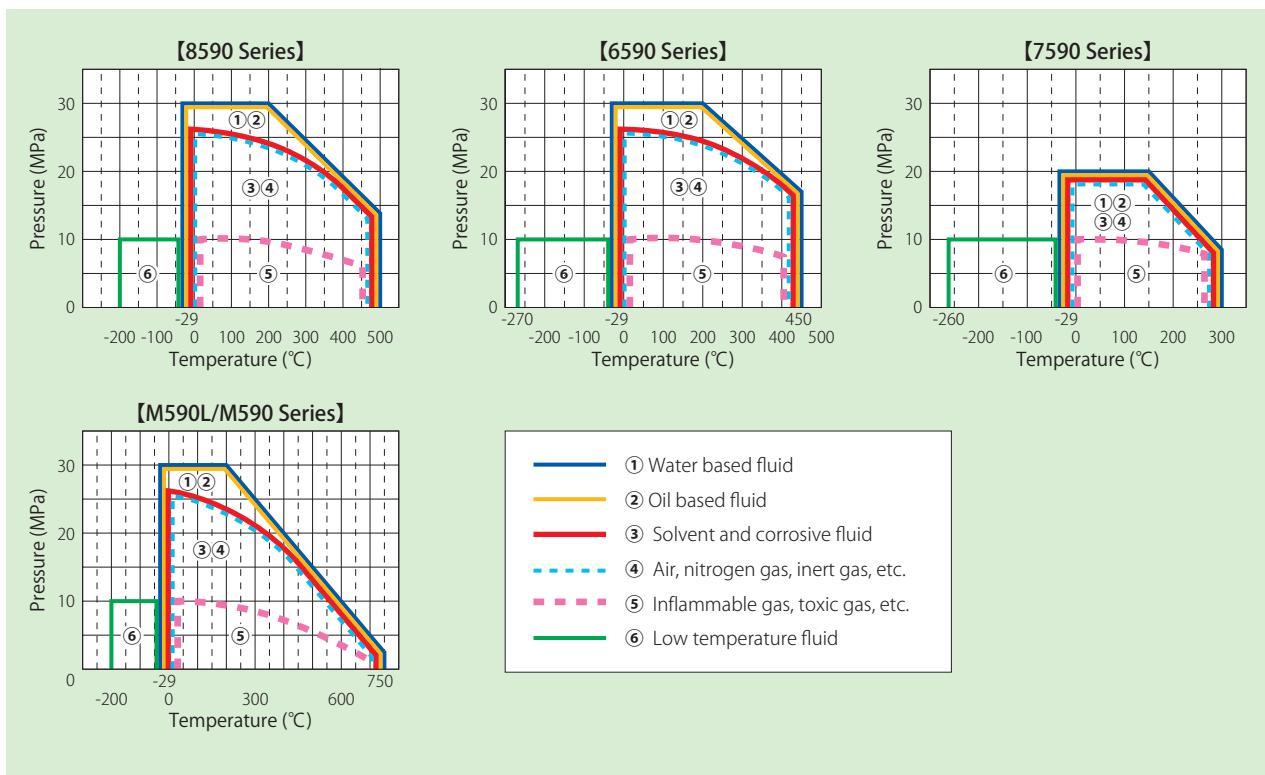
Spiral Wound Gaskets have m and y values that are the same as those defined in Appendix G to JIS B 8265.

VALQUA No.	Gasket factor "m"	Minimum design seating stress "y" (N/mm ²)	Recommended tightening stress (MPa) ⁽¹⁾	
			Liquid	Gas
8590 Series	3.0	68.9	35.0	70.0
6590 Series				50.0
7590 Series				35.0
M590 Series				70.0

Note (1) The recommended tightening stress is the pressures required under standard conditions without consideration to the endforce due to internal fluid. It is stress on the contact area of the gasket.

Remark Separate consultation is required if flange deformation is anticipated for large diameter gaskets.

Allowable ranges per fluid



Metal Jacketed Gasket

Metal Jacketed Gasket

VALQUA No. **N510/N520 Series / N530/N570/N580/N6510/N6520/N6580**



The Metal Jacketed Gasket is a semi-metallic gasket where the outside of the core material (cushion material), such as heat-resistant felt, is covered with a metal sheet. Various shapes are available on request, suitable for irregular flanges and heat exchange gaskets. Two types of gaskets are available for cross shapes, flat or corrugated. In addition to the above, VALQUAFOIL Gathered Tape with Adhesive (No.VF-70) or VALQUAFOIL Sheet (No.VF-30) are also available to enhance the sealing property.

Metal Jacketed Gasket (Corrugated coating)

VALQUA No. **N510**

This Metal Jacketed Gasket uses heat-resistant felt and other materials as the core material, and the outside of the core is covered with two sheets of metal which are corrugated in a multi-concentric pattern. A complete sealing can be assured with low seating stress. A labyrinth effect can also be expected due to corrugation.

Metal Jacketed Gasket (All-covered coating)

VALQUA No. **N520**

This flat Metal Jacketed Gasket uses heat-resistant felt and other materials as the core material, and the outside of the core is covered with two sheets of metal.

Metal Jacketed Gasket (Half-covered coating)

VALQUA No. **N530**

The core materials of these Gaskets are covered with a metal sheet on one side. They are ideal for applications that require narrow and flat products with small diameters, which are difficult to fabricate with N520 or N580.

Metal Jacketed Gasket (Round coating)

VALQUA No. **N570**

The core material of this Gasket is warped with a thin metal sheet and processed into a circular cross section. In addition to circles, the product can be fabricated into non-standard flat shapes such as oval, ellipse, angular, diamond and pear-shaped.

Metal Jacketed Gasket (Double-covered coating)

VALQUA No. **N580**

The core material of this flat Gasket is covered with two sheets of metal, and it has a structure in which the lower sheet is folded onto the upper surface; then, the upper sheet is folded onto the lower surface.

In the case of a large-diameter gasket, which is equipped in the male-female flange of a horizontal type machine, this product has superior safety in its application as compared to N520.

Metal Jacketed Gasket with VALQUAFOIL adhered

VALQUA No. **N6510/N6520/N6580**

VALQUAFOIL is adhered on both sides of N510 / N520 / N580 to enhance sealing performance.

Metal Jacketed Gasket (French cross-section)

VALQUA No. **N520-F**

This flat gasket has a core made of heat-resistant felt or Compressed Non-asbestos Fiber Sheet, or a combination of both, and the core is covered by thin metal shaped into a u-shape.

Types

No.N510	No.N520	No.N530	No.N570	No.N580
 Cushion material	 Cushion material	 Cushion material	 Cushion material	 Cushion material
No.N6510	No.N6520	No.N6580	No.N520-F	
 VALQUAFOIL Cushion material	 VALQUAFOIL Cushion material	 VALQUAFOIL Cushion material	 Cushion material	

Remark Except for products attached with VALQUAFOIL, gasket paste (SEALPASTE or No.6M) should be used in general. The recommended flange surface finish is 1.6a (Ra).

Metal Jacketed Gasket (Grommet processed product)

VALQUA No. **N520-C**

The cut surface on the inner diameter side of the sheet gaskets, which are made of Compressed Non-asbestos Fiber Sheet, etc., is covered with a thin metal sheet (grommet-finished), and it helps to prevent permeation leakage as well as erosion.

Note: Heat-resistant felt cannot be used.

Compressed Fiber Sheet, etc.



Design data

Allowable ranges

VALQUA No.	Temperature (°C)	Pressure (MPa)
N510	Depending on cover metal ⁽¹⁾	7.0
N520		
N530		
N570		
N580		
N6510		
N6520	-240~400	7.0
N6580		
N520-F		
N520-C	Depending on core material	

Note (1) Please refer to the reference values listed below for the maximum service temperatures of gasket metallic materials.

Dimensions

Any forms or shapes are available. For dimensions, products with a maximum diameter of about 3,000 mm can be manufactured, while even larger ones may also be produced on site upon request. It is also possible to manufacture highly reliable products with minimal junctions of gasket cores (patented manufacture) to be used for heat exchangers and the like. Further information is available upon request. In case of No.N520-C, dimension specifications depend on core materials used.

Design Criteria

VALQUA No.	Cover Material	Gasket factor "m"	Minimum design seating stress "y" (N/mm ²) ⁽¹⁾	Recommended tightening stress (MPa) ⁽³⁾	
				Liquid	Gas ⁽⁴⁾
N510 Series	Soft aluminum	2.50	20.0	—	—
	Soft copper or Brass	2.75	25.5	—	—
	Low CS or Iron	3.00	31.0	—	—
	Monel	3.25	37.9	—	—
	4 - 6% chrome steel	3.25	37.9	—	—
	Stainless steel	3.50	44.8	—	—
N520 Series ⁽²⁾	Soft aluminum	3.25	37.9	20	60
	Soft copper or Brass	3.50	44.8	30	100
	Low CS or Iron	3.75	52.4	45	140
	Monel	3.50	55.2	—	—
	4 - 6% chrome steel	3.75	62.1	—	—
	Stainless steel	3.75	62.1	70	200

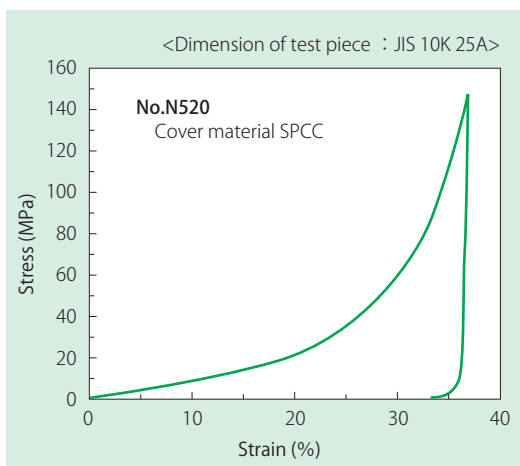
Notes (1) The minimum design seating stress "y" corresponds to values obtained when applied with gasket paste.

(2) For No.N520-C, the m, y values of core materials are applicable.

(3) The recommended tightening stress is the pressures required under standard conditions without consideration to the endforce due to internal fluid. It is stress on the contact area of the gasket.

(4) The values of recommended tightening stress shown under the gas sealing category indicate those without the application of gasket paste. If gasket paste is used, the values of recommended tightening stress for liquid will apply.

Stress strain characteristics



Maximum service temperatures for gasket metallic materials (for reference)

Material	Maximum service temp. (°C)	Material	Maximum service temp. (°C)
Lead	100	5Cr-0.5Mo steel	621
Brass	260	SUS 410	649
Aluminum	260	Silver	649
Copper	400	Nickel	760
SUS 304	427	Monel metal	816
SUS 316	816	SUS 321	816
Pure iron	538	SUS 347	816
Low CS	538	Inconel	1,093
Titanium	1,093	Hastelloy	1,093

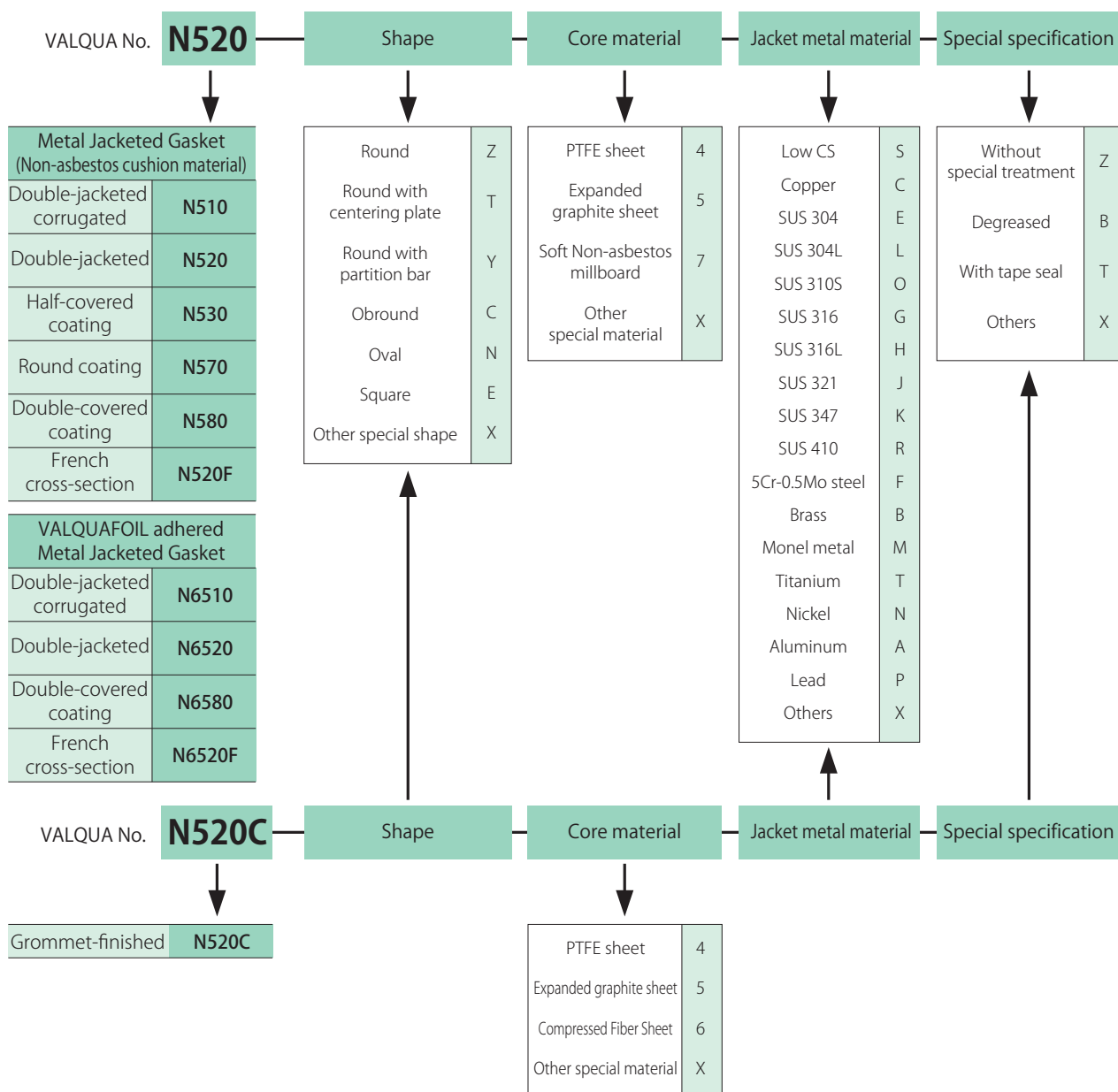
Remark Since the above maximum service temperatures are based on air with a certain constant temperature, the products vary to a great extent depending on the type of fluids, pressures and mode of use.

Ordering Information

Please specify the following to place an order for these products:

- | | | |
|-------------------|---------------------------------------|-------------|
| 1. Product number | 4. Presence of special specification | 7. Quantity |
| 2. Material | 5. Nominal pressure, Nominal diameter | |
| 3. Shape | 6. Operating temperature, Fluid | |

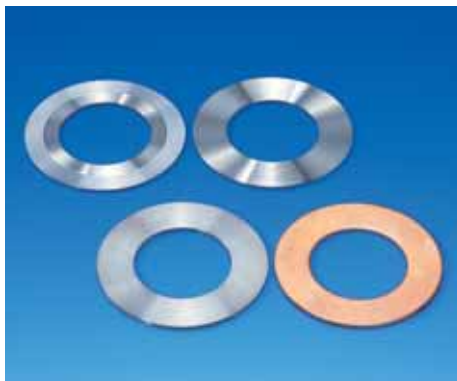
Please refer to the following guide if necessary:



- Remarks
1. Shapes, core materials, coated metallic materials and special specifications may be indicated in alphanumeric characters.
 2. Please consult us if you are not able to find your desired shape or material in this table.
 3. When ordering N520C (grommet processed products), please clearly specify the dimensions and the core material.

[Ex] Metal Jacketed Gasket, Round, Soft Non-Asbestos millboard, SUS316, Degreased
 • VALQUA No. N520—Z7GB
 or
 • VALQUA No. N520—Round, Soft Non-Asbestos millboard, SUS316, Degreased

These gaskets are manufactured from cold rolled metal plate, and include flat gaskets made of metallic sheet which is processed into a specified dimension and shape, and serrated gaskets with concentric grooves to improve sealing property.



■ Allowable ranges ■

VALQUA No.	540 Series	6560 ⁽¹⁾ Series	560 Series	6540H ⁽¹⁾ Series
Temperature	Depending on the component metallic materials ⁽²⁾			
Pressure	14.0 MPa			

Notes (1) The heat resistance temperature of products with VALQUA-FOIL attached is 400°C. Applications subject to temperatures exceeding 400°C require separate consultation.

(2) For maximum service temperatures of component metallic materials, refer to "Maximum service temperatures for gasket metallic materials (for reference)" on page 33.

Remark Temperature and pressure show individual service limits.

■ Types ■

VALQUA No.	Types	Cross section
560 Series	Metallic Flat Gasket	
6560 Series	Metallic Flat Gasket with VALQUAFOIL attached	
540 Series	Metallic Serrated Gasket	
6540H Series	Kammprofile Gasket	

■ Applications ■

These are used as joints in the form of either raised face flanges, tongue and groove flanges or male and female flange for towers, tanks, heat exchangers, autoclaves and valve bonnets for high temperature & high pressure steam and in process lines.

Ordering Information

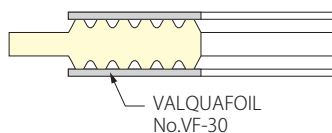
Products with any given dimensions can be made to order by providing information concerning the material, shape and dimensions. Gaskets of various dimensions made of oxygen free copper are also available, which are to be used for knife-edged shape bakable flanges (ICF, UFC flanges, etc.) in use for semiconductor related facilities and vacuum equipment.

Kammprofile Gasket (For piping)



VALQUA No. **6540HP**

Features	This is a 6540H-series product for piping applications, and its dimension is optimally set as an alternate for a Compressed Fiber Sheet.
Dimensions	JIS 10K, Max 600A JPI Class 150, 300, Max 24 inch
Composition	SUS304, SUS316L
Service temp.	-240°C ~ 400°C



VALQUA No.	Recommended tightening stress (MPa) ⁽¹⁾
6540HP	35.0

Note (1) The recommended tightening stress is the pressures required under normal conditions, and correspond to the projected area of the gasket, where fluid pressure is not taken into consideration.

Ordering Information

Please specify the following to place an order for these products:

- | | | |
|-------------------|---------------------------------------|-------------|
| 1. Product number | 4. Presence of special specification | 7. Quantity |
| 2. Material | 5. Nominal pressure, Nominal diameter | |
| 3. Shape | 6. Operating temperature, Fluid | |

Please refer to the following guide if necessary:

[Metallic Serrated Gasket]

VALQUA No.	540	Shape	Cross section	Material	Special specifications
Metallic Serrated Gasket Kammprofile Gasket	540 6540H	Round Z Round with bar Y Other special shape X	Without collar Z With outer collar M With inner collar V With outer and inner collar W Other special shape X	Low CS S Copper C SUS 304 E SUS 304L L SUS 316 G SUS 316L H 5Cr-0.5Mo steel F Monel metal M Titanium T Aluminum A Others X	Without special treatment Z Degreased B V groove finished K Others X

[Metallic Flat Gasket]

VALQUA No.	560	Shape	Cross section	Material	Special specifications
Metallic Flat Gasket Metallic Flat Gasket with VALQUAFOIL attached	560 6560	Round Z Round with bar Y Obround C Square E Other special shape X	Without collar Z With outer collar M With inner collar V With outer and inner collar W Other special shape X	Pure iron D Low CS S Copper C SUS 304 E SUS 304L L SUS 316 G SUS 316L H SUS 321 J SUS 347 K SUS 410 R SUS 430 U 5Cr-0.5Mo steel F Monel metal M Titanium T Silver V Aluminum A Lead P Others X	Without special treatment Z Degreased B Others X

Remarks 1.Shapes and materials may be indicated in alphanumeric characters.
2.Please consult us if you are not able to find your desired shape or material in this table.
3.Please contact us if you need a copper flat gasket for knife-edged shape bakable flange use.

(Ex) Serrated Gasket, Round, With outer collar, SUS304, V groove finished
 • VALQUA No. 540—ZMEK
 or • VALQUA No. 540—Round, With outer collar, SUS304, V groove finished

These gaskets are made of a single metal, and to be used for ring joint flanges.



Applications

Widely used as gaskets for pipe flanges, pressure vessels, towers, tanks and valve bonnets for handling high temperature & high pressure steam, gas, oil and solvents used in oil refining, chemicals, power, shipbuilding and other similar activities.

Manufacturing ranges

Dimensional Standards

The dimensions specified in JPI, ASME, API, MSS and the like for ring joint flanges are standards dimensions.

Maximum Hardness by Material

Material	
Names	Maximum Hardness (H _b)
Low CS	120
Pure iron	90
Copper	60
SUS304	160
SUS304L	150
SUS310S	160
SUS316	160
SUS316L	150
SUS321	160
SUS347	160
SUS430	170
5Cr-0.5Mo steel	130
Monel metal	140
Titanium	140
Aluminum	40
Nickel	120

Types

VALQUA No.	Names (Cross section name)	Cross section
550-ZO	Ring Joint Gasket (Oval)	
550-ZS	Ring Joint Gasket (Octagonal)	
550-ZA	Ring Joint Gasket (API-RX)	
550-ZP	Ring Joint Gasket (API-BX)	
550-ZB	Improved Bridgeman Gasket (Wedged cross section)	
550-ZD	Delta Ring (Triangular)	
550-ZL	Lens Ring (Lens)	
550-ZW	Double Corn-Shaped Gasket (Double corn)	
550-ZR	Circle Shaped Metallic Gasket (Circle cross section)	
550-ZE	Diamond Shaped Ring	

Ordering Information

Please specify the following to place an order for these products:

1. Product number	4. Presence of special specification	7. Quantity
2. Material	5. Nominal pressure, Nominal diameter	
3. Shape	6. Operating temperature, Fluid	

Please refer to the following guide if necessary:

VALQUA No.	550	Shape	Cross section	Material	Special specifications																																																																				
		↓	↓	↓	↓																																																																				
		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; padding: 2px;">Round</td> <td style="text-align: center; padding: 2px;">Z</td> </tr> <tr> <td style="text-align: center; padding: 2px;">Other special shape</td> <td style="text-align: center; padding: 2px;">X</td> </tr> </table>	Round	Z	Other special shape	X	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Ring Joint (Oval cross section)</td> <td style="text-align: center; padding: 2px;">O</td> </tr> <tr> <td style="padding: 2px;">Ring Joint (Octagonal cross section)</td> <td style="text-align: center; padding: 2px;">S</td> </tr> <tr> <td style="padding: 2px;">Ring Joint (API-RX cross section)</td> <td style="text-align: center; padding: 2px;">A</td> </tr> <tr> <td style="padding: 2px;">Ring Joint (API-BX cross section)</td> <td style="text-align: center; padding: 2px;">P</td> </tr> <tr> <td style="padding: 2px;">Improved Bridgeman Gasket</td> <td style="text-align: center; padding: 2px;">B</td> </tr> <tr> <td style="padding: 2px;">Delta Ring</td> <td style="text-align: center; padding: 2px;">D</td> </tr> <tr> <td style="padding: 2px;">Lens Ring</td> <td style="text-align: center; padding: 2px;">L</td> </tr> <tr> <td style="padding: 2px;">Corn-Shaped Gasket</td> <td style="text-align: center; padding: 2px;">C</td> </tr> <tr> <td style="padding: 2px;">Double Corn-Shaped Gasket</td> <td style="text-align: center; padding: 2px;">W</td> </tr> <tr> <td style="padding: 2px;">Circle Shaped Metallic Gasket</td> <td style="text-align: center; padding: 2px;">R</td> </tr> <tr> <td style="padding: 2px;">Diamond Shaped Ring</td> <td style="text-align: center; padding: 2px;">E</td> </tr> <tr> <td style="padding: 2px;">Special Shaped</td> <td style="text-align: center; padding: 2px;">X</td> </tr> </table>	Ring Joint (Oval cross section)	O	Ring Joint (Octagonal cross section)	S	Ring Joint (API-RX cross section)	A	Ring Joint (API-BX cross section)	P	Improved Bridgeman Gasket	B	Delta Ring	D	Lens Ring	L	Corn-Shaped Gasket	C	Double Corn-Shaped Gasket	W	Circle Shaped Metallic Gasket	R	Diamond Shaped Ring	E	Special Shaped	X	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Low CS</td> <td style="text-align: center; padding: 2px;">S</td> </tr> <tr> <td style="padding: 2px;">Pure iron</td> <td style="text-align: center; padding: 2px;">D</td> </tr> <tr> <td style="padding: 2px;">Copper</td> <td style="text-align: center; padding: 2px;">C</td> </tr> <tr> <td style="padding: 2px;">SUS304</td> <td style="text-align: center; padding: 2px;">E</td> </tr> <tr> <td style="padding: 2px;">SUS304L</td> <td style="text-align: center; padding: 2px;">L</td> </tr> <tr> <td style="padding: 2px;">SUS310S</td> <td style="text-align: center; padding: 2px;">O</td> </tr> <tr> <td style="padding: 2px;">SUS316</td> <td style="text-align: center; padding: 2px;">G</td> </tr> <tr> <td style="padding: 2px;">SUS316L</td> <td style="text-align: center; padding: 2px;">H</td> </tr> <tr> <td style="padding: 2px;">SUS321</td> <td style="text-align: center; padding: 2px;">J</td> </tr> <tr> <td style="padding: 2px;">SUS347</td> <td style="text-align: center; padding: 2px;">K</td> </tr> <tr> <td style="padding: 2px;">SUS430</td> <td style="text-align: center; padding: 2px;">U</td> </tr> <tr> <td style="padding: 2px;">5Cr-0.5Mo steel</td> <td style="text-align: center; padding: 2px;">F</td> </tr> <tr> <td style="padding: 2px;">Monel metal</td> <td style="text-align: center; padding: 2px;">M</td> </tr> <tr> <td style="padding: 2px;">Titanium</td> <td style="text-align: center; padding: 2px;">T</td> </tr> <tr> <td style="padding: 2px;">Nickel</td> <td style="text-align: center; padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;">Aluminum</td> <td style="text-align: center; padding: 2px;">A</td> </tr> <tr> <td style="padding: 2px;">Others</td> <td style="text-align: center; padding: 2px;">X</td> </tr> </table>	Low CS	S	Pure iron	D	Copper	C	SUS304	E	SUS304L	L	SUS310S	O	SUS316	G	SUS316L	H	SUS321	J	SUS347	K	SUS430	U	5Cr-0.5Mo steel	F	Monel metal	M	Titanium	T	Nickel	N	Aluminum	A	Others	X	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Without special treatment</td> <td style="text-align: center; padding: 2px;">Z</td> </tr> <tr> <td style="padding: 2px;">Degreased</td> <td style="text-align: center; padding: 2px;">B</td> </tr> <tr> <td style="padding: 2px;">Others</td> <td style="text-align: center; padding: 2px;">X</td> </tr> </table>	Without special treatment	Z	Degreased	B	Others	X
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Others	X																																																																								

Remarks 1. Please indicate the shape and material by entering the code in the parenthesis ().
2. Please consult us if you are not able to find your desired shape or material in this table.

[Ex] Round shape (Oval cross section), SUS304L, Degreased • VALQUA No. 550—ZOLB or • VALQUA No. 550—Round, Oval cross section, SUS304L, Degreased
--

This is a metal C-ring made of a coil spring as an elastic element, which is covered with a thin metal sheet such as an aluminum sheet. Since it is elastic and high in recovery and also able to seal at low tightening forces, the product can be used in fields handling high temperatures, ultra high vacuum, as well as in applications subject to extremely low temperature and high pressure, where rubber O-rings cannot be used.

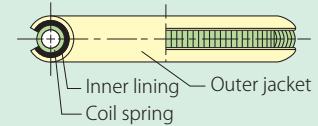


■ Applications ■

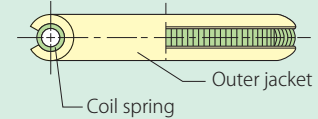
This product is used for semiconductor-related items, nuclear-related items, electronic industry, laser equipment, joints, valves, injection molding machines, etc.

■ Types of products ■

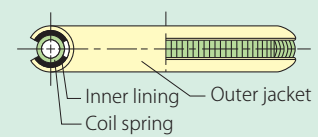
No.3645
Double layer



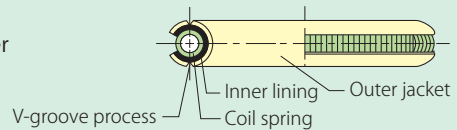
No.3645
Single layer



No.3645
Double layer
(Split Inner lining)



No.3645LS
Double layer
(LS Type)



■ Design data ■

■ Allowable ranges ■

Temperature ⁽¹⁾ (°C)	-270~250
Pressure (MPa)	Ultra high vacuum ~7

Temperature and pressure show individual service limits.
Note (1) The temperature ranges shown are for aluminum, and they vary depending on the component materials used.

■ Manufacturing ranges ■

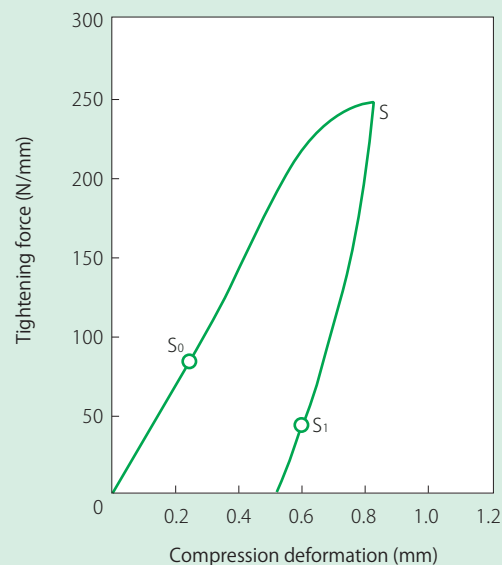
Cross sectional diameter (mm) ⁽¹⁾	Inner diameter (mm)
3.8	25~1500
5.6	150~2000

Note (1) This product is also available in cross sectional diameters of 1.7, 2.6, 8.0, 10.0, etc.

■ Design data ■

Cross sectional diameter (mm)	Inner diameter (mm)	Groove depth (mm)	Required tightening force(N/mm)			
			Aluminum	Silver/Copper	Nickel/Tantalum	Stainless steel/Titanium
1.7	5~50	1.4	200	220	250	290
2.6	10~100	2.1	220	250	340	400
3.8	25~1500	3.0	250	310	490	590
5.6	150~2000	4.5	320	390	640	780
8.0	175 or above	7.0	340	490	—	—
10.0	175 or above	9.0	390	590	—	—
Flange surface roughness (Ra)			0.8	0.4	0.2	0.2

■ Compression Recovery Characteristics of TRYPACK (No. 3645) ■



- Sample
Single-layer
Outer jacket : A1050P
Coil spring : SUS304-WPB
 - Dimension
Cross sectional diameter : 3.8mm
Inner diameter : 71mm
 - Acceptable leak rate : He 1.0×10^{-11} Pa·m³/s
 - Initial sealing point : S₀ 78.4 N/mm
 - Sealing limit point : S₁ 44.1 N/mm
- Note : S₀ is the point where the leak volume becomes below the acceptable leak rate, and S₁ is the limit point where the leak volume can be kept below the acceptable leak rate.

■ Component materials ■

Component	Material	Frequency of use	Element
Outer jacket	Aluminum (A1050P)	◎	Seal
	Nickel (NLCP, NNCP)	◎	
	Silver	○	
	Stainless steel (SUS304L, SUS316L)	○	
	Tantalum (TaP)	○	
	Copper (C1100P)	△	
Inner lining	Stainless steel (SUS304, SUS316)	◎	Stress dispersion
	Inconel (Inco.600)	◎	
Coil spring	Stainless steel (SUS304—WPB)	◎	Elasticity
	Inconel (Inco.X750)	◎	

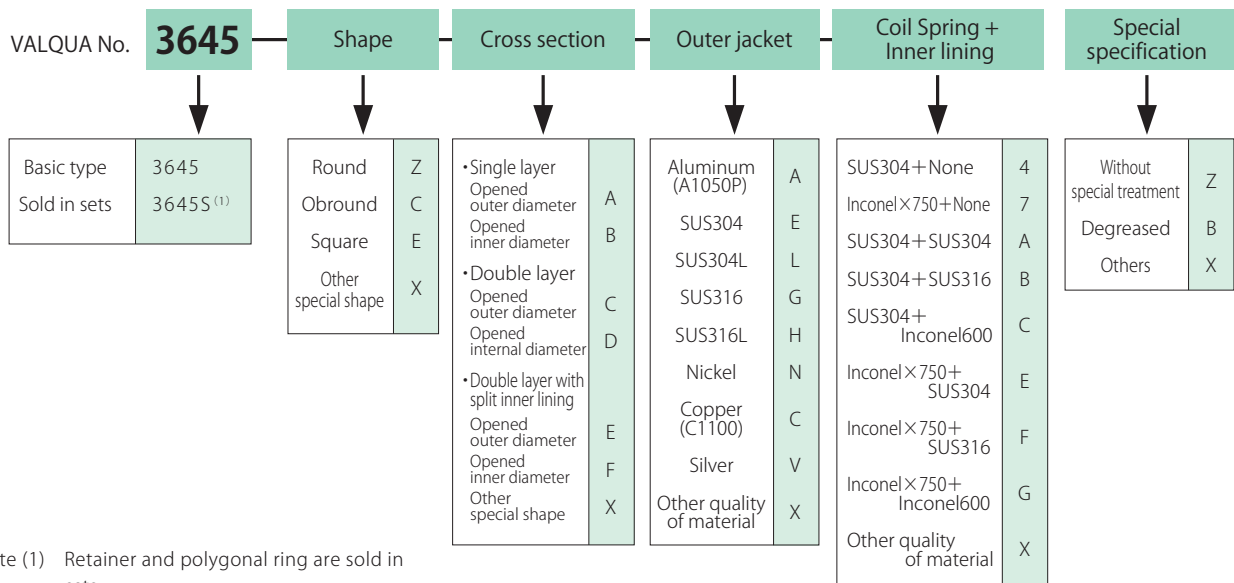
◎ : Used often ○ : Used sometimes △ : Rarely used

Ordering Information

Please specify the following to place an order for these products:

- | | | |
|-------------------|---------------------------------------|-------------|
| 1. Product number | 4. Presence of special specification | 7. Quantity |
| 2. Material | 5. Nominal pressure, Nominal diameter | |
| 3. Shape | 6. Operating temperature, Fluid | |

Please refer to the following guide if necessary:

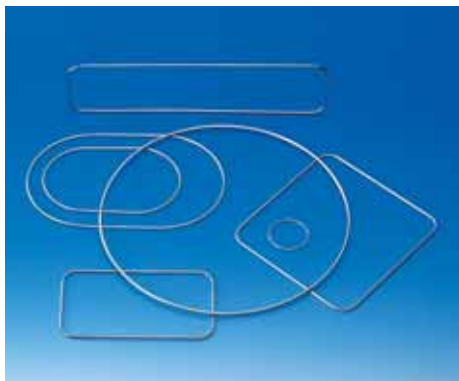


Note (1) Retainer and polygonal ring are sold in sets.

- Remarks
1. Shapes and materials may be indicated in alphanumeric characters.
 2. Please consult us if you are not able to find your desired shape or material in this table.
 3. Please let us know if you are ordering the set of a retainer and polygonal ring.

[Ex] In the case of a round shape, single layer (opened outer diameter), coating SUS304, spring Inconel, no-special specification.
 • VALQUA No. 3645-ZAE7Z

Metal Hollow O-rings are made of thin metal pipe processed into a circle or other specified shapes, with both ends welded together. Since they can offer sealing with a relatively low tightening force as well as compact gasket joints, these products can be used in various types of equipment for high temperature, high pressure and high vacuum applications.



Product types

VALQUA No.	Types	Cross section
3640	Basic type	
3641	Balancing design	

Applications

They are used as gaskets for equipment in various industries, such as aerospace equipment, vacuum equipment, semiconductor-related items, nuclear power-related items, electronic equipment, agitators, melt spinning machines and hydraulic machines.

Design data

Tube Material and Surface treatment ...Service Temperature

	Material	Service temperature ⁽¹⁾ (°C)
Tube Material	Stainless steel (SUS304)	-250~540
	Stainless steel (SUS316)	-250~820
	Stainless steel (SUS321)	-250~870
	Incoloy 800	-250~980
Surface treatment	VALFLON PTFE Coating	-200~260
	Plated silver	-250~650
	Plated nickel	-250~760
	Plated copper	-250~400
	Plated gold	-250~850

Note (1) The heat resistance of a surface-treated metal hollow O-ring is determined by the lower maximum temperature of either the tube material or coating material.

Allowable ranges

VALQUA No.	Temperature (°C)	Pressure (MPa)
3640	Depending on the component metallic materials ⁽¹⁾	High vacuum~7MPa
3641		Vacuum~300MPa

Note (1) Please refer to the table shown below for the temperature limit of the component metallic materials.

Manufacturing ranges

(Unit: mm)

Pipe symbol	Pipe diameter× pipe thickness	SUS304	SUS316	SUS321	Incoloy800	Minimum bending radius of square-shaped product ⁽¹⁾ (inner diameter)	Manufacturable dimensions (outer diameter)
J	0.9×0.15			○		4	8 ~ 100
L	0.9×0.25		○				
G	1.6×0.15			○		7	11 ~ 200
A	1.6×0.25	○	○	◎	○		
M	1.6×0.35			○			
B	1.6×0.5	○		○	○	6	
H	2.4×0.15			○		22	25 ~ 350
C	2.4×0.25	○	○	○	○		
N	2.4×0.35			◎		17	
D	2.4×0.5	○	○	○	○	10	
E	3.2×0.25	○		○	○	45	
O	3.2×0.35			○		38	40~1500
F	3.2×0.5	○	○	◎	○	20	
P	3.2×0.8			○			
I	4.8×0.5	○		○		75	200~2000
K	6.4×0.8	○		○		90	400~2500

◎ : Materials that are used often

○ : Standard inventory materials

Note (1) Please use this value as a reference for the corner radius of square-shaped products.

Ordering Information

Please specify the following to place an order for these products:

1. Product number	4. Presence of special specification	7. Quantity
2. Material	5. Nominal pressure, Nominal diameter	
3. Shape	6. Operating temperature, Fluid	

Please refer to the following guide if necessary:

VALQUA No.	3640	Shape	Cross section	Tube material	Surface treatment	Special specifications
	↓	↓	↓	↓	↓	↓
Basic type	3640 3640S (Sold in set ⁽²⁾)	Round Z Obround C Square E Other special shape X	Basic design (without hole) Z With an internal diameter hole N With an outer diameter hole T Other special shape X	SUS304 E SUS316 G SUS321 J Incoloy 800 W Special material X	No coating Z VALFLON coating 4 Plated silver V Plated nickel N Plated copper C Plated gold 5 Special material X	Without special treatment Z Degreased B For vacuum, external pressure V Others X
Balancing design type	3641 ⁽¹⁾ 3641S (Sold in set)					

- Notes (1) Please contact us if you are using the balancing design type with the standard number of holes to handle highly viscous fluid or slurry that could possibly clog its holes.
 (2) Metal Hollow O-rings are sold in sets with a retainer.
 (3) The heat resistance of a surface-treated metal hollow O-ring is determined by the lower maximum temperature of either the tube material or coating material.

- Remarks 1.Shapes and materials may be indicated in alphanumeric characters.
 2.Please consult us if you are not able to find your desired shape or material in this table.

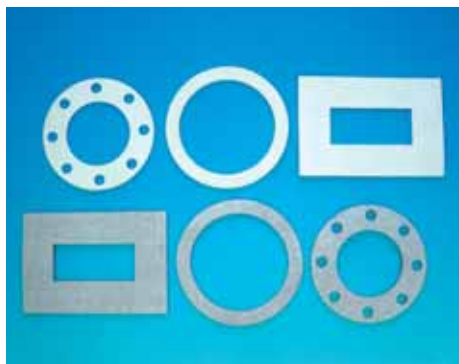
[Ex] In the case of balancing design, round shape, for internal pressure, use SUS304 or plated silver
 or • VALQUA No. 3641 - round shape, for internal pressure, use SUS304 or plated silver
 • VALQUA No. 3641 – ZNEVZ

Rubber Coated
Fabric Gasket

VALQUATEX Gasket

VALQUA No. N214/N314

VALQUATEX is a rubber-coated fabric that uses materials such as glass and ceramic fibers.



Applications

- ▶ VALQUATEX Gaskets are used for equipment manhole flanges or exhaust gas duct flanges.
- ▶ Since these gaskets do not have sufficient air-tightness, use them where some leakage is allowable.

VALQUA No.	Types of products	Allowable temperature (°C)
N214	This type of gasket is made from rubberized glass fiber fabric.	400
N314	This type of gasket is made from rubberized metal wire-reinforced ceramic fiber fabric.	800

Manufacturing ranges

VALQUA No.	Nominal thickness (mm)	Shape
N214	1.6, 3.2, 4.8, 6.4 <1.6×any>	Products with any specified shape and dimensions can be manufactured.
N314	2.0, 4.0, 6.0, 8.0 <2.0×any>	

- ▶ Products with surface treatment using graphite are available upon request. (This facilitates peeling off gaskets when disassembling joints.)

Rubber Sheet
Gasket

Synthetic Rubber Sheet Gasket

VALQUA No. 2010/4010/5010

These gaskets are made by punching synthetic rubber sheets of various materials, and are used for low pressure applications where adequate tightening force is not available.



Manufacturing ranges

VALQUA No.	Rubber material	Allowable ranges	
		Temperature (°C)	Pressure (MPa)
2010	Nitrile rubber (NBR)	-30 ~ 120	0.5
	Chloroprene rubber (CR)	-30 ~ 120	
	Ethylene propylene rubber (EPDM)	-40 ~ 150	
4010	Fluoro rubber (FKM)	-15 ~ 200	
5010	Silicone rubber (VMQ)	-60 ~ 200	

Remark The above temperatures should be used as a reference.

Manufacturing ranges

Thickness (mm)	1.0, 1.5, 2.0, 3.0, 4.0, 5.0
Size (mm)	Max. OD 1000

Ordering Information

Sheet or punched gaskets can be made to order by providing information concerning the material, shape and dimensions.

Because they use bulking treated yarn, these are better in flexibility and heat resistance than conventional glass cloth. They are best suited for cladding material to be used in heat insulation & cold insulation work.



Features

- ▶ Even in direct contact with strong flame, flame resisting carbonized fiber becomes red hot, but will not fuse or stick.
- ▶ It has excellent heat insulation efficiency, with its heat conductivity being less than that of glass fiber, and the same level as wool.
- ▶ It has excellent heat resistance. (Max. service temperature: 250°C).
- ▶ Also has excellent chemical resistance, as its weight loss in organic solvent is negligible, while in inorganic chemicals, weight loss is as low as 2 to 3%.
- ▶ The product has a drape property that is not available in glass fiber, and it is easy to handle and high in flexibility.

Yarn

VALQUA No. 101C

Application | Heat resistant glass yarns

Standard dimensions

Nominal size (mm)	Weight (kg)	Length (m)
φ 3	1	180 ⁽¹⁾
φ 5		92 ⁽¹⁾
φ 6.5		52 ⁽¹⁾
φ 8		35 ⁽¹⁾
φ 9.5		26 ⁽¹⁾
φ 12.5	—	30
φ 16	—	
φ 19	—	
φ 22	—	
φ 25	—	

Note (1) These lengths are approximate estimates.

Cloth

VALQUA No. 105C

Application | Cladding material for heat insulation & cold insulation of pipe and ducts, heat insulating material around engines and boilers, cloth for heat resisting protective equipment and the like

Standard dimensions

Nominal thickness (mm)	Dimensions	Reference weight (g/m ²)	Weave
1.5	1,000mm × 30m	670	Plain weave

Ribbon

VALQUA No. 112C

Application | Cladding material for heat insulation & cold insulation of pipe and ducts, heat insulating material around engines and boilers, cloth for heat resisting protective equipment and the like

Standard dimensions

Nominal thickness (mm)	Width (mm)	Length (m)
1.5	25, 32, 38, 50, 65, 75, 100	30

With the use of bulking treated yarn, these are better in flexibility and heat resistance than a conventional glass cloth, and are best suited for cladding material to be used in heat insulation and cold insulation work.

**Features**

- ▶ Maximum service temperature: 350°C
- ▶ These are excellent heat insulating materials, with heat conductivity of one half or below than that of asbestos cloth.
- ▶ Their tensile strength is high, as much as several times higher than that of asbestos under normal temperatures.

Ribbons

VALQUA No. **112G** (Ribbon)
112GA (Ribbon with aluminum on one side)
112GC (Ribbon with adhesive on one side)

Application | Cladding material for heat insulation & cold insulation of pipe and ducts, heat insulating material around engines and boilers, maintenance material for high temperature work and the like

Dimensions

Nominal thickness (mm)	Length (m)	Reference weight (g/m)							Weave
		W25	W32	W38	W50	W65	W75	W100	
0.7	50 ⁽¹⁾	—	—	—	26	—	38	52	Diagonal weave
1.7	30	22	30	34	45	59	68	90	Plain weave
2.7		42	53	64	85	106	128	170	

Note (1) Length of No.112G, t0.7 is 30m.

YarnVALQUA No. **101G**

Application | Heat resistant glass yarns

Dimensions

Nominal size (mm)	Weight (kg)	Length (m)
φ 3	1	120 ⁽¹⁾
φ 5		44 ⁽¹⁾
φ 6.5		25 ⁽¹⁾
φ 8		18 ⁽¹⁾
φ 9.5		13 ⁽¹⁾
φ 12.5	—	30
φ 16	—	
φ 19	—	
φ 22	—	
φ 25	—	

Note (1) These lengths are approximate estimates.

PackingVALQUA No. **102G**

Application | Heat resisting sealing material, door packing and the like

Dimensions

Nominal size (mm)	Length (m)	Reference weight (g/m)	
		Round Braid	Square Braid
6.5	30	55	60
8		78	87
9.5		94	107
11		127	151
12.5		160	194
16		227	300
19		340	400
22		467	534
25		567	717
32		900	1,140
38	1,300	1,440	

ClothVALQUA No. **105G** (Cloth) / **105GF** (Cloth with heat resisting SUS wire)

Application | Cladding material for heat insulation & cold insulation of pipe and ducts, insulating material around engines and boilers, cloth for heat resisting protective and the like

Dimensions

Nominal thickness (mm)	Width (mm)	Length (m)	Reference weight (g/m)	Weave
0.5	1,000	50	450	Diagonal weave
0.7			490	
1.7	1,000	30	920	Plain weave
2.7			1,750	

Remark For No.105GF, only t1.5×W1,000mm×L30m is available.

Made of ceramic fiber, having excellent flexibility and heat resistance, these are used as various types of sealing materials, such as heat insulating material, shielding material and protective material. Since a small amount of organic fiber is included in the manufacturing process, some amount of smoke is generated at the initial stage of heating, while No.105SN cloth and No.112SN ribbon (liver) are smoking prevention treated.



Features

- ▶ These are excellent in heat resistance and fire resistance. (Max. service temperature: 1,260°C, and 600°C for No.102SF)
- ▶ These have low heat conductivity and have excellent heat insulation properties.
- ▶ These are flexible and have excellent workability.
- ▶ These also have excellent chemical stability.

Cloth

VALQUA No. **105S** (Cloth)
105SN (Smoke prevention treated cloth)

Application | High temperature curtains, high temperature sealing material, gaskets, various types of high temperature heat insulating material, protectors against weld spark and the like

Dimensions

VALQUA No.	105S	105SN
Color tone	White	Dark brown
Weave	Plain weave	Plain weave
Reinforcing material	Stainless steel wire	Stainless steel wire
Max. temp. (°C)	1,260	1,260
Ignition loss (%)	< 28	< 10
Thickness (mm)	2, 3	1.8, 2.7
Width (mm)	1,000	1,000
One roll length (m)	30	30

Ribbons

VALQUA No. **112S** (Ribbon)
112SN (Smoke prevention treated ribbon)

Application | High temperature sealing material, various types of high temperature heat insulating material, and the like

Dimensions

VALQUA No.	112S	112SN
Color tone	White	Dark brown
Weave	Plain weave	Plain weave
Reinforcing material	Stainless steel wire	Stainless steel wire
Max. service temp. (°C)	1,260	1,260
Ignition loss (%)	< 28	< 10
Thickness (mm)	2, 3	1.8, 2.7
Width (mm)	25, 32, 38, 50, 65, 75, 100	25, 32, 38, 50, 65, 75, 100
One roll length (m)	30	30

Yarns and Rope

VALQUA No. **101S** (Yarns)

Application | Various types of high temperature heat insulating material, textile material and the like

VALQUA No. **102SF** (Braided yarn)

Application | High temperature sealing material, various types of high temperature heat insulating material, and the like

Components | Core: ceramic fiber Cladding: glass fiber

VALQUA No. **102S** (Stainless steel wire insert braided rope)

Application | High temperature sealing material

Dimensions

VALQUA No.	101S	102SF	VALQUA No.	102S
Color tone	White		Nominal size(mm)	Length(m)
Max. service temp. (°C)	1,260	600	6.5	
Ignition loss (%)	< 25		8	
			9.5	
			11	
			12.5	
			16	
			19	
			22	
			25	
			32	
			38	
VALQUA No.	Nominal size (mm)	Weight (kg)	Length (m)	30
101S	φ3	1	200	
	φ5		100	
101S 102SF	φ6	-	30	
	φ9			
	φ12.5			
	φ16			
	φ19			
	φ22			
	φ25			
	φ30			
	φ38			
	φ50			
Remark	Both square-shaped and round-shaped types are manufactured.			



- | | |
|----------------------------------|-----------------------------------|
| ① Supporting iron (300L) | ⑦ Knob for floating pole (spare) |
| ② Floating pole for needle core | ⑧ Straight stud for floating pole |
| ③ Floating pole for cutter blade | ⑨ Pressure bolt for needle core |
| ④ Straight core needle | ⑩ Pressure bolt for cutter blade |
| ⑤ Bending type core needle | ⑪ L-shaped handle |
| ⑥ Blade | ⑫ Grinding stone |

Features

- ▶ This is a set of convenient tools to easily cut out flange gaskets at a construction site or for assembly work.
- ▶ The supporting iron has scale marks, which allows easy and accurate size adjustments.
- ▶ By using a supporting iron (500L) which is sold separately, it is possible to cut out gaskets as large as 1,000 mm.
- ▶ It is highly recommended to keep this tool as an indispensable workshop tool not only in the maintenance department of a chemical plant, oil refinery or iron plant, but also in the assembly area of machine or equipment manufacturers as well as in pipe laying companies.

■ Cutting range ■

Minimum diameter : 50mm

(approx.20mm by using bending type core needle ⑤)

Maximum diameter : 540mm

By using a supporting iron (500 L) which is sold separately, it is possible to cut out gaskets as large as 1,000 mm.

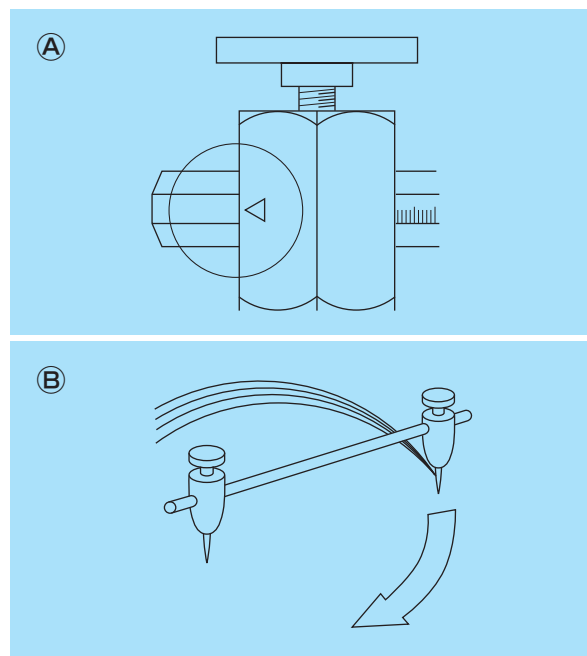
■ Placing part orders ■

Parts worn after long years of operation should be replaced with new parts. Orders for single items are also accepted when certain items are missing.

(For cutter blades ⑥, one replacement set consisting of five blades is available)

■ Instructions for use ■

1. First, insert the straight core needle ④ or the bending type core needle ⑤ at the bottom of the floating pole of the needle core ②, and fix it using the pressure bolt for the needle core ⑨. In this case, use the bending type core needle ⑤ if the cut diameter is up to 50 mm, and use the straight core needle ④ for a cut diameter larger than 50 mm.
2. Next, at the groove of the floating pole of the cutter blade ③, attach the blade ⑥ with two pressure bolts from the cutter blade ⑩.
3. Thread the supporting iron ① into the floating pole of the needle core ② and the floating pole for the cutter blade ③.
4. Set the part marked with "<" of the floating pole of the needle core ② to zero to match the supporting iron ① as shown in Figure A, and firmly tighten with the knob.
5. Then, also shift the part marked with "<" of the floating pole for cutter blade ③ to a desired position on the supporting iron ① determined by the radius of the gasket to be cut, and tighten firm with the knob.
6. Before cutting, place the material on a sheet of plywood board or a corrugated paper that is placed on a flat base or floor. Then, put the gasket cutter as shown in Figure B, hold the floating pole of the needle core with your left hand ②, and lightly dig in the straight core needle ④ or the bending type core needle ⑤. Now, lightly holding the floating pole for cutter blade ③ with your right hand, rotate it to cut forward while slightly pushing as if you were making a circle.



Product No. Index

Please use below table if you are looking up the page numbers from the product number.

Product No. (VALQUA No.)	Product name	Page	Product No. (VALQUA No.)	Product name	Page
101C	Flame-resistant Carbonized Fiber Textile Product (Yarn)	44	6590 Series	BLACKTIGHT	28-31
101G	Heat-resistant Glass Fiber Textile Product (Yarn)	45	6590VC Series	BLACKTIGHT for Extremely Low Temperature	28-31
101S	Ceramic Fabric Textile Product (Yarn)	46	7010	VALFLON Sheet Gasket	15-16,18
102G	Heat-resistant Glass Fiber Textile Product (Packing)	45	7010-EX	New VALFLON Gasket	15-16,18
102S	Ceramic Fabric Textile Product (Braided rope with stainless wire)	46	7020	VALFLON Gasket	15-16,18
102SF	Ceramic Fabric Textile Product (Rope with glass fiber)	46	7026	Black VALQUALON Gasket	15-16,18
105C	Flame-resistant Carbonized Fiber Textile Product (Cloth)	44	7590 Series	WHITETIGHT	28-31
105G	Heat-resistant Glass Fiber Textile Product (Cloth)	45	7GP61	VALFLON Soft Gasket (Sheet)	15,16,18
105GF	Heat-resistant Glass Fiber Textile Product (Cloth with SUS lines)	45	7GP61S	VALFLON Soft Gasket (Sheet)	15,16,18
105S	Ceramic Fabric Textile Product (Cloth)	46	7GP66	VALFLON Soft Gasket (Gasket)	15,16,18
105SN	Ceramic Fabric Textile Product (Smoke prevention treated cloth)	46	7GP66S	VALFLON Soft Gasket (Gasket)	15,16,18
112C	Flame-resistant Carbonized Fiber Textile Product (Ribbon)	44	7GS66A	Cord Seal [Oval type]	17,18
112G	Heat-resistant Glass Fiber Textile Product (Ribbon)	45	7GS62A	Cord Seal [Tape type]	17,18
112GA	Heat-resistant Glass Fiber Textile Product (Ribbon with aluminum on one side)	45	7GS64N	Cord Seal [Rope type]	17,18
112GC	Heat-resistant Glass Fiber Textile Product (Ribbon with single-sided adhesive material)	45	8590TN	NONASUPER	27
112S	Ceramic Fabric Textile Product (Ribbon)	46	8590 Series	CLEANTIGHT	27,29-31
112SN	Ceramic Fabric Textile Product (Smoke prevention treated ribbon)	46	(CUTTER)	Gasket Cutter	47
2010	Synthetic Rubber Sheet Gasket (NBR)	43	GF300	BLACKHYPER	7,9,13,14
2010	Synthetic Rubber Sheet Gasket (CR)	43	M590 Series	Mica Filler Spiral Wound Gaskets	28-31
2010	Synthetic Rubber Sheet Gasket (EPDM)	43	M590L Series	Lined Mica Filler Spiral Wound Gaskets	28-31
3640	Metal Hollow Gasket	41,42	MF300	BRIGHTHYPER	8,9,13,14
3641	Metal Hollow Gasket (Balancing design)	41,42	N214	VALQUATEX Gasket (Rubber-coated glass fiber)	43
3645	TRYPACK	39,40	N314	VALQUATEX Gasket (Ceramic fiber cloth with rubber-coated metal wire)	43
3645LS	TRYPACK (Low tightening force type)	39,40	N510	Metal Jacketed Gasket (Corrugated coating)	32-34
4010	Synthetic Rubber Sheet Gasket (FKM)	43	N520	Metal Jacketed Gasket (All-covered coating)	32-34
540 Series	Metal Serrated Gasket	35,36	N520-C	Metal Jacketed Gasket (Grommet processed product)	32-34
550-ZA	Ring Joint Gasket(API-RX)	37,38	N520-F	Metal Jacketed Gasket (French cross-section)	32-34
550-ZB	Improved Bridgeman Gasket (Wedged cross section)	37,38	N530	Metal Jacketed Gasket (Half-covered coating)	32-34
550-ZD	Delta Ring (Triangular)	37,38	N570	Metal Jacketed Gasket (Round coating)	32-34
550-ZE	Diamond Shaped Ring	37,38	N580	Metal Jacketed Gasket (Double-covered coating)	32-34
550-ZL	Lens Ring (Lens)	37,38	N6510	Metal Jacketed Gasket with VALQUAFOIL adhered	32-34
550-ZO	Ring Joint Gasket (Oval)	37,38	N6520	Metal Jacketed Gasket with VALQUAFOIL adhered	32-34
550-ZP	Ring Joint Gasket (API-BX)	37,38	N6580	Metal Jacketed Gasket with VALQUAFOIL adhered	32-34
550-ZR	Circle Shaped Metallic Gasket (Circle cross section)	37,38	N7030	VALFLON Envelope Gasket	19-22
550-ZS	Ring Joint Gasket (Octagonal)	37,38	N7031	VALFLON Envelope Gasket	19-22
550-ZW	Double Corn-Shaped Gasket (Double corn)	37,38	N7035	VALFLON Envelope Gasket	19-22
560 Series	Metal Flat Gasket	35,36	(PS5)	Gasket Paste No.5	26
5010	Synthetic Rubber Sheet Gasket (VMQ)	43	(PS5M)	Gasket Paste No.5M	26
6500	Compressed Non-asbestos Fiber Sheet for general use	10,12-14	(PS6)	Gasket Paste No.6	26
6500AC	Anti-corrosion Compressed Non-asbestos Fiber Sheet	10,12-14	(PS6M)	Gasket Paste No.6M	26
6502	BLACKSUPER	10,12-14	(PSVO)	NEW VALFLON Paste	26
6503	White Compressed Non-asbestos Fiber Sheet for general use	11-14	(SEALP)	SEALPASTE	26
6503AC	Anti-corrosion white Compressed Non-asbestos Fiber Sheet	11-14	SF300	WHITEHYPER	8,9,13,14
6540HP	Kammprofile Gasket (For piping)	35	UF300	UNIVERSALHYPER	7,9,13,14
6540H Series	Kammprofile Gasket	35,36	VF-30	VALQUAFOIL Gasket	23-25
6560 Series	Metallic Flat Gasket with VALQUAFOIL attached	35,36	VF-35E	VALQUAFOIL Gasket	23-25



**"VALQUA" is a compounded word coming from VALUE and QUALITY
which is the symbol and motto of the company.**

The above trade mark is registered in Japan, Australia, China, India, Indonesia,
Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand and U.S.A.

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