

O-Rings

Back-Up Rings / P Series

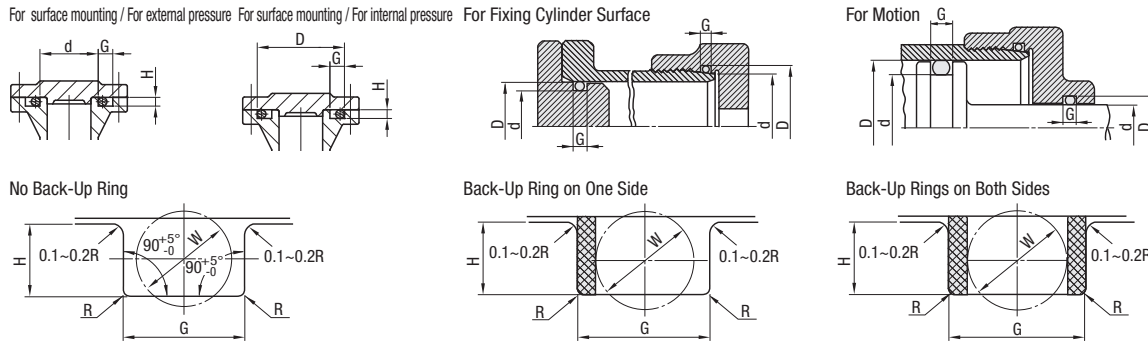
Type	Material	Hardness (JIS H)	Color	Operable Temperature Range	JIS Symbol	Applications	Features
NPA	Nitrile Rubber	70±5	Black	-30~100°C	Class 1A	Mineral Oil Resistant	Most representative material with superior oil / abrasion resistance and heat stability.
NPB	Nitrile Rubber	90±5	Black	-25~100°C	Class 1B	-	-
NPSW	Silicon Rubber	50±5	Milky White	-50~200°C	-	Heat Resistant	Having excellent high and low temperature resistances, this material covers the widest range of operating temperatures among synthetic rubbers. It is suitable for food-related applications.
NPS	Silicon Rubber	70±5	Dark Blue	-50~200°C	Class 4C	Heat Resistant	-
NPF	Fluoro Rubber	70±5	Black	-15~200°C	Class 4D	Heat Resistant	Best in oil / chemical resistance and heat stability as synthetic rubber. Suitable for a wide range of applications.
NPFH	Fluoro Rubber	90±5	Black	-15~200°C	-	Heat Resistant	-
NPEG	Ethylene Propylene Rubber	70±5	Black	-45~130°C	-	For weather resistant items	Excellent material in weather resistance, ozone resistance and electrical characteristics.
NPBR	Fluororesin	-	White	-	-	For high voltage use	Used when the pressure resistance of O-ring is insufficient.

⚡ NPS is colored with dark blue very close to black.

Detailed Fitting Size

Type	No.	G Dimension (Tolerance $+0.25$ 0)			H Dimension H±0.05	R Dimension Max. Value
		No Back-Up Ring	Back-Up Ring on One Side	Back-Up Rings on Both Sides		
NPA	3~10	2.5	3.9	5.4	1.4	0.4
NPB	10A~22	3.2	4.4	6.0	1.8	0.4
NPSW	22A~50	4.7	6.0	7.8	2.7	0.8
NPS	50A~80	7.5	9.0	11.5	4.6	0.9

- When an internal pressure is applied to an o-ring for surface mounting, design the structure to bring the outer circumference of the o-ring to a close contact with the outer wall of the groove. When an external pressure is applied to an o-ring for surface mounting, design the structure to bring the inner circumference of the o-ring to a close contact with the inner wall of the groove.
- When using an o-ring for surface mounting for an internal pressure, if the length of D is 30 mm or less, make the length 0.2 to 0.3 mm longer.
- The groove dimensions are for reference.



JIS B 2407 Back-Up Rings (For the P Series, Bias Cut)

Part Number	Nominal No. of Applicable O-Rings	W	d	D	T	Unit Price	Volume Discount Rate	
Type	No.					1 ~ 19 pc(s).	20~50	
NPBR (Fluororesin, White)	15	2.0	+0.15 0	15	19	1.25	±0.1	
	16			20				
	18			22				
	20			24				
	21			25				
	22			26				
	22A			28				
	24			30				
	25			31				
	26			32				
	28	34	3.0	+0.20 0	36			40
	30	38						
	32	40						
	34	42						
	38	44						
	40	46						
	42	48						
	48	54						
	50	56						

JIS B 2401 P Series (For Mounting, Dynamic)

Part Number	JIS Nominal Number	W	I.D.			Matching Material		NPF	NPB	NPSW	NPS	NPFH	NPEG
			do	NPA, NPB Tolerance	NPS, NPSW, NPEG Tolerance	NPF, NPFH Tolerance	d						
3	P3	1.9±0.08	2.8	±0.14	±0.21	±0.16	3	6					
4	P4		3.8				4	7					
5	P5		4.8	±0.15	±0.22	±0.18	5	8					
6	P6		5.8				6	9					
7	P7		6.8				7	10					
8	P8		7.8	±0.16	±0.24	±0.19	8	11					
9	P9		8.8				9	12					
10	P10		9.8	±0.17	±0.25	±0.20	10	13					
10A	P10A		9.8				10	14					
11	P11		10.8	±0.18	±0.27	±0.21	11	15					
11.2	P11.2	11.0				11.2	15.2						
12	P12	11.8				12	16						
12.5	P12.5	12.3	±0.19	±0.28	±0.22	12.5	16.5						
14	P14	13.8				14	18						
15	P15	14.8				15	19						
16	P16	15.8	±0.20	±0.30	±0.24	16	20						
18	P18	17.8	±0.21	±0.31	±0.25	18	22						
20	P20	19.8	±0.22	±0.33	±0.26	20	24						
21	P21	20.8	±0.23	±0.34	±0.27	21	25						
22	P22	21.8				22	26						
22A	P22A	21.7				22	28						
22.4	P22.4	22.1	±0.24	±0.36	±0.28	22.4	28.4						
24	P24	23.7				24	30						
25	P25	24.7				25	31						
25.5	P25.5	25.2	±0.25	±0.37	±0.30	25.5	31.5						
26	P26	25.7	±0.26	±0.39	±0.31	26	32						
28	P28	27.7	±0.28	±0.42	±0.33	28	34						
29	P29	28.7				29	35						
29.5	P29.5	29.2	±0.29	±0.43	±0.34	29.5	35.5						
30	P30	29.7				30	36						
31	P31	30.7	±0.30	±0.45	±0.36	31	37						
31.5	P31.5	31.2	±0.31	±0.46	±0.37	31.5	37.5						
32	P32	31.7				32	38						
34	P34	33.7	±0.33	±0.49	±0.39	34	40						
35	P35	34.7				35	41						
35.5	P35.5	35.2	±0.34	±0.51	±0.40	35.5	41.5						
36	P36	35.7				36	42						
38	P38	37.7				38	44						
39	P39	38.7	±0.37	±0.55	±0.44	39	45						
40	P40	39.7				40	46						
41	P41	40.7	±0.38	±0.57	±0.45	41	47						
42	P42	41.7	±0.39	±0.58	±0.48	42	48						
44	P44	43.7				44	50						
45	P45	44.7	±0.41	±0.61	±0.49	45	51						
46	P46	45.7	±0.42	±0.63	±0.50	46	52						
48	P48	47.7	±0.44	±0.66	±0.52	48	54						
50	P50	49.7	±0.45	±0.67	±0.54	50	56						
50A	P50A						60						
52	P52	51.6	±0.47	±0.70	±0.56	52	62						
53	P53	52.6	±0.48	±0.72	±0.57	53	63						
55	P55	54.6	±0.49	±0.73	±0.58	55	65						
56	P56	55.6	±0.50	±0.75	±0.60	56	66						
58	P58	57.6	±0.52	±0.78	±0.62	58	68						
60	P60	59.6	±0.53	±0.79	±0.63	60	70						
62	P62	61.6	±0.55	±0.82	±0.66	62	72						
63	P63	62.6	±0.56	±0.84	±0.67	63	73						
65	P65	64.6	±0.57	±0.85	±0.68	65	75						
67	P67	66.6	±0.59	±0.88	±0.70	67	77						
70	P70	69.6	±0.61	±0.91	±0.73	70	80						
71	P71	70.6	±0.62	±0.93	±0.74	71	81						
75	P75	74.6	±0.65	±0.97	±0.78	75	85						
80	P80	79.6	±0.69	±1.03	±0.82	80	90						

O-Rings

V Series / AS Series

Type	Material	Hardness (JIS H)	Color	Operable Temperature Range	JIS Symbol	Applications
NVA	Nitrile Rubber	70±5	Black	-30~100°C	Class 1 A	Mineral Oil Resistant
NVF	Fluoro Rubber	70±5	Black	-15~200°C	Class 4 D	Heat Resistant
NASA	Nitrile Rubber	70±5	Black	-30~100°C	-	Mineral Oil Resistant
NASF	Fluoro Rubber	70±5	Black	-15~200°C	-	Heat Resistant

JIS B 2401 V Series (For Vacuum Flanges)

Part Number		JIS Nominal Number	W	I.D.		NVA		NVF		
Type	No.			do	NVA Tolerance	NVF Tolerance	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
NVA (Nitrile Rubber, Black)	15	V15	4.0±0.1	14.5	±0.20	±0.24	1~49	50~100	1~49 pc (s)	50~100
	24	V24		23.5	±0.24	±0.29				
	34	V34		33.5	±0.33	±0.40				
	40	V40		39.5	±0.37	±0.45				
	55	V55		54.5	±0.49	±0.59				
NVF (Fluoro Rubber, Black)	70	V70		69.0	±0.61	±0.74				
	85	V85		84.0	±0.72	±0.87				
	100	V100		99.0	±0.83	±1.00				
	120	V120		119.0	±0.97	±1.17				
	150	V150		148.5	±1.18	±1.42				
	175	V175		173.0	±1.36	±1.63				

AS568 AS Series

Part Number		W	I.D.		NASA		NASF		
Type	No.		do	Tolerance	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	
NASA (Nitrile Rubber, Black)	001	1.02±0.07	0.74	±0.10	1~49 pc (s)	50~100	1~49 pc (s)	50~100	
	002	1.27±0.07	1.07						
	003	1.52±0.07	1.42						
	004		1.78						
	005		2.57						
	006		2.90						
	007		3.68						
	008		4.47						
	009		5.28						
	010		6.07						
	NASF (Fluoro Rubber, Black)	011		7.65					±0.12
		012		9.25					
		013		10.82					
		014		12.42					
		015		14.00					
		016		15.60					
		017		17.17					
		018		18.77					
		019		20.35					
		020		21.95					
		021		23.52					
		022		25.12					
		023		26.70					
		024		28.30					
	NASA	025		29.87					±0.15
		026		31.47					
		027		33.05					
		028		34.65					
		029		37.82					
		030		41.00					

Ordering Example Part Number NASA001

High Chemical Resistant / High Heat Resistant Seals

Type	Grade	Color	Max. Operating Temp.	Material
MPPEM	Chemical Resistant Grade	Black	260°C	Perfluoro Rubber
MPPEJ	Special Heat Resistant Grade	Black	320°C	

- Features**
- Excellent resistances required in extreme conditions such as strong acid, strong alkali, amines, steam and high temperature polar solvent (260 ~ 320°C).
 - Has the properties of Low gas precipitation, Low Out-gas, etc. and can be used under high vacuum.
 - Heavy metal and molding agents are not used in the process of production.

P Series (For Mounting, Dynamic)

Part Number	Type	No.	Nominal Number	W	I.D.	Matching Material				MPPEM		MPPEJ				
						MPPEM, MPPEJ Tolerance	d	Tolerance	D	Tolerance	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate		
MPPEM (Chemical Resistant Grade)	MPPEJ (Special Heat Resistant Grade)	3	3	1.9±0.08	2.8	±0.16	3	6	0	+0.05	1~19 pc (s)	20~50	1~19 pc (s)	20~50		
		4	4		3.8	7										
		5	5		4.8	8										
		6	6		5.8	9										
		7	7		6.8	10										
		8	8		7.8	11										
		9	9		8.8	12										
		10	10		9.8	13										
		11	11		10.8	15										
		12	12		11.8	16										
		MPPEM	MPPEJ	14	14	2.4±0.09	13.8	±0.22	14	18					0	+0.06
				15	15		14.8	19								
				16	16		15.8	20								
				18	18		17.8	22								
				20	20		19.8	24								
				21	21		20.8	25								
				22	22		21.8	26								
				24	24		23.7	30								
				25	25		24.7	31								
				26	26		25.7	32								
		MPPEM	MPPEJ	28	28	3.5±0.1	27.7	±0.33	28	34					0	+0.08
				29	29		28.7	35								
				30	30		29.7	36								

Specifications

Type	MPPEM		MPPEJ
	Chemical Resistant Grade	Special Heat Resistant Grade	Special Heat Resistant Grade
Color	Black	Black	Black
Hardness (Shore)	75	74	74
Tensile Strength (kgf/cm ²)	216	161	161
Elongation (%)	183	205	205
Operable Temperature Range (°C)	260	320	320
Compression Set	200°Cx70h(%)	21	19
	230°Cx70h(%)	31	26

Ordering Example Part Number MPPEM5

Chemical Resistance Data (MPPEM Chemical Resistant Grade) [Evaluation] A: ΔV = ~ 5%, B: 5 ~ 20%, C: 21 ~ 35%

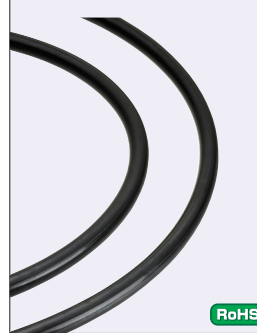
Chemical	Soaking Temperature (°C)	Soaking Time (Day)	Volume Change (ΔV%)
Sodium Hydroxide (50%)	150	7	A
Ammonia Water (35%)	45	20	A
Ammonia	100	7	A
N-Butylamine	23	7	A
Formic Acid (12%)	100	7	B
Chlorosulfonic Acid	23	7	A
Hydrochloric Acid (37%)	24	28	B
Nitric Acid (65%)	40	30	B
Sulfuric Acid (94%)	70	14	A
Phosphoric Acid (45%)	60	7	A
Hydrogen Sulfide	70	7	A
Hydrogen Fluoride (50%)	80	7	B
MBK (Methyl Isobutyl Ketone)	118	7	A
Dimethylformamide	153	7	B
1,2-Dichlorobenzene	180	7	B
Chlorobenzol	100	7	A
R123 (CFC)	24	28	C
Steam	121	7	A
Phenol	220	7	A
Ethylene Oxide	23	7	A

*Data above are not guaranteed values but experimental value. For actual use, confirm the applicability under specific conditions.

Large Diameter O-Rings

Configurable Type

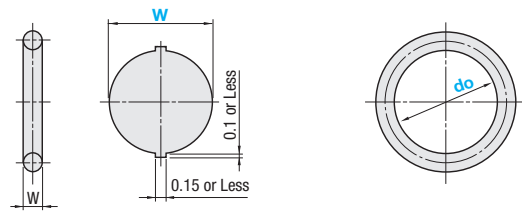
Large Diameter O-Rings



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.



Part Number	Wire Dia. W	Wire Dia. Tolerance	I.D. do 1mm Increment	I.D. tolerance
DFA (Nitrile Rubber 70, Black)	3.1	±0.13	300-2000	300-400
	3.53			401-500
	4			501-600
	5.33			601-700
	5.7			701-800
DFB (Nitrile Rubber 90, Black)	6	±0.15	300-2000	801-900
	7			901-1000
	8			1001-1100
DFE (Fluoro Rubber 70, Black)	8.4	±0.20	300-2000	1101-1200
	9			1201-1300
	10			1301-1400
DFF (Fluoro Rubber 70, Black)	11	±0.30	300-2000	1401-1500
	12			1501-1600
	13			1601-1700
	15			1701-1800
	16			1801-1900
	18			1901-2000
	20			1901-2000

I.D. do	I.D. tolerance
300-400	±2.82
401-500	±3.30
501-600	±4.00
601-700	±4.70
701-800	±5.30
801-900	±6.00
901-1000	±6.70
1001-1100	±7.50
1101-1200	±8.80
1201-1300	±9.40
1301-1400	±10.0
1401-1500	±10.4
1501-1600	±10.8
1601-1700	±11.2
1701-1800	±11.7
1801-1900	±12.2
1901-2000	±12.7

The unit price of this product is the price shown in the table multiplied by each material factor.
 (Ex.) Part Number - do For (Price in the Table) x (Material Factor) = (Price of Standard Type)
 DFB10 - 550

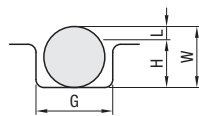
Type	I.D. do	Unit Price Wire Dia. W						
		3.1-4	5.33-7	8, 8.4	9	10-12	13, 15	16-20
DFA (x1.0) (Nitrile Rubber 70, Black)	300-400							
	401-500							
	501-600							
	601-700							
	701-800							
	801-900							
	901-1000							
	1001-1100							
	1101-1200							
	1201-1300							
DFB (x1.3) (Nitrile Rubber 90, Black)	300-400							
	401-500							
	501-600							
	601-700							
	701-800							
	801-900							
	901-1000							
	1001-1100							
	1101-1200							
	1201-1300							
DFF (Fluoro Rubber 70, Black)	300-400							
	401-500							
	501-600							
	601-700							
	701-800							
	801-900							
	901-1000							
	1001-1100							
	1101-1200							
	1201-1300							

Material Specification Table (JISB2401)

Type	DFA	DFB	DFF
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
 d (mm) : Crush Width (=W-H)
 W (mm) : O-Ring Wire Dia.
 H (mm) : Groove Depth

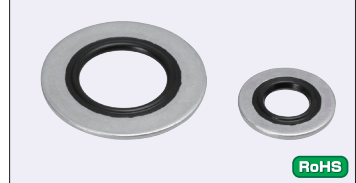
- Design Standards of Internal and External Circumstances (Reference)

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

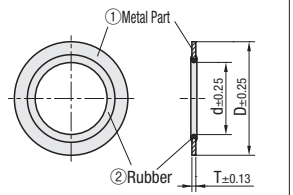
Ordering Example
 Part Number - do
 DFA4 - 850

Seal Washers

Bolt Head Fixed Type



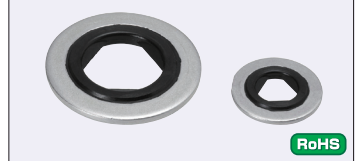
Type	Metal Part		Rubber		Operable Temperature Range
	Material	Surface Treatment	Material	Hardness	
GSW	SPCC Equivalent	Chromate	Nitrile Rubber (NBR)	Shore A65	-30~100°C
GSWF	-	-	Fluoro Rubber (FKM)	Shore A70	-10~200°C
SGSW	SUS304	-	Nitrile Rubber (NBR)	Shore A65	-30~100°C
SGSWF	-	-	Fluoro Rubber (FKM)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



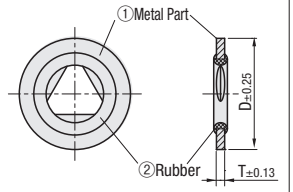
Part Number	Type	No.	T	D	d	Applicable Bolt	Max. Allowable Pressure	Reference Value				GSW		GSWF		SGSW		SGSWF																						
								Tightening Torque N·m min.	max.	Hole I.D. max.	Tightening Face O.D. min.	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate																					
GSW (Nitrile Rubber)	GSW	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												
																				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												
SGSW (Stainless Steel Nitrile Rubber)	SGSW	10	1.3	20	9.8	M10	10MPa	6	25	10.8	15																													
																					12	24	11.8	M12	10MPa	8	56	13.7	17.5											
																					16	30.3	15.8	M16	10MPa	10	125	17.5	22											
																					20	32.7	19.8	M20	10MPa	40	135	21.5	26											
SGSWF (Stainless Steel Fluoro Rubber)	SGSWF	24		37.6	23.8	M24	10MPa	60	190	25	30																													

Please use air under 0.98MPa.

Thread Fixed Type



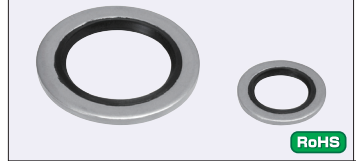
Type	Metal Part		Rubber		Operable Temperature Range
	Material	Surface Treatment	Material	Hardness	
GSWM	SPCC Equivalent	Chromate	Nitrile Rubber (NBR)	Shore A65	-30~100°C
GSWMF	-	-	Fluoro Rubber (FKM)	Shore A70	-10~200°C
SGSWMF	SUS304	-	Fluoro Rubber (FKM)	Shore A70	-10~200°C



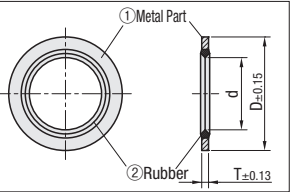
Part Number	Type	No.	T	D	Applicable Bolt	Max. Allowable Pressure	Reference Value				GWSM		GWSMF		SGWSMF																													
							Tightening Torque N·m min.	max.	Hole I.D. max.	Chamfering Face O.D. min.	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate																												
GWSM (Nitrile Rubber)	GWSM	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																											
																		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																		
																		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																		
GWSMF (Stainless Steel Nitrile Rubber)	GWSMF	10	1.5	20.3	M10	10MPa	6	25	10.8	15	0.4																																	
																							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													
																							20	36.5	M20	10MPa	40	135	21.5	28	0.8													
SGWSMF (Stainless Steel Fluoro Rubber)	SGWSMF	24	3	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	
GSWC	SUS301	-	Nitrile Rubber (NBR)	Shore A80	-30~100°C
GSWCF	-	-	Fluoro Rubber (FKM)	Shore A75	-10~200°C



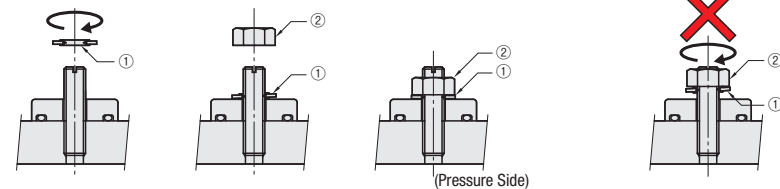
Part Number	Type	No.	T	D	d	Applicable Bolt	Max. Allowable Pressure	Reference Value			GSWC		GSWCF																																	
								Tightening Torque N·m min.	max.	Hole I.D. Counterbore Dia. min.	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate																																
GSWC (Nitrile Rubber)	GSWC	3	0.7	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																						
																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																						
GSWCF (Fluoro Rubber)	GSWCF	10	1	17	9.9	M10	10MPa	6	73	10.4	18																																			
																								12	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
 SGWSMF6

Seal Plugs / Lubrication-Free Seals

Oil Seals

Seal Plugs **FSPS**




Operating Temperature Range: -40 ~ 200°C
 Material: Body: SUS304
 O-Ring: Fluoro Rubber (Hardness Shore A75) (JIS B2401 Class 4 D)

Part Number Type	No.	M (Fine)	L	D1	B	t	O-Ring No.	Recommended Tightening Torque (N·m)	Mass (g)	Unit Price	
										1 ~ 9 pc (s).	10~50
FSPS	8	M 8x1.0	7	16	5	3.5	P10	10.9	4		
	10	M10x1.0	8	19.5	5	4	P12.5	13.7	7		
	12	M12x1.5	12	21	6	5	P14	19.2	14		
	14	M14x1.5	12	23	6	5	P16	27.4	19		
	16	M16x1.5	12	25	8	6	P18	44.5	25		

Ordering Example **Part Number**
FSPS10

Lubrication-Free Seals **MFHN**

Type	Material		Applications
	① Resin Part	② Metal Part	
MFHN	Polytetrafluoroethylene (PTFE)	SUS304	Rotary Motion



Conditions of Use

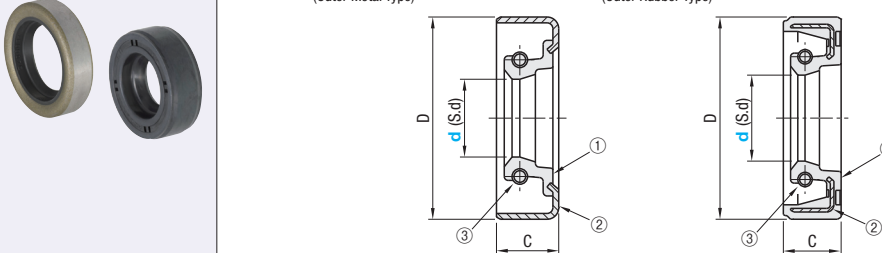
Operating Temperature Range	-60~200°C
Operating Pressure	0.03MPa or Less
Wind Velocity	30m/sec. or Less
Shaft Tolerance	h7 (or g6)
Shaft Coarseness	Ra:0.2~0.45µm Rz:0.8~1.8µm
Sealed Substance	High Temperature Vapor, Water, Chemicals, Oil

Part Number Type	d	D	C	Unit Price	
MFHN	10	25	+0.09 +0.04	7.0	±0.3
	12	30			
	15	40			
	20	45	+0.11 +0.05	11.0	±0.4
	25	50			
	30	55			
	35	62	+0.14 +0.06		
	40	72			
	50				

Ordering Example **Part Number**
MFHN25

Oil Seals - Single Lip

Type	Material			Applications
	① Oil Seal: Rubber Hardness	② Metal Ring	③ Spring	
MUSB	Nitrile Rubber (NBR): Hs70	SPCC	SW-B	Rotary Motion
MUSC	Nitrile Rubber (NBR): Hs70	SPCC	SW-B	Rotary Motion



Conditions of Use

Operating Temperature Range	-25~120°C
Operating Pressure	0.03MPa or Less
Wind Velocity	10m/sec. or Less
Shaft Tolerance	h8 (or g6)
Shaft Coarseness	3S or Less
Sealed Substance	Oil, Grease

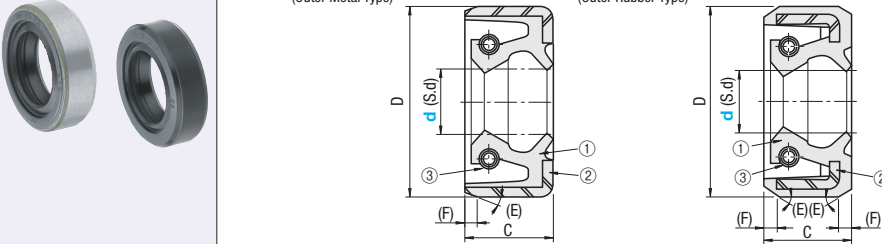
Part Number Type	d	D	C	Unit Price
MUSB	20	32		8
	25	38	+0.11 +0.05	7
	30	40		7
	35	50		8

Part Number Type	d	D	C	Unit Price
MUSC	10	20		7
	12	22	+0.09 +0.04	7
	15	35		7
	20	35		8
	25	40	+0.11 +0.05	8
	30	42		8

Ordering Example **Part Number**
MUSC30

Oil Seals - Double Lip

Type	Material			Applications
	① Oil Seal: Rubber Hardness	② Metal Ring	③ Spring	
MUDN	Nitrile Rubber (NBR): Hs70	SPCC	SW-B	Rotary Motion
MUEN	Nitrile Rubber (NBR): Hs70	SPCC	SW-B	Rotary Motion



Conditions of Use

Operating Temperature Range	-25~120°C
Operating Pressure	0.03MPa or Less
Wind Velocity	10m/sec. or Less
Shaft Tolerance	h8 (or g6)
Shaft Coarseness	3S or Less
Sealed Substance	Oil, Grease

Part Number Type	d	D	C	(E)	(F)	Unit Price
MUDN	10	20	7	30°	1	
	12	25	+0.09 +0.04	20°	1.5	
	15	25		30°	1	
	20	32	8	±0.3	30°	1
	25	38	+0.11		20°	1
	30	42	+0.05		30°	1
	35	50	8		30°	1
	40	62	+0.14	12 ±0.4	30°	1
	45	62	+0.06	9 ±0.3	30°	1
	50	65		9	20°	1

Part Number Type	d	D	C	(E)	(F)	Unit Price
MUEN	10	20	7	30°		
	12	25	+0.30 +0.10	20°		
	15	25		30°		
	17	30	7	±0.3	30°	
	20	32	8		30°	
	25	38	8		20°	1.0
	30	42	8		30°	
	35	50	+0.35 +0.10		30°	
	40	62	8		30°	
	50	65	9		20°	

Ordering Example **Part Number**
MUEN10