Compressed fiber sheet gasket

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

VALQUA No. **6500**

Product name **General Use Compressed Non-Asbestos Fiber Sheet**

Features1 These are suitable to be used as Non-asbestos gaskets for pipe flanges and equipment in various industries.

Features2 The adaptability of these sheets as water apparatus according to JIS S 3200-7 has been confirmed.

Features3 Pipe flanges, valve bonnets and other equipment used in various industries including oil refineries, chemical industries and shipyards

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Applicable fluids Water, Sea water, Hot water, Steam,Crude oil, Alcohol, Animal & vegetable oil, Heat transfer oilGeneral solvent,

Inappropriate fluid Strong oxidizing acid, Strong alkali, Various solvents, Inflammable gas, Gas susceptible to burn, Poisonous

Application Pipe flanges, valve bonnets and other equipment used in various industries including oil refineries, chemical inc

main ingredient NBR, Aramid yarn, Mineral wool, Inorganic fillers

Color/Print Blue/Black

■ Available ranges

Temperature (℃)	Pressure (MPa) Water based	Pressure (MPa) Oil based	Pressure (MPa) Gas based
-50～183	3.0	3.0	1.0

For service conditions exceeding 100°C, the notes on "The fluid-wise available ranges" shall be observed.
Oil gas, solvent and corrosive fluid are not included, thus requiring separate consultation.
Remarks : Temperature and pressure classifications show individual service limits.

■ Dimensions

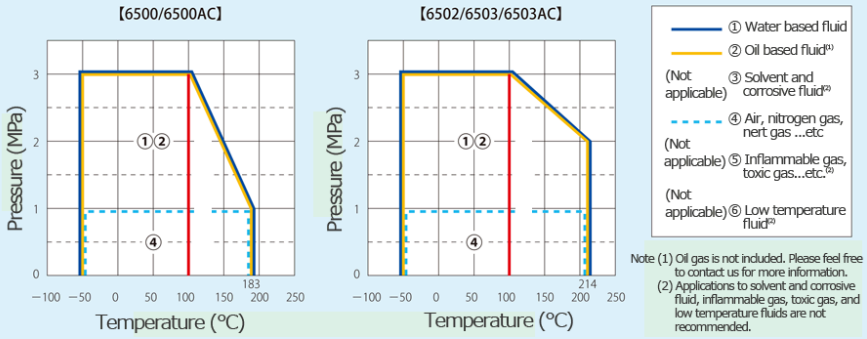
Thickness (mm)	Size (mm)
0.4、0.5、0.8 1.0、1.5、2.0 3.0	1270×1270 1270×3810 2540×3810 3048×3810

■ Design criteria

Thickness (mm)	Gasket factor"m"	Minimum design seating stress "y" (N/mm^2)	Recommended tightening stress (MPa) Liquid	Recommended tightening stress (MPa) Gas
1.0	3.50	44.8	25.5	40.0
1.5	2.75	25.5	25.5	40.0
3.0	2.00	11.0	25.5	40.0

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

■ The fluid-wise available ranges



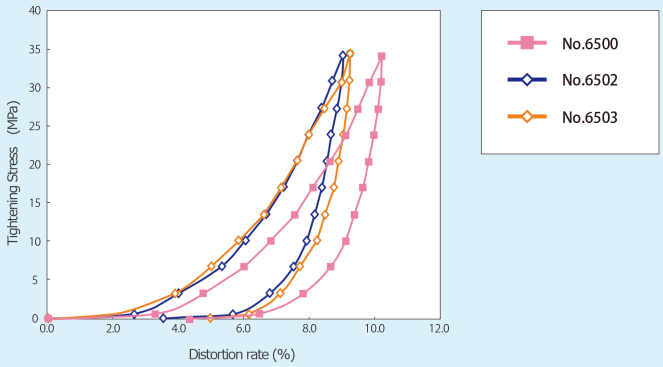
▼ Precautions

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

①Please keep the gasket thickness at 1.5mm or less.
②Please apply gasket paste (seal paste).
③Please keep the tightening stress at 30MPa or higher.
④Please use the gasket in the area where it is unlikely to bear the piping load or in the area where it may be easily replaced.
⑤Use of ring gaskets is recommended since the outer diameter of a ring gasket is the dimension to internally contact the bolt, which increases the tightening stress of the gasket.

■ Stress strain characteristics of Compressed Fiber Sheets

(Specimen dimensions : JIS 10K 25A t=1.5mm)



■ Comparison of physical properties

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Item		High Performance Sheet Gasket								Compressed Fiber Sheet					
		No.UF300		No.GF300		No.SF300		No.MF300		No.6500		No.6502		No.6503	
Thickness	(mm)	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5	3.0
Physical Properties															
Tensile strength (across grain)	(MPa)	12.0	14.6	12.4	10.9	16	15.8	12	14.1	17	15.3	13.1	12.5	19.2	18.1
Compressibility (34.3MPa)	(%)	4	4	5	4	5	6	5	4	10	10	9	10	9	6
Recovery (34.3MPa)	(%)	49.0	46	53	54	42	50	32	36	57	55	67	64	60	61
Flexibility with grain in multiple to thickness	(kg/m^3)	<2	<2	<2	<2	<2	<2	<2	<2	9	9	11	12	10	10
Density		2576.0	2557	2315	2262	2319	2280	2910	2839	1810	1813	1761	1759	1803	1857
Oil resistance 〈IRM903 OIL 150℃×5h〉															
Tensile strength loss	(%)	0.6	0.2	1.0	7.6	3.8	5.1	1.5	5.9	16.7	6.3	9.2	9.6	13.0	0.0
Thickness increase	(%)	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.2	2.2	1.2	1.3	1.0	2.1	0.6
Weight increase	(%)	0.4	0.2	0.5	0.6	0.5	0.7	1.1	1.4	3.9	3.2	4.4	3.0	4.2	1.7
Fuel oil resistance 〈JIS fuel oil B RT × 5h〉															
Thickness increase	(%)	0.0	0.3	0.4	0.3	0.4	0.1	0.2	0.5	5.6	2.8	4.3	2.6	5.4	2.3
Weight increase	(%)	1.0	1.2	0.9	1.2	0.9	1.3	0.9	1.8	5.6	4.0	6.7	6.0	7.0	3.2
Creep relaxation 〈 JIS R 3453 Tightening stress 20.6MPa 〉															

100℃×22h		20.3	44.5	16.2	37.0	16.1	42.7	16.9	30.2	27.5	47.0	23.5	37.8	27.3	45.0
200℃×22h		44.7	71.9	35.3	65.8	40.5	68.8	35.8	55.0	52.0	78.8	41.1	65.5	43.6	60.5
Sealability〈JIS 10K50A, Internal pressure 1.0MPa, Tightening stress 25.5MPa, Thickness 1.5mm〉														
Without paste	(Pa・m^3/s)	1.7×10^{-4} or below	1.7×10^{-4} or below	1.7×10^{-4} or below	1.7×10^{-4} or below	1.4×10^{-3}	1.9×10^{-4}	1.2×10^{-3}						
	(atm・cc/min.)	0.1 or below	0.1 or below	0.1 or below	0.1 or below	0.83	0.11	0.74						
With paste	(Pa・m^3/s)	-	-	-	-	1.7×10^{-4} or below	1.7×10^{-4} or below	1.7×10^{-4} or below						
	(atm・cc/min.)	-	-	-	-	0.1or below	0.1or below	0.1or below						

Note（1） Flexibility is in accordance with JIS R 3453 6.2.5. Refer to "Comparison of high temperature hardening properties".
Remark All the above physical properties are measurement examples, and not regulatory values.

■ Notes to be observed in design and usage

The following descriptions summarizes precautions for design, storage, and installation, in order to properly use Sheet Gasket.

▼ 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 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 before installation

1. When installing gas seals, refer to the following "Counter measures against permeation leakage".
2. Install the gaskets in a clean environment so as to prevent entry of foreign substances between the gaskets and the flanges.
3. Flange bolts shall be gradually tightened each time, and repeat this process 4 to 5 times, so as to finally ensure uniform tightening.
4. When tightening, pay attention to prevent the occurrence of crush.
5. In particular, when using gaskets of 150 Lb, 1B or smaller, or those of smaller gasket width, care shall be given as gasket stress is likely to be excessive.
6. At the time of load up or restarting, check for any loose bolts.
7. If retightening of gaskets that have already once experienced leakage fails in preventing leakage, replace them with new ones.
8. Please note that joint sheet may harden over 100℃. Please refer to precaution of available range per fluid and adequate tightening shall be performed initially to avoid retightening after use at high temperature. If necessary, retightening should be performed within 24 hours after heating operation starts and until material hardening is not significant.

▼ 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.

■ Countermeasures against permeation leakage

Since permeation leakage occurs in Compressed Fiber Sheet , 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 attention is required in tightening, and also the amount of gasket paste shall be minimized.
2. Maintain the tightening stress to be around 40 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 far as possible (1.5 mm or less).

- **FAQ**
- **VALQUA HAND BOOK TECHNICAL DATA**
- **VALQUA HAND BOOK DIMENSIONAL DATA**