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Hydraulic Packing



VALQUA, LTD.

<http://www.valqua.co.jp>

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List of registered trademarks

In this catalogue, the display of trademarks is omitted, but the following are our trademarks.

- SLIPPER SEAL
- SUPER RUBBER
- TOUGHRETHANE
- TOUGHRILE
- VALFLON

Piston seal selection guidelines

Packing name	Cross-sectional shape	Series	Operating pressure MPa ⁽¹⁾ {kgf/cm ² }	Operating speed ⁽¹⁾ m/s	Operating temperature range ⁽¹⁾ (Reference)	Standard materials		Valqua No.
						Type	Material ID	
U packing		UHP	Refer to Table-1	0.04~1	-20~ 80	TOUGHRETHANE	R5590	E9625
		UNP				Nitrile rubber	B0390	TE9625
		MLP				SUPER RUBBER	B5290	2060
SLIPPER SEAL		APS	20.6 {210}	0.01~1	-30~ 80	Back ring	R5590	2060
		APL	34.3 {350}			-10~150	Nitrile rubber	B0390
	APT	Sliding ring			3M0	7160		
		VALFLON			3U8	7160		
		CPL			34.3 {350}	-20~ 90	Back-up ring	-
			Nitrile rubber				B0390	7740
Sliding ring	VALFLON	8H0						
Back-up ring	Polyamide	-						
V packing ⁽²⁾		VNV	58.8 {600}	0.1 ~1.5	-30~ 80	Cloth-inserted nitrile rubber	2630-2-25	2630
		VNF	17.2 {175}	0.05~0.5	-10~150	Cloth-inserted fluoro rubber	4630-4-25	4630
		VGH			17.2 {175}	0.05~0.5	-30~ 80	Nitrile rubber
					-10~150	Fluoro rubber	D0390	4631

Rod seal selection guidelines

Packing name	Cross-sectional shape	Series	Operating pressure MPa ⁽¹⁾ {kgf/cm ² }	Operating speed ⁽¹⁾ m/s	Operating temperature range ⁽¹⁾ (Reference)	Standard materials		Valqua No.
						Type	Material ID	
U packing		UHR	Refer to Table-1	0.04~1	-20~ 80	TOUGHRETHANE	R5590	E9625
		UNR				Nitrile rubber	B0390	TE9625
		MLR				SUPER RUBBER	B5290	2060
		UHS				Fluoro rubber	D0390	2060
		UNS				Fluoro rubber	D0390	4060
Ring buffer		URHP	34.3 {350}	0.1 ~1.5	-20~ 90	TOUGHRETHANE	R6390	E9625
		URBF				Packing TOUGHRETHANE	R6395	
V packing ⁽²⁾		VNV	58.8 {600}	0.1 ~1.5	-30~ 80	Cloth-inserted Nitrile rubber	2630-2-25	2630
		VNF	17.2 {175}	0.05~0.5	-10~150	Cloth-inserted Fluoro rubber	4630-4-25	4630
		VGH			17.2 {175}	0.05~0.5	-30~ 80	Nitrile rubber
							Fluoro rubber	D0390
Packing MV		MV	34.3 {350}	0.1 ~1.5	-30~ 80	Nitrile rubber	B0390	2632
					-25~120	SUPER RUBBER	B5090	4632
					-10~150	Fluoro rubber	D0390	4632

Table-1 U-packing material and operating pressure conditions MPa {kgf/cm²}

	TOUGHRETHANE	Nitrile rubber	Fluoro rubber	SUPER RUBBER
General purpose type	20.6 {210}	13.7 {140}	13.7 {140}	17.2 {175}
UH series	44.1 {450}			34.3 {350}
UR series				
High pressure type	34.3 {350}	34.3 {350}	34.3 {350}	20.6 {210}
UN series	68.6 {700}			44.1 {450}
ML series				

Note: The pressure indicated at the bottom of the table is the pressure when the back-up ring is used. The numbers are for reference only, so please consult with us regarding specific details.

Table-2 TOUGHRETHANE Valqua Nos. No. E9625 and No. TE9625

Valqua No. (material ID)	Selection guidelines
E9625 (R5590)	Standard type
TE9625 (R5990)	When heat resistance and hydrolysis resistance are required

Note: MLP and the MLR series are found below.
No. E9625 → R5595 No. TE9625 → R5995
The URHP and the URBF series are found below.
URHP → R6390 URBF → R6395

Dust seal selection guidelines

Packing name	Cross-sectional shape	Series	Operating pressure MPa ⁽¹⁾ {kgf/cm ² }	Operating speed ⁽¹⁾ m/s	Operating temperature range ⁽¹⁾ (Reference)	Standard materials		Valqua No.
						Type	Material ID	
Dust seal		DHS	-	0.04~1	-20~ 80	TOUGHRETHANE	R5590	E9625
		Nitrile rubber				B0390	2060	
		Fluoro rubber				D0390	4060	
		TOUGHRETHANE				R0490	TP9625	
					-20~ 90	TOUGHRETHANE	R5590-S	E9625
						Cold rolled steel sheet		

Back-up ring and wear ring selection guidelines

Packing name	Cross-sectional shape	Series	Operating pressure MPa ⁽¹⁾ {kgf/cm ² }	Operating speed ⁽¹⁾ m/s	Operating temperature range ⁽¹⁾ (Reference)	Standard materials		Valqua No.
						Type	Material ID	
Ring-back		-	44.1 {450}	0.04~1	-30~150	VALFLON	2N0	7645
		For URHP				Polyamide	-	ENPLA
Wear ring		WPL	44.1 {450}	0.04~1	-30~150	Cloth-inserted phenol plastic	-	432
		WPG				With glass polyamide		
Ring slide		SRPG				With glass polyamide		ENPLA

Note 1: The values in the table are reference limit values for pressure, speed and temperature under general conditions. Please consult with us regarding specifics.
Note 2: V packing can be used in combination with both cloth-inserted rubber and synthetic rubber

Hydraulic and pneumatic packing material types and characteristics

Types	Material name	Valqua material ID Material ID No.	Properties				Wear resistance ◎Superior ○Good	Suitable temperature °C	
			Hardness HS (JIS A)	Tensile strength MPa {kgf/cm ² }	Stretch %	Compressi on set% (°C × h)			
Rubber	Nitrile rubber (NBR)	B0570	70	17.5 {180}	300	18 (120 × 70)	○	-30 to 120	
		B1270		15.5 {160}	330	16 (100 × 70)	○	-25 to 120	
		B2670		20.5 {210}	270	11 (100 × 70)	◎		
		B0180	83	21 {215}	240	14 (100 × 70)	○	-20 to 120	
		B0380	78	16.5 {170}	220	12 (100 × 70)	○	-25 to 120	
		B0780	82	20.5 {210}	200	16 (100 × 70)	○		
		B0880	80	21 {215}	180	12 (100 × 70)	◎		
		B0385	89	23 {235}	170	14 (100 × 70)	◎		
		B0390	88	19 {195}	160	16 (120 × 70)	○	-30 to 120	
		B0490	89	16 {165}		21 (120 × 70)	○	-40 to 100	
	SUPER RUBBER (HNBR)	B5290	91	26.2 {267}	150	13 (120 × 70)	◎	-25 to 150	
	TOUGHRETHANE (U)	R0490	93	43 {440}	360	20 (70 × 22)	◎	-20 to 120	
		R5590	90	44 {450}	500	35 (70 × 22)	◎	-30 to 100	
		R5990		39 {400}	450		◎	-20 to 100	
		R5595	95	44 {450}			410	◎	-30 to 100
		R5995	39 {400}	40 (70 × 22)	◎	-20 to 100			
		R5590-S	91	37.5 {382}	410	34 (70 × 22)	◎	-30 to 100	
		R6390	93	42.3 {431}	510	28 (80 × 70)	◎	-30 to 110	
		R6395	95	39.2 {400}	540	23 (80 × 70)	◎		
	Fluoro rubber (FKM)	D0270	73	16 {165}	270	8 (175 × 22)	○	-20 to 200	
		D0875	78	18.5 {190}	280	7 (175 × 22)	○	-30 to 200	
		D0390	90	17.5 {180}	170	14 (175 × 22)	○	-15 to 200	
	Ethylene-Propylene rubber (EPDM)	H1070	70	20 {205}	280	13 (175 × 22)	○	-50 to 130	
Resin	Cloth-inserted Phenol	—	90 (Rockwell M)	78.5 {800}	—	—	◎	-55 to 140	
	Polyamide		117 (Rockwell R)	78.5 {800}	30		◎	-55 to 120	
	Polyamide with glass		120 (Rockwell R)	110 {1122}	2		◎		
	PTFE	VALFLON 3U8	73 (Durometer D)	18.5 {190}	240		280	◎	-100 to 200
		VALFLON 2N0	65 (Durometer D)	16.5 {170}	280			◎	
VALFLON 9BI		62 (Durometer D)	17.5 {180}	◎					

Note: The properties in this table are measured values and are not standard values.

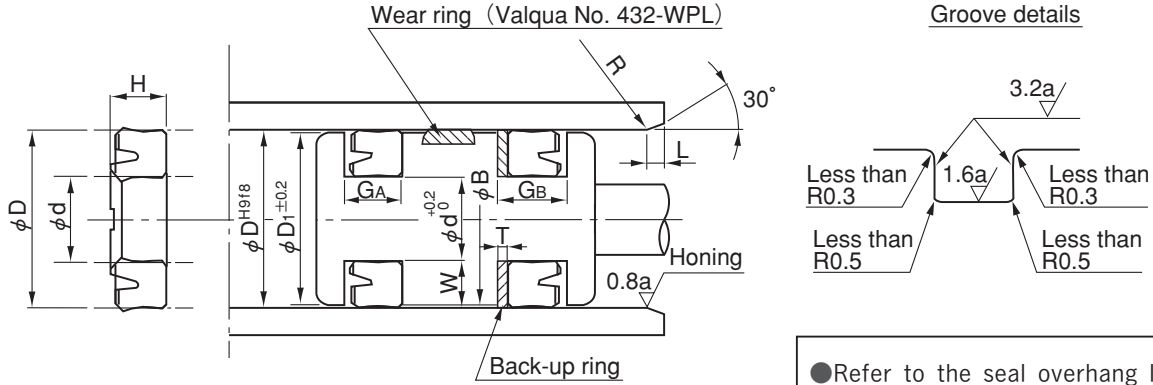
Resistance to fluids ○:Conforming △:Check required ×:Not conforming														Features and uses
Hydraulic oil					Lubricant					Grease		Water based		
General mineral oil type	Emulsion type	Water + glycol-based	Phosphate ester type	Brake oil	Engine oil	Gear oil	Machine oil	Spindle oil	Silicone oil	Lithium grease	Silicone grease	Water	Steam and hot water	
○	○	○	×	×	○	○	○	○	○	○	○	○	×	JIS B 2401 I Type A standard material
○	○	○	×	×	○	○	○	○	○	○	○	○	×	For SLIPPER SEAL back ring
○	○	○	×	×	○	○	○	○	○	○	○	○	×	Wear resistance For non-hydraulic pressure packing "TOUGHRILE"
○	○	○	×	×	○	○	○	○	○	○	○	○	×	For pneumatic packing
○	○	○	×	×	○	○	○	○	○	○	○	○	×	For SLIPPER SEAL back ring
○	○	○	×	×	○	○	○	○	○	○	○	○	×	For pneumatic packing wear resistance
○	○	○	×	×	○	○	○	○	○	○	○	○	×	For pneumatic packing
○	○	○	×	×	○	○	○	○	○	○	○	○	×	Wear resistance For non-hydraulic pressure packing "TOUGHRILE"
○	○	○	×	×	○	○	○	○	○	○	○	○	×	JIS B 2401 I Type B standard material For hydraulic U packing, V packing, and dust seals
△	△	△	×	×	△	△	△	△	△	△	△	△	×	Cold resistance
○	○	○	×	×	○	○	○	○	○	○	○	○	○	Heat-resistant, high-strength, wear-resistant "SUPER RUBBER" For hydraulic U packing, V packing, and dust seals
○	×	×	×	×	△	×	○	○	○	○	○	△	×	Long life seal (Mirable type) For hydraulic U packing
○	×	×	×	×	△	×	○	○	○	○	○	△	×	For hydraulic U packing, and dust seals
○	×	×	×	×	△	×	○	○	○	○	○	△	×	Long life seal For hydraulic U packing
○	×	×	×	×	△	×	○	○	○	○	○	△	×	For hydraulic U packing
○	×	×	×	×	△	×	○	○	○	○	○	△	×	Long life seal For hydraulic U packing
○	×	×	×	×	△	×	○	○	○	○	○	△	×	For hydraulic dust seal
○	×	×	×	×	△	×	○	○	○	○	○	△	×	For hydraulic U packing Heat-resistant, long life
○	×	×	×	×	△	×	○	○	○	○	○	△	×	For hydraulic U packing, buffer-ring Heat-resistant, long life
○	△	×	○	×	○	○	○	○	○	○	○	○	×	Oil-resistant, heat resistant, chemical resistant SLIPPER SEAL For back ring JIS B 2401 4 Type D standard material
○	△	×	○	×	○	○	○	○	○	○	○	○	×	Oil resistant, heat resistant, chemical resistant, cold resistant
○	△	×	○	×	○	○	○	○	○	○	○	○	×	Oil resistant, heat resistant, chemical resistant For U packing, dust seals, and V packing
×	×	○	○	○	×	×	×	×	○	×	○	○	○	For steam, brake oil
○	○	○	○	×	○	○	○	○	○	○	○	○	△	For wear ring
○	○	○	○	○	○	○	○	○	○	○	○	△	△	For back-up ring
○	○	○	○	○	○	○	○	○	○	○	○	△	△	For wear ring, slide ring
○	○	○	○	○	○	○	○	○	○	○	○	△	△	For SLIPPER SEAL
○	○	○	○	○	○	○	○	○	○	○	○	△	△	For back-up ring
○	○	○	○	○	○	○	○	○	○	○	○	○	○	For SLIPPER SEAL, soft counterpart material

U packing

UHP series

- **TOUGHRETHANE** (Valqua Nos. TE9625-UHP, E9625-UHP)
- **Nitrile rubber** (Valqua No. 2060-UHP)
- **Fluoro rubber** (Valqua No. 4060-UHP)

Please consult with us when ordering SUPER RUBBER.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	D	d	H	GA	GB	T	D ₁	L	W
UHP 40	40	30	6.5	7	+0.3 0	9	+0.3 0	2	39
UHP 50	50	40							49
UHP 63	63	53							62
UHP 80	80	71							79
UHP 90 ⁽¹⁾	90	80							89
UHP100	100	85	9.5	10	+0.5 0	13	3	98	7.5
UHP110 ⁽²⁾	110	95						108	
UHP125	125	112	9.0	9.5	+0.3 0	12.5	3	123	6.5
UHP140	140	125	9.5	10	+0.5 0	13		138	7.5
UHP150	150	136	9.0	9.5	+0.3 0	12.5		148	7
UHP160	160	145	9.5	10	+0.5 0	13		157	7.5
UHP180	180	165						177	
UHP200	200	180	12.5	13	+0.5 0	16	4	197	10
UHP220	220	200						217	
UHP224	224	204						221	
UHP250	250	230						247	

Caution 1: UHP90 is made from TOUGHRETHANE and fluoro rubber.

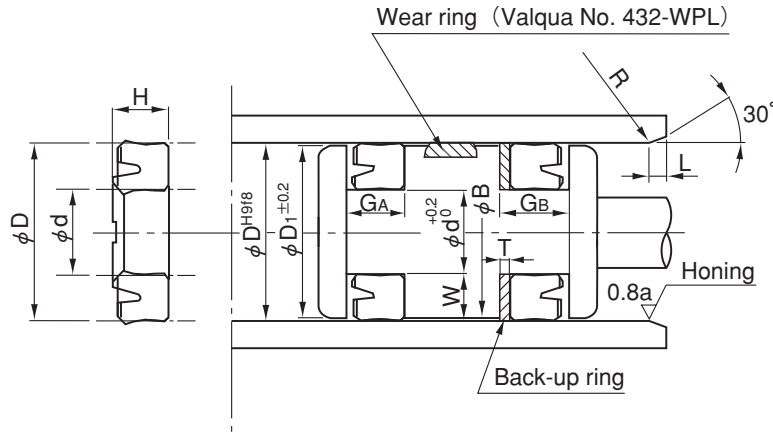
Caution 2: UHP110 is made from TOUGHRETHANE.

Note 1: The packing has a groove to prevent back pressure.

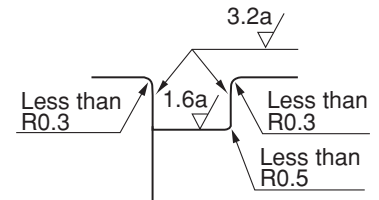
Note 2: The packing can be used with a single groove.

● TOUGHRETHANE (Valqua Nos. TE9625-UNP, E9625-UNPP)

For nitrile rubber, SUPER RUBBER, or fluoro rubber orders, please consult with us.



Groove details



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	D	d	H	$G_A^{+0.5}_0$	$G_B^{+0.5}_0$	T	D_1	L	W
UNP180	180	155	16	17	20	3	177	5	12.5
UNP190	190	165					187		
UNP200	200	175					197		
UNP205	205	180					202		
UNP215	215	190					212		
UNP224	224	199					221		
UNP237	237	212	19	20	4	234	6	15	
UNP250	250	225				247			
UNP261	261	236				257			
UNP275	275	250				271			
UNP280	280	255				276			
UNP295	295	265				291			
UNP300	300	270	310	280	4	296	6	15	
UNP310	310	280				306			
UNP330	330	300				326			

Note 1: The packing has a groove to prevent back pressure.

Note 2: The standard material for high pressure is TOUGHRETHANE.

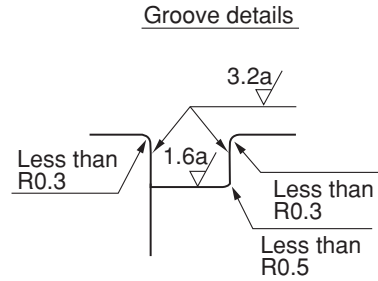
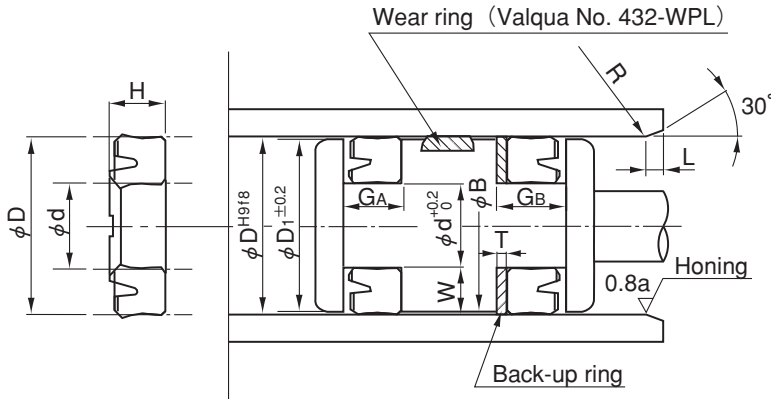
Note 3: The packing should be used in a split groove

U packing

MLP series

- **TOUGHRETHANE** (Valqua Nos. TE9625-MLP, E9625-MLP)
- **Nitrile rubber** (Valqua No. 2060-MLP)
- **Fluoro rubber** (Valqua No. 4060-MLP)

Please consult with us when ordering SUPER RUBBER.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	D	d	H	G _A		G _B		T	D ₁	L	W	
MLP 40	40	30	6.5	7	$+0.3$ 0	9	$+0.3$ 0	2	39	2	5	
MLP 50	50	40							49			
MLP 63	63	53							62			
MLP 80	80	71							79			
MLP100	100	85	9.5	10	$+0.5$ 0	20	$+0.5$ 0	3	98	3	7.5	
MLP125	125	105	16 (16.5)	17					13	123	4	10
MLP140	140	120								138		
MLP160	160	135								158	5	
MLP180	180	155			177							
MLP200	200	175			197							
MLP224	224	199			221							
MLP250	250	225	19 (20)	21	24	247						

Note 1: The packing has a groove to prevent back pressure.

Note 2: These dimensions are based on the Japanese Hydraulic Industry Association's standard JOHS-110 "Hydraulic Cylinders for Steelmaking Machinery (Heavy Machinery)".

Note 3: For MLP125 and above, use with a split groove.

Note 4: The dimensions in parentheses are dimensions for Valqua Nos. 2060-MLP and 4060-MLP.

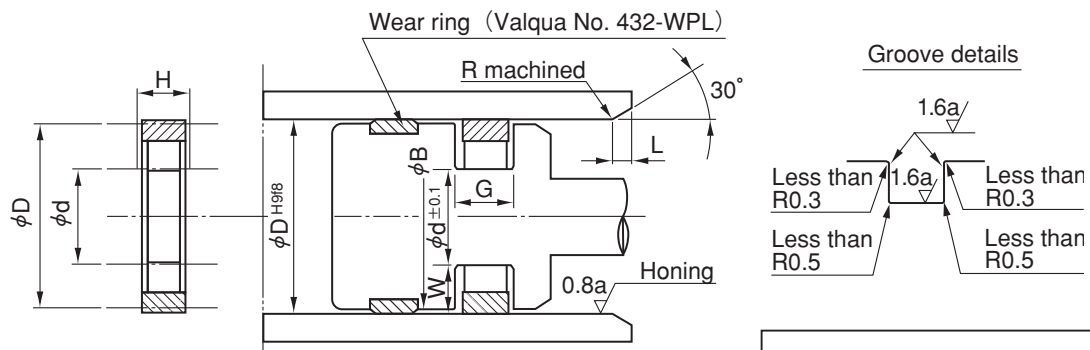
Note 5: MLP40 to MLP100 can be used with the UHP series.

SLIPPER SEAL

APS series

(Valqua No. 7740-APS)

The back ring standard material is nitrile rubber.
For fluoro rubber orders, please consult with us.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

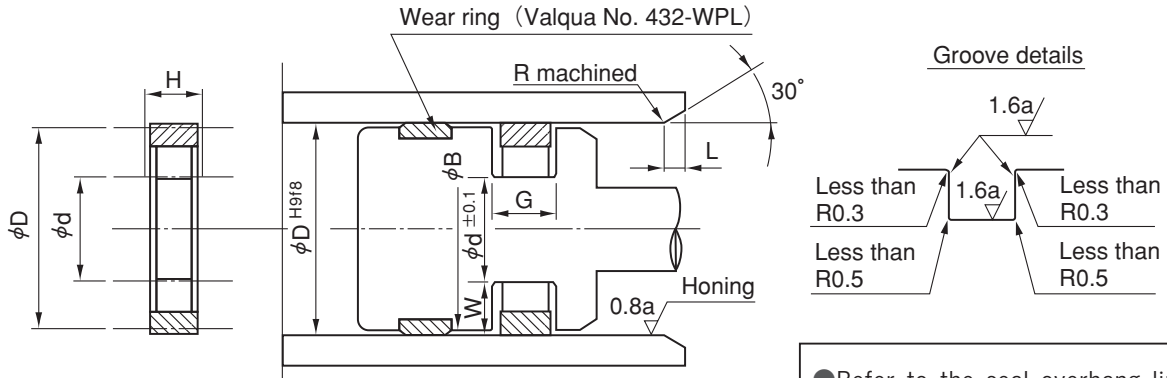
Nominal number	D	d	H	G ^{+0.1} ₀	L	W
APS 20	20	15.0	2.7	2.7	2	2.5
APS 25	25	20.0				
APS 30	30	22.8				
APS 31.5	31.5	24.3				
APS 32	32	24.8				
APS 35	35	27.8				
APS 35.5	35.5	28.3				
APS 40	40	32.8				
APS 45	45	37.8				
APS 50	50	42.8				
APS 56	56	48.8	3.4	3.4	3.6	
APS 60	60	52.8				
APS 63	63	55.8				
APS 65	65	57.8				
APS 69	69	61.8				
APS 71	71	63.8				
APS 75	75	67.8				
APS 80	80	72.8				
APS 85	85	77.8				
APS 90	90	80.4				
APS100	100	90.4	4.3	4.3	4.8	
APS108	108	98.4				
APS112	112	102.4				
APS125	125	115.4				
APS140	140	130.0				
APS150	150	140.0				
APS160	160	150.0				
APS170	170	160.0				
APS180	180	170.0				
APS190	190	180.0				
APS200	200	186.5	5.6	5.6	6.75	
APS224	224	210.5				
APS250	250	236.5				

SLIPPER SEAL

APL series

(Valqua No. 7740-APL)

The back ring standard material is nitrile rubber.
For fluoro rubber orders, please consult with us.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

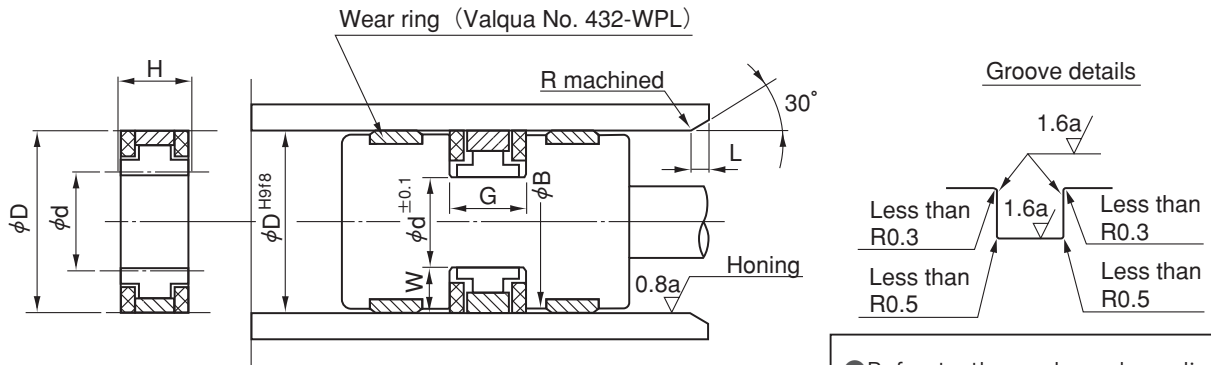
Nominal number	D	d	H	G ^{+0.1} ₀	L	W
APL 40	40	29	5	5	2	5.5
APL 50	50	39				
APL 60	60	49				
APL 70	70	59				
APL 80	80	69	6	6	3	7
APL 90	90	79				8
APL 100	100	86				9
APL 110	110	94			8	8
APL 120	120	104	10			
APL 130	130	112	10			
APL 140	140	122	10			
APL 150	150	132	9	9	4	10
APL 160	160	140				10
APL 180	180	160				10
APL 200	200	180				10

SLIPPER SEAL

APT series

(Valqua No. 7740-APT)

The back ring standard material is nitrile rubber.
For fluoro rubber orders, please contact us.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

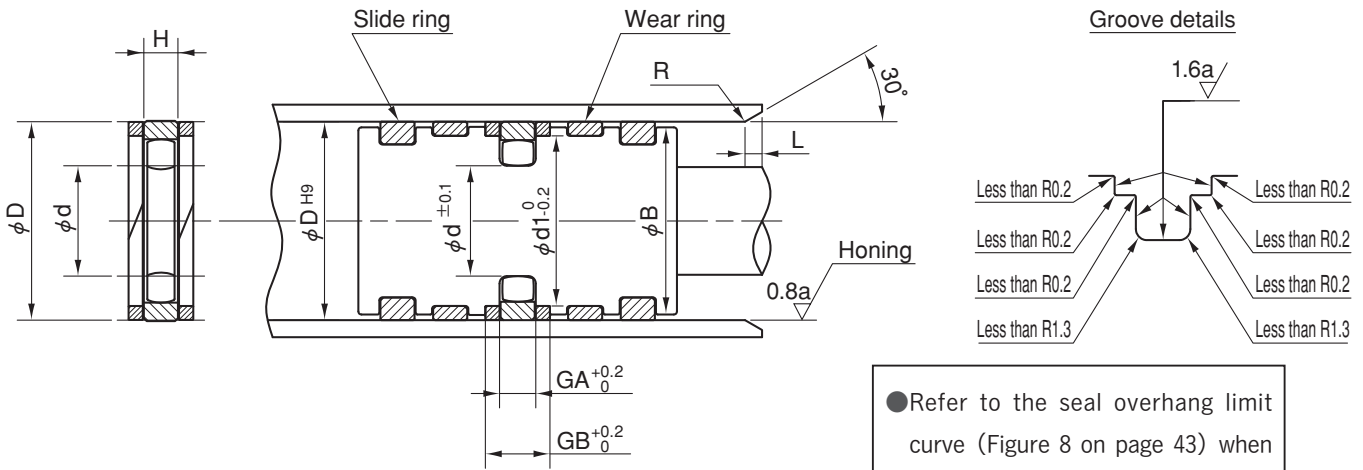
Nominal number	D	d	H	G ^{+0.1} ₀	L	W	
APT 50	50	36	9	9	3	7	
APT 60	60	46					
APT 70	70	55					
APT 80	80	65	11	11		7.5	
APT 90	90	75					
APT100	100	85					
APT110	110	95	12.5	12.5	11.5		
APT120	120	105					
APT130	130	107					
APT140	140	117	16	16		5	
APT150	150	127					
APT160	160	137					
APT170	170	147					
APT180	180	157					
APT185	185	162					
APT190	190	167					
APT200	200	177					
APT210	210	187			17.5	17.5	6
APT220	220	197					
APT225	225	202					
APT230	230	207					
APT240	240	217					
APT250	250	222					
APT260	260	232	14				
APT270	270	242					
APT280	280	252					
APT300	300	272					
APT320	320	292					

SLIPPER SEAL

CPL series

(Valqua No. 7740-CPL)

The back ring standard material is nitrile rubber.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

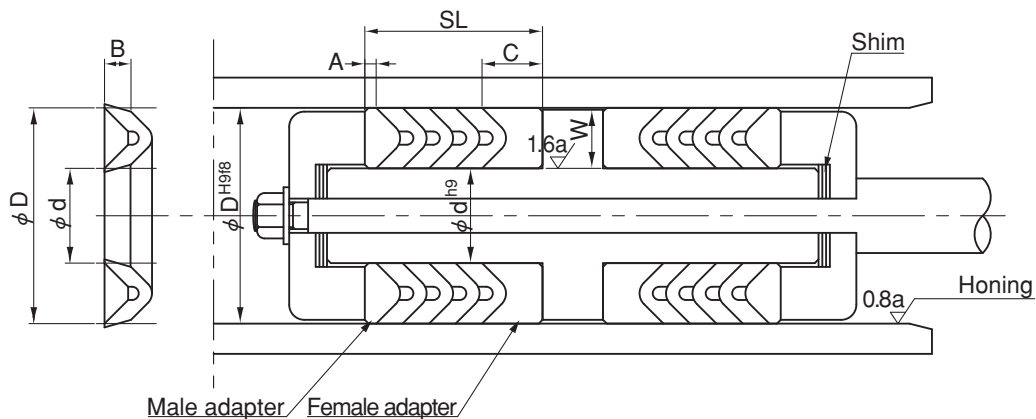
Unit: mm

Nominal number	D	d	d1	H	GA	GB	L	
CPL 80	80	64.5	75	6	6.3	11.6	3	
CPL 85	85	69.5	80					
CPL 90	90	74.5	85					
CPL 95	95	79.5	90					
CPL100	100	84.5	95					
CPL105	105	89.5	100	7.8	8	14.3	5	
CPL110	110	89	104					
CPL115	115	94	109					
CPL120	120	99	114					
CPL125	125	104	119					
CPL130	130	109	124			8	14.3	5
CPL135	135	114	129					
CPL140	140	119	134					
CPL145	145	124	139			8	8	5
CPL150	150	129	144					
CPL165	165	144	159					
CPL170	170	149	164					
CPL180	180	159	174					
CPL190	190	169	184					
CPL200	200	179	194					
CPL215	215	194	209					

V packing

VNV series

Cloth-inserted rubber V packing (Valqua Nos. 2630-VNV, 4630-VNV)
(Valqua standard)



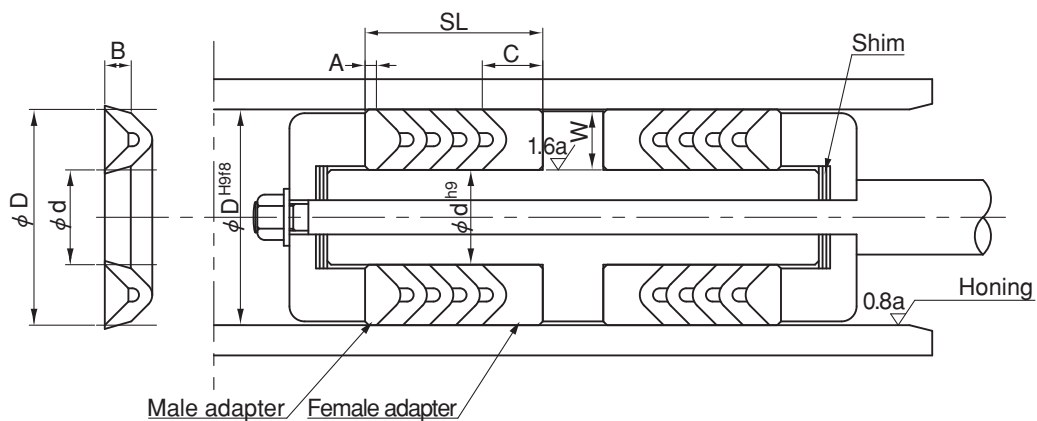
Unit: mm

Nominal number	Nominal dimensions			Height B ^{+0.5} _{-0.2}	Adapter		VNV set of 4 ⁽¹⁾		VNV set of 5 ⁽²⁾	
	D	d	W		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
V 6	16	6	5	3	6	3	21	20.4	24	23.2
V 7	17	7								
V 8	18	8								
V 9	19	9								
V10	20	10								
V11	21	11								
V12	22	12								
V14	24	14								
V15	25	15	7.5	5	3	29	27.8	36	32.4	
V15A	30									
V16	31									16
V18	33									18
V20	35									20
V21	36									21
V22	37									22
V24	39	24								
V25	40	25	10	6	10	37	35.4	43	40.9	
V25A	45									
V26	46									26
V28	48									28
V29	49									29
V30	50									30
V32	52									32
V34	54									34
V35	55									35
V36	56									36
V38	58									38
V39	59									39
V40	60									40
V42	62	42								
V44	64	44								
V45	65	45								
V46	66	46								
V48	68	48								
V49	60	49								

Caution 1: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

Caution 2: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

Note: SL (mounting dimensions) are for reference only



Unit: mm

Nominal number	Nominal dimensions			Height B $\begin{smallmatrix} +0.5 \\ -0.2 \end{smallmatrix}$	Adapter		VNV set of 4 ⁽¹⁾		VNV set of 5 ⁽²⁾	
	D	d	W		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
V 50	70	50	10	6 $\begin{smallmatrix} +0.5 \\ -0.2 \end{smallmatrix}$	10	3	37	35.4	43	40.9
V 55	75	55								
V 60	80	60								
V 65	85	65								
V 70	90	70								
V 75	95	75								
V 80	100	80								
V 80A	110	80	15	7 $\begin{smallmatrix} +0.8 \\ -0.3 \end{smallmatrix}$	10	41	38.1	48	44.3	
V 85	115	85								
V 90	120	90								
V 95	125	95								
V100	130	100								
V105	135	105								
V110	140	110								
V115	145	115								
V120	150	120								
V125	155	125								
V130	160	130								
V135	165	135								
V140	170	140								
V145	175	145								
V150	180	150								
V160	190	160								
V170	200	170								
V180	210	180								
V190	220	190								
V200	230	200								
V210	240	210								
V220	250	220								
V230	260	230								
V240	270	240								
V250	280	250								
V275	305	275								
V300	330	300								
V325	365	325								
V350	390	350	20	8 $\begin{smallmatrix} +1.2 \\ -0.4 \end{smallmatrix}$	15	50	47.4	58	54.6	
V375	415	375								
V400	440	400								

Caution 1: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

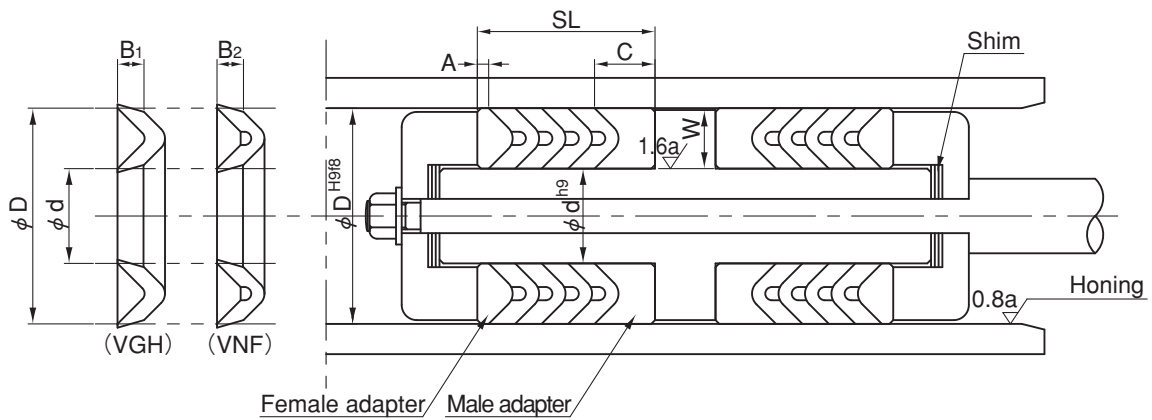
Caution 2: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

Note: SL (mounting dimensions) are for reference only

V packing

VGH, VNF series

Rubber V packing (Valqua Nos. 2631-VGH, 4631-VGH)
 Cloth-inserted rubber V packing (Valqua Nos. 2630-VNF, 4630-VNF)
 (JIS standard)



Unit: mm

Nominal number ⁽¹⁾	Nominal dimensions			Height B ₁ ⁽²⁾		Height B ₂ ⁽²⁾		Adapter		Set of 4 ⁽³⁾		Set of 5 ⁽⁴⁾	
	Outer diameter D	Inner diameter d	Width W	Rubber packing (H)		Cloth-inserted rubber V packing (F)		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
				Base dimensions	Tolerance	Base dimensions	Tolerance						
H 6.3 or F 6.3	16.3	6.3	5	2.5				5		20	19.4	23	22.1
H 7.1 or F 7.1	17.1	7.1											
H 8 or F 8	18	8											
H 9 or F 9	19	9											
H10 or F10	20	10											
H11.2 or F11.2	21.2	11.2											
H12.5 or F12.5	22.5	12.5											
H14 or F14	24	14											
H15 or F15	28	15	6.5	3	3	5	6.5	3	21.5	20.5	24.5	23.2	
H16 or F16	26	16	5	2.5					5	20	19.4	23	22.1
H18 or F18	31	18	6.5	3					±0.3	+0.5 -0.2	3	6.5	21.5
H18.5 or F18.5	31.5	18.5											
H20 or F20	33	20											
H22.4 or F22.4	35.4	22.4											
H25 or F25	38	25											
H27 or F27	40	27											
H28 or F28	41	28											
H31.5 or F31.5	44.5	31.5											
H32 or F32	45	32	8	3.5	4	8	8	27	25.8	31	29.4		
H34 or F34	50	34											
H35.5 or F35.5	51.5	35.5											
H40 or F40	56	40											
H45 or F45	61	45											
H47 or F47	63	47											
H50 or F50	66	50											
H53 or F53	69	53											
H55 or F55	71	55											
H56 or F56	72	56											
H60 or F60	76	60											
H63 or F63	79	63											
H64 or F64	80	64											
H67 or F67	87	67											
H70 or F70	90	70											
H71 or F71	91	71	10	4	5	10		33	31.3	38	35.8		
H75 or F75	95	75											
H80 or F80	100	80											

Caution 1: The H series nominal number is a rubber V packing value, for F series use the cloth-inserted V packing value.

Caution 2: B indicates the height per piece of packing installed.

Caution 3: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

Caution 4: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

Note: SL (mounting dimensions) are for reference only.

Unit: mm

Nominal number ⁽¹⁾	Nominal dimensions			Height B ₁ ⁽²⁾		Height B ₂ ⁽²⁾		Adapter		Set of 4 ⁽³⁾		Set of 5 ⁽⁴⁾	
	Outer diameter D	Inner diameter d	Width W	Rubber packing (H)		Cloth-inserted rubber V packing (F)		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
				Base dimensions	Tolerance	Base dimensions	Tolerance						
H 85 or F 85	105	85	10	4		5		10		33	31.3	38	35.8
H 90 or F 90	110	90											
H 92 or F 92	112	92											
H 95 or F 95	115	95											
H100 or F100	120	100											
H105 or F105	125	105											
H106 or F106	126	106											
H112 or F112	132	112											
H118 or F118	138	118											
H120 or F120	140	120											
H125 or F125	150	125	12.5	5	±0.3	6	+0.5 -0.2	12.5	3	39.5	37.4	45.5	42.7
H132 or F132	157	132											
H135 or F135	160	135											
H140 or F140	165	140											
H145 or F145	170	145											
H150 or F150	175	150											
H155 or F155	180	155											
H160 or F160	185	160											
H165 or F165	190	165											
H170 or F170	195	170											
H175 or F175	200	175											
H180 or F180	205	180											
H190 or F190	215	190											
H199 or F199	224	199											
H200 or F200	225	200											
H212 or F212	237	212											
H224 or F224	249	224											
H225 or F225	250	225											
H236 or F236	261	236											
H250 or F250	275	250											
H265 or F265	297	265	16	6	±0.4	7	+0.8 -0.3	16		47	44.3	54	50.5
H280 or F280	312	280											
H300 or F300	332	300											
F 315	347	315											
F 335	367	335											
F 355	387	355											
F 375	407	375											
F 400	432	400											
F 425	457	425											
F 450	482	450											
F 475	507	475											
F 500	532	500											
F 530	570	530	20			8	+1.2 -0.4	20		55	52.1	63	59.2
F 560	600	560											
F 600	640	600											
F 630	670	630											
F 670	710	670											
F 710	750	710	20			8	+1.2 -0.4	20	3	55	51.5	63	58.5
F 750	790	750											
F 800	840	800											
F 850	890	850											
F 900	940	900											
F 950	990	950											
F1000	1040	1000											

Caution 1: The H series nominal number is a rubber V packing value, for F series use the cloth-inserted V packing value.

Caution 2: B indicates the height per piece of packing installed.

Caution 3: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

Caution 4: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

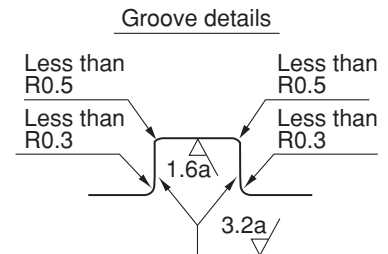
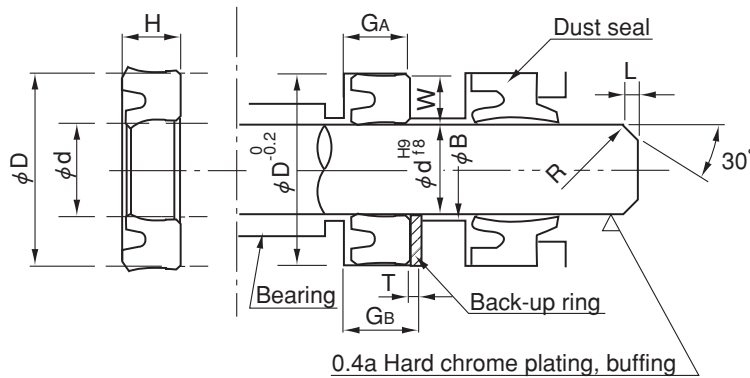
Note: SL (mounting dimensions) are for reference only.

U packing

UHR series

- **TOUGHRETHANE** (Valqua Nos. TE9625-UHR, E9625-UHR)
- **Nitrile rubber** (Valqua No. 2060-UHR)
- **Fluoro rubber** (Valqua No. 4060-UHR)

Please contact us when ordering SUPER RUBBER.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	d	D	H	GA	GB	T	L	W
UHR 18	18	26	5.2	5.7	7.2	1.5	2	4
UHR 20 ⁽¹⁾	20	28						3.8
UHR 22.4	22.4	30						3.75
UHR 28	28	35.5						4.75
UHR 35.5	35.5	45	6.5	7	9	2	3	5
UHR 40	40	50						5.5
UHR 45A	45	55	7.5	8	10	2	3	5
UHR 45		56						5.5
UHR 50	50	60	6.5	7	9	2	3	5
UHR 56	56	66						4.5
UHR 63	63	73						5
UHR 67	67	77						4.5
UHR 71	71	80	9.5	10	13	3	4	5
UHR 80	80	90						7.5
UHR 85	85	100						6.5
UHR 90	90	105						7.5
UHR100	100	115	9.5	10	13	3	4	6.5
UHR112	112	125						6.5
UHR125	125	140						7.5
UHR140	140	155						6.5
UHR160	160	175	12.5	13	16	4	4	7.5
UHR165 ⁽²⁾	165	180						7.5
UHR180	180	200	12.5	13	16	4	4	10
UHR200 ⁽³⁾	200	220						10

Caution 1: UHR20 is made from nitrile rubber and fluoro rubber.

Caution 2: UHR165 is made from TOUGHRETHANE only.

Caution 3: UHR200 dimensions are reference only.

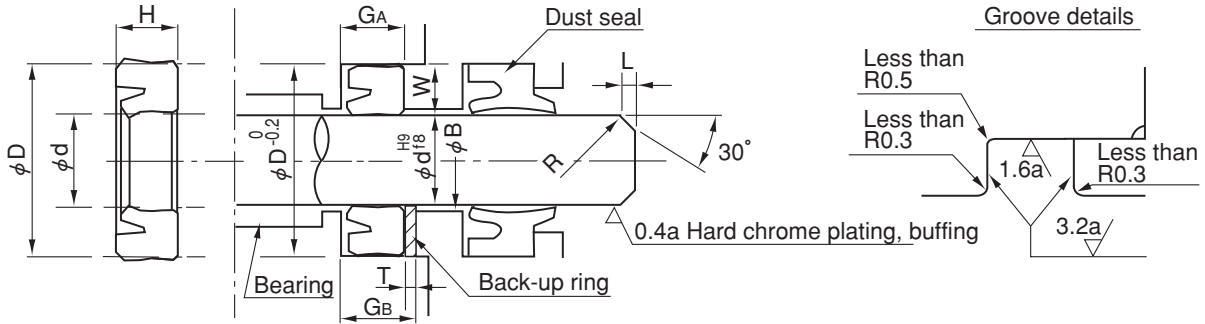
Note: The packing can be used with a single groove.

U packing

UNR series

● TOUGHRETHANE (Valqua Nos. E9625-UNR, E9625-UNR)

For nitrile rubber, SUPER RUBBER, or fluoro rubber orders, please contact us.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	d	D	H	$G_A^{+0.5}_0$	$G_B^{+0.5}_0$	T	L	W
UNR160	160	185	16	17	20	3	5	12.5
UNR170	170	195						
UNR180	180	205						
UNR190	190	215						
UNR200	200	225	19	20	23	4	6	15
UNR212	212	237						
UNR224	224	249						
UNR230	230	255						
UNR236	236	261						
UNR250	250	275						
UNR265	265	295						
UNR270	270	300						
UNR280	280	310						

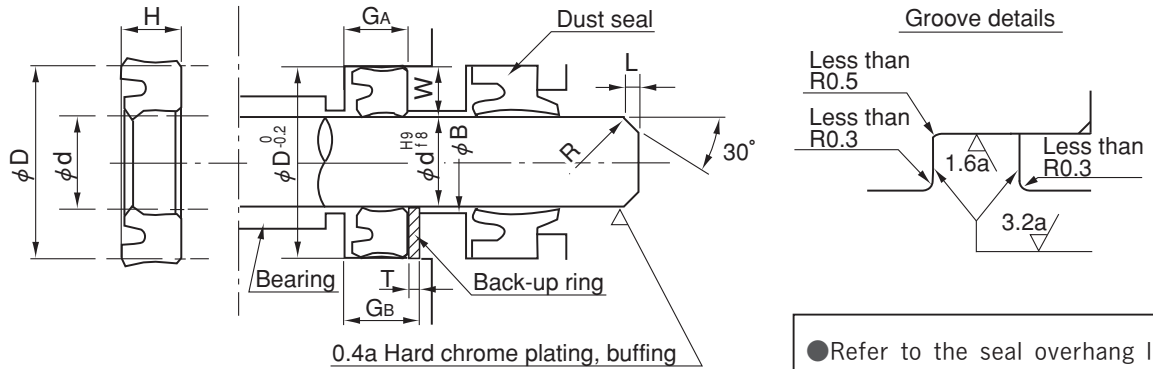
Note: The packing should be used in a split groove.

U packing

MLR series

- **TOUGHRETHANE** (Valqua Nos. TE9625-MLR, E9625-MLR)
- **Nitrile rubber** (Valqua No. 2060-MLR)
- **Fluoro rubber** (Valqua No. 4060-MLR)

Please contact us when ordering SUPER RUBBER.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	d	D	H	$G_A^{+0.5}_0$	$G_B^{+0.5}_0$	T	L	W
MLR 22.4	22.4	35.4	10(10.5)	11	12.5	1.5	3	6.5
MLR 28	28	41						
MLR 35.5	35.5	51.5	12(12.5)	13	15	2	4	8
MLR 45	45	61						
MLR 56	56	72	15(15.5)	16	18	5	10	
MLR 71	71	91						
MLR 80	80	100						
MLR 90	90	110						
MLR100	100	120			19	3		

Note 1: These dimensions are based on the Japanese Hydraulic Industry Association's standard JOHS-110 "Hydraulic Cylinders for Steelmaking Machinery (Heavy Machinery)".

Note 2: The dimensions in parentheses are dimensions for Valqua Nos. 2060-MLR and 4060-MLR.

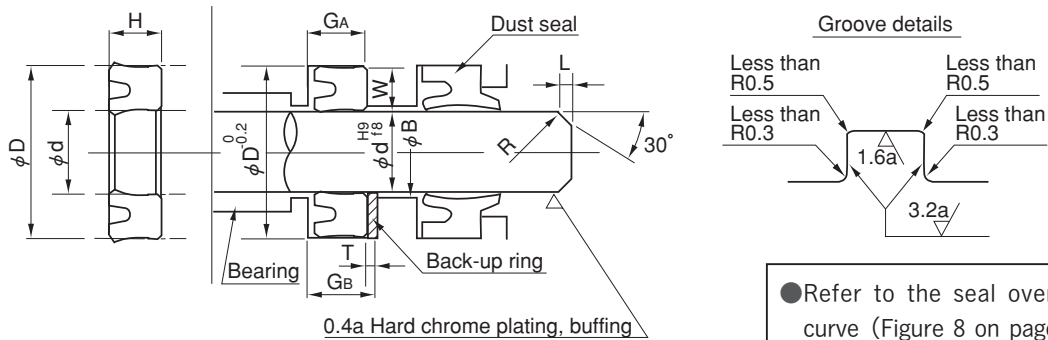
Note 3: The packing should be used in a split groove.

U packing

UHS series

- **TOUGHRETHANE** (Valqua Nos. TE9625-UHS, E9625-UHS)
- **Nitrile rubber** (Valqua No. 2060-UHS)
- **Fluoro rubber** (Valqua No. 4060-UHS)

Please contact us when ordering SUPER RUBBER.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	d	D	H	GA	GB	T	L	W		
UHS 11.2	11.2	19.2	5	5.7	7.2	1.5	2	4		
UHS 14	14	22								
UHS 16	16	24								
UHS 18	18	26								
UHS 20	20	28								
UHS 22.4	22.4	30								
UHS 23.5	23.5	31.5								
UHS 25	25	33								
UHS 28	28	35.5	6	7	9	+0.3 0	2	3	5	
UHS 30	30	40								
UHS 31.5	31.5	41.5								
UHS 32	32	42								
UHS 35	35	45								
UHS 35.5	35.5	45								
UHS 38	38	48								
UHS 40	40	50								
UHS 45A	45	55								
UHS 45		56								
UHS 50	50	60	7	8	10	+0.5 0	2	3	5	
UHS 53	53	63								
UHS 55	55	65								
UHS 56	56	66								
UHS 58	58	68								
UHS 60A	60	70								
UHS 60		71								
UHS 63	63	73								
UHS 65	65	75								
UHS 67	67	77								
UHS 70	70	80	6	7	9	+0.3 0	3	4	7.5	
UHS 71	71									
UHS 75	75									85
UHS 80	80									90
UHS 85	85	100	9	10	+0.5 0	13	+0.5 0	3	4	7.5
UHS 90	90	105								
UHS 95	95	110								
UHS 98	98	112								
UHS100	100	115								
UHS112	112	125								
UHS115 ⁽¹⁾	115	130								
UHS125	125	140								
UHS136	136	150	140	155	160	7	7.5			
UHS140	140	155								
UHS145	145	160								

Caution 1: UHS115 is made from TOUGHRETHANE.

Note 1: For UHS14 and below, use with a split groove.

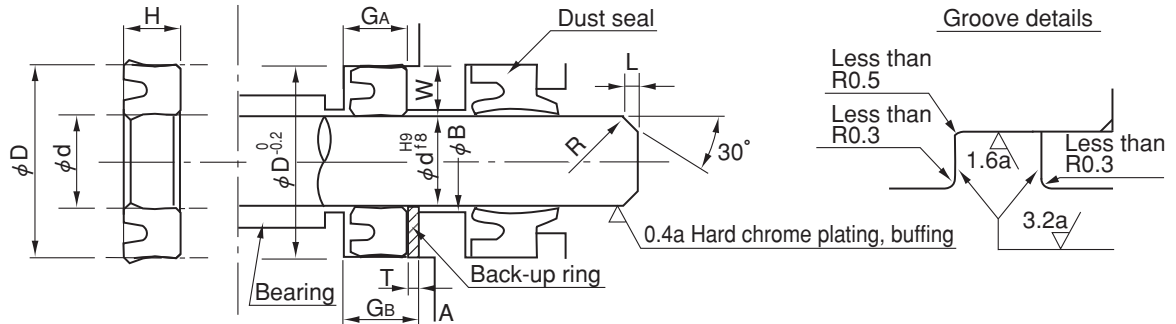
Note 2: If this packing is to be used on a piston, attaching of a support ring is desirable. (For specifics, please contact us)

U packing

UNS series

TOUGHRETHANE (Valqua Nos. TE9625-UNS, E9625-UNS)

For nitrile rubber, SUPER RUBBER, or fluoro rubber orders, please contact us.



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

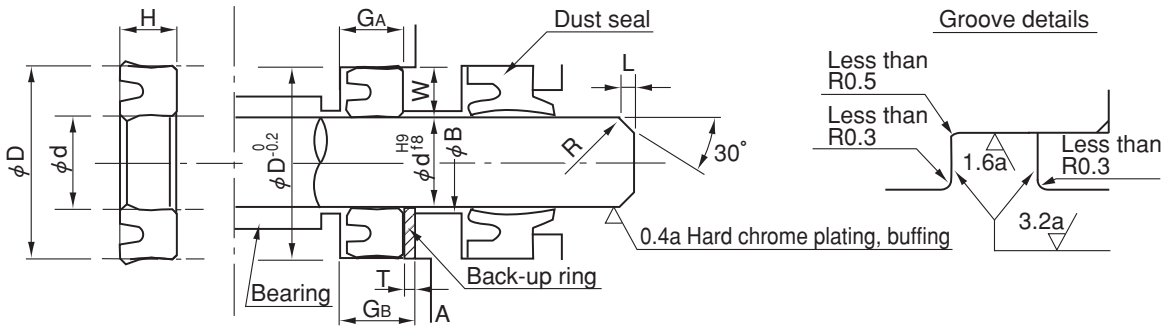
Unit: mm

Nominal number	d	D	H	G_A	G_B	T	L	W
UNS 6.3	6.3	16.3	8	9	$+0.3$ 0	10.5	1.5	3
UNS 7.1	7.1	17.1						
UNS 8	8	18						
UNS 9	9	19						
UNS10	10	20						
UNS11.2	11.2	21.2						
UNS12.5	12.5	22.5						
UNS14	14	24						
UNS15	15	25						
UNS16	16	26						
UNS18	18	28	10.2	11	$+0.5$ 0	13	2	4
UNS20	20	30						
UNS22.4	22.4	32.4						
UNS25	25	35						
UNS28	28	43						
UNS30	30	45						
UNS31.5	31.5	46.5						
UNS35	35	50						
UNS35.5	35.5	50.5						
UNS40	40	55						
UNS45	45	60	12	13	15	5	10	
UNS48	48	63						
UNS50	50	65						
UNS53	53	73						

Note 1: The standard material for high pressure is TOUGHRETHANE.

Note 2: The packing should be used in a split groove.

Note 3: Please contact us regarding orders for the old US series (Valqua No. P9625).



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	d	D	H	G _A	G _B	T	L	W
UNS 55	55	75	12	13	15	2	5	10
UNS 56	56	76						
UNS 60	60	80						
UNS 63	63	83						
UNS 65	65	85						
UNS 67	67	87						
UNS 70	70	90						
UNS 71	71	91						
UNS 75	75	95						
UNS 80	80	100						
UNS 85	85	105	16	17	20	3	5	10
UNS 90	90	110						
UNS 95	95	115						
UNS100	100	120						
UNS105	105	125						
UNS106	106	126						
UNS110	110	130						
UNS112	112	132						
UNS118	118	138						
UNS120	120	140						
UNS125	125	145						
UNS130	130	150						
UNS140	140	160						
UNS150	150	170						

Note 1: The standard material for high pressure is TOUGHRETHANE.

Note 2: The packing should be used in a split groove.

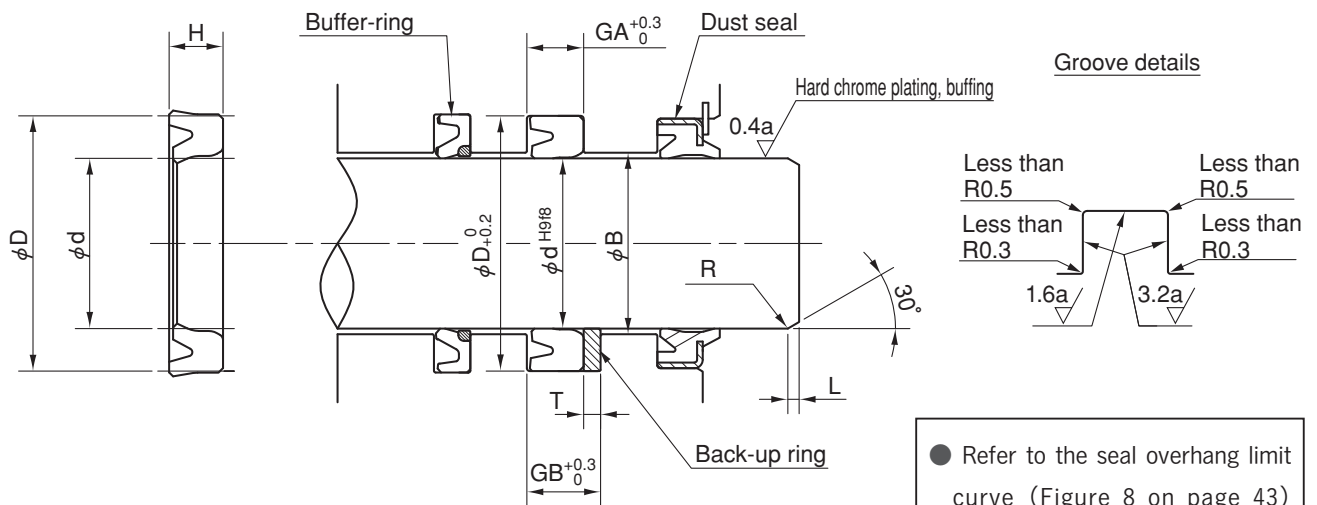
Note 3: Please contact us regarding orders for the old US series (Valqua No. P9625).

U packing

URHP series

● TOUGHRETHANE (Valqua No. E9625-URHP)

The standard material is TOUGHRETHANE R6390 (material ID).



Rod seal

Unit: mm

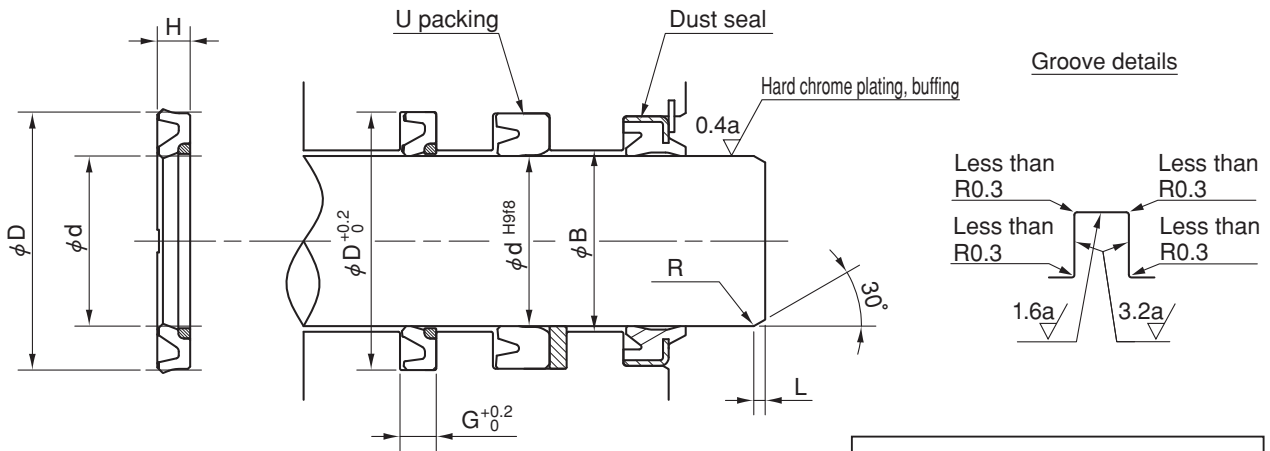
Nominal number	d	D	H	GA	GB	T	L
URHP 40	40	55	9.5	10	13	3	3
URHP 45	45	60					
URHP 50	50	65					
URHP 55	55	70					
URHP 60	60	75					
URHP 65	65	80					
URHP 70	70	85					
URHP 75	75	90					
URHP 80	80	95					
URHP 85	85	100					
URHP 90	90	105					
URHP 95	95	110					
URHP100	100	115					
URHP105	105	120					
URHP120K	120	135					
URHP110	110	130					
URHP115	115	135					
URHP120	120	140					
URHP125	125	145					
URHP130	130	150					
URHP140	140	160					
URHP150	150	170					

Buffer-ring

URBF series

● **TOUGHRETHANE** (Valqua No. E9625-URHP)

The standard material is TOUGHRETHANE R6390 (material ID).



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

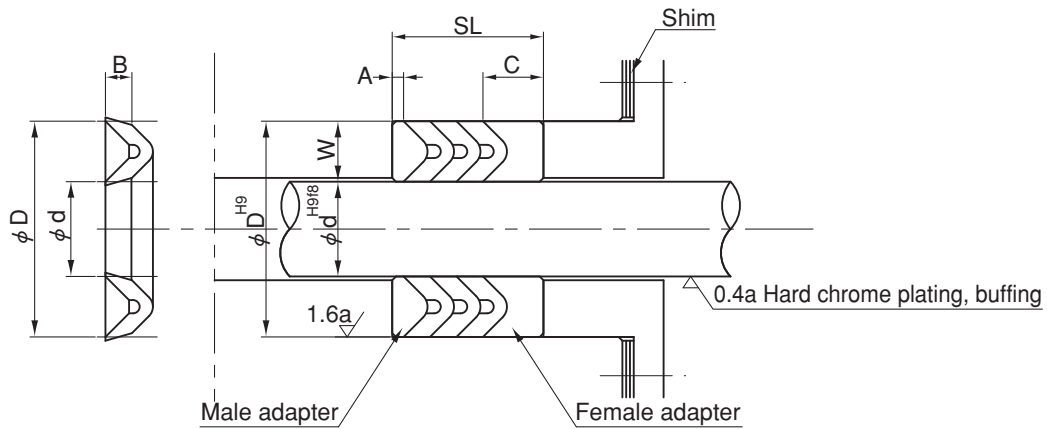
Nominal number	d	D	H	G	L
URBF 40	40	55.5	5.8	6.4	3
URBF 45	45	60.5			
URBF 50	50	65.5			
URBF 55	55	70.5			
URBF 60	60	75.5			
URBF 65	65	80.5			
URBF 70	70	85.5			
URBF 75	75	90.5			
URBF 80	80	95.5			
URBF 85	85	100.5			
URBF 90	90	105.5			
URBF 95	95	110.5			
URBF100	100	115.5			
URBF105	105	120.5			
URBF110	110	125.5			
URBF115	115	130.5			
URBF120	120	135.5			
URBF125	125	140.5			
URBF130	130	145.5			
URBF140	140	155.5			
URBF150	150	165.5			

Note: The packing has a groove to prevent back pressure.

V packing

VNV series

Cloth-inserted rubber packing (Valqua Nos. 2630-VNV, 4630-VNV)
(Valqua standard)



Rod seal

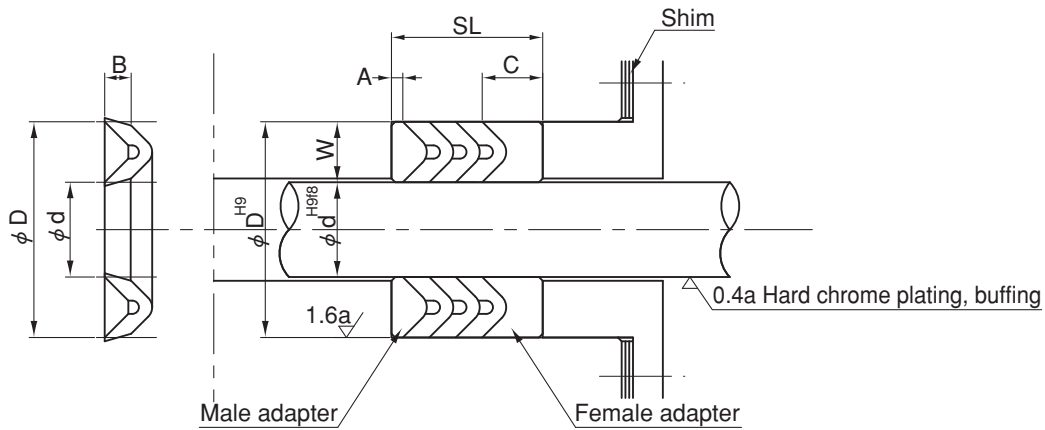
Unit: mm

Nominal number	Nominal dimensions			Height B $+0.5$ -0.2	Adapter		VNV set of 4 ⁽¹⁾		VNV set of 5 ⁽²⁾	
	d	D	W		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
V 6	6	16	5	3	6	3	21	20.4	24	23.2
V 7	7	17								
V 8	8	18								
V 9	9	19								
V10	10	20								
V11	11	21								
V12	12	22								
V14	14	24								
V15	15	25								
V15A	15	30	7.5	5	6	29	27.8	36	32.4	
V16	16	31								
V18	18	33								
V20	20	35								
V21	21	36								
V22	22	37								
V24	24	39								
V25	25	40								
V25A	25	45	10	6	10	37	35.4	43	40.9	
V26	26	46								
V28	28	48								
V29	29	49								
V30	30	50								
V32	32	52								
V34	34	54								
V35	35	55								
V36	36	56								
V38	38	58								
V39	39	59								
V40	40	60								
V42	42	62								
V44	44	64								
V45	45	65								
V46	46	66								
V48	48	68								
V49	49	69								

Caution 1: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

Caution 2: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

Note: SL (mounting dimensions) are for reference only.



Unit: mm

Nominal number	Nominal dimensions			Height B	Adapter		VNV set of 4 ⁽¹⁾		VNV set of 5 ⁽²⁾	
	d	D	W		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
V 50	50	70	10	$6^{+0.5}_{-0.2}$	10	3	37	35.4	43	40.9
V 55	55	75								
V 60	60	80								
V 65	65	85								
V 70	70	90								
V 75	75	95								
V 80	80	100								
V 80A		110								
V 85	85	115	15	$7^{+0.8}_{-0.3}$	10	41	38.1	48	44.3	
V 90	90	120								
V 95	95	125								
V100	100	130								
V105	105	135								
V110	110	140								
V115	115	145								
V120	120	150								
V125	125	155								
V130	130	160								
V135	135	165								
V140	140	170								
V145	145	175								
V150	150	180								
V160	160	190	15	$8^{+1.2}_{-0.4}$	50	47.4	58	54.6		
V170	170	200								
V180	180	210								
V190	190	220								
V200	200	230								
V210	210	240								
V220	220	250								
V230	230	260								
V240	240	270								
V250	250	280								
V275	275	305								
V300	300	330								
V325	325	365								
V350	350	390								
V375	375	415								
V400	400	440								

Caution 1: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

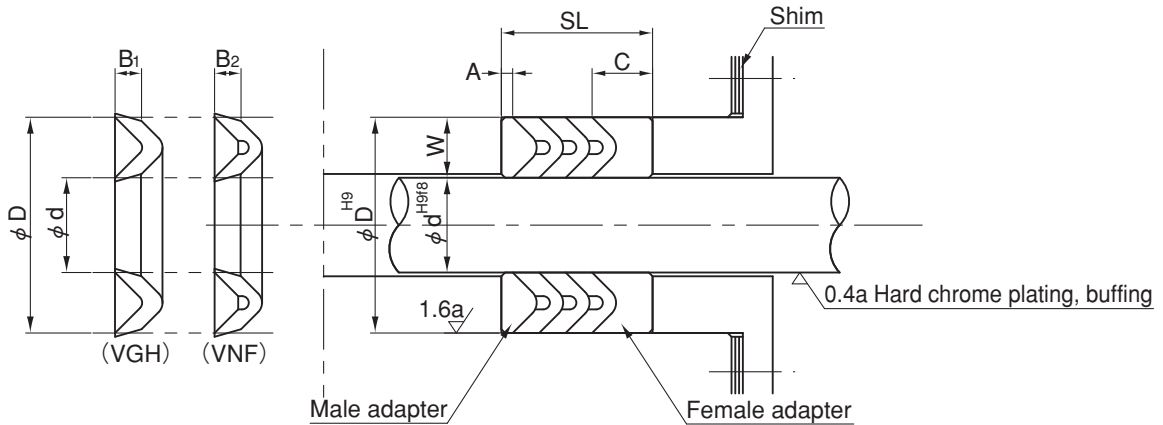
Caution 2: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

Note: SL (mounting dimensions) are for reference only.

V packing

VGH, VNF series

Rubber V packing (Valqua Nos. 2631-VGH, 4631-VGH)
Cloth-inserted rubber V packing (Valqua Nos. 2630-VNF, 4630-VNF)
 (JIS standard)



Unit: mm

Nominal number ⁽¹⁾	Nominal dimensions			Height B ₁ ⁽²⁾		Height B ₂ ⁽²⁾		Adapter		Set of 4 ⁽³⁾		Set of 5 ⁽⁴⁾	
	Inner diameter d	Outer diameter D	Width W	Rubber V packing (H)		Cloth-inserted rubber V packing (F)		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
				Base dimensions	Tolerance	Base dimensions	Tolerance						
H 6.3 or F 6.3	6.3	16.3	5	2.5	±0.3	3	+0.5 -0.2	5	3	20	19.4	23	22.1
H 7.1 or F 7.1	7.1	17.1											
H 8 or F 8	8	18											
H 9 or F 9	9	19											
H10 or F10	10	20											
H11.2 or F11.2	11.2	21.2											
H12.5 or F12.5	12.5	22.5											
H14 or F14	14	24	6.5	3	±0.3	3	6.5	3	21.5	20.5	24.5	23.2	
H15 or F15	15	28											
H16 or F16	16	26											
H18 or F18	18	31											
H18.5 or F18.5	18.5	31.5											
H20 or F20	20	33											
H22.4 or F22.4	22.4	35.4											
H25 or F25	25	38											
H27 or F27	27	40											
H28 or F28	28	41											
H31.5 or F31.5	31.5	44.5	8	3.5	±0.3	4	8	3	27	25.8	31	29.4	
H32 or F32	32	45											
H34 or F34	34	50											
H35.5 or F35.5	35.5	51.5											
H40 or F40	40	56											
H45 or F45	45	61											
H47 or F47	47	63											
H50 or F50	50	66											
H53 or F53	53	69											
H55 or F55	55	71											
H56 or F56	56	72											
H60 or F60	60	76											
H63 or F63	63	79											
H64 or F64	64	80	10.0	4	±0.3	5	10	3	33	31.3	38	35.8	
H67 or F67	67	87											
H70 or F70	70	90											
H71 or F71	71	91											
H75 or F75	75	95											
H80 or F80	80	100											

Caution 1: The H series nominal number is a rubber V packing value, for F series use the cloth-inserted V packing value.

Caution 2: B indicates the height per piece of packing installed.

Caution 3: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

Caution 4: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

Note: SL (mounting dimensions) are for reference only.

Unit: mm

Nominal number ⁽¹⁾	Nominal dimensions			Height B ₁ ⁽²⁾		Height B ₂ ⁽²⁾		Adapter		Set of 4 ⁽³⁾		Set of 5 ⁽⁴⁾	
	Inner diameter d	Outer diameter D	Width W	Rubber V packing (H)		Cloth-inserted rubber V packing (F)		Female C	Male A	Combined nominal height	SL	Combined nominal height	SL
				Base dimensions	Tolerance	Base dimensions	Tolerance						
H 85 or F 85	85	105	10	4		5		10		33	31.3	38	35.8
H 90 or F 90	90	110											
H 92 or F 92	92	112											
H 95 or F 95	95	115											
H100 or F100	100	120											
H105 or F105	105	125											
H106 or F106	106	126											
H112 or F112	112	132											
H118 or F118	118	138											
H120 or F120	120	140											
H125 or F125	125	150	12.5	5	±0.3	6	+0.5 -0.2	12.5	3	39.5	37.4	45.5	42.7
H132 or F132	132	157											
H135 or F135	135	160											
H140 or F140	140	165											
H145 or F145	145	170											
H150 or F150	150	175											
H155 or F155	155	180											
H160 or F160	160	185											
H165 or F165	165	190											
H170 or F170	170	195											
H175 or F175	175	200											
H180 or F180	180	205											
H190 or F190	190	215											
H199 or F199	199	224											
H200 or F200	200	225											
H212 or F212	212	237											
H224 or F224	224	249											
H225 or F225	225	250											
H236 or F236	236	261											
H250 or F250	250	275											
H265 or F265	265	297	16	6	±0.4	7	+0.8 -0.3	16		47	44.3	54	50.5
H280 or F280	280	312											
H300 or F300	300	332											
F 315	315	347											
F 335	335	367											
F 355	355	387											
F 375	375	407											
F 400	400	432											
F 425	425	457											
F 450	450	482											
F 475	475	507											
F 500	500	532											
F 530	530	570	20			8	+1.2 -0.4	20		55	52.1	63	59.2
F 560	560	600											
F 600	600	640											
F 630	630	670											
F 670	670	710											
F 710	710	750	20			8	+1.2 -0.4	20	3	55	51.5	63	58.5
F 750	750	790											
F 800	800	840											
F 850	850	890											
F 900	900	940											
F 950	950	990											
F1000	1000	1040											

Caution 1: The H series nominal number is a rubber V packing value, for F series use the cloth-inserted V packing value.

Caution 2: B indicates the height per piece of packing installed.

Caution 3: SL is the length of the combination of 4 cloth inserted rubber V packings and adapter.

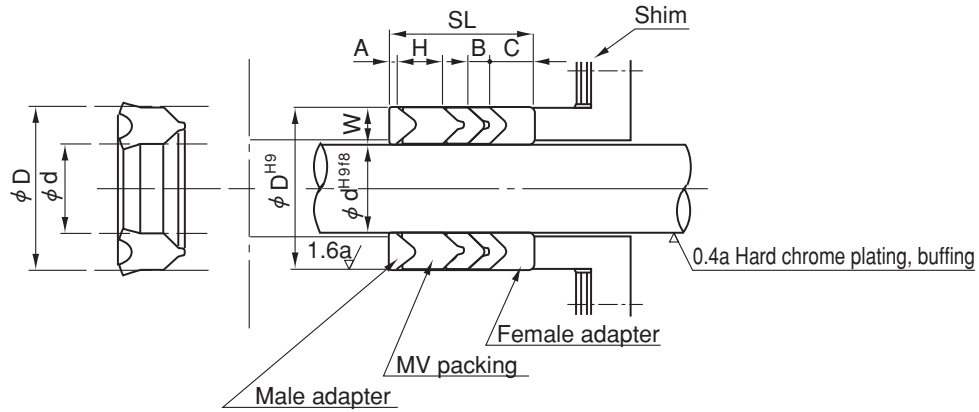
Caution 4: SL is the length of the combination of 5 cloth inserted rubber V packings and adapter.

Note: SL (mounting dimensions) are for reference only.

MV packing

- Nitrile rubber (Valqua No. 2632-MVF)
- SUPER RUBBER (Valqua No.2632-MVF)
- Fluoro rubber (Valqua No. 4632-MVF)

Goes together with JIS B 2403 V packings (Valqua No. 2630-VNF)



Unit: mm

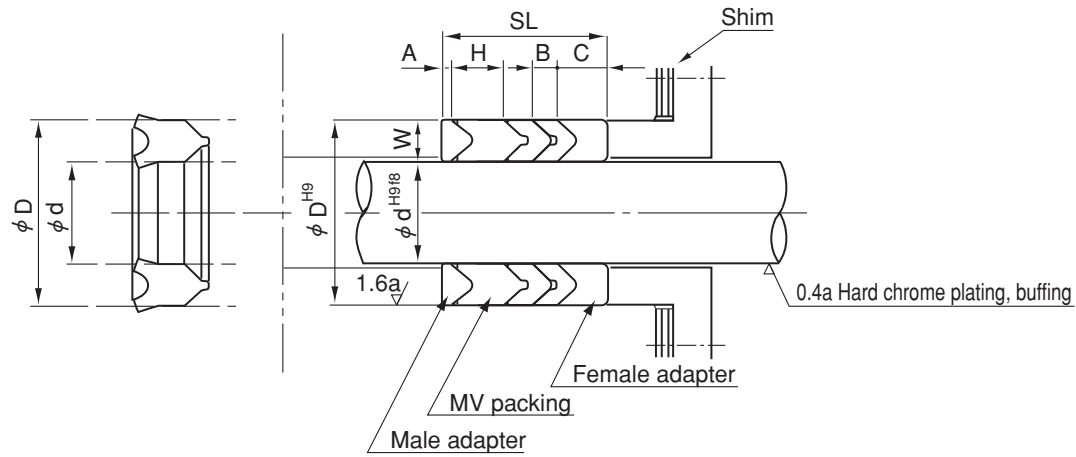
Nominal number	d	D	H	B	W	Adapter		SL
						Female C	Male A	
F 25	25	38	6	3	6.5	6.5	3	21.5
F 28	28	41						
F 35.5	35.5	51.5						
F 40	40	56	8	4	8	8	3	27
F 45	45	61						
F 50	50	66						
F 55	55	71						
F 63	63	79						
F 67	67	87						
F 70	70	90	10	5	10	10	3	33
F 71	71	91						
F 75	75	95						
F 80	80	100						
F 85	85	105						
F 90	90	110						
F100	100	120						
F112	112	132						
F120	120	140						
F125	125	150						
F140	140	165	12	6	12.5	12.5	3	39.5
F145	145	170						
F160	160	185						
F165	165	190						
F180	180	205						
F190	190	215						
F200	200	225						
F236	236	261						
F250	250	275						
F280	280	312						
F300	300	332	14	7	16	16	3	47
F315	315	347						
F335	335	367						
F475	475	507						
F500	500	532						
F630	630	670						
F670	670	710	16	8	20	20	3	55

Note: The packing standard material is nitrile rubber. For SUPER RUBBER and fluoro rubber orders, please contact us.

MV packing

- **Nitrile rubber** (Valqua No. 2632-MVV)
- **SUPER RUBBER** (Valqua No. 2632-MVV)
- **Fluoro rubber** (Valqua No. 4632-MVV)

Goes together with Valqua standard V packings (Valqua No. 2630-VNV)



Unit: mm

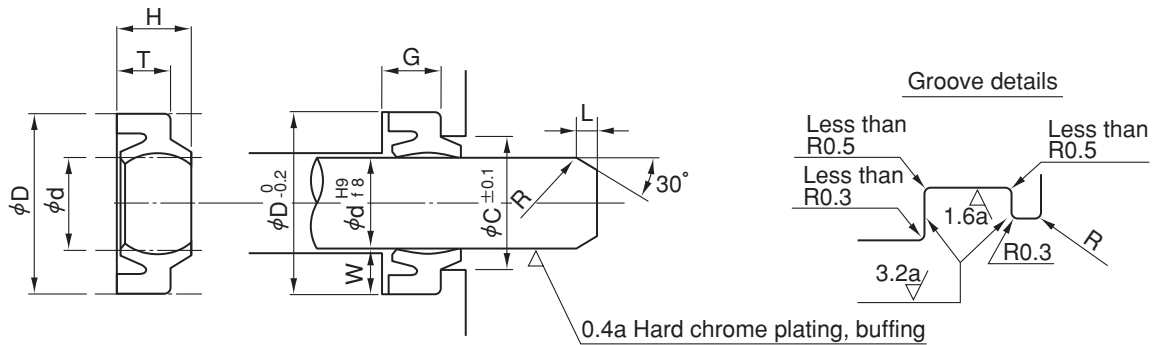
Nominal number	d	D	H	B	W	Adapter		SL
						Female C	Male A	
V 40	40	60	12	6	10			37
V 95	95	125						
V100	100	130						
V110	110	140						
V120	120	150						
V125	125	155						
V130	130	160						
V135	135	165						
V140	140	170						
V145	145	175						
V150	150	180						
V160	160	190	14	7	15	10	3	41
V170	170	200						
V180	180	210						
V190	190	220						
V200	200	230						
V210	210	240						
V220	220	250						
V230	230	260						
V240	240	270						
V250	250	280						
V300	300	330						

Note: The packing standard material is nitrile rubber. For SUPER RUBBER and fluoro rubber orders, please contact us.

Dust seal

DHS series

- **TOUGHRETHANE** (Valqua No. E9625-DHS)
- **Nitrile rubber** (Valqua No. 2060-DHS)
- **Fluoro rubber** (Valqua No. 4060-DHS)



Unit: mm

Nominal number	d	D	H	T	C	G ^{+0.3} ₀	L	W
*DHS 11.2	11.2	19.2	6	4.5	15.5	5		
*DHS 14	14	22			18.3			
DHS 16	16	24			20.3			
DHS 18	18	26			22.3			
DHS 20	20	28			24.3			
DHS 22.4	22.4	30.4			26.7			
*DHS 23.5	23.5	31.5			27.8			
DHS 25	25	33			29.3			
DHS 28	28	36			32.3			
DHS 30	30	38			34			
*DHS 31.5	31.5	39.5	6.5	5	35.5	6	2	4
*DHS 32	32	40			36			
DHS 35	35	43			39			
DHS 35.5	35.5	43.5			39.5			
*DHS 38	38	46			42			
DHS 40	40	48			44			
DHS 45	45	53			49			
DHS 50	50	58			54			
*DHS 53	53	61			57			
*DHS 55	55	63			59			
DHS 56	56	64	60					
*DHS 60	60	68	64					
DHS 63	63	71	67					
*DHS 65	65	73	69					
DHS 67	67	75	71					
*DHS 70	70	80	8	6	75	7		5
DHS 71	71	81			76			
*DHS 75	75	85			80			
DHS 80	80	90			85			
DHS 85	85	95			90			
DHS 90	90	100			95			
*DHS 98	98	108			103			
DHS100	100	110			105			
DHS112	112	122			117			
DHS125	125	138			132			
*DHS136	136	149	143					
DHS140	140	153	147					
*DHS145	145	158	152					
DHS160	160	174	167					
*DHS165	165	179	172					
DHS180	180	194	187					
*DHS200	200	214	207					
*DHS204	204	218	211					
*DHS230	230	244	237					

Note 1: The dust seal can be used with a single groove. However, for DHS 22.4 and below, use with a split groove.

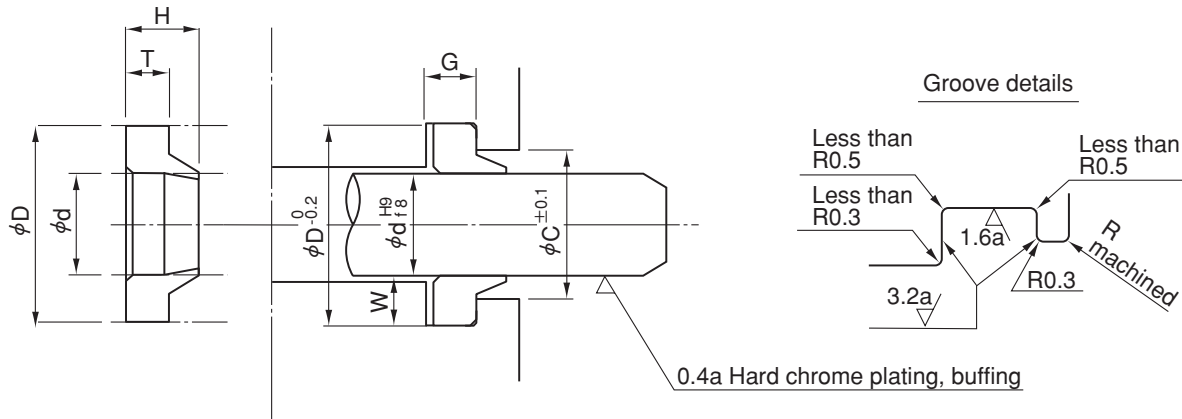
Note 2: Materials indicated by the asterisk are made from TOUGHRETHANE only.

Dust seal

DRL series

TOUGHRETHANE (Valqua No. E9625-DRL)

For nitrile rubber and fluoro rubber orders, please contact us.



Unit: mm

Nominal number	d	D	T	H	C	G ^{+0.3} ₀	W	Nominal number	d	D	T	H	C	G ^{+0.3} ₀	W							
DRL 6.3	6.3	14.9	4.2	7	10.5	4.4	4.3	DRL 92	92	105.1	7.2	11	97.9	7.4	6.55							
DRL 7.1	7.1	15.9			11.5		4.4	DRL 95	95	108.2	5.2	8	5.4	101.1	5.4	6.6						
DRL 8	8	16.9			12.5		4.45	DRL100	100	113.2				106.1								
DRL 9	9	17.9			13.5		4.35	DRL105	105	120.2				111.9								
DRL10	10	18.9			14.2		4.7	DRL106	106	121.2				112.9								
DRL11.2	11.2	19.9			15.5		4.45	DRL110	110	125.2				116.9								
DRL12.5	12.5	21.9			17.5		5.45	DRL112	112	127.2				118.9								
DRL14	14	22.9			18.5		5.45	DRL115	115	126.2				120.3								
DRL15	15	23.9			19.5		5.45	DRL118	118	133.2				124.9								
DRL16	16	24.9			20.5		5.45	DRL120	120	135.2				126.9								
DRL18	18	28.9	22.9	5.45	DRL125	125	140.2	131.9														
DRL20	20	30.9	24.9	5.45	DRL130	130	145	136.9	7.5													
DRL21.5	21.5	30.4	26	4.45	DRL132	132	147	138.9														
DRL22.4	22.4	33.3	5.2	9	27.3	5.4	DRL135	135		154	143.5											
DRL25	25	35.9	4.2	7	29.9	4.4	DRL140	140		159	148.5											
DRL27	27	37.9	5.2	9	31.9	5.4	DRL145	145		164	153.5											
DRL28	28	38.9	4.2	7	32.9	4.4	DRL150	150		169	158.5											
DRL30	30	40.9			34.9		DRL155	155		170	161.9											
DRL31.5	31.5	42.9			36.8		5.7	DRL160		160	179	168.5										
DRL32	32	43			6.2		10	37		6.4	DRL165	165	184	173.5								
DRL35	35	46			5.2		8	40		5.4	DRL170	170	189	178.5								
DRL35.5	35.5	46.5						40.5	DRL175		175	194	183.5									
DRL38	38	49						6.2	10		43	6.4	DRL180	180	204	190.3						
DRL40	40	51						5.2	8		45	5.4	DRL190	190	214.2	200.5						
DRL45	45	56									50		DRL200	200	224.2	210.6						
DRL47	47	58									6.2		10	52	6.4	DRL204	204	219.2	211.2			
DRL48	48	59	5.2	8		53					5.4		DRL210	210	234.2	220.6						
DRL50	50	61				57							DRL212	212	236.2	11	17	222.6	11.2			
DRL53	53	66				58.8							DRL220	220	244.2	7	11	230.6	7.2			
DRL55	55	68				60.8							6.5	5.4	DRL224	224	247.2	11	17	11.2	11.6	
DRL56	56	69			61.8	DRL225	225			248.2												
DRL60	60	73			65.8	DRL230	230			254.2					7	11	240.6					7.2
DRL63	63	76			68.8	DRL236	236			259.2					11	17	245.6					11.2
DRL64	64	77.1			7.2	11	69.9	7.4	6.55	DRL240		240			264.2	7.2	12.1					
DRL65	65	78			5.2	8	70.8	5.4	DRL250	250		274.2			250.6							
DRL67	67	80					72.8		DRL260	260		279			8.8							14
DRL70	70	83	75.8	DRL265			265		288.8	10.8	17	275.2			11							
DRL71	71	84	76.8	6.5			5.4		DRL270	270	289	8.8			14							9
DRL75	75	88	80.8						DRL280	280	309											
DRL80	80	93	85.8						DRL290	290	309		293.4									
DRL85	85	98.2	91						DRL300	300	329		298.6									
DRL90	90	103.2	96						6.6	DRL315	315		334	313.4								
																		323.6				

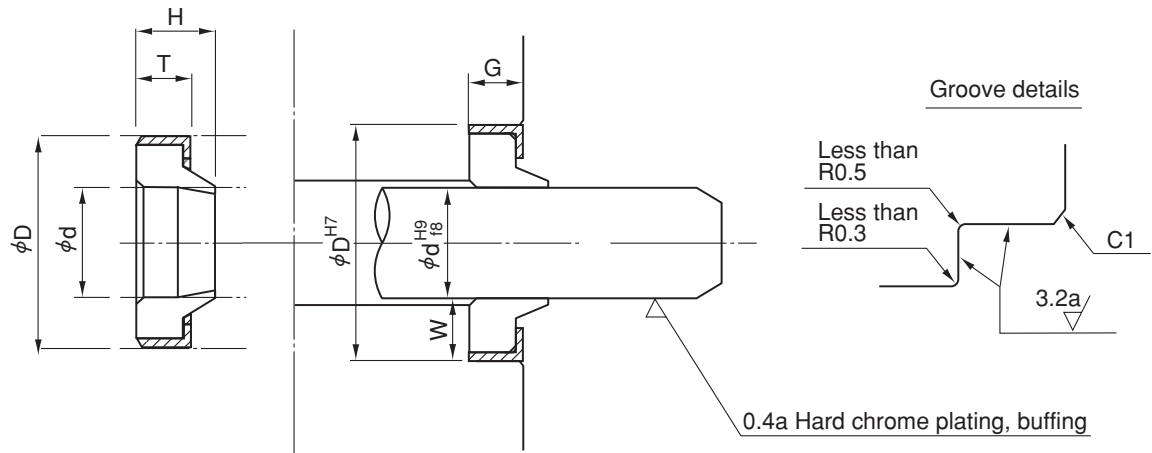
Note: The standard material is TOUGHRETHANE

Dust seal

DSL series

● TOUGHRETHANE (Valqua No. E9625-DSL)

For nitrile rubber and fluoro rubber orders, please contact us.



Unit: mm

Nominal number	d	D	T	H	G ^{+0.3} ₀	W	Nominal number	d	D	T	H	G ^{+0.3} ₀	W							
DSL 6.3	6.3	16	5	7	5	4.65	DSL 92	92	106	6	8	6	8							
DSL 7.1	7.1	17				4.95	DSL 95	95	109											
DSL 8	8	18				5	DSL100	100	114											
DSL 9	9	19					DSL105	105	121											
DSL10	10	20					DSL106	106	122											
DSL11.2	11.2	21					4.9	DSL110	110					126						
DSL12.5	12.5	23				5	7	5	5.25					DSL112	112	128	6	8	6	8
DSL14	14	24							DSL115					115	127					
DSL15	15	25							DSL118					118	134					
DSL16	16	26							DSL120					120	136					
DSL18	18	30	6	9	6	6	DSL125	125	141	8	11	8	8							
DSL20	20	32				DSL130	130	146												
DSL21.5	21.5	31.5				5	DSL132	132	148											
DSL22.4	22.4	34.4				6	DSL135	135	155											
DSL25	25	37	6	7	5	6	DSL140	140	160	10	10	8	10							
DSL27	27	39					6	DSL145	145					165						
DSL28	28	40					5	DSL150	150					170						
DSL30	30	42					5	DSL155	155					171						
DSL31.5	31.5	44	7	10	7	6.25	DSL160	160	180	8	11	8	8							
DSL32	32						DSL165	165	185											
DSL35	35	47	6	8	6	6	DSL170	170	190	10	10	8	10							
DSL35.5	35.5	47.5					DSL175	175	195											
DSL38	38	50					7	10	7					6	DSL180	180	205			
DSL40	40	52					6	8	6					6	DSL190	190	215			
DSL45	45	57	7	10	7	6	DSL200	200	225	12.5	12.5	12	12.5							
DSL47	47	59					DSL204	204	220											
DSL48	48	60					DSL210	210	235											
DSL50	50	62					6.25	DSL212	212					237						
DSL53	53	67	6	8	6	7	8	DSL220	220	245	10	14	10	10						
DSL55	55	69					8	11	8	8					DSL224	224	249			
DSL56	56	70					12	17	12	12					DSL225	225	250			
DSL60	60	74					8	11	8	8					DSL230	230	255			
DSL63	63	77					12	17	12	12					DSL236	236	261			
DSL64	64	78					8	11	8	8					DSL240	240	265			
DSL65	65	79					8	11	8	8					DSL250	250	275			
DSL67	67	81					10	14	10	10					DSL260	260	280			
DSL70	70	84					12	17	12	12					DSL265	265	290			
DSL71	71	85					10	14	10	10					DSL270	270	290			
DSL75	75	89	6	8	6	7	10	DSL280	280	310	10	14	10	10						
DSL80	80	94					10	14	10						10	DSL290	290			
DSL85	85	99					10	14	10						10	DSL300	300	330		
DSL90	90	104					10	14	10						10	DSL315	315	335		

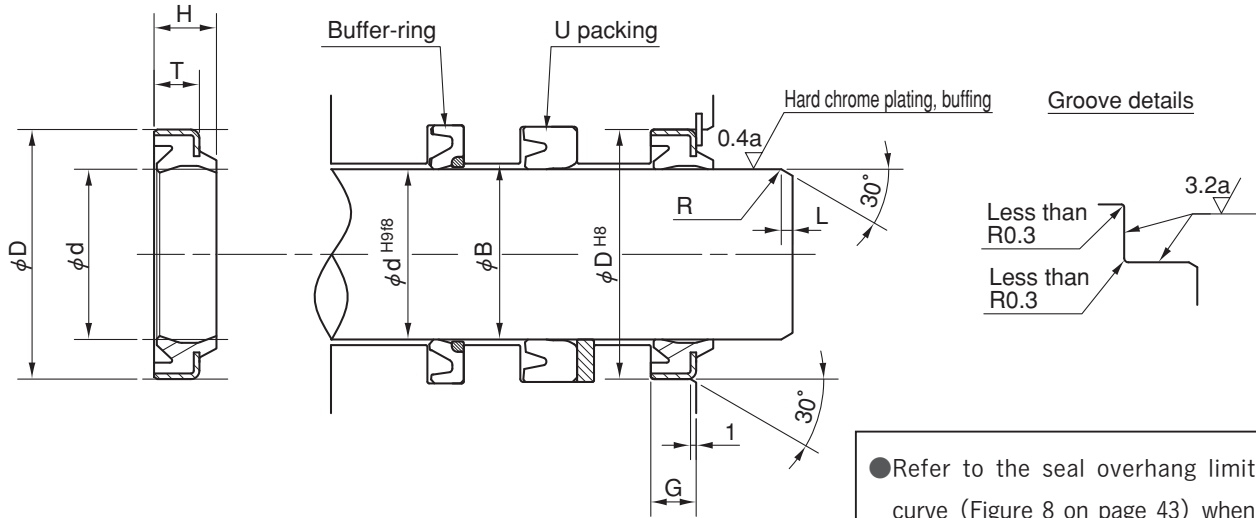
Note: The standard material is TOUGHRETHANE

Dust seal

DSB series

TOUGHRETHANE (Valqua No. E9625-DSB)

The standard material is TOUGHRETHANE R5590-S (material ID).



● Refer to the seal overhang limit curve (Figure 8 on page 43) when determining B dimensions.

Unit: mm

Nominal number	d	D	T	H	G	L
DSB 40	40	52	7	10	7 ^{+0.5} _{+0.3}	3
DSB 45	45	57				
DSB 50	50	62				
DSB 55	55	69				
DSB 60	60	74				
DSB 65	65	79				
DSB 70	70	84				
DSB 75	75	89	8	11	8 ^{+0.6} _{+0.4}	
DSB 80	80	94				
DSB 85	85	99				
DSB 90	90	104				
DSB 95	95	109				
DSB100	100	114	9	12	9 ^{+0.6} _{+0.4}	
DSB105	105	121				
DSB110	110	126				
DSB115	115	131				
DSB120	120	136				
DSB125	125	141	10	14	10 ^{+0.6} _{+0.4}	
DSB130	130	146				
DSB140	140	160				
DSB150	150	170				

Dust seal

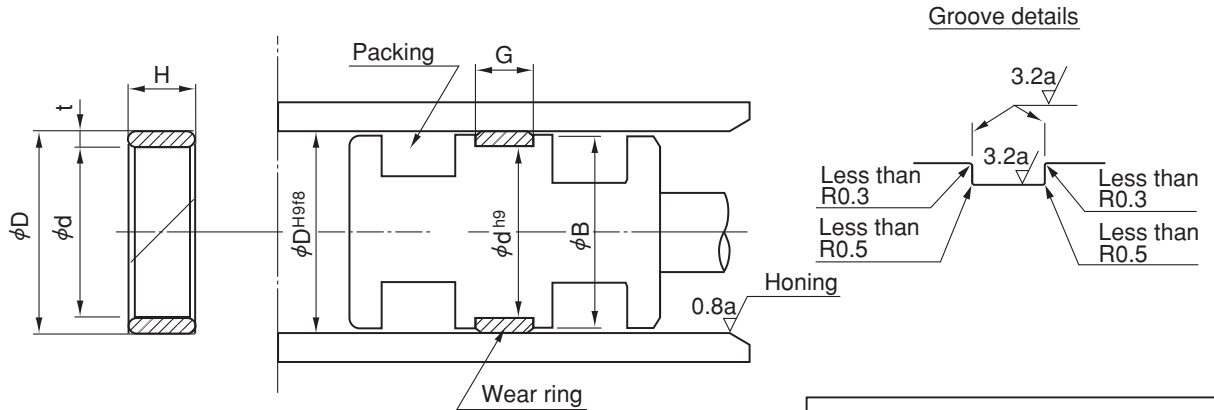
Wear ring

WPL series

(Valqua No. 432-WPL)

The standard material is cloth-inserted phenol resin.

Please contact us when ordering VALFLON (PTFE), polyamide plastic and other products.



● Dimension B should conform to the packing being used.

Unit: mm

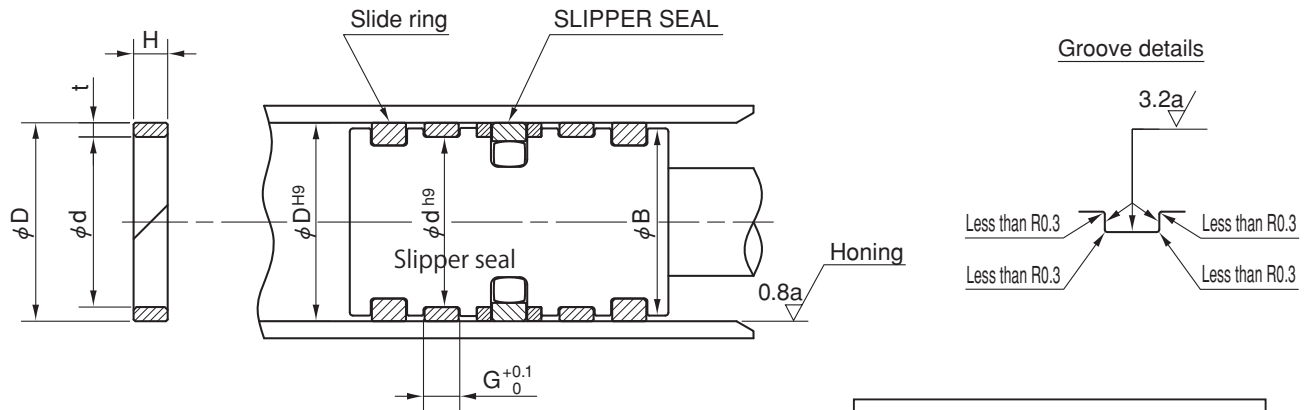
Nominal number	D	d	H	t	G ^{+0.1 0}	
WPL 31.5	31.5	27.5	8	2	8	
WPL 32	32	28				
WPL 35.5	35.5	31.5	10		10	
WPL 40	40	36				
WPL 45	45	41	12			12
WPL 50	50	46				
WPL 56	56	50	16	16		
WPL 63	63	57				
WPL 71	71	65	20		20	
WPL 80	80	74				
WPL 90	90	84	25			25
WPL100	100	94				
WPL112	112	106	30	30		
WPL125	125	119				
WPL140	140	134	40		40	
WPL150	150	144				
WPL160	160	154	50			50
WPL170	170	164				
WPL180	180	174	60	60		
WPL190	190	184				
WPL200	200	194	60		60	
WPL224	224	218				
WPL250	250	244	60			60

Wear ring

WPG series

(Valqua No. 432-WPG)

The standard material is glass-inserted polyamide.



● Dimension B should conform to the packing being used.

Unit: mm

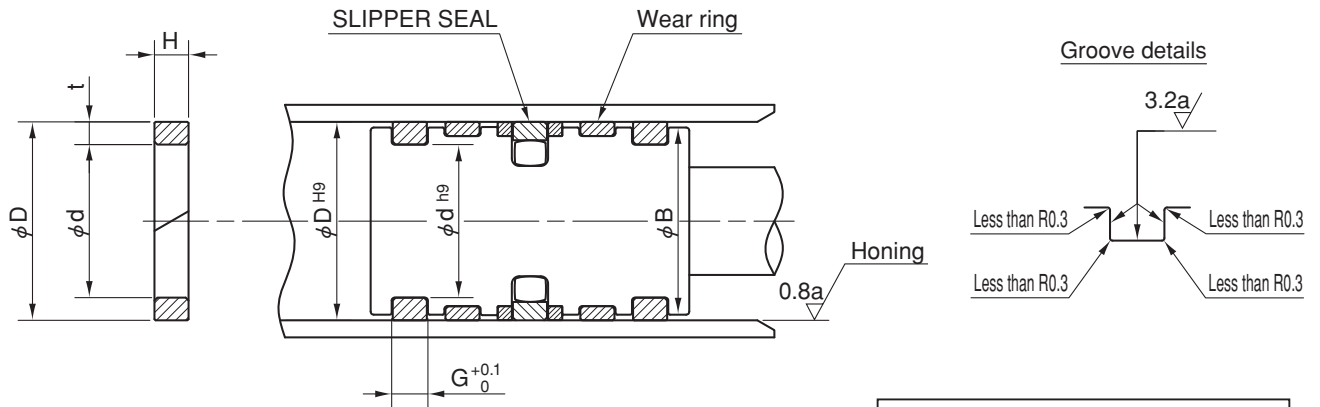
Nominal number	D	d	H	t	G
WPG 80	80	75	6	2.5	6
WPG 85	85	80			
WPG 90	90	85			
WPG 95	95	90			
WPG100	100	95			
WPG105	105	100	8	2.5	8
WPG110	110	105			
WPG115	115	110			
WPG120	120	115			
WPG125	125	120			
WPG130	130	125	9.5	3	9.5
WPG135	135	130			
WPG140	140	135			
WPG145	145	140			
WPG150	150	145			
WPG165	165	159	20	3	20
WPG170	170	164			
WPG180	180	174			
WPG190	190	184			
WPG200	200	194			
WPG215	215	209			

Slide ring

SRPG series

(Valqua No. ENPLA-SRPG)

The standard material is glass-inserted polyamide.



● Dimension B should conform to the packing being used.

Unit: mm

Nominal number	D	d	H	t	G
SRPG 80	80	72	6		6
SRPG 85	85	77			
SRPG 90	90	82			
SRPG 95	95	87			
SRPG100	100	92			
SRPG105	105	97			
SRPG110	110	102			
SRPG115	115	107	8	4	8
SRPG120	120	112			
SRPG125	125	117			
SRPG130	130	122			
SRPG135	135	127			
SRPG140	140	132			
SRPG145	145	137			
SRPG150	150	142	9.5		9.5
SRPG160	160	152			
SRPG165	165	157			
SRPG170	170	162			
SRPG180	180	172			
SRPG190	190	182			
SRPG200	200	192			
SRPG215	215	207			

Rotating X ring

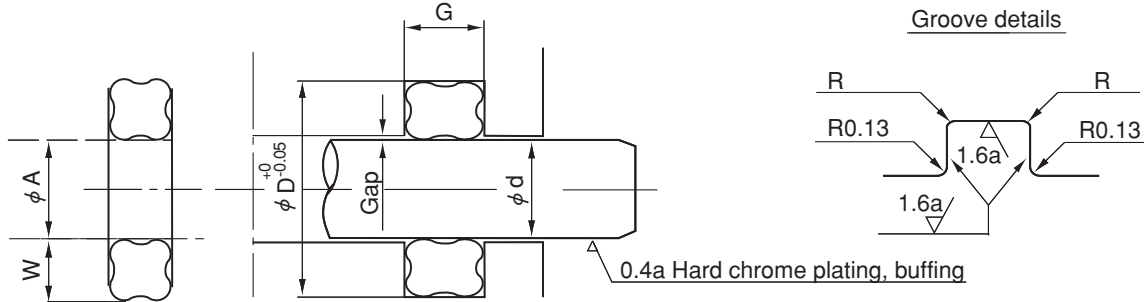
- Nitrile rubber (Valqua No. 4641)
- Fluoro rubber (Valqua No. 4641)

Please consult with us when ordering SUPER RUBBER.

Types and usage limitations

Valqua No.	Material	Usage limitations
641	Nitrile rubber Rubber hardness Shore A = 80	Pressure 3.9MPa {40kgf/cm ² } or less Speed 3m/s or less Temperature 80°C or less
4641	Fluoro rubber Rubber hardness Shore A = 80	Pressure 3.9MPa {40kgf/cm ² } or less Speed 3m/s or less Temperature 150°C or less

Note: The values in the table are reference limit values for pressure, temperature and speed under typical conditions. Please contact us regarding specific details.



(For R55 and above, only nitrile rubber is available.)

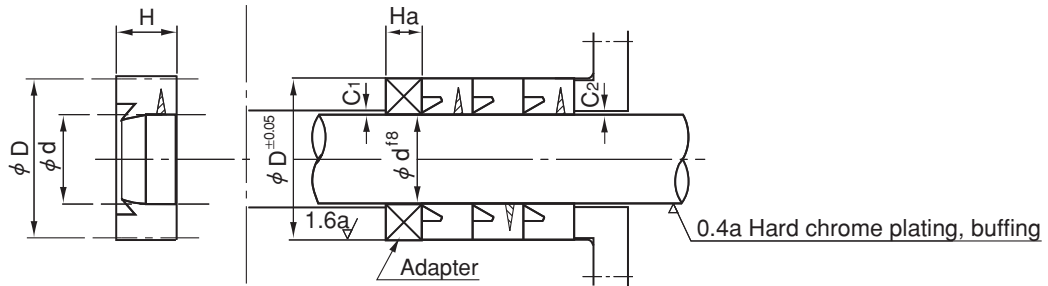
Unit: mm

Nominal number	Shaft diameter		Packing dimensions			Groove dimensions			Diameter gap
	d		W	A		D ⁰ _{-0.05}	G ^{+0.13} ₀	R	
R 7	7	+0 -0.015	2.1	7.4	±0.15 (±0.3)	10.7	2.6	0.4	0.18 or less
R 8	8								
R 9	9								
R 10	10								
R 11	11	+0 -0.018	2.7	11.5	±0.15 (±0.3)	15.9	3.2	0.4	
R 12	12			12.5		16.9			
R 13	13			13.6		17.9			
R 14	14			14.6		18.9			
R 15	15			15.6		19.9			
R 16	16			16.8		20.9			
R 17	17			17.8		21.9			
R 18	18			19.0		22.9			
R 19	19	20.0	23.9	±0.25 (±0.5)	5.1	0.8			
R 20	20	21.2	24.9						
R 21	21	22.2	25.9						
R 22	22	23.2	26.9						
R 24	24	25.2	31.9				±0.25 (±0.5)	6.5	0.25 or less
R 25	25	26.2	32.9						
R 26	26	27.2	33.9						
R 28	28	29.2	35.9						
R 30	30	31.2	37.9						
R 32	32	33.2	39.9						
R 35	35	36.3	42.9						
R 38	38	39.3	45.9						
R 40	40	41.4	47.9	±0.4	6.5	0.25 or less			
R 42	42	43.5	49.9						
R 45	45	46.5	52.9						
R 48	48	49.6	55.9						
R 50	50	51.7	57.9						
R 55	55	56.7	65.6						
R 60	60	61.8	70.6						
R 65	65	67.0	75.6						
R 70	70	72.0	80.6	±0.4	6.5	0.25 or less			
R 75	75	77.5	85.6						
R 80	80	82.4	90.6						
R 90	90	92.7	100.6						
R100	100	-0.035		103.0		110.6			

Note: Dimension tolerances in parentheses apply to Valqua No. 4641

Hydraulic lip packing

- Cloth-inserted natural rubber (Valqua No. 2710)
- Cloth-inserted nitrile rubber (Valqua No. 2710)



Unit: mm

Nominal number	d	D	H	C ₁	C ₂
H 50	50	80	22	0.17 or less	0.03 or less
H 75	75	105			
H100	100	130			
H125	125	155			
H150	150	190	30	0.20 or less	0.10 or less
H175	175	215			
H200	200	240			
H225	225	265			
H250	250	290			
H275	275	325			
H300	300	350			
H325	325	375			
H350	350	400	37	0.30 or less	0.15 or less
H375	375	425			
H400	400	450			
H425	425	475			
H450	450	500			
H475	475	525			
H500	500	550			
H525	525	575			
H550	550	600			
H575	575	625			
H600	600	650			
H625	625	675			
H650	650	700			
H675	675	725			
H700	700	750			
H725	725	775			
H750	750	800			
H800	800	850			
H850	850	900			
H900	900	950			

Types and applications

Valqua No.	Material	Application			
		Machine used	Fluid type	Temperature	Pressure
710	Cloth-inserted natural rubber	Hydraulic press ram	Water, warm water	70°C	29.4MPa {300kgf/cm ² }
2710	Cloth-inserted nitrile rubber	Hydraulic press or hydraulic press ram	Water, warm water Petroleum based operating oil	80°C	29.4MPa {300kgf/cm ² }

Note: The values in the table are reference limit values for pressure and temperature under typical conditions. Please contact us regarding specific details.

Adapter dimensions table

Unit: mm

d	D	Height Ha	Tightenin δ_2
50~125	d+30	15 $\begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	2.2
150~250	d+40	20 $\begin{smallmatrix} +2 \\ 0 \end{smallmatrix}$	3.0
275~500	d+50	25 $\begin{smallmatrix} +3 \\ 0 \end{smallmatrix}$	3.7
525~900			

Note: Use a gland packing (Valqua No. 61) for the adapter.

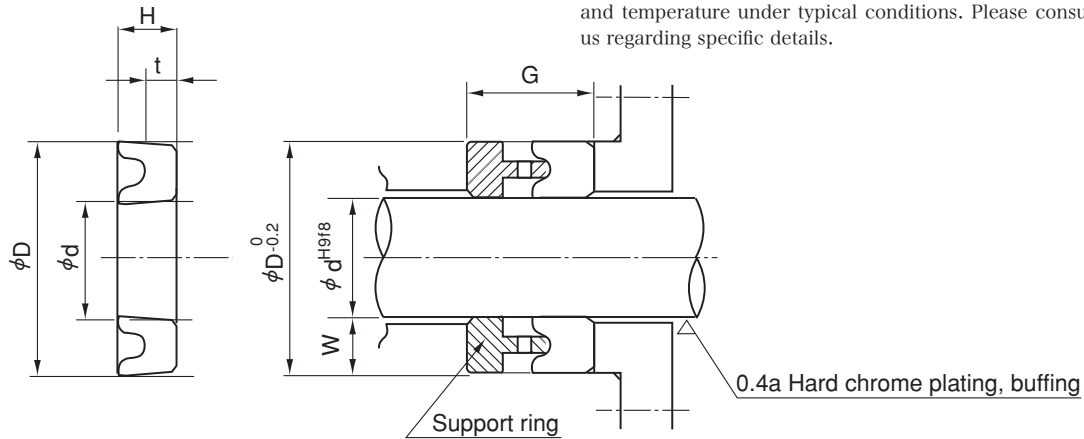
Cloth-inserted U packing

- Cloth-inserted nitrile rubber (Valqua No. 2625U)
- Cloth-inserted fluoro rubber (Valqua No. 4625U.4625U)

Types and applications

Valqua No.	Application			
	Machine used	Fluid	Temperature	Pressure
2625	Rod seals and piston seals for various cylinders	Water, warm water Petroleum based operating oil	80°C	20.6MPa {210kgf/cm ² }
4625		Phosphate ester type hydraulic oil	150°C	

Note: The values in the table are reference limit values for pressure and temperature under typical conditions. Please consult with us regarding specific details.



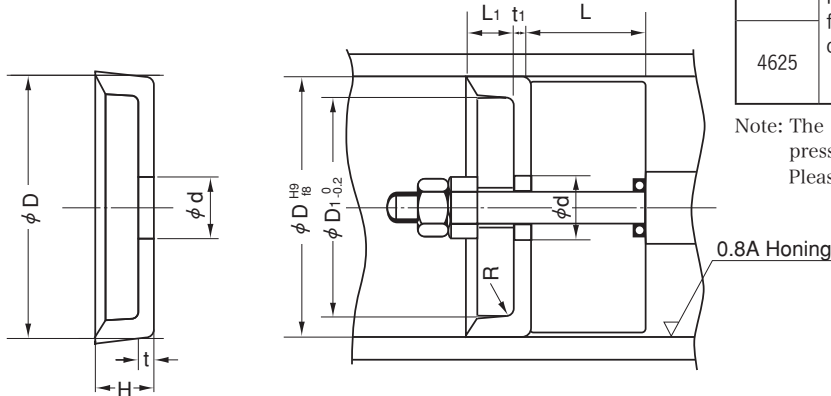
Unit: mm

Nominal number	d	D	H	t	G	W	Nominal number	d	D	H	t	G	W
U 18	18	33	7.5	3	15 ^{+0.3} ₀	7.5	U140	140	170	15	6	26 ^{+0.6} ₀	15
U 20	20	35					U145	145	175				
U 22	22	37					U150	150	180				
U 25	25	40					U160	160	190				
U 25A		45					U170	170	200				
U 28	28	48					U180	180	210				
U 30	30	50					U190	190	220				
U 32	32	52	U200	200	230								
U 35	35	55	U210	210	240								
U 38	38	58	U220	220	250								
U 40	40	60	10	4	19 ^{+0.4} ₀	10	U230	230	260				
U 42	42	62					U230A	270					
U 45	45	65					U240	240	280				
U 48	48	68					U250	250	290				
U 50	50	70					U275	275	315				
U 55	55	75					U300	300	340				
U 60	60	80					U325	325	365				
U 65	65	85					U350	350	390				
U 70	70	90					U375	375	415				
U 75	75	95					U400	400	440				
U 80	80	100					U425	425	465				
U 80A		110					U450	450	490				
U 85	85	115					U475	475	515				
U 90	90	120					U500	500	540				
U 95	95	125					U525	525	565				
U100	100	130					U550	550	590				
U105	105	135					U575	575	615				
U110	110	140	U600	600	640								
U115	115	145	U625	625	665								
U120	120	150	U650	650	690								
U125	125	155	U675	675	715								
U130	130	160	U700	700	740								
U135	135	165											

Note: There are cases where no molding dies are available for the dimensions indicated in the above table, so please consult with us when ordering.

Cloth-inserted L packing

- Cloth-inserted nitrile rubber (Valqua No.2625L)
- Cloth-inserted fluoro rubber (Valqua No.4625L)



Types and applications

Valqua No.	Application			
	Machine used	Fluid type	Temperature	Pressure
2625	Piston seal for various cylinders	Water, warm water Petroleum based operating oil	80°C	6.9MPa {70kgf/cm ² }
4625		Phosphate ester type hydraulic oil	150°C	

Note: The values in the table are reference limit values for pressure and temperature under typical conditions. Please consult with us regarding specific details.

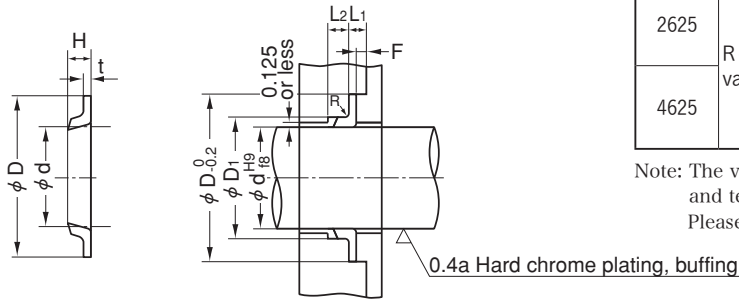
Unit: mm

Nominal number	D	d	H	t	t ₁	L	L ₁	D ₁	R
L 25	25	10	10	3	2.7	20 and above	5.5	17	2.5
L 28	28							20	
L 30	30							22	
L 32	32							24	
L 35	35	12	12	3	2.7	24 and above	7.5	27	3
L 38	38							30	
L 40	40							32	
L 42	42							34	
L 45	45							37	
L 48	48							40	
L 50	50							42	
L 55	55							47	
L 60	60							52	
L 65	65							57	
L 70	70	16	16	4	3.6	32 and above	10.0	62	3.5
L 75	75							67	
L 80	80							72	
L 85	85							74	
L 90	90							79	
L 95	95							84	
L100	100							89	
L105	105							94	
L110	110							99	
L115	115							104	
L120	120	25	20	5	4.5	40 and above	12.5	109	4
L125	125							114	
L130	130							116	
L135	135							121	
L140	140	40	20	5	4.5	40 and above	12.5	126	4
L145	145							131	
L150	150							136	
L160	160							146	
L170	170							156	
L180	180							166	
L190	190							176	
L200	200							186	
L210	210							193	
L220	220							203	
L230	230	100	25	6	5.4	50 and above	16.0	213	5
L240	240							223	
L250	250							233	
L275	275							258	
L300	300	125	32	6	5.4	64 and above	23.0	283	5

Note: There are cases where no molding dies are available for the dimensions indicated in the above table, so please consult with us when ordering

Cloth-inserted J packing

- Cloth-inserted nitrile rubber (Valqua No. 2625J)
- Cloth-inserted fluoro rubber (Valqua No. 4625J)



Types and applications

Valqua No.	Application			
	Machine used	Fluid type	Temperature	Pressure
2625	Rod seal for various cylinders	Water, warm water Petroleum based operating oil	80°C	3.4MPa {35kgf/cm ² }
4625		Phosphate ester type hydraulic oil	150°C	

Note: The values in the table are reference limit values for pressure and temperature under typical conditions.
Please consult with us regarding specific details.

Unit: mm

Nominal number	d	D	H	t	F	L ₁	L ₂	D ₁	R				
J 6	6	30	10	3	4	6.7	10	14	3				
J 8	8							16					
J 10	10							18					
J 10A	12	40						20					
J 12								23					
J 15								26					
J 15A	15	50	10	3	4	6.7	10	28					
J 18	18							30					
J 20	20							33					
J 22	22	36											
J 25	25	60						12	4	5	8.6	12	39
J 25A	25												41
J 28	28		43										
J 30	30	80	12	4	5	8.6	12						46
J 32	32												49
J 35	35												51
J 35A	35	100						12	4	5	8.6	12	53
J 38	38												56
J 40	40												59
J 42	42	120	16	5	6	10.5	16						61
J 45	45												66
J 48	48												71
J 50	50	145						16	5	6	10.5	16	76
J 50A	50												81
J 55	55												83.5
J 60	60	165	16	5	6	10.5	16						88.5
J 65	65												93.5
J 70	70												98.5
J 70A	70	185						16	5	6	10.5	16	103.5
J 75	75												108.5
J 80	80												113.5
J 85	85	185	16	5	6	10.5	16						118.5
J 90	90												123.5
J 90A	90												128.5
J 95	95	185						16	5	6	10.5	16	133.5
J100A	100												138.5
J105	105												143.5
J110	110	185	16	5	6	10.5	16						148.5
J110A	110												153.5
J115	115												158.5
J120	120	185						16	5	6	10.5	16	163.5
J125	125												163.5
J130	130												163.5
J130A	130	185	16	5	6	10.5	16						163.5
J135	135												163.5
J140	140												163.5
J145	145	185						16	5	6	10.5	16	163.5
J150	150												163.5

Note: There are cases where no molding dies are available for the dimensions indicated in the above table, so please consult with us when ordering.

1 Hydraulic packing name conventions

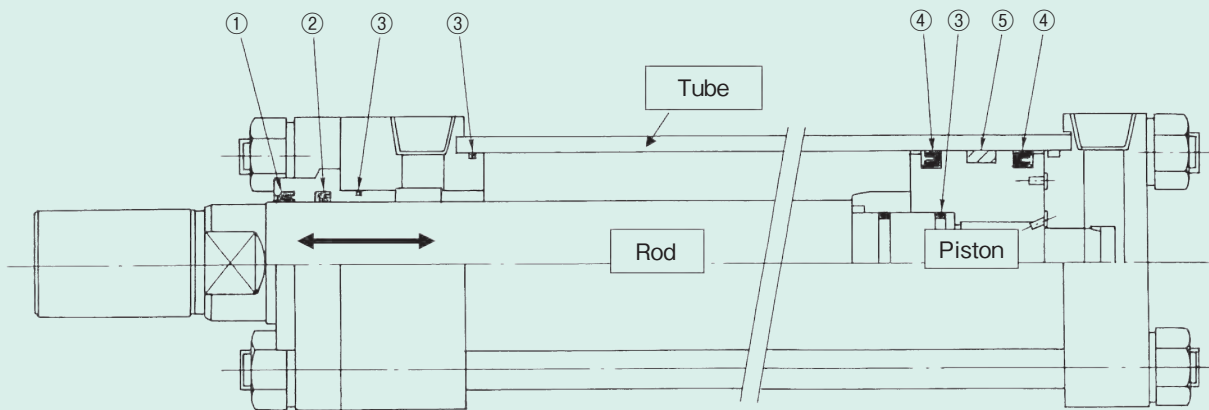


Diagram 1 Hydraulic cylinder packing installation diagram

- ①Dust seal ②Rod packing ③O-ring ④Piston packing ⑤Wear ring

2 Ground design

Please note the following points regarding ground design.

1. For U packing

(1) The dimensional tolerances of the housing and the finishing surface accuracy are as shown in Figure 2. The surface roughness of the sliding part is 0.4a with rubber and 0.8a with cloth-inserted rubber and other materials.

(2) Figure 3 shows the diameter clearance between the diameter D_1 of the piston part of the pressurized side of the piston packing and the cylinder diameter.

(3) As shown in Figure 3, the end of the cylinder tube and the end of the piston rod should be chamfered so as not to damage the packing when installing the packing or assembling the cylinder.

(4) The fit between the tube and the piston is H9/ f8, as shown in Figure 2.

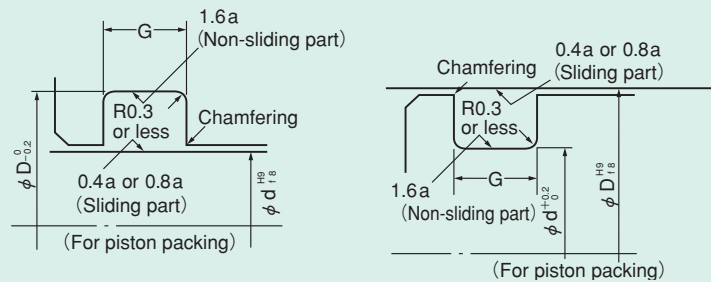


Diagram 2 U packing housing dimensions

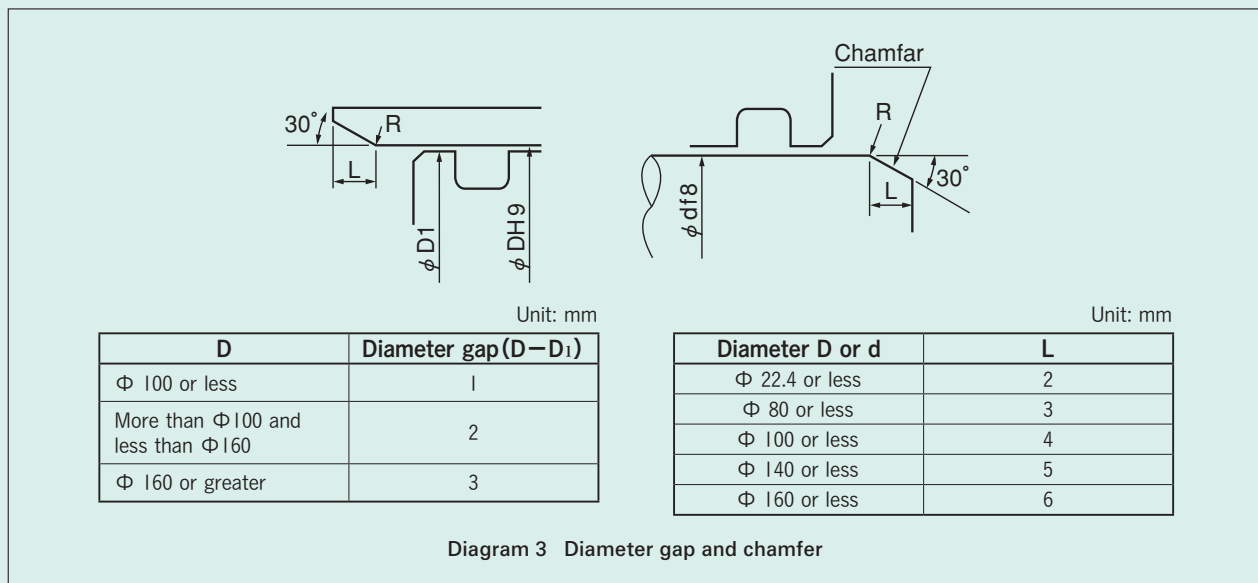
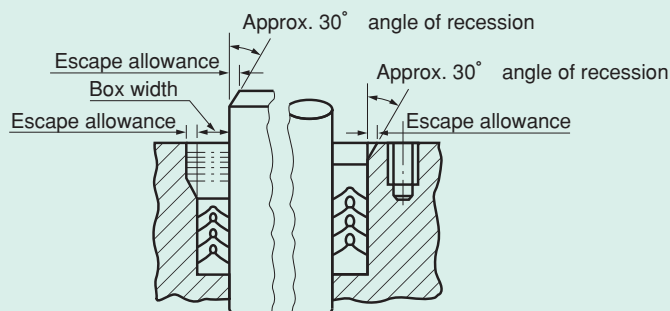


Diagram 3 Diameter gap and chamfer

2. For V packing



Box width	Escape allowance
6 or less	0.8 (1.6 per diameter)
Over 6 and under 10	1.5 (3.0 per diameter)
Over 10 and under 15	2.5 (5.0 per diameter)
Over 15 and under 20	3.5 (7.0 per diameter)
Over 20	4.5 (9.0 per diameter)

Figure 4 V packing insertion area chamfering

3 Using the back-up ring

If the pressure is high, or the gap at the packing attachment point on the sliding side (Figure 5) is large, the heel of the packing will protrude, causing damage. (Figure 6)

In this case, a back-up ring is used in conjunction with a back-up ring to prevent heel overhang. (Diagram 7)

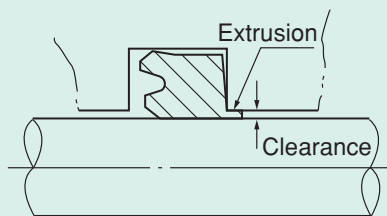


Figure 5 Gap and overhang

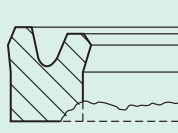


Figure 6 Heel damage

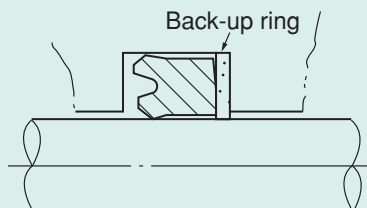


Diagram 7 Use with back-up ring

Factors that may cause the heel part to protrude are related to the gap and pressure of the area where packing is installed and the hardness of the packing rubber. Refer to the seal overhang limit curve in Figure 8 in considering the use of a back-up ring. The design criteria for the back-up ring is shown in Figure 9.

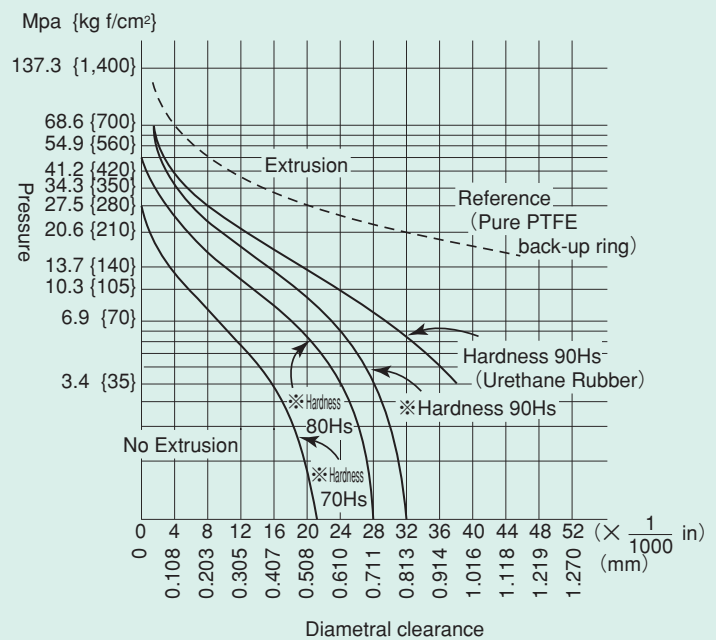
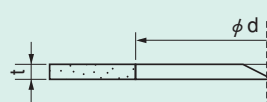


Figure 8 Limits For Extrusion



※For rubber that is other than polyurethane

Unit: mm	
ϕd	t
28 or less	1.5
Over 28 and under 80	2
Over 80 and under 250	3
Over 250 and under 500	4

Diagram 9 Back-up ring design criteria

4 U packing with asymmetric back-pressure protection grooves features

UHP series

UNP series

MLP series

The piston packings are used back to back for double-acting type. In this case, back pressure (reversed pressure, back pressure) is generated. This may cause the packing to be pushed out and the lip on the sliding side to be trapped in the gap between the piston and the cylinder tube, resulting in damage. (Diagram 10 and Diagram 11)

Causes of occurrence include pressure, temperature,

stroke, speed and packing leakage, but nothing conclusive. At present it is not possible to prevent back pressure completely, so we take steps to release it when it occurs.

U-packings with a groove to prevent back pressure are equipped with a "groove" to prevent back pressure. (Diagram 12 and Diagram 13)

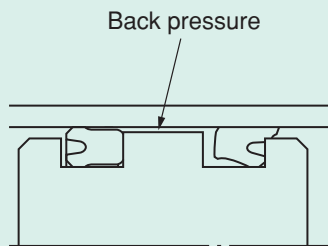


Figure 10 Piston packing crumpling due to back pressure

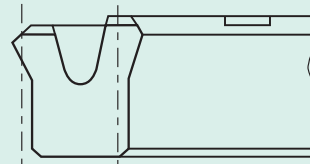


Figure 12 Asymmetrical piston packing with a groove for preventing back pressure (UHP, UNP, MLP series)

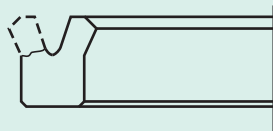


Figure 11 Lip area damage

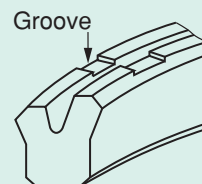
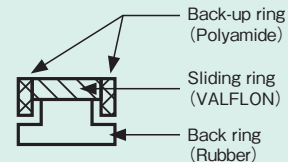
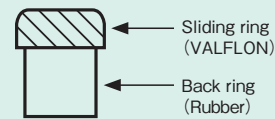


Figure 13 Asymmetrical piston packing with back pressure prevention groove

5 SLIPPER SEAL features

The SLIPPER SEAL is a combination seal with a back-ring (rubber) and a sliding ring (VALFLON) that offers the following advantages.

- Low sliding resistance
- Difficult for stick-slip to occur
- Compact packing slot
- One ring (pair) can seal the fluid from both sides.



6 MV packing features

MV packing is a high-performance composite seal consisting of a special U packing and a rubber V packing with cloth and has the following features.

(1) Seal performance

Since this is a packing with the lip structure of hydraulic U packings, the seal performance is as stable as that of U packings used with a single ring.

(2) Low sliding resistance

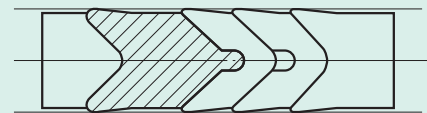
Lower sliding resistance than cloth-inserted rubber V packings.

(3) Pressure resistance

Since the material and rubber hardness are the same as for the hydraulic U packings and V packings, they are used together as a backup ring, it can be used up to 37.3 MPa.

(4) Durability

Life expectancy is the same as that of a conventional V packing-only combination.



MV packing

(5) Installation particulars

In the case of a combination of only V packings, proper tightening is required, while MV packings do not require it, it makes the installation easier. It is compatible with the groove dimensions of conventional cloth-filled rubber V packings.

7 Method for calculating the sliding resistance of packings

For reciprocating actuators such as hydraulic cylinders, it is important to know the resistance of the packing in order to determine the actual output. The following conceptualizes the overall resistance of various packings. Please refer to it.

Packing resistance calculation formula

[Bi-directional]

$$F = \mu k \cdot \pi \cdot d \cdot H \cdot P_g \quad (1)$$

[Rotation]

$$T = F \cdot \frac{d}{2000} \quad (2)$$

Where

- F : packing sliding resistance [N]
- T : Torque [N·m]
- μ : Friction coefficient
- k : Side pressure coefficient
- π : Pi of circumference
- d : Packing slider diameter [mm]
- H : Packing height [mm]
- P_g : Internal pressure [MPa]

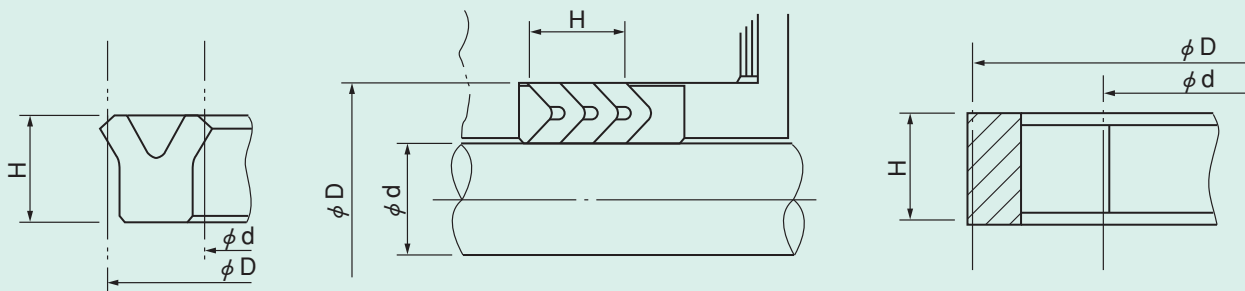
Equations (1) and (2) show that the resistance of the packing is the product of the contact area of the packing, the load (pressure) and the coefficient of friction. The lateral pressure coefficient k indicates the ratio of the stress in the radial direction (as the stress at the sliding part) that is converted from the stress in the thrust direction applied to the packing, which is difficult to measure

It is also difficult to accurately determine the friction coefficient μ from the operating conditions of the actual machine, so if μk is set as a coefficient, it is as follows, based on actual results and experience.

Test material	Item	μk value	
		Dry slide	Oil lubrication
U packing (Rubber component)		0.7~1.0	0.05~0.15
SLIPPER SEAL (VALFLON)		0.2~0.3	0.03~0.10
Cloth-inserted rubber V packing (Cloth-inserted rubber)		0.8~1.0	0.07~0.12

The above calculation method can be used to obtain the packing sliding resistance, but in the low-pressure range, the resistance caused by the packing's own tension must be taken into account. This value depends on the various types of packing, so it is safer to contact us if you are using something at low pressure. This calculation method should be used on the assumption that the overall resistance is determined at the time of design.

Various packing H (can be done at nominal height)



8 Relationship between operating pressure and the number of V packings installed

Classified pressure MPa {kgf/cm ² }	Number of V-packings installed		Adapter material			Spacer material	
	VGH	VNV, VNF	Hard cloth-inserted rubber	Bronze	Aluminum bronze	Bronze	Aluminum bronze
3.9 {40} or less	3	3	○	○	○	○	○
Greater than 3.9 {40} Less than 29.4 {300}	4	4	△	○	○	○	○
Greater than 29.4 {300} Less than 58.8 {600}	—	5	×	△	○	△	○
Over 58.8 {600}	—	6	×	×	○	×	○

Symbol explanation
 ○ : applicable
 △ : Consider conditions of use
 × : Not applicable

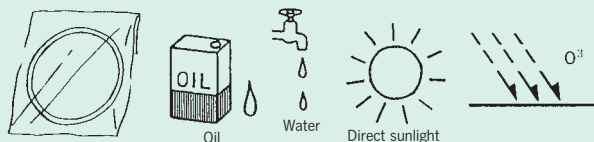
Note: When the pressure exceeds 58.8 MPa (600 kgf/cm²), increasing the number of packings is not very effective, so the use of spacer rings is recommended.

9 Regarding use

9.1 Precautions for storing and installing seals

9.1.1 Storage of seals

- (1) Seals are made with rubber material and deteriorate when exposed to direct sunlight, oil, water, and ozone. Store unused seals in a polyethylene bag.



- (2) Store seals in a cool, dark place where the temperature does not exceed 37°C throughout the year.



- (3) Seal storage period limit

The seal must be assembled onto the equipment within three years of manufacture or use the equipment within one year of its assembly.

9.1.2 Seal assembly

- Keep seals, glands, grease and lubricating oil clean and free from glove lint, debris, dust and foreign matter.
- For ease of installation, generally, grease or lubricant should be thoroughly applied to the seal before installation.
- For directional seals, be careful not to mount them in the opposite direction.
- Take care to ensure that the seal is installed correctly so that it is not twisted, etc.
- As for V packings and other seals that are used by piling up several layers of packing, if air

accumulates between the packing and the other packing during installation, there is a risk of shortening the life of the seal. Use a bamboo spatula or similar tool to vent the air that has accumulated.

- If there is a risk of scratching the threads or edges of the seal during installation, use a jig for installation to prevent scratching.
- Excessive elongation of the seal causes permanent distortion and changes the dimensions.

9.2 SLIPPER SEAL

(Valqua Nos. 7740-APS, APL, APT, CPL)

Installation Procedures

- Attach the rubber ring into the packing groove.
- Attach the VALFLON ring.

The VALFLON ring does not stretch for the most part. Press down R on the end face of the piston or use a tapered jig to press down. (Refer to Table 1)

There is also a method of warming the Valflon ring and inserting it, but because comparatively it does not keep its original properties and is not recommended.

Table 1 R removal and dimensions of the tapered jig Unit: mm

D	R	a	b
~ 100	6	4	0.5
~ 150	8	5	0.8
~ 250	10	6	1.0
~ 500	15	7	1.5
~ 1000		8	2.0

The VALFLON ring may remain distorted when stretched, so please refer to the following method of restoring to its original condition.

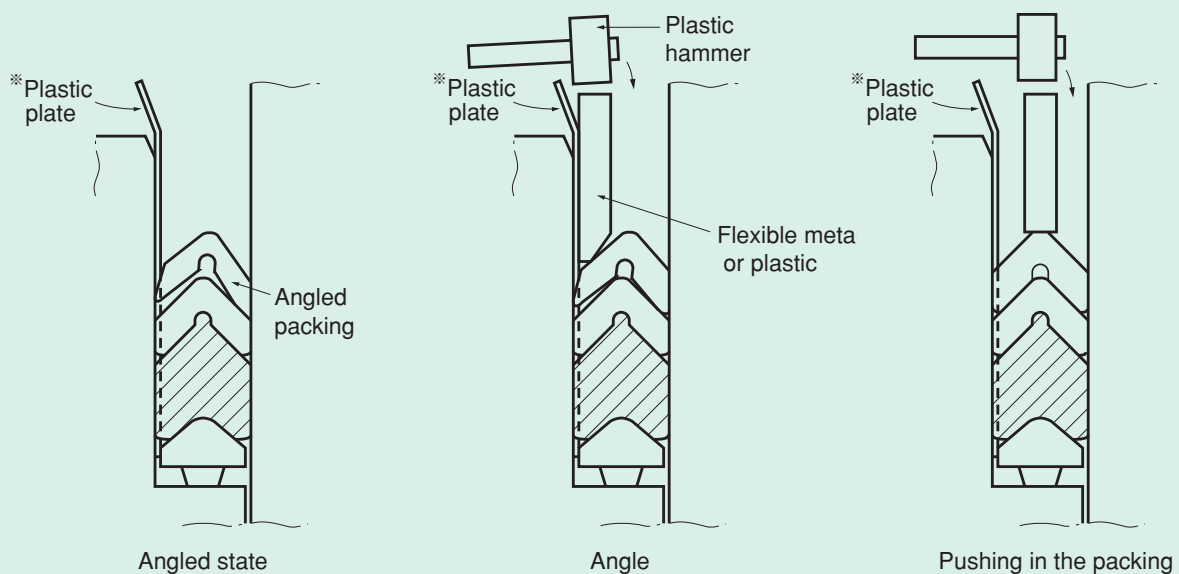
- Soak in heated water or heated oil (about 80°C to 100°C)
- Compress with bands, etc.

9.3 How to install the Valqua MV packing (No. 2632)

- (1) Check that there are no scratches or foreign matter on the part of the packing that will adversely affect the seal, and if so, repair and clean it before applying hydraulic oil.
- (2) Apply lubricant (hydraulic oil or grease) to the packing and adapter.
- (3) Insert the male adapter all the way in.
- (4) Push the MV packing into the male adapter until it is affixed. When inserting the packing, press down on the outer diameter lip of the packing little by little with a soft metal or plastic spatula so as not to damage it.

- (5) Push the V packing into the MV packing until affixed. At this time, the packing is inclined as shown in the figure below and is easy to insert, so correct it so that it will be in the normal position.
- (6) Insert the female adapter after putting in the prescribed number of packings and tighten the packings to complete the process. Refer to the dimensions table for mounting length (SL).

Caution: Endless products are difficult to release air from, so it is easier to install by inserting a 1×10 approx. * plastic plate as shown in the diagram below.

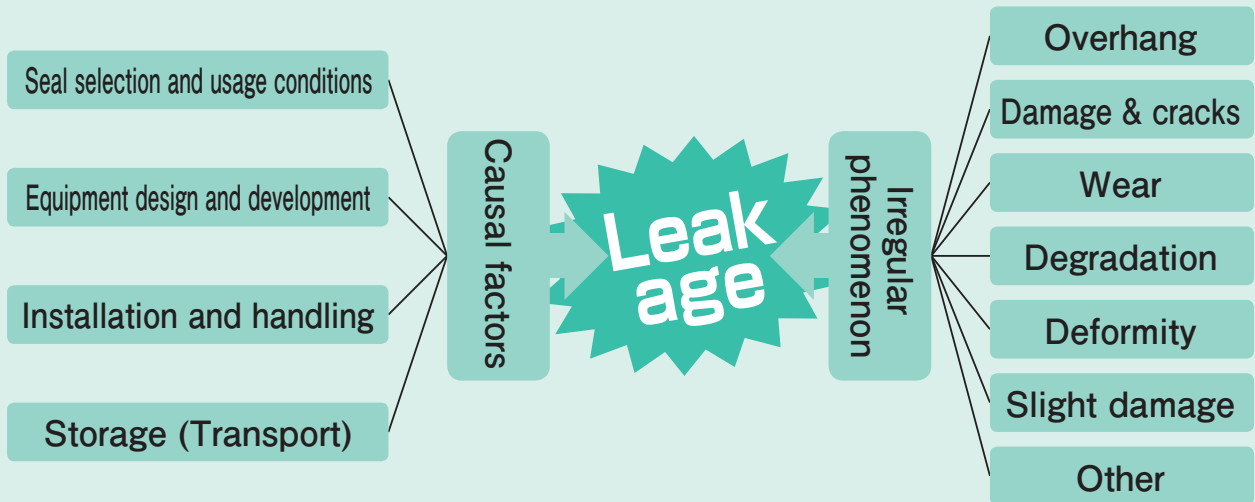


10 Related standards

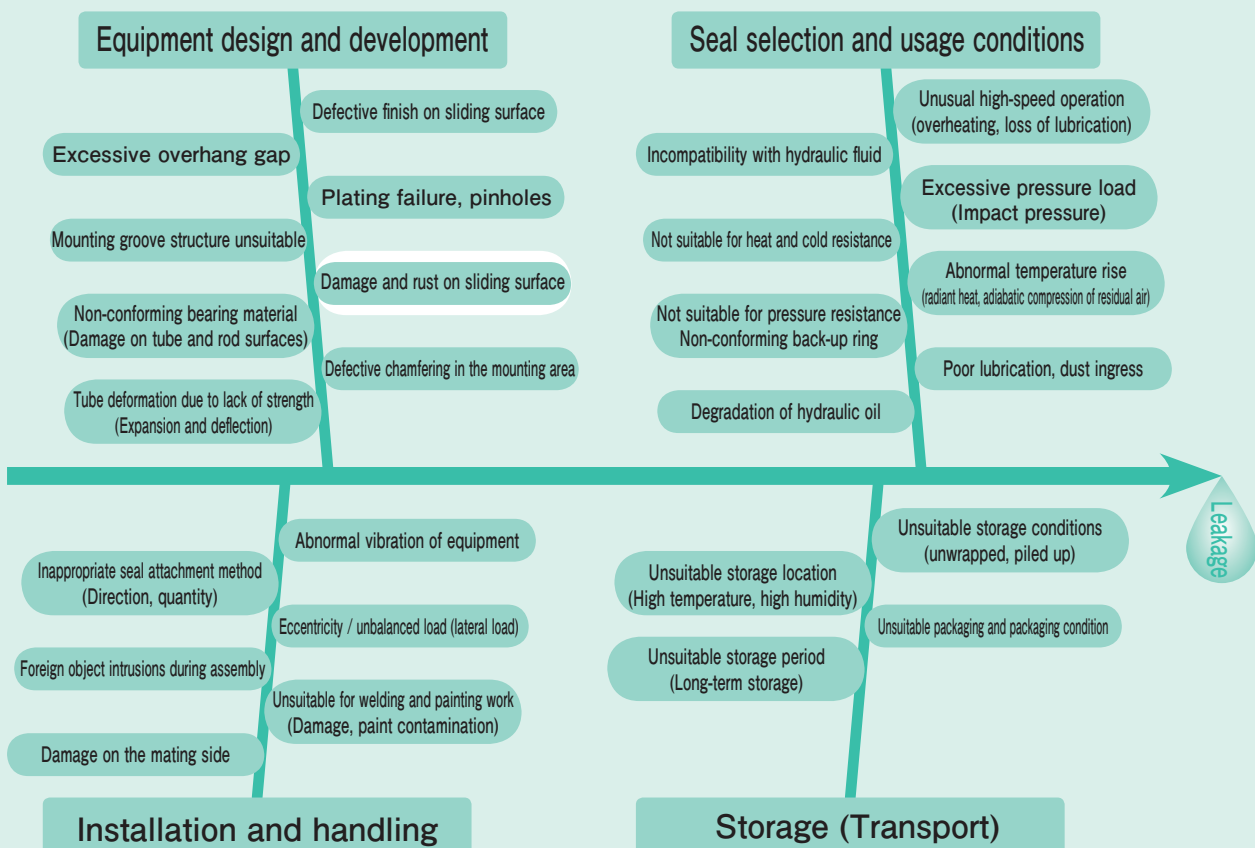
JIS	(Japan Industrial Standards)	JOHS	(Japan Hydraulic Industry Association Standard)
B0125	Hydraulic and pneumatic diagram symbols	JOHS 110	Hydraulic cylinders for steelmaking machinery (Heavy machinery)
B8361	Hydraulic system general regulations	JOHS 112	Hydraulic cylinder packing use and selection guidelines
B8366	General rules for hydraulic and pneumatic cylinder components and symbols		
B8354	Hydraulic cylinder		
B8367	Hydraulic cylinder mounting dimensions		
B2401	O-ring		
B2403	V packing		

1 Causes of sealing problems and countermeasures

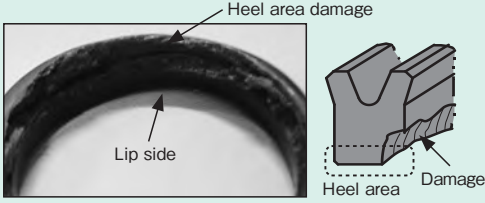


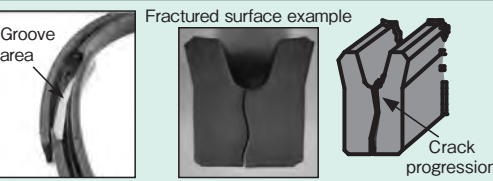
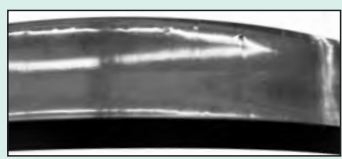
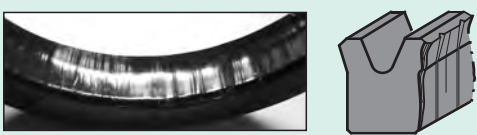
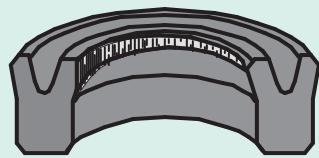
1 Typical leakage factors and abnormal phenomena flow sheet

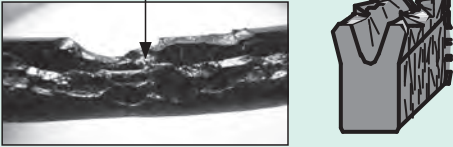
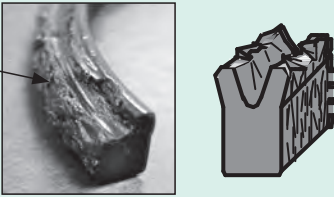
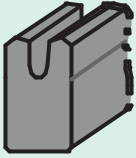
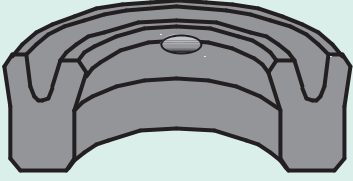
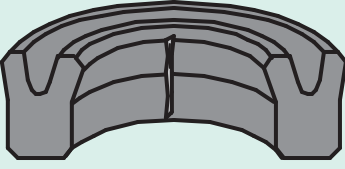
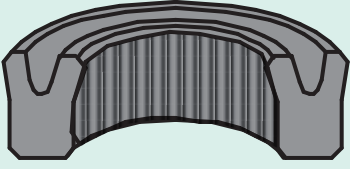


2 Trouble factors (Causal factors and abnormal phenomena) diagram



3 Causes of problems (abnormal phenomena) and countermeasures

External appearance		Cause	Countermeasures
Phenomenon	Condition		
Overhang	 <p>The heel of the sliding part is protruding and damaged.</p>	<ul style="list-style-type: none"> • Gap is large • Pressure is excessive <hr/> <ul style="list-style-type: none"> • Sealant strength insufficient 	<ul style="list-style-type: none"> • Reduce the size of the gaps • Use with back-up ring <hr/> <ul style="list-style-type: none"> • Increase the hardness of the rubber • Re-select the seal shape
	Cracked damage	 <p>The piston packing sliding part lip is missing its circular shape.</p>	<ul style="list-style-type: none"> • Excessive back pressure occurrence
 <p>The sliding part lip is missing across the entire surface.</p>		<ul style="list-style-type: none"> • Abnormal rise in oil temperature • Degradation of rubber materials <hr/> <ul style="list-style-type: none"> • Oil and rubber material incompatibility • Oil degradation 	<ul style="list-style-type: none"> • Change to a rubber material with good heat and oil resistance <hr/> <ul style="list-style-type: none"> • Change to a compatible rubber material • Replace with new oil
 <p>A crack has occurred in the U packing groove (pocket area).</p>		<ul style="list-style-type: none"> • Fatigue failure due to impact pressure <hr/> <ul style="list-style-type: none"> • Breakdown at low temperatures 	<ul style="list-style-type: none"> • Treat to reduce shock pressure • Increase strength of the sealant • Change to a SLIPPER SEAL <hr/> <ul style="list-style-type: none"> • Change to cold-resistant materials
Wear	 <p>The sliding surface has shiny, mirror-like wear.</p>	<ul style="list-style-type: none"> • Lubricant film breakdown due to micro strokes <hr/> <ul style="list-style-type: none"> • Surface is too coarse 	<ul style="list-style-type: none"> • Change to a SLIPPER SEAL <hr/> <ul style="list-style-type: none"> • Change to proper coarseness
	 <p>The entire sliding surface is worn with longitudinal scratches.</p>	<ul style="list-style-type: none"> • Intrusion of wear debris from bearings <hr/> <ul style="list-style-type: none"> • Coarseness of the sliding surface is too poor <hr/> <ul style="list-style-type: none"> • Foreign object contamination 	<ul style="list-style-type: none"> • Examination of bearing materials (metal and plastic) <hr/> <ul style="list-style-type: none"> • Change to proper coarseness <hr/> <ul style="list-style-type: none"> • Change in dust seal shape and/or material
	 <p>Maximum and minimum locations of wear are spatially symmetrical or occur only on one side.</p>	<ul style="list-style-type: none"> • Rod and piston packing attachment point centering <hr/> <ul style="list-style-type: none"> • Wear and abnormal bearing wear due to excessive lateral loads 	<ul style="list-style-type: none"> • Keep the eccentricity within an acceptable range. <hr/> <ul style="list-style-type: none"> • Strengthen wear rings and bearing materials

External appearance		Cause	Countermeasures
Phenomenon	Condition		
Degradation (Hardening Softening)	<p>Defects and ruptures due to loss of rubbery elasticity</p>  <p>The entire packing is hardened. Bending or pressing on the packing will cause cracks or defects.</p>	<ul style="list-style-type: none"> • Increase in oil temperature • Oil and rubber material incompatibility • Oil degradation • Heat generated by high speed sliding 	<ul style="list-style-type: none"> • Lowering the oil temperature • Change to a rubber material with better heat resistance. • Change to a rubber material with better heat resistance. • Change to new oil • Change to low friction material packing (SLIPPER SEAL)
	<p>The entire surface seems to have melted (softening)</p>  <p>The entire packing has become loose and softened.</p>	<ul style="list-style-type: none"> • Oil and rubber material incompatibility 	<ul style="list-style-type: none"> • Check the oil resistance and change the seal material or hydraulic fluid
Deformity	 <p>Prior to use and while using</p>	<ul style="list-style-type: none"> • Permanent deformation due to long-term storage after installation onto equipment • Deformation at low temperatures 	<ul style="list-style-type: none"> • Improve storage methods • Use within 6 months after installation • Change to a rubber material with better cold resistance
	<p>The entire lip of the inner and outer diameter of the packing has been deformed into a straight form that has no tension.</p> <p>After use</p>	<ul style="list-style-type: none"> • Degradation of rubber materials 	<ul style="list-style-type: none"> • Change to a rubber material with good heat and oil resistance
Slight damage	 <p>Partial loss or dent in the lip end of the packing.</p>	<ul style="list-style-type: none"> • External forces that cause localized deformations during storage (contact and contact damage) • Insufficient chamfering of the holes and shaft edges of the packing installation areas • Misalignment and or deviation between the hole and the core shaft. • Use one type of driver when assembling 	<ul style="list-style-type: none"> • Improve storage methods • Increase the amount of chamfering and smooth the corners • To improve shaft core deviation and misalignment • Use jigs for assembling
	 <p>Scratches found on the sliding surface</p>	<ul style="list-style-type: none"> • Mating sliding surface damage • According to the mating surface angle edges • Foreign matter intrusion 	<ul style="list-style-type: none"> • Carry out a thorough inspection prior to assembly • Smooth the edges of the corners • Thorough cleaning and inspection
	 <p>Scratches found on the entire sliding surface.</p>	<ul style="list-style-type: none"> • Mating sliding surface damage • According to the mating surface angle edges • Foreign matter intrusion 	<ul style="list-style-type: none"> • Carry out a thorough inspection prior to assembly • Smooth the edges of the corners • Thorough cleaning and inspection

Regarding orders

■ Example of product number indication

Valqua No. **TE9625—UHP 180**

● Nominal number

Inner diameter of the cylinder, for outer diameter sliding
Indicates the rod diameter dimensions for inner diameter sliding

● Packing type

UHP	U packing piston seal
UNP	U packing piston seal
MLP	U packing piston seal
APS	SLIPPER SEAL
APL	SLIPPER SEAL
APT	SLIPPER SEAL
CPL	SLIPPER SEAL
VNV	cloth-inserted rubber V packing V standard
VNF	cloth-inserted rubber V packing F standard
VGH	synthetic rubber V packing H standard
UHS	U packing rod seal
UHR	U packing rod seal
UNS	U packing rod seal
UNR	U packing rod seal
URHP	U packing rod seal
URBF	buffer-ring rod seal
MVV	MV packing V standard
MVF	MV packing F standard
DHS	dust seal
DRL	dust seal
DSL	dust seal
DSB	dust seal
WPL	wear ring
WPG	wear ring
SRPG	slide ring

2060	Nitrile rubber molded product
4060	Fluorine rubber molded product
TE9625	TOUGHRETHANE molded product
E9625	TOUGHRETHANE molded product
P9625	TOUGHRETHANE molded product
7740	SLIPPER SEAL
7645	Back-up ring
432	Wear ring
2631	Nitrile rubber V packing
2630	Cloth-inserted nitrile rubber V packing
2632	MV packing
4631	Fluoro rubber packing
4630	Cloth-inserted fluoro rubber V packing
2625	Cloth-inserted nitrile rubber irregular packing
4625	Cloth-inserted fluoro rubber irregular packing
641	nitrile rubber x ring
4641	Fluorine rubber x ring
ENPLA	Engineered Plastic Molded Products

■ Example Specifications

- Name of machine used
- Cylinder name
- Lubricant
- Pressure

- Temperature
- Frequency
- Operational method
- Method of sliding surface finishing

- Outer diameter / Inner diameter
- Stroke
- Surface roughness
- Plating or no plating



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

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