RAMAN

Gasket Manufacturer

Raman

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Raman

Non-Metallic Sheets & Gaskets

Compressed Non-Asbestos Sheets & Gaskets

Sheets & Gaskets

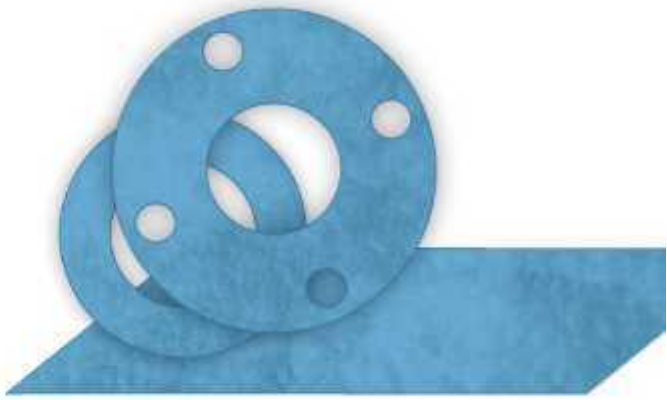
Aramid Fiber+NBR

RAMAN 6000

Industrial Applications

[Characteristic]

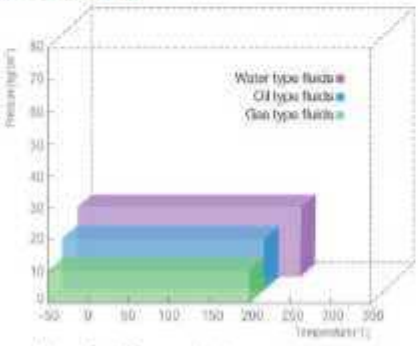
RAMAN-6000 is manufactured by the hot calender process using high quality Non-Asbestos fiber (Aramid Fiber) and oil resistant synthetic rubber (NBR). Specially, this sheet has superior sealing performance with excellent oil resistance.



[Application]

Short-term peak Temp.	350°C [662°F]
Maximum continuous Temp.	220°C [428°F]
Short-term peak Pressure	80kgf/cm² [7.85 MPa]
Applied Fluids : Water, Alkali, Salt Solution, Hot Oil, Oil Gas, Freon Gas below, Organic Solvent	

[Service Range]



*Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	0.5 ~ 3.2
Sheet(mm)	1270×1270 / 1270×2540
	1270×3810 / 1520×1520
	2540×3810 / 1520×3040

*Other Sizes can be available, if required.
*One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description	RAMAN 6000
	Density [g/cm³]	1.7
ASTM F152	Tensile strength Across grain MPa (kgf/mm²)	13.7 (1.4)
ASTM F36R	Compressibility [%]	9
	Recovery [%]	55
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%]	5
	Tensile Loss [%]	23
	ASTM Fuel B (23~30°C) Thickness Increase [%]	5
	Weight Increase [%]	9
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%] 900°C(1123°F) x 30min	29

*All data are typical values.

[Design Data]

Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

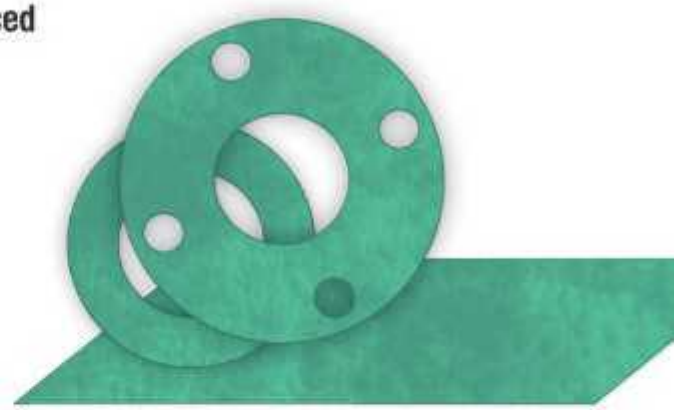
Note

Water type fluids : For steam line, spiral wound gasket or graphite sheet gasket is recommended.
Oil type fluids : For organic solvents, use below 150°C.
Gas type fluids : Do not use for tank & explosive gas line.
If properties out of guideline needed, Please contact our Technical Team.

Aramid Fiber+NBR+Wire Reinforced

RAMAN 6000W

Industrial Applications



[Characteristic]

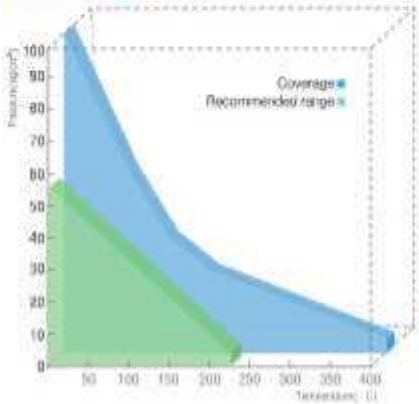
This 6000W is an excellent quality Non-Asbestos gasket material (same compounds of RAMAN-6000) with stainless steel wire-mesh inserted to be suitable for exhaust Line under high temperature and high pressure (Aramid Fiber + NBR Binder).

[Application]

Short-term peak Temp.	400°C [752°F]
Short-term peak Pressure	100kgf/cm^2 [9.8 MPa]

Applied Fluids : Suitable for Water, Hot Oil, Oil Gas Alkali, Salt Solutions, Solvents, Etc. Not be Used in Steam, Strong Acid and Alkali, Soluble Chemicals.

[Service Range]



*Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	1.0 ~ 3.2
Sheet(mm)	1524×3100

*Other Sizes can be available, if required.
*One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description	RAMAN 6000
	Density [g/cm^3]	1.7
ASTM F152	Tensile strength Across grain.MPa (kgf/mm^2)	17.7 (1.8)
ASTM F36R	Compressibility [%]	9
	Recovery [%]	53
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%]	5
	Tensile Loss [%]	21
	ASTM Fuel B (20~30°C) Thickness Increase [%]	3
	Weight Increase [%]	11
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%]	25
	850°C(1123°F) x 30min	

*All data are typical values

[Design Data]

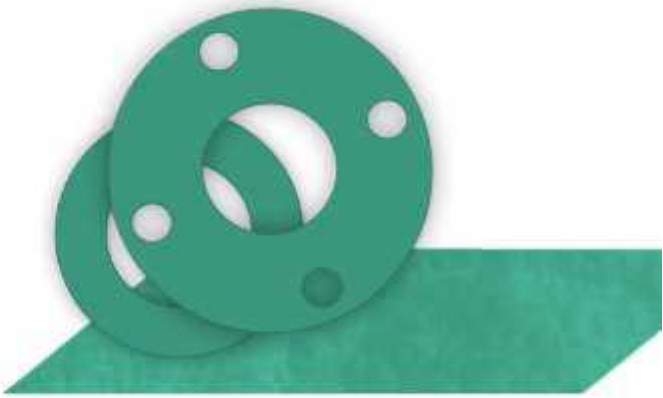
Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm^2 (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

note
Metal type Rings : For steam line, spiral wound gasket or graphite sheet gasket is recommended.
LD type Rings : For organic solvents, use below 150°C
Gas type Rings : Do not use for toxic & explosive gas line.
※ If properties out of guideline needed, Please contact our Technical Team.

Aramid Fiber+NBR

RAMAN 6010

Industrial Applications



[Characteristic]

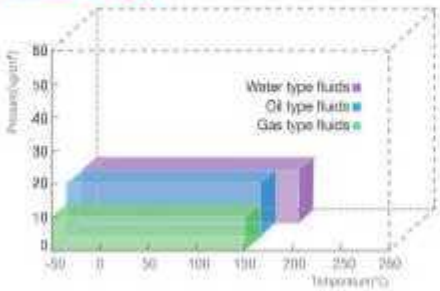
High quality heat esistant fiber(Aramid Fiber)and excelent oil resistant synthetic rubber (NBR) are compounded and calendered into a gasket sheet for oil resistance required applications.

[Application]

Short-term peak Temp.	260°C [500°F]
Maximum continuous Temp.	180°C [356°F]
Short-term peak Pressure	60kgf/cm² [5.88 MPa]

Applied Fluids : Water, Hot Water, Oils, Mild acids and alkalis.

[Service Range]



*Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	0.5 ~ 3.2
Sheet(mm)	1270×1270 / 1270×2540
	1270×3810 / 1520×1520
	2540×3810 / 1520×3040

*Other Sizes can be available, if requires.
*One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description	RAMAN 6010
	Density [g/cm³]	1.6
ASTM F152	Tensile strength Across grain,MPa (kgf/mm²)	10.8 (1.1)
ASTM F36R	Compressibility [%]	11
	Recovery [%]	53
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%]	6
	Tensile Loss [%]	26
	ASTM Fuel B (20~30°C) Thickness Increase [%]	5
	Weight Increase [%]	13
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%]	31
	850°C(1123°F) x 30min	

*All data are typical values

[Design Data]

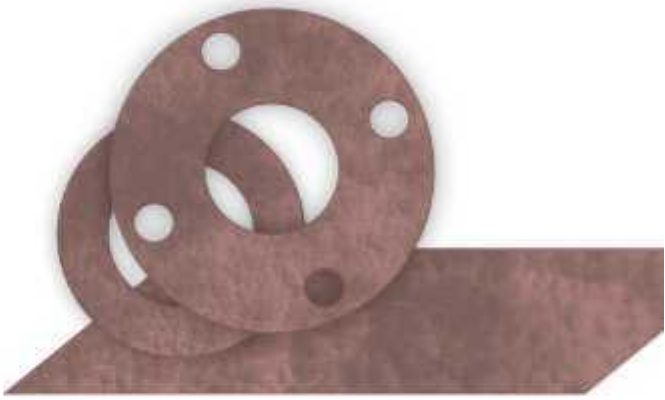
Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

Note
Water type fluids : For steam line, spiral wound gasket or graphite sheet gasket is recommended.
Oil type fluids : For organic solvents, use below 150°C.
Gas type fluids : Do not use for toxic & explosive gas line.
*If properties out of guideline needed, Please contact our Technical Team.

Organic Fiber+NBR

RAMAN 6030

Industrial Applications



[Characteristic]

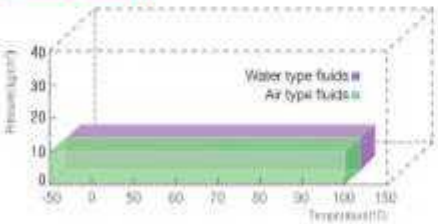
This is an economical Non-Asbestos sheet that is compounded with high quality Non-Asbestos fiber and filler & synthetic rubber materials. Especially, it shows a decent quality in processing & sealing performance under water, hot water, mild acids and alkalis and building-fire-fighting pipe.

[Application]

Short-term peak Temp.	150°C [423°F]
Maximum continuous Temp.	100°C [212°F]
Short-term peak Pressure	40kgf/cm² [3.92 MPa]

Applied Fluids : Air, Water, Hot Water, Salt Solution, Mild Acids and Alkalies.

[Service Range]



*Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	0.5 ~ 3.2
Sheet(mm)	1270×1270 / 1270×2540
	1270×3810 / 1520×1520
	2540×3810 / 1520×3040

*Other Sizes can be available, if required.
*One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description	RAMAN 6030
	Density [g/cm³]	1.6
ASTM F152	Tensile strength Across grain MPa (kgf/mm²)	7.8 (0.8)
ASTM F36R	Compressibility [%]	13
	Recovery [%]	55
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%]	11
	Tensile Loss [%]	40
	ASTM Fuel B (20~30°C) Thickness Increase [%]	10
	Weight Increase [%]	15
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%]	34
	850°C(1123°F) x 30min	

*All data are typical values.

[Design Data]

Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

Note

*Water type fluids : For steam line, spiral wound gasket or graphite sheet gasket is recommended.
Oil type fluids : For organic solvents, use below 150°C
Gas type fluids : Do not use for toxic & explosive gas line.
*If properties out of guideline needed, Please contact our Technical Team.

Aramid Fiber+SBR

RAMAN 6100

Industrial Applications

[Characteristic]

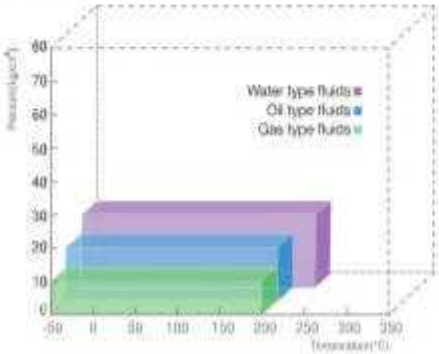
RAMAN-6100 is designed specifically to perform and seal more effectively than other Non-Asbestos sheet materials. This sheet provides superior heat resistance and excellent recovery because of unique blends of special Non-Asbestos fiber (Aramid Fiber) & fillers and SBR binder

[Application]

Short-term peak Temp.	350°C [662°F]
Maximum continuous Temp.	220°C [428°F]
Short-term peak Pressure	80kgf/cm² [7.85 MPa]

Applied Fluids : Air, Water, Oils, Mild Acids and Alkali, Inert Gases, Fuels, Salt Solution, Lubricant.

[Service Range]



•Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	0.5 ~ 3.2
Sheet(mm)	1270×1270 / 1270×2540
	1270×3810 / 1520×1520
	2540×3810 / 1520×3040

•Other Sizes can be available, if required.
•One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description	RAMAN 6100
	Density [g/cm³]	1.7
ASTM F152	Tensile strength Across grain.MPa (kgf/mm²)	13.7 (1.4)
ASTM F36R	Compressibility [%]	10
	Recovery [%]	55
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%]	15
	Tensile Loss [%]	30
	ASTM Fuel B (20~30°C) Thickness Increase [%]	13
	Weight Increase [%]	17
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%]	30
	850°C(1123°F) x 30min	

•All data are typical values

[Design Data]

Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

Note

Water type fluids : For steam line, spiral wound gasket or graphite sheet gasket is recommended.
Oil type fluids : For organic solvents, use below 150°C.
Gas type fluids : Do not use for hard & explosive gas line.
※ properties out of guideline needed. Please contact our Technical Team.

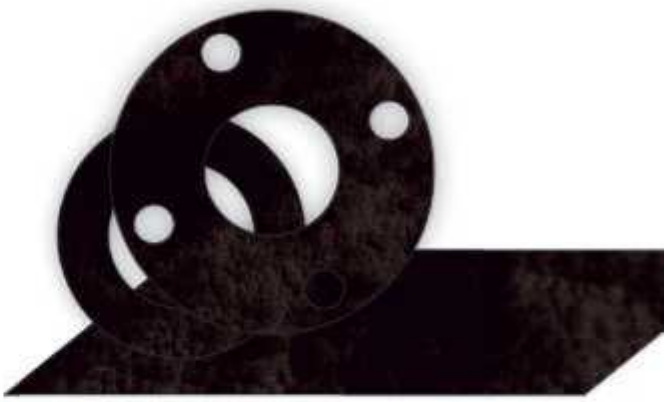
Aramid Fiber+NBR

RAMAN 6200

Industrial Applications

[Characteristic]

High quality Non-Asbestos fiber (Aramid Fiber) and excellent heat & oil resistant rubber are compounded and calendered into a gasket sheet with superior chemical resistance. Especially it shows a good sealing performance under hot oil, oil gas, etc.

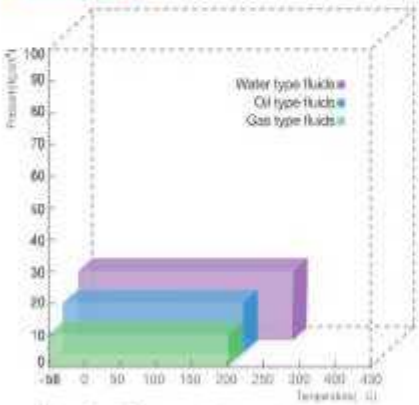


[Application]

Short-term peak Temp.	430°C [806°F]
Maximum continuous Temp.	250°C [482°F]
Short-term peak Pressure	100kgf/cm² [9.8 MPa]

Applied Fluids : Water,Alkali,Salt Solution, Hot Oil, Oil Gas, Fuels below, Organic Solvents

[Service Range]



*Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	0.5 ~ 3.2
Sheet(mm)	1270×1270 / 1270×2540
	1270×3810 / 1520×1520
	2540×3810 / 1520×3040

*Other Sizes can be available, if required.
*One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description RAMAN 6200	RAMAN 6200
	Density [g/cm³]	1.7
ASTM F152	Tensile strength Across grain,MPa (kgf/mm²)	11.8 (1.2)
ASTM F36R	Compressibility [%]	10
	Recovery [%]	53
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%]	4
	Tensile Loss [%]	17
	ASTM Fuel B (20~30°C) Thickness Increase [%]	5
	Weight Increase [%]	8
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%]	28
	850°C(1123°F) x 30min	

*All data are typical values

[Design Data]

Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

Note

Raman

Non-Metallic Sheets & Gaskets

Compressed Non-Asbestos Sheets & Gaskets

Carbon Fiber+NBR

RAMAN 6400

Industrial Applications

[Characteristic]

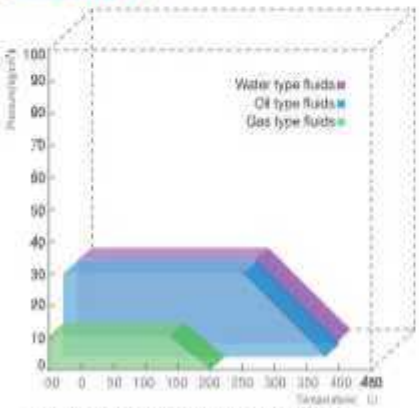
This Non-Asbestos sheet,RAMAN-6400 provides superior chemical resistance and excellent heat resistance to use in steam and other high-temperature required lines. Suitable for a wide range of fluids like as fuel, lubricating, animal & vegetable oil, organic solvents, etc..

[Application]

Short-term peak Temp.	480°C [896°F]
Maximum continuous Temp.	320°C [608°F]
Short-term peak Pressure	100kgf/cm² [9.8 MPa]

Applied Fluids : Lubricating Oil, Fuel, Animal Oil, Organic Solvents, etc / Water, Hot Water, Steam, Hot Oil, Oil Gas, Salt Solution.

[Service Range]



•Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	0.5 ~ 3.2
Sheet(mm)	1270×1270 / 1270×2540
	1270×3810 / 1520×1520
	2540×3810 / 1520×3040

•Other Sizes can be available, if required.
•One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description	RAMAN 6400
	Density [g/cm³]	1.8
ASTM F152	Tensile strength Across grain MPa (kgf/mm²)	13.7 (1.4)
ASTM F36R	Compressibility [%]	9
	Recovery [%]	58
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%]	5
	Tensile Loss [%]	23
	ASTM Fuel B (20~30°C) Thickness Increase [%]	4
	Weight Increase [%]	9
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%]	26
	850°C(1123°F) x 30min	

•All data are typical values

[Design Data]

Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

Note
Water type fluids : For steam line, please contact to our Technical Team in advance.
Oil type fluids : For organic solvents, use below 100°C.
Gas type fluids : Do not use for steam & explosive gas line.
If parameters out of guideline needed, Please contact our Technical Team.

Carbon Fiber + NBR+Wire Reinforced

RAMAN 6400W

Industrial Applications

[Characteristic]

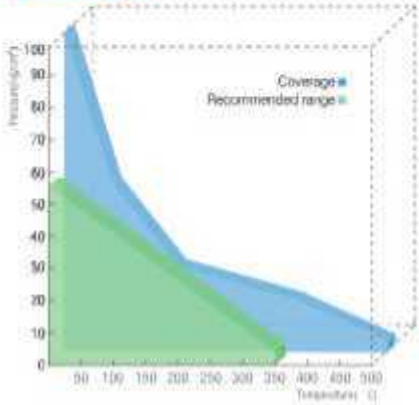
This 6400W is excellentquality Non-Asbestoscarbon fiber gasket material with stainless steel wire-mesh inserted to be suitable for exhaust line under high temperature and high pressure.

[Application]

Short-term peak Temp.	500°C [932°F]
Maximum continuous Temp.	350°C [662°F]
Short-term peak Pressure	100kgf/cm² [9.8 MPa]

Applied Fluids : Suitable for Water, Hot Oil, Oil Gas Alkali, Salt Solutions, Solvents, Etc. , Strong Acid and Alkali, Soluble Chemicals.

[Service Range]



*Maximum Temp. & Pressure combinations can not be used at the same time.

[Size]

Thickness(mm)	1.0 ~ 3.2
Sheet(mm)	1524×3100

*Other Sizes can be available, if required.
*One or both sides Graphite & PTFE coating available, if required.

[Typical Physical Properties]

Test Method	Description	RAMAN 6400W
	Density [g/cm³]	1.8
ASTM F152	Tensile strength Across grain.MPa (kgf/mm²)	17.7 (1.8)
ASTM F36R	Compressibility [%]	10
	Recovery [%]	57
ASTM F146	Fluid Resistance after 5hrs immersions	
	ASTM #3 oil (150°C) Thickness Increase [%] Tensile Loss [%]	4 15
	ASTM Fuel B (20~30°C) Thickness Increase [%] Weight Increase [%]	3 6
ASTM F147	Flexibility	No Crack
ASTM F495	Ignition Loss [%]	24
	850°C(1123°F) x 30min	

*All data are typical values

[Design Data]

Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.2	2.00	112 (1600)
1.6	2.75	260 (3700)
0.8	3.50	457 (6500)

note

Water-type fluids : For steam line, spiral wound gasket or graphite sheet gasket is recommended.
Oil-type fluids : For organic solvents, use below 150°C
Gas-type fluids : Do not use for toxic & explosive gas line
*If service has out of guideline ranges, Please contact our Technical Team.

Aramid Fiber+Synthetic Rubber

RAMAN **6210**

Automotive Applications

[Characteristic]

RAMAN 6210 is designed for Automotive purposes. It shows excellent oil-resistance and recovery with the use of high quality fibers (Aramid Fiber) and NBR rubber binder.

[Application]

Applied Fluids : Water, Hot Water, Oils, Mild Acids and Alkalis

Aramid Fiber+NBR

RAMAN **6215**

Automotive Applications

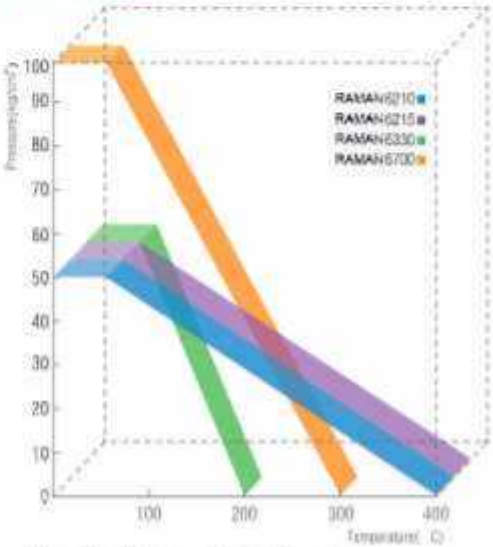
[Characteristic]

Same as RAMAN 6210, but this RAMAN 6215 is also suitable for fuel-resistant application.

[Application]

Applied Fluids : Water, Air, Mild Acids and Alkalis, Salt Solution, Lubricant

[Service Range]



*Maximum Temp. & Pressure combinations can not be used at the same time.

Aramid Fiber+Synthetic Rubber

RAMAN 6330

Automotive Applications

[Characteristic]

This sheet has a self-swelling property to perform high pressure sealing performance in spite of low bolt force, which is compounded with excellent quality Aramid Fiber and SBR rubber binder.

[Application]

Applied Fluids : Water, Oil, Fuels, Salt Solution, Mild Acids and Alkalis

Aramid Fiber+NBR

RAMAN 6700

Automotive Applications

[Characteristic]

Special high quality fibers and oil resistant rubber are compounded and calendered into an Non-Asbestos gasket sheets. It shows very excellent properties in stress relaxation and tensile strength, etc.

[Application]

Applied Fluids : Water, Alkali, Salt Solution, Hot oil, oil Gas, Freon Gas Gas type Fluids

[Typical Physical Properties]

Test Method	Description	RAMAN 6210	RAMAN 6215	RAMAN 6330	RAMAN 6700
	Short-term peak Temp.(°C)	400°C (752°F)	400°C (752°F)	200°C (392°F)	300°C (572°F)
	Pressure MPa. (kgf/cm²)	4.9 (50)	4.9 (50)	4.9 (50)	9.8 (100)
	Density (g/cm³)	1.7	1.7	1.7	1.7
ASTM F152	Tensile strength Across grain.MPa (kgf/mm²)	1.0 (9.8)	1.4 (13.7)	1.0 (9.8)	1.6 (15.7)
ASTM F38	Creep Relaxation (%)	25	21	24	16
ASTM F36R	Compressibility (%)	12	8	13	9
	Recovery (%)	58	60	56	55
ASTM F146	Fluid Resistance after 5hrs immersions				
	ASTM No.3 5h / 150°C				
	Thickness Increase (%)	7	2	17	5
	Tensile Strength Loss (%)	-	-	-	17
	Weight Increase	13	6	24	-
	ASTM Fuel B 5h / 20~30°C				
	Thickness Increase (%)	6	5	10	3
	Weight Increase (%)	10	5	16	5
ASTM F495	Ignition Loss (%) 850°C(1123°F)x30min	28	28	29	35

• The Thickness of material tested 0.5mm for JIC 6210, 6215, 6330 and 6700
• All data are typical values

Raman

Non-Metallic Sheets & Gaskets

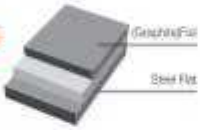
Sheets& Gaskets

(Flexible Graphite) Sheets & Gaskets

RAMAN 4201 Series

RAMAN 4201
Pure Graphite Sheet

RAMAN 4201-P
Stainless Steel Flat
Reinforced Graphite Sheet



RAMAN 4201-B
Stainless Steel Tanged
Reinforced Graphite Sheet

RAMAN 4201-W
Stainless Steel Wire-Mesh
Reinforced Graphite Sheet

[Characteristic]

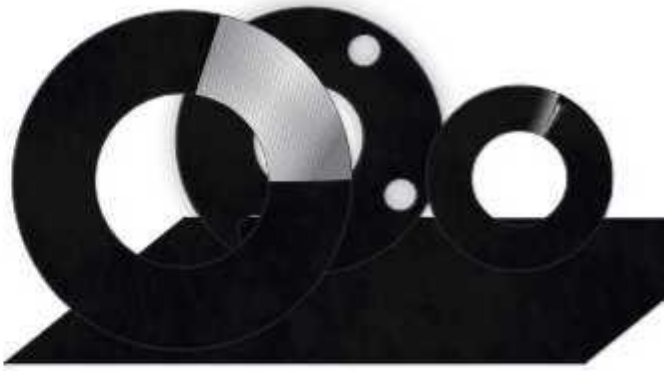
Expanded gasket shows a good adherence to flange and performs sealing performance even under low seating stress. There is no property change under temperature variation from cryogenic to High Temperature range. It shows good corrosive and chemical resistance. Various kinds of graphite gaskets such as stainless steel(wire-mesh, foil and tang) inserted types can be available in accordance with some special conditions.

[Application]

Temp.	-200°C ~ 450°C (Non-Oxidizing Atmosphere Grade) -200°C ~ 525°C (Oxidation Resistant Grade) 650°C (in steam service)
pH range	0~14
Applied Fluids	High temperature & high pressure steam, hot water, gas, organic solvents, acid, alkali, LPG, LNG, Liquid N2, etc.

[Size]

Thickness(mm)	0.8 ~ 3.2
Sheet(mm)	1000×1000 / 1500×1500



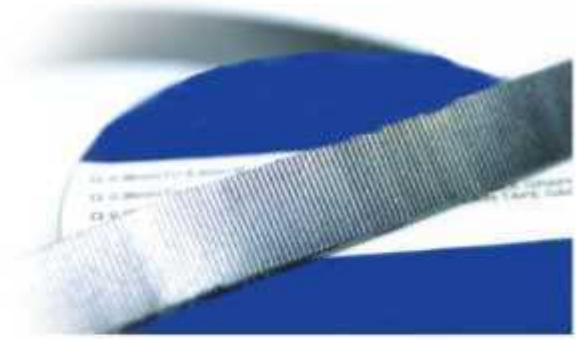
[Typical Physical Properties]

Test Method	Description	RAMAN 4201	RAMAN 4201 - P,B,W
	Carbon Content	Min. 98%	
	Ash Content	Max. 2%	
	Leachable Chloride Content	Max. 50 ppm	
	Sulfur Content	Max. 550 ppm	
ASTM F36A	Compressibility[%]	40	35
	Recovery[%]	15	20
ASTM F38	Creep Relaxation[%]	< 5	< 5

[Design Data]

RAMAN No.	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
RAMAN 4201 RAMAN 4201-P RAMAN 4201-W	2	63 (900)
RAMAN 4201-B	2	176 (2500)

(Flexible Graphite) Plain Tape

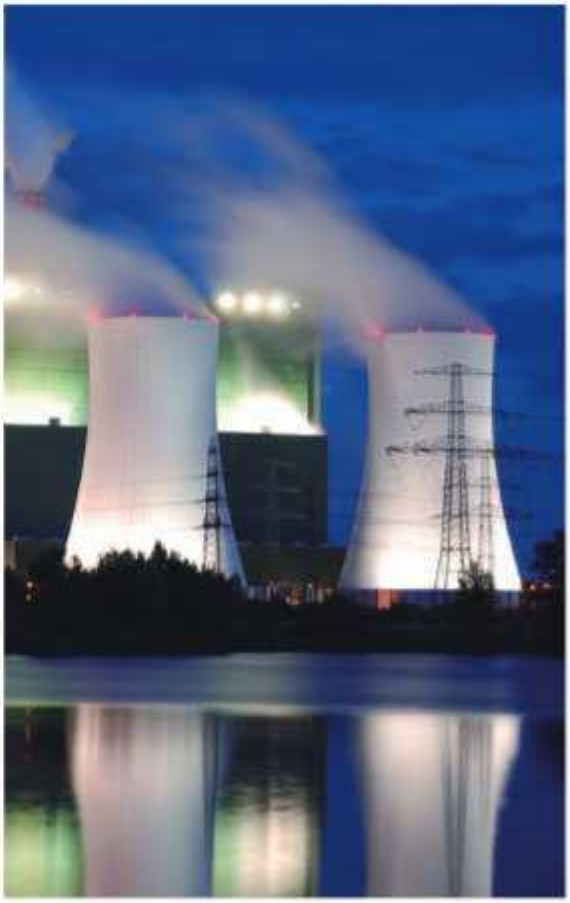


RAMAN 4204
(FlexibleGraphite)
crinkled Tape

RAMAN 4205

[Characteristic]

One side of (Expanded Graphite) sheet is treated with adhesive and cut into tapes. Plain and Crinkled types can be provided. RAMAN-4204 is plain tape and RAMAN-4205 is crinkled tape.



[Application]

Mainly used for the cover to the surface of metal gaskets or flanges. Service temperature and pH range same as those of JIC 4201.

Temp.	-200°C ~ 450°C (Non-Oxidizing Atmosphere) 650°C (in steam service)
pH range	0~14

[Size]

Thickness(mm)	Width(mm)	Length(M)
0.4 (0.38)	6.4	15
0.4 (0.38)	12.7	15
0.4 (0.38)	19.1	15
0.4 (0.38)	25.4	15

*Other Sizes can be available, if required.

note

Avoid gaskets from damage/breakdown with care when transporting and using gaskets.
Do not recommend the use of gaskets under Strong Acid / Alkali.
Do not recommend the use of gasket under High-temperature Oxygen Lines.

(PTFE) Solid Gasket

RAMAN 8305

[Characteristic]

Solid Gasket, RAMAN 8305 is made into cut gaskets. It shows very excellent in chemical resistance. Carbon, Glass or other filler materials can be used for widseervice applications.

[Application]

Maximum Service Temp.	100°C
Maximum Service Pressure	10kgf/cm²

Applied Fluids : Alkaline metallic organic chemical compounds, chemicals or solvents except fluorine under high temperature and high pressure, oil gas, foods and medicines to avoid fluid contamination.

[Size]

Thickness(mm)	1.0 ~ 3.0
Sheet(mm)	1000×1000 / 1500×1500

*Other Sizes can be available, if required.

[Typical Physical Properties]

Test Method	Description	Value
RAMAN K 7137	Density [g/cm3]	2.15
	Tensile strength,MPa (kgf/mm²)	23.2 (2.37)
	Elogation [%]	310
RAMAN R 3453	Compressibility [%]	16
	Recovery [%]	45
ASTM F38	Creep relaxation [%]	79

*All data are typical values

[Design Data]

Material	Thickness (mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)	Flange Surface
PTFE	1.5	3.2	230 (3271)	12.5 ~ 25S
	3.0	2.5	200 (2845)	

*Pure PTFE Gasket can be applied to I, M&F flange, I, T&G flange

(PTFE) Reinforced Gasket

RAMAN 8305G

[Characteristic]

This RAMAN 8305G is very special Gasket that is reinforced with some filler materials such as Carbon or Glass, etc. to improve Cold-Flow Phenomenon as the week point of Starflon Gasket.

[Application]

Maximum Service Temp.	200°C
Maximum Service Pressure	40kgf/cm²

Applied Fluids : Alkaline metallic organic chemical compounds, chemicals or solvents except fluorine under high temperature and high pressure, oil gas, foods and medicines to avoid fluid contamination.

[Size]

Thickness(mm)	1.0 ~ 3.0
Sheet(mm)	1000×1000 / 1270×1270

*Other Sizes can be available, if required.

[Typical Physical Properties]

Test Method	Description	Value
RAMAN K 7137	Density [g/cm]	2.28
	Tensile strength,MPa (kgf/mm²)	14.7 (1.5)
	Elogation [%]	330
RAMAN R 3453	Compressibility [%]	5
	Recovery [%]	60
ASTM F38	Creep relaxation [%]	51

*All data are typical values

[Design Data]

Material	Thickness (mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
PTFE	1.0	3.5	250 (3556)
	1.5	3.2	230 (3271)
	2.0	3.0	200 (2845)
	3.0	2.5	

(PTFE) EnvelopedGasket

RAMAN 8310

[Characteristic]

Elastic cushion materials (Compressed Non-Asbestos sheet, Rubber sheet) is enveloped with PTFE sheet into a gasket. Excellent in chemical resistance.

[Application]

Maximum Service Temp.	150℃
Maximum Service Pressure	20kgf/cm²

Applied Fluids : Elastic enough to perform a sealability by low face pressure. Suitable for strong acid, strong alkali, low temperature fluid, oxygen, Cl_2 gas, organic solvents, corrosive fluid, etc.

[Design Data]

Gasket Type	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
A	3.5	150 (2134)
B	4.0	200 (2845)
C	3.5	150 (2134)

[Standard Size]

KS 5K, 10K FLANGE / ANSI 150LB FLANGE

(PTFE) JacketedGasket

RAMAN 8313

[Characteristic]

Elastic cushion materials (Compressed Non-Asbestos sheet or Rubber sheet) is completely shielded into a gasket. This prevents the contamination of cushion materials from the fluid flow

[Application]

Maximum Service Temp.	150℃
Maximum Service Pressure	20kgf/cm²

Applied Fluids : Strong acid, strong alkali, low temperature fluid, oxygen, Cl_2 gas, oil solvents, corrosive fluids.

[Design Data]

Gasket Type	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
A	3.5	150 (2134)
B	4.0	200 (2845)
C	3.5	150 (2134)

[Standard Size]

KS 5K, 10K FLANGE / ANSI 150LB FLANGE

(PTFE)
Expanded Sheet asket

RAMAN **8312**

[Characteristic]

This Sheet Gasket is made from 100% expanded PTFE with multidirectional strength. Developed to come up with theproblemsofcreepandcoldflow.Excellentin chemical resistance and in the use and cut gasketing process.

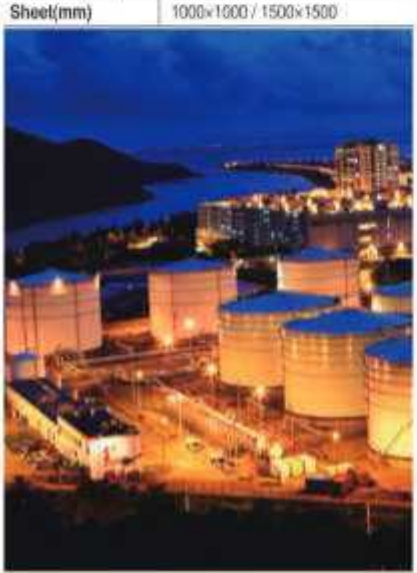
[Application]

Maximum Service Temp.	260℃
Maximum Service Pressure	20kgf/cm²

Applied Fluids : Alkaline metallic organic chemical compounds, chemicals or solvents except fluorine under high temperature and high pressure, oil gas, foods and medicines to avoid fluid contamination.

[Size]

Thickness(mm)	1.0 ~ 3.0
Sheet(mm)	1000×1000 / 1500×1500



[Typical Phisical Poperties]

Test Method	Description	Value
ASTM D792	Density (g/cm³)	0.60
ASTM F152	Tensile Strength .MPa (kgf/mm²)	47.56 (4.85)
ASTM F36	Compressibility(%)	66
	Recovery(%)	16
ASTM F37B	Sealability Nitrogen Gasket Stress = 60 psi Internal Pressure = 4 bar (mL/min)	0.16
ASTM F38	Creep relaxation(%)	38

*All data are typical values.

[Design Data]

Thickness(mm)	Gasket Factor(m)	Min. Design Seating Stress (y) kgf/cm² (psi)
1.0	3.5	250 (3556)
1.5	3.2	230 (3271)
2.0	3.0	200 (2845)
3.0	2.5	

(PTFE) Expanded Joint Sealant Gasket

RAMAN **6066**

[Characteristic]

This is an expanded, pure PTFE sealing material.From very conformable flexible strip forms, usingin applications involving non-standad flanges and harshsurface and places where the enough force cannot be given.

This has outstanding chemical resistance and is inherently clean, making the product particularly suitable for sealing against aggressive media or in situations where feedstock contamination may be of concern.

[Application]

Maximum Service Temp.	260℃
Maximum Service Pressure	20kgf/cm²

Applied Fluids : Chemical pipe, steam & heat exchanger, flange with rough surface & places where the strong bolting force is not available.

[Size]

Width(mm)	Thickness(mm)	Length(M)
7.0	2.5	15
10.0	3.0	8
12.0	4.0	4.5
16.0	6.0	4.5
20.0	7.0	4.5
25.0	5.0	4.5
25.0	7.0	4.5

Installation Instructions

1) Clean flange surface completely to ensure optimal adhesion.
2) Measure all sizes correctly.
3) Remove the adhesive backing tape.
4) Position sealant on the surface.
5) Finish install with overwrapping each ends as picture.

Size Selection Criteria

Flange Diameter	0 - 500Ø	500 - 1000Ø	1000 - 1500Ø	Over 1500Ø
Joint Sealant Size(mm)	3 - 9	6 - 12	9 - 16	12 - 19

*Other sizes can be available as customer's requirements.

Stainless Steel Reinforced Sheet

RAMAN **4201-HT**

[Characteristic]

RAMAN-4201 HT is desingned mineral material with stainless steel tanged reinforced to versatile demanding sealing application for chemical and temperature resistance. Expecially, excellent in oxidation and chemical compatibility exceeds that of graphite and will successfully seal up to 980°C (1800°F)

[Application]

Maximum Service Temp.	982°C (1800°F)
Maximum Tested Pressure	203kgf/cm² (2900psi)

Applied Fluids : combustion engine exhaust, nitrogen fertilizer manufacturing, steam and other applications.

[Size]

Thickness range(inch)	1/32", 1/16", 1/8"
Sheet(mm)	1000×1000 / 1500X1500

*Other sizes can be available as customer's requirements.

[Typical Phisical Poperties]

Test Method	Description	1/32"	1/16"	1/8"
	Facing Density(g/cm³)	1.2	1.2	1.2
ASTM F36	Compressibility(%)	33	44	44
	Recovery(%)	13	9	9
ASTM F38	Creep Relaxation(%)	23.5%		

[Design Data]

Thickness (inch)	Gasket Factor (m)	Min. Design Seating Stress (y) kgf/cm² (psi)
1/32"	2.0	176 (2500)
1/16"		
1/8"		

*Other sizes can be available as customer's requirements.

Non-Metallic Sheets & Gaskets

Non-Metallic Sheets & Gaskets Description

[Properties for Compressed Non-Asbestos Sheet Materials]

Test Method	Description	6000	6100	6200	6400	6000W	6400W	6810	6830	6700	6210	6215	6330
	Density (g/cm³)	1.7	1.7	1.7	1.8	1.7	1.8	1.6	1.6	1.7	1.7	1.7	1.7
ASTM F152	Tensile Strength.MPa (kgf/mm²) Across grain.	13.7 [1.4]	13.7 [1.4]	11.8 [1.2]	13.7 [1.4]	17.7 [1.8]	17.7 [1.8]	10.8 [1.1]	7.8 [0.8]	16.7 [1.8]	9.8 [1.0]	13.7 [1.4]	9.8 [1.0]
ASTM F36R	Compressibility [%]	9	10	10	9	9	10	11	13	9	12	8	13
Recovery [%]		55	55	53	58	53	57	53	55	55	58	60	56
ASTM F146	Fluid Resistance after 5hrs immersions												
	Oil Resistance ASTM # 3 oil (150°C)												
	Thickness Increase [%]	5	15	4	5	5	4	6	11	5	7	2	17
	Tensile Strength Loss [%]	23	30	17	33	21	16	26	40	17			
	Weight Increase [%]								17		13	6	24
	Fuel Resistance ASTM Fuel B(20~30°C)												
	Thickness Increase [%]	5	13	5	4	3	3	5	10	3	6	5	10
	Weight Increase [%]	8	17	8	9	11	6	13	15	5	10	5	15
ASTM F147	Flexibility(Fs12)	No Break	No Break	No Break	No Break	No Break	No Break	No Break	No Break	No Break	No Break	No Break	No Break
ASTM F495	Ignition Loss [%] 850°C (1123°F) x 30min	29	30	28	26	25	24	31	34	35	28	28	29
Standard Size	Thickness [mm]	0.5~3.2				1.0~3.2		0.5~3.2		0.35~2.0			
	Sheet Size [mm]	1270×1270, 1270×2540 1270×3810, 1520×1520 2540×3810, 1520×3040				1524×3100		1270×1270 1270×2540 1270×3810 1520×1520 2540×3810 1520×3040		1220×1240, 1220×1570 1220×3730, 1270×1270 1270×2540,			
Application		KS L 5406 , RAMAN R 3453, ASTM F 104											

* Thickness of material tested 1.5mm (except JIC 6000W, 6400W : 3.0mm)
* Thickness of material tested 0.5mm for JIC 6210, 6215, 6330 & 6700
* Other thickness can be available as customer's requirements.
* All data are typical values.

[Gasket Design Data]

Thickness (mm)	Gasket Factor (m)	Min. Design Seating Stress (y) kgf/cm² (psi)
3.0(1/8")	2.00	112 (1600)
1.5(1/16")	2.75	260 (3700)
1.0(1/32")	3.50	457 (6500)

note

Maximum Temp. & Pressure combinations can not be used simultaneously.
If properties out of guideline needed, contact our Technical Team.
Do not recommend the use of gaskets under material & appliance. Get their application.
When the use of Steam Line, make sure to refer to Notice or contact our Technical Team.

Raman

Semi-Metallic Gaskets

Spiral Wound Gaskets
High Temperature Spiral Wound Gaskets
Metal Jacketed Gaskets
Kammprofile Gaskets

Semi-Metallic Gaskets

Spiral Wound Gaskets

(Flexible Graphite) Filled Type

RAMAN380 □ -SF	Basic Type
RAMAN380 □ -R-SF	Inner Ring Type
RAMAN383 □ -SF	Outer Ring Type
RAMAN383 □ -R-SF	Inner-Outer Ring Type

[Characteristic]

This spiral wound gasket is manufactured by spirally winding a preformed V-shaped metal strip and flexible (graphite) filler on the outer periphery under tension properly. Varying metallic inner & outer rings can be attached as required by operating conditions and applications with a variety of winding metal materials. Widely used in the chemical, petrochemical, oil refining, gas, power plant, various pipe flanges, heat-exchangers and shipbuilding

[Application]

Maximum Service Temp.	450°C
Maximum Pressure Range	Class 150 to 2500
Applied Size	ASME B16.20 / RAMAN B2404 KS B1518 / JPI 7S-41

* Maximum Temperature & pressure combinations can not be used at the same time.

note

Do not recommend for use of gaskets under steep and end of gas under high temperature environment.
Inner ring is mandatory for the use of raised face, full face, male & female flanges to prevent damages to the gasket ends and inner windings.

Non-Asbestos Filled Type

RAMAN380 □ -NA	Basic Type
RAMAN380 □ -R-NA	Inner Ring Type
RAMAN383 □ -NA	Outer Ring Type
RAMAN383 □ -R-NA	Inner-Outer Ring Type

[Characteristic]

This spiral wound gasket is manufactured by spirally winding a preformed V-shaped metal strip and non-asbestos filler on the outer periphery under tension properly. Varying metallic inner & outer rings can be attached as required by operating conditions and applications with a variety of winding metal materials. Suitable for use in the chemical & petrochemical industries and various pipe flanges, etc.

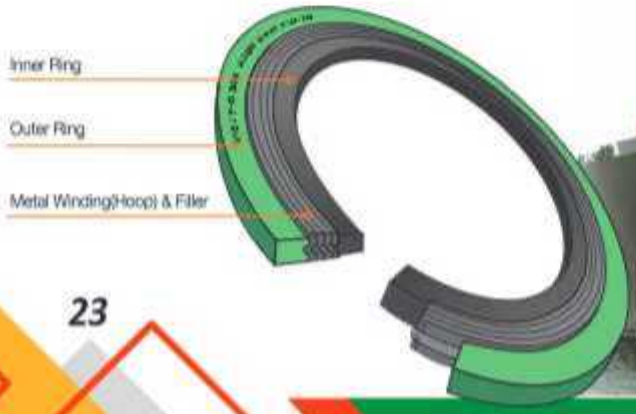
[Application]

Maximum Service Temp.	400°C
Maximum Pressure Range	Class 150 to 2500
Applied Size	ASME B16.20 / RAMAN B2404 KS B1518 / JPI 7S-41

* Maximum Temperature & pressure combinations can not be used at the same time.

note

Inner ring are mandatory for the use of raised face, full face, male & female flanges to prevent damages to the gasket ends and inner windings.



Semi-Metallic Gaskets

Spiral Wound Gaskets

(PTFE) Filled Type

RAMAN380 □-TF	Basic Type
RAMAN380 □-R-TF	Inner Ring Type
RAMAN380 □-TF	Outer Ring Type
RAMAN380 □-R-TF	Inner-Outer Ring Type

[Characteristic]

This spiral wound gasket is manufactured by spirally winding a preformed V-shaped metal strip and (PTFE) filler on the outer periphery under tension properly. Varying metallic inner & outer rings can be attached as required by operating conditions and applications with a variety of winding metal materials. Superior in chemical resistance.
Suitable for use in the chemical plants, oxygen pipe lines, LPG lines and other pipe flanges for che esistance.

[Application]

Maximum Service Temp.	260°C
Maximum Pressure Range	Class 150 to 2500
Applied Size	ASME B16.20 / RAMAN B2404 KS B1518 / JPI 7S-41

* Maximum Temperature & pressure combinations can not be used at the same time.

note

[Spiral Wound Gaskets Types]

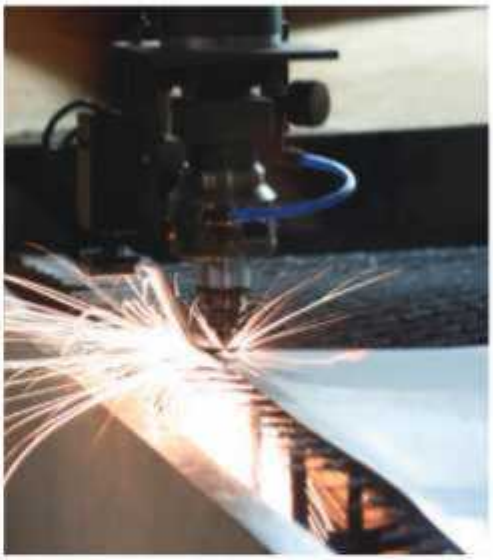
Semi-Metallic Gaskets

High Temperature
Spiral Wound Gaskets

Multi-Filler Filled Type

RAMAN380 ☐ -Multi- filler	Basic Type
RAMAN380 ☐ -R-Multi-filler	Inner Ring Type
RAMAN380 ☐ -Multi- filler	Outer Ring Type
RAMAN380 ☐ -R-Multi- filler	Inner-Outer Ring Type

This is a spiral wound gasket utilizing a combination of fillers (non-asbestos & (flexible graphite)) to give excellent sealing performance at critical high temperature applications. Flexible is susceptible to degradation due to oxidation when exposed under air or other oxidizing media. This multi-filler spiral wound gasket protects the and shields it from contact of oxidizers without any loss in .



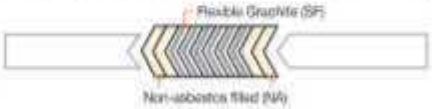
[Characteristic]

Very Special structure in multi-fillers as Non-asbestos (NA) /Ceramic (CE)+Non-asbestos(NA) / Ceramic(CE) to protect from oxidation and degradation

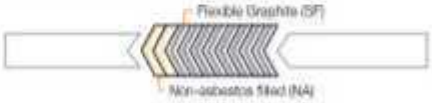
Each 3 times NA/CE windings around inside & outside of filler SUS 316, hoop material is mandatory at ○/C conditions. But, maximum temperature & pressure combinations cannot be used at the same time.

[Structure]

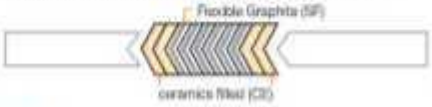
·Non-asbestos filled+Non-asbestos filled(NA+SF+NA)



·Non-asbestos filled(NA+SF)



·Ceramics filled +Ceramics filled(CE+SF+CE)



[Application]

Maximum Service Temp.	600°C
Maximum Pressure Range	Class 150 to 2500
Applied Size	ASME B16.20 /RAMAN B2404 KS B1518 / JPI 7S-41

Suitable for the use at high temperature(over450°C)/pressure application to protect the from oxidation in air or using fluids.

* Maximum Temperature & pressure combinations can not be used at the same time.

Semi-Metallic Gaskets

High Temperature Spiral Wound Gaskets

Filled Type

RAMAN 380 ☐ -HT	Basic Type
RAMAN380 ☐ -R-HT	Inner Ring Type
RAMAN380 ☐ -HT	Outer Ring Type
RAMAN380 ☐ -R-HT	Inner-Outer Ring Type

[Characteristic]

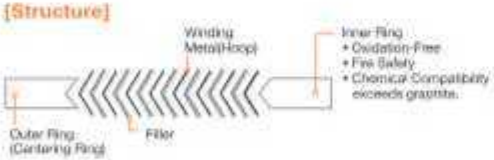
This spiral wound gasket is designed to use at extremely high temperature applicatiions and has been replacing asbestos filed spiral wound gaskets which are being phased out. This can be used in up to 1000 C with very excellent sealing performance and chemical compatibility in totally free oxidation.

[Application]

Maximum Service Temp.	1000°C
Maximum Pressure Range	Class 150 to 2500
Applied Size	ASME B16.20 /RAMAN B2404 KS B1518 / JPI 7S-41

• Maximum Temperature & pressure combinations can not be used at the same time.

[Structure]



Multi-Filler Filled Type (HTG)

RAMAN380 ☐ -HTG	Basic Type
RAMAN380 ☐ -R-HTG	Inner Ring Type
RAMAN380 ☐ -HTG	Outer Ring Type
RAMAN380 ☐ -R-HTG	Inner-Outer Ring Type

[Characteristic]

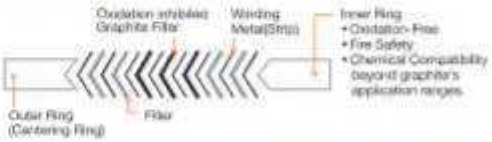
This is spiral wound gasket winding filler in the middle of filler of RAMAN 3808-HT Series gaskets to improve the sealing performance.

[Application]

Maximum Service Temp.	800°C
Maximum Pressure Range	Class 150 to 2500
Applied Size	ASME B16.20 / JIS B2404 KS B1518 / JPI 7S-41

• Maximum Temperature & pressure combinations can not be used at the same time.

[Structure]



Semi-Metallic Gaskets

Metal Jacketed Gaskets

Non-Asbestos Filled (NA) Filler

RAMAN 3840-NA	Double Jacketed Type
RAMAN 3841-NA	Double Shell Type
RAMAN 3860-NA	Double Jacketed Corrugated type

[Characteristic]

This Metal Jacketed Gaskets consist of a metallic outer shell with non-asbestos filler inside. The metal jacket protects the filler and resists pressures, temperature and the filler material gives the gasket resilience. A wide range of materials are available in accordance with the relevant temperature and corrosive conditions. They are used for heat exchanger applications with pass partition bars.

[Application]

Maximum Service Temp.	530°C
Maximum Service Pressure	60kgf/cm^2
Heat exchanger, High-pressure vessels, Boiler, Pumps, Valve bonnet, etc.	
Applied Fluids : Steam, Lubricants, Hydrocarbon, Water, Hot water, Organic solvents, Cryogenic line, Oxygen gas, Low temperature gases, LPG, etc.	

Ceramic (CE) Filler

RAMAN 3840-CE	Double Jacketed Type
RAMAN 3841-CE	Double Shell Type
RAMAN 3860-CE	Double Jacketed Corrugated type

[Characteristic]

This Gaskets using Ceramic filler with metallic outer shell. "CE" means a ceramic board which resists temperature up to 1300°C. JIC no. 3840-CE is ceramic board completely covered with stainless steel such stainless steel 304 or 316, etc in a flat shape. JIC 3860-CE is corrugated jacket type, specially designed for goose neck spherical joints which may be considered as most difficult to seal.

[Application]

Maximum Service Temp.	1300°C
Short-term peak Pressure	60kgf/cm^2
Goose neck of blast furnace, Heat exchanger, Naphtha cracking furnace, Valve bonnet, etc.	

Semi-Metallic Gaskets

Metal Jacketed Gaskets

(SF) Filler

RAMAN 3840-SF	Double Jacketed Type
RAMAN 3841-SF	Double Shell Type
RAMAN 3860-SF	Double Jacketed Corrugated type

[Characteristic]

Same as **RAMAN** 3840-NA Series, but its filler material is. A wide range of materials are available in accordance with the relevant temperature and corrosive conditions.
They are used for heat exchanger applications with pass partition bars.

[Application]

Maximum Service Temp.	530°C
Short-term peak Pressure	60kgf/cm²
Heat exchanger, High-pressure vessels, Boiler, Pumps, Valve bonnet, etc.	
Applied Fluids ; Steam, Lubricants, Hydrocarbon, Water, Hot water, Organic solvents, Cryogenic line, Oxygen gas, Low temperature gases, LPG, etc.	

Tape Attached

RAMAN 3840-☐-(SF)	Double Jacketed Type
RAMAN 3841-☐-(SF)	Double Shell Type
RAMAN 3860-☐-(SF)	Double Jacketed Corrugated type

☐ : INR, SPACE available

[Characteristic]

Metal jacketed gasket with tape 0.5mm thick on the sealing face. Excellent sealing performance with low bolt stress. Recommended for sealing gases.

[Application]

Maximum Service Temp.	530°C (Neutral or reducing atmosphere) 400°C (Oxidizing atmosphere)
Short-term peak Pressure	100kgf/cm²
Heat exchanger, High-pressure vessels, Boiler, Pumps, Valve bonnet, etc.	

Double Jacketed Type

Double Shell Type

Double Jacketed Corrugated type

Semi-Metallic Gaskets

Kammprofile Gaskets

Kammprofile Gaskets

Kammmprofile Gasket is comprised of a concentrically serrated solid metal ring and various soft facing materials of soft facing such as flexible Graphite, PTFE, and Non-asbestos providing stable sealing performance.

The sealing layers protect flange surface damage from high bolt stress and excellent in recovery and compressibility. Especially, the metal core ensures the blowout resistance under operating condition.

Solid metal core
Availability on low bolting stress in small contract area. Strong resistance in cold flow, over compression and breakage, High Stability of large size installation and handling

Soft sealing material
Supplement of uneven surface imperfections metal to metal during installation. Ideal for low stress and weak flange. Resistance in extreme temperature and pressure changes

[Kammprofile Gaskets Type]

Name	Cross Section	Construction		Centering Ring		Flange			
		Parallel Root	Convex Root	Integral	Floating	Male / Female	Tongue / Groove	Flat Face	Raised Face
Parallel Type - Without Collar		•				•	•		
Parallel Type - With outer Collar		•		•				•	•
Parallel Type - With outer Ring		•			•			•	•
Convex Type - With outer Ring			•			•	•		
Convex Type - Without Collar			•	•				•	•
Convex Type - With outer Collar			•		•			•	•

Semi-Metallic Gaskets

Kammprofile Gaskets

RAMAN 3850-SE	Parallel Root
RAMAN 3850-SEB	Floating Centering Ring
RAMAN 3850-SEC	Convex Root

[Characteristic]

This Kammprofile gaskets provide a safe, effective seal with excellent flexibility and recovery, allowing seal integrity under the most severe operating conditions. Two part assembly, consisting of a precision serrated metallic core with the addition of flexible Tapes bonded to each face of a solid metal core. While the solid metal core prevents gasket blowout, the facing flows easily into the flange faces allowing a high integrity seal out of's characteristics, even under low applied seating stresses. Suitable for the application required a small bolt load since the contact area is very small and gasket seating pressures and temperature are very high. A full range of metallic core materials are available. RAMAN 3850-SE(SF) series. The soft facing material is tape which is preferred where extremely high temperature (max.1000°C) is required. 4 types of cross section as basic, with inner, with outer ring and with inner & outer ring are availablein coordance with applied flanges.

[Standard Facing Materials]

Facing Material	Temp. Max.	Range Stress at Room Temp. Min. (psi)	Maximum Service Pressure	Applied
RAMAN 3850-SE (SF)	450°C (840°F)	17 MPa (2500)	Class 150 to 2500	- Valve Bonnet and non-circular Flange, Heat Exchanger, Pressure Container - Depend on Temperature and liquid, Ring Material should be changeable
RAMAN 3850-SE(TF)	260°C (500°F)	23 MPa (3300)		
RAMAN 3850-SE (HT)	1000°C (1830°F) Per Material	17 MPa (2500) Per Material		

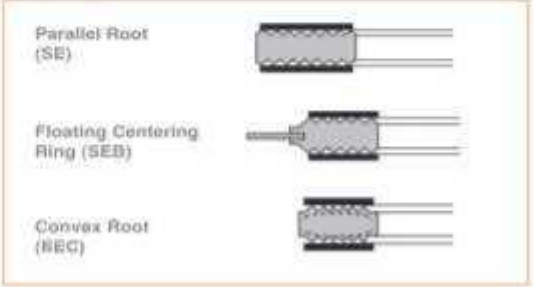
* Maximum temp.&pressure combination can not be used at the same time

[Standard Core Materials]

Core Material	Temp. Max.
Stainless Steel	535-870°C (1000-1600°F)
Carbon Steel	426°C (800°F)
Brass	260°C (500°F)
Copper	315°C (600°F)
Aluminum	425°C (800°F)
Monel	815°C (1500°F)
Nickel	760°C (1400°F)
Inconel	1100°C (2000°F)

* Standard core thickness is 0.2mm (nominal), other thicknesses and materials are readily available to suit specific applications.

[Structure]



Raman

Semi-Metallic Gaskets

Spiral Wound Gasket Description

[Structure]

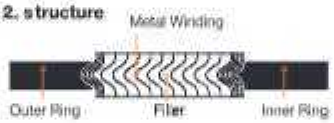
1. spiral Wound gasket feature & Construction

The Spiral wound gasket is the ideal gasket in the semi-metallic category. The effects of pressure and temperature fluctuations, the temperature difference across the flange face, along with flange rotation, bolt stress relaxation and creep, demand a gasket with adequate flexibility and recovery, to maintain a seal under variable working conditions. The spiral wound gasket meets these reqirements.

Widely used in the petrochemical, power plant, shipbuilding and oil refining industries where a cryogenic to high temperature and high pressure is required.

- Resistance to high temperature and high pressure.
- Superior resilence with allows the gasket to adjust automatically to change in operaling conditions, like pressure and thermal shocks, vibrants, etc.
- Excellent sealing performance even on irregular flange surface finishes.
- Designed to diversified dimensions and shapes(round, oval, square, diamond, etc) with economical costs.
- Various hoop & filler materials available for specific operating conditions.

2. structure



3. Metal Winding and filler

- The unique structure of alternate plies of perfomed winding metal strip and a soft non-metallic filler materials with 'V' shape allows superior resiliency and self-adjustment.
- The soft non-metallic fillers having good chemical resistance & heat resistance are necessarily flush with the metal widing on both contact faces of the gasket, thus producing a smooth sealing surface.

[How to Order Spiral Wound Gasket]

RAMAN NO.□□-□-□-□-□-□-□-□

3 8 NON-ASBESTOS — (A) (B) (C) (D) (E) (F) (G)

(A)	**Outer Ring**	
	0	No Outer Ring
	3	With Outer Ring
(B)	**Metal Winding**	
	4	S.S 304
	6	S.S 316
	8	Others
(C)	**Inner Ring**	
	None	No Inner Ring
	R	With Inner Ring
(D)	**Filler Material**	
	SF	
	TF	
	NA	NA Filler
	NA+	NGLN +NA
	CGC	CERAMIC+ STARFOIL®+ CERAMIC
	HT	
	HTG	

(E)	**Inner Ring Material**	
(F)	**Outer Ring Material**	
	None	No Outer Ring
	SS	Low Carbon Steel
	304	S.S 304
	As per table A	Others
(G)	**Metal Winding**	
	None	S.S 304, 316
	As per table A	Others
	SS	Low Carbon Steel
	304	S.S 304
	As per table A	Others

Table A.
Material Code of Inner and Outer Ring

Material	Code	Material	Code
Low Carbon Steel	SS	S.S 321	321
S.S 304	304	S.S 430	430
S.S 316	316	Titanium	Ti
S.S 316L	316L	S.S 304L	304L
S.S 347	347	MONEL	MO
NICKEL	Ni	ALUMINUM	AL
INCONEL	INC	INCOLOY	IN

EX)RAMAN-3604-R-SF-304-SS means Graphite with 304 winding and inner & outer ring type
=Winding(Hoop) SS304, Filler : STARFOIL®, Inner Ring : SS304, Outer Low carbon steel

4. When recommend the use of outer ring

- To make Gasket centering with flanges.
- To protect Gasket Body
- To prevent over compression damage which might occur due to the high available bolt loading.

5. When recommend the use of inner ring

- Under high pressure & temperature in process fluids.
- To protect accumulation of solids, reduce turbulents flow of process fluids and minimize erosion of flange faces.
- When bigger size gasket required.
- When the use of filler materials (to prevent over compression damage)

1. [illegible]
2. [illegible]

Semi-Metallic Gaskets

Spiral Wound Gasket Description

[How to Handle and use big sized Semi Metallic Gaskets]

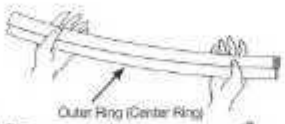
1. Carrying

Specified workers required when carrying big size gasket to prevent deformation and it shall be moved in even interval for safety protection.

Diameter	1500mm Under	2000mm Under	2500mm Under	3000mm Under	3500mm Under	3500mm Over
Min. Worker	2	3	4	6	7	8

2. grid Method

a. Horizontally
Keeping your palm horizontal, place the gasket on the palms and then firmly but softly hold it with your thumbs.



b. Vertically
keep your palms vertically and hold the gasket with thumbs and remaining firmly so as not to drop it.

* Treating : Gasket must not be thrown and fallen

3. storage and Precautions

- Please do not put any of heavy things on top of the gasket.
- Please do not storage in unstable and vibration conditions.
- Please avoid direct sunlight and keep in cool place, caring of humid and dust.
- Please observe first & first out process.
- Please pile up old gasket on top and using firstly, new one storages in bottom.

[Spiral Wound Gasket Marking]

[Recommended Compressed Thickness(RCT)]

Gasket Thickness	RCT
3.2	2.4 - 2.6
4.5	3.2 - 3.4
6.4	4.6 - 4.8

[Recommended Gasket Thickness]

Gasket Thickness	Flange Diameter
4.5mm	- Ø 1000
6.4mm	Ø 1000 -

[Recommended Design Parameters]

Item / Winding Material	Gasket Factor (m)	Min. Design Seating Stress Y(psi / MPa)	Sketches
Carbon Steel	2.50	10,000 / 69	
Stainless and Nickel-base alloys	3.00	10,000 / 69	

Raman

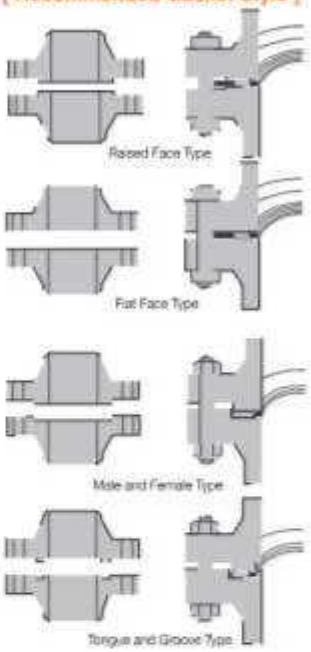
Semi-Metallic Gaskets

Application for Flanges (Spiral Wound Gasket)

[Cross Section as Flanges]

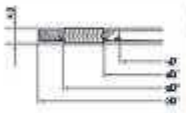
Type	Cross Section	Flanges	Remarks
Basic		Tongue & Groove, Male & Female	At Filler, inner ring type should be recommended.
With Inner Ring Type		Male & Female	
Face & Flat Face At Filler, inner ring type should be recommended.			With Outer Ring Type Raised
With Inner & Outer Type		Raised Face & Flat Face	

[Recommended Gasket Style]



[Tolerance of Dimensions]

[Unit : mm]



Nominal Pipe Size (NPS)	Inner Ring I.D (D1)	Gasket I.D (D2)	Gasket O.D (D3)	Outer Ring (D4)	Gasket Thickness T(1)
1/2" ~ 3"	±0.8	±0.4	±0.8	±0.8	±0.13
4" ~ 8"	±1.5				
10" ~ 24"		±0.8	+1.5, -0.8		
26" ~ 34"	±3.0		±1.5		
36" ~ 60"		±1.3			

Range : ASME B16.5 / ASME B16.47
Ref. Spec : ASME B16.20 (2007)

note
(1) The gasket thickness is ±0.13mm measured across the raised portion of the gasket, not including the fins which may protrude slightly beyond the circle.

[Cross Section andRAMANNo.]

Cross Section	Metal Winding	Filler Material			Application	Standard
		Non-Asbestos	(Graphite)	(PTFE)		
Gasket Thickness : 4.5mm **Basic type** (Without anything attached)	Stainless Steel 304	3804-NA	3804-SF	3804-TF	High Temperature & Pressure Equipment, Extreme Low Temperature Equipment, Valve, Boiler Manhole, Handhole, Turbine, Pump Casting Cover T&G, M&F Flange Special Flange	KS B1518 **RAMAN** B2404 JPI 7S-41
	Stainless Steel 316	3806-NA	3806-SF	3806-TF		
	As specified	3808-NA	3808-SF	3808-TF		
inner ring : Low Carbon Steel 3.0mm Stainless Steel 3.0mm Gasket Thickness : 4.5mm	Stainless Steel 304	3804-R-NA	3804-R-SF	3804-R-TF	High Temperature & Pressure Equipment, Extreme Low Temperature Equipment, T&G, M&F Flange	KS B1518 **RAMAN** B2404 JPI 7S-41
	Stainless Steel 316	3806-R-NA	3806-R-SF	3806-R-TF		
	As specified	3808-R-NA	3808-R-SF	3808-R-TF		
outer ring : Low Carbon Steel 3.0mm Stainless Steel 3.0mm Gasket Thickness : 4.5mm With outer guide ring attached	Stainless Steel 304	3834-NA	3834-SF	3834-TF	High Temperature & Pressure Equipment, Extreme Low Temperature Pipe, General Pipe Flange, R.F. Flange, Flat Flange	KS B1518 **RAMAN** B 2404 JPI-7S-41 ASME B16.20
	Stainless Steel 316	3836-NA	3836-SF	3836-TF		
	As specified	3838-NA	3838-SF	3838-TF		
inner & outer ring : Low Carbon Steel 3.0mm Stainless Steel 3.0mm Gasket Thickness : 4.5mm With outer guide ring and inner ring attached	Stainless Steel 304	3834-R-NA	3834-R-SF	3834-R-TF	Places requiring Merits of Outer and Inner Rings, RF Flange, Flat Flange	KS B1518 **RAMAN** B 2404 JPI-7S-41 ASME B16.20
	Stainless Steel 316	3836-R-NA	3836-R-SF	3836-R-TF		
	As specified	3838-R-NA	3838-R-SF	3838-R-TF		

Semi-Metallic Gaskets

Maximum Bore of ASME B16.5 Flanges for use with Spiral Wound Gaskets

<table>
<tr><th rowspan="2">Flanges Size (NPS)</th><th colspan="8">Pressure Class</th></tr>
<tr><th>75</th><th>150</th><th>300</th><th>400</th><th>600</th><th>900(1)</th><th>1500(1)</th><th>2500(1)</th></tr>
<tr><td>1/2</td><td rowspan="18">No Flange</td><td colspan="2" rowspan="3">W/N Flange only (2)</td><td rowspan="8">No Flanges Use Class 600</td><td rowspan="3">W/N Flange only (2)</td><td rowspan="9">No Flanges Use Class 1500</td><td colspan="2" rowspan="7">W/N Flange only (2)</td></tr>
<tr><td>3/4</td></tr>
<tr><td>1</td></tr>
<tr><td>1 1/4</td><td colspan="2" rowspan="2">SO Flange (3) W/N Flange (2)</td><td rowspan="2">SO Flange (3) W/N Flange (2)</td></tr>
<tr><td>1 1/2</td></tr>
<tr><td>2</td><td colspan="2" rowspan="2">SO Flange (3) W/N Flange, any bore</td><td rowspan="2">SO Flange (3) W/N Flange, any bore</td></tr>
<tr><td>2 1/2</td></tr>
<tr><td>3</td><td colspan="2" rowspan="11">SO Flange W/N Flange, any bore</td><td>SO Flange (3) W/N Flange, any bore</td><td colspan="2" rowspan="2">W/N Flange with SW bore(includes nozzle(4) but excludes SO Flange)</td></tr>
<tr><td>4</td><td colspan="2" rowspan="5">W/N Flange with Schedule 10S bore described in ASME B36.19M(includes nozzle(4) but excludes SO Flange)</td></tr>
<tr><td>6</td><td colspan="2" rowspan="9">W/N Flange with Schedule 80 bore (excludes nozzle (4) and SO Flange)(5)</td><td rowspan="4"></td></tr>
<tr><td>8</td></tr>
<tr><td>10</td></tr>
<tr><td>12</td></tr>
<tr><td>14</td><td colspan="2" rowspan="5">W/N Flange with Schedule 10S bore described in ASME B36.19M(includes nozzle(4) and excludes SO Flange)(5)</td><td rowspan="5">No Flanges</td></tr>
<tr><td>16</td></tr>
<tr><td>18</td></tr>
<tr><td>20</td></tr>
<tr><td>24</td></tr>
</table>

general note:
[illegible]

note:
[illegible]

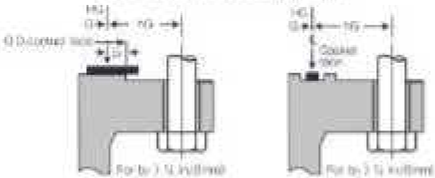
[Effective Gasket Width[1](Cont'd)]

Facing Sketch	Basic Gasket Seating Width b_0 Column I	Column II
(1a) 	$\frac{N}{2}$	$\frac{N}{2}$
(1b) 		
(1c) 	$\frac{W+T}{2}; \left(\frac{W+N}{2} \text{ max}\right)$	$\frac{W+T}{2}; \left(\frac{W+N}{4} \text{ max}\right)$
(1d) See Note(1) 		
(2) 1/64 in.(0.4mm) nubbin 	$\frac{W+N}{4}$	$\frac{W+3N}{8}$
(3) 1/64 in.(0.4mm) nubbin 	$\frac{N}{4}$	$\frac{3N}{8}$
(4) See Note(1) 	$\frac{3N}{8}$	$\frac{7N}{16}$
(5) See Note(1) 	$\frac{N}{4}$	$\frac{3N}{8}$
(6) 	$\frac{N}{8}$	-

Effective Gasket Seating Width, b

$b=b_0$ When $b_0 \le$ ¼ in.(6mm); $b=C_b\sqrt{b_0}$ When $b_0 >$ ¼ in.(6mm)

Location of Gasket Load Reation



note:
[illegible]

Semi-Metallic Gaskets

Standard Type of Metal Jacketed Gaskets

[Availability of Jacket Materials]

A Wide range of gasket material is available to company with specific operating conditions.
Jeil's extensive material inventories are as introduced below

Metal of Jacket (Vickers, Max)	Carbon Sheet	Copper	SS 304	SS 304L	SS 316	SS 316L	SS 317L	SS 321	SS 347	SS 310S	SS 410	Bronze	Al-Bronze	Monel	Titanium	Nickel	Aluminium	Lead
Max Hardness Vickers(HV)	140	80	180	170	180	170	170	180	180	180	190	130	150	150	180	150	40	10
Max OD (Outer Diameter,mm)	1200	980	1200	1200	1200	1200	980	1200	1200	1080	960	980	980	880	980	880	980	1500

Filler : NA Millboard / Sheet (Graphite) / Sheet(PTFE) / Ceramic Board

Additional Attachment : (Expended Graphite Tape)

[Design data for Metal Jacketed Gasket]

Jacket Material	Soft Aluminum	Soft Copper or Brass	Iron or Soft Steel	Monel	4%–6% Chrome	Stainless and Nickel - Base Alloys
Gasket Factor M	3.25	3.50	3.75	3.50	3.75	3.75
Min. Design Seating Stress Y (MPa/psi)	38 / 5,500	45 / 6,500	52 / 7,600	55 / 8,000	62 / 9,000	62 / 9,000
Sketches						

[Coss Section and JIC NO.]

Type	Cross Section	Filler Material Material		
		Non-asbestos	Ceramic	
Double Jacketed Gasket		3840-NA	3840-CE	
Double Jacketed & Double Shell Gasket		3841-NA	3841-CE	
Double Jacketed Corrugated Gasket		3860-NA	3860-CE	
French Type Gasket		3842-NA	3842-CE	
Round Jacketed Gasket		3843-NA	3843-CE	
Double Jacketed Gasket withTape		3840-NA(SF) 3841-NA(SF)	3840-CE(SF) 3841-CE(SF)	

Semi-Metallic Gaskets

Standard Type of Metal Jacketed Gaskets

[How to Order Metal Jacketed Gasket]

RAMAN NO.□□-□-□-□-□-□-□-□

3 8 Metal(Jacket) Gasket (A) (B) (C) (D) (E) (F)

(A)	**Cross Section**		(E)	**Material of Jacket Metal**	
	4	Flat Type		S	Low Carbon Steel
	6	Corrugated Type		S	Copper
(B)	**Jacket Type**			AL	Aluminium
	0	Double Jacketed		304	SUS 304
	1	Double Jacketed Double Shell		304L	SUS 304L
	2	French Type		316	SUS 316
	3	Round Type		316L	SUS 316L
(C)	**Filler Material**			321	SUS 321
	NA	NA Filler		410S	SUS 410S
	SF	(Graphite)		MO	Monel
	TF			BS	Brass
	CE	Ceramic		PB	Lead
(D)	* **With Tape:** (SF)			NI	Nickel
				TI	Titanium
			(F)	**Gasket Shape : A-Z**	

Ex. JIC NO. 3840-TF-(SF)-S-Z Double Jacketed Gasket with Tape Cross Section : Flat Jacket Type / Double Jacket Filler : (PTFE) / Metal : Low Carbon Steel / Shape : Z

[Dimensional Data]

• Double Jacketd Gasket (Unit : mm)

Standard Thickness	3.0 or 1/8
R	8 min
W	7 min
I	2.0 ~ 3.0
L	2.5 min
a	2.0 min
Metal Thickness	0.3 ~ 0.5

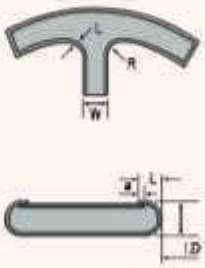
• Double Jacket Corrugated Gasket (Unit : mm)

T (Gasket Thickness)	3.0 min
W (Gasket Width)	15.0 min
t (Corrugation Height)	1.0±0.3
P(Corrugation Pitch)	6.4
Metal Thickness	0.3 ~ 0.5

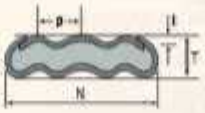
• Tolerance (Unit : mm)

Dimensions	Tolerance
Up to 250mm ID, OD	± 0.5
251~500mm ID, OD	± 1.0
501~1000mm ID, OD	± 1.5
1001mm ~ ID, OD	± 2.0
Metal Thickness	± 0.2

[Double Jacket Gasket]

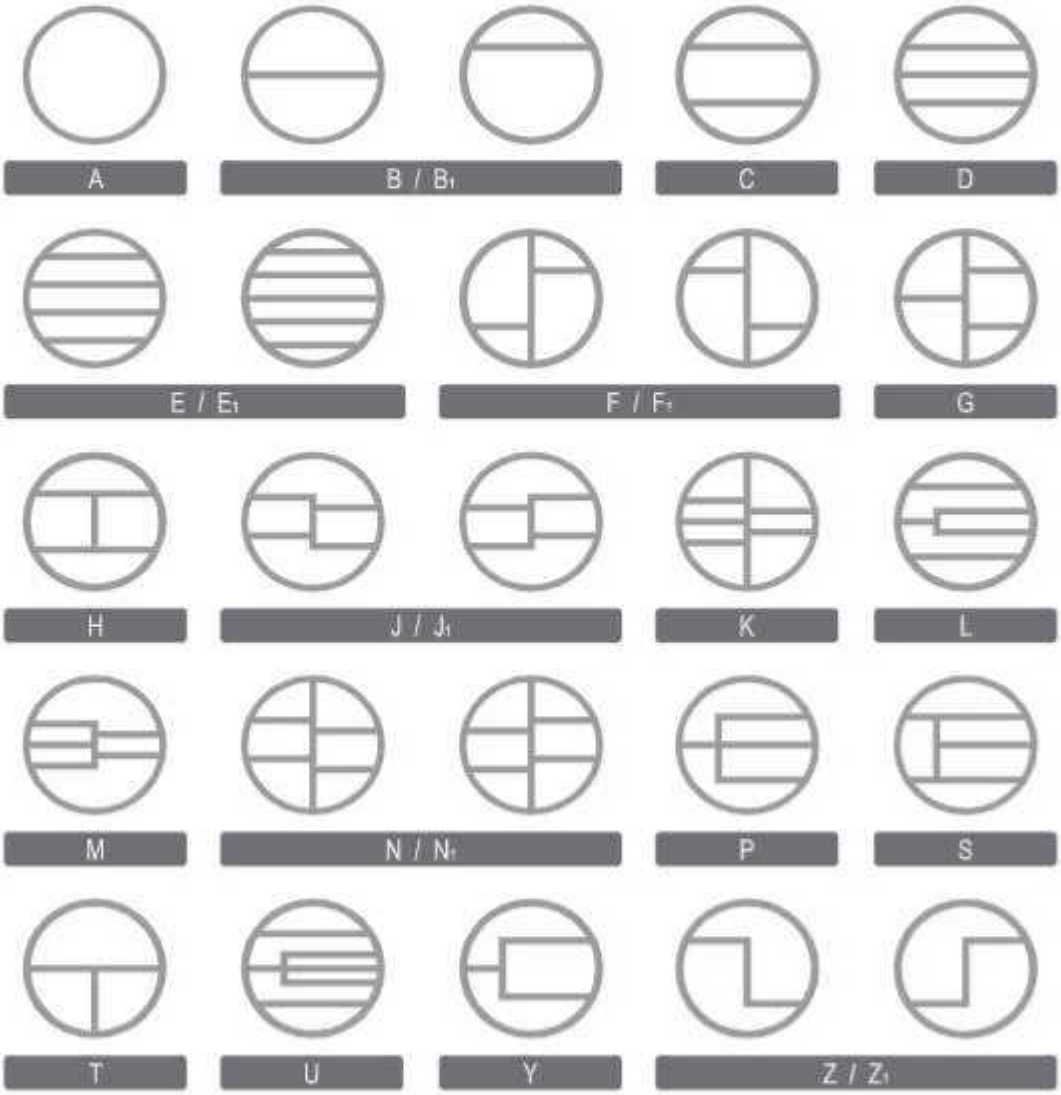


[Double Jacket Corrugated Gasket]



Semi-Metallic Gaskets

Standard Shapes for Heat Exchanger Gaskets



* All shape sketched above are seen from the side A

Metal Gaskets

Ring Joint Gaskets / Other Metal Gaskets

RAMAN 3850

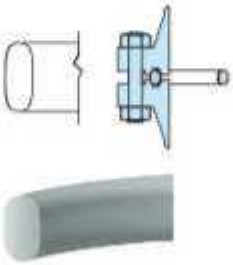
[Characteristic]

This ring joint gasket designed for use in high pressure, temperature applications necessitated the need for a high integrity seal. They are mainly used in the high pressure vessel, pipe flanges, valve bonnets handling high pressure steam, gas, hot oil, oil gas, solvent vapor industries, etc.

A wide range of sizes and materials are available on request. The hardness of the ring should always be less than the hardness of the flanges.

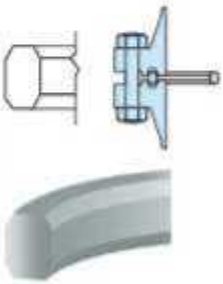
3850-V (Ring joint Oval Type)

This type is the original Joint design. Contacts flange face at the curved surface and provides a high reliability seal. But due to its shape, it is harder to achieve accuracy of dimensions and surface finish in oval type than in octagonal one and also more expensive to make. Reduce is not possible. Complies with ASME B16. 20, API 6A, RAMAN F 7102 510SR, JPI-7S-23.



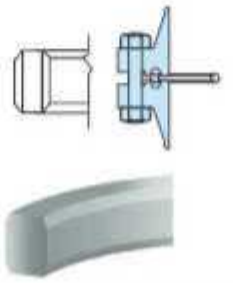
3850-C (Ring joint Octagonal Type)

More economical to make and more accurate in dimensions and surface finish than oval type because it consists of straight surfaces only. But more torque load is required to flow the gasket material into imperfections on the flange facings. Reuse is possible. Complies with the same standards as above.



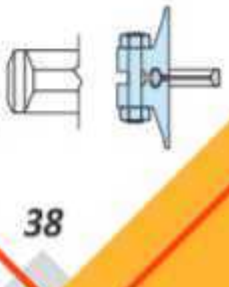
3850-BX (Ring joint BX Type)

Designed to API 6A for use with grooved flanges on special applications involving high pressures from 5,000 to 15,000 psi



3850-RX (Ring joint RX Type)

Designed to API 6A. Interchangeable with the oval and octagonal series of identical reference numbers, and used in the same flange grooves.



Metal Gaskets

Ring Joint Gaskets / Other Metal Gaskets

Cross Section and RAMAN No.

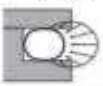
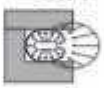
	**3850-P** (Plain)	Flat ring punched or lathed from comparatively soft metal such as aluminum, copper etc. Relatively inexpensive to make.
	**3850-I** (Lens Ring)	Designed to DIN 2696. Bolt load will be comparatively small, because its contact surface with flange face is spherical.
	**3850-DC** (Double Cone)	Auto seal type gasket. For effective sealability, aluminum sheets of 1.5~2.0mm are used together. Used for pressure vessel.
	**3850-B** (Bridgeman)	Auto seal type gasket. It is called a seal ring when this gasket is used for valve. Used for valve bonnet, pressure vessel, heat exchanger.
	**3850-D** (Delta)	Auto seal type gasket. For effective sealability, silver is plated on surface. Used for pressure vessel.
	**3850-se** (Serrated)	Flat ring with concentric serrations made of various types of metal. Used when bolting force is not sufficient to seal a flat gasket because it contacts flange face only at ser-ration peaks, commonly used on valve bonnets and flanges attached to equipment. 3 types of cross section- basic, with outer ring and with inner & outer ring-are available.
	**3850-Wr** (-I)	The use of welded gasket with hollow lip type "H" is recommended for connecting constructional part with different thermal expansion coefficients. This Welded Ring type "H" gasket have the advantage of increased ability to absorb movement. For example, this type "H" is preferably installed to seal heat exchanger bonnet Flanges and tube plate, Where different radial movement occurs.
	**3850-Wr** (-HR)	"HR" type gaskets supplied with a female face and Grooved Gasket inserted, so that if there is any damage to the gasket it can be replaced. The advantage of the welded ring gasket lies in its great ability to absorb movement. It is mainly used on heat exchangers to cope with different radial expansions, for instance of bonnet flange and tube plate.
	**3850-Wr** (-B)	Type "B" Gaskets are predominantly used in pipeline construction, where the twin flange design means that no large differences in strain properties arise when the same material for the gasket and flange is selected.
	**3850-Cor** (SF)	This graphite laminate is produced by bonding two flexible graphite sheets either to each other or to a central metal inset. Since only very small quantities of adhesive-thickness below 20mm are used, the outstanding chemical resistance of flexible graphite remains unaffected.

RAMAN 3800 Metal O-Ring

[Characteristic]

Metal O-Ring shape gasket made of stainless steel (SUS 321) or Inconel (IN-600) tube. Bent metal tube is welded and finished very precisely. For sealing of gases and volatile fluids, vacuum service, PTFE coated type or silver plated type are recommended. 2 types are available as follows.

[Type and Recommendation]

3800-P 	**Standard type :** From vacuum to 70kgf/cm²
3800-V 	**With small vent holes type :** Small vent holes of 2 and over are made either ID or OD side of gasket. **Self sealing type :** For high pressure seal over 70kgf/cm²

[Service Range]

Maximum Pressure Range	up to 4000kgf/cm² for water up to 3000kgf/cm² for gases up to 10^{-4}mm Hg for vacuum service
Lubricating oil, Hydraulic fluid, Fuel, Molten plastic, Molten rubber, Steam, Hot water	

[Standard Material and Service Temperature]

Material	Code	Coating	Service Temp.(C)	Remarks
SUS 321	321	None	-250 ~ 300	
		PTFE	-250 ~ 250	Coating Thickness : 0.03~0.05mm
		Silver	~ 300	Plating Thickness : 0.03~0.05mm
Inconel 600	IN	None	~ 500	
		PTFE	~ 250	Coating Thickness : 0.03~0.05mm
		Silver	~ 500	Plating Thickness : 0.03~0.05mm

[Standard Dimensions]

(Unit : mm)

Tube Diameter	Standard Wall Thickness	Available Size(O.D)	Recommended Size	Compression Load(1)
0.8	0.15	6~30	6~25	60kgf/cm
1.6	0.36	13~200	15~50	200~250
2.4	0.48	40~500	40~200	200~250
3.2	0.50	50~1500	65~700	150~250
4.8	0.80	150~1500	500~1200	300~350
6.4	0.80	250~1500	1000~1500	150~200

(1) For SUS 321

Metal Gaskets

Information

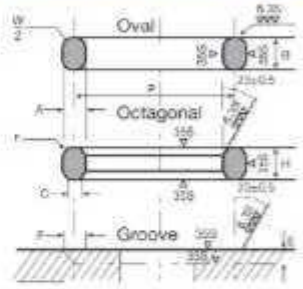
[How to Order RAMAN Metal Gasket]

RAMAN NO. 3850-□-□
- Cross Sectional Shape : such as "C", "V", "P", etc. (see 44 page)
- Material Code : such as "S", "304", etc.

[Metallic Codes for Metal Gaskets]

Material	Ident. Code	Temp.(C)		UNS Code
		Brinell	Rockwell Scale "B"	
Soft Iron	D	90	56	-
Low Carbon Steel	S	120	68	-
Copper	CU	60	-	-
SS 304	304	160	83	S30400
SS 304L	304L	150	81	S30403
SS 316	316	160	83	S31600
SS 316L	316L	150	81	S31603
SS 321	321	160	83	S32100
SS 347	347	160	83	S34700
SS 410	410	170	87	S41000
SS 430	430	170	87	S43000
5cr-0.5Mo	F5	130	72	K42544
Monel400	M	140	77	N04400
Titanium	TI	160	83	-
Aluminium	AL	40	-	-
Nickel200	NI	120	67	N02200

[Standard Sizes (ASME B16.20-2007)]



r_1 : 1.59mm when W is 22.225mm and smaller
2.38mm when W is 25.400mm and larger

Insulation Textiles

RAMAN 7000 Glass Fiber Cloth

Characteristic : E Glass or bulky glass yarns are woven into a cloth.

Application : Used as heat insulating or Flame resistant curtain. Especially RAMAN 7000 is suitable for asbestos substitute cloth due to flexibility good resin impregnation and heat insulation.

Max Service Temp. (°C)	550
Width (mm)	1000
Thickness (mm)	1.5 / 3.0
Length (M)	30

RAMAN 7200 Glass Fiber Cloth

Characteristic : E Glass Yarns are bulky-processed and woven into a tape.

Application : Heat insulation, Flame protector

Max Service Temp. (°C)	550
Width (mm)	25-100
Thickness (mm)	1.5 / 3.0
Length (M)	30

RAMAN 7300 Ceramic Fiber Cloth

Characteristic : Ceramic yarns are woven into a cloth.

Application : Heat insulation, Flame protector

Max Service Temp. (°C)	1300
Width (mm)	1000
Thickness (mm)	1.5 / 3.0
Length (M)	30

RAMAN 7400 Ceramic Fiber Tape

Characteristic : Ceramic yarns are woven into a tape.

Application : Heat insulation, Flame protector

Max Service Temp. (°C)	1300
Width (mm)	25-100
Thickness (mm)	1.5 / 3.0
Length (M)	30

RAMAN 7500 Silica Fiber Cloth

Characteristic : Silica yarns are woven into a cloth.

Application : Heat insulation, Flame protector, Flame resistant curtain

Max Service Temp. (°C)	1000
Width (mm)	1000
Thickness (mm)	1.5 / 3.0
Length (M)	30

RAMAN 7600 Silica Fiber Tape

Characteristic : Silica yarns are woven into a tape.

Application : Heat insulation, Flame protector

Max Service Temp. (°C)	1000
Width (mm)	25-100
Thickness (mm)	1.5 / 3.0
Length (M)	30

Gland Packing

Expanded Graphite Packing

RAMAN 3020 Expanded Graphite Packing

Expanded Graphite Yarns are braided into a square type of packing with high flexibility, elasticity and anti-abrasiveness to shaft or sleeve of high temperature/pressure valve or pump. Suitable for chemical plants, water, steam, gases, solvents, etc.

pH	0~14
Service Temp. Range (°C)	-200 ~ 600°C
Max. Pressure	200kgf/cm²

RAMAN 3020-I Inconel Wire Inserted Expanded Graphite Packing

Inconel wire inserted expanded Graphite yarns are braided into a square type of packing with flexibility. It shows superior heat resistant and thermal conductivity. Excellent thermal scattering and long life by self-lubricating. Suitable for high temperature/pressure valves, etc.

pH	0~14
Service Temp. Range (°C)	-200 ~ 600°C
Max. Pressure	260kgf/cm²

PTFE Fiber Packing

RAMAN 3063 PTFE Fiber Packing

Pure PTFE fiber yarns are braided into a packing in square or lattice-section type. Excellent heat resistant and chemical resistant, but suitable for places where contamination of fluids must be avoided because of excellent resistance against chemicals and corrosion. Outer cooling device is required when heated packing is likely to stick to shaft in operation due to nature of PTFE. Suitable for fusing alkali, metal, acid except hot fluoric acid, alkaline solvents, rotary machine, reciprocating machine, valve, etc.

pH	0-14
Max. Temp.(C)	260 (500°F)
Max. Pressure	100kgf/cm²

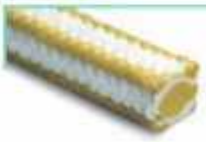
RAMAN 3064 Lubricated PTFE Fiber Packing

Same as JIC 3063 but impregnated with PTFE dispersion and special lubricant. Mechanically strong, anti-corrosive and suitable for variety of machinery. Suitable for corrosive fluid, hydrochloric acid, acetic acid, lactic acid, chemicals, strong alkali, rotary pump, reciprocating machine, rotary machine, etc.

pH	0-14
Max. Temp.(C)	260 (500°F)
Max. Pressure	20kgf/cm²
Shaft speed	V-10m/s

PTFE Fiber and Aramid Fiber Packing

RAMAN 3065 Lubricated PTFE Fiber and Aramid Fiber Packing



Lubricated PTFE fiber yarns and aramid fiber yarns are braided in combination. Excellent chemical resistant and mechanically strong packing. Suitable for strong acid, strong alkali, chemicals, solvents, rotary pumps, reciprocating machine, chemical pumps, rotary machine, etc.

pH	0-14
Max. Temp.(C)	260 (500°F)
Max. Pressure	20kgf/cm²
Shaft speed	V-16m/s

PTFE Fiber and Graphite / PTFE Fiber Packing

RAMAN 3067 Lubricated PTFE Fiber and Graphite Fiber Packing

PTFE/Graphite fiber yarns and lubricated PTFE yarns are braided to a packing in combination. It shows excellent chemical resistance, mechanic strength and self-lubricating. Suitable for corrosive fluid, organic solvents, chemicals rotary machine, rotary pumps, reciprocating pumps, agitator, etc.

pH	0-14
Max. Temp.(C)	260 (500°F)
Max. Pressure	20kgf/cm²
Shaft speed	V-20m/s

RAMAN 3076 PTFE / Graphite Fiber Packing

Consisting of PTFE / Graphite and lubricant are braided into square section. Good chemical resistant and heat resistant. Excellent self-lubricating, thermal conductive and low frictional co-efficient packing with no damage to shaft. Suitable for corrosive fluids, organic solvents, steam, hot water, oil, rotary machines, valves, rotary pump, agitator, flange, etc..

pH	0 – 14
Max. Temp.(°C)	260 (570°F)
Max. Pressure	20kgf/cm²
Shaft speed	V-16m/s

RAMAN 3076W PTFE Fiber Packing

PTFE fiber yarns are impregnated with special white filler and heat resistant lubricant, are braided into square section. Excellent thermal conductive and low frictional co-efficient packing with no damage to shaft. Suitable for a shaft seal for rotary pumps & equipments for food and medicine industries.

pH	0 – 14
Max. Temp.(°C)	260 (570°F)
Max. Pressure	20kgf/cm²
Shaft speed	V-16m/s

Hatch Cover Packing

RAMAN 3069 Hatch Cover Packing

Special packing for hatch cover made of excellent elastic rubber, chemical resistant synthetic fiber and PTFE fiber. This shows excellent sealing performance even under low seating stress without deformation for repeated usage. Order made product.

pH	0 – 14
Max. Temp.(°C)	100

RAMAN3069-GS Hatch Cover Packing

Same as JIC 3069 but, using high-grade core rubber tube and PTFE tapes and improving work-process to be suitable for the use of Gas application. Excellent sealing performance in Gas lines.

Max. Temp.(°C)	100

Applied Fluids : Oil refined products, animal or vegetable oil, acid, alkali, oil, brine, etc.

Carbon Fiber Packing

RAMAN 3072 Inconel Wire Inserted Carbon Fiber Packing

Carbon fiber yarns with inconel wire insertion are square-braided. Anti-corrosive material is treated. Suitable for high temperature & high pressure valve packing. Mainly used in combination with JIC 4101.

pH	2 ~ 12
Max. Temp.(°C)	450 (840°F)
Max. Pressure	100kgf/cm²

RAMAN3074 PTFE Impregnated Carbon Fiber Packing

Carbon fiber yarns are square-braided and then impregnated with PTFE dispersion. It shows excellent heat resistance, chemical resistance and thermal conductivity. High friction thermal conductivity, superior heat radiation and long life by self-lubricating. Suitable for strong acid, strong alkali, hydrocarbon, organic solvents, hot oil, steam, etc.

pH	2 ~ 12
Max. Temp.(°C)	300 (570°F)
Max. Pressure	50kgf/cm²

RAMAN 3074-CR Lubricated Carbon Fiber Packing

Carbon fiber yarns are impregnated with special heat resistant lubricant, lattice-braided into a packing and then, retreated on the surface with Graphite. It shows excellent heat resistance, chemical resistance and thermal conductivity. High friction thermal conductivity and long life by self-lubricating. Mainly used in combination with JIC 4101.

pH	2 ~ 12
Max. Temp.(°C)	450 (840°F)
Max. Pressure	100kgf/cm²

RAMAN 3075 Lubricated PTFE Impregnated Carbon Fiber Packing

Carbon fiber yarns are square-braided, impregnated with PTFE dispersion and lubricant. Excellent heat resistant and chemical resistant packing. Suitable for corrosive fluids, organic solvents, steam, hot water, hydrocarbon, oil, rotary machine, valve, rotary pump, agitator, flange, etc.

pH	2 ~ 12
Max. Temp.(°C)	300 (570°F)
Max. Pressure	20kgf/cm²
Shaft Speed	V-15m/s

Carbonized Fiber Packing

RAMAN 3094 PTFE Impregnated Carbonized Fiber Packing

Pan-carbonized fiber yarns are square or lattice-braided and impregnated with PTFE dispersion and lubricant. Light and excellent self-lubricating packing. Suitable for acid, alkaline fluids, brine, industrial waste water, mineral oil, vegetable oil, valve, etc.

pH	2 ~ 12
Max. Temp.(°C)	200 (390°F)
Max. Pressure	50kgf/cm²

RAMAN 3095 Lubricated PTFE Impregnated Carbonized Fiber Packing

Pan-carbonized fiber yarns are square or lattice-braided. Impregnated with PTFE dispersion and lubricated. Very light and self-lubricating packing. Suitable for acid, alkaline fluids, brine, industrial waste water, pumps, etc.

pH	2 ~ 12
Max. Temp.(°C)	200 (390°F)
Max. Pressure	15kgf/cm²
Shaft speed	V-16m/s

PTFE / Graphite Fiber and Aramid Fiber Packing

RAMAN 3077 PTFE / Graphite Fiber and Aramid Fiber Packing

PTFE / Graphite fiber yarns and aramid fiber yarns are braided in combination. Excellent heat resistant, chemical resistant and self-lubricating packing. Suitable for corrosive fluids, organic solvents, steam, hot water, oil, rotary machine, rotary pumps, agitator, etc.

pH	2 ~ 14
Max. Temp.(°C)	260 (500°F)
Max. Pressure	20kgf/cm²
Shaft speed	V-16m/s

RAMAN 3080 Lubricated PTFE Impregnated Aramid Fiber Packing

Aramid fiber yarns produced by DuPont are square or lattice-braided. Impregnated with PTFE dispersion and lubricated. Suitable for water, brine, exhaust water acid, alkali, oil fluid, solvents, rotary pumps, chemical pumps, agitator, etc.

pH	3 ~ 11
Max. Temp.(°C)	260 (500°F)
Max. Pressure	20kgf/cm²
Shaft speed	V-10m/s

Glass Fiber Packing

RAMAN 3085 Inconel Wire Inserted Glass Fiber Packing

Glass fiber yarns with inconel wire insertion are lubricated, braided and then Graphite treated. Excellent heat, chemical, pressure resistant and suitable for valves under high temperature and pressure. Mainly used in combination with RAMAN 4101.

pH	3 - 11
Max. Temp.(℃)	450 (840°F)
Max Pressure	150kgf/cm²

MoldedPacking

RAMAN 4101 (Graphite) Molded Packing

STARFOIL® (natural pure graphite) with a wide range of service temperature is made into compression mold ring packing. Especially there is little creep relaxation and temperature loss. Suitable for high temperature and high pressure steam, hot water, gas, hot oil, hot hydrocarbon, organic solvents, cryogenic fluids, LNG, valves, pumps, etc.

pH	0 - 14
Service Temp. Range (℃)	-240 ~ 450 (Oxidizing Atmosphere)
	-240~1650 (Non-Oxidizing Atmosphere)
Max Pressure	350kgf/cm²

Anti - VOC(Volatile Organic Compound) Packing Set

RAMAN 4101-VOC Anti - VOC Packing Set

Nowadays the environmental problems have been more considerably recognized all over the world anfd many companies have been trying to comply with ISO 14000 program. Especially as the Volatile Organic Compounds (VOC) was known as the main cause of ozone and stink generation, the protective regulations and have been more reinforced against the whole process of oil and acts petrochemical products. ANTI-VOC packing (AVP) is a kind of enviroment-friendly packing designed to minimize the leakage of VOC.

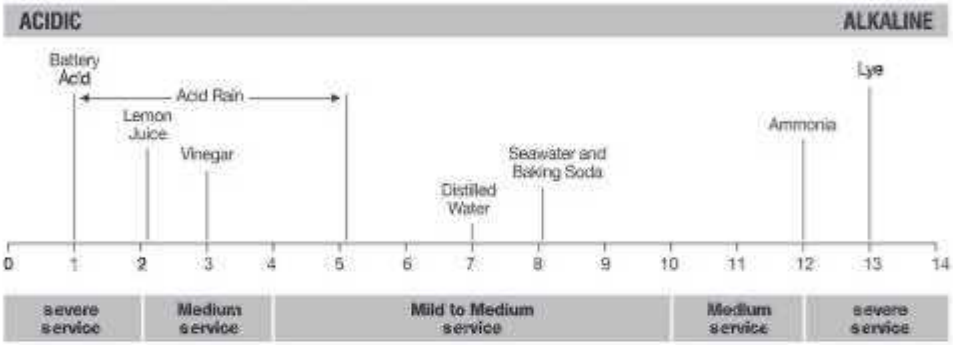
pH	0 - 14
Service Temp. Range (℃)	-240 ~ 450 (Oxidizing Atmosphere)
	-240 ~ 450 (Non-Oxidizing Atmosphere)
Max Pressure	350kgf/cm²

Applications

Chemicals Pistons Centrifugal Pumps Valves

[pH Values]

The scientific shorthand for indicating the level of acidity or alkalinity of a substance is the pH value.
The scale is logarithmic, making lye, at 13, ten times as alkaline as ammonia at 12.



[Properties]

RAMAN No.	Material Classification	Temp. F	Temp. C	Pressure (Max.)	Valves	Centrifugal pumps	Pistons	Chemicals	Shaft Speed	pH
3020	Expanded Graphite yarn		-200℃ to 600℃	200kgf/cm²	O	O	O	O		0-14
3020-I	INCONEL wire inserted Expanded Graphite yarn		-200℃ to 600℃	260kgf/cm²	O	X	X	O		0-14
3063	PTFE fiber	To 500℉	To 260℃	100kgf/cm²	O	X	O	O		0-14
3064	PTFE fiber	To 500℉	To 260℃	20kgf/cm²	X	O	O	O	10m/s	0-14
3065	PTFE fiber&Aramid fiber	To 500℉	To 260℃	20kgf/cm²	X	O	O	O	16m/s	0-14
3067	PTFE fiber&Grachite fiber	To 500℉	To 260℃	20kgf/cm²	X	O	O	O	20m/s	0-14
3076	PTFE fiber	To 570℉	To 260℃	20kgf/cm²	O	O	O	O	16m/s	0-14
3076W	PTFE fiber	To 570℉	To 260℃	20kgf/cm²	O	O	O	O	16m/s	0-14
3069	PTFE yarn		To 100℃		X	X	X	O		0-14
3069-GS	PTFE yarn		To 100℃		X	X	X	O		
3072	INCONEL wire inserted carbon fiber	To 840℉	To 450℃	100kgf/cm²	O	X	X	X		2-12
3074	Carbon Fiber	To 570℉	To 300℃	50kgf/cm²	O	X	X	X		2-12
3074-CR	Carbon Fiber	To 840℉	To 450℃	100kgf/cm²	O	X	X	X		2-12
3075	Carbon Fiber	To 570℉	To 300℃	20kgf/cm²	O	O	O	X	15m/s	2-12
3094	Carbonized Fiber	To 390℉	To 200℃	50kgf/cm²	O	X	X	X		2-12
3096	Carbonized Fiber	To 390℉	To 200℃	15kgf/cm²	X	O	O	X	16m/s	2-12
3077	PTFE fiber&Aramid fiber	To 500℉	To 260℃	20kgf/cm²	X	O	O	O	16m/s	2-14
3060	Aramid Fiber	To 500℉	To 260℃	20kgf/cm²	X	O	O		10m/s	3-11
3085	INCONEL wire inserted glass Fiber	To 840℉	To 450℃	150kgf/cm²	O	X	X	X		3-11
4101	Graphite		-240℃ to 450℃ -240℃ to 1650℃ Non-Oxidizing Atmosphere	350kgf/cm²	O	O	X	X		0-14
4101-VCC	Graphite		-240℃ to 450℃	350kgf/cm²	O	X	X	O		0-14 without strong acid

Rubber Sheets & Gaskets

RAMAN 9000 / 9001

[Characteristic]

Elastomeric gaskets provide excellent compressibility & recovery and have relatively soft compression characteristics and can show good sealing performance even under low stress load.

Recommend varying types of elastomers to be suitable for required diverse operating chemicals and temperature.

[Application]

Maximum Service Temp.	Depending on elastomers used.
Maximum Service Pressure	10kgf/cm² (150psi)
Materials	NR, NBR, CR, EPDM, SL, SBR, VITON, BUTYL
Size	1/32"(0.8mm), 1/16"(1.5mm), 1/8"(3.0mm), 3/16"(5.0mm)

*Other Sizes can be available , if required

[Typical Phisical Poperties]

Code	Typical Properties	Temp.range(C)
NR	Natural Rubber (Excellent mechanical properties)	-20 ~ 100
NBR	Acrylonitrile Butadiene Rubber (Excellent oil resistance)	-30 ~ 120
CR (NEOPRENE)	Chloroprene Rubber (Excellent weather, ozone, heat & flame resistance)	-30 ~ 120
EPDM	Ethy lene Propylene Diene Monomer (Excellent ageing & ozone resistance)	-40 ~ 150
SL (SILICONE)	Silicone Rubber (Excellent in heat, cold & chemical resistance)	-60 ~ 200
SBR	Styrene Butadiene Rubber (Excellent in ageing & abrasion resistance)	-20 ~ 100
FKM (VITON)	Fluoroelastomer (Superior in heat, oil & chemical resistance)	-20 ~ 200
IIR (BUTYL)	Isobutylene isoprene Rubber (Excellent ozone,weather, electricity resistance)	-40 ~ 120

RAMAN 9010-EPDM

[Characteristic]

The composition of RAMAN 9010 is integrated EPDM with pressurized and hesled Fluoroplastic film and characteristic of rubber elasticity and PTFE heat and chemical resistance perform excellent sealing ability. Industrial fields requiring high cleanness and purification in electronics, food, pharmaceutical etc.

[Application]

Maximum Service Temp.	-30~150°C
Maximum Service Pressure	20kgf/cm² (300psi)
Materials	EPDM
Size	1/32"(0.8mm), 1/16"(1.5mm), 1/8"(3.0mm), 3/16"(5.0mm)

*Other Sizes can be available , if required

[Products Description]

RAMAN 900 - □ - ▭

Material Codes
Normal Type : 0 / Serrated Type : 1

Products symbols
NR / NBR / CR(NEOPRENE) / EPDM / SI(SILICON) / SBR / FKM(VITON) / IR(BUTYL)

[Properties & Chemical Resistance]

	NR	NBR	CR (NEOPRENE)	EPDM	SI	SBR	FKM(VITON)	BUTYL(IIR)
Hardness(Shore A)	70±5	60±5	60±5	75±5	65±5	60±5	75±5	60±5
Tensile Strength(kgf/cm²)	min.70	min.80	min.80	min.152	min.80	min.30	min.93	min.70
Elongation(%)	min.150	min.300	min.350	min.240	min.100	min.150	min.220	min.350
Rebound Resilience	◎	○	◎	○	◎	○	△	△
Service Temp.(°C)	-20~100	-30~120	-30~120	-40~150	-60~200	-20~100	-20~200	-40~120
Wear Resistance	○	◎	○	△	△	◎	○	△
Flexibility	◎	○	○	○	△	○	○	◎
Ozone Resistance	X	X	○	◎	◎	X	◎	◎
Gas permeability	△	○	○	△	X	△	○	◎
Flame Resistance of Salt Tolerance	X	X	○	X	△	X	◎	X
Lubricant	X	◎	○	X	○	X	◎	X
Gasoline	X	○	△	X	X	X	◎	X
Aliphatic Hydrocarbon	X	◎	○	X	X	X	◎	X
Hydrocarbon	X	X	X	X	X	X	○	X
Aromatic hydrocarbon	X	X	X	X	X	X	◎	X
Alcohol	◎	◎	◎	◎	△	◎	○	◎
Ketone	○	○	◎	◎	○	○	△	◎
Water	◎	◎	◎	◎	◎	◎	◎	◎
Weak Acid	○	○	◎	◎	○	○	◎	◎
Strong Acid	X	X	△	○	X	X	◎	○
Alkali	○	○	◎	◎	○	○	△	◎

Note : ◎ Excellent / ○ Good / △ Suitable / X Unsuitable

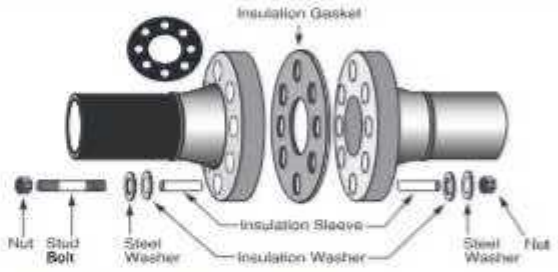
Insulation Sets

Insulation Sets

RAMAN **7700-R** TYPE 'R' - Raised Face
RAMAN **7700-F** TYPE 'F' - Full Face
RAMAN **7700-RJ** TYPE 'RJ' - R.T.J

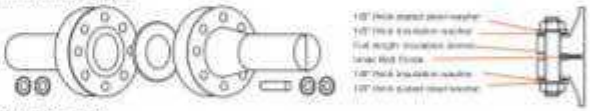
[Characteristic]

Insulation sets are used for pipeline flange corrosion protection and for complete electrical insulation protection where a seal is required between dissimilar flange materials.
There are three standard styles available to suit raised face, full face and ring grooved flanges.

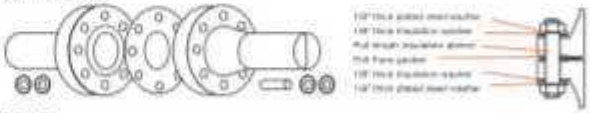


[Standard Styles of Insulation Sets]

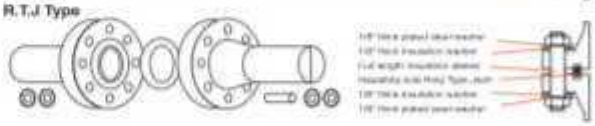
Raised Face Type



Full Face Type

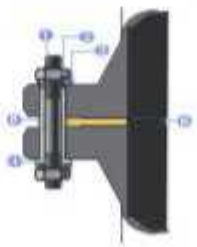


R.T.J Type



[Insulation Set Material]

Items	Materials	Max.Temp. (C)	Thickness
Insulation Gasket	PTFE Solid	260	3.0T~3.2T
	Rubber	150	
	Neoprene Faced Reinforced Phenolic	130	
	Glass Reinforced Epoxy with Viton Seals	180	
Insulation Sleeve	Phenolic Glass	130	0.8T~1.0T
	Epoxy Glass	180	
	PTFE	260	
Insulation Washer	Glass Reinforced Epoxy	180	3.0T
	Glass Reinforced Phenolic	130	
Steel Washer	Carbon Steel	N/A	3.0T~4.0T
	Stainless Steel	N/A	
Nut	A194 Gr.2H (ASTM)	N/A	N/A
Bolt	A193 Gr.B7 (ASTM)	N/A	N/A



❶ Nut
❷ Stud Bolt
❸ Insulation Washer
❹ Steel Washer
❺ Insulation Sleeve
❻ Insulation Gasket

Gasket

RAMAN CODE / EQ	Max. Temp. (C) / Pressure Class (lb)	Insulation Resistance (Ω)	
RAMAN **8305** PTFE Solid Gasket	-100 ~ 100 150	Over 2.0×10^{12}	
RAMAN **8305G** Reinfoeced PTFE Gasket	-200 ~ 200 300	1.3×10^{11}	
RAMAN **9020-CP** Neoprene Faced Phenolic Gasket	-30 ~ 120 150	RUBBER	CR 1.8×10^{7}
RAMAN **9210-ER** Gasket (Glass Reinforced Phenolic Plate Gasket with Rubber O-Ring)	-40 ~150 600	RUBBER	EPDM 2.0×10^{13}
RAMAN **9220-PR** Gasket (Glass Reinforced Phenolic Plate Gasket with Rubber O-Ring)	-40 ~150 600	RUBBER	VITON 9.7×10^{9}
RAMAN **9230-ES** Gasket (Glass Reinforced Epoxy Plate Gasket with Rubber O-Ring) EQ : PIKOTEK PGE TYPE	-60 ~150 600	RUBBER	NBR 1.3×10^{11}
RAMAN **9310-OS** Gasket (Phenolic Faced Metal Plate with Rubber O-Ring) EQ : PIKOTEK VCS TYPE	150 1500	RUBBER	-
RAMAN **9320-OS** Gasket (Phenolic Faced Metal Plate with PTFE Seal) EQ : PIKOTEK VCS Type	150 2500	Over 2.0×10^{12}	
RAMAN **3850-SE(HT)** KAMMPROFILE Gasket	1000 2500	9.9×10^{10}	

* Insulation Resistance(Ω) ASTM D257-07 ; Usage Voltage : 1000V, Capacity of Tester : 2.0×10^{13} Ω
* Gasket type confirmed by customer.
* For Specific size & application recommendations consult **RAMAN**
* PTFE Gasket : Not suitable for FR type.

Bolt / Nut / Sleeve / Washer

		Insulation Resistance (Ω)	Max. Temp. (C)	Thickness
Insulation Sleeve	Glass Reinforced EPOXY	Over 2.0×10^{12}	150	0.8T ~ 1.0T
	Phenolic	2.2×10^{9}	180	
	PTFE	Over 2.0×10^{13}	100	
	Mica	9.9×10^{10}	1000	
Insulation Washer	Glass Reinforced EPOXY	Over 2.0×10^{12}	150	3.0T
	Phenolic	2.2×10^{9}	180	
	Mica	9.9×10^{10}	1000	
Steel Washer	Carbon Steel	N / A	N / A	3.0T ~ 5.0T
	Stainless Steel	N / A	N / A	
Nut (Heavy Hex Nut)	A194 Gr.2H (ASTM)	N / A	N / A	-
	A194 Gr.8 (ASTM)	N / A		
	A194 Gr.8M (ASTM)	N / A		
Bolt (Stud Bolt)	A193 Gr.B7 (ASTM)	N / A	N / A	-
	A193 Gr.B8 (ASTM)	N / A		
	A193 Gr.B8M (ASTM)	N / A		

* Insulation Resistance(Ω) ASTM D257-07 Usage Voltage: 1000V, Capacity of Tester : 2.0×10^{13} Ω
* Steel Washer, Nut, Bolt : Special Material can be available as customer's requirements.

Gasket Standard Dimension Table

Non-Metallic Gaskets Dimension

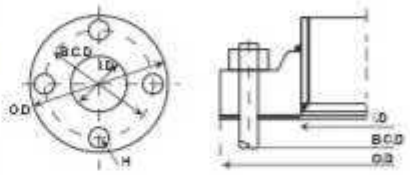
ASME B 16.21(2011)

FF(Full Face) : ASME / ANSI B 16.5 Pipe Flanges

[Unit : mm]

Size (NPS)	Class 150				
	I.D	O.D	B.C.D	H	N
1/2	21	89	60.3	15.7	4
3/4	27	98	69.9	15.7	4
1	33	108	79.4	15.7	4
1-1/4	42	117	88.9	15.7	4
1-1/2	48	127	98.4	15.7	4
2	60	152	120.7	19.1	4
2-1/2	73	178	139.7	19.1	4
3	89	191	152.4	19.1	4
3-1/2	102	216	177.8	19.1	8
4	114	229	190.5	19.1	8
5	141	254	215.9	22.4	8
6	168	279	241.3	22.4	8
8	219	343	298.5	22.4	8
10	273	406	362.0	25.4	12
12	324	483	431.8	25.4	12
14	356	533	476.3	28.4	12
16	406	597	539.8	28.4	16
18	457	635	577.9	31.8	16
20	508	699	635.0	31.8	20
24	610	813	749.3	35.1	20

1) B.C.D : Bolt Circle Diameter
2) H : Bolt hole Diameter
3) N : Number of Bolt hole

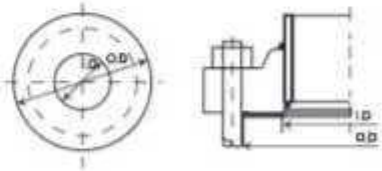


ASME B 16.21(2011)

RF(Flat Ring) : ASME / ANSI B 16.5 Pipe Flanges

[Unit : mm]

Size (NPS)	Gasket I.D	Gasket O.D				
		Class 150	Class 300	Class 400	Class 600	Class 900
1/2	21	46	54	54	54	64
3/4	27	57	67	67	67	70
1	33	67	73	73	73	79
1-1/4	42	76	83	83	83	89
1-1/2	48	86	95	95	95	98
2	60	105	111	111	111	143
2-1/2	73	124	130	130	130	165
3	89	137	149	149	149	168
3-1/2	102	162	165	162	162	-
4	114	175	181	178	194	206
5	141	197	216	213	241	248
6	168	222	251	248	267	289
8	219	279	308	305	321	359
10	273	340	362	359	400	435
12	324	410	422	419	457	498
14	356	451	486	483	492	521
16	406	514	540	537	565	575
18	457	549	597	594	613	638
20	508	606	654	648	683	689
24	610	718	775	768	791	838



Gasket Standard Dimension Table

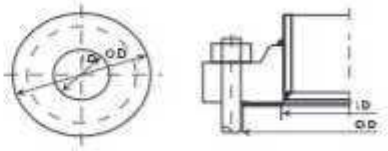
Non-Metallic Gasket Dimension

ASME B 16.21(2011)

RF(Flat Ring) : ASME B 16.47 Series "A" Large Diameter Steel Flanges (MSS SP-44 Flanges)

[Unit : mm]

Size (NPS)	Gasket I.D	Gasket O.D			
		Class 150	Class 300	Class 400	Class 600
22	559	660	705	702	733
26	660	775	835	832	867
28	711	832	899	892	914
30	762	883	953	946	972
32	813	940	1006	1003	1022
34	864	991	1057	1054	1073
36	914	1048	1118	1118	1130
38	965	1111	1054	1073	1105
40	1016	1162	1114	1127	1156
42	1067	1219	1165	1178	1219
44	1118	1276	1219	1232	1270
46	1168	1327	1273	1289	1327
48	1219	1384	1324	1346	1391
50	1270	1435	1378	1403	1448
52	1321	1492	1429	1454	1499
54	1372	1549	1492	1518	1556
56	1422	1607	1543	1568	1613
58	1473	1664	1594	1619	1664
60	1524	1715	1645	1683	1721

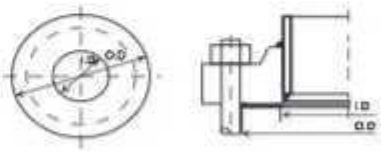


ASME B 16.21(2011)

RF(Flat Ring) : ASME / ASNI B 16.47 Series "B" Large Diameter Steel Flanges (API 605 Flanges)

[Unit : mm]

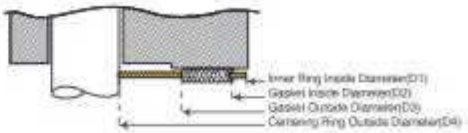
Size (NPS)	Gasket I.D	Gasket O.D				
		Class 75	Class 150	Class 300	Class 400	Class 600
26	660	708	725	772	746	765
28	711	752	776	826	800	819
30	762	810	827	886	857	879
32	813	860	881	940	911	933
34	864	911	935	994	962	997
36	914	973	987	1048	1022	1048
38	965	1024	1045	1092	-	-
40	1016	1075	1095	1149	-	-
42	1067	1126	1146	1200	-	-
44	1118	1181	1197	1251	-	-
46	1168	1232	1256	1318	-	-
48	1219	1283	1307	1368	-	-
50	1270	1334	1357	1419	-	-
52	1321	1387	1408	1470	-	-
54	1372	1439	1464	1530	-	-
56	1422	1495	1514	1594	-	-
58	1473	1546	1580	1656	-	-
60	1524	1597	1630	1705	-	-



Gasket Standard Dimension Table

Spiral Wound Gaskets Dimension

ASME B 16.20 (2007)



ASME B16.5 Pipes Flanges

[Unit : mm]

Size (NPS)	Class 150				Class 300				Class 400				Class 600			
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
1/2	14.2	19.1	31.8	47.8	14.2	19.1	31.8	54.1	14.2	19.1	31.8	54.1	14.2	19.1	31.8	54.1
3/4	20.6	25.4	39.6	57.2	20.6	25.4	39.6	66.8	20.6	25.4	39.6	66.8	20.6	25.4	39.6	66.8
1	26.9	31.8	47.8	66.8	26.9	31.8	47.8	73.2	26.9	31.8	47.8	73.2	26.9	31.8	47.8	73.2
1-1/4	38.1	47.8	60.5	76.2	38.1	47.8	60.5	82.6	38.1	47.8	60.5	82.6	38.1	47.8	60.5	82.6
1-1/2	44.5	54.1	69.9	85.9	44.5	54.1	69.9	95.3	44.5	54.1	69.9	95.3	44.5	54.1	69.9	95.3
2	55.6	69.9	85.9	104.9	55.6	69.9	85.9	111.3	55.6	69.9	85.9	111.3	55.6	69.9	85.9	111.3
2-1/2	66.5	82.6	98.6	124.0	66.5	82.6	98.6	130.3	66.5	82.6	98.6	130.3	66.5	82.6	98.6	130.3
3	81.0	101.6	120.7	136.7	81.0	101.6	120.7	149.4	78.7	101.6	120.7	149.4	81.0	101.6	120.7	149.4
4	106.4	127.0	149.4	174.8	106.4	127.0	149.4	181.1	102.6	120.7	149.4	177.8	102.6	120.7	149.4	193.8
5	131.8	155.7	177.8	196.9	131.8	155.7	177.8	215.9	128.3	147.6	177.8	212.9	128.3	147.6	177.8	241.3
6	157.2	182.6	209.6	222.3	157.2	182.6	209.6	251.0	154.9	174.8	209.6	247.7	154.9	174.8	209.6	266.7
8	215.9	233.4	263.7	279.4	215.9	233.4	263.7	308.1	205.7	225.6	263.7	304.8	205.7	225.6	263.7	320.8
10	268.2	287.3	317.5	339.9	268.2	287.3	317.5	362.0	255.3	274.6	317.5	358.9	255.3	274.6	317.5	400.1
12	317.5	339.9	374.7	409.7	317.5	339.9	374.7	422.4	307.3	327.2	374.7	419.1	307.3	327.2	374.7	457.2
14	349.3	371.6	406.4	450.9	349.3	371.6	406.4	485.9	342.9	362.0	406.4	482.6	342.9	362.0	406.4	492.3
16	400.1	422.4	463.6	514.4	400.1	422.4	463.6	539.8	389.9	412.8	463.6	536.7	389.9	412.8	463.6	565.2
18	449.3	474.7	527.1	549.4	449.3	474.7	527.1	596.9	438.2	469.9	527.1	593.9	438.2	469.9	527.1	612.9
20	500.1	525.5	577.9	606.6	500.1	525.5	577.9	654.1	489.0	520.7	577.9	647.7	489.0	520.7	577.9	682.8
22*	552.4	577.8	635.0	660.4	552.4	577.8	635.0	704.8	552.4	577.8	635.0	701.8	552.4	577.8	635.0	733.6
24	603.3	628.7	685.8	717.6	603.3	628.7	685.8	774.7	590.6	628.7	685.8	768.4	590.6	628.7	685.8	790.7

22* : Facing Dimensions for JPI 7S-41-2000

ASME B16.5 Pipes Flanges

[Unit : mm]

Size (NPS)	Class 900				Class 1500				Class 2500			
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
1/2	14.2	19.1	31.8	63.5	14.2	19.1	31.8	63.5	14.2	19.1	31.8	69.9
3/4	20.6	25.4	39.6	69.9	20.6	25.4	39.6	69.9	20.6	25.4	39.6	76.2
1	26.9	31.8	47.8	79.5	26.9	31.8	47.8	79.5	26.9	31.8	47.8	85.9
1-1/4	33.3	39.6	60.5	88.9	33.3	39.6	60.5	88.9	33.3	39.6	60.5	104.9
1-1/2	41.4	47.8	69.9	98.6	41.4	47.8	69.9	98.6	41.4	47.8	69.9	117.6
2	52.3	58.7	85.9	143.0	52.3	58.7	85.9	143.0	52.3	58.7	85.9	146.1
2-1/2	63.5	69.9	98.6	165.1	63.5	69.9	98.6	165.1	63.5	69.9	98.6	168.4
3	78.7	95.3	120.7	168.4	78.7	92.2	120.7	174.8	78.7	92.2	120.7	196.9
4	102.6	120.7	149.4	206.5	97.8	117.6	149.4	209.6	97.8	117.6	149.4	235.0
5	128.3	147.6	177.8	247.7	124.5	143.0	177.8	254.0	124.5	143.0	177.8	279.4
6	154.9	174.8	209.6	289.1	147.3	171.5	209.6	282.7	147.3	171.5	209.6	317.5
8	196.9	222.3	257.3	358.9	196.9	215.9	257.3	352.6	196.9	215.9	257.3	387.4
10	246.1	276.4	311.2	435.1	246.1	266.7	311.2	435.1	246.1	270.0	311.2	476.3
12	292.1	323.9	368.3	498.6	292.1	323.9	368.3	520.7	292.1	317.5	368.3	549.4
14	320.8	355.6	400.1	520.7	320.8	362.0	400.1	577.9	-	-	-	-
16	374.7	412.8	457.2	574.8	368.3	406.4	457.2	641.4	-	-	-	-
18	425.5	463.6	520.7	638.3	425.5	463.6	520.7	704.9	-	-	-	-
20	482.6	520.7	571.5	698.5	476.3	514.4	571.5	755.7	-	-	-	-
24	590.6	628.7	679.5	838.2	577.9	616.0	679.5	901.7	-	-	-	-

22* | Facing Dimensions for JPI7S-41-1998

Spiral Wound Gaskets Dimension

ASME B16.20 (2007)

ASME B16.47 Series "A" Large Diameter Steel Flanges (MSS SP-44 Flanges)

[Unit : mm]

Size (NPS)	Class 150				Class 300				Class 400				Class 600				Class 900			
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
26	654.1	673.1	704.9	774.7	654.1	685.8	736.6	835.2	660.4	685.8	736.6	831.9	647.7	685.8	736.6	866.9	660.4	685.8	736.6	882.7
28	704.9	723.9	755.7	831.9	704.9	736.6	787.4	898.7	711.2	736.6	787.4	892.3	698.5	736.6	787.4	914.4	711.2	736.6	787.4	946.2
30	755.7	774.7	806.5	882.7	755.7	793.8	844.6	952.5	755.7	793.8	844.6	946.2	755.7	793.8	844.6	971.6	768.4	793.8	844.6	1009.7
32	806.5	825.5	860.6	939.8	806.5	850.9	901.7	1006.6	812.8	850.9	901.7	1003.3	812.8	850.9	901.7	1022.4	812.8	850.9	901.7	1073.2
34	857.3	876.3	911.4	990.6	857.3	901.7	952.5	1057.4	863.6	901.7	952.5	1054.1	81.0	901.7	952.5	1073.2	863.6	901.7	952.5	1136.7
36	908.1	927.1	965.5	1047.8	908.1	955.8	1006.6	1117.6	917.7	955.8	1006.6	1117.6	917.7	955.8	1006.6	1130.3	920.8	958.9	1008.7	1200.2
38	958.9	977.9	1019.3	1111.3	962.5	977.9	1016.0	1054.1	962.5	971.6	1022.4	1073.2	952.5	990.6	1041.4	1104.9	1009.7	1035.1	1086.9	1200.2
40	1009.7	1028.7	1070.1	1162.1	1003.3	1022.4	1070.1	1114.6	1009.3	1025.7	1076.5	1127.3	1009.7	1047.8	1098.6	1155.7	1060.5	1098.6	1149.4	1251.0
42	1060.5	1079.5	1124.0	1219.2	1054.1	1073.2	1120.9	1165.4	1051.1	1076.5	1127.3	1178.1	1066.8	1104.9	1155.7	1219.2	1111.3	1149.4	1200.2	1301.8
44	1111.3	1130.3	1178.1	1276.4	1104.9	1130.3	1181.1	1219.2	1104.9	1130.3	1181.1	1231.9	1111.3	1162.1	1212.9	1270.0	1165.7	1206.5	1257.3	1368.6
46	1162.1	1181.1	1228.9	1327.2	1152.7	1178.1	1228.9	1273.3	1168.4	1193.8	1244.6	1289.1	1162.1	1212.9	1263.7	1327.2	1219.2	1270.0	1320.8	1435.1
48	1212.9	1231.9	1279.7	1384.3	1209.8	1235.2	1295.0	1324.1	1206.5	1244.6	1295.4	1346.2	1219.2	1270.0	1320.8	1390.7	1270.0	1320.8	1371.6	1486.9
50	1263.7	1282.7	1333.5	1435.1	1244.6	1295.4	1346.2	1378.0	1257.3	1295.4	1346.2	1403.4	1270.0	1320.8	1371.6	1447.8	-	-	-	-
52	1314.5	1333.5	1384.3	1492.3	1320.8	1346.2	1397.0	1428.8	1308.1	1346.2	1397.0	1454.2	1320.8	1371.6	1422.4	1498.6	-	-	-	-
54	1358.9	1384.3	1435.1	1549.4	1352.6	1403.4	1454.2	1492.3	1352.6	1403.4	1454.2	1517.7	1378.0	1428.8	1479.6	1555.8	-	-	-	-
56	1409.7	1435.1	1485.9	1606.6	1403.4	1454.2	1505.0	1543.1	1403.4	1454.2	1505.0	1568.5	1428.8	1479.6	1530.4	1612.9	-	-	-	-
58	1460.5	1485.9	1536.7	1663.7	1447.8	1511.3	1562.1	1593.9	1454.2	1505.0	1555.8	1619.3	1473.2	1536.7	1587.5	1663.7	-	-	-	-
60	1511.3	1536.7	1587.5	1714.5	1524.0	1562.1	1612.9	1644.7	1517.7	1568.5	1619.3	1682.8	1530.4	1593.9	1644.7	1733.6	-	-	-	-

ASME B 16.47 Series "B" Large Diameter Steel Flanges (API 605 Flanges)

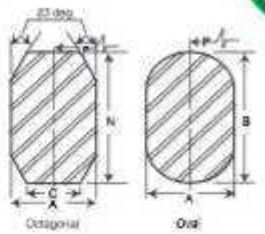
[Unit : mm]

Size (NPS)	Class 150				Class 300				Class 400				Class 600				Class 900			
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
26	654.1	673.1	698.5	725.4	654.1	675.1	711.2	771.7	654.1	666.8	698.5	746.3	644.7	663.7	714.5	765.3	666.8	692.2	749.3	838.2
28	704.9	723.9	749.3	776.2	704.9	723.9	762.0	825.5	701.8	714.5	749.3	800.1	685.8	704.9	755.7	819.2	717.6	743.0	800.1	901.7
30	755.7	774.7	800.1	827.0	755.7	774.7	812.8	882.0	752.6	765.3	806.5	857.3	752.6	778.0	828.8	879.6	781.1	806.5	857.3	958.9
32	806.5	825.5	850.9	881.1	806.5	825.5	863.6	939.8	800.1	812.8	860.6	911.4	793.8	831.9	882.7	933.5	838.2	863.6	914.4	1016.0
34	857.3	876.3	908.1	935.0	857.3	876.3	914.4	993.9	850.9	866.9	911.4	962.2	850.9	889.0	939.8	997.0	895.4	920.8	971.6	1073.2
36	908.1	927.1	958.9	987.6	908.1	927.1	965.2	1047.8	898.7	917.7	965.2	1022.4	901.7	939.8	990.6	1047.8	920.8	946.2	997.0	1124.0
38	958.9	974.0	1009.7	1044.7	971.6	1009.7	1047.8	1098.6	952.5	971.6	1022.4	1073.2	952.5	990.6	1041.4	1104.9	1009.7	1035.1	1086.9	1200.2
40	1009.7	1022.4	1060.8	1095.5	1022.4	1060.5	1098.6	1149.4	1000.3	1025.7	1076.5	1127.3	1009.7	1047.8	1098.6	1155.7	1060.5	1098.6	1149.4	1251.0
42	1060.5	1079.5	1114.6	1146.3	1065.9	1111.3	1149.4	1200.2	1051.1	1076.5	1127.3	1178.1	1066.8	1104.9	1155.7	1219.2	1111.3	1149.4	1200.2	1301.8
44	1111.3	1124.0	1165.4	1197.1	1124.0	1162.1	1200.2	1251.0	1104.9	1130.3	1181.1	1231.9	1111.3	1162.1	1212.9	1270.0	1155.7	1206.5	1257.3	1368.6
46	1162.1	1181.1	1224.0	1255.8	1178.1	1216.2	1254.3	1317.8	1168.4	1193.8	1244.6	1289.1	1162.1	1212.9	1263.7	1327.2	1219.2	1270.0	1320.8	1435.1
48	1212.9	1231.9	1270.0	1306.0	1231.9	1263.7	1311.4	1368.0	1206.5	1244.6	1295.4	1346.2	1219.2	1270.0	1320.8	1390.7	1270.0	1320.8	1371.6	1486.9
50	1263.7	1282.7	1325.6	1357.4	1267.0	1317.8	1355.9	1419.4	1257.3	1295.4	1346.2	1403.4	1270.0	1320.8	1371.6	1447.8	-	-	-	-
52	1314.5	1333.5	1376.4	1408.2	1317.8	1368.6	1406.7	1470.2	1308.1	1346.2	1397.0	1454.2	1320.8	1371.6	1422.4	1498.6	-	-	-	-
54	1365.3	1384.3	1422.4	1463.8	1365.3	1403.4	1454.2	1530.4	1352.6	1403.4	1454.2	1517.7	1378.0	1428.8	1479.6	1555.8	-	-	-	-
56	1422.4	1444.8	1478.0	1514.6	1428.8	1479.6	1524.0	1593.9	1403.4	1454.2	1505.0	1568.5	1428.8	1479.6	1530.4	1612.9	-	-	-	-
58	1478.0	1500.1	1528.8	1570.0	1484.4	1535.2	1573.3	1655.8	1454.2	1505.0	1555.8	1619.3	1473.2	1536.7	1587.5	1663.7	-	-	-	-
60	1535.2	1557.3	1586.0	1630.4	1557.3	1589.0	1630.4	1706.6	1517.7	1568.5	1619.3	1682.8	1530.4	1593.9	1644.7	1733.6	-	-	-	-

Gasket Standard Dimension Table

Ring Joint Gaskets Dimension

ASME B 16.20 (2007)



(Unit : mm)

Ring No.	Flanges (Pressure Classes)													Gsaket Dimension					
	ASME B 16.5 (JPI - 7S - 15)					API 6B					ASME B 16.47 SERIES A			P ±0.18	A ±0.20	T ±1.3–0.5		C ±0.20	R_1 ±0.60
	150	300–600	900	1500	2500	700–960	2000	3000	5000	10000	150	300–600	900			Oval B	Octagonal H		
R11		1/2												34.14	6.35	11.2	9.7	4.32	1.5
R12			1/2	1/2										39.70	7.95	14.2	12.7	5.23	1.5
R13		3/4			1/2									42.88	7.95	14.2	12.7	5.23	1.5
R14			3/4	3/4										44.45	7.95	14.2	12.7	5.23	1.5
R15	1													47.63	7.95	14.2	12.7	5.23	1.5
R16		1	1	1	3/4	1	1	1	1					50.80	7.95	14.2	12.7	5.23	1.5
R17	1-1/4													57.15	7.95	14.2	12.7	5.23	1.5
R18		1-1/4	1-1/4	1-1/4	1	1-1/4	1-1/4	1-1/4	1-1/4					60.33	7.95	14.2	12.7	5.23	1.5
R19	1-1/2													65.10	7.95	14.2	12.7	5.23	1.5
R20		1-1/2	1-1/2	1-1/2		1-1/2	1-1/2	1-1/2	1-1/2					69.28	7.95	14.2	12.7	5.23	1.5
R21					1-1/4									72.24	11.13	17.5	16.0	7.75	1.5
R22	2													82.55	7.95	14.2	12.7	5.23	1.5
R23		2			1-1/2	2	2							82.55	11.13	17.5	16.0	7.75	1.5
R24			2	2				2	2					95.25	11.13	17.5	16.0	7.75	1.5
R25	2-1/2													101.60	7.95	14.2	12.7	5.23	1.5
R26		2-1/2			2	2-1/2	2-1/2							101.60	11.13	17.5	16.0	7.75	1.5
R27			2-1/2	2-1/2				2-1/2	2-1/2					107.95	11.13	17.5	16.0	7.75	1.5
R28					2-1/2									111.13	12.70	19.1	17.5	8.66	1.5
R29	3													114.30	7.95	14.2	12.7	5.23	1.5
# R30		3												117.48	11.13	17.5	16.0	7.75	1.5
R31		3	3			3	3	3						123.83	11.13	17.5	16.0	7.75	1.5
R32					3									127.00	12.70	19.1	17.5	8.66	1.5
R33	3-1/2													131.78	7.95	14.2	12.7	5.23	1.5
R34		3-1/2												131.78	11.13	17.5	16.0	7.75	1.5
R35				3					3					136.53	11.13	17.5	16.0	7.75	1.5
R36	4													149.23	7.95	14.2	12.7	5.23	1.5
R37		4	4			4	4	4	3-1/2					149.23	11.13	17.5	16.0	7.75	1.5
R38					4									157.18	15.88	22.4	20.6	10.49	1.5
R39				4					4					161.93	11.13	17.5	16.0	7.75	1.5
R40	5													171.45	7.95	14.2	12.7	5.23	1.5
R41		5	5			5	5	5						180.98	11.13	17.5	16.0	7.75	1.5
R42					5									190.50	19.05	25.4	23.9	12.32	1.5
R43	6													193.68	7.95	14.2	12.7	5.23	1.5
R44				5					5					193.68	11.13	17.5	16.0	7.75	1.5
R45		6	6			6	6	6						211.15	11.13	17.5	16.0	7.75	1.5
R46				6					6					211.15	12.70	19.1	17.5	8.66	1.5
R47					6									228.60	19.05	25.4	23.9	12.32	1.5
R48	8													247.68	7.95	14.2	12.7	5.23	1.5
R49		8	8			8	8	8						269.88	11.13	17.5	16.0	7.75	1.5
R50				8					8					269.88	15.88	22.4	20.6	10.49	1.5
R51					8									279.40	22.23	28.7	26.9	14.81	1.5
R52	10													304.80	7.95	14.2	12.7	5.23	1.5
R53		10	10			10	10	10						323.85	11.13	17.5	16.0	7.75	1.5
R54				10					10					323.85	15.88	22.4	20.6	10.49	1.5
R55					10									342.90	28.58	36.6	35.1	19.81	2.3

Ring Joint Gaskets Dimension

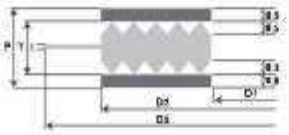
[Unit : mm]

Ring No.	Flanges (Pressure Classes)													Gasket Dimension				
	ASME B 16.5 (JPI - 7S - 15)					API 6B					ASME B 16.47 SERIES A			P ±0.13	A ±0.20	T ±1.3~0.5		C ±0.20	R1 ±0.50
	150	300~600	900	1500	2500	700~960	2000	3000	5000	10000	150	300~600	900			Oval B	Octagonal H		
R56	12													381.00	7.95	14.2	12.7	5.23	1.5
R57		12	12			12	12	12						381.00	11.13	17.5	16.0	7.75	1.5
R58				12										381.00	22.23	28.7	26.9	14.81	1.5
R59	14													396.88	7.95	14.2	12.7	5.23	1.5
R60					12									406.40	31.75	39.6	38.1	22.33	2.3
R61		14				14	14	14						419.10	11.13	17.5	16.0	7.75	1.5
R62			14											419.10	15.88	22.4	20.6	10.49	1.5
R63				14										419.10	25.40	33.3	31.8	17.30	2.3
R64	16													454.03	7.95	14.2	12.7	5.23	1.5
R65		16				16	16							469.90	11.13	17.5	16.0	7.75	1.5
R66			16					16						469.90	15.88	22.4	20.6	10.49	1.5
R67				16										469.90	28.58	36.6	35.1	19.81	2.3
R68	18													517.53	7.95	14.2	12.7	5.23	1.5
R69		18				18	18							533.40	11.13	17.5	16.0	7.75	1.5
R70			18					18						533.40	19.05	25.4	23.9	12.32	1.5
R71				18										533.40	28.58	36.6	35.1	19.81	2.3
R72	20													558.80	7.95	14.2	12.7	5.23	1.5
R73		20				20	20							584.20	12.70	19.1	17.5	8.66	1.5
R74			20					20						584.20	19.05	25.4	23.9	12.32	1.5
R75				20										584.20	31.75	39.6	38.1	22.33	2.3
R76	24													673.10	7.95	14.2	12.7	5.23	1.5
R77		24												692.15	15.88	22.4	20.6	10.49	1.5
R78			24											692.15	25.40	33.3	31.8	17.30	2.3
R79				24										692.15	34.93	44.5	41.4	24.82	2.3
R80														615.95	7.95	-	12.7	5.23	1.5
R81														635.00	14.30	-	19.1	9.58	1.5
R82										1				57.15	11.13	-	16.0	7.75	1.5
R84										1-1/2				63.50	11.13	-	16.0	7.75	1.5
R85										2				79.38	12.70	-	17.5	8.66	1.5
R86										2-1/2				96.50	15.88	-	20.6	10.49	1.5
R87										3				108.03	15.88	-	20.6	10.49	1.5
R88										4				123.83	19.05	-	23.9	12.32	1.5
R89										3-1/2				114.30	19.05	-	23.9	12.32	1.5
R90										5				155.58	22.23	-	26.9	14.81	1.5
R91										10				260.35	31.75	-	38.1	22.33	2.3
R92														229.60	11.13	17.5	16.0	7.75	1.5
R93		*26										26		749.30	19.05	-	23.9	12.32	1.5
R94		*28										28		800.10	19.05	-	23.9	12.32	1.5
R95		*30										30		857.25	19.05	-	23.9	12.32	1.5
R96		*32										32		914.40	22.23	-	26.9	14.81	1.5
R97		*34										34		965.20	22.23	-	26.9	14.81	1.5
R98		*36										36		1022.35	22.23	-	26.9	14.81	1.5
R99							8	8						234.95	11.13	-	16.0	7.75	1.5
R100			*26										26	749.30	28.58	-	35.1	19.81	2.3
R101			*28										28	800.10	31.75	-	38.1	22.33	2.3
R102			*30										30	857.25	31.75	-	38.1	22.33	2.3
R103			*32										32	914.40	31.75	-	38.1	22.33	2.3
R104			*34										34	965.20	34.93	-	41.4	24.82	2.3
R105			*36										36	1022.35	34.93	-	41.4	24.82	2.3

1) Table are based on the use of gasket with ring type flange of JPI-7S-23, ASME B16.20, API SPEC 6A.
2) R30 only be supplied on the class 400 & 600 PSI and lapped joint.
3) * Applied of JPI-7S-23 only.

Gasket Standard Dimension Table

Kammprofile Gaskets Dimension



ASME B16.5 Flange

[Unit : mm]

Size (NPS)	D_1	D_2	D_3						
			Class150	Class300	Class400	Class600	Class900	Class1500	Class2500
1/2	23.0	33.3	44.4	50.8	50.8	50.8	60.3	60.3	66.7
3/4	28.6	39.7	53.9	63.5	63.5	63.5	66.7	66.7	73.0
1	36.5	47.6	63.5	69.8	63.5	69.5	76.2	76.2	82.5
1-1/4	44.4	60.3	73.0	79.4	79.4	79.4	85.7	85.7	101.6
1-1/2	52.4	69.8	82.5	92.1	92.1	92.1	95.2	95.2	114.3
2	69.8	88.9	101.8	106.0	108.0	108.0	139.7	139.7	142.8
2-1/2	82.5	101.6	120.6	127.0	127.0	127.0	161.9	161.9	165.1
3	98.4	123.8	133.4	146.1	146.1	146.1	165.1	171.5	193.7
3-1/2	111.1	136.5	158.8	161.9	158.7	158.7	-	-	-
4	123.8	154.0	171.5	177.8	174.6	190.5	203.2	206.4	231.7
5	150.8	182.6	193.7	212.7	209.5	238.1	244.5	250.8	276.2
6	177.8	212.7	219.1	247.7	244.5	263.5	285.8	279.4	314.3
8	228.6	266.7	276.2	304.8	301.6	317.5	355.6	349.3	384.1
10	282.6	320.7	336.5	358.8	355.6	396.9	431.8	431.8	473.0
12	339.7	377.8	406.4	419.1	415.9	454.0	495.3	517.5	546.1
14	371.5	409.6	447.7	482.6	479.4	488.9	517.5	574.7	-
16	422.3	466.7	511.2	536.6	533.4	561.9	571.5	638.1	-
18	479.4	530.2	546.1	593.7	590.5	609.6	635.0	701.7	-
20	530.2	581.0	603.2	650.9	644.5	679.5	695.3	752.4	-
24	631.8	682.6	714.4	771.5	765.2	787.4	835.0	898.5	-

ASME B16.47 Series A Flange

[Unit : mm]

Size (NPS)	D_1	D_2	D_4				
			Class150	Class300	Class400	Class600	Class900
26	690	740	772	832	829	864	880
28	740	790	829	895	889	911	943
30	800	850	880	949	943	968	1007
32	845	905	937	1003	1000	1019	1070
34	895	955	987	1054	1051	1070	1134
36	950	1010	1045	1114	1114	1127	1197
38	960	1020	1108	1051	1070	1102	1197
40	1015	1075	1159	1111	1124	1153	1248
42	1065	1125	1216	1162	1175	1216	1299
44	1125	1185	1273	1216	1229	1267	1365
46	1175	1236	1324	1270	1286	1324	1432
48	1220	1290	1381	1321	1343	1388	1483
50	1270	1350	1432	1376	1400	1445	-
52	1320	1400	1489	1426	1451	1496	-
54	1375	1455	1546	1489	1515	1553	-
56	1430	1510	1603	1540	1565	1610	-
58	1485	1566	1661	1591	1616	1661	-
60	1535	1615	1711	1742	1680	1730	-

NOTE:

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