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CATALOGUE No. ZY03

NON-ASBESTOS Gasket

NIPPON VALQUA INDUSTRIES, LTD.
http://www.valqua.co.jp

VALQUA NON-ASBESTOS GASKET

Nowadays, the need to sustain the environment has been becoming increasingly important and manufacturers are required to actively implement more environmental measures. As a total sealing manufacturer, NIPPON VALQUA INDUSTRIES, LTD. (VALQUA) has been making efforts to deal with such circumstances and is focusing on the development of highly reliable Non-Asbestos sealing products that can replace Asbestos sealing products and 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, which includes Non-Asbestos products.

Cautions regarding the use of VALFLON (Fluorocarbon Resin Products)

- These products are not specifically designed and manufactured for use in medical devices to be implanted in human bodies or to be in contact with body fluids or living organisms. So, if you are planning to use them for such applications, please contact us for consultation in advance.
- When the products are to be heated to more than 200°C, be sure to provide sufficient air exhaust and ventilation in order to prevent the inhalation of dissolved gases.
- Please make sure to never incinerate these products and dispose of the them in accordance with the Waste Management and Public Cleansing Law.

※Please confirm the MSDS (material safety data sheet) with the precautions of industrial safety and health regulations.

Registered trademarks

The below are our registered trademarks in Japan. Indicators of registered trademarks have been omitted within this catalogue.

- VALQUA
- VALQUA(mark)
- VALFLON
- CLEANTIGHT
- NONASUPER

Trademarks

Trademark indicators have been omitted within this catalogue. The following are our trademarks.

- BLACKHYPER
- WHITEHYPER
- BLACKTIGHT
- WHITETIGHT
- BRIGHTHYPER
- VALQUAFOIL
- VALQUATEX
- VALQUALON
- BLACKSUPER
- CORDSEAL

INDEX

Gasket

Related Product

Gasket

Textile Products

Table for Types and General Characteristics of Non-Asbestos Gaskets

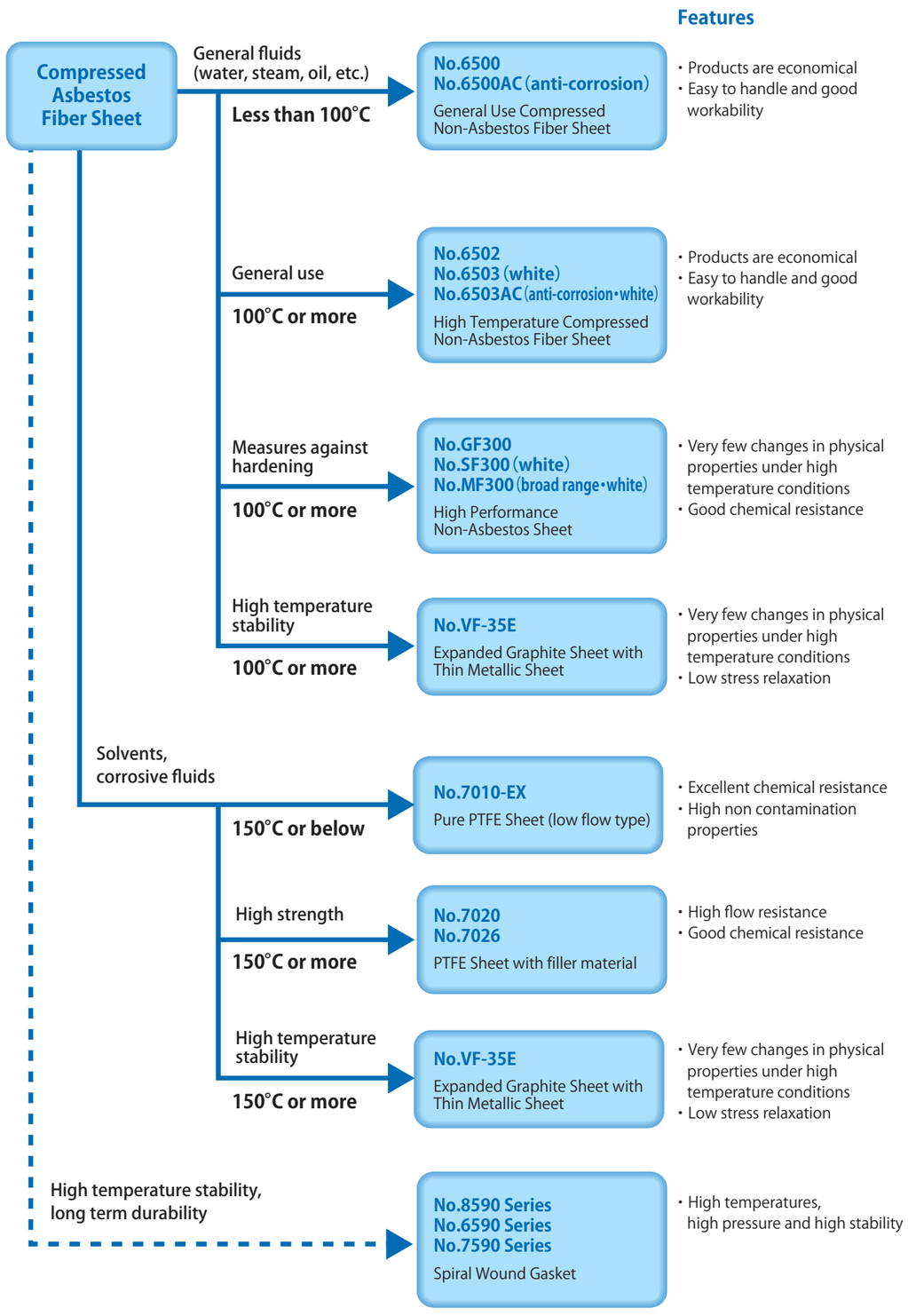
Type		VALQUA No.	Product name		Available range[1]		Product Summary	Page
					Temperature (℃)	Pressure (MPa)		
Non-Metallic Gasket	Rubber Sheet Gasket	2010	NBR Sheet Gasket		−30～120	0.5	Nitrile rubber sheet gasket	39
		2010	CR Sheet Gasket		−30～120	0.5	Chloroprene rubber sheet gasket	
		2010	EPDM Sheet Gasket		−40～150	0.5	Ethylene-propylene rubber sheet gasket	
		4010	FKM Sheet Gasket		−15～200	0.5	Fluoro rubber sheet gasket	
		5010	VMQ Sheet Gasket		−60～200	0.5	Silicone rubber sheet gasket	
	High Performance Non-Asbestos Sheet	GF300	BLACKHYPER		−200～300	3.5	High temperature black sheet gasket using PTFE as a binder	5
		SF300	WHITEHYPER		−200～300	3.5	High temperature white sheet gasket using PTFE as a binder	
		MF300	BRIGHTHYPER		−200～300	3.5	White sheet gasket using PTFE as a binder applicable for high temperatures and a broad range of uses	
	Compressed Non-Asbestos Fiber Sheet	6502	BLACKSUPER		−50～214[2]	3	Black Compressed Fiber Sheet with enhanced heat resistance	8
		6500	Compressed Non-Asbestos Fiber Sheet for general use		−50～183[2]	3	Compressed Fiber Sheet for general use	
		6500AC	Anti-corrosion Compressed Non-Asbestos Fiber Sheet		−50～183[2]	3	Anti-corrosion Compressed Fiber Sheet	
		6503	White Compressed Non-Asbestos Fiber Sheet for general use		−50～214[2]	3	White Compressed Fiber Sheet with enhanced heat resistance	9
		6503AC	Anti-corrosion white Compressed Non-Asbestos Fiber Sheet		−50～214[2]	3	Anti-corrosion white Compressed Fiber Sheet with enhanced heat resistance	
		8590TN	NONASUPER		−200～450	JIS10K JPI Class 150	An alternative to a high temperature Compressed Fiber Sheet that functions with a low clamp load	13
	Fluorocarbon Resin Gasket	7010	VALFLON		−50～100	1	Pure PTFE sheet gasket	15
		7010-EX	NEW VALFLON		−50～150	1	PTFE sheet gasket with improved creep resistance	
		7GP66	VALFLON Soft Sheet Gasket		−240～260	2	Expanded PTFE gasket with mesh construction	
		7020	VALQUALON		−200～200	4	Low creep type PTFE Gasket reinforced with inorganic filler	
		7026	BLACK VALQUALON		−200～200	4	Low creep type PTFE Gasket reinforced with carbon filler	
	Fluorocarbon Resin Envelope Gasket	N7030(N) Series	VALFLON Envelope Gasket		−100～150	1.5	Fluorocarbon resin envelope gasket using Compressed Fiber Sheet in the core	19
		N7030(S) Series	VALFLON Envelope Gasket		−100～200	2	Fluorocarbon resin envelope gasket using Compressed Fiber Sheet and felt in the core	
		N7030(H) Series	VALFLON Envelope Gasket		−100～260	3	Fluorocarbon resin envelope gasket using expanded graphite sheet and felt in the core (high temperature use)	
	Fluorocarbon Resin String Type Gasket	7GS66A	CORDSEAL <Soft>		−240～260	5	Free size PTFE string type material that can be installed in arbitrary shapes as required	18
	Expanded Graphite Sheet Gasket	VF-30	VALQUAFOIL Sheet Gasket		−240～400	2	Expanded graphite gasket	23
		VF-35E	VALQUAFOIL Sheet Gasket with thin metallic sheet		−240～400	5	Expanded graphite gasket reinforced with a stainless steel foil	
		VFT-30	VALQUAFOIL Sheet Gasket		−240～300	2	Expanded graphite gasket laminating PTFE sheets on both sides of No.VF-30	
		VFT-35E	VALQUAFOIL Sheet Gasket with thin metallic sheet		−240～300	5	Expanded graphite gasket laminating PTFE sheets on both sides of No.VF-35E	
	Rubber Coated Fabric Gasket	N214	VALQUATEX Gasket		400	0.1	Gasket made of rubber coated glass fiber fabric	39
		N314	VALQUATEX Gasket		800	0.1	Gasket made of rubber coated ceramic fiber fabric with metallic wire (heat resistant)	
Semi-Metallic Gasket	Spiral Wound Gasket	8590 Series	CLEANTIGHT		−200～500	30	Spiral wound gasket using non-asbestos inorganic paper as filler	27
		6590 Series	BLACKTIGHT		−270～450	30	Spiral wound gasket using expanded graphite tape as filler	
		7590 Series	WHITETIGHT		−260～300	20	Spiral wound gasket using PTFE tape as filler	
		M590 Series	Mica filler product		750	30	Spiral wound gasket using mica as filler	
	Metal Jacketed Gasket	N510 Series	Non-Asbestos Corrugated Metal Jacketed Gasket		Depending on the material used	7	Concentric corrugated gasket with a metal sealing element coating the soft filler material	32
		N520 Series	Non-Asbestos Flat Metal Jacketed Gasket		Depending on the material used	7	Flat gaskets with a metal sealing element coating the soft filler material	
Metal Gasket	Metal Flat Gasket	560 Series	Flat Metal Gasket		Depending on the material used	14	Flat metal gaskets are either cut or machined from flat plates, round rods, forging metals, etc	35
	Metal Serrated Gasket	540 Series	Serrated Metal Gasket		Depending on the material used	14	Concentric grooved metal gasket	
	Ring Joint Gasket	550 Series	Ring Joint Gasket		Depending on the material used	45	A gasket machined from metal (usually oval or octagonal in cross-section) and used in conjunction with ring-joint flanges	37

Remark For further details on the properties, please refer to our publication catalogue, the information provided for each product on our homepage and the VALQUA handbook (technical or dimensions editions).

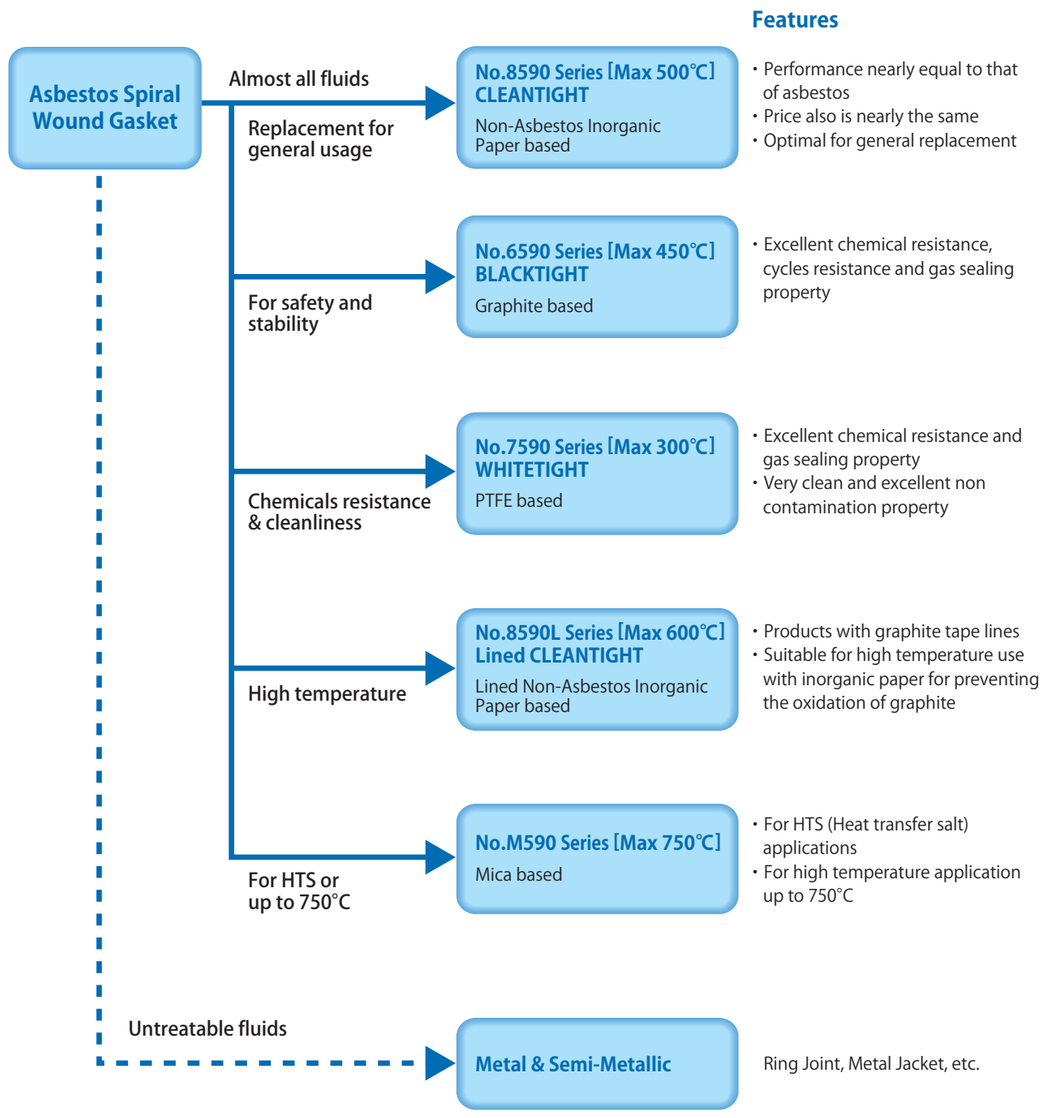
Notes (1) Since Available Ranges define only the maximum permissible ranges of temperature and pressure under ideal conditions, any does not cover any special applications.
(2) For applications subject to temperatures 100°C or higher, refer to "Notes" on page 10.

Flowchart for Non-Asbestos Alternatives to Asbestos Products

Flowchart for Alternatives to Compressed Asbestos Fiber Sheets



Flowchart for Alternatives to Asbestos Spiral Wound Gaskets



For further details including available ranges, please refer to relevant pages of this catalogue.

Note Since this alternative flowchart provides only rough standards, please contact us for your final selections.

High Performance Non-Asbestos Sheet

VALQUA No. MF300 / GF300 / SF300

These gaskets have excellent chemical resistance, heat resistance, are easy to handle and do not harden easily because these gaskets use PTFE as binders. The gaskets do not contain any rubber, and retightening is possible since deterioration with age and hardening does not occur.

BRIGHTHYPER

VALQUA No.
MF300

With using special methods and materials, these non asbestos sheet gaskets have enhanced brightness level and chemical resistance. These are applicable for both acid and alkali, and have long-term stability for high temperature like No.GF300 and No.SF300.

Suitable fluids	Water, seawater, hot water, steam, air, acid, aqueous solution of strong alkaline salt, oils, alcohol, aliphatic solvent and its vapor, and general gases
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
Dimensions	〈Width × Length〉(mm) 1270 × 1270 (t1.5、t3.0) 〈Color type〉white 〈Print color〉no-printed

食

■ Design data ■

▼Recommended tightening stress

Tightening stress is defined as the pressure required under standard conditions without consideration to the opening force due to internal fluid.

Fluid	Recommended tightening stress (MPa)
Liquid	25.5
Gas	35.0

▼Available ranges

Temperature and pressure classifications show individual service limits.

Temperature (℃)	Pressure (MPa)
−200～300	3.5

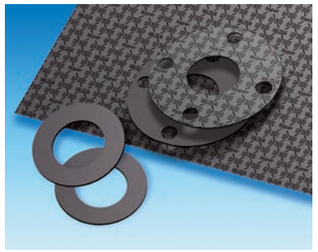
▼m,y values

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

Thickness (mm)	Gasket factor "m"	Minimum design seating stress "y" (N/mm^2)
3.0	2.00	11.0
1.5	2.75	25.5
1.0	3.50	44.8

Features

- Free from hardening deterioration and aging due to heat.
- Retightening is possible as no hardening occurs.
- Applicable to a wider variety of fluids compared to other Compressed Fiber Sheet.
- No sticking to flanges.



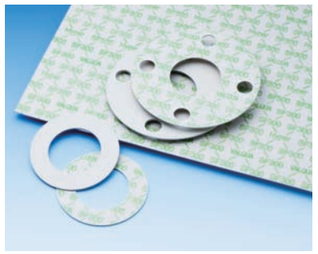
BLACKHYPER

VALQUA No.
GF300

The use of flexible resin binders results in improved properties against brittleness and damages compared to expanded graphite sheet gaskets.

Unsuitable fluids	Oxidizing acids and substances susceptible to burn such as oxygen, polymerizable monomer, strong alkali, gas susceptible to burn 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
Dimensions	〈Width × Length〉(mm) 1270 × 1270 (t1.0、t1.5) 1500 × 1500 (t2.0、t3.0) 〈Color type〉black 〈Print color〉black

食



WHITEHYPER

VALQUA No.
SF300

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.

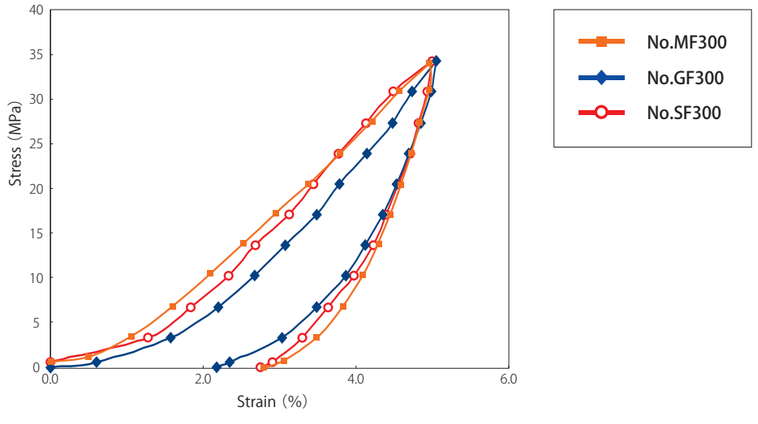
Unsuitable fluids	Polymerizable monomer, strong alkali, and toxic gas
Applications	Joint sections of cover flanges and nozzles and the like for pipe flanges, valve bonnets, towers & tanks, ovens, pressure vessels and heat exchangers used in various factories including power stations, oil refineries, steel plants and shipyards
Dimensions	〈Width × Length〉(mm) 1000 × 1000 (t1.5) 1270 × 1270 (t2.0、t3.0) 〈Color type〉off-white 〈Print color〉green

食

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

■ Stress strain characteristics of High Performance Non-Asbestos Sheet

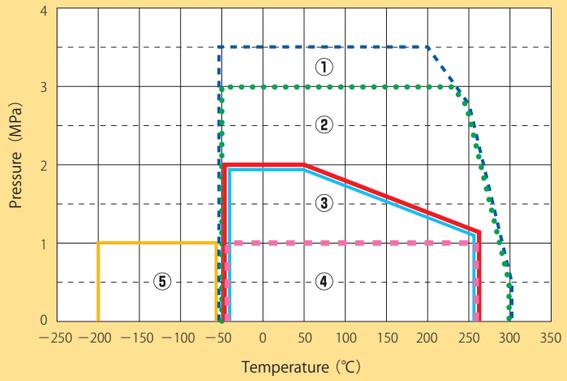
(Dimension of test piece : JIS 10K 25A t =1.5mm)



High Performance Non-Asbestos Sheet

VALQUA No. MF300 / GF300 / SF300

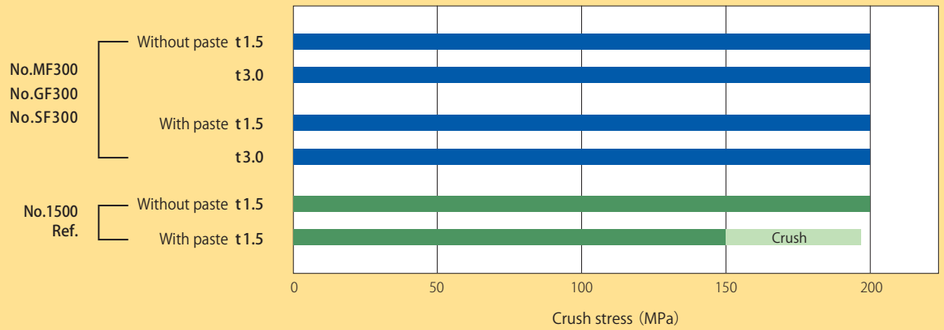
■ Available ranges per fluid ■



① Water based fluid
② Oil based fluid
③ Acid, alkali and solvent
Air, nitrogen gas, inert gas
④ Inflammable gas
⑤ Low temperature fluid

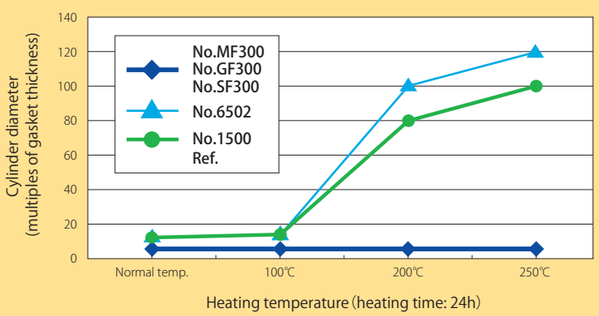
Remark When using gas application, we recommend applying gasket paste to the flange and the inner diameter section before applying a tightening stress of about 35 MPa.
When using gasket paste, please use NEW VALFLON paste.
Please note, No.6 and No.6M are not suitable.

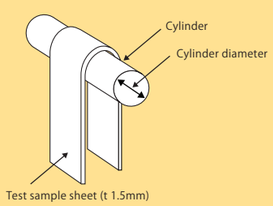
■ Crush strength comparison ■



Remark Tested by applying a recommended paste to the surface of each product.
No.MF300, No.GF300, No.SF300 : NEW VALFLON Paste
No.1500 : SEALPASTE

■ Comparison of high temperature hardening properties ■





A heated sheet is wound around a cylinder with a specified diameter to check the occurrences of "cracks".

Compressed Non-Asbestos Fiber Sheet

VALQUA No. 6502 / 6500 / 6500AC / 6503 / 6503AC

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

BLACKSUPER

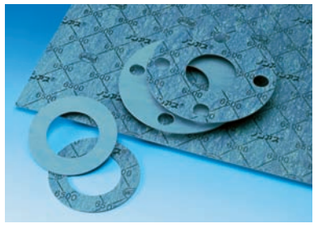
VALQUA No. 6502

Calendered gasket material made of selected synthetic organic, inorganic fibers and carbon fiber bonded with special rubber binder using the minimum required amount of organic fiber. 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

Applications: Joint areas of steam lines, pipe flanges, valve bonnets and other equipment used in oil refineries and chemical industries

Dimensions:
〈Width × Length〉(mm)
1270 × 1270、1270 × 3810、2540 × 3810、3048 × 3810
〈Thickness〉(mm)
0.5、0.8、1.0、1.5、2.0、3.0
〈Color type〉gray
〈Print color〉black



Compressed Non-Asbestos Fiber Sheet for general use

VALQUA No. 6500

These are suitable to be used as Non-asbestos gaskets for pipe flanges and equipment in various industries. The adaptability of these sheets for water apparatus has been confirmed based on JIS S 3200-7.

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 including oil refineries, chemical industries and ship-yards

Dimensions:
〈Width × Length〉(mm)
1270 × 1270、1270 × 3810、2540 × 3810、3048 × 3810
〈Thickness〉(mm)
0.4、0.5、0.8、1.0、1.5、2.0、3.0
〈Color type〉blue
〈Print color〉black

Anti-corrosion Compressed Non-Asbestos Fiber Sheet

VALQUA No. 6500AC

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.

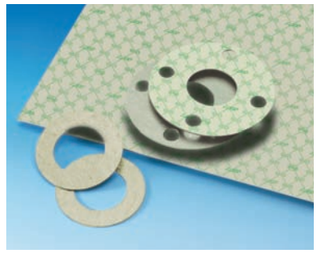
Unsuitable fluids: Strong acid, strong alkali, various solvents, inflammable gas, gas susceptible to burn and toxic gas

Applications: Stainless steel pipe flanges, valve bonnets and other equipment used in various industries requiring corrosion resistance

Dimensions:
〈Width × Length〉(mm)
1270 × 1270、1270 × 3810、2540 × 3810
〈Thickness〉(mm)
1.0、1.5、2.0、3.0
〈Color type〉blue
〈Print color〉orange

Compressed Non-Asbestos Fiber Sheet

VALQUA No. 6502 / 6500 / 6500AC / 6503 / 6503AC



White Compressed Non-Asbestos Fiber Sheet

VALQUA No. 6503

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

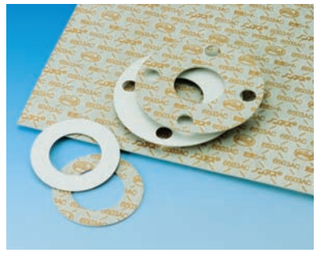
Strong acid, strong alkali, various solvents, inflammable gas, gas susceptible to burn and toxic gas

Applications

Applications should be avoided in which black foreign substances are included into process fluids, such as in petrochemical industry

Dimensions

〈Width × Length〉(mm)
1270 × 1270、1270 × 3810、2540 × 3810、3048 × 3810
〈Thickness〉(mm)
0.5、0.8、1.0、1.5、2.0、3.0
〈Color type〉white
〈Print color〉green



Anti-corrosion white Compressed Non-Asbestos Fiber Sheet

VALQUA No. 6503AC

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

Dimensions

〈Width × Length〉(mm)
1270 × 1270、1270 × 3810、2540 × 3810
〈Thickness〉(mm)
0.5、0.8、1.0、1.5、2.0、3.0
〈Color type〉white
〈Print color〉orange

■ Design data ■

▼Recommended tightening stress

Tightening stress is defined as a pressure required under standard conditions without consideration for the opening force due to internal fluid.

Fluid	Recommended tightening stress (MPa)
Liquid	25.5
Gas	40.0

▼m,y values

The m, y values for Compressed Fiber Sheets defined in the Appendix G of JIS B 8265 can be applied to the m, y values of Compressed Non-Asbestos Fiber Sheets.

Thickness (mm)	Gasket factor "m"	Minimum design seating stress "y" (N/mm²)
3.0	2.00	11.0
1.5	2.75	25.5
1.0	3.50	44.8

▼Available ranges

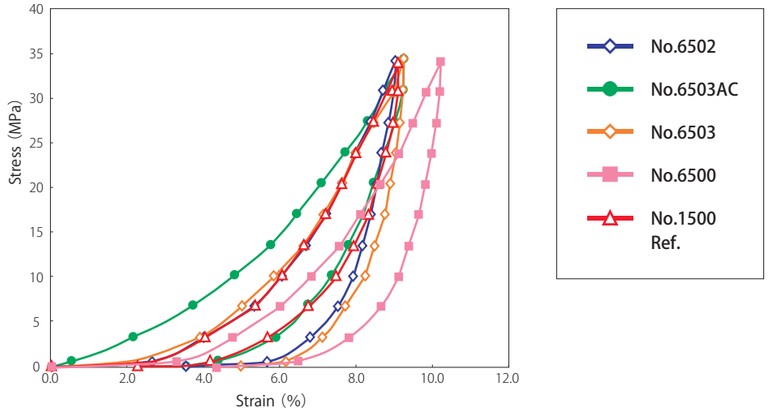
Temperature and pressure classifications show individual service limits.

VALQUA No.	Temperature (℃) (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

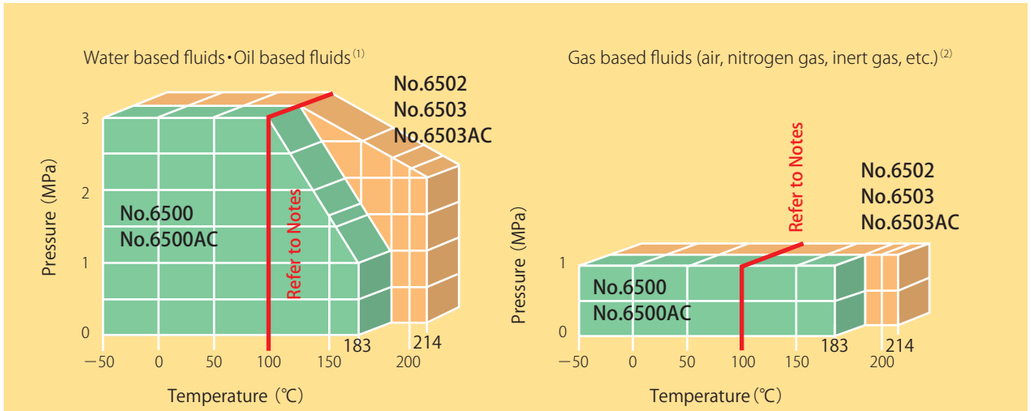
Notes (1) For service conditions exceeding 100°C, please refer to the notes on page 10.
(2) Regarding oil gas, solvent and corrosive fluid, separate consultation is required.

■ Stress strain characteristics of Compressed Non-Asbestos Fiber Sheet

(Dimension of test piece：JIS 10K 25A t=1.5mm)



■ Temperature & Pressure ranges per fluid ■



Notes (1) Oil gas, solvents and corrosive fluids are not included and therefore require separate consultation.
(2) Inflammable gas, gas susceptible to burn and toxic gas are not included and therefore require separate consultation.

▼ Note

If joint sheets No.6502, No.6503, No.6503AC, No.6500 and No.6500AC are used under conditions subject to temperatures exceeding 100°C, gaskets may break due to hardening, thus, please observe the following notes :

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.

High Performance Non-Asbestos Sheet / Compressed Non-Asbestos Fiber Sheet

VALQUA No. MF300 / GF300 / SF300 / 6502 / 6500 / 6500AC / 6503 / 6503AC

■ Comparison of physical properties ■

Item		High Performance Non-Asbestos Sheet						Compressed Non-Asbestos Fiber Sheet								No.1500 [Ref.]	
		No.MF300		No.GF300		No.SF300		No.6502		No.6503		No.6500		No.6503AC			
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	1.5	3.0
Physical Properties																	
Tensile strength (CD)	(MPa)	12.0	14.1	12.4	10.9	16.0	15.8	13.1	12.5	19.2	18.1	17.0	15.3	18.6	17.8	28.4	27.3
Compressibility (34.3MPa)	(%)	5	4	5	4	5	6	9	10	9	6	10	10	8	8	9	8
Recovery (34.3MPa)	(%)	32	36	53	54	42	50	67	64	60	61	57	55	58	54	61	55
Flexibility (MD)(1)		<2	<2	<2	<2	<2	<2	11	12	10	10	9	9	12	12	11	12
Density	(kg/m^3)	2910	2839	2315	2262	2319	2280	1761	1759	1803	1857	1810	1813	1821	1807	1880	1924
Oil resistance 〈 IRM903 OIL 150℃×5h 〉																	
Tensile strength loss	(%)	1.5	5.9	−8.9	7.6	3.8	5.1	9.2	9.6	13.0	0	16.7	−1.1	15.1	7.9	26.8	16.8
Thickness increase	(%)	0.2	0.2	0.9	0.1	0.0	0.0	1.3	1.0	2.1	0.6	2.2	0.9	2.2	0.7	20.1	12.4
Weight increase	(%)	1.1	1.4	0.7	0.6	0.5	0.7	4.4	3.0	4.2	1.7	3.9	2.2	4.7	3.5	24.9	10.2
Fuel oil resistance 〈 JIS Fuel oil B RT×5h 〉																	
Thickness increase	(%)	0.2	0.5	1.1	0.3	0.4	0.1	4.3	2.6	5.4	2.3	5.6	2.8	4.9	3.1	14.5	10.6
Weight increase	(%)	0.9	1.8	1.8	1.2	0.9	1.3	6.7	6.0	7.0	3.2	5.6	4.0	6.4	4.9	9.4	8.2
Creep relaxation 〈 JIS R 3453 Tightening stress 20.6MPa 〉																	
100℃×22h	(%)	16.9	30.2	16.2	37.0	16.1	42.7	23.5	37.8	27.3	45.0	27.5	47.0	25.5	43.0	31.0	46.1
200℃×22h	(%)	35.8	55.0	35.3	65.8	40.5	68.8	41.1	65.5	43.6	60.5	52.0	78.8	43.4	69.5	39.7	53.4
Sealability 〈φ48×φ67×t1.5, Tightening stress 19.6MPa, Internal pressure 0.98MPa N_2 gas〉																	
With paste	($Pa \cdot m^3/s$)	1.7×10^{-5} or below		1.7×10^{-5} or below		1.7×10^{-5} or below		3.0×10^{-5}		2.0×10^{-4}		6.0×10^{-4}		2.0×10^{-4}		6.0×10^{-5}	
	(atm·cc/min.)	0.01 or below		0.01 or below		0.01 or below		0.02		0.12		0.36		0.12		0.04	
Without paste	($Pa \cdot m^3/s$)	1.7×10^{-5} or below		4.0×10^{-4}		3.5×10^{-4}		1.5×10^{-4}		1.0×10^{-3}		3.0×10^{-3}		9.3×10^{-4}		1.5×10^{-4}	
	(atm·cc/min.)	0.01 or below		0.24		0.21		0.09		0.59		1.78		0.55		0.09	

Note (1) Flexibility is in accordance with JIS R 3453 6.2.5. Refer to "Comparison of high temperature hardening properties" on page 7.
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℃, 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.

■ 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.MF300/GF300/SF300)

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". No.6 and No.6M for BLACKHYPER and WHITEHYPER are not recommended.

▼ For Compressed Non-Asbestos Fiber Sheet (No.6502/6500/6500AC/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. 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).

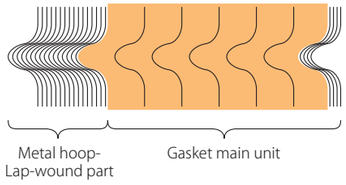
NONASUPER

VALQUA No. 8590TN

NONASUPER gaskets are manufactured by winding metal strips (SUS304) around the periphery of basic 3.2 mm thick spiral wound gaskets. The lap wound section of this metal strips around the periphery facilitates centering at the time of gasket installation, and also enhances the strength of the gasket's main body. Provided with better sealing performance than conventional Compressed Asbestos Fiber Sheets, these NONASUPER gaskets can be used with the same level of tightening force as that of Compressed Asbestos Fiber Sheets.

Features

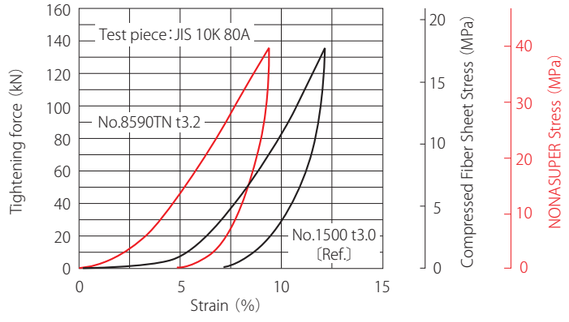
- ▶Main body made of Non-Asbestos filler having durability and heat resistance.
- ▶Applicable to steam lines without causing any problems.
- ▶Can withstand impact pressure such as water hammer
- ▶Longer life than Compressed Fiber Sheet.



NONASUPER

VALQUA No. **8590TN**	These are gaskets best suited for high temperature utility lines as alternatives for Compressed Asbestos Fiber Sheets (heat resistant up to 450℃).
Applicable fluids	Water, hot water, steam
Applications	Standard pipe flanges in various factories
Dimensions	JIS 10K、JPI Class 150、Max 200A 〈Thickness〉 3.2mm 〈Filler Color〉 Cream
Composition	Hoop：SUS304 Filler：Non-asbestos inorganic paper

▼Stress strain characteristics



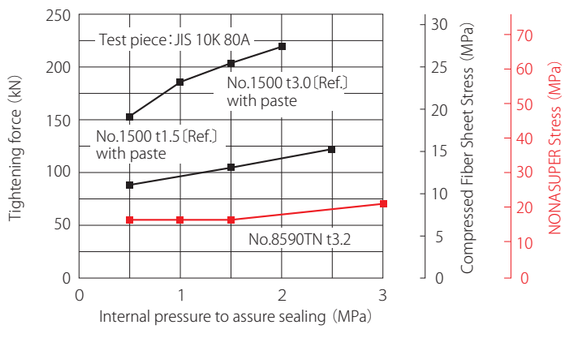
■ Design data ■

▼Available ranges and tightening stress

Maximum service temp.	450℃
Pressure rating	JIS 10K JPI Class 150
Recommended tightening stress(1)	30 MPa

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.

▼Sealing performance



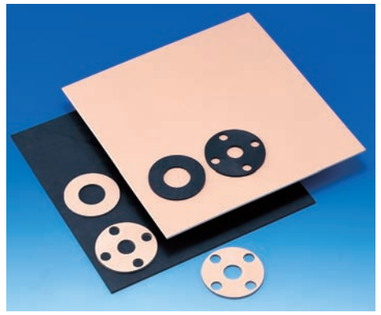
Gasket Paste is an agent employed to enhance the sealing effect of gasket contact surfaces and to facilitate peeling off gaskets when disassembling joints. Select an optimum type among a variety of products.

Product name	Description	Applicable fluids	Available temp. range (℃)	Mode of packing
Gasket Paste No.5	Black paste containing special oil-soluble adhesive compounded with fine particles of graphite.	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.	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.	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	White paste containing special water-soluble adhesive, which have high oil and solvent resistance, compounded with fine particles of mica.	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	Light brown paste containing a special non-drying oil adhesive, compounded with inorganic filler material and a small amount of solvent.	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	It is a fluororesin powder that is water-dispersed using surfactant agents.	When handling highly corrosive fluids such as strong acids, alkalis, or halogens and when handling oxygen where noncombustible materials are required.	—200～300 (O_2 gas 100℃)	100g metallic tube 1 kg polyethylene container

VALFLON Gasket

VALQUA No. 7010 / 7010-EX / 7020 / 7026 / 7GP61 / 7GP66

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.)



▲No.7020/7026

VALQUALON Gasket

VALQUA No. 7020

In order to improve the cold flow (creep phenomenon), which is a drawback in PTFE, these gaskets are shaped by means of a special manufacturing process where inorganic filler material is compounded. Provided with heat resistance, chemicals resistance, and anti-cold flow property, they are best suited for lines handling various chemicals (high concentrated hot sulfuric acid, hot nitric acid, etc.). However, they are not suited for high concentrated alkali such as sodium hydroxide and hydrofluoric acid.

食

BLACK VALQUALON Gasket

VALQUA No. 7026

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 best suited for lines handling various chemicals. However, as they are not suited for oxidizing fluids such as high concentrated hot sulfuric acid and hot nitric acid, please use No.7020 instead for such applications.

食

▲No.7010

VALFON Gasket

VALQUA No. 7010

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.

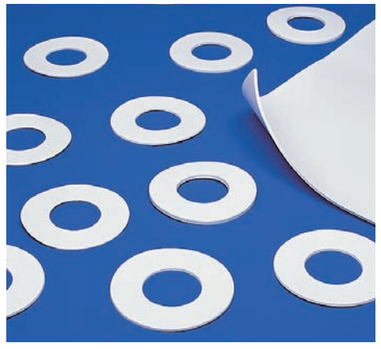
食

NEW VALFON Gasket

VALQUA No. 7010-EX

No.7010-EX gaskets are made of "NEW VALFLON" material that has improved anti-creeping performance, 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.

食



▲No.7GP61/7GP66

VALFON Soft Sheet

VALQUA No. 7GP61 (Sheet) 7GP66 (Gasket)

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

食

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

■ Available ranges ■

VALQUA No.	Temperature (℃)	Pressure (MPa)
7010 (1)	−50～100	1.0
7010-EX	−50～150	1.0
7020 **7026**	−200～200	4.0
7GP66	−240～260	2.0

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

■ Standard dimensions ■

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

■ Design data ■

▼m, y values

VALQUA No.	Thickness (mm)	Gasket factor "m"	Minimum design seating stress "y" (N/mm²)
7010 **7010-EX**	1.0/1.5	3.0	19.6
	2.0	2.5	14.7
	3.0	2.0	
7020 **7026**	1.0	3.5	24.5
	1.5	3.2	22.5
	2.0	3.0	19.6
	3.0	2.5	
7GP66	0.5～3.0	2.5	19.6

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

▼Recommended tightening stress

VALQUA No.	Recommended tightening stress (MPa) (1)	
	Liquid	Gas
7010 (2) **7010-EX**	10.0	15.0
7020 **7026**	20.0	24.5

Notes (1) These tightening stresses are the pressures required under normal conditions, and correspond to the projected area of the gasket, where fluid pressure is not taken into consideration.
(2) For No.7010, grooved flanges should be used in principle.

▼Characteristic values of VALFLON Gasket

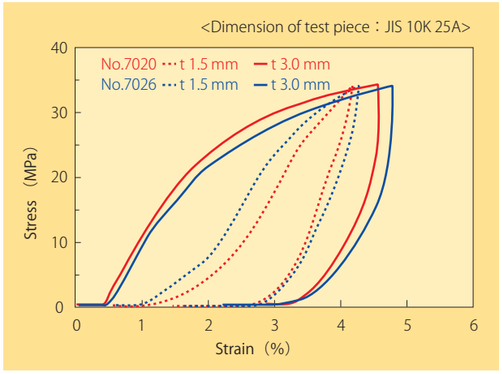
Item	No.7020		No.7026		No.7010		No 7010-EX		No.7GP66		Ref.
Thickness (mm)	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	—
Density (kg/m³)	2330	2300	2070	2070	2170	2180	2210	2200	620	670	—
Elongation (%)	405	415	370	286	460	445	588	574	334	336	—
Tensile strength (MPa)	15.6	15.8	24.2	23.2	30.2	27.3	26.4	24.2	24.0	18.4	JIS R 3453
Compressibility (34.3MPa) (%)	4	5	4	5	19	12	20	12	69	71	
Recovery (34.3MPa) (%)	69	54	67	63	51	64	63	48	15	16	
Creep relaxation (20.6MPa) 100℃×22h (%)	37.2	55.0	42.8	60.8	75.9	88.4	63.7	79.6	51.9	68.3	
200℃×22h (%)	66.7	81.0	79.3	85.5	92.4	97.3	86.0	90.8	59.3	75.3	

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

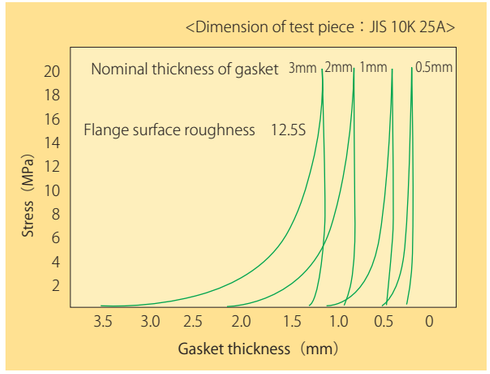
VALFLON Gasket

VALQUA No. 7010 / 7010-EX / 7020 / 7026 / 7GP61 / 7GP66

▼ 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.

▼ 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. Particularly care shall be given when using gaskets of 150 Lb, 1B or smaller, or those of smaller gasket width 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 already once experienced leakage, fails in preventing leakage, replace them with new ones.

CORDSEAL <Soft>

VALQUA No. 7GS66A / 7GS62A / 7GS64N

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	15
	2	5
	3	5

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	

■ Available ranges ■

No.7GS66A	Nominal size <Width> (mm)		
	6	9	12
Temperature (℃)	−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.

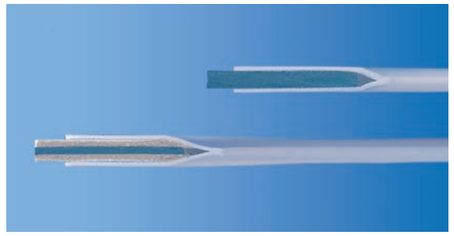
▼Gaskets for duct flanges and pipe flanges.

▼Gland packing for valves

VALFLON Envelope Gasket

VALQUA No. N7030 / N7031 / N7035

VALFLON (PTFE) Envelope Gasket using Compressed Non-Asbestos Fiber Sheet and Flexible Graphite in the core. 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

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

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

VALFLON Envelope Gasket

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

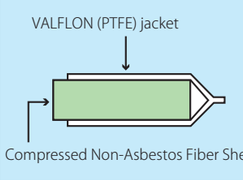
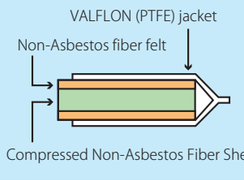
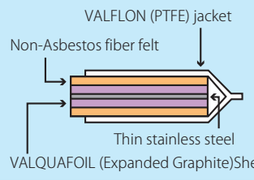
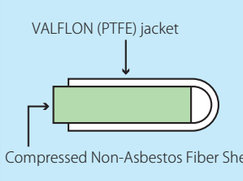
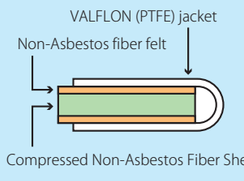
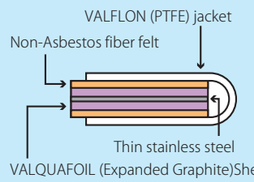
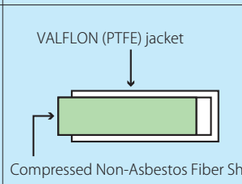
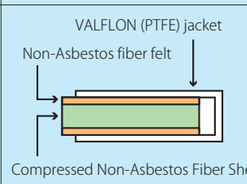
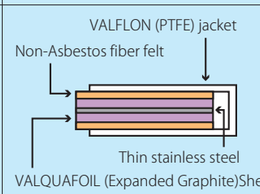
High temperature & high pressure use Envelope Gasket for preventing the flow of PTFE jacket, in which Non-Asbestos Felt Sheets are attached on both sides of the Compressed Non-Asbestos Fiber Sheet to form the core.

VALFLON Envelope Gasket

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

Envelope Gasket that can be used under conditions subject to extremely high temperatures, in which Non-Asbestos Felt Sheet are attached on both sides of the VALQUAFOIL (expanded graphite) Sheet, incorporating thin stainless steel sheet to form the core.

▼Types

VALQUA No.	N type	S type	H type
N7030 Series			
N7031 Series(1)			
N7035 Series			

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.

■ Available ranges ■

VALQUA No.	Temperature (℃)	Pressure (MPa)
N7030 (N) **N7031 (N)** **N7035 (N)**	−100～150(1)	1.5
N7030 (S) **N7031 (S)** **N7035 (S)**	−100～200(1)	2.0
N7030 (H) **N7031 (H)** **N7035 (H)**	−100～260	3.0

Note (1) If the service temperature exceeds 120℃, 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.
Remarks 1. Temperature and pressure show individual service limits.
2. Please use of the above values as a guide for selecting the gaskets.

■ Standard 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

Note (1) The standard thickness is 4.5mm for those that exceed the 950mm size of No.N7031 (H).

■ Design data ■

▼m, y values

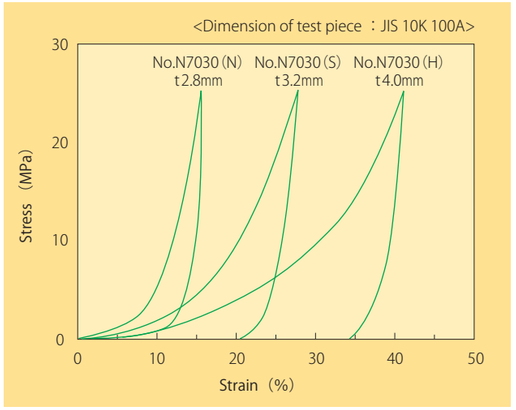
VALQUA No.	Gasket factor "m"	Minimum design seating stress "y" (N/mm^2)
N7030 Series	3.5	14.7
N7031 Series	4.0	19.6
N7035 Series	3.5	14.7

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

▼Recommended tightening stress

VALQUA No.	Recommended tightening stress (MPa)	
	Liquid	Gas
N7030 Series **N7035 Series**	15.0	20.0
N7031 Series	20.0	24.5

▼Stress strain characteristics of VALFLON Envelope Gasket (No.N7030)



VALFLON Envelope Gasket

VALQUA No. N7030 / N7031 / N7035

■ 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 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
2. Shape
3. Presence of special specification
4. Nominal pressure, Nominal diameter
5. Operating temperature, Fluid
6. Quantity

Please refer to the following guide if necessary:

VALQUA N703□ - □□□□□□

VALQUA No. 5th	
Code	Content
0	Split Design
1	Folded Design
5	Machined Design

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	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	A	Raised Face 〈 Non-Standard size 〉	A	No.6502
G	Glass lined piping	4	FEP	H	No.VF-35E + Non-Asbestos Felt	W	All outside welding (General use)	B	Flat Face 〈Envelope fitting〉 inside bolt circle	B	No.6503
				R	Metal + No.6500 + Non-Asbestos Felt	R	All side spot welding	E	Flat Face Full covered 〈 with envelope 〉	H	No.VF-35E
				X	Others	S	Partial side spot welding	X	Others	X	Compressed Fiber Sheet
						K	Simple welding				

Example of Description

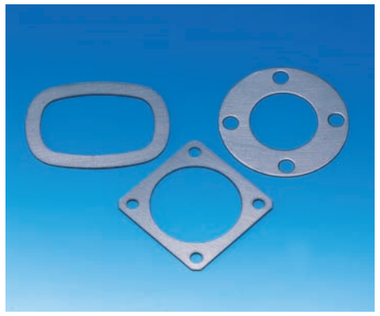
High temperature use (H)：N703□ - □□H□□H

Multiple sheet construction using No.VF-35E：N703□ - □□R□□H

VALQUAFOIL Gasket

VALQUA No. VF-30 / VF-35E / VFT-30 / VFT-35E

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. Gaskets with PTFE sheet lamination on both sides are also available.
("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

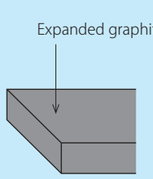
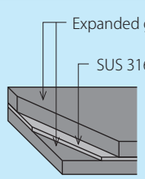
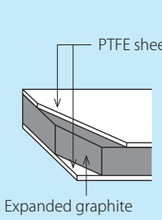
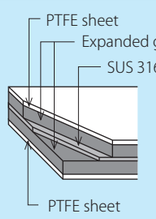
This gasket is made by attaching VALQUAFOIL Sheets on both sides of a thin stainless steel sheet (0.05 mm thick), which is then punched into a specified flat shape.

VALQUAFOIL Gasket

VALQUA No. VFT-30 VFT-35E

With a view to enhancing the sealing property, No.VFT-30 or No.VFT-35E gasket is made by laminating PTFE sheets (soft type) on both sides of No.VF-30 or No.VF-35E, which is then punched into a specified flat shape. Even with a low tightening force, sufficient sealing property is expected, together with adhesion suppression on the flange surface.

▼Type

No.VF-30	No.VF-35E	No.VFT-30	No.VFT-35E
			

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.

■ Available ranges ■

VALQUA No.	Temperature (℃)	Pressure (MPa)
VF-30	−240～400	2.0
VF-35E		5.0
VFT-30	−240～300(1)	2.0
VFT-35E		5.0

Note (1) VFT gaskets may stick to flanges at temperatures exceeding 250℃.
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.

■ Standard dimensions ■

VALQUA No.	Nominal thickness (mm)	Size (mm)
VF-30	0.4、0.8、1.0	980×1000
	1.2	730×1000
	1.6、3.0	600×1000
VF-35E	0.8、1.6、3.0	1000×1000
VFT-30	0.5、0.8、1.0	1000×1000(1)
	1.5	1000×1000
VFT-35E	0.8、1.6、3.0	1000×1000

Note (1) Products as long as 10 m are also available for No.VFT-30 with thicknesses of 0.5, 0.8 and 1.0 mm. Further information is available upon request.

■ Design data ■

▼m,y values

VALQUA No.	Gasket factor "m"	Minimum design seating stress "y" (N/mm²)
		Liquid <steam>(1)
VF-30	2.0	26.0
VF-35E		29.4
VFT-30		26.0
VFT-35E		29.4

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

▼ Recommended tightening stress

VALQUA No.	Recommended tightening stress (MPa)(1)	
	Liquid	Gas
VF-30	26.0	40.0
VF-35E	30.0	
VFT-30	26.0	26.0
VFT-35E	30.0	30.0

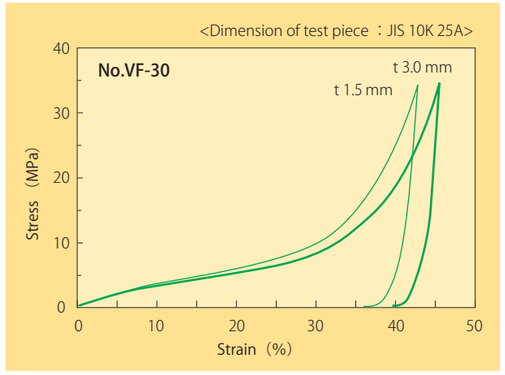
Note (1) The recommended tightening stress is the pressures required under normal conditions, and correspond to the projected area of the gasket, where fluid pressure is not taken into consideration.

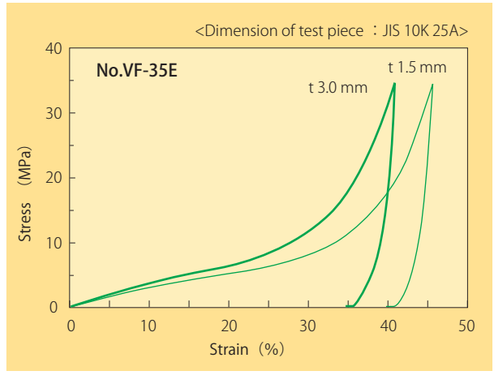
▼Characteristic values of VALQUAFOIL Gasket

Item		No.VF-30		No.VF-35E(1)		Ref.
Thickness	(mm)	1.6	3.0	1.6	3.0	—
Density	(kg/m³)	1067	1054	1216	1143	—
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	
Creep relaxation (20.6MPa) 100℃×22h	(%)	7.3	12.4	9.5	9.2	
200℃×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.

■ Stress strain characteristics ■





VALQUAFOIL Gasket

VALQUA No. VF-30 / VF-35E / VFT-30 / VFT-35E

■ 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.

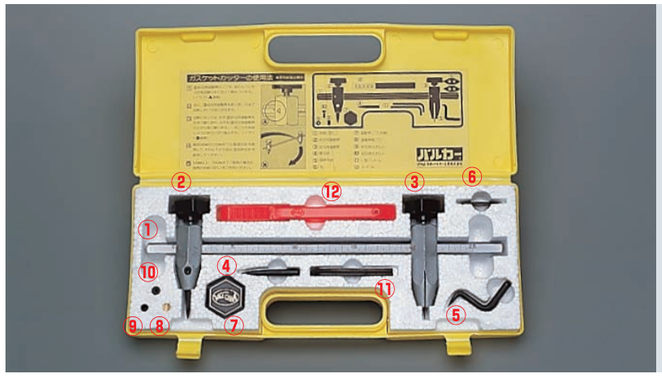
▼ Notes to be observed during installation work

- 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.

▼ 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. Application of gasket paste on the contact surface between the gasket and the flange is likely to cause crush, so that careful attention is required in tightening, and also the amount of gasket paste shall be minimized.
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).



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

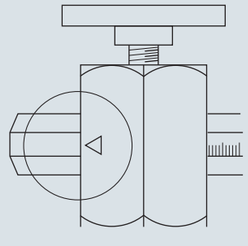
■ Placing part orders ■

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.

Ⓐ



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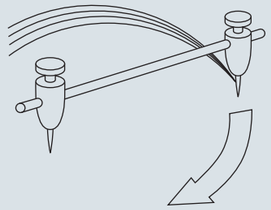


Non-Asbestos Spiral Wound Gasket

VALQUA No. 8590 Series / 6590 Series / 7590 Series / M590 Series

Non-Asbestos Spiral Wound Gaskets use Non-Asbestos inorganic paper, VALQUAFOIL (expanded graphite) and VALFLON (PTFE) tape as filler materials, and 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 inner ring	With outer ring	With inner & outer ring
CLEANTIGHT	Non-Asbestos inorganic paper	**No.8590**	**No.8592**	**No.8591**	**No.8596**
BLACKTIGHT	VALQUAFOIL tape	**No.6590**	**No.6592**	**No.6591** (1)	**No.6596**
WHITETIGHT	VALFLON tape	**No.7590**	**No.7592**	**No.7591** (1)	**No.7596**
Mica filler products	Mica tape	**No.M590**	**No.M592**	**No.M591**	**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

These Spiral Wound Gaskets use non-asbestos based inorganic paper instead of conventional asbestos filler, and are more economical compared to other products employing non-asbestos fillers (VALQUAFOIL or VALFLON).

Features

- They have heat resistance comparable to that of asbestos fillers.
- They can be used with the same design as conventional asbestos spiral wound gaskets.
- Products that comply with nuclear power specifications are also available.

BLACKTIGHT

VALQUA No. 6590 Series

Using pure graphite (expanded graphite) sealing material, VALQUAFOIL, as filler material, these Spiral Wound Gaskets have excellent sealing properties and also respond well to heat and pressure cycles.

Features

- 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 best suited for use in handling high temperature & high pressure steam, as well as cryogenic fluids such as LNG, liquid nitrogen and liquid hydrogen.

WHITETIGHT

VALQUA No. 7590 Series

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.

Features

- 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.

Mica filler products

VALQUA No. M590 Series

These spiral wound gaskets are made of special clothless mica filler containing minimal organic constituents like rubber and has excellent heat resistance. Please use graphite tape line added spiral wound gaskets for places in which greater sealability is required.

Features

- Maximum service temperature is 750°C.
- By optimizing the shape of mica particle, sufficient filler strength is acquired, eliminating the need for cloth reinforcement and the like.

Applications

For HTS (Heat transfer salt) application or high temperature application up to 750°C

Non-Asbestos Spiral Wound Gasket

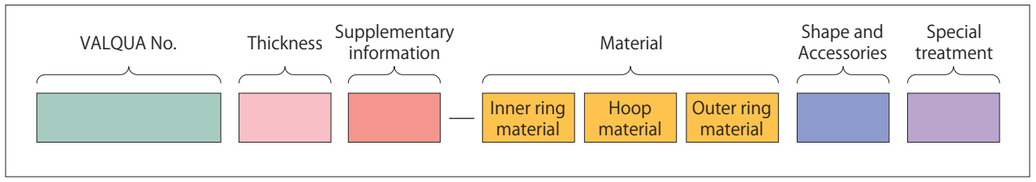
VALQUA No. 8590 Series / 6590 Series / 7590 Series / M590 Series

Ordering Information

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

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

Please refer to the following guide if necessary:



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

Notes (1) 4.5, 4.8, 6.4mm are available for mica filler products

Supplementary information	
Content	Code
Graphite tape line added	L[2]
Graphite tape line added with special requirements incorporated	S[2]
Cryogenic Temperature service	C[3]
Others	–

Notes (2) Available for CLEANTIGHT and mica filler products
(3) Available for BLACKTIGHT only

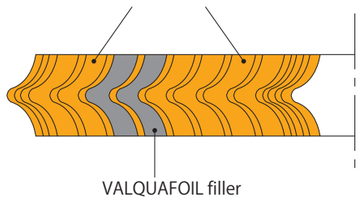
Material					
Inner ring material		Hoop material		Outer ring material	
Content	Code	Content	Code	Content	Code
SUS304	E	SUS304	E	SUS304	E
SUS304L	L	SUS304L	L	SUS304L	L
SUS310S	O	SUS310S	O	SUS310S	O
SUS316	G	SUS316	G	SUS316	G
SUS316L	H	SUS316L	H	SUS316L	H
SUS317L	Q	SUS317L	Q	SUS317L	Q
SUS321	J	SUS321	J	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	
Content	Code
Basic model	Z
Basic model + Handle	B
Basic model + Rib(s) heat exchanger application	Y
Basic model + Hanger	H
Irregular shape without accessories	E
Other special shapes	X

Special treatment	
Content	Code
Without Special treatment	Z
Nuclear application	E
Pitting corrosion-preventive finish	C
Degreased	B
Other special treatment (Also includes combinations for the above special treatments)	X

▼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.

▼ Combination of special treatments and each product

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

○ Available
× Unavailable

Non-Asbestos Spiral Wound Gasket

VALQUA No. 8590 Series / 6590 Series / 7590 Series / M590 Series

■ Design data ■

▼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

● No.8590 Series / 6590 Series / 7590 Series

Gasket Thickness	Manufacturing ranges (mm)
6.4 mm (W)	300 ～ 3500
4.5 mm (V)	10 ～ 3000
3.2 mm (T)	10 ～ 1500
1.6 mm (P)(1)	10 ～ 150

Note (1) For products with gasket thicknesses of 1.6 mm, only the basic type with hoop made of SUS316 are available.
Remarks 1. The sign "( )" shows thickness classifications.
2. Round type gaskets are available.

● No.M590 Series

Gasket Thickness	Manufacturing ranges (mm)
6.4 mm (W)	300 ～ 2500
4.5 mm (V)	10 ～ 2500

Remark The sign "( )" shows thickness classifications.

▼m, y values

The m, y values of Non-Asbestos Spiral Wound Gaskets are the same as those defined in the Appendix G of JIS B 8265.

Gasket factor "m"	Minimum design seating stress "y" (N/mm²)
3.0	68.9

In case of low pressure gas sealing gaskets, the bolt loading obtained by the above m and y values may not provide sufficient sealing performance. We therefore recommend adopting the tightening stresses given in the table below, which are to be applied to the projected area (total contact area) of gaskets as minimum tightening pressures. That is, first, calculate the tightening forces (Wm_1 and Wm_2) using the Appendix G in JIS B 8265, and also obtain the tightening forces from the recommended tightening stresses and the total contact areas below. Then, choose the larger value among the two tightening forces above and apply it as the minimum tightening force.

▼Recommended tightening stress

VALQUA No.	Recommended tightening stress (MPa)(1) <gas>
8590 Series	70.0
6590 Series	50.0
7590 Series	35.0
M590 Series	70.0

Note (1) Tightening stress is defined as the pressure required under standard conditions without consideration to the opening force due to internal fluid.
Remark Separate consultation is required if flange deformation is anticipated for large diameter gaskets.

■ Available ranges ■

VALQUA No.	Temperature (℃)	Pressure (MPa)
8590 Series	−200 ～ 500(1)	30.0
6590 Series	−270 ～ 450	
7590 Series	−260 ～ 300	20.0
M590 Series	−200 ～ 750	30.0

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:
①Adequate tightening shall be performed initially. Further information is available upon request.
②Their 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 & outer rings.

Non-Asbestos Metal Jacketed Gasket

VALQUA No. N510 Series / N520 Series

A Non-Asbestos metal jacketed gasket is a semi-metallic gasket with the insert material jacketed outside a metal thin board. 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.

Non-Asbestos Metal Jacketed Gasket

VALQUA No. **N510**

These gaskets are composed of carefully selected cushion materials such as non-asbestos millboard, ceramic fiber, compressed non-asbestos sheet and PTFE sheet with two sheets of corrugated thin metal jackets. A complete sealing can be assured with low seating stress. A labyrinth effect can also be expected due to corrugation.

Non-Asbestos Metal Jacketed Gasket

VALQUA No. **N520**

These are flat metal jacketed gaskets whose core is made of non-asbestos millboard and covered with two metallic sheets on its outside.

Non-Asbestos Metal Jacketed Gasket (with VALQUAFOIL adhered)

VALQUA No. **N6510** **N6520**

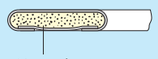
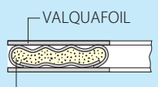
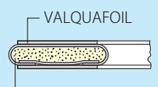
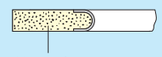
VALQUAFOIL is attached on both sides of No.N510 / No.N520 to enhance sealing performance.

Non-Asbestos Metal Jacketed Gasket

VALQUA No. **N520-C**

The cut surface on the inner diameter side of sheet gaskets made of Compressed Non-Asbestos Fiber Sheet and the like is covered with a thin metallic sheet (grommet-finished), which contributes to permeation leakage prevention and erosion prevention.

▼Types

No.N510	No.N520	No.N6510	No.N6520	No.N520-C
 Non-asbestos cushion material	 Non-asbestos cushion material	 VALQUAFOIL Non-asbestos cushion material	 VALQUAFOIL Non-asbestos cushion material	 Non-asbestos 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).

■ Available ranges ■

VALQUA No.	Temperature (℃)	Pressure (MPa)
N510	Depending on cover metal(1)	7.0
N520		
N6510	−240 ～ 400	
N6520		
N520-C	Depending on core material	

Note(1) For maximum service temperatures for component metallic materials, refer to "Maximum service temperatures for gasket metallic materials (for reference)" on page 33.

■ Standard 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.

Non-Asbestos Metal Jacketed Gasket

VALQUA No. N510 Series / N520 Series

■ Design data ■

▼m, y values

VALQUA No.	Cover material	Gasket factor "m"	Minimum design seating stress "y" (N/mm²)(1)
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
	Soft copper or Brass	3.50	44.8
	Low CS or Iron	3.75	52.4
	Monel	3.50	55.2
	4 - 6% chrome steel	3.75	62.1
	Stainless steel	3.75	62.1

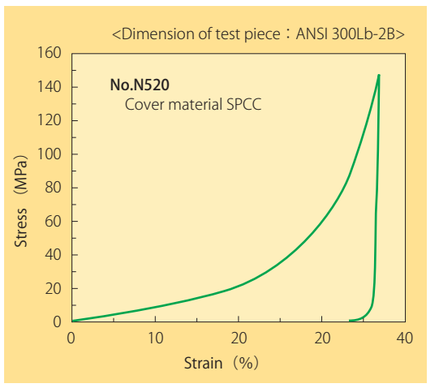
Notes (1) The minimum design seating stress "y" corresponds to values obtained when applied with gasket paste.
(2) For No.N520-C, the m, y values of core materials are applicable.

▼Recommended tightening stress

VALQUA No.	Cover material	Recommended tightening stress (MPa)(1)	
		Liquid	Gas
N520(2)	Cu	30	100
	SPCC	45	140
	SUS 304	70	200
	Al	20	60

Notes (1) Recommended tightening stress are based on the premise of gasket paste application. If the application is not possible, please contact us.
(2) For No.N520-C, refer to the recommended tightening stress for core materials.

▼Stress strain characteristics



▼Maximum service temperatures for gasket metallic materials (for reference)

Material	Maximum service temp. (℃)	Material	Maximum service temp. (℃)
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
2. Material
3. Shape
4. Presence of special specification
5. Nominal pressure, Nominal diameter
6. Operating temperature, Fluid
7. Quantity

Please refer to the following guide if necessary:

VALQUA No. **N520** — Shape — Core material — Jacket metal material — Special specification

Shape		Core material		Jacket metal material		Special specification	
Metal Jacketed Gasket (Non-asbestos cushion material)							
Double-jacketed corrugated	N510	Round	(Z)	PTFE sheet	(4)	Low CS	(S)	Without special treatment	(Z)
Double-jacketed	N520	Round with centering plate	(T)	Expanded graphite sheet	(5)	Copper	(C)	Degreased	(B)
Grommet-finished	N520C	Round with partition bar	(Y)	Soft Non-Asbestos millboard	(7)	SUS 304	(E)	With tape seal	(T)
Metal Jacketed Gasket with VALQUAFOIL adhered (Non-asbestos cushion material)		Obround	(C)	Other special material	(X)	SUS 304L	(L)	Others	(X)
Double-jacketed corrugated	N6510	Oval	(N)			SUS 310S	(O)		
Double-jacketed	N6520	Square	(E)			SUS 316	(G)		
		Other special shape	(X)			SUS 316L	(H)		
						SUS 321	(J)		
						SUS 347	(K)		
						SUS 410	(R)		
						5Cr-0.5Mo steel	(F)		
						Brass	(B)		
						Monel metal	(M)		
						Titanium	(T)		
						Nickel	(N)		
						Aluminum	(A)		
						Lead	(P)		
						Others	(X)		

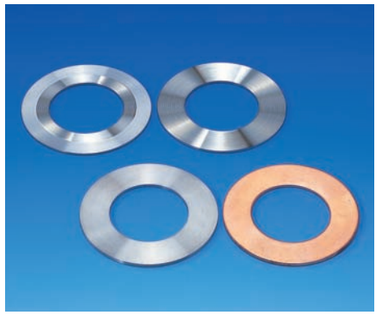
Remarks 1. Please indicate the shape, core material jacket metal material and special specification by entering the code in the parenthesis ( ).
2. Please consult us if you are not able to find your desired shape or material in this table.

〔Ex〕 Metal Jacketed Gasket, Round, Soft Non-Asbestos millboard, SUS316, Degreased
or
・VALQUA No. N520—Z7GB
・VALQUA No. N520—Round, Soft Non-Asbestos millboard, SUS316, Degreased

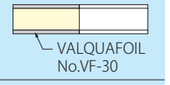
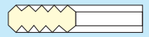
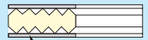
Metallic Serrated and Flat Gasket

VALQUA No. 540 Series / 6560 Series / 560 Series / 6540H Series

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.



▼Types of products

VALQUA No.	Names	Cross section
560 Series	Metallic Flat Gasket	
6560 Series	Metallic Flat Gasket with VALQUAFOIL attached	 VALQUAFOIL No.VF-30
540 Series	Metallic Serrated Gasket	
6540H Series	Kammprofile Gasket	 VALQUAFOIL No.VF-30

■ Available 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 VALQUAFOIL attached is 400℃. Applications subject to temperatures exceeding 400℃ 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.

■ 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 substituted by Compressed Fiber Sheet

VALQUA No. 6540HP

This gasket is part of No.6540H series, designed to replace Compressed Fiber Sheet.

Dimensions	JIS 10K、Max 600A JPI Class 150、300 、Max 24B
Composition	SUS304、SUS316L
Service temp.	−240℃～ 400℃

Ordering Information

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

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

Please refer to the following guide if necessary:

[Metallic Serrated Gasket]

VALQUA No. 540 — Shape — Cross section — Material — Special specifications

	540
Metallic Serrated Gasket	540
Kammprofile Gasket	6540H

Shape	
Round	(Z)
Round with bar	(Y)
Other special shape	(X)

Cross section	
Without collar	(Z)
With outer collar	(M)
With inner collar	(V)
With outer and inner collar	(W)
Others	(X)

Material	
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)

Special specifications	
Without special treatment	(Z)
Degreased	(B)
V groove finished	(K)
Others	(X)

[Metallic Flat Gasket]

VALQUA No. 560 — Shape — Cross section — Material — Special specifications

	560
Metallic Flat Gasket	560
Metallic Flat Gasket with VALQUAFOIL attached	6560

Shape	
Round	(Z)
Round with bar	(Y)
Obround	(C)
Square	(E)
Other special shape	(X)

Cross section	
Without collar	(Z)
With outer collar	(M)
With inner collar	(V)
With outer and inner collar	(W)
Others	(X)

Material	
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)

	Special specifications	
	Without special treatment	(Z)
	Degreased	(B)
	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.
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
or
・VALQUA No. 540−ZMEK
・VALQUA No.540−Round , With outer collar, SUS304, V groove finished

Ring Joint Gasket

VALQUA No. 550 Series

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

▼Types of products

VALQUA No.	Cross section name	Cross section
550-ZO	Oval	
550-ZS	Octagonal	
550-ZA	API-RX	
550-ZP	API-BX	

■ 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.

Ordering Information

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

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

Please refer to the following guide if necessary:

VALQUA No. 550 — Shape — Cross section — Material — Special specifications

Shape	
Round	(Z)
Other special shape	(X)

Cross section	
Oval cross section	(O)
Octagonal cross section	(S)
API-RX cross section	(A)
API-BX cross section	(P)

Material	
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)

Special specifications	
Without special treatment	(Z)
Degreased	(B)
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.

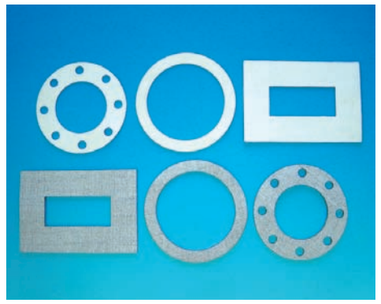
〔Ex〕 Round shape〔Oval cross section〕, SUS304L, Degreased
- or
  - ・VALQUA No. 550－ZOLB
  - ・VALQUA No.550－Round, Oval cross section, SUS304L, Degreased

Rubber Coated Fabric Gasket

VALQUATEX Gasket

VALQUA No. N214 / N314

VALQUATEX is fabric which uses non-asbestos material such as ceramics instead of conventional asbestos.



VALQUA No.	Types of products	Temperature limits (℃)
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.)

■ 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.

Synthetic Rubber Gasket

Rubber Sheet Gasket

VALQUA No. 2010 (NBR / CR / EPDM) / 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	Available ranges	
		Temperature (℃)	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.

Textile Product

Flame-Resistant Carbonized Fiber Textile

VALQUA No. 101C / 105C / 112C

Flame resistant carbonized fiber is made by the heating treatment of polyacrylonitrile (PAN) fibers. With excellent flame resistance and heat resistance as well as tough elasticity, it is highly comparable with high grade asbestos fiber based textiles.

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℃).

▶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%.

▶Unlike glass fiber or asbestos fiber, it has draping property and soft touch, thus is easy to handle.

Yarn

VALQUA No. 101C | Application: Heat resisting seal and the like

■ 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/m²)	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

Heat-Resistant Glass Fiber Textile

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

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 as an alternative textile for high grade asbestos textile.

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

■ Standard 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.

Yarn

VALQUA No. 101G

Application
Heat resistant glass yarns

■ Standard 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.

Packing

VALQUA No. 102G

Application
Heat resisting sealing material, door packing and the like

■ Standard 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

Cloth

VALQUA 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

■ Standard 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		30	920	Plain weave
2.7			1,750	

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

Ceramic Fiber Textile

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

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

■ Standard dimensions ■

VALQUA No.	105S	105SN
Color tone	White	Liver
Weave	Plain weave	Plain weave
Reinforcing material	Stainless steel wire	Stainless steel wire
Max. service temp. (℃)	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

■ Standard dimensions ■

VALQUA No.	112S	112SN
Color tone	White	Liver
Weave	Plain weave	Plain weave
Reinforcing material	Stainless steel wire	Stainless steel wire
Max. service temp. (℃)	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

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

102S (Stainless steel wire insert braided rope)

Application
High temperature sealing material (Max. service temperature: 1,260°C)

■ Standard dimensions ■

VALQUA No.	101S	102SF
Color tone	White	
Max. service temp. (℃)	1,260	600
Ignition loss (%)	< 25	

VALQUA No.	Nominal size (mm)	Weight (kg)	Length (m)
101S	ϕ3	1	200
	ϕ5		100
	ϕ6～ϕ50	—	30
102SF	ϕ6～ϕ50	—	30

VALQUA No.	102S
Nominal size(mm)	Length (m)
6.5	30
8	
9.5	
11	
12.5	
16	
19	
22	
25	
32	
38	

Remark Square braid and round braid are available.

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

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