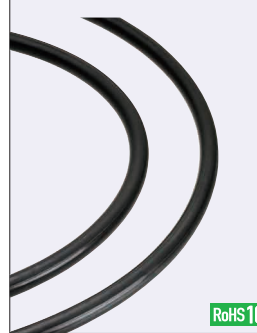


Large Diameter O-Rings

Configurable Type

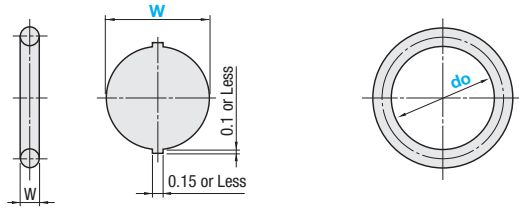
Large Diameter O-Rings



Type	Material	Hardness (JIS Hs)	Color	Operable Temperature Range	JIS Symbol
DFA	Nitrile Rubber	70±5	Black	-30~100°C	Class 1 A
DFB	Nitrile Rubber	90±5	Black	-25~100°C	Class 1 B
DFE	Fluoro Rubber	70±5	Black	-15~200°C	Class 4 D

Features

- Wire dia. and I.D. are selectable.
- Able to keep high level of air tightness because of vulcanization molding.
- No breaks from joint parts.



RoHS10

Part Number	Wire Dia. W	Wire Dia. Tolerance	I.D. do 1mm Increment
DFA	3.1	±0.13	300~400
	3.53		
	4		
	5.33		
	5.7		
DFA	6	±0.15	401~500
	7		
	8		
	8.4		
	9		
DFB	10	±0.20	501~600
	11		
	12		
	13		
	15		
DFE	16	±0.25	601~700
	18		
	20		
	24		
	28		
	31	±0.30	701~800
	35.3		
	40		
	45		
	50		
	55	±0.39	801~900
	60		
	65		
	70		
	75		
	80	±0.48	901~1000
	85		
	90		
	95		
	100		
	105	±0.50	1001~1100
	110		
	115		
	120		
	125		
	130	±0.50	1101~1200
	135		
	140		
	145		
	150		
	155	±0.50	1201~1300
	160		
	165		
	170		
	175		
	180	±0.50	1301~1400
	185		
	190		
	195		
	200		
	205	±0.50	1401~1500
	210		
	215		
	220		
	225		
	230	±0.50	1501~1600
	235		
	240		
	245		
	250		
	255	±0.50	1601~1700
	260		
	265		
	270		
	275		
	280	±0.50	1701~1800
	285		
	290		
	295		
	300		
	305	±0.50	1801~1900
	310		
	315		
	320		
	325		
	330	±0.50	1901~2000
	335		
	340		
	345		
	350		

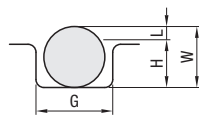
Wire and I.D. tolerances of DFE are 1.5 times larger than those in the table above.

Material Specification Table (JISB2401)

Type	DFA	DFB	DFE
JIS Symbol	Class 1 A	Class 1 B	Class 4 D
Tensile Strength (MPa)	9.8	14	9.8
Elongation (%)	250	100	200
Tensile Stress (MPa)	2.7	-	1.9
Compression Set (%)	40	40	40

Design Standards of O-Rings and Groove Dimension

- In case of internal or external pressure seal on flat surfaces, set crush rate at 8 to 30% as a guide.



Setting Crush Ratio (Operating Range 8 ~ 30%)

$$E = \frac{L}{W} \times 100$$

E (%) : Crush Rate
L (mm) : Crush Width (=W-H)
W (mm) : O-Ring Wire Dia.
H (mm) : Groove Depth

Design Standards of Internal and External Circumstances (Reference)

- I.D. Expansion Rate (%): 0 ~ 5%
Outer Tensile Rate (%): 0 ~ 3%

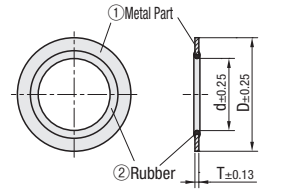
Ordering Example
Part Number - do
DFA4 - 850

Seal Washers

Bolt Head Fixed Type



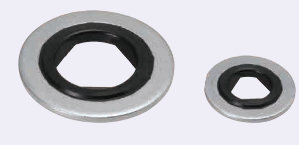
Type	Metal Part		Rubber		Operable Temperature Range
	Material	Surface Treatment	Material	Hardness	
GSW	SUS304	-	Nitrile Rubber (NBR)	Shore A65	-30~100°C
GSWF	SPCC Equivalent	Chromate	Fluoro Rubber (FKM)	Shore A70	-10~200°C
GSW	SUS304	-	Nitrile Rubber (NBR)	Shore A65	-30~100°C
GSWF	SUS304	-	Fluoro Rubber (FKM)	Shore A70	-10~200°C



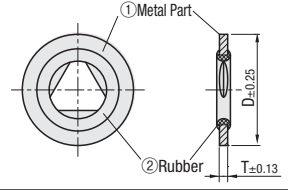
Part Number	Type	No.	T	D	d	Applicable Bolt	Max. Allowable Pressure	Reference Value				GSW		GSWF		GSW		GSWF	
								Tightening Torque N·m min.	max.	Hole I.D. min.	max.	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
GSW	(Nitrile Rubber)	3	1	7.8	2.85	M3	5MPa	0.7	1.2	3.3	5.4	1~49 pc (s)	50~100	1~49 pc (s)	50~100	1~49 pc (s)	50~100	1~49 pc (s)	50~100
		4		10.2	3.85	M4	5MPa	1	2.2	4.4	7								
		5		12.5	4.85	M5	5MPa	2.2	3.8	5.3	8								
GSWF	(Fluoro Rubber)	6		14	5.85	M6	10MPa	3	8.5	6.5	10								
		8		17.5	7.8	M8	10MPa	4.5	20	8.7	13								
GSW	(Stainless Steel)	10	1.3	20	9.8	M10	10MPa	6	25	10.8	15								
	(Nitrile Rubber)	12		24	11.8	M12	10MPa	8	56	13.7	17.5								
		16		30.3	15.8	M16	10MPa	10	125	17.5	22								
GSWF	(Stainless Steel)	20		32.7	19.8	M20	10MPa	40	135	21.5	26								
	(Fluoro Rubber)	24		37.6	23.8	M24	10MPa	60	190	25	30								

Please use air under 0.98MPa.

Thread Fixed Type



Type	Metal Part		Rubber		Operable Temperature Range
	Material	Surface Treatment	Material	Hardness	
GSM	SUS304	-	Nitrile Rubber (NBR)	Shore A65	-30~100°C
GSMF	SPCC Equivalent	Chromate	Fluoro Rubber (FKM)	Shore A70	-10~200°C
GSM	SUS304	-	Nitrile Rubber (NBR)	Shore A65	-30~100°C
GSMF	SUS304	-	Fluoro Rubber (FKM)	Shore A70	-10~200°C

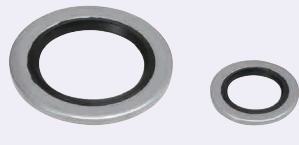


Be sure to see Caution for Fastening shown below.

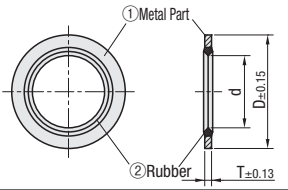
Part Number	Type	No.	T	D	Applicable Bolt	Max. Allowable Pressure	Reference Value				GSM		GSMF		GSM		GSMF		
							Tightening Torque N·m min.	max.	Hole I.D. min.	max.	Chamfering max.	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
GSM	(Nitrile Rubber)	3	1	7.8	M3	5MPa	0.7	1.2	3.3	5.4	0.2	1~49 pc (s)	50~100	1~49 pc (s)	50~100	1~49 pc (s)	50~100	1~49 pc (s)	50~100
		4		10.2	M4	5MPa	1	2.2	4.4	7	0.2								
		5		12.5	M5	5MPa	2.2	3.8	5.3	8	0.2								
GSMF	(Fluoro Rubber)	6		14	M6	10MPa	3	8.5	6.5	10	0.2								
		8		17.5	M8	10MPa	4.5	20	8.7	13	0.4								
GSM	(Stainless Steel)	10	1.5	20.3	M10	10MPa	6	25	10.8	15	0.4								
	(Fluoro Rubber)	12		24.3	M12	10MPa	8	56	13.7	17.5	0.4								
		16		30.3	M16	10MPa	10	125	17.5	23	0.8								
GSMF	(Stainless Steel)	20		36.5	M20	10MPa	40	135	21.5	28	0.8								
	(Fluoro Rubber)	24		42.8	M24	10MPa	60	190	25	34	0.8								

Please use air under 0.98MPa.

Counterbore Hole Fixed Type



Type	Metal Part		Rubber		Operable Temperature Range
	Material	Surface Treatment	Material	Hardness	
GSC	SUS301	-	Nitrile Rubber (NBR)	Shore A80	-30~100°C
GSCF	SUS301	-	Fluoro Rubber (FKM)	Shore A75	-10~200°C



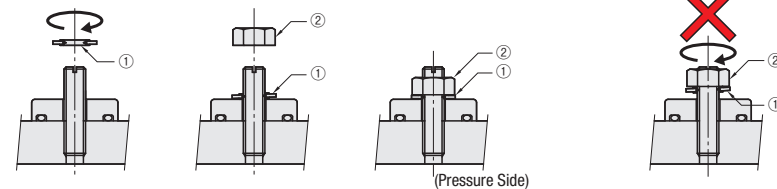
Part Number	Type	No.	T	D	d	Applicable Bolt	Max. Allowable Pressure	Reference Value				GSC		GSCF	
								Tightening Torque N·m min.	max.	Hole I.D. min.	max.	Counterbore Dia. min.	Unit Price	Volume Discount Rate	Unit Price
GSC	(Nitrile Rubber)	3		6	2.9	M3	10MPa	0.7	1.4	3.3	6.6	1~49 pc (s)	50~100	1~49 pc (s)	50~100
		4		7.5	3.9	M4	10MPa	1.1	3.1	4.2	8.2				
		5		9	4.9	M5	10MPa	2.2	6.5	5.2	10				
GSCF	(Fluoro Rubber)	6		10.5	5.9	M6	10MPa	3	15	6.2	11.5				
		8		13.5	7.9	M8	10MPa	4.5	37	8.2	14.5				
		10		17	9.9	M10	10MPa	6	73	10.4	18				
		12	1.5	19	11.9	M12	10MPa	8	115	12.5	21				
		16		25	15.9	M16	10MPa	10	290	16.5	27				

Please use air under 0.98MPa.

Cautions for Thread Fixed Type

- Install the washer by rotating onto the thread.
- Install the washer completely to the base, then install the nut.
- Tighten the nut until it firmly contacts the washer.

- Do not force the washer down by pushing with the nut.



For rubber properties, see P.391

Ordering Example
Part Number
GSW4
GSWFM6