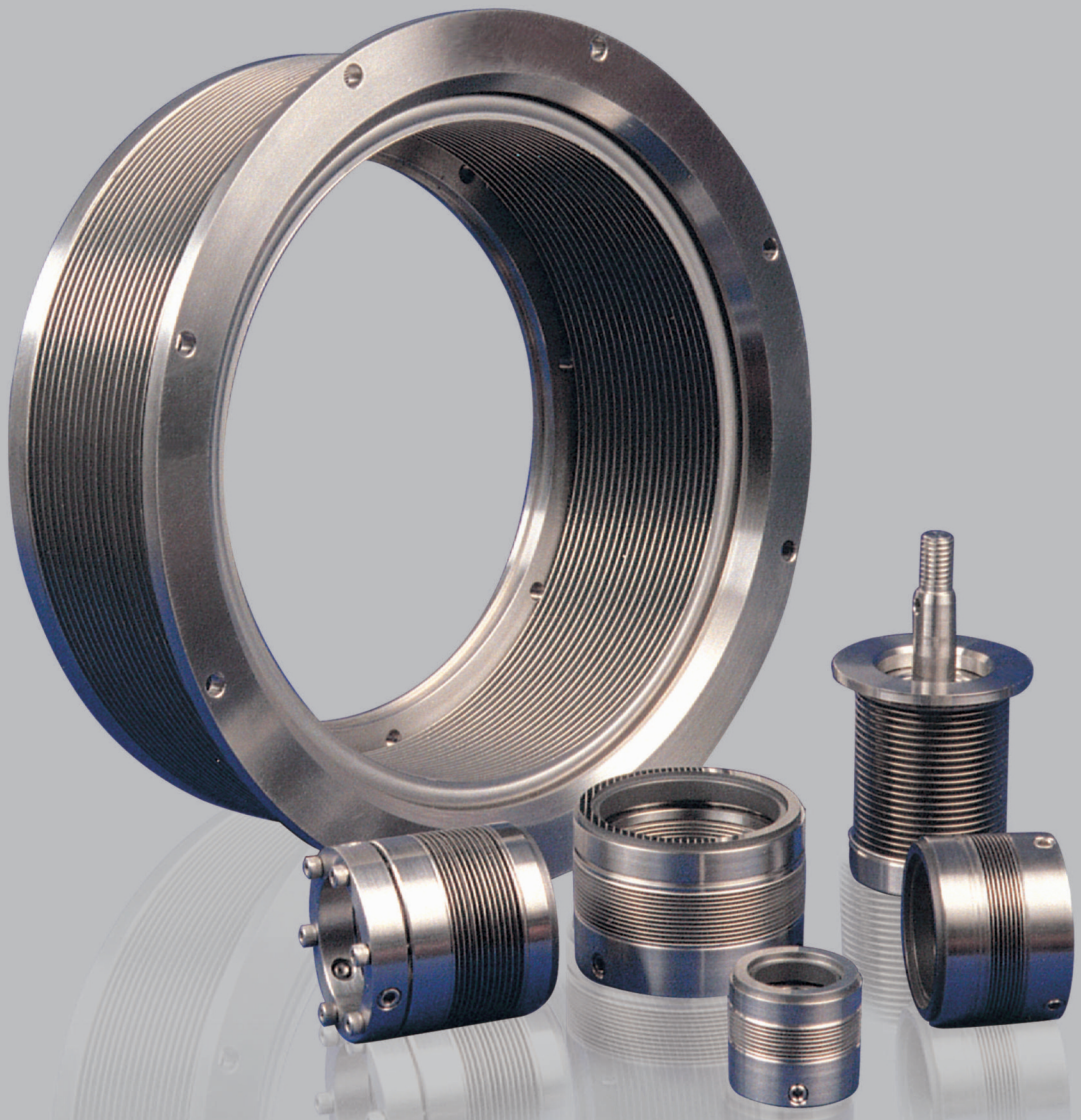
국내업계최초 Metal Bellows 국산화실현, 수출유망중소기업, INNO-BIZ인증
벤처기업선정, 우량기술기업선정, 우수품질인증(EM)획득, Q마크(품질보증)선정

MECHANICAL SEAL

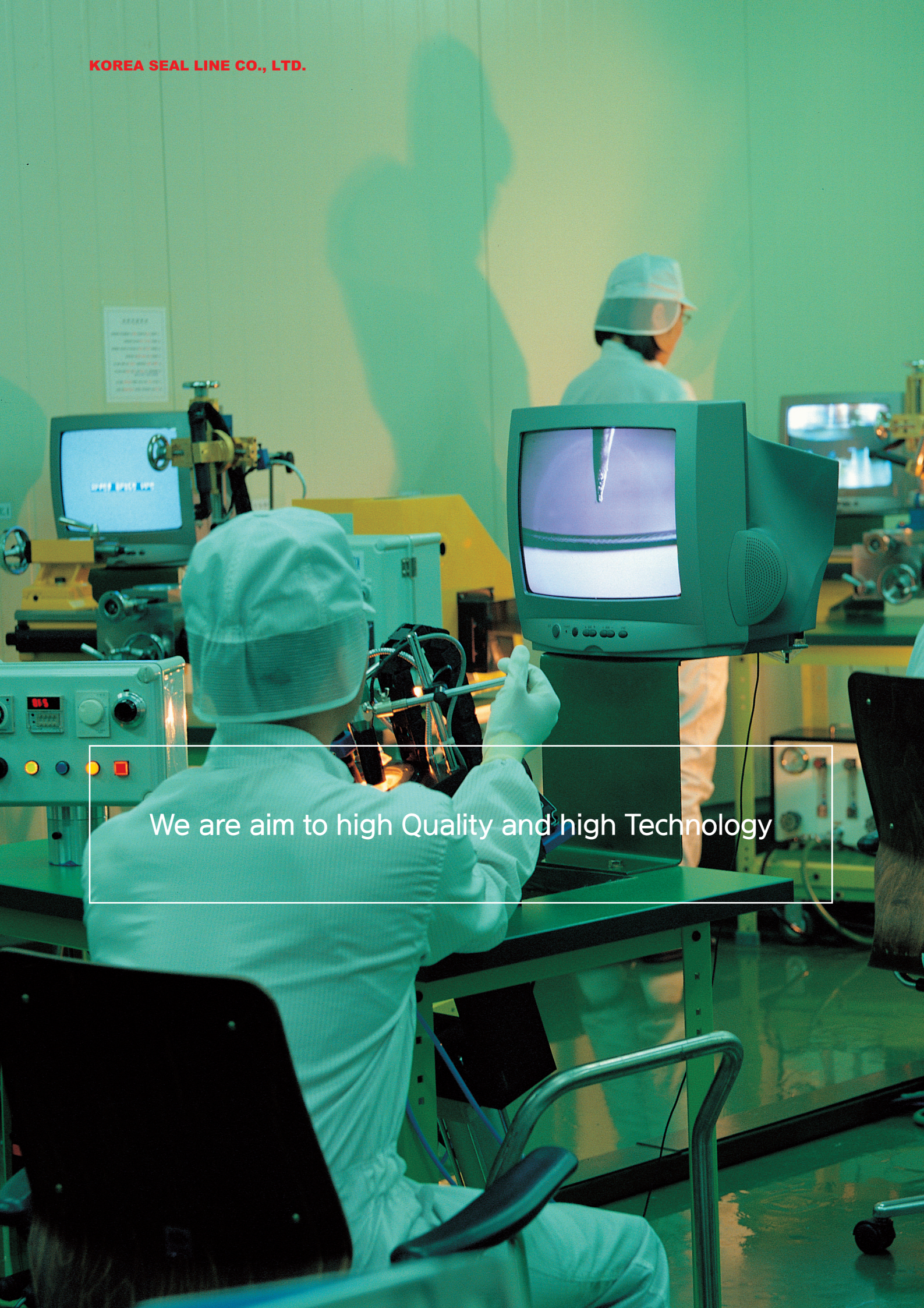
METAL BELLOWS



KSL

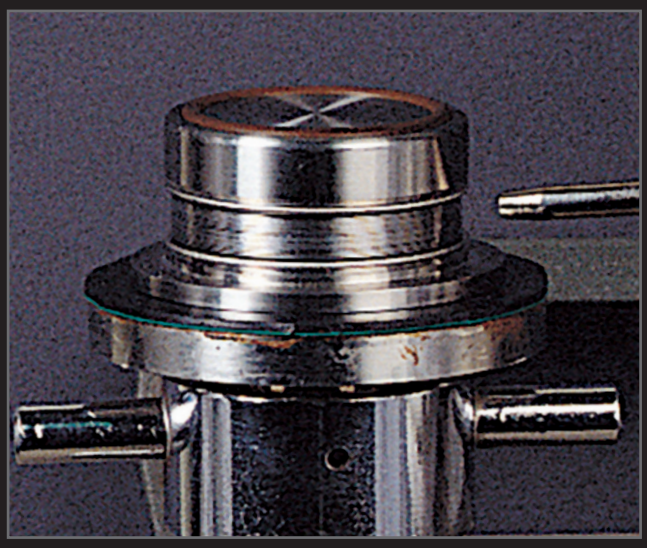
코리아 씰 라인 주식회사

KOREA SEAL LINE CO., LTD.



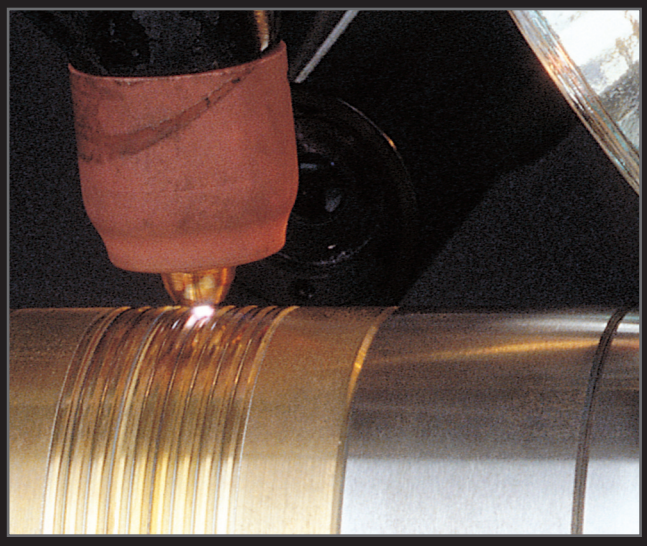
We are aim to high Quality and high Technology

Ultra Precision Welding in Clean Room



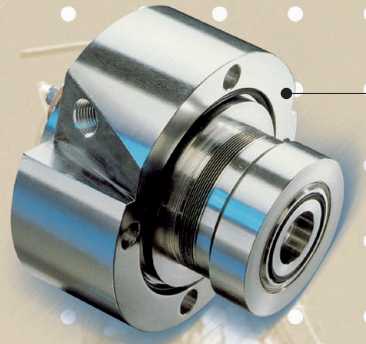
Spectrometer Leak Detector

Bellows Tension Test

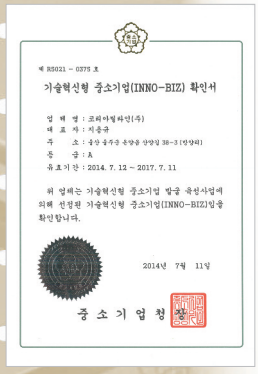


Bellows OD Plasma Welding

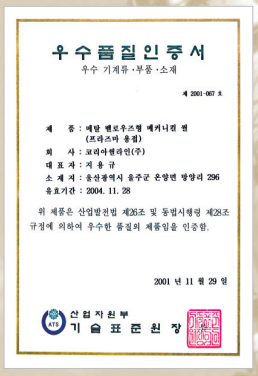
KOREA SEAL LINE CO., LTD.

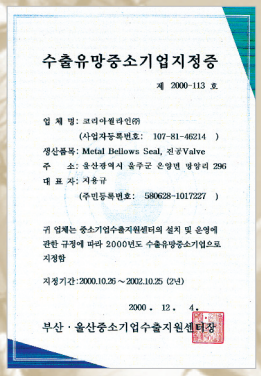


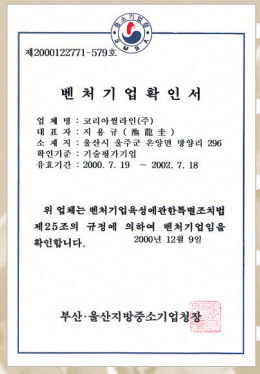
국내업계최초 Metal Bellows 국산화실현, 벤처기업선정, 수출유망중소기업, 우량기술기업, 우수품질(EM)선정 등


기술혁신형 중소기업(INNO-BIZ) 확인서


기업부설연구소 인정서

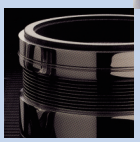

우수품질인증서


수출유망중소기업지정증


벤처기업확인서

코리아 씰 라인(주)는 수년간 각고의 노력 끝에 Welded Metal Bellows를 국내 최초로 자체기술진에 의해 개발됨으로써 수입대체효과는 물론 막대한 로열티를 지불하지 않으므로 국내 중요 기간 사업은 물론, 중화학공업, 반도체장비, 진공 Valve, 우주항공산업에 지대한 영향을 줄 것으로 기대한다. 이에 대한 기술평가는 Mechanical seal 업체 최초 우수벤처기업 선정, 수출유망 중소기업선정, 우량기술기업선정, 우수품질(EM) 선정 등 더욱 정진하여 보다나은 Service를 제공할 예정이다.

KSL *Korea Seal Line Co., Ltd*
President : Jee Yong Gyoo



KOREA SEAL LINE CO., LTD.

Process

Pump

Seal

Agitator

Catalog

CONTENTS

Ⅰ. Mechanical Seal 의 선정 및 구조

1. Korea Seal Line 의 적용 기준

Mechanical Seal 제조방법에 관하여 DIN 24960 및 ISO 3069의 Dimension에 입각하여 생산·설계하고 있으며, 이에 따른 보조장치는 API 610 규정에 따른다.

Korea Seal Line의 모든 제품은 직경 100mm까지는 DIN 규격에 의해 설계·제작되고 있으며, 직경 100mm이상일 경우 ISO규격을 적용하고 있다.

다만 예외적으로 100mm이하일 경우라도 요청에 따라 ISO규격으로 제작 될 수 있어 어떠한 Pump의 Stuffing box에도 맞도록 설계되어 부품의 호환성을 높여 주고 있다.

2. Korea Seal Line의 재질 선정

Mechenical Seal Type의 선정기준 방법은 Type 3 Code와 Shaft dia 3 Code Material 5 Code 방식으로 표기한다.

Korea Seal Line Material : for example(Bellows type, Pusher type)

For Bellows Type Seal :

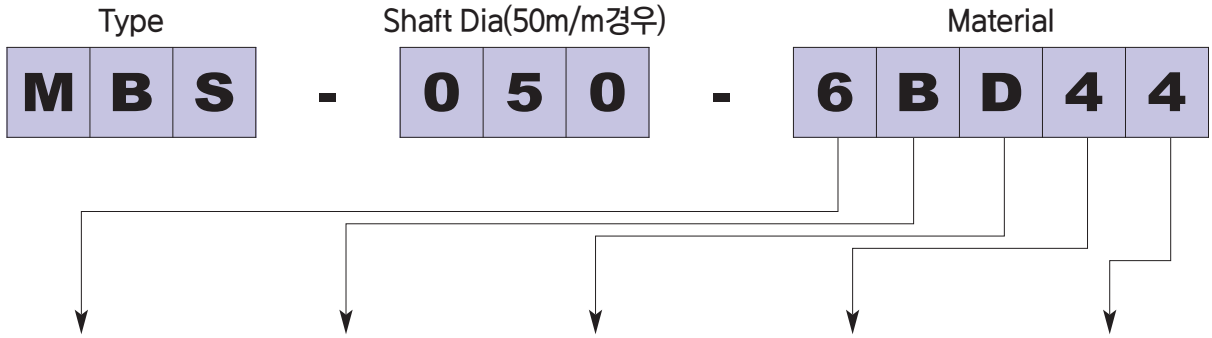
Series NO.	1st.	2nd	3th	4th	5th
Code No.	6	B	D	4	4
Material	Has-C+SUS316	Carbon.P.F	Silicon Carbide·S	Teflon Coated Viton	Teflon Coated Viton
Part Name	Bellows Assembly	Seal Ring	Insert	shaft packing	Insert Mounting

For Pusher Type Seal :

Series NO.	1st.	2nd	3th	4th	5th
Code No.	2	D	A	3	3
Material	SUS316	Silicon Carbide,S	Carbon,S	Viton	Viton
Part Name	Rotary Unit	Seal Ring	Insert	shaft packing	Insert Mounting

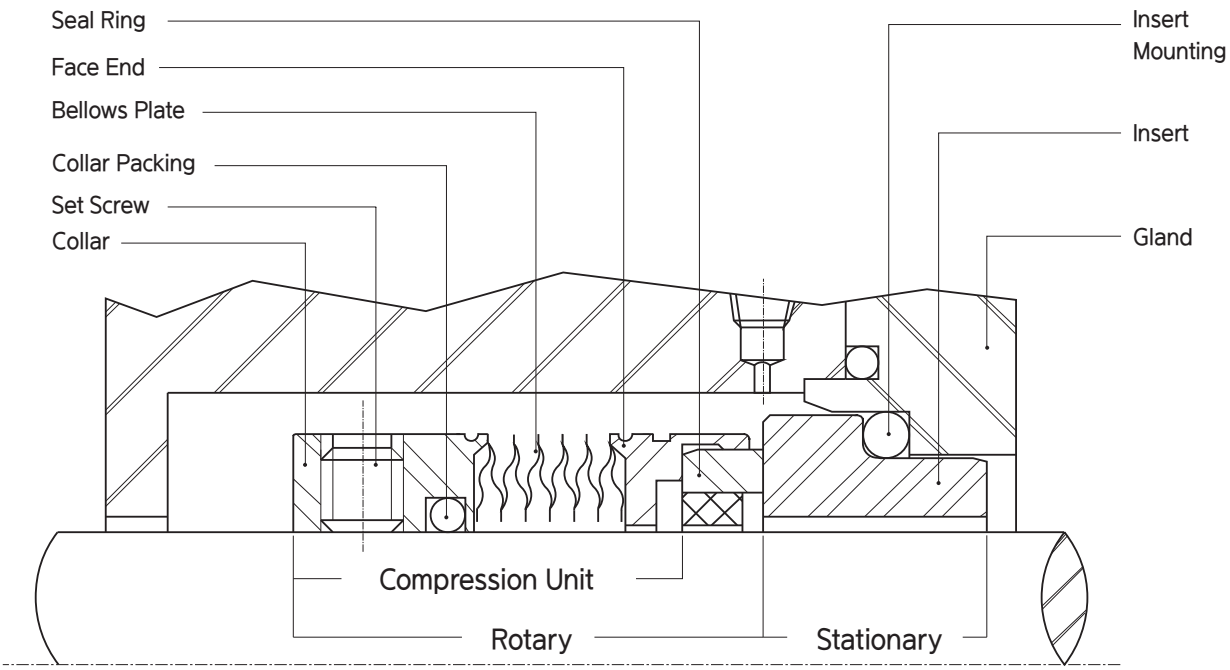
KOREA SEAL LINE Mateial Codes

"S" : Solid
"A" : SUS Fit
"B" : Has Fit

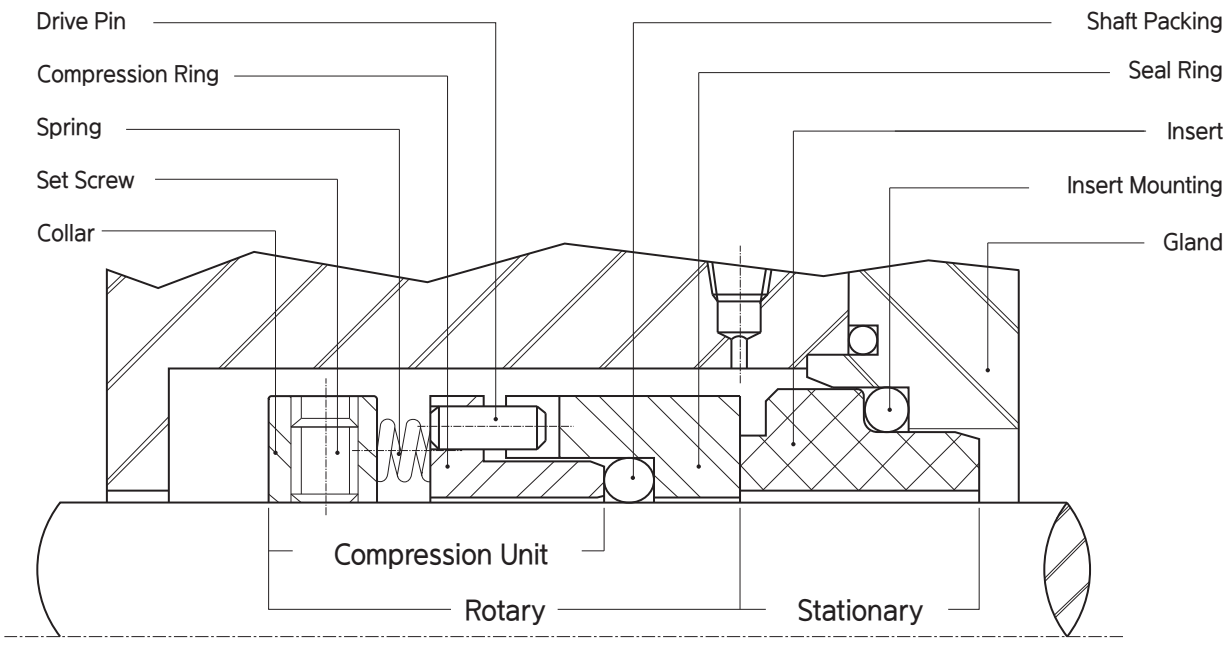


METAL PARTS 1st. digit		ROTARY FACE 2nd. digit		STATIONARY FACE 3th. digit		ROTARY PACKING 4th. digit		STATIONARY PACKING 5th. digit	
Symbol	Material	Symbol	Material	Symbol	Material	Symbol	Material	Symbol	Material
1	SUS 304	A	Carbon Soild	A	Carbon Soild	1	NBR	1	NBR
2	SUS 316	B	Carbon Press Fit	B	Carbon Press Fit	2	NEOPRENE	2	NEOPRENE
3	SUS 316L	C	Silicon Carbide Press Fit	C	Silicon Carbide Press Fit	3	VITON	3	VITON
4	ALLOY 20	D	Silicon Carbide "S"	D	Silicon Carbide "S"	4	TEFLON COATED VITON	4	TEFLON COATED VITON
5	Hastelloy B.C	E	Carbon Anti	E	Carbon Anti	5	KALREZ	5	KALREZ
6	Hastelloy+SUS 316	F	Ceramic Solid	F	Ceramic Solid	6	GRAFOIL	6	GRAFOIL
7	AM 350	G	Ceramic Facing	G	Ceramic Facing	7	TEFLON	7	TEFLON
8	Titanium	H	Tungsten press Fit	H	Tungsten press Fit	8	Silicon	8	Silicon
9	Inconel	I	Tungsten Solid	I	Tungsten Solid	9	EPDM	9	EPDM
10	Special	J	Tungsten Facing	J	Tungsten Facing	10	Special	10	Special
		K	Special	K	Special				

3. Korea Seal Line의 구조의 명칭



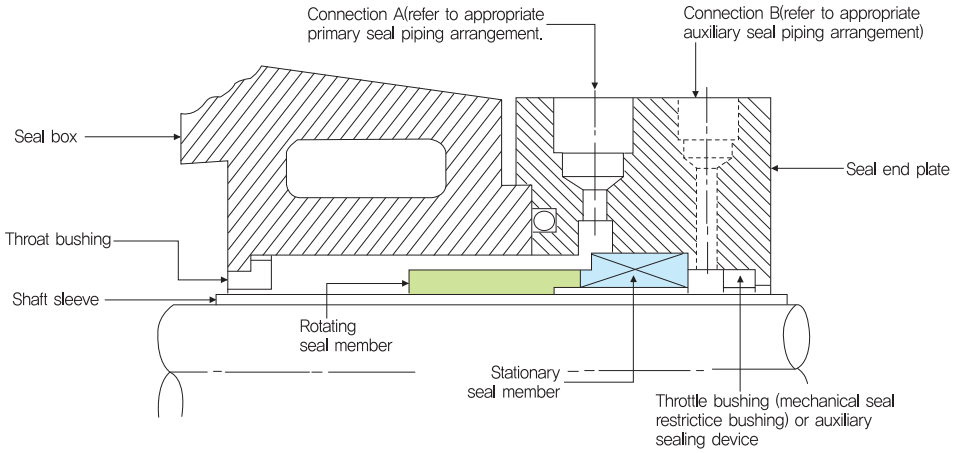
Bellows Seal Type (Non Pusher Type)



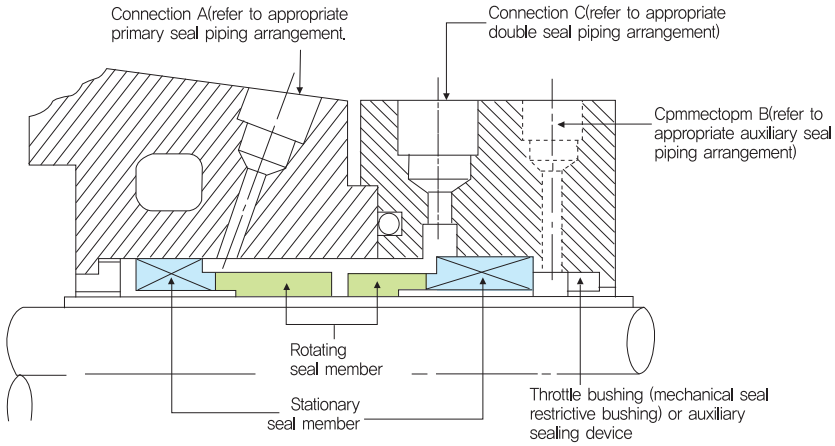
Spring Seal Type (Pusher Type)

4. Typical Mechanical Seal Arrangements

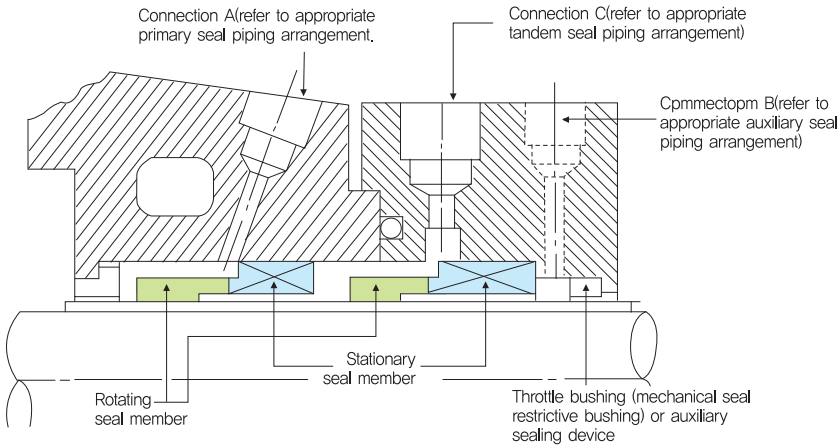
Single Seal



Double Seal

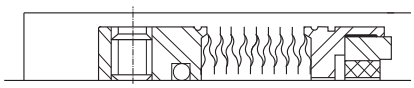
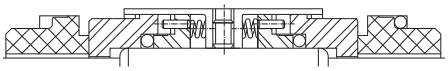
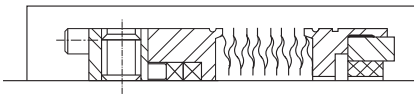
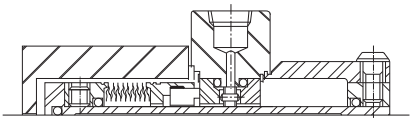
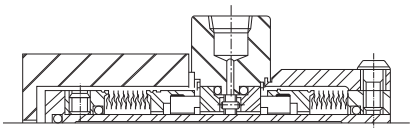
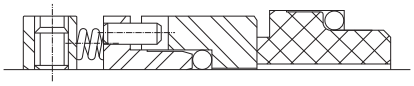
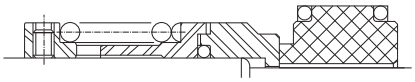
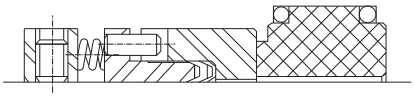
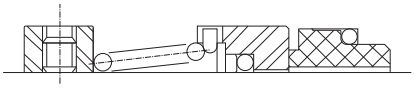
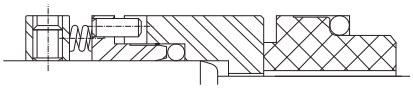
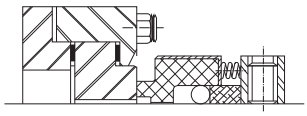
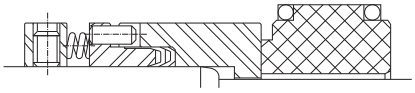
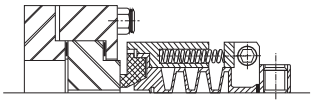
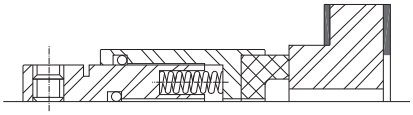
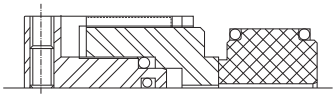
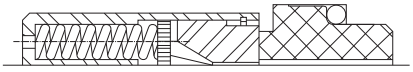
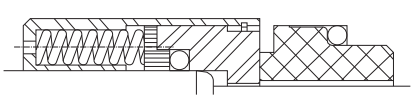
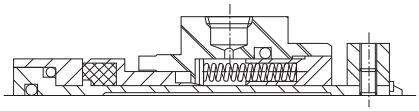
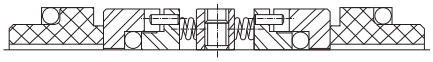
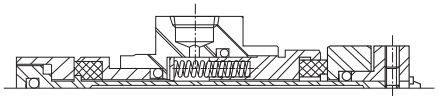


Tandem Seal



Note : These illustrations are typical and to not constitute any specific design

KOREA SEAL LINE ROTARY VERSION

TYPE	DRAWING	TYPE	DRAWING
MBS		SDB	
HBS		L1A	
SBS		L1B	
DBS		L1C	
K1A		L2B	
K1B		L3A	
K2A		L4B	
K2B		TBS	
K3B		L5B	
K4W		LWS	
K5A		KSM	
SDU		KSD	

KOREA SEAL LINE STAYIONARY VERSION

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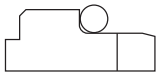
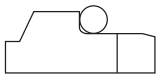
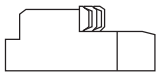
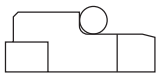
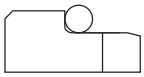
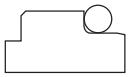
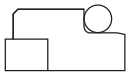
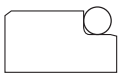
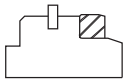
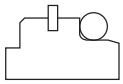
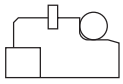
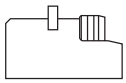
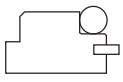
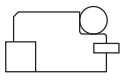
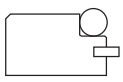
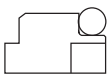
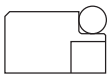
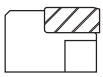
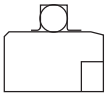
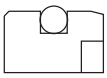
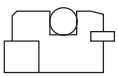
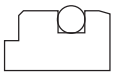
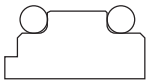
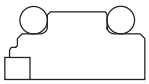
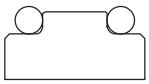
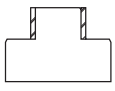
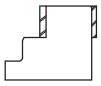
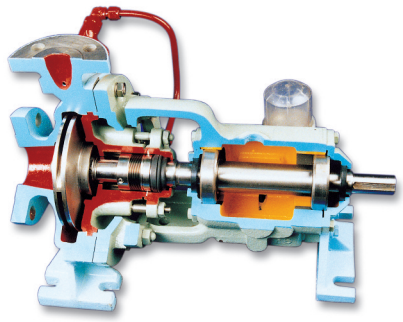
K1		1. CARBON/SOLID 2. T/C SOLID 3. SIC SOLID 4. CERAMIC SOLID
K2		1. CARBON/SOLID 2. T/C SOLID 3. SIC SOLID 4. CERAMIC SOLID
K3		1. CARBON/SOLID 2. T/C SOLID 3. SIC SOLID 4. CERAMIC SOLID
K4		1. T/C SOLID 2. SIC SOLID 3. CARBON RING
K5		1. T/C SOLID 4. T/C COATED 2. SIC SOLID 5. CERAMIC COATED 3. CERAMIC SOLID 6. STELLITE COATED
K6		1. CARBON/SOLID 2. T/C SOLID 3. SIC SOLID 4. CERAMIC SOLID
K7		1. T/C SOLID 2. SIC SOLID 3. CARBON RING
K8		1. T/C SOLID 4. T/C COATED 2. SIC SOLID 5. CERAMIC COATED 3. CERAMIC SOLID 6. STELLITE COATED
K9		1. CARBON/SOLID 2. TC SOLID 3. SIC SOLID 4. CERAMIC SOLID
K10		1. CARBON/SOLID 2. TC SOLID 3. SIC SOLID 4. CERAMIC SOLID
K11		1. T/C RING 2. SIC SOLID 3. CARBON RING
K12		1. T/C SOLID 2. SIC SOLID 3. CERAMIC SOLID
K13		1. CARBON/SOLID 2. T/C SOLID 3. SIC SOLID 4. CERAMIC SOLID
K14		1. T/C RING 2. SIC RING 3. CARBON RING
K15		1. T/C SOLID 2. SIC SOLID 3. CERAMIC SOLID
K16		1. CARBON/SOLID 2. T/C SOLID 3. SIC SOLID 4. CERAMIC SOLID
K17		1. T/C SOLID 2. SIC SOLID 3. CERAMIC SOLID
S1		1. T/C SOLID 2. SIC SOLID 3. CERAMIC SOLID
S2		1. T/C SOLID 2. SIC SOLID 3. CERAMIC SOLID
S3		1. T/C SOLID 4. T/C COATED 2. SIC SOLID 5. CERAMIC COATED 3. CERAMIC SOLID 6. STELLITE COATED
S4		1. T/C SOLID 4. T/C COATED 2. SIC SOLID 5. CERAMIC COATED 3. CERAMIC SOLID 6. STELLITE COATED
S5		1. T/C SOLID 2. SIC SOLID 3. CARBON RING
S6		1. CARBON/SOLID 2. T/C SOLID 3. SIC SOLID 4. CERAMIC SOLID
S7		1. CARBON SOLID
S8		1. T/C RING 2. SIC SOLID 3. CARBON RING
S9		1. T/C RING 2. SIC SOLID 3. CARBON RING
L1		1. SIC SOLID 2. CERAMIC SOLID 3. T/C COATED 4. CERAMIC COATED
L2		1. T/C SOLID 4. T/C COATED 2. SIC SOLID 5. CERAMIC COATED 3. CERAMIC SOLID
L3		1. T/C SOLID 2. SIC SOLID 3. CARBON SOLID
L4		1. T/C SOLID 2. SIC SOLID 3. CERAMIC SOLID

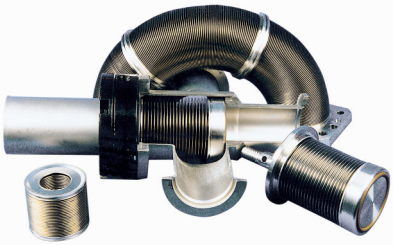
Composition of Common Metal

MATERIAL	COMPOSITION(% OF EACH ELEMENT BY WEIGHT)
17-4PH	15.5 – 17.5 Chrome, 3 – 5 Copper, 72-78 Iron, 〈.07 Charbon, 〈 1 MANGANESE, 〈 .04 Phosphorus, 〈 .03 Sulfur, 〈 1 Slicon, .15-45 Columbium plus Titaninum,.15-45
SUS 304	18-20 Chrome, 8-12 Nickel, 〈.08 Carbon, 64-70 Iron,〈1 Silicon, 〈2 Manganese,〈.030 Sulfur〈.045 Phosphorus
AM-350	75 iron,16.5 Chromium, 4.3 Nickel, 2.75 Molybdenum,.8 Manganese, .25 Silicon.,1 Nitrgen,.08 Carbon
SUS 316	16-18 Chrome, 10-14 Nickel, 〈 .08 Carbon, 62-71 Iron, 〈 1 Silicon, 〈 2 Manganese, 2 – 3 Molybdenum, 〈 .030 Sulfur, 〈 .045 Phosphorus
ALLOY-20	19-21 Chrome, 32.5-35 Nickel,〈.07 Carbon, 37-43 Iron,〈1 Silicon, 〈2 Manganese, 2-3 Molybdenum, 3-4 Copper,〈.035 Phosporus 〈.035 Sulfur, 〈1 Columbium and Titanium
Hastelloy C	50 – 63 Nickel, 14.5 – 16.5 Chrome, 〈 .08 Carbon, 4-7 Iron, 〈 1 Silicon, 〈 1 Manganese, 15 – 17 Molybdenum, 3 – 4.5 Tungasten, 〈 2.50 Cobalt, 〈 .04 Phosphorus, 〈 .03 Sulfur, 〈 .35 Vanadinum
Hastelloy B	58 – 70 Nickel, 〈 1 Chrome, 〈 .05 Carbon, 4-7 Iron, 〈 1 Silicon, 〈 1 Manganese, 26-30 Molybdenum, .2 – .6 Vanadium, 〈 .04 Phosphorus, 〈 .03 Sulfur, 〈 2.5 Cobalt
Inconel 600	72 Nickel (with Cobalt), 14 – 17 Chromium, 6 – 10 Iron, 〈 .15 Carbon, 〈 1 Manganese, 〈 .015 Sulfur, 〈 .05 Silicon, 〈 .5 Copper
Inconel 718	50 – 55 Nickel (with Cobalt), 14 – 19 Chromium, 12 – 24 Iron, 4.75-5.5 Columbium and Tantalum, 2.8-3.3 Molybdenum, .65 – 1.15 Titanium, .2-.8 Aluminum, 〈 1 Colbalt, 〈 .3 Copper, ,.006 Boron, 〈 .015 Sulfur
Titanium	99.2 Titanium, 〈.10 Carbon, 〈.2 Nitrogren, 〈.15 Hydrogen
Bronze	78-82 Copper, 9 – 11 Tin, 8 – 11 Lead, 〈 .8 Zinc, 〈 .15 Iron, 〈 .55 Antimony, 〈 1.0 Nickel, 〈 .08 Sulfur, 〈 .15 Phosphorus, 〈 .005 Aluminum, 〈 .005 Cobalt
Monel	63-72 Nickel, 24-31 Copper, 〈 .30 Carbon, 〈 2.50 Iron, 〈 .50 Silicon, 〈 2 Manganese, 〈 .024 Sulfur, Trace of Cobalt
Nickel	99 Nickel (plus Cobalt), 〈 .40 Iron, 〈 .35 Silicon, 〈 .15 Carbon, 〈 .35 Manganese, 〈 .01 Vanadium
Tantalum	99.8 Tantalum, .005 Nickel,.005 Carbon, .01 Iron, .03 Tungsten, .02 Cobalt, .03 Molybdenum,.002 Vanadium

Metal Bellows Seal의 특성

일반적으로 Mechanical Seal(Pusher Type)에서 Spring의 역할은 섭동면의 압축과 균형을 유지하기 위해 사용된다. 그러나 Metal Bellows Seal (Nonpusher type)의 경우 필요한 하중을 Spring 대신 Bellows를 사용함으로 다음과 같은 특징을 가지고 있다.





1. 정밀성이 높다.

Bellows 자체형상이 Spring역할을 하므로 일정한 면압과 균형을 이루어 완벽한 Sealing을 한다.

2. 진동과 유연성이 탁월하다.

기밀성이 높은 Bellows를 사용함으로 진동흡수력이 뛰어나 Run out 및 End Play에 적응력이 우수하다.

3. 부품이 간소하다.

Spring Seal 처럼 여러 부품이 조합되어있지 않아 구조가 간결하고 설치가 용이하다.

4. 다양한 온도 조건에 적합하다.

Bellows는 열팽창 계수가 작으므로 극저온 혹은 극한온도에 사용이 가능하다.

5. 고압에 적절하다.

Bellows자체에서 유체역학적 Balance를 잡아주는 Balanced Seal로서 고압에서도 부하를 작게 하여 수명을 연장시킨다.

6. 기계장치 보호역할 수행 (Sleeve 불필요)

Bellows seal은 Hang up이 발생되지 않아서 Shaft의 마모나 부식을 일으키지 않으므로 Shaft를 보호하는 Sleeve를 장착할 필요가 없다.

7. 부식성 유체에 적합

부식성이 강한 유체에 대항 Hastelloy 276과 같은 박판으로 Bellows를 제작함으로서 우수한 성능을 발휘한다.

8. Hang up이 발생되지 않는다.

Spring Seal (Pusher Type)은 유체의 압력에 의해 Spring이나 O-Ring(dymamic)이 움직임으로 인해 Leakage가 발생되나, Bellows Seal은 O-Ring(static)이 움직이지 않으므로 안정적으로 회전하여 Hang up이 발생되지 않아 Seal의 수명은 연장시킨다.

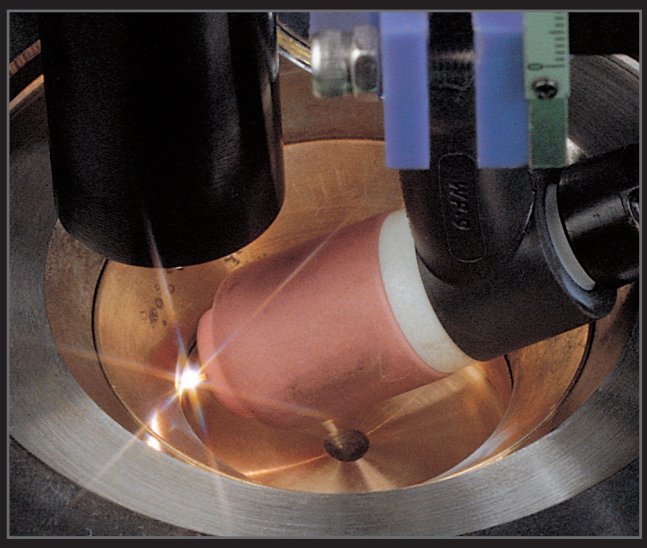
9. Pumping Screw 역할수행

Bellows 자체가 Screw역할을 함으로 Slurry유체에 효과적으로 대처할 수 있고, Flushing도 원활하도록 도와준다.

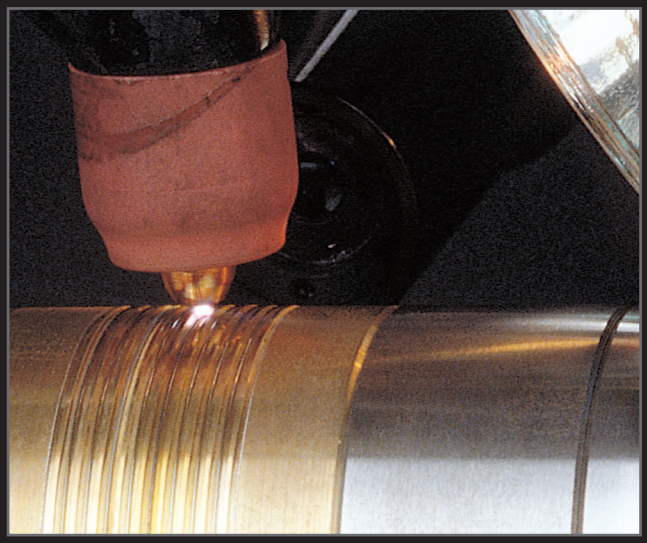
10. Seal Face 부하

자체 Balance역할을 함으로 고압에서도 Seal Face의 부하를 적게하여 수명을 연장시킨다.

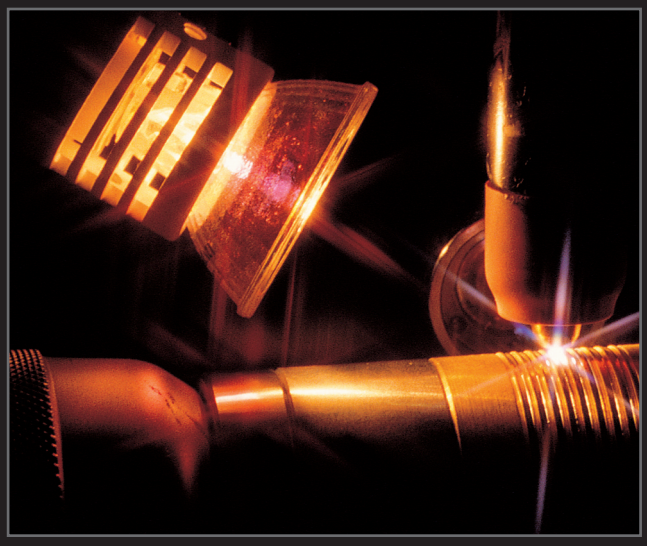
KOREA SEAL LINE CO., LTD.



Bellows ID Plasma Welding



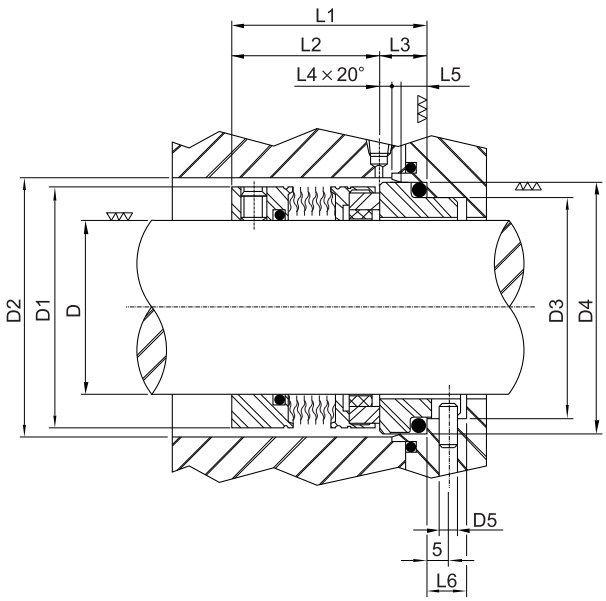
Bellows OD Plasma Welding



Bellows OD Plasma Welding

Ultra Precision Plasma Welding

MBS TYPE Metal bellows seal design DIN standard



Application Range

Max. pressure ..... 23kg/㎠
Max. temperature ..... ~ +230°C
Max. viscosity 1000cp
Slurry 0.5%max

Particular's of type

Metal bellows type
Never hang up(static)
Simple construction
Excellence precision

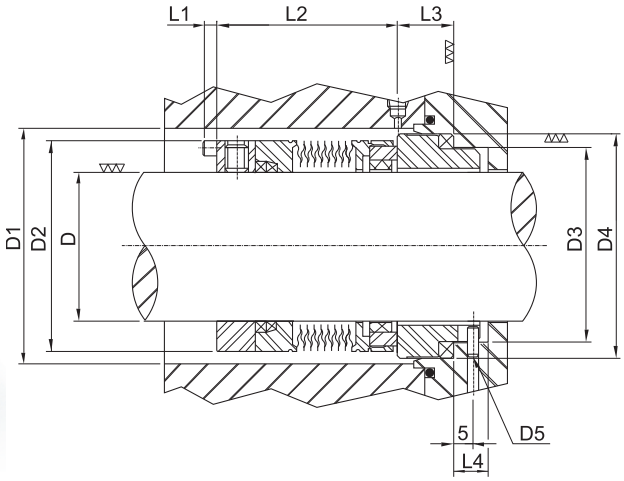
Compatible Seal Liquid

Chemical processing
Oil & refinery pump
Power plant etc.

(MM)

SEAL SIZE	D h6	D1	D2 MIN.	D3 H11	D4 H8	D5	L1 ±0.5	L2	L3	L4	L5	L6
M018	18	31.8	34	27	33	3	37.5	27.5	10	2	5	9
M020	20	33.3	36	29	35	3	37.5	27.5	10	2	5	9
M022	22	36.5	38	31	37	3	37.5	27.5	10	2	5	9
M024	24	38.1	40	33	39	3	40.0	30.0	10	2	5	9
M025	25	39.3	41	34	40	3	40.0	30.0	10	2	5	9
M028	28	42.2	44	37	43	3	42.5	32.5	10	2	5	9
M030	30	44.2	46	39	45	3	42.5	32.5	10	2	5	9
M032	32	46.0	48	42	48	3	42.5	32.5	10	2	5	9
M033	33	47.2	49	42	48	3	42.5	32.5	10	2	5	9
M035	35	49.2	51	44	50	3	42.5	32.5	10	2	5	9
M038	38	52.4	58	49	56	4	45.0	34.0	11	2	6	9
M040	40	55.5	60	51	58	4	45.0	34.0	11	2	6	9
M043	43	58.7	63	54	61	4	45.0	34.0	11	2	6	9
M045	45	58.7	65	56	63	4	45.0	34.0	11	2	6	9
M048	48	61.9	68	59	66	4	45.0	34.0	11	2	6	9
M050	50	65.1	70	62	70	4	47.5	34.5	13	2.5	6	9
M053	53	68.2	73	65	73	4	47.5	34.5	13	2.5	6	9
M055	55	71.4	75	67	75	4	47.5	34.5	13	2.5	6	9
M058	58	74.6	83	70	78	4	52.5	39.5	13	2.5	6	9
M060	60	74.6	85	72	80	4	52.5	39.5	13	2.5	6	9
M063	63	80.9	88	75	83	4	52.5	39.5	13	2.5	6	9
M065	65	84.1	90	77	85	4	52.5	39.5	13	2.5	6	9
M068	68	87.3	93	81	90	4	52.5	37.2	13	2.5	7	9
M070	70	87.3	95	83	92	4	60.0	44.7	15.3	2.5	7	9
M075	75	95.2	104	88	97	4	60.0	44.7	15.3	2.5	7	9
M080	80	101.6	109	95	105	4	60.0	44.3	15.7	3	7	9
M085	85	104.8	114	100	110	4	60.0	44.3	15.7	3	7	9
M090	90	111.1	119	105	115	4	65.0	49.3	15.7	3	7	9
M095	95	114.3	124	110	120	4	65.0	49.3	15.7	3	7	9
M100	100	120.6	129	115	125	4	65.0	49.3	15.7	3	7	9

HBS TYPE Metal bellows seal design DIN standard



Application Range

Max. pressure ····· 23kg/㎠
Max. temperature ····· ~ +400°C
Max. viscosity ····· 1000cp
Slurry ····· 0.5%max

Particular's of type

Metal bellows type,
Graphite packing used,
High temperature

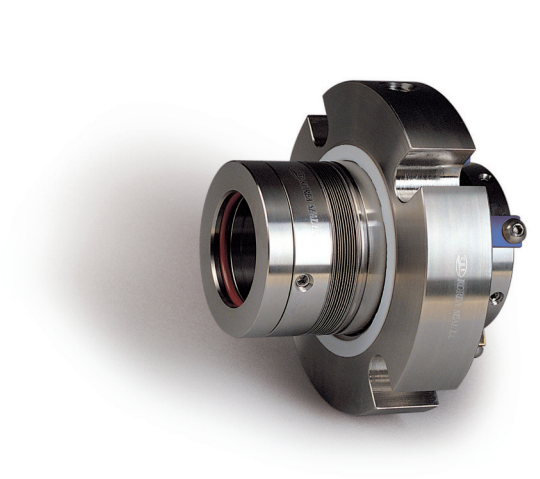
Compatible Seal Liquid

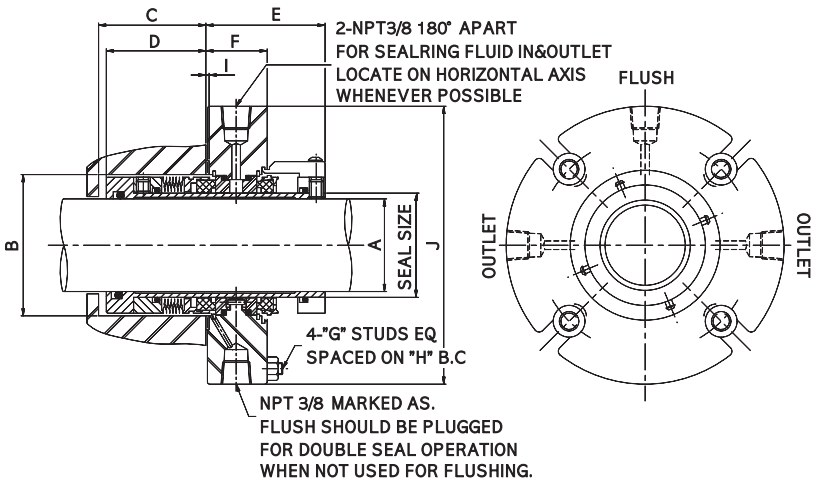
Hot molten fluid
Hot oil pump
High temperature refinery

(MM)

D ±.001	D1 ±.005	D2	D3 +.001 −.000	D4 +.005 −.000	D5	L1	L2	L3	L4
1.125″	1.937″	1.687″	1.515″	1.750″	0.12″	0.11″	1.94″	0.50″	0.354″
1.250″									
1.375″	2.250″	2.000″	1.765″	2.000″	0.12″	0.14″	2.06″	0.50″	0.354″
1.500″	2.375″	2.125″	1.890″	2.250″	0.16″	0.14″	2.06″	0.56″	0.354″
1.625″									0.354″
1.750″	2.625″	2.437″	2.140″	2.500″	0.16″	0.14″	2.06″	0.56″	0.354″
1.875″	2.750″	2.562″	2.265″	2.625″	0.16″	0.14″	2.06″	0.56″	0.354″
2.000″	2.875″	2.687″	2.390″	2.750″	0.16″	0.14″	2.06″	0.56″	0.354″
2.125″	3.000″	2.812″	2.515″	2.875″	0.16″	0.14″	2.31″	0.56″	0.354″
2.250″	3.250″	2.937″	2.765″	3.125″	0.16″	0.14″	2.31″	0.56″	0.354″
2.375″	3.375″	3.062″	2.890″	3.250″	0.16″	0.14″	2.31″	0.56″	0.354″
2.500″	3.500″	3.250″	3.015″	3.375″	0.16″	0.14″	2.31″	0.56″	0.354″
2.625″	3.625″	3.375″	3.140″	3.500″	0.16″	0.16″	2.31″	0.56″	0.354″
2.750″	3.750″	3.500″	3.265″	3.625″	0.16″	0.16″	2.31″	0.56″	0.354″
2.875″	3.875″	3.625″	3.390″	3.750″	0.16″	0.16″	2.31″	0.56″	0.354″
3.000″	4.000″	3.750″	3.515″	3.875″	0.16″	0.16″	2.31″	0.56″	0.354″
3.125″	4.188″	4.000″	3.702″	4.062″	0.16″	0.19″	2.75″	0.56″	0.354″
3.250″									
3.375″	4.437″	4.250″	3.953″	4.312″	0.16″	0.19″	2.75″	0.56″	0.354″
3.500″	4.562″	4.375″	4.077″	4.437″	0.16″	0.19″	2.75″	0.56″	0.354″
3.625″									
3.750″	4.812″	4.625″	4.327″	4.687″	0.16″	0.19″	2.75″	0.56″	0.354″
3.875″	4.937″	4.750″	4.452″	4.812″	0.16″	0.19″	2.75″	0.56″	0.354″
4.000″									
4.125″	5.312″	5.062″	4.702″	5.187″	0.16″	0.19″	2.75″	0.62″	0.354″
4.250″	5.437″	5.187″	4.827″	5.312″	0.16″	0.19″	2.75″	0.62″	0.354″
4.375″									
4.500″	5.688″	5.437″	5.007″	5.562″	0.16″	0.19″	2.75″	0.62″	0.354″

SBS TYPE Single cartridge metal bellows seal design ANSI standard





Application Range

Max. pressure ..... 20kg/㎠
Max. temperature ..... ~ +200°C
Max. viscosity 1000cp
Slurry 3%max

Particular's of type

Ease of installation
Metal bellows type
Extreme corrosion resistance
Cartridge mounted

Compatible Seal Liquid

Chemical processing
Mixer, Agitator
Oil & refinery pump

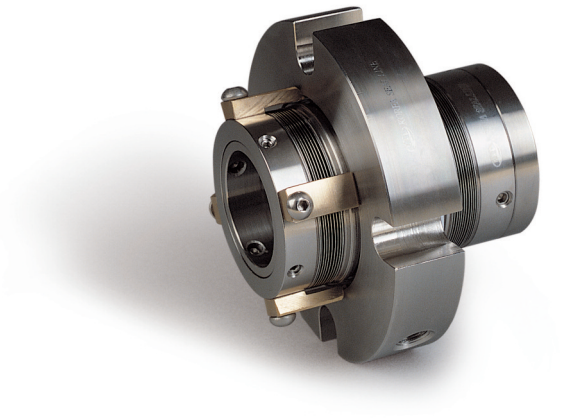
(MM)

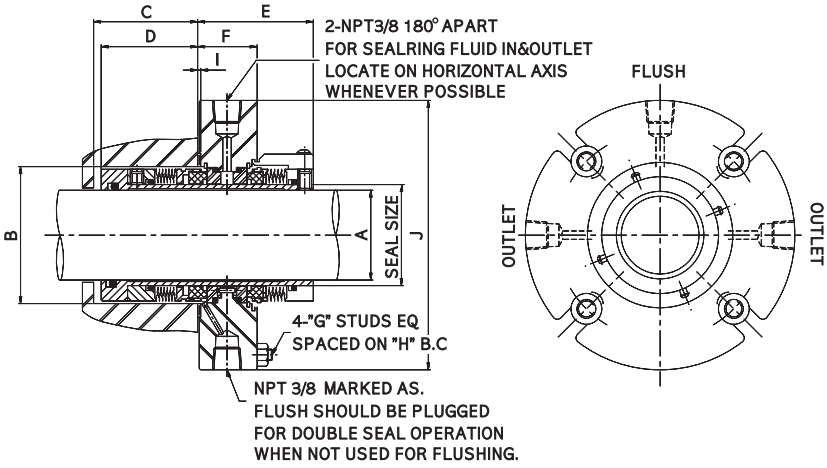
Seal Size	A	B		C	D	E	F	G	H	I	J
+0.00 −0.05	±0.025	MIN.	MAX.	MIN.	±0.5			MIN.			±0.5
M028	25	44	49	45.5	43.0	50.8	25.8	70.0	11.2	0.8	95
M032	28	48	52	45.5	43.0	50.8	25.8	76.2	14.3	0.8	96
M035	32	51	55	45	42.5	50.8	25.8	79.4	14.3	0.8	108
M040	35	58	65	47	44.5	50.8	25.8	95.2	11.2	0.8	120
M045	40	61	68	47	44.5	50.8	25.8	95.2	14.3	0.8	120
M050	45	67	74	50	47.5	50.8	25.8	98.4	14.3	0.8	127
M055	50	73	84	50	47.5	50.8	25.8	111.1	17.5	0.8	112
M060	55	77	87	50	47.5	508.5	25.8	117.54	17.5	0.8	165
M065	60	86	96	55	52.5	53.1	28.2	127.0	17.5	0.8	168
M070	65	89	100	55	52.5	53.4	28.2	146.0	20.7	0.8	184

(INCH)

Seal Size	A	B		C	D	E	F	G	H	I	J
+0.000 −0.002	±0.001	MIN.	MAX.	MIN.	±0.5			MIN			
1.125″	1.000″	1.750″	1.875″	1.78″	1.68″	2.00″	1.02″	2.75″	.375″	.03″	2.75″
1.250″	1.125″	1.750″	2.000″	1.75″	1.68″	2.00″	1.02″	3.00″	.500″	.03″	3.00″
1.375″	1.250″	2.000″	2.125″	1.97″	1.88″	2.00″	1.02″	3.12″	.500″	.03″	3.12″
1.500″	1.375″	2.000″	2.250″	1.97″	1.88″	2.00″	1.02″	3.25″	.375″	.03″	3.25″
1.625″	1.500″	2.250″	2.500″	1.97″	1.88″	2.00″	1.02″	3.75″	.375″	.03″	3.75″
1.750″	1.625″	2.375″	2.625″	1.97″	1.88″	2.00″	1.02″	3.75″	.500″	.03″	3.75″
1.875″	1.750″	2.500″	2.750″	1.97″	1.88″	2.00″	1.02″	3.75″	.500″	.03″	3.75″
2.000″	1.875″	2.625″	2.875″	1.97″	1.88″	2.00″	1.02″	3.89″	.500″	.03″	3.88″
2.125″	2.000″	2.750″	3.000″	1.97″	1.88″	2.00″	1.02″	4.12″	.625″	.03″	4.12″
2.250″	2.125″	2.875″	3.250″	1.97″	1.88″	2.00″	1.02″	4.38″	.625″	.03″	4.38″
2.375″	2.250″	3.000″	3.375″	1.97″	1.88″	2.00″	1.02″	4.62″	.625″	.03″	4.62″
2.500″	2.375″	3.250″	3.625″	2.16″	2.06″	2.09″	1.11″	5.00″	.625″	.03″	5.00″
2.625″	2.500″	3.375″	3.750″	2.16″	2.06″	2.09″	1.11″	5.00″	.625″	.03″	5.00″
2.750″	2.625″	3.500″	3.675″	2.16″	2.06″	2.09″	1.11″	5.75″	.750″	.03″	5.75″

DBS TYPE Double cartridge metal bellows seal design ANSI standard





Application Range

Max. pressure ····· 20kg/㎠
Max. temperature ····· ~ +250°C
Max. viscosity ····· 1000cp
Slurry ····· 3%max

Particular's of type

Ease of installation
Metal bellows type
Extreme corrosion resistance
Cartridge mounted

Compatible Seal Liquid

Chemical processing
Mixer, Agitator
Oil & refinery pump

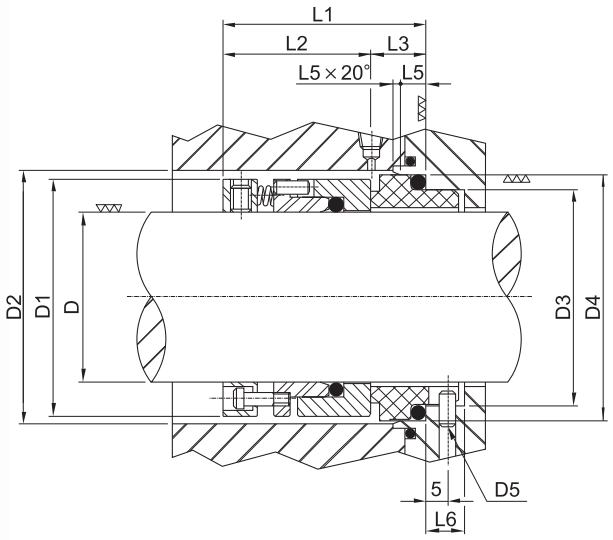
(MM)

Seal Size	A	B		C	D	E	F	G	H	I	J
+0.00 −0.05	±0.025	MIN.	MAX.	MIN.	±0.5			MIN.			±0.5
M028	25	44	49	45.5	43.0	50.8	25.8	70.0	11.2	0.8	95
M032	28	48	52	45.5	43.0	50.8	25.8	76.2	14.3	0.8	98
M035	32	51	55	45	42.5	50.8	25.8	79.4	14.3	0.8	108
M040	35	58	65	47	44.5	50.8	25.8	95.2	11.2	0.8	120
M045	40	61	68	47	44.5	50.8	25.8	95.2	14.3	0.8	120
M050	45	67	74	50	47.5	50.8	25.8	98.4	14.3	0.8	127
M055	50	73	84	50	47.5	50.8	25.8	111.1	17.5	0.8	112
M060	55	77	87	50	47.5	50.8	25.8	117.5	17.5	0.8	165
M065	60	86	96	55	52.5	53.1	28.2	127.0	17.5	0.8	168
M070	65	89	100	55	52.5	53.1	28.2	146.0	20.7	0.8	184

(INCH)

Seal Size	A	B		C	D	E	F	G	H	I	J
+0.000 −0.002	±0.001	MIN.	MAX.	MIN.	±0.5			MIN			
1.125″	1.000″	1.750″	1.875″	1.78″	1.68″	2.00″	1.02″	2.75″	.375″	.03″	2.75″
1.250″	1.125″	1.750″	2.000″	1.75″	1.68″	2.00″	1.02″	3.00″	.500″	.03″	3.00″
1.375″	1.250″	2.000″	2.125″	1.97″	1.88″	2.00″	1.02″	3.12″	.500″	.03″	3.12″
1.500″	1.375″	2.000″	2.250″	1.97″	1.88″	2.00″	1.02″	3.25″	.375″	.03″	3.25″
1.625″	1.500″	2.250″	2.500″	1.97″	1.88″	2.00″	1.02″	3.75″	.375″	.03″	3.75″
1.750″	1.625″	2.375″	2.625″	1.97″	1.88″	2.00″	1.02″	3.75″	.500″	.03″	3.75″
1.875″	1.750″	2.500″	2.750″	1.97″	1.88″	2.00″	1.02″	3.75″	.500″	.03″	3.75″
2.000″	1.875″	2.625″	2.875″	1.97″	1.88″	2.00″	1.02″	3.89″	.500″	.03″	3.88″
2.125″	2.000″	2.750″	3.000″	1.97″	1.88″	2.00″	1.02″	4.12″	.625″	.03″	4.12″
2.250″	2.125″	2.875″	3.250″	1.97″	1.88″	2.00″	1.02″	4.38″	.625″	.03″	4.38″
2.375″	2.250″	3.000″	3.375″	1.97″	1.88″	2.00″	1.02″	4.62″	.625″	.03″	4.62″
2.500″	2.375″	3.250″	3.625″	2.16″	2.06″	2.09″	1.11″	5.00″	.625″	.03″	5.00″
2.625″	2.500″	3.375″	3.750″	2.16″	2.06″	2.09″	1.11″	5.00″	.625″	.03″	5.00″
2.750″	2.625″	3.500″	3.675″	2.16″	2.06″	2.09″	1.11″	5.75″	.750″	.03″	5.75″

K1A TYPE — Inside unbalanced seal design DIN standard



Application Range

Max. pressure ····· 10kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 300cp
Slurry ····· 0.5%max

Particular's of type

Multi spring type
Variety elastomers
Unbalanced seal
General seal

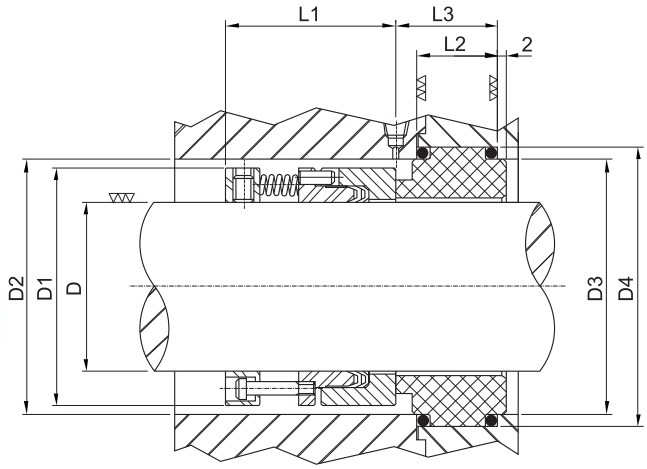
Compatible Seal Liquid

Variable industrial fluid
Centrifugal pump, etc

(MM)

SEAL SIZE	D h6	D1	D2 MIN.	D3 H11	D4 H8	D5	L1 ±0.5	L2	L3	L4	L5	L6
M018	18	32	34	27	33	3	44.5	35	9.5	2	5	9
M020	20	34	36	29	35	3	44.5	35	9.5	2	5	9
M022	22	36	38	31	37	3	44.5	35	9.5	2	5	9
M024	24	38	40	33	39	3	45	35	10	2	5	9
M025	25	39	41	34	40	3	45	35	10	2	5	9
M028	28	42	44	37	43	3	45	35	10	2	5	9
M030	30	44	46	39	45	3	45	35	10	2	5	9
M032	32	46	48	42	48	3	45	35	10	2	5	9
M033	33	47	49	42	48	3	45	35	10	2	5	9
M035	35	49	51	44	50	3	45	35	10	2	5	9
M038	38	54	58	49	56	4	48	35	13	2	6	9
M040	40	56	60	51	58	4	48	35	13	2	6	9
M043	43	59	63	54	61	4	56	43	13	2	6	9
M045	45	61	65	56	63	4	56	43	13	2	6	9
M048	48	64	68	59	66	4	56	43	13	2	6	9
M050	50	66	70	62	70	4	58.5	43	15.5	2.5	6	9
M053	53	69	73	65	73	4	58.5	43	15.5	2.5	6	9
M055	55	71	75	67	75	4	58.5	43	15.5	2.5	6	9
M058	58	78	83	70	78	4	59	43	16	2.5	6	9
M060	60	80	85	72	80	4	59	43	16	2.5	6	9
M063	63	83	88	75	83	4	59	43	16	2.5	6	9
M065	65	85	90	77	85	4	59	43	16	2.5	6	9
M068	68	88	93	81	90	4	59	43	16	2.5	7	9
M070	70	90	95	83	92	4	62	43	19	2.5	7	9
M075	75	95	104	88	97	4	63	44	19	2.5	7	9
M080	80	100	109	95	105	4	63	44	19	3	7	9
M085	85	105	114	100	110	4	63	44	19	3	7	9
M090	90	110	119	105	115	4	63	44	19	3	7	9
M095	95	115	124	110	120	4	63	44	19	3	7	9
M100	100	120	129	115	125	4	63	44	19	3	7	9

K1B TYPE — Inside unbalanced seal design ISO standard



Application Range

Max. pressure ····· 10kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 300cp
Slurry ····· 0.5%max

Particular's of type

Multi spring type
Teflon V-cup used
Unbalanced seal
General seal

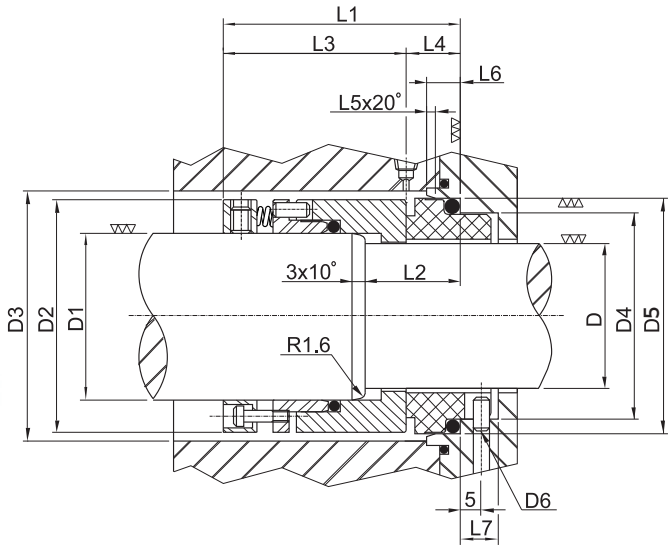
Compatible Seal Liquid

Variable industrial fluid
Centrifugal pump
Acid, solvent liquid, etc

(MM)

SEAL SIZE	D h6	D1	D2 MIN.	D3 H11	D4 H8	L1 ±0.5	L2 ±0.05	L3
M020	20	34	36	36	42	35	19	24
M022	22	36	38	38	44	35	19	24
M025	25	39	41	41	47	35	19	24
M028	28	42	44	44	50	35	19	24
M030	30	44	46	46	52	35	19	24
M032	32	46	48	48	54	35	19	24
M035	35	49	51	51	57	35	19	24
M038	38	54	58	58	64	35	19	24
M040	40	56	60	60	66	35	19	24
M042	42	58	62	62	68	43	19	24
M045	45	61	65	65	71	43	19	24
M048	48	64	68	68	74	43	19	24
M050	50	66	70	70	76	43	19	24
M052	52	68	72	72	78	43	19	24
M055	55	71	75	75	81	43	19	24
M058	58	78	83	83	89	43	19	24
M060	60	80	85	85	92	43	21	26
M062	62	83	87	87	94	43	21	26
M065	65	85	90	90	97	43	21	26
M068	68	88	93	93	100	43	21	26
M070	70	90	95	95	102	43	25	30
M075	75	95	104	104	111	45	25	30
M080	80	100	109	109	116	45	25	30
M085	85	105	114	114	121	45	25	30
M090	90	110	119	119	126	45	25	30
M095	95	115	124	124	131	45	25	30
M100	100	120	129	129	137	45	27	33
M110	110	130	139	139	147	45	27	33
M120	120	145	150	150	158	45	27	33
M130	130	155	160	160	168	45	27	33
M140	140	165	175	175	183	45	30	36
M150	150	175	190	190	198	45	30	36

K2A TYPE — Inside balanced seal design DIN standard



Application Range

Max. pressure ····· 30kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 300cp
Slurry ····· 0.5%max

Particular's of type

Multi spring type
Balanced seal
High pressure

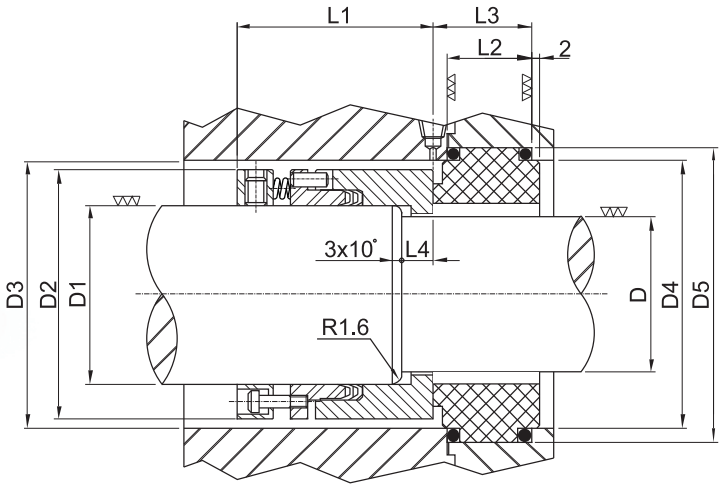
Compatible Seal Liquid

Variable industrial fluid
Hight pressure pump
Non crystallizing acid, water, etc

(MM)

SEAL SIZE	D h6	D1 h6	D2	D3 MIN.	D4 H11	D5 H8	D6	L1 ±0.5	L2 ±0.5	L3	L4	L5	L6	L7
M022	18	22	36	38	27	33	3	54.5	20	45	9.5	2	5	9
M024	20	24	38	40	29	35	3	53.5	20	44	9.5	2	5	9
M026	22	26	40	42	31	37	3	53.5	20	44	9.5	2	5	9
M028	24	28	42	44	33	39	3	54	20	44	10	2	5	9
M030	25	30	44	46	34	40	3	54	20	44	10	2	5	9
M033	28	33	47	49	37	43	3	54	20	44	10	2	5	9
M035	28	35	49	51	39	45	3	54	20	44	10	2	5	9
M038	33	38	54	58	42	48	4	54	20	44	10	2	5	9
M040	35	40	56	60	44	50	4	54	20	44	13	2	5	9
M043	38	43	59	63	49	56	4	65	23	52	13	2	6	9
M045	40	45	61	65	51	58	4	65	23	52	13	2	6	9
M048	43	48	64	68	54	61	4	65	23	52	13	2	6	9
M050	45	50	66	70	56	63	4	65	23	52	13	2	6	9
M053	48	53	69	65	59	66	4	65	23	52	13	2	6	9
M055	50	55	71	75	62	70	4	67.5	25	52	15.5	2.5	6	9
M058	53	58	78	83	65	73	4	67.5	25	52	15.5	2.5	6	9
M060	55	60	80	85	67	75	4	67.5	25	52	15.5	2.5	6	9
M063	58	63	83	88	70	78	4	68	25	52	16	2.5	6	9
M065	60	65	85	90	72	80	4	68	25	52	16	2.5	6	9
M068	63	68	88	93	75	83	4	68	25	52	16	2.5	6	9
M070	65	70	90	95	77	85	4	68	25	52	16	2.5	6	9
M075	70	75	95	104	83	92	4	72	28	53	19	2.5	7	9
M080	75	80	100	109	88	97	4	72	28	53	19	2.5	7	9
M085	80	85	105	114	95	105	4	72	28	53	19	3	7	9
M090	85	90	110	119	100	110	4	72	28	53	19	3	7	9
M095	90	95	115	124	105	115	4	72	28	53	19	3	7	9
M100	95	100	120	129	110	120	4	72	28	53	19	3	7	9

K2B TYPE — Inside balanced seal design ISO standard



Application Range

Max. pressure ····· 30kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 300cp
Slurry ····· 0.5%max

Particular's of type

Multi spring type
Balanced seal
High pressure

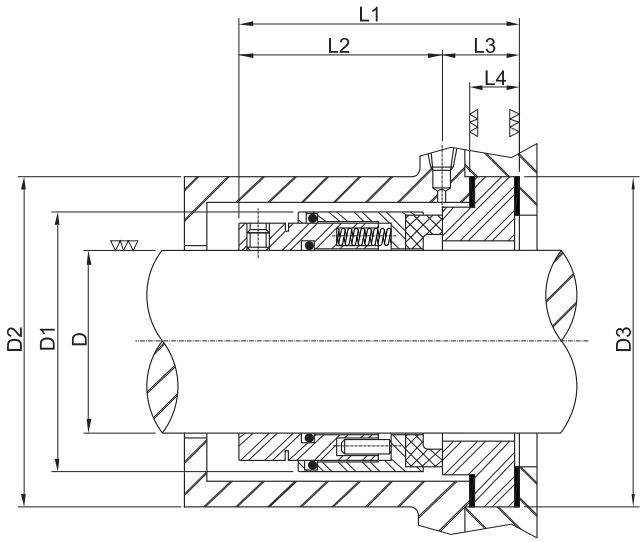
Compatible Seal Liquid

Variable industrial fluid
High pressure pump
Non crystallizing acid, solvent, etc

(MM)

SEAL SIZE	D h6	D1 h6	D2	D3 MIN.	D4 H11	D5 H8	L1 ±0.5	L2 ±0.05	L3	L4
M020	16	20	34	36	36	42	41	19	24	7
M022	18	22	36	38	38	44	41	19	24	7
M025	21	25	39	41	41	47	41	19	24	7
M028	24	28	42	36	44	50	41	19	24	7
M030	25	30	44	46	46	52	41	19	24	7
M032	27	32	46	48	48	54	41	19	24	7
M035	30	35	49	51	51	57	41	19	24	7
M038	33	38	54	58	58	64	46	19	24	7
M040	35	40	56	60	60	66	46	19	24	7
M042	37	42	58	62	62	68	46	19	24	7
M045	40	45	61	65	65	71	46	19	24	7
M048	43	48	64	68	68	74	49	19	24	8
M050	45	50	66	70	70	76	49	19	24	8
M052	47	52	68	72	72	78	49	19	24	8
M055	50	55	71	75	75	81	49	19	24	8
M058	53	58	76	83	83	89	49	19	24	8
M060	55	60	78	85	85	92	49	21	26	8
M062	57	62	80	87	87	94	49	21	26	8
M065	60	65	85	90	90	97	49	21	26	8
M068	63	68	88	93	93	100	49	21	26	8
M070	65	70	90	95	95	102	51	25	30	9
M075	70	75	95	104	104	111	51	25	30	9
M080	75	80	100	109	109	116	51	25	30	9
M085	80	85	105	114	114	121	51	25	30	9
M090	85	90	110	119	119	126	51	25	30	9
M095	90	95	115	124	124	131	51	25	30	9
M100	95	100	120	129	129	137	51	27	33	9
M110	105	110	132	139	139	147	51	27	33	9
M120	110	120	144	150	150	158	51	27	33	9
M130	120	130	154	160	160	168	51	27	33	9
M140	130	140	164	175	175	183	51	30	36	9
M150	140	150	180	190	190	198	51	30	36	9

K3B TYPE — Inside balanced seal design ISO standard



Application Range

Max. pressure ····· 21kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 300,000cp
Slurry ····· 7%max

Particular's of type

Multi spring type
Isolated spring seal
High slurry
Balanced seal

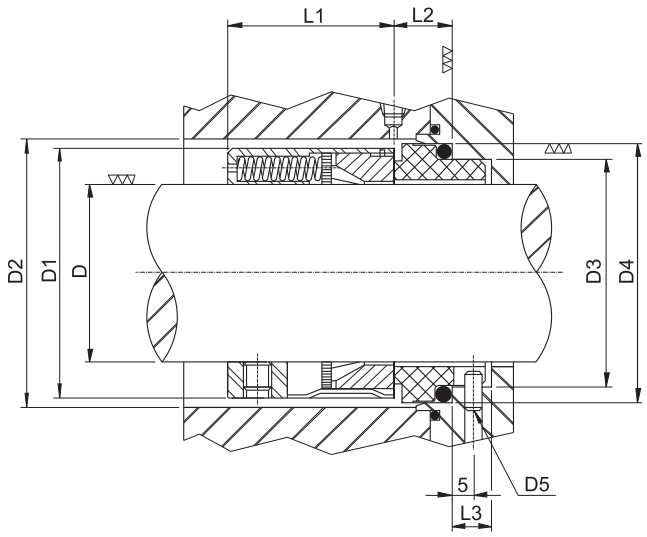
Compatible Seal Liquid

Crystallizing acid, salt
High viscosity oil
High slurry fluid

(MM)

SEAL SIZE	D H6	D1	D2 MIN.	D3 H7	L1	L2	L3	L4 ±0.03
M020	20	35	43	47.8	61.5	44.5	17	11
M025	25	39.7	47.6	53.5	61.5	44.5	17	11
M028	28	43	50.8	56.7	61.5	44.5	17	11
M030	30	46	52	62.3	61.5	44.5	17	11
M032	32	48	55.5	61.4	61.5	44.5	17	11
M035	35	49.2	55.5	61.4	61.5	44.5	17	11
M038	38	54	62	69.4	61.5	44.5	17	11
M040	40	57.2	65	72.6	61.5	44.5	17	11
M045	45	63.5	71.5	79	61.5	44.5	17	11
M050	50	66.7	78	88.5	62	44.5	17.5	12
M056	55	73	87	95	62	44.5	17.5	12
M060	60	76.2	89	98.8	62	44.5	17.5	12
M065	65	83.5	94	105	62	44.5	17.5	12

K4W TYPE — Inside unbalanced seal design DIN standard



Application Range

Max. pressure ····· 10kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 300cp
Slurry ····· 0.5%max

Particular's of type

Multi spring type
Teflon wedge used
Unbalanced seal

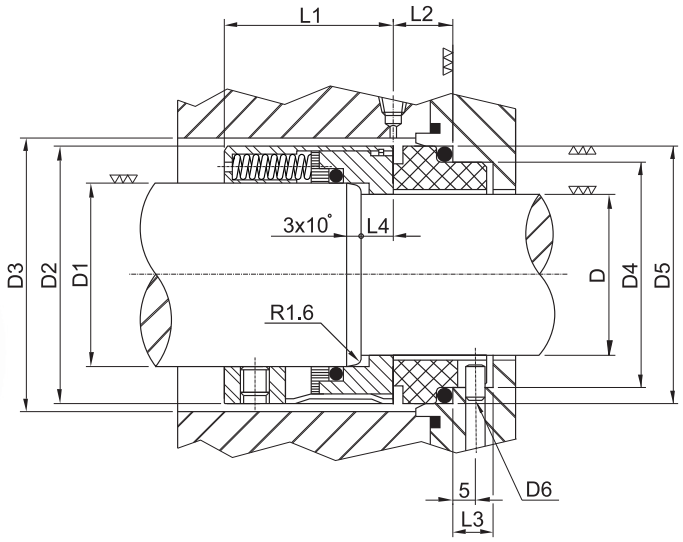
Compatible Seal Liquid

Chemical processing
Non crystallizing acid,
Centrifugal pump, etc

(MM)

SEAL SIZE	D h6	D1	D2 MIN.	D3 H11	D4 H8	D5	L1 ±0.5	L2	L3
M020	20	34	36	29	35	3	30	9.5	9
M025	25	39	41	34	40	3	30	10	9
M028	28	42	44	37	43	3	30	10	9
M030	30	44	46	39	45	3	30	10	9
M032	32	46	48	42	48	3	30	10	9
M035	35	49	51	44	50	3	30	10	9
M040	40	56	60	51	58	4	30	13	9
M045	45	61	65	56	63	4	30	13	9
M048	48	64	68	59	66	4	34	13	9
M050	50	66	70	62	70	4	34	15.5	9
M055	55	71	75	67	75	4	34	15.5	9
M060	60	78	85	72	80	4	34	16	9
M065	65	83	90	77	85	4	34	16	9
M070	70	90	95	83	92	4	40	19	9
M075	75	95	104	88	97	4	40	19	9
M080	80	100	109	95	105	4	40	19	9
M085	85	105	114	100	110	4	40	19	9
M090	90	110	119	105	115	4	40	19	9
M095	95	115	124	110	120	4	40	19	9
M100	100	120	129	115	125	4	45	19	9

K5A TYPE — Inside balanced seal design DIN standard



Application Range

Max. pressure ····· 30kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 300cp
Slurry ····· 0.5%max

Particular's of type

Multi spring type
Balanced seal
Teflon wedge or O-ring used
High pressure

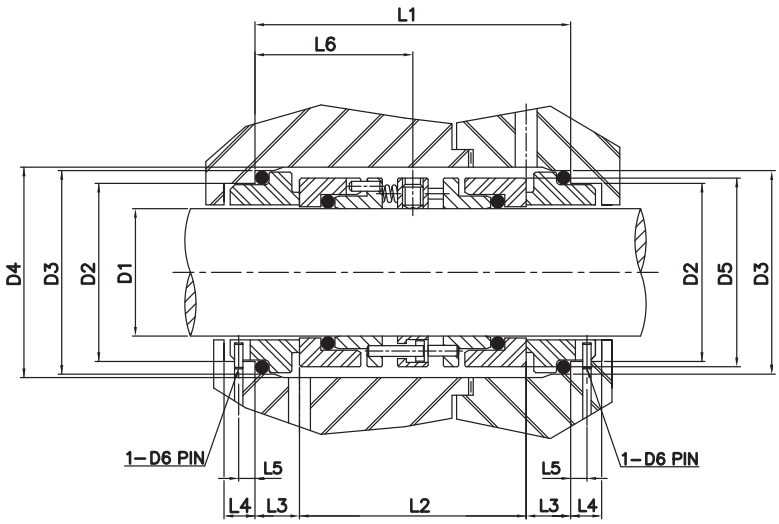
Compatible Seal Liquid

Variable industrial fluid
High pressure pump
Non crystallizing acid, solvent etc

(MM)

SEAL SIZE	D h6	D1 h6	D2	D3 MIN.	D4 H11	D5 H8	D6	L1 ±0.5	L2	L3	L4
M020	16	20	39	41	23	27	3	37	9.5	9	7
M025	21	25	44	46	30	36	3	37	10	9	7
M028	24	28	46	48	33	39	3	37	10	9	7
M030	25	30	49	51	34	40	3	37	10	9	7
M032	27	32	54	58	36	42	3	37	10	9	7
M035	30	35	56	60	39	45	3	37	10	9	7
M040	35	40	61	65	44	50	4	37	13	9	7
M045	40	45	66	70	51	58	4	41	13	9	7
M048	43	48	69	73	54	61	4	41	13	9	8
M050	45	50	71	75	56	63	4	41	15.5	9	8
M055	50	55	78	85	62	70	4	41	15.5	9	8
M060	55	60	83	90	67	75	4	41	16	9	8
M065	60	65	90	95	72	80	4	41	16	9	8
M070	65	70	95	104	77	85	4	48	19	9	9
M075	70	75	100	109	83	92	4	48	19	9	9
M080	75	80	105	114	88	97	4	48	19	9	9
M085	80	85	110	119	95	105	4	48	19	9	9
M090	85	90	115	124	105	115	4	48	19	9	9
M095	90	95	120	129	110	120	4	54	19	9	9
M100	95	100	125	134	115	125	4	54	19	9	9

SDU TYPE Double unbalanced seal design DIN standard



Application Range

Max. pressure ..... 10kg/㎠
Max. temperature ..... ~ +200°C
Max. viscosity 300cp
Slurry 4%max

Particular's of type

Multi spring type
Unbalanced double seal
Circulating Shroud

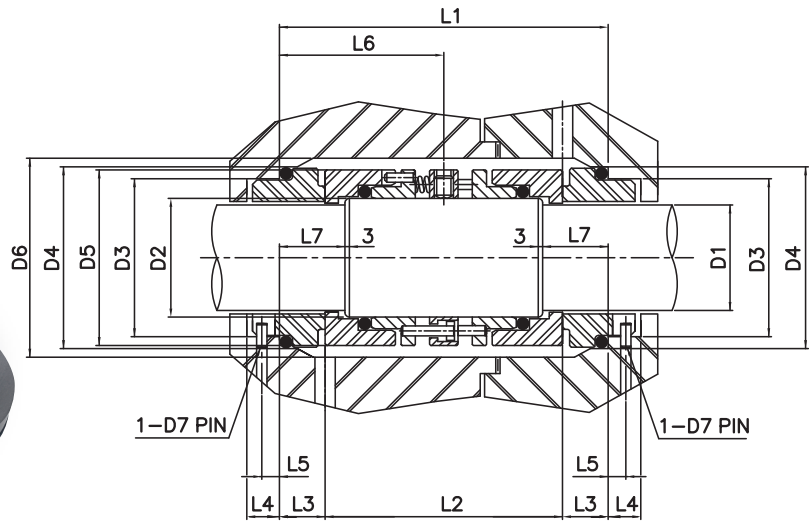
Compatible Seal Liquid

Strongly corrosive fluid
Non-crystallizing acid
Low slurry water, etc

(MM)

SEAL SIZE	D1 h6	D2 H11	D3 H8	D4 MIN.	D5	D6	L1 ±0.5	L2	L3	L4	L5	L6
M022	22	31	37	38	36	3	80	61	9.5	9	5	40
M025	25	34	40	41	41	3	81	61	10	9	5	40.5
M028	28	37	43	44	42	3	81	61	10	9	5	40.5
M030	30	39	45	46	44	3	81	61	10	9	5	40.5
M032	32	42	48	46	46	3	81	61	10	9	5	40.5
M035	35	44	50	51	49	3	81	61	10	9	5	40.5
M040	40	51	58	60	56	4	87	61	13	9	5	43.5
M043	42	54	61	63	59	4	91	65	13	9	5	43.5
M045	45	56	63	65	61	4	91	65	13	9	5	45.5
M048	48	59	66	68	64	4	91	65	13	9	6	45.5
M050	50	62	70	70	66	4	96	65	15.5	9	6	48
M055	55	67	75	75	71	4	91	65	15.5	9	6	48
M060	60	72	60	85	80	4	97	65	16	9	6	48.5
M065	65	77	65	90	85	4	97	65	16	9	6	48.5
M070	70	83	92	95	90	4	103	65	19	9	6	51.5
M075	75	88	97	104	95	4	105	67	19	9	7	52.5
M080	80	95	105	109	100	4	105	67	19	9	7	52.5
M085	85	100	110	114	105	4	105	67	19	9	7	52.5
M090	90	105	115	119	110	4	105	67	19	9	7	52.5
M095	95	110	120	124	124	4	105	67	19	9	7	52.5
M100	100	115	125	129	129	4	105	67	19	9	7	52.5

SDB TYPE — Double balanced seal design DIN standard



Application Range

- Max. pressure ····· 30kg/㎠
- Max. temperature ····· ~ +220°C
- Max. viscosity ····· 300cp
- Slurry ····· 4%max

Particular's of type

- Multi spring type
- Balanced double seal
- Circulating Shroud
- High pressure

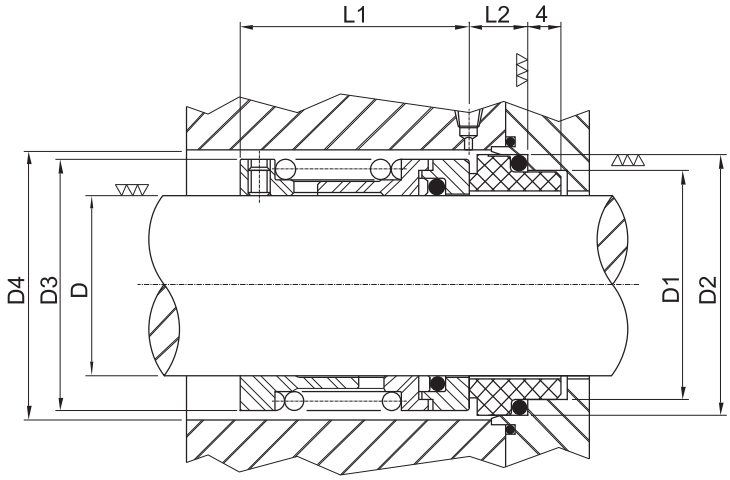
Compatible Seal Liquid

- Strongly corrosive fluid
- Low lubricant fluid
- High pressure pump

(MM)

SEAL SIZE	D1 h6	D2 h6	D3 H11	D4 H8	D5	D6 MIN.	D7	L1 ±0.5	L2	L3	L4	L5	L6	L7
M018	18	22	27	33	36	38	3	98	79	9.5	9	5	49	20
M020	20	24	29	35	38	40	3	98	79	9.5	9	5	49	20
M022	22	26	31	37	40	42	3	98	79	9.5	9	5	49	20
M025	25	30	34	40	44	46	3	99	79	10	9	5	49.5	20
M028	28	33	37	43	47	49	3	99	79	10	9	5	49.5	20
M030	30	35	39	45	49	51	3	99	79	10	9	5	49.5	20
M032	32	38	42	48	54	58	3	99	79	10	9	5	49.5	20
M035	35	40	44	50	56	60	3	99	79	10	9	5	49.5	20
M040	40	45	51	58	61	65	4	109	83	13	9	6	54.5	23
M043	43	48	54	61	64	68	4	109	83	13	9	6	54.5	23
M045	45	50	56	63	66	70	4	109	83	13	9	6	54.5	23
M048	48	53	59	66	69	73	4	109	83	13	9	6	57	25
M050	50	55	62	70	71	75	4	114	83	15.5	9	6	57	25
M055	55	60	67	75	80	85	4	114	83	15.5	9	6	57	25
M060	60	65	72	80	85	90	4	115	83	16	9	6	57.5	25
M065	65	70	77	85	90	95	4	115	83	16	9	6	57.5	25
M070	70	75	83	92	95	104	4	123	85	19	9	7	61.5	28
M075	75	80	88	97	100	109	4	123	85	19	9	7	61.5	28
M080	80	85	95	105	105	114	4	123	85	19	9	7	61.5	28
M085	85	90	100	110	110	119	4	123	85	19	9	7	61.5	28
M090	90	95	105	115	115	124	4	123	85	19	9	7	61.5	28
M095	95	100	110	120	120	129	4	123	85	19	9	7	61.5	28
M100	100	105	115	125	125	134	4	123	85	19	9	7	61.5	28

L1A TYPE — Inside unbalanced seal design DIN standard



Application Range

- Max. pressure ····· 10kg/㎠
- Max. temperature ····· ~ +220°C
- Max. viscosity ····· 150,000cp
- Slurry ····· 7%max

Particular's of type

One coil spring type
Unbalanced seal
High slurry used

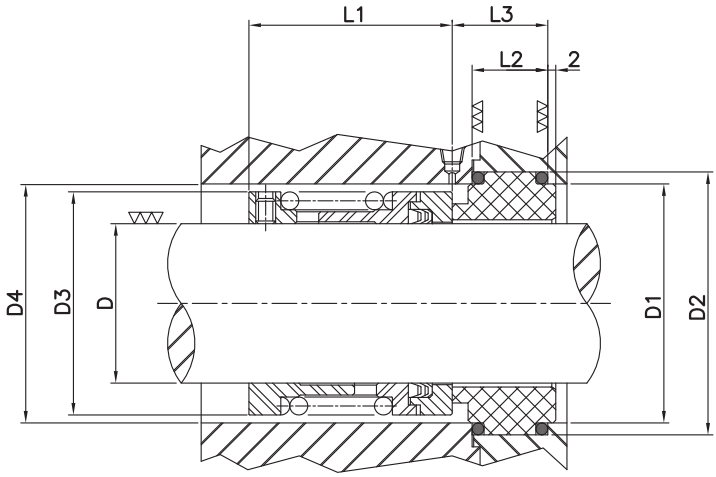
Compatible Seal Liquid

High slurry fluid
Paper plup, paint
Waste water, etc

(MM)

SEAL SIZE	D h6	D1 H11	D2 H8	D3	D4 MIN.	L1 ±0.5	L2 ±0.05
M020	20	29	35	34	36	44	9.5
M022	22	31	37	36	38	45	9.5
M025	25	34	40	39	41	47	10
M028	28	37	43	42	44	47	10
M030	30	39	45	44	46	49	10
M032	32	42	48	46	48	49	10
M035	35	44	50	49	51	51	10
M038	38	49	56	54	58	51	13
M040	40	51	58	56	60	53	13
M045	45	56	63	61	65	53	13
M048	48	59	66	64	68	60	13
M050	50	62	70	66	70	60	15.5
M055	55	67	75	71	75	64	15.5
M058	58	70	78	76	83	67	16
M060	60	72	80	78	85	67	16
M065	65	77	85	83	90	72	16
M068	68	81	90	86	93	73	16
M070	70	83	92	90	95	74	19
M075	75	88	97	95	104	75	19
M080	80	95	105	100	109	77	19
M085	85	100	110	105	114	78	19
M090	90	105	115	110	119	79	19
M095	95	110	120	115	124	81	19
M100	100	115	125	120	129	82	19

L1B TYPE — Inside unbalanced seal design ISO standard



Application Range

Max. pressure ····· 10kg/㎠
Max. temperature ····· ~ +220°C
Max. viscosity ····· 150,000cp
Slurry ····· 7%max

Particular's of type

One coil spring type
Unbalanced seal
Teflon V-ring used
High slurry

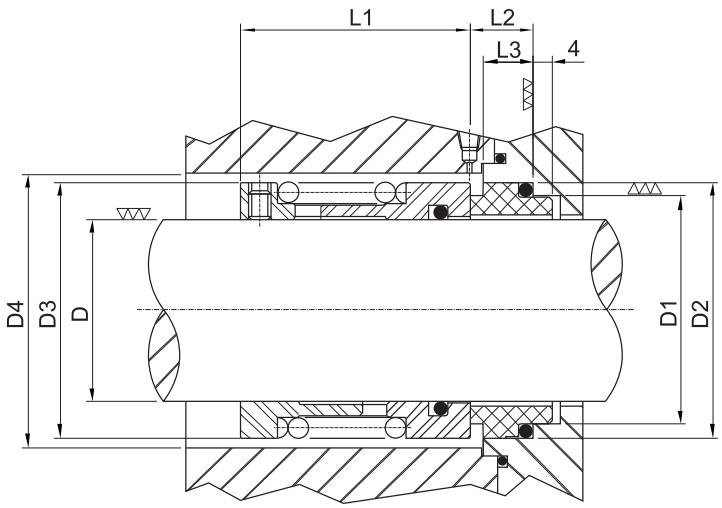
Compatible Seal Liquid

High slurry fluid
Paper plup, paint, slovent
High polymer, etc.

(MM)

SEAL SIZE	D h6	D1 H11	D2 H8	D3	D4 MIN.	L1 ±0.5	L2 ±0.05	L3
M020	20	36	42	34	36	44	19	24
M022	22	38	44	36	38	45	19	24
M025	25	41	47	39	41	47	19	24
M028	28	44	50	42	44	47	19	24
M030	30	46	52	44	46	49	19	24
M035	35	51	57	49	51	51	19	24
M038	38	58	64	54	58	51	19	24
M040	40	60	66	56	60	53	19	24
M045	45	65	71	61	65	53	19	24
M048	48	68	74	64	68	60	19	24
M050	50	70	76	66	70	60	19	24
M055	55	75	81	71	75	64	19	24
M058	58	83	89	76	83	67	19	24
M060	60	85	92	78	85	67	21	26
M065	65	90	97	83	90	72	21	26
M068	68	93	100	86	93	73	21	26
M070	70	95	102	90	95	74	25	30
M075	75	104	111	95	104	75	25	30
M080	80	109	116	100	109	77	25	30
M085	85	114	121	105	114	78	25	30
M090	90	119	126	110	119	79	25	30
M095	95	124	131	115	124	81	25	30
M100	100	129	137	120	129	82	27	33

L1C TYPE — Inside unbalanced seal design ISO standard



Application Range

- Max. pressure ····· 10kg/㎠
- Max. temperature ····· ~ +200°C
- Max. viscosity ····· 150,000cp
- Slurry ····· 7%max

Particular's of type

- One coil spring type
- Unbalanced seal
- Non com'p collar
- High slurry

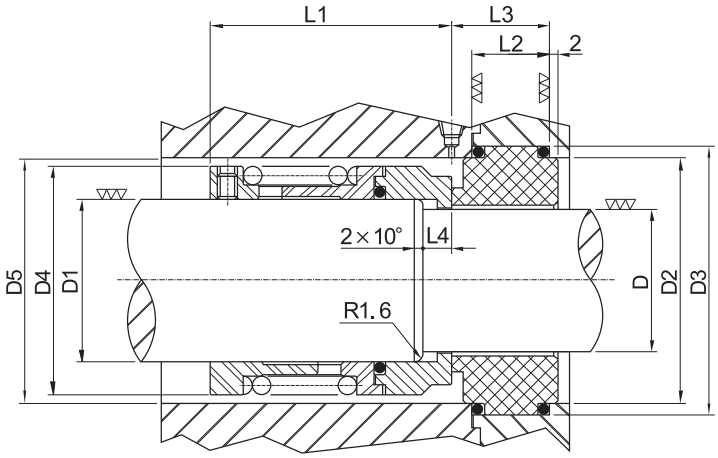
Compatible Seal Liquid

- High slurry fluid
- Paper plup, paint
- High polymer, etc.

(MM)

SEAL SIZE	D h6	D1 H11	D2 H8	D3	D4 MIN.	L1 ±0.5	L3
M020	20	36	42	34	36	41	18
M022	22	38	44	36	38	41	18
M025	25	41	47	39	41	43	18
M028	28	44	50	42	44	45	18
M030	30	46	52	44	46	45	18
M032	35	48	54	46	48	45	18
M035	35	51	57	49	51	49	18
M038	38	58	64	54	58	53	20
M040	40	60	66	56	60	55	20
M042	42	62	68	58	62	55	20
M043	43	63	69	59	63	55	20
M045	45	65	71	61	65	55	20
M048	48	68	74	64	68	60	20
M050	50	70	76	66	70	60	20
M052	52	72	78	68	72	61	20
M055	55	75	81	71	75	61	20
M058	58	83	89	76	83	63	22
M060	60	85	91	78	85	63	22
M062	62	87	93	80	87	63	22
M065	65	90	96	84	90	67	22
M068	65	93	99	87	93	67	24
M070	70	95	101	90	95	68	24
M075	75	104	110	95	104	72	24
M080	80	109	115	100	109	72	25
M085	85	114	120	107	114	77	25
M090	90	119	125	112	119	77	25
M095	95	124	130	119	124	82	25
M100	100	129	135	124	129	82	25

L2B TYPE — Inside balance seal design ISO standard



Application Range

- Max. pressure ····· 30kg/㎠
- Max. temperature ····· ~ +220°C
- Max. viscosity ····· 150,000cp
- Slurry ····· 7%max

Particular's of type

One coil spring type
Balanced seal
High pressure
High slurry

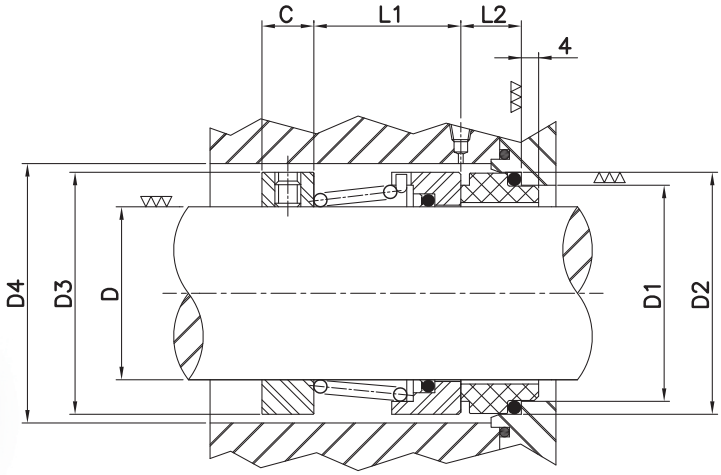
Compatible Seal Liquid

High pressure fluid
Crystallizing acid, water
High slurry pump, etc

(MM)

SEAL SIZE	D h6	D1 h6	D2 H11	D3 H8	D4	D5 MIN.	L1 ±0.5	L2 ±0.05	L3	L4
M025	20	25	41	47	39	47	53	19	23	7
M030	25	30	46	52	44	52	55	19	23	7
M032	28	32	48	54	46	54	55	19	23	7
M035	30	35	51	57	49	57	57	19	23	7
M038	32	38	58	64	54	64	57	19	23	7
M040	35	40	60	66	56	66	59	19	23	7
M045	38	45	65	71	61	71	59	19	23	8
M048	40	48	68	74	63	74	66	19	24	8
M050	45	50	70	76	66	76	67	19	24	8
M052	48	52	72	78	69	78	70	19	24	8
M055	50	55	75	81	71	81	70	19	24	8
M060	55	60	85	92	80	92	75	19	26	8
M065	60	65	90	97	85	97	78	21	26	8
M070	65	70	95	102	90	102	80	21	30	9
M075	70	75	104	111	95	111	81	25	30	9
M080	75	80	109	116	100	116	83	25	30	9
M085	80	85	114	121	107	121	84	25	30	9
M090	85	90	119	126	112	126	85	25	30	9
M095	90	95	124	131	119	131	87	25	30	9
M100	95	100	134	137	124	137	88	27	33	9

L3A TYPE — Inside unbalanced seal design ISO standard



Application Range

- Max. pressure ····· 10kg/㎠
- Max. temperature ····· ~ +200°C
- Max. viscosity ····· 100,000cp
- Slurry ····· 7%max

Particular's of type

- One coil taper type
- Short working length
- Simple structure
- Unbalanced seal

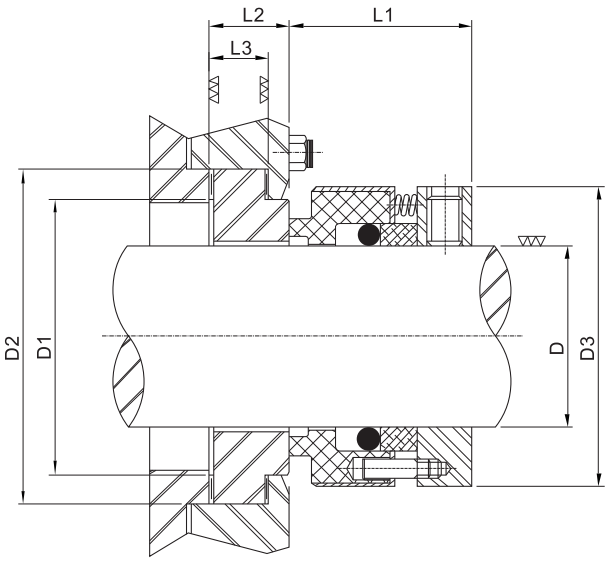
Compatible Seal Liquid

- Sanitary fluid
- Cost saving
- Easy cleaning pump, etc

(MM)

SEAL SIZE	D h6	D1 H11	D2 H8	D3	D4 MIN.	L1 ±0.5	L2
M020	20	30	36	34	36	24	11
M025	25	35	41	39	41	26	12
M028	28	38	44	42	44	26	12
M030	30	40	46	44	46	26	13
M032	32	42	48	46	48	28	13
M035	35	45	51	54	51	28	13
M040	40	50	56	56	60	34	14
M042	42	52	58	58	62	34	14
M045	45	55	61	61	65	37	14
M048	48	58	64	64	68	37	15
M050	50	60	66	66	70	43	15
M055	55	65	71	71	75	49	15
M060	60	72	78	78	85	55	16
M065	65	77	83	85	90	58	16
M070	70	81	90	90	95	60	18
M075	75	86	95	95	104	60	18
M080	80	91	100	100	109	60	18
M085	85	96	105	105	114	60	18
M090	90	101	110	110	119	60	18
M095	95	106	115	115	124	60	18
M100	100	116	125	120	129	60	20

L4B TYPE — Outside balance seal design ISO standard



Application Range

Max. pressure ····· 4kg/㎠
Max. temperature ····· ~ +200°C
Max. viscosity ····· 100cp
Slurry ····· 0.1%max

Particular's of type

Multi spring type
Outside seal
Strongly acid

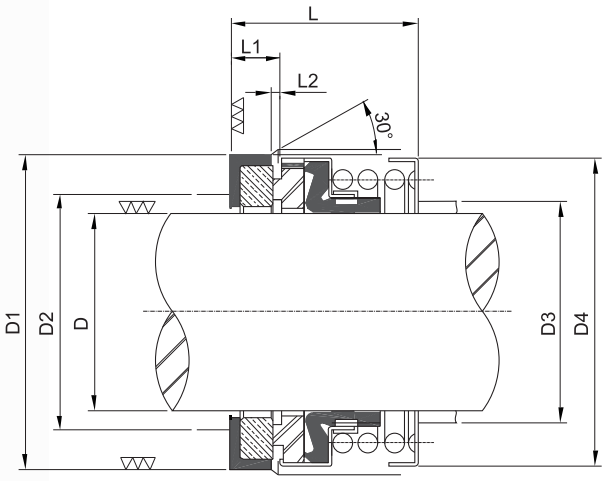
Compatible Seal Liquid

Strongly corrosive fluid

(MM)

SEAL	D	D1	D2	D3	L1	L2	L3
SIZE	h6	C6	C9		±0.5		±0.05
M025	25	41.5	54.5	51	38	13	17.5
M028	28	45	57.5	54	38	13	17.5
M030	30	46.5	63	56	38	13	17.5
M032	32	48	60.5	58	38	13	17.5
M035	35	51	62.5	61	38	13	17.5
M040	40	60.5	73.5	66	40	13	17.5
M045	45	64	80	71	40	13	17.5
M050	50	70	89.5	76	40	13	17.5
M055	55	73.5	96	81	40	13	17.5
M060	60	78	99.5	86	40	13	17.5
M065	65	83	105	91	40	13	17.5

LWS TYPE Inside unbalanced seal design ISO standard



Application Range

Max. pressure ····· 5kg/㎠
Max. temperature ····· ~ +80°C
Max. viscosity ····· 300cp
Slurry ····· 7%max

Particular's of type

One coil spring type
Short length
Unbalanced seal

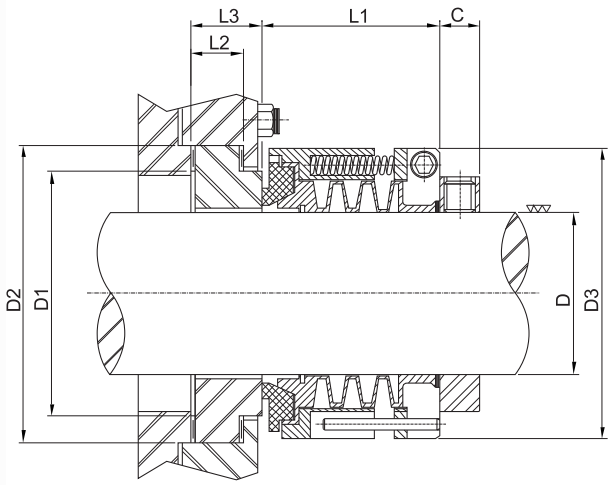
Compatible Seal Liquid

Water seal

(MM)

SIZE D	D1	D2	D3	D4	L	L1	L2
H9	H7		MIN.	MAX.	±0.3		
M08	21	13	12	20.0	18	7	2
M09	24	16	13	21.0	23	7	2
M010	24	16	14	23.5	23	7	2
M011	24	16	15	23.5	23	7	2
M012	26	17	16	26.0	24	7	2
M013	26	17	17	26.0	24	7	2
M014	28	21	18	28.0	25	7	2
M015	28	21	19	28.0	25	8	2
M016	32	22	20	30.0	25	8	2
M017	32	22	21	30.0	26	8	2
M018	35	25	22	32.5	26	8	2
M019	35	25	23	32.5	26	8	2
M020	38	27	24	35.5	28	8	2
M022	40	29	26	37.5	28	8	2
M025	44	32	29	42.0	29	9	2
M028	46	34	32	45.5	30	9	2
M030	50	38	35	48.0	31	9	2
M032	54	40	37	50.0	33	9	2
M035	58	44	40	54.5	36	10	2
M038	60	46	43	58.5	37	10	2
M040	64	48	45	62.5	38	10	2
M045	66	52	50	66.5	40	10	2
M050	72	58	55	72.5	42	10	2

TBS TYPE Outside teflon bellows seal design ISO standard



Application Range

Max. pressure ..... 4kg/㎠
Max. temperature ..... ~ +200°C
Max. viscosity 100cp
Slurry 0.1%max

Particular's of type

Multi spring type
Teflon bellows seal
Outside seal

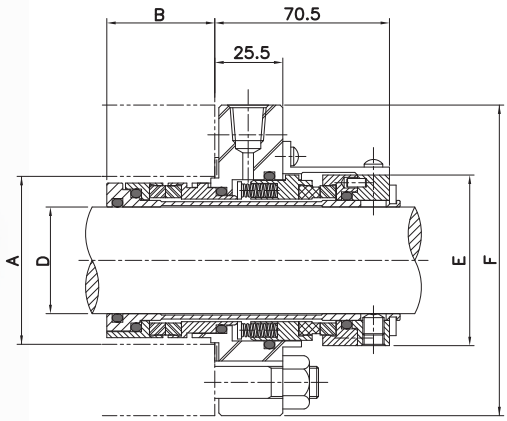
Compatible Seal Liquid

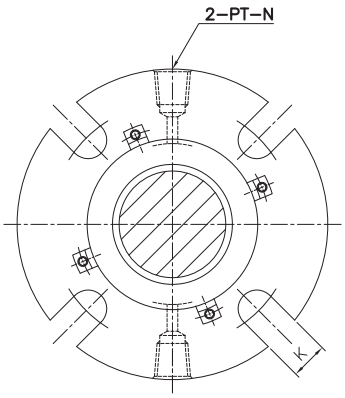
Corrosion resistance fluid
Teflon, FRP. PVDF pump

(MM)

SIZE	D	D1	D2	D3	L1	L2	L3	C
	h6	C6	C9					
025	25	41.5	54.5	57	44	13	17.5	10
028	28	45	57.5	60	44	13	17.5	10
030	30	46.5	63	62	44	13	17.5	10
032	32	48	60.5	64	44	13	17.5	10
035	35	51	62.5	67	44	13	17.5	10
040	40	60.5	73.5	72	44	13	17.5	12
045	45	64	80	77	44	13	17.5	12
050	50	70	89.5	82	44	13	17.5	12
055	55	73.5	96	87	44	13	17.5	12
060	60	78	99.5	92	44	13	17.5	12
065	65	83	105	97	44	13	17.5	12

KSD TYPE Double cartridge balanced design ANSI standard





Application Range

Max. pressure ..... 15kg/㎠
Max. temperature ..... ~ +200°C
Max. viscosity 300,000cp
Slurry 10%max

Particular's of type

Ease of installation
Multi spring type
Extreme corrosion resistance
Cartridge mounted

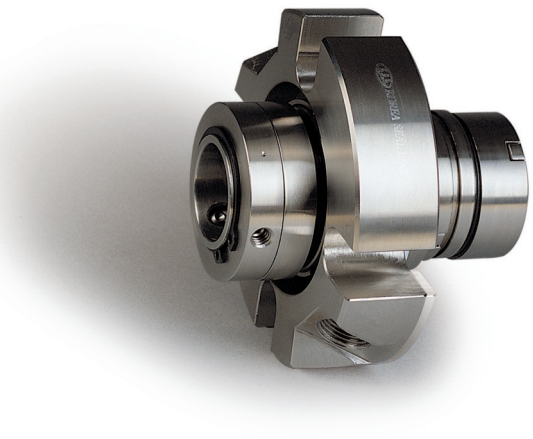
Compatible Seal Liquid

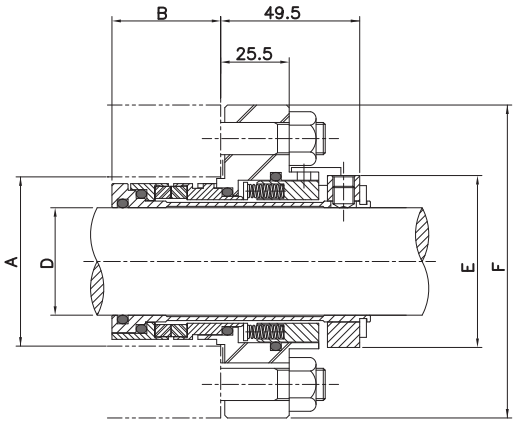
Chemical processing
High slurry fluid, etc

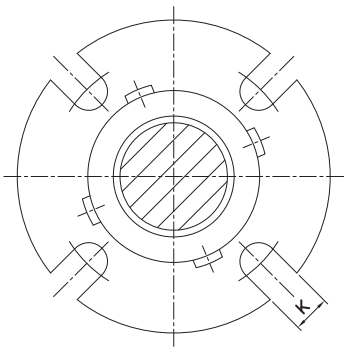
(MM)

SEAL	D	A	B	E	F	K	N	B.C.D	
SIZE								MIN.	MAX.
M020	20	39	38.5	44	105	14	1/4″	69	86
M025	25	44	38.5	49	105	14	1/4″	74	86
M030	30	49	38.5	54	105	14	1/4″	79	86
M035	35	54	38.5	59	115	14	1/4″	84	86
M040	40	59	38.5	64	130	14	1/4″	89	111
M045	45	64	39.5	69	140	14	1/4″	94	121
M050	50	69	39.5	74	140	14	1/4″	99	121
M055	55	74	39.5	79	155	17	1/4″	110	131
M060	60	79	39.5	84	155	17	1/4″	115	131
M065	65	84	39.5	89	165	17	1/4″	120	141
M070	70	95	43.5	100	200	17	1/4″	131	176
M075	75	100	43.5	105	205	17	1/4″	136	181
M080	80	105	43.5	110	210	17	1/4″	141	186
M085	85	110	43.5	115	215	17	1/4″	146	190
M090	90	115	43.5	120	220	21	1/4″	158	190
M095	95	120	43.5	125	225	21	1/4″	163	195
M100	100	125	43.5	130	230	21	1/4″	168	200
M110	110	135	43.5	140	240	25	1/4″	185	204
M120	120	145	43.5	150	250	25	1/4″	195	214
M130	130	155	43.5	160	260	25	1/4″	205	224
M140	140	165	43.5	170	270	25	1/4″	215	234
M150	150	175	43.5	180	280	25	1/4″	225	244

KSM TYPE Single cartridge balanced seal design ANSI standard







Application Range

Max. pressure ..... 15kg/㎠
Max. temperature ..... ~ +200°C
Max. viscosity 300,000cp
Slurry 10%max

Particular's of type

Ease of installation
Multi spring type
Single balanced seal
Cartridge mounted

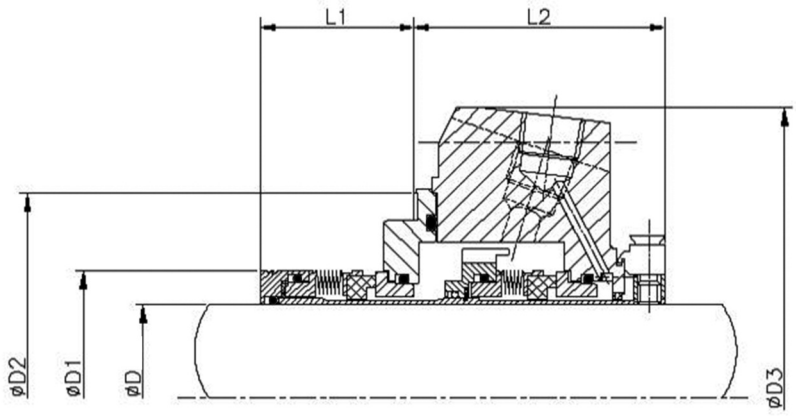
Compatible Seal Liquid

Chemical processing
High slurry fluid, etc

(MM)

SEAL SIZE	D	A	B	E	F	K	B.C.D MIN.	B.C.D MAX.
M020	20	39	38.5	44	105	14	69	86
M025	25	44	38.5	49	105	14	74	86
M030	30	49	38.5	54	105	14	79	86
M035	35	54	38.5	59	115	14	84	86
M040	40	59	38.5	64	130	14	89	111
M045	45	64	39.5	69	140	14	94	121
M050	50	69	39.5	74	140	14	99	121
M055	55	74	39.5	79	155	17	110	131
M060	60	79	39.5	84	155	17	115	131
M065	65	84	39.5	89	165	17	120	141
M070	70	95	43.5	100	200	17	131	176
M075	75	100	43.5	105	205	17	136	181
M080	80	105	43.5	110	210	17	141	186
M085	85	110	43.5	115	215	17	146	190
M090	90	115	43.5	120	220	21	158	190
M095	95	120	43.5	125	225	21	163	195
M100	100	125	43.5	130	230	21	168	200
M110	110	135	43.5	140	240	25	185	204
M120	120	145	43.5	150	250	25	195	214
M130	130	155	43.5	160	260	25	205	224
M140	140	165	43.5	170	270	25	215	234
M150	150	175	43.5	180	280	25	225	244

TDB TYPE Double cartridge metal bellows seal design ANSI standard



Application Range

Max. pressure ····· 14㎏/㎠
Max. temperature ····· ~ +250℃
Max. viscosity ····· 1000cp
Slurry ····· 0.5%max

Particular's of type

Ease of installation.
Double metal bellows type
Circulating shroud, Tandem seal
Cartridge mounted.

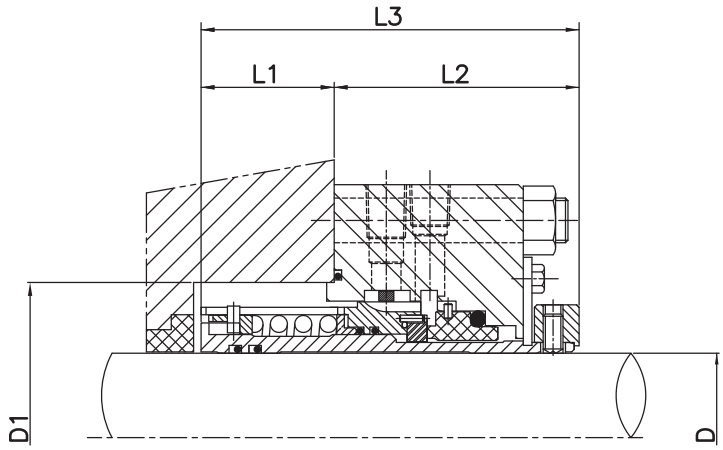
Compatible Seal Liquid

Tandem seals are frequently use for volatile,toxic, carcinogenic,hazadous or poor lubricating fluid.

(INCH)

Seal Size	D	D1h6	D2	D3	L1	L2
+0.00						
+0.05						
1.375″	1.375″	1.937″	3.375″	5.250″	1.84″	2.06″
1.875″	1.875″	2.564″	4.125″	5.88″	1.571″	2.454″
2.625″	2.625″	3.437″	5.125″	7.000″	2.097″	3.238″

KSQ TYPE Single cartridge balanced seal design ANSI standard



Application Range

Max. pressure ..... 70kgf/㎠
Max. temperature ..... ~ +220℃
Max. viscosity 1000cp
Slurry 3%max

Particular's of type

Ease of installation.
One coil spring type
Circulating shroud
Cartridge mounted.

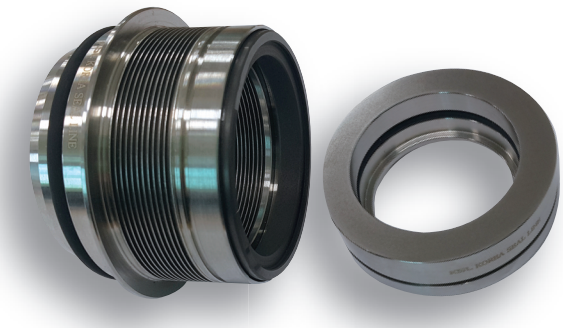
Compatible Seal Liquid

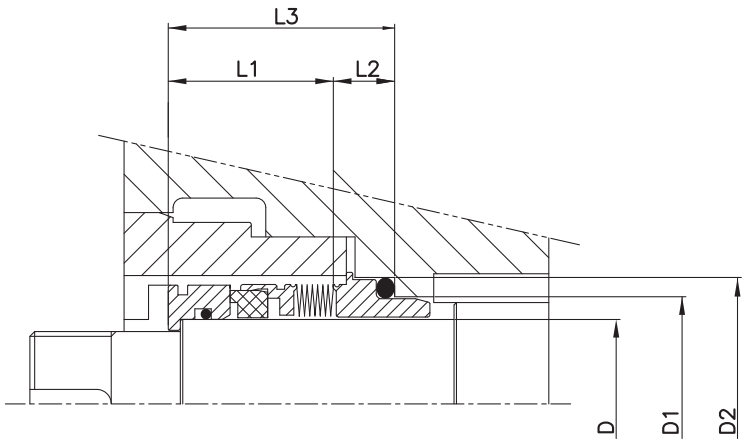
Boiler feed pump
Hot-molten fluid.
High pressure

(INCH)

Seal Size	Inches				
	D	D1	L1	L2	L3
1.250	0.875	2.063	2.000	2.750	4.750
1.437	1.065	2.438	1.938	2.750	4.688
1.500	1.128	2.375	2.063	3.000	5.063
1.750	1.315	2.938	2.281	3.063	5.344
1.875	1.440	2.813	2.406	3.094	5.500
2.062	1.565	3.125	2.625	3.750	6.375
2.250	1.815	3.250	2.375	3.688	6.063
2.375	1.878	3.500	3.156	3.656	6.812
2.500	2.003	3.750	3.094	3.969	7.063
2.875	2.378	4.063	2.813	4.031	6.844
3.000	2.503	4.438	2.813	4.313	7.126
3.250	2.753	4.563	2.813	4.313	7.126
3.375	2.878	4.938	2.938	4.500	7.438
3.500	3.003	4.938	2.844	4.438	7.282
3.625	3.128	4.938	3.000	4.375	7.375
3.750	3.253	5.188	3.031	4.438	7.469
4.000	3.503	5.250	3.063	4.500	7.563
4.250	3.753	5.625	3.188	4.406	7.594
4.312	3.753	5.750	3.438	4.469	7.907
4.500	4.003	6.063	3.063	4.563	7.626
4.875	4.315	6.313	3.594	4.281	7.875
5.125	4.565	6.625	3.688	4.625	8.313
5.500	4.940	7.125	3.813	4.813	8.626
6.000	5.503	7.750	3.875	4.719	8.594

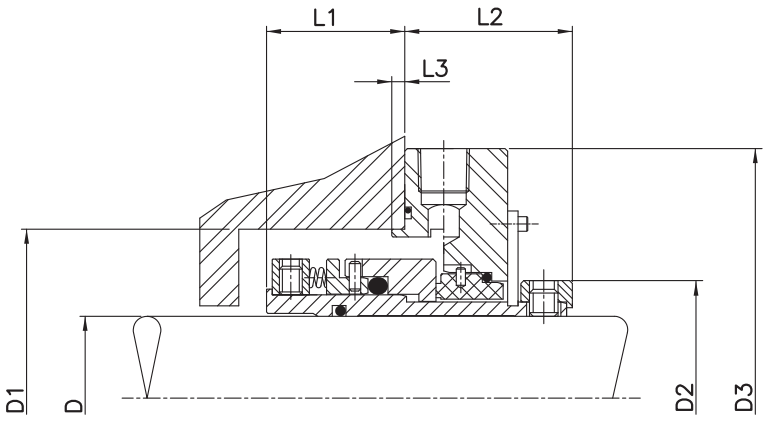
MBV TYPE — Metal bellows seal design DIN Standard





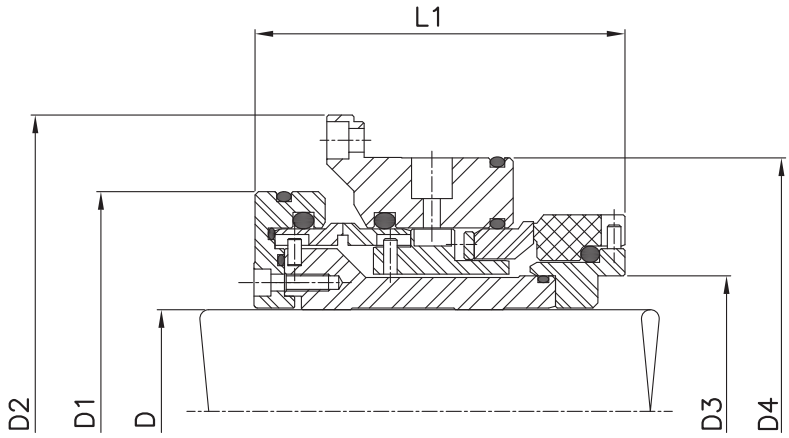
Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	7kg/㎠	Metal bellows type.	Screw vacuum pump
Max. temperature	~ +260℃	High vacuum pump	Hydrocarbon, etc.
Max. viscosity	1000cp	Static seal, High speed	
Slurry	0.3%max	Patent 10-1028112	

KSB TYPE — Single cartridge balanced seal design ANSI Standard



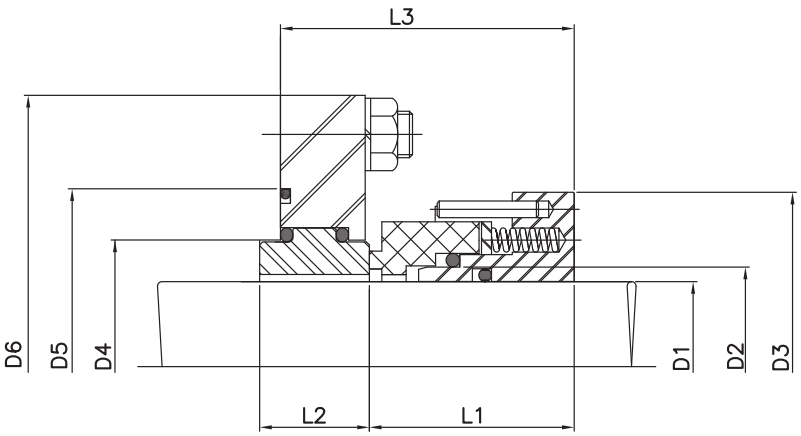
Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	40kg/㎠	Ease of installation.	High pressure pump
Max. temperature	~ +220℃	Multi spring type	Hot-molten fluid.
Max. viscosity	1000cp	Balanced seal, High pressure	Non crystallizing acid, salt
Slurry	3%max	Cartridge mounted.	Hydrocarbon, etc.

DMS TYPE Double Cartridge balanced seal design ANSI Standard



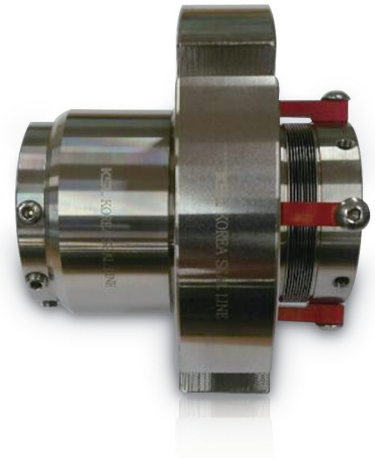
Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	17kg/㎠	Ease of installation.	Homo mixer pump
Max. temperature	~ +220℃	Multi spring type	Paper pulp
Max. viscosity	3000cp	Balanced seal, High viscosity	Crystallizing acid, salt
Slurry	7%max	Cartridge mounted.	Hydrocarbon, etc.

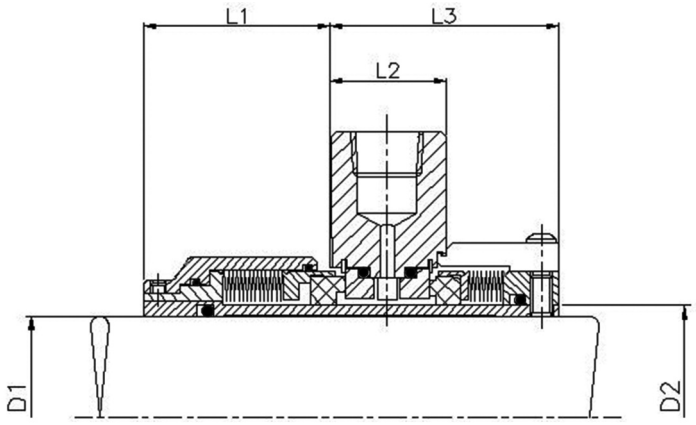
L5B TYPE Outside balanced seal design ANSI Standard



Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	15kg/㎠	Multi spring type	Full vacuum vessel
Max. temperature	~ +120℃	Balanced seal	Mixer, Agitator
Max. viscosity	350 rpm	Dry running seal	Heavy duty design
Slurry	0.3%max	Non sealant	

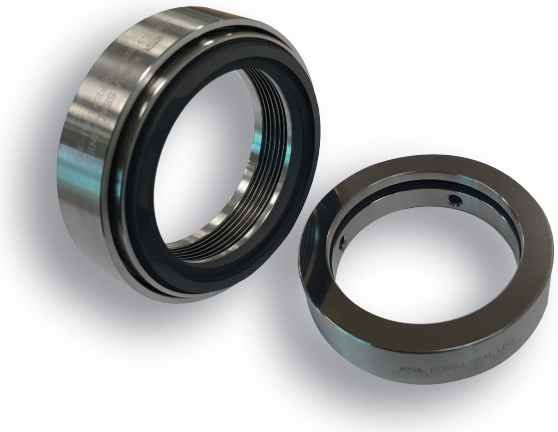
ABS TYPE Double cartridge metal bellows seal design ANSI Standard

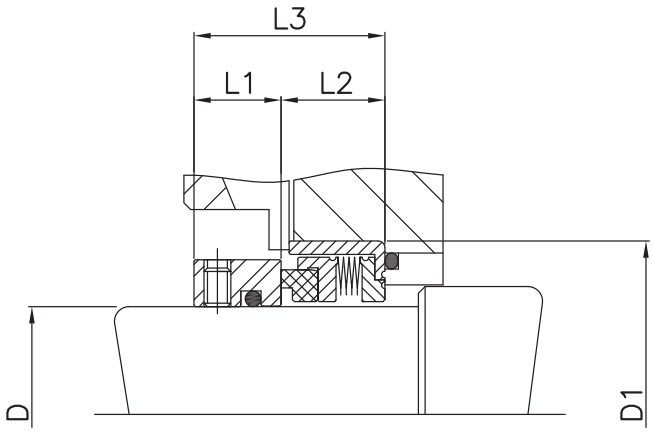




Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	20kg/㎠	Easy of installation	High slurry pump
Max. temperature	~ +220℃	Metal bellows type	High viscosity
Max. viscosity	15000cp	Bellows protect cover	Crystallizing liquid, etc
Slurry	7%max	Patent 10-0970466	

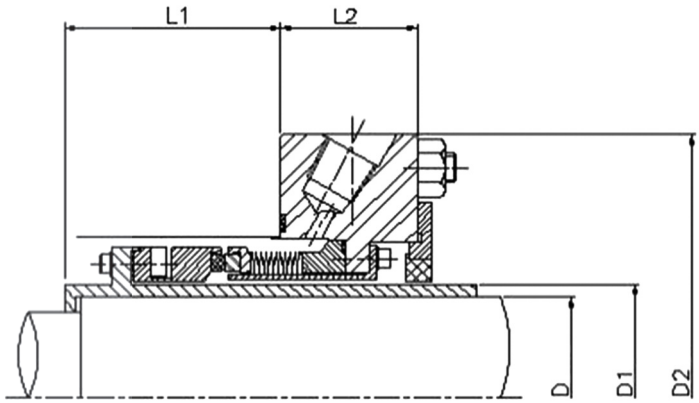
MCS TYPE Metal bellows seal design ANSI Standard





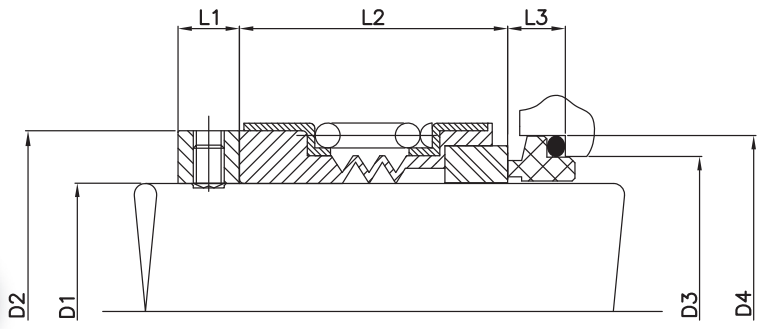
Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	7kg/㎠	High vacuum	Vacuum pump
Max. temperature	~ +260℃	Metal bellows type.	Turbine, compressor
Max. viscosity	1000rpm	Static seal	Centrifuge, etc.
Slurry	0.3%max	Patent 10-1370773	High speed

FBS TYPE Single cartridge metal bellows seal design ANSI Standard



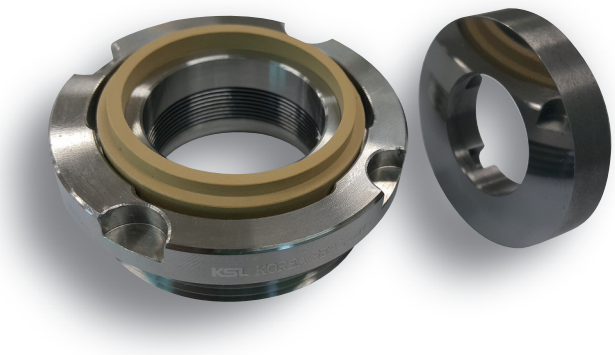
Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	20kg/㎠	Metal bellows type	Hot water
Max. temperature	~ +400℃	Graphite sheet used as packing	Hot-molten fluid.
Max. viscosity	1000cp	High temperature,static seal	Crystallizing acid, salt
Slurry	2%max	Cartridge mounted	Hydrocarbon, etc.

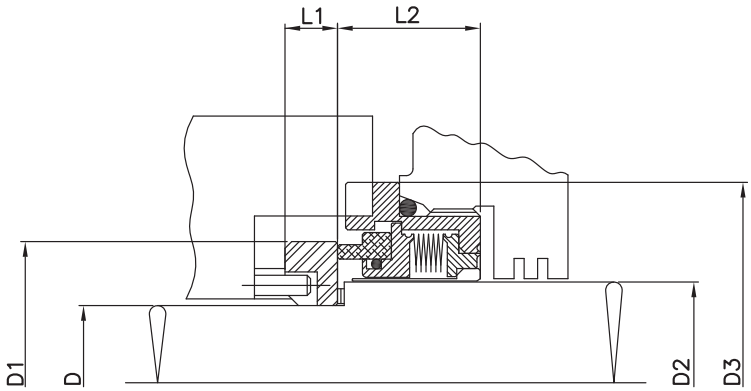
SLWS TYPE Rubber bellows seal design ANSI Standard



Application Range		Particular's of type	Compatible Seal Liquid
Max. pressure	10kg/㎠	Rubber bellows type	Sea water pump
Max. temperature	~ +90℃	One coil spring	Oil pump
Max. viscosity	1000rpm		Centrifugal pump,etc
Slurry	3%max		

GCS TYPE Metal bellows seal design ANSI Standard





Application Range

Max. pressure	10kg/㎠
Max. temperature	−170℃ ~ −200℃
Max. viscosity	1000cp
Slurry	0.3%max

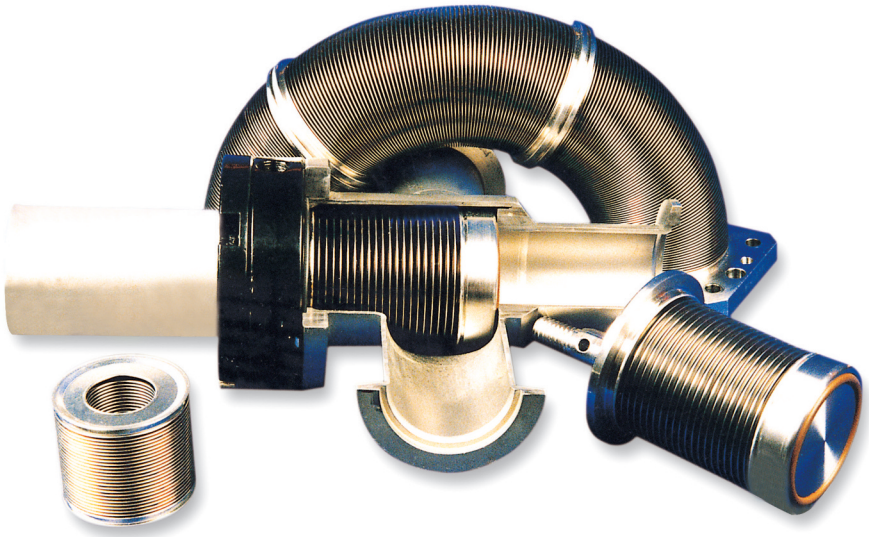
Particular's of type

Extreme low Temperature used
Metal bellows type
Flange screw
Static seal

Compatible Seal Liquid

Extreme low temperature
Gas seal
Oxygen gas liquid
Nitrogen gas liquid
Argon gas liquid

Welded Metal Bellows



Ultra−High Vacuum Metal Bellows Valve

Agitator Mixer Seal

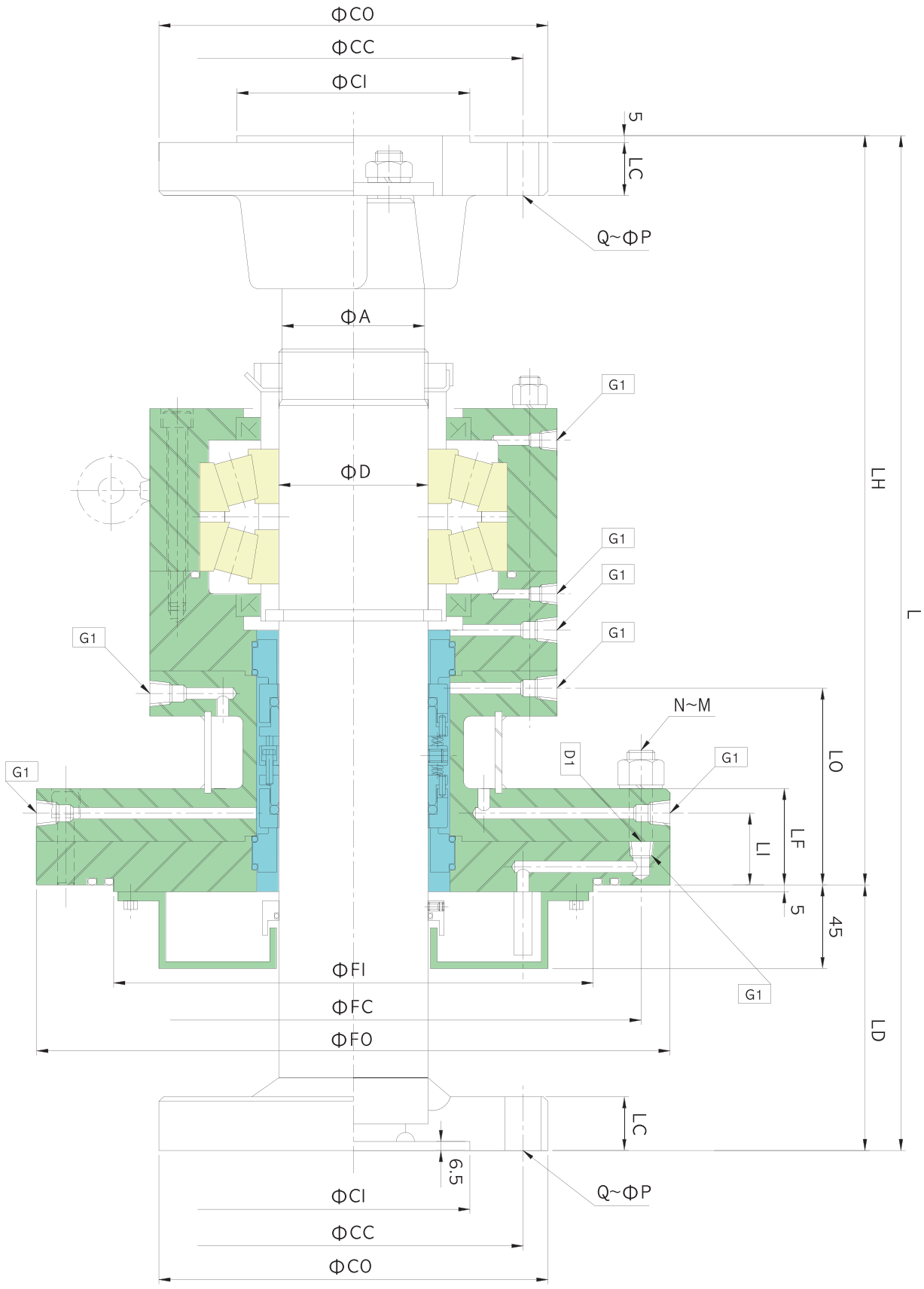
KSL – 200

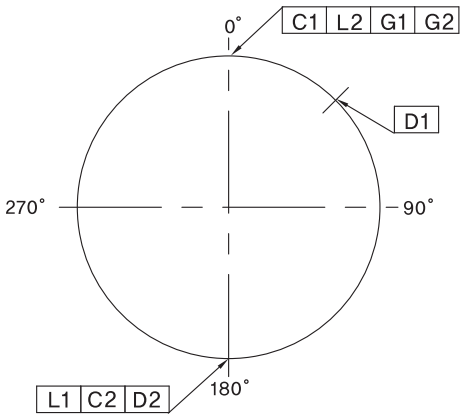
KSL – 300

Agitator Mixer Seal

구 분 \ Type		KSL100	KSL200	KSL300
적용범위	일반특징	Seal Unit에서 Shaft Thrust 및 Redial Force를 잡아주며, Shaft Coupling이 함께조립되어 있다.	가장 일반적인 Type으로서 Shaft의 Redial Force만을 잡아준다.	Glass Lining용 및 특수재질을 요하는 내산용 Seal Unit.
	적용온도	250°C	250°C	250°C
	적용압력	Full Vac.~30kg/㎠ (MAX. 60kg/㎠)	Full Vac.~30kg/㎠ (MAX. 60kg/㎠)	Full Vac.~15kg/㎠ (MAX. 30kg/㎠)
사용 Seal Type	Indoard	K1B	K1B	K1B
	Outdoard	K1B	K1B	L4B
Bearing Type		Taper Roller	자동조심형	Taper Roller
Shaft and Coupling		Yes	No	No
Sleeve		No Yes(Optional)	Yes	Yes
Shaft 동력 전달 방법		Lock Nut	Clutch System with Set Collar and Set Screw	Clutch System with Set Collar and Set Screw
Drain Box		Yes	Yes	No
Cooling Jacket		Yes	Yes	Yes
보조 System 및 보조 장치		Lubricating System Cooling System Lubricator (Optional)	Lubricating System Cooling System Lubricator (Optional)	Lubricating System Cooling System Lubricator (Optional)
기타				

KSL-100 TYPE Agitator Seal





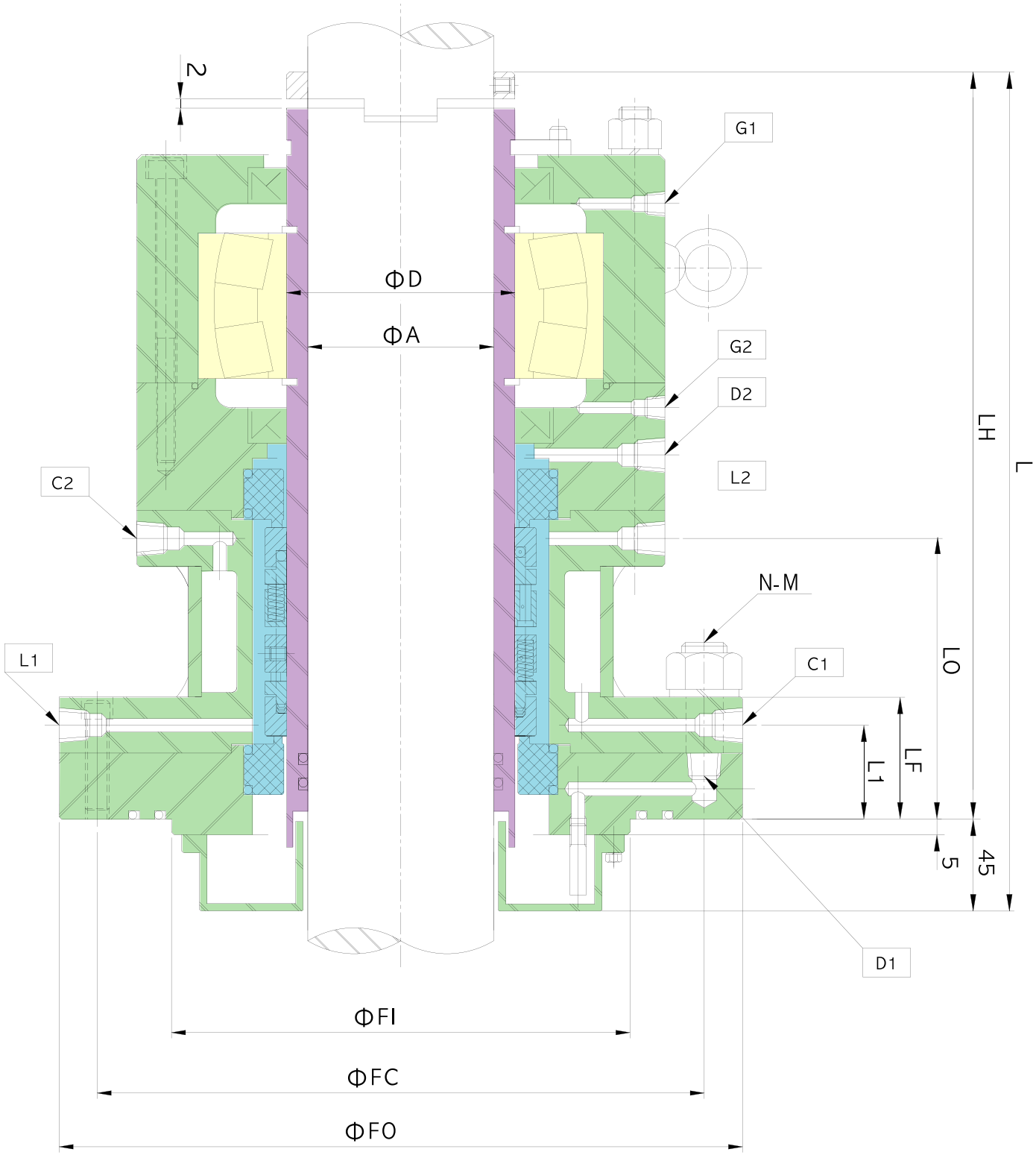
NO.	SERVICE	CONNECTION	REMARK
L1	SEALANT OIL INLET	PT3/8"	
L2	SEALANT OIL OUTLET	PT3/8"	
C1	COOLING WATER INLET	PT3/8"	
C2	COOLING WATER OUTLET	PT3/8"	
D1	DRAIN HOLE	PT3/8"	
D2	DRAIN HOLE	PT3/8"	
G1	GREASE OUTLET	PT1/4"	
G2	GREASE INLET	PT1/4"	

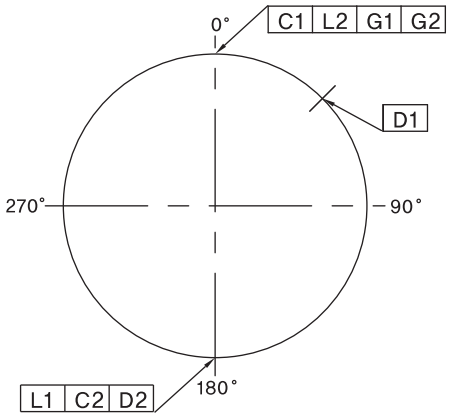
"KSL - 100" DIMENSION

(MM)

	A	D	F1	FC	FC	L	LH	LO	LF	LI	LD	N	M	O	P	CI	CC	CO	LC	BEARING NO.
020	25	30	125	170	200	467	329	109	54	43	138	8	16	6	14	70	95	120	16	#7306
030	35	40	145	195	235	504	354	119	54	43	150	8	20	6	18	80	110	140	18	08
040	45	50	160	215	255	523	371	119	54	43	152	8	20	6	18	95	125	155	20	10
050	55	60	180	235	275	552	392	124	56	44	160	8	20	6	18	115	145	175	22	12
060	65	70	210	260	300	581	414	127	58	45	167	12	20	6	22	130	165	205	25	14
070	75	80	225	280	320	600	431	127	58	45	169	12	20	6	22	145	180	220	27	16
080	85	90	160	315	355	618	446	127	58	45	172	12	20	6	26	170	210	255	30	18
090	95	100	275	335	380	623	449	128	60	46	174	12	24	8	26	185	225	270	32	#30220
100	105	110	290	350	395	640	463	128	60	46	177	12	24	8	26	200	240	285	35	22
110	115	120	315	375	420	655	473	128	60	46	182	12	24	8	26	225	265	310	40	24
120	125	130	335	395	440	665	481	128	60	46	184	12	24	10	26	245	285	330	42	26
130	135	140	355	415	460	690	503	128	60	46	187	12	24	10	26	265	305	350	45	28
140	145	150	365	425	470	703	514	128	62	46	189	12	24	10	26	275	315	360	47	30
150	155	160	375	435	480	746	546	138	62	48	200	16	24	10	26	285	325	370	50	32
160	165	170	385	445	490	774	572	138	62	48	202	16	24	10	26	295	335	380	52	34
180	185	190	405	465	510	802	594	138	62	48	208	16	24	12	26	315	355	400	57	38
200	215	220	435	530	575	896	673	149	65	51	223	20	24	12	26	335	385	430	65	44

KSL-200 TYPE Agitator Seal





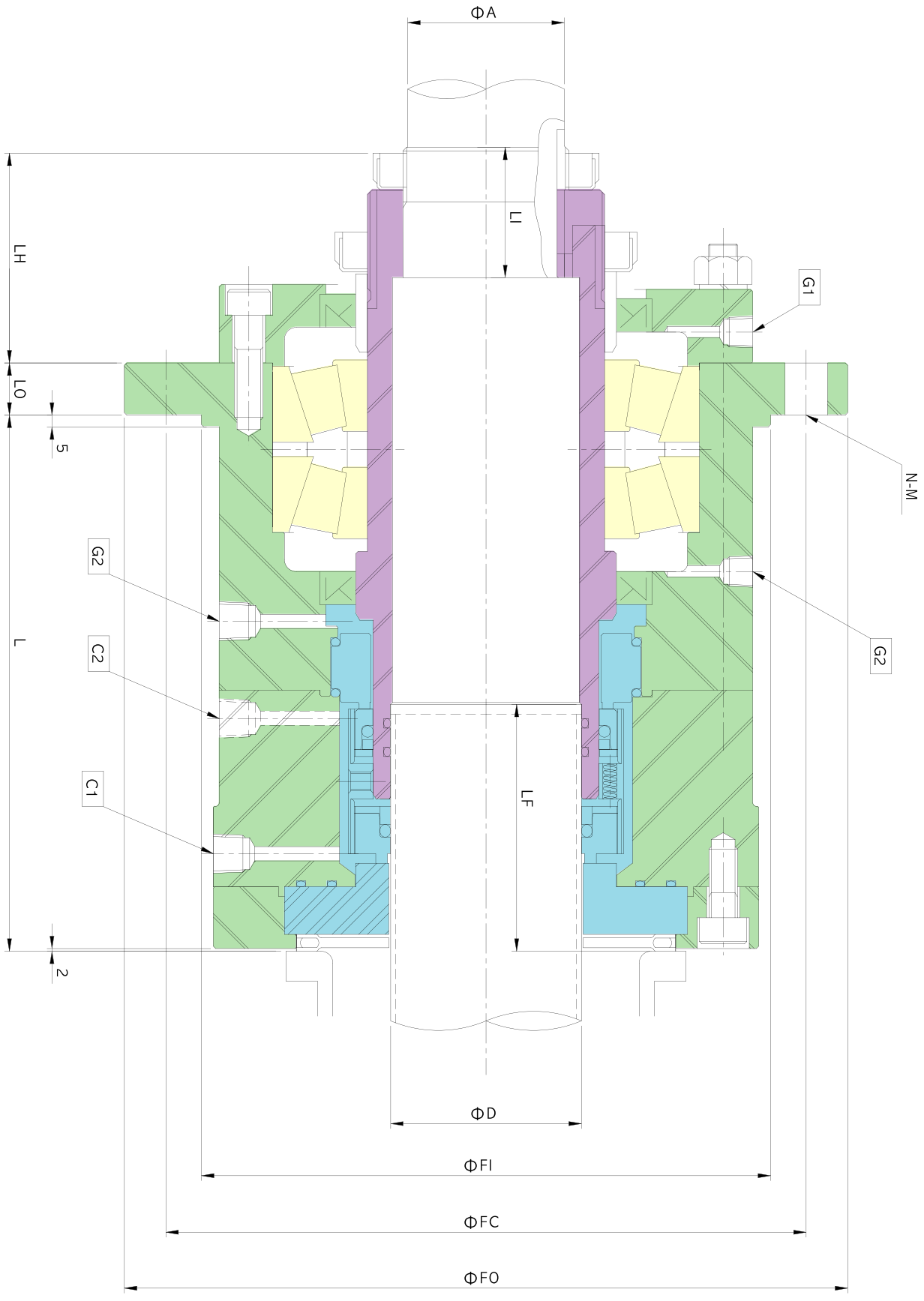
NO.	SERVICE	CONNECTION	REMARK
L1	SEALANT OIL INLET	PT3/8"	
L2	SEALANT OIL OUTLET	PT3/8"	
C1	COOLING WATER INLET	PT3/8"	
C2	COOLING WATER OUTLET	PT3/8"	
D1	DRAIN HOLE	PT3/8"	
D2	DRAIN HOLE	PT3/8"	
G1	GREASE OUTLET	PT1/4"	
G2	GREASE INLET	PT1/4"	

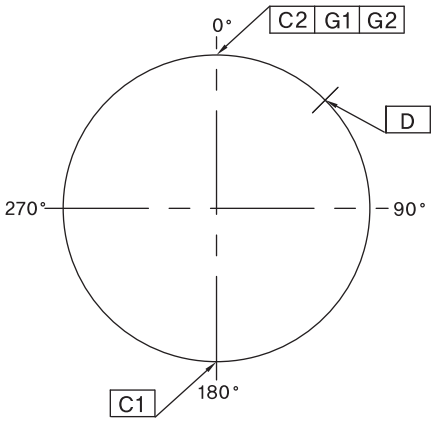
"KSL - 200" DIMENSION

(MM)

	A	D	F1	FC	FO	L	LH	LO	LF	LI	N	M	BEARING NO.
030	30	50	140	195	235	323	278	119	54	43	8	20	#22210
040	40	60	160	215	255	336	291	124	56	44	8	20	12
050	50	70	175	230	270	349	304	127	58	45	12	20	14
060	60	80	190	245	285	351	306	127	58	45	12	20	16
070	70	90	210	265	305	358	313	127	58	45	12	20	18
080	80	100	235	300	345	368	323	128	60	46	12	24	20
090	90	110	255	320	365	377	332	128	60	46	12	24	22
100	100	120	270	335	380	384	339	128	60	46	12	24	24
110	110	130	285	350	395	390	345	128	60	46	12	24	26
120	120	140	305	370	415	397	352	128	60	46	12	24	28
130	130	150	325	390	435	402	357	128	60	46	12	24	30
140	140	160	345	410	455	419	374	138	62	48	16	24	32
150	150	170	365	430	475	427	382	138	62	48	16	24	34
160	160	180	375	440	485	427	382	138	62	48	16	24	36
180	180	200	415	480	525	450	405	138	65	51	16	24	40
200	200	220	450	520	565	473	429	138	66	52	16	24	44

KSL-300 TYPE Agitator Seal





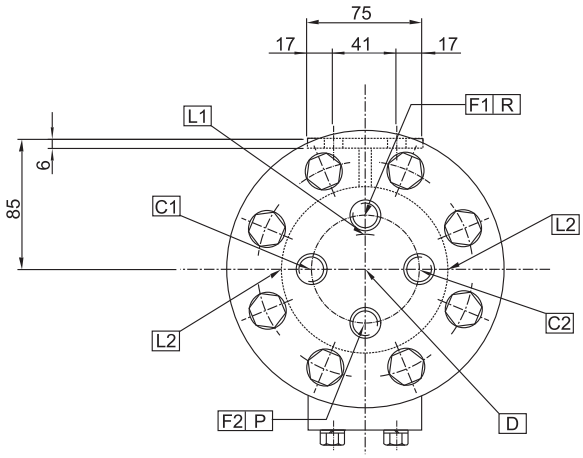
NO.	SERVICE	CONNECTION	REMARK
L1	SEALANT OIL INLET	PT3/8"	
L2	SEALANT OIL OUTLET	PT3/8"	
D	DRAIN HOLE	PT3/8"	
G1	GREASE INLET	PT1/4"	
G2	GREASE OUTLET	PT1/4"	

"KSL - 300" DIMENSION

(MM)

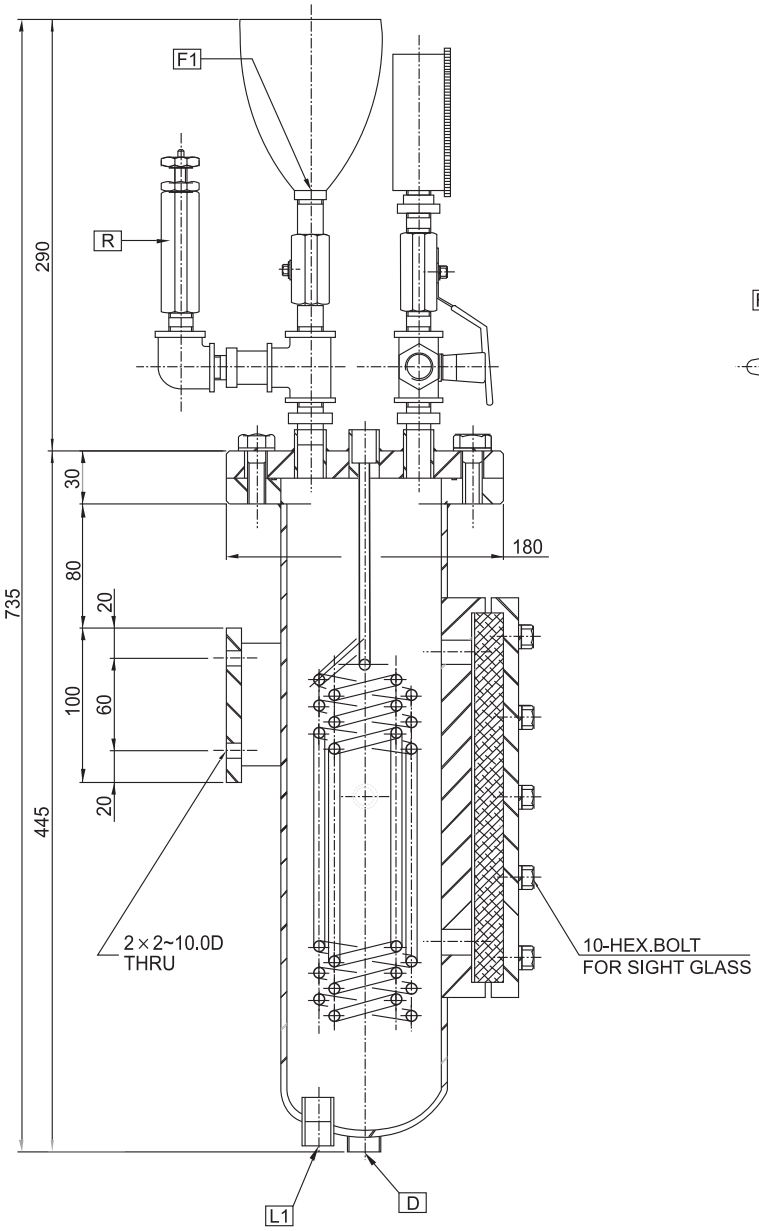
SIZE	ΦA	ΦD	ΦFI	ΦFC	ΦFO	L	LO	LH	LF	LI	N-M	BEARING SIZE
50	30	50	Φ185	Φ205	Φ230	196	20	57	105	47	6-14	#7214
60	40	60	Φ195	Φ215	Φ240	205	20	61	105	48	6-14	#7216
80	55	80	Φ240	Φ270	Φ305	227	22	73	105	53	8-18	#30220
90	65	90	Φ275	Φ313	Φ350	237	22	76	105	56	12-22	#30222
100	75	100	Φ300	Φ340	Φ380	251.5	22	76.5	115	56	12-22	#30224
110	85	110	Φ330	Φ370	Φ410	252	22	79	115	62	12-22	#30226
120	95	120	Φ350	Φ400	Φ440	262	22	81	115	62	12-22	#30228
140	110	140	Φ350	Φ400	Φ440	277	25	85	115	62	12-22	#30232
150	125	150	Φ410	Φ460	Φ500	302	26	89	115	62	12-24	#30234
160	135	160	Φ420	Φ470	Φ510	302	26	91	115	62	12-24	#30236
180	145	180	Φ460	Φ510	Φ560	318	26	93	115	62	12-24	#30240
200	165	200	Φ500	Φ550	Φ600	336	26	97	115	62	12-24	#30244

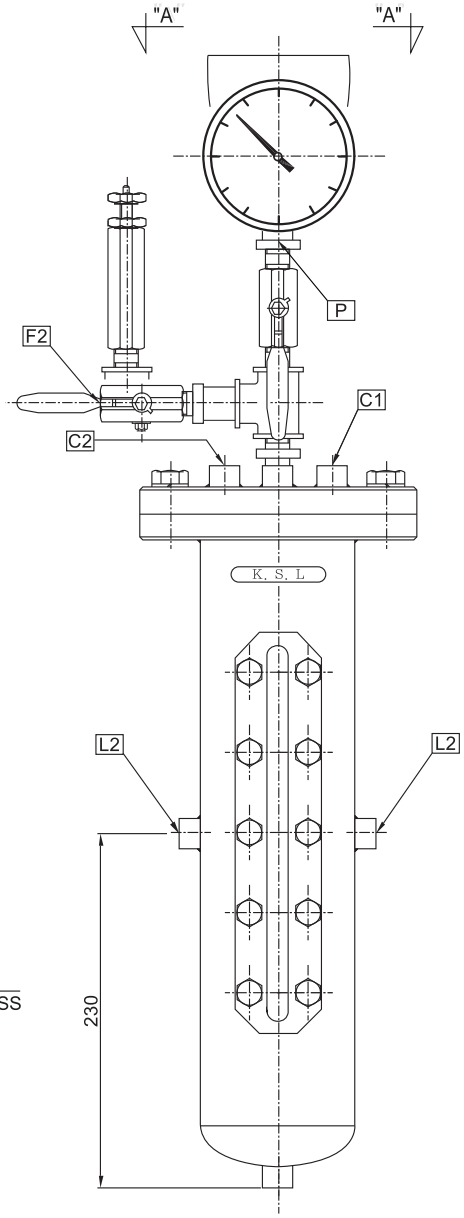
Sealant System



VIEW FROM "A" -"A"

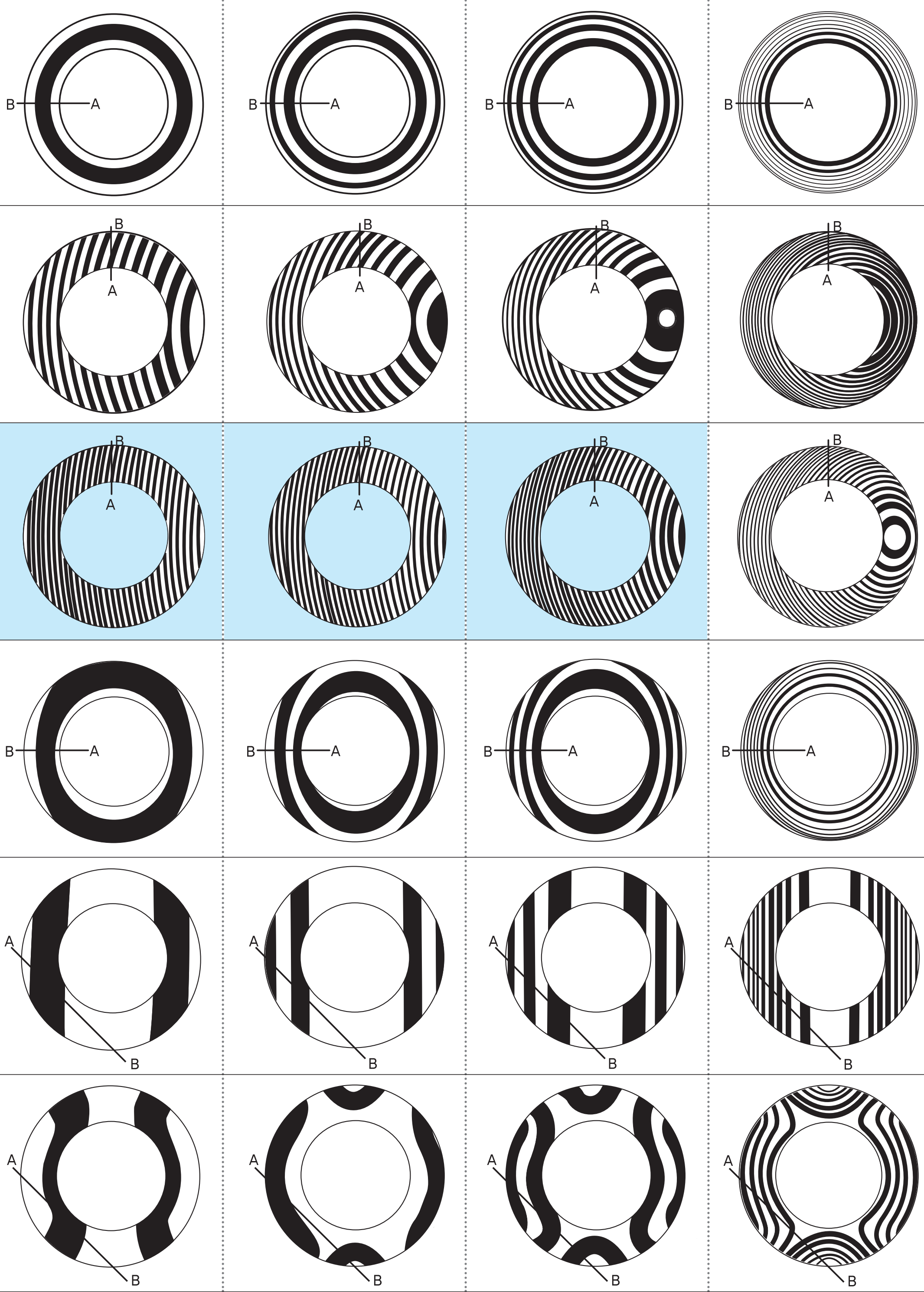
NOZZLE ORIENTATION		
NO	SERVICE	CONNECTION
C1	COOLING WATHER IN	PT 3/8″
C2	COOLING WATHER OUT	PT 3/8″
F1	SEANANT FILLING	PT 3/8″
F2	N_2 GAS SUPPLY	PT 3/8″
L1	SEALANT RETURN	PT 3/8″
L2	SEALANT SUPPLY	PT 3/8″
D	DRAING HOLE	PT 3/8″
P	PRESSURE GAUGE	PT 3/8″
R	RELIEF VALVE	PT 3/8″





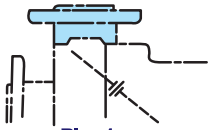
Check for Mechanical Seal Face

One Light Band	Two Light Bands	Three Light Bands	Nine Light Bands
.0000116" (0.29 micron)	.000023" (0.58 micron)	.000035" (0.58 micron)	.0001 (2.7 micron)



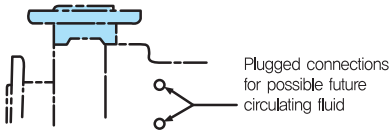
API STANDARD 610

Piping for Primary Seals



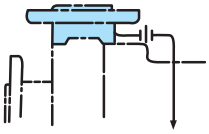
Plan 1

Integrai (internai) recirculation from pump discharge to seal



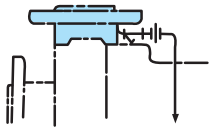
Plan 2

Deed–ended seal box wich no circulation of flush fluid Water–cooled box jacker. and throat bushing required unlless otherwise specified.



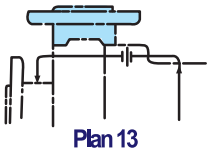
Plan 11

Recirculation from pump case through orifice to seal.



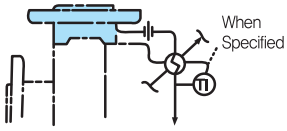
Plan 12

Recirculation from pump case through strainer and orifice to seal.



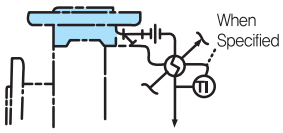
Plan 13

Recirculation from seal chamber through orifice and back to pump suction.



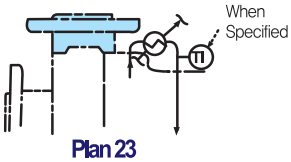
Plan 21

Recirculation from pump case through orifice and cooler to seal.



Plan 22

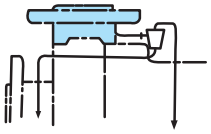
Recirculation from pump case through strainer, orifice, and cooler to seal.



Plan 23

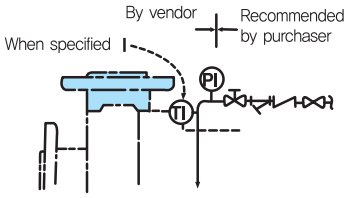
Recirculation from seal with pumping ring through cooler and back to seal.

Dirty or special Pumpage



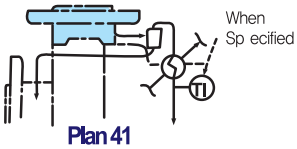
Plan 31

Recirculation from pump case through cyclone separator delivering clean fluid to seal and fluid with solids back to pump suction.



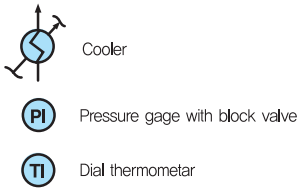
Plan 32

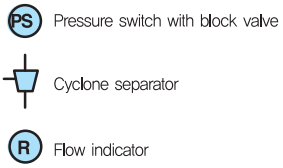
Injection to seal from external source of clean fluid[see note 2.

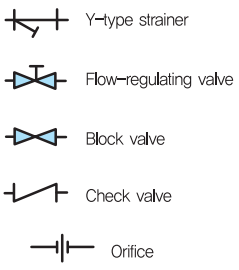


Plan 41

Recirculation from pump case through cyclone separator delivering clean fluid through cooler to seal and fluid with solids back to pump suction





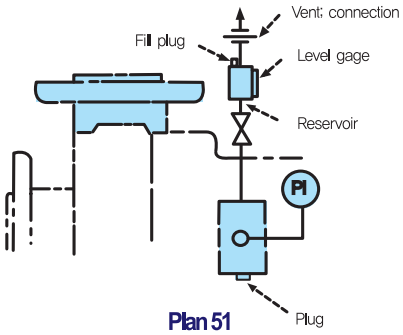


Note :

1. These plans represent commonly used systems. Other variations and systems are available and should be specified in detail by the purchaser or mutually agreed upon by the purchaser and the vendor.
2. For Plan 32, the purchaser shall specify the fluid characteristics, and the vendor shall specify the volume(gallons per minute)and pressure (pounds per square inch gage)required.

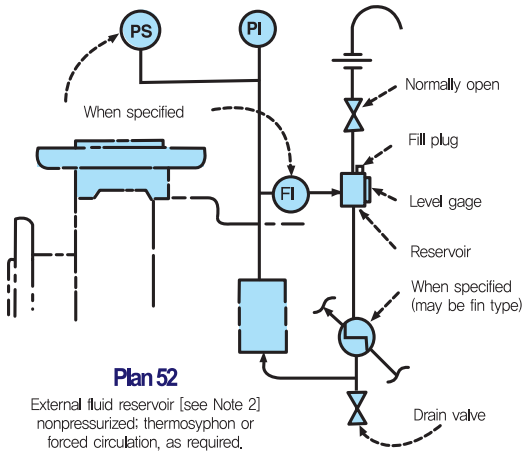
CENTRIFUGAL PUMPS FOR GENERAL REFINRY SERVICES

Piping for Throttle Bushing, Auxiliary Seal Device, or Double Seal, Tandem Seals



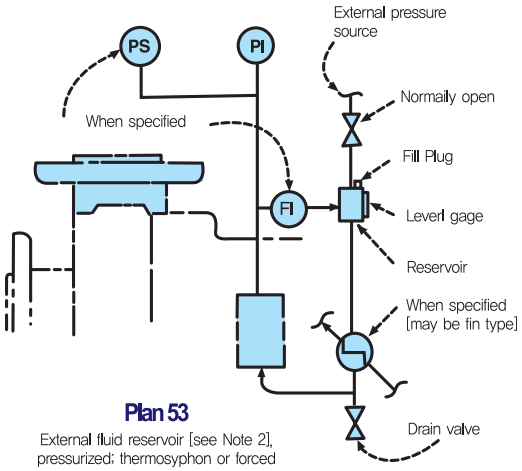
Plan 51

Deed-ended blanke:(usually methanol: see Note 2).



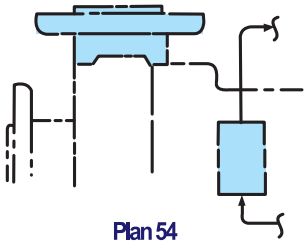
Plan 52

External fluid reservoir [see Note 2] nonpressurized: thermosyphon or forced circulation, as required.



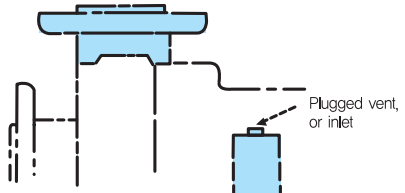
Plan 53

External fluid reservoir [see Note 2], pressurized: thermosyphon or forced circulation, as required.



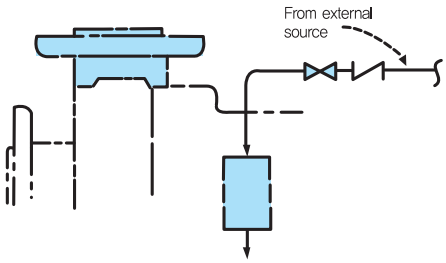
Plan 54

Circulation of clean fluid from an external system [see Note 2].



Plan 61

Tapped connections for purchaser's use: Note 2 shall apply when purchaser is to supply fluid [steam, gas, water, etc.] to auxiliary sealing device.



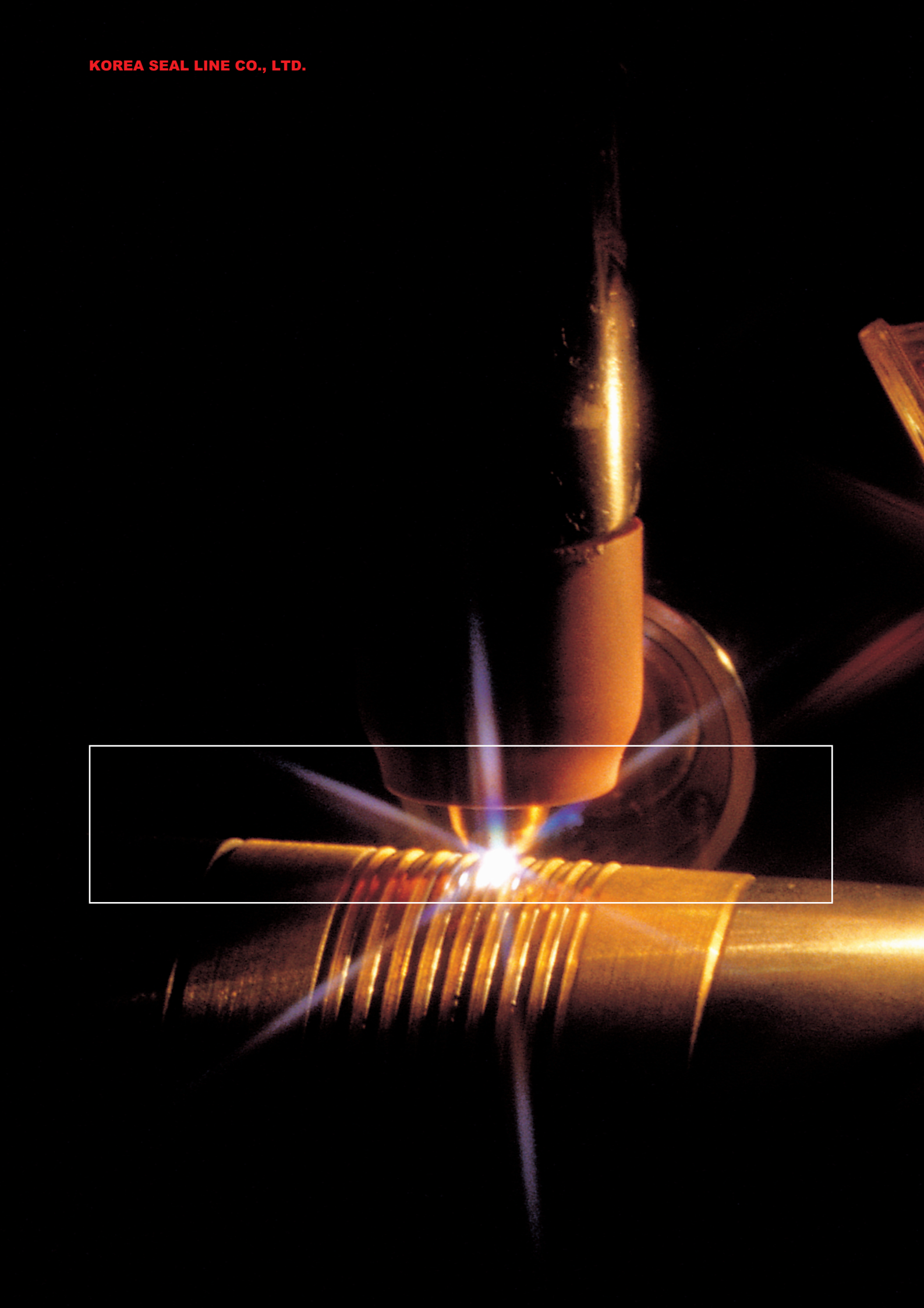
Plan 52

External fluid quench [steam, gas, water, etc, see Note 2].

Notes:

1. These plans represent commonly used systems. Other variations and systems are available and should be specified in detail by the purchaser or mutually agreed upon by the purchaser and the vendor.
2. The purchaser shall specify the fluid characteristics when supplemental seal fluid is provided. the vendor shall specify the volume (gallons per minute)and pressure (pounds per square inch gage) required, where these are factors.
3. See Figure D-2 for explanation of symbols not specified here.

KOREA SEAL LINE CO., LTD.



MBS

HBS

DBS

Ultra Precision Plasma Welding

Mechanical Seal 재질 선정 분석표

A = Good as ant component B = Good for glands, collars and compression unis
X = Not recommended

LIQUID NAME		APPLI CATION		PACKING					FACES						BODY			
		(%) DENS ITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Acetaldehyde	CH_3CHO		〈100	x	x	x	A	x	A	A	A	A	A	A	A	A	A	A
Acetic Acid	CH_3COOH	〈40	〈100	x	x	x	A	A	A	X	A	A	A	X	A	A	A	X
Acetic Anhydride	$(CH_3CO)_2O$		〈100	x	x	x	A	A	A	X	A	A	A	X	A	B	A	B
Acetone	CH_3COOH		〈100	x	x	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetylene	C_2H_2		〈100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acrolein	$CH_2=CHCOOH$	10	〈100	x	x	x	A	A	A	A	A	A	A	A	B	A	A	B
Acetonitrile	CH_3CN		〈80	x	x	x	A	A	A	A	A	A	A	A	B	A	A	B
Acrylic Acid	$CH_2=CHCOOH$		〈66	x	x	x	A	A	A	A	A	A	A	A	A	A	A	B
Acrolein	$CH_2=CHCOOH$	10	〈100	x	x	x	A	A	A	A	A	A	A	A	B	A	A	B
Adipic Acid	$(CH_2),(COOH)_2$		25	x	x	x	A	A	A	A	A	A	A	A	A	A	A	A
Allyl Alcohol	$CH_2=CHCH_2OH$	all	〈100	x	x	x	A	A	A	A	A	A	A	A	A	A	A	A
Allyl Chlorid	CH_2CHCH_2CL	90	〈100	x	x	x	A	A	A	A	A	A	A	A	B	B	B	X
Allyl Acetate	$CH_3COOCH_2CHCH_2$			x	x	x	A	A	A	A	A	A	A	A	A	A	A	A
AluminiumChioride	$ALCL_3$		〈100	A	A	A	A	A	A	X	A	A	A	X	X	X	A	X
Aluminium Hydroxide	$A1(OH)_2$	10	〈100	x	A	x	A	A	A	A	A	A	X	A	B	B	B	B
Aluminium Sulfate	$AL_2(SO_4)_2$	〈50	〈100	A	A	x	A	A	A	X	A	A	X	X	B	B	B	X
Arithracen Oil			〈300	x	x	x	A	A	A	A	A	A	A	A	A	A	A	A
Apiezon				A	x	A	A	A	A	A	A	A	A	A	A	A	A	A
Aqua Regia	HNO_3+HCL		〈66	X	x	x	A	A	x	X	A	A	X	X	X	X	X	X
Arsenic Acid	$H_3A_3O_4$		〈100	A	A	A	A	A	A	X	A	A	X	X	B	B	B	B
Arachis Oil				A	x	A	A	A	A	A	A	A	A	A	A	A	A	A
Asphalt				x	x	A	A	A	A	A	A	A	A	A	A	A	A	A

A = Good as ant component
B = Good for glands, collars and compression unis
X = Not recommended

LIQUID NAME	APPLICATION		PACKING					FACES						BODY			
	(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Barium Chloride $BACL_4 2H_2O$	⟨60	⟨100	A	A	A	A	A	A	X	A	A	X	X	B	B	A	B
Barium Hydroxide $Ba(OH)_2$	⟨50	⟨100	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B
Barium Nitrate $Ba(NO_3)_2$	⟨30	⟨100	A	A	A	A	A	A	X	A	A	X	X	B	B	B	B
Barium Sulfide $BaSO_4$	⟨10	⟨100	A	A	A	A	A	A	X	A	X	X	X	B	B	B	B
Barium Sulfide	⟨10	⟨100	A	A	A	A	A	A	X	A	X	X	X	B	B	B	B
Barium Sulfide $BaSO_2$	⟨10	⟨100	A	A	A	A	A	A	X	A	X	X	X	B	B	B	B
Beer			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzene C_4H6		⟨100	X	X	A	A	A	A	A	A	A	A	A	B	A	A	B
Benine			B	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzenesulfonic Acid $C6H5SO_3H$	all	⟨21	X	X	A	A	A	A	X	A	X	A	X	B	A	B	B
Benzoicacid $C7H6O_3$		⟨100	X	X	A	A	A	A	X	A	A	X	A	A	A	A	A
Blast Furance Gas			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Boiler Feed Water H_2O			A	A	A	A	A	A	A	A	A	A	A	B	A	A	A
Bonc Acid H_3BO_3	⟨50	⟨100	A	A	A	A	A	A	X	A	A	A	X	B	B	A	B
Bromic Acid $HBrO_3$	⟨50	25	X	X	x	A	A	A	X	A	A	X	X	X	B	A	X
Bromine Br_2		25	X	X	A	A	A	A	X	A	A	X	X	X	B	A	X
Bunder Fuen			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Butadiener $H_2C=CHCN=CH_2$		⟨100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Butyl Acetate $CH_3(COOC)H9$			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
N-Butyl Acrylate $C7H12O_2$		⟨100	A	X	A	A	A	A	X	A	A	A	X	A	A	A	A
N-Butanol $CH_3(CH_2)_3OH$		⟨100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Butyl Aldehyde C_2H7CHO		⟨100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A

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LIQUID NAME		APPLICATION		PACKING					FACES						BODY			
		(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Butyl Phenol	$C_4H_9C_6H_4OH$			X	X	X	A	A	A	X	A	A	X	X	X	B	B	X
Butyric Acid	$C_4H_6O_2$		〈100	X	X	X	A	A	A	X	A	A	X	X	X	A	A	B
Carvon Disulfide	CS_2	90	〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Calcium Bisulfite	$Ca(HSO_3)_2$		〈100	X	A	X	A	A	A	X	A	A	A	X	A	A	A	X
Calcium Carbonate	$CaCO_3$			A	A	A	A	A	A	A	A	A	A	A	A	B	B	A
Calcium Chloride	$CaCl_2$	〈30	〈100	A	A	A	A	A	A	A	A	A	A	A	X	B	A	X
Calcium Nitrate	$Ca(NO_3)_2,4H_2O$	〈40	〈100	A	A	A	A	A	A	X	A	A	A	X	B	B	B	B
Calcium Phosphate Dibasic	$CaHPO_4O,\sim2H_2O$			A	A	A	A	A	A	X	A	A	A	X	B	B	B	B
Calcium Sulftite	$CaSO_3,2H_2O$	10	〈100	A	A	A	A	A	A	X	A	A	A	X	A	A	A	A
Cane Sugar Liquors		〈20		A	A	A	A	A	A	A	A	A	A	A	A	A	A	X
Caprolactam	$CH_2CH_2CH_2CH_2CH_2CONH$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Carbonic Acid Aqueous		〈10	〈100	X	A	A	A	A	A	X	A	A	A	X	A	A	A	A
Carbon Monoxide	CO		〈100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon Tetrachloride	$CC1_4$	〈100	〈100	X	X	A	A	A	A	A	A	A	A	A	B	A	A	X
Castor Oil				A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Caustic Soda	NaOH	〉30	〈100	X	A	X	A	A	A	X	A	A	A	X	A	A	A	X
Chlorine	Cl_2		〈50	X	X	X	A	A	A	X	A	A	X	A	B	A	A	B
Chloropicrin	$CCINO_2$	〈100	〈100	X	X	X	A	A	A	X	A	A	A	X	B	B	A	B
Chlorosulphonic	Acid $SO_2Cl(OH)$		25	X	X	X	A	A	X	X	A	A	A	X	X	B	A	X
Chromic Acid	H_2CrO_4	〈20	〈60	X	X	X	A	A	X	X	A	A	X	X	X	X	A	X
Citric Acid	$(OH)C_3H_4(COOH)_3,H_2O$	〈50	〈100	A	A	A	A	A	A	X	A	A	A	A	A	B	A	B
Clay Slurry				A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

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X = Not recommended

LIQUID NAME	APPLICATION		PACKING					FACES						BODY			
	DENSITY (%)	TEMPERATURE (°C)	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Cider		25	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Coal Tar	〈50	〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	X
Coconut Acid			X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Condensate Water		〈100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Cooling Tower Water			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Cooper Acetate $Cu(CH_3COO)_2,H_2O$	〈20	〈100	X	A	X	A	A	A	X	A	A	A	X	A	A	B	B
Cooper Cyandide $CuSO_4,5H_2O$	10	〈100	A	A	A	A	A	A	X	A	A	A	X	A	A	B	A
Cooper Sulfte $CuSO_4,5H_2O$	〈70	〈100	A	A	A	A	A	A	X	A	A	A	X	B	B	A	B
Com Oil			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Cotton Seed Oil			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Creosote		〈100	A	X	A	A	A	A	X	A	A	X	X	B	B	B	B
Cupric Chloride $CuCl_2$	〈40	25	X	X	A	A	A	A	X	A	A	A	X	X	X	A	X
Cumene $C_6H_5CH(CH_3)$		〈100	X	X	A	A	A	A	X	A	A	X	X	B	B	B	B
Cyclohexane C_6H_{12}		〈100	A	X	A	A	A	A	X	A	A	A	X	B	B	B	B
Cyclohexane $C_6H_{11}OH$		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Cyclohexanol $CH_2(CH_2)_4CO$		〈100	X	X	X	A	A	A	A	A	A	X	A	B	B	B	B
Diamyf Phthalate $C_6H_5(COOCH_{11})_2$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Diamyf Phthalate $C_6H_4(COOC_4H_9)2$		〈200	X	A	X	A	A	A	A	A	A	A	A	A	A	A	A
Dichloropentane $C_5H_{10}C_{12}$		〈21	X	X	A	A	A	A	A	A	A	A	A	A	A	B	A
Diethy Benzene $C_6H_4(C_2H_6)_2$			X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Diethyl Carbonate $(C_2H_5)_2CO_2$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Dimethyl Amine $(CH_3)_2NH$	all	〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A

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LIQUID NAME	APPLICATION		PACKING					FACES						BODY			
	(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Dimenthyl Ether $(CH_3)_2O$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Dimethyl Formamide (C_3H_7NO)			X	A	X	A	A	A	A	A	A	A	A	A	A	A	A
Dimethyl Terephthalate $C_{10}H_{10}O_4$			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Di-n-Butyl Ether $C_4H_9OC_4H_9$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Dinitro Chlorobenzen $C_6N_3(NO_2)_2O_4$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Dioctyl Phthalate $C_6H_4(COOC_8H_{17})_2$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Diphenyl $C_6H_5C_6H_5$		〈100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Didecyl Benzene $C_{12}H_{25}C_6H_5$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Diphenylmethane $(C_6H_5)_2CH_2$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Epichlrohydrine C_3H_5OCl		〈100	X	X	X	A	A	A	A	A	A	A	A	B	A	A	X
Ethane C_2H_6		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl Acetate $Ch_3COOC_2H_5$		〈80	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Ethylbenzene $C_6H_5C_2H_5$		〈100	X	X	A	A	A	A	A	A	A	A	A	B	A	A	B
Ethyl Bromide C_2H_5Br		25	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl Formate $HCOOC_2H_5$		〈100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl Cellulose $C_6H_7O_2(OH)_2OC_2H_5$		〈100	X	X	X	A	A	A	x	A	A	X	X	B	B	B	B
Ethyl Chloride C_2H_5Cl			A	X	A	A	A	A	A	A	A	A	A	A	A	B	A
Ethylene $CH_2=CH_2$		〈100	A	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Ethylene Chlorohydrine $CLCH_2CH_2OH$	90	〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	B	A
Ethylene dichloride $CLCH_2CH_2Cl$		25	X	X	X	A	A	A	X	A	A	X	X	B	B	X	X
3-Thylpyridine C_7H_9N			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Ethylene Glycol CH_2OHCH_2OH		〈100	X	A	X	A	A	A	A	A	A	A	A	A	A	A	A

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LIQUID NAME		APPLICATION		PACKING					FACES						BODY			
		(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Ethylene Oxde	$(CH_2)_2O$		25	X	X	X	A	A	A	A	A	A	A	A	B	B	A	B
Fatty Acids			〈150	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Ferric Chloride	$Fecl_3$		25	A	A	A	A	A	X	X	A	A	A	X	X	X	B	X
Febric Hydroxide	$Fe(OH)_2$	10	〈100	X	A	A	A	A	A	X	A	A	X	X	B	B	B	B
Febric Nitrate	$Fe(NO_3)_39H_2O$	〈50	〈100	A	A	A	A	A	A	X	A	A	A	X	B	A	B	B
Ferric Chloride	$FeCl_2$	10	〈100	X	A	A	A	A	A	X	A	A	X	X	X	X	B	X
Fish Oil			〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Flon Gas			0	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Formaldehyde	HCHO	〈40	〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Formic Acid	HCOOH	〈90	〈100	X	X	X	A	A	A	X	A	A	A	A	X	A	A	X
Fuel Oil				A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Fufural	C_4H_2OCHO	〈30		X	X	X	A	A	A	X	A	A	A	X	A	A	B	A
Fuset Oil			〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Gasoline			〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Gelatine				A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glucouse	$C_9H_{12}O_6$			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glue				A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glycerine	$C_3H_5(OH)_2$	10	〈50	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Grease				A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Green Liquor				X	A	A	A	A	A	A	A	A	A	A	B	B	A	X
Hellium	He			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Heptance(Liquid)	$CH_2(CH_2)_5CH_3$		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	X

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LIQUID NAME	APPLICATION		PACKING					FACES						BODY			
	(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Hexane $CH_3(CH_2)_4CH_3$		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydrogen Cyanide HCN	〈10	〈100	X	X	X	A	A	A	X	A	A	A	X	X	B	B	X
Hydrazine N_2H_4	〈50	25	X	A	X	A	A	A	X	A	A	A	X	X	X	X	X
Hydrobromic Acid HBr	〈40	〈100	X	A	A	A	A	A	X	A	A	X	X	X	X	X	X
Hydrochloric Acid HCl	〈40	25	X	A	A	A	A	A	X	A	A	X	X	X	X	A	X
Hydrochloric Acid HF	all	25	X	X	A	A	A	X	X	A	A	X	X	X	B	B	X
Hydrogen Peroxide H_2O_2		25	X	X	A	A	A	X	X	A	A	X	X	B	B	B	B
Hydrogen Sulfide H_2S	〈50	25	X	A	X	A	A	A	X	A	A	A	X	B	A	A	X
Hypochlorous Acid HOCl	〈20		X	A	X	A	A	X	X	A	A	X	X	X	X	A	X
Ink			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Iodine I_2+H_2O		〈100	X	X	A	A	A	X	X	A	A	X	X	B	B	B	B
Iodoform CHI_2		〈100	X	A	X	A	A	A	X	A	A	A	X	A	A	B	X
Isobutane C_4H_{10}			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Isobuthyl Alcohol $(CH_3)_2CHCH_2OH$			A	X	A	A	A	A	X	A	A	X	X	B	B	B	B
Isopentane $CH_3CHCH_3CH_2CH_3$		〈100	A	X	A	A	A	A	X	A	A	X	X	B	B	B	B
Isopropyl Acetate $CH_3CO_2CH(CH_3)_2$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Alcohol $(CH_3)_2CHOH$			X	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Amine $(CH_3)_2CHNH_2$			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Kaoline $Al_2O_32SIO_22H_2O$			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kerosene			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Latex	〈50		A	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Lavender Oil		〈100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A

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LIQUID NAME	APPLICATION		PACKING					FACES						BODY			
	(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Lead Acetate $Pb(CH_3COO)_23H_2O$		〈100	X	A	X	A	A	A	X	A	A	X	X	B	B	B	B
Lead Nitrate $Pb(NO_3)_2$		〈100	A	A	X	A	A	A	X	A	A	X	X	B	B	B	B
Lime Water		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Liquefied Natural Gas			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Liquefied Petroleum Gas		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Liqid Nitrogen LN_2			X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Lithium Bromide LiBr			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Lithium Chioride LiCI	〈60	〈100	X	A	X	A	A	A	A	A	A	A	A	B	A	A	X
Lubricating Oil			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Lye		〈50	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Magnesium Chloride $MgCl_3$	〈10	〈100	A	A	A	A	A	A	A	A	A	A	A	X	X	A	X
Magnesium Hydroxide $Mg(OH)_2$	〈10	〈100	X	A	A	A	A	A	A	A	A	X	A	B	B	B	B
Magnesium Nitrate $Mg(NO_3)_27H_2O$	all	〈100	A	A	A	A	A	A	A	A	A	X	A	B	B	B	B
Magnesium Sulfate $MgSO_46H_2O$	140	〈100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	X
Maleic Acid $COOH(CH)_2COOH$	〈50	〈100	X	X	A	A	A	A	X	A	A	X	X	B	B	B	B
Maleic Anhydride $(CHCO)_2O$			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Malic Acid $COOHCH_2CH(OH)COOH$	〈50	〈100	A	X	A	A	A	A	X	A	A	X	X	A	B	B	A
Nabgabese Cguibde $MnCl_2$	〈40	〈100	X	X	X	A	A	A	X	A	A	X	X	B	A	A	X
Manganese Sulfate $MnSO_4$	〈10	〈100	A	A	A	A	A	A	X	A	A	X	X	A	A	A	X
Mercaptan C_2H_5SH		25	X	A	X	A	A	A	X	A	A	X	X	A	A	A	A
Mercuric Chloride HgCL	〈10	25	A	A	A	A	A	A	X	A	A	X	X	X	X	B	X
Mercury Hg		〈370	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

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LIQUID NAME	APPLI CATION		PACKING					FACES						BODY			
	(%) DENS ITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Methane(Gas) CH_4		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Methanol CH_3OH	all	〈100	A	A	X	A	A	A	A	A	A	A	A	A	A	A	B
Methyl Acetate CH_3COOCH_3	〈30	〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Acrylate $CH_3CHCOOCH_3$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Chloride CH_3CI		〈100	X	X	A	A	A	A	X	A	A	A	X	A	B	A	X
Methyl Isopropyl Ketone $CH_3COOH(CH_3)_2$		25	X	X	X	A	A	A	X	A	A	X	X	B	B	B	B
Methyl Methacrylate $CH_2=C(CH_2)CO_2CH_2$		〈100	X	X	X	A	A	A	X	A	A	A	X	A	A	A	X
Methyl Cydopentane C_6H12_2		25	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Formate $HCOOCH_2$	〈30	〈100	X	X	X	A	A	X	A	A	X	X	A	A	A	A	A
Milk			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Mineral Oil		〈100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Mineral Spirits			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Mine Water		〈100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Monobasic Sodium Phosphate $NaH_2PO4_2H_2O$	all	〈100	A	X	A	A	A	A	X	A	A	A	X	X	A	A	B
Monoethanolamine$HOCH_2CH_2NH_2$	all	〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Naphtha			X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Naphthalene $C_{10}H_8$			X	X	A	A	A	A	X	A	A	A	X	A	A	A	A
Naphthenic Acid			X	X	A	A	A	A	X	A	A	A	X	A	A	B	X
Nickel Chloride $NiCL_2$	〈40	〈100	A	A	A	A	A	A	X	A	A	A	X	B	B	A	X
Nicket Sulfate $NiSO_4$	〈60	〈100	A	A	A	A	A	A	X	A	A	A	A	B	B	B	A
Nitric Acid HNO_3	all	〈100	X	X	X	A	A	X	X	A	A	A	X	A	B	X	B
Nitrocellulose Lacquar			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A

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		(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Nitromethane	CH_3NO_3		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Nitrobenzene	$C_6H_5NO_2$		〈100	X	A	X	A	A	A	A	A	A	A	A	A	A	B	A
Nitrous Acid	HNO_2		25	X	X	X	A	A	A	X	A	A	X	X	B	B	X	X
Nonane	C_9H_{20} or $CH_3(CH_2)_7CH_3$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Nonyl Phenol	$C_9H_{19}OH$		〈100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Octanol	C_8H_{16}		〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Oleic Aicd	$C_{16}H_{34}O_2$	〈90	25	X	X	X	A	A	A	X	A	A	A	X	B	A	A	X
Olive oil				A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Oxalic Acid	$(CO_2H)_2$	〈90	25	X	A	A	A	A	A	X	A	A	A	X	X	A	B	X
Palmitic Acid	$C_{15}H_{31}COOH$		〈200	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Palm Oil			〈100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Paraffin, Wax				A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Penctin				A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Penicillin	$C_{16}H_{18}O_4N_2S$	〈100	〈50	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
n-Pentane(Gas)	$CH_3(CH_2)_3CH_3$	90	〈100	A	X	A	A	A	A	A	A	A	A	A	B	B	A	B
Perchloroethylene	CCl_2		35	X	X	A	A	A	A	A	A	A	A	A	B	B	A	B
Phenol	C_6H_5OH		〈100	X	X	A	A	A	A	X	A	A	A	X	B	B	A	B
Phenyl acetic Acid	$C_8H_8D_2$	〈80		X	A	X	A	A	A	A	A	A	A	A	B	A	A	B
Phosgene	$COCL_2$		〈100	X	X	X	A	A	A	A	A	A	A	A	X	X	A	X
Phoshorc Acid	H_3PO_4	10	50	X	A	A	A	A	X	A	A	A	A	A	A	A	A	A
Phosphorus Oxychloride	$POCL_3$		25	X	X	X	A	A	X	A	A	A	X	X	X	X	B	X
Phosphorus Trichloride	PCL_3		25	X	A	A	A	A	X	A	A	A	A	A	A	A	A	A

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	(%) DENS ITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Phthalic Acid $C_6H_4(CO_2H)_2$	all		X	X	X	A	A	A	X	A	A	X	X	A		B	B
Phthalic Anhydride $C_8H_4O_3$		〈 260	X	X	X	A	A	A	A	A	A	A	A	A		A	A
Picric Acid $C_6H_3O_7N_3$		25	X	X	A	A	A	A	X	A	A	X	X	B		B	B
Piperazine C_4H10N_2		〈 100	X	X	X	A	A	A	A	A	A	A	A	A		A	A
Pitch			X	X	X	A	A	A	A	A	A	A	A	A		A	A
Potassium Alum $K_2SO_4 \cdot AL_2(SO_4)_3 \cdot 2H_2O$	〈 10	〈 100	A	X	A	A	A	A	A	A	A	A	A	A		A	A
Polyethylene $(C_2H_4)n$		〈 100	X	X	X	A	A	A	A	A	A	A	A	A		A	A
Polyethylene Glycol $-HO(CH_2CH_2O)mH$		〈 100	X	A	A	A	A	A	A	A	A	A	A	A		A	A
Polyethylene	〈 70		X	X	A	A	A	A	A	A	A	A	A	A		A	A
Polystyrene $(C_6H_5CH=CH_2)n$		25	X	X	X	A	A	A	A	A	A	X	A	B		B	B
Potassium Carbonate K_2CO_3	〈 30	〈 100	A	X	A	A	A	A	X	A	A	A	X	B		A	B
Potassium Chlorate $KCrO_3$	〈 30	〈 100	A	A	A	A	A	A	X	A	A	A	X	B		B	X
Potassium Chloride KCl		〈 100	A	A	A	A	A	A	X	A	A	A	X	B		B	B
Potassium Chromate $K_2C_1O_4$		〈 100	A	A	A	A	A	A	X	A	A	A	X	B		B	B
Potassium Hydroxide KOH	〈 60	〈 100	X	A	X	A	A	X	X	A	A	X	X	X		B	X
Potassium Permanganate $KMnO_4$	〈 30	〈 100	X	A	X	A	A	A	X	A	A	X	X	B		B	B
Potassium Silicate K_2SiO_4	all	〈 100	A	A	A	A	A	A	X	A	A	A	X	B		B	B
Potassium Sulfate K_2SO_4	〈 20	〈 100	A	A	A	A	A	A	X	A	A	A	X	A		B	A
Propane Liquid C_3H_4		〈 100	A	X	A	A	A	A	A	A	A	A	A	A		A	A
Propionaldehyde C_3H_6O		25	X	A	X	A	A	A	A	A	A	A	A	A		A	A
Propionic Acid CH_3CH_2COOH	50	25	X	A	X	A	A	A	X	A	A	A	X	B		A	X
Propylene Liquid $CH_3CH=CH_2$		〈 100	X	X	A	A	A	A	A	A	A	A	A	A		A	A

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	(%) DENS ITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Propylene Glycol $CH_3CH(OH)CH_2OH$		〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Propylene Oxide C_3H_6O	70	50	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Pyridine C_5H_5N	20	〈 100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Salicylic Acid $C_7H_6O_3$	all	25	X	A	A	A	A	A	A	A	A	A	A	B	A	B	B
See Water	10	25	A	A	A	A	A	A	A	A	A	A	A	B	B	A	B
Sewage		〈 50	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Silicone Oil		〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Silver Chloride AgCl	10	25	A	A	A	A	A	A	X	A	A	X	X	X	B	B	X
Siver Nitrate $AgNO_3$		〈 100	X	A	A	A	A	A	X	A	A	A	X	A	A	A	B
Sodium Acetate $CH_3COONa \cdot 3H_2O$	〈 60	〈 100	X	A	X	A	A	A	A	A	A	A	A	B	A	A	B
Sodium Bicarbonate $NaHCO_3$	〈 20	〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A
Sodium Bromide NaBr	〈 50	〈 100	X	A	A	A	A	A	X	A	A	X	X	B	B	B	B
Sodium Chlorate $NaClO_3$		〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Chloride NaCl	〈30	〈 100	A	A	A	A	A	A	A	A	A	A	A	X	B	A	X
Sodium Chromate $Na_2CrO_4 \cdot 10H_2O$	all	〈 100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Cyanide NaCN	10	〈 100	A	A	X	A	A	A	X	A	A	A	X	X	A	A	X
Sodium Sulfide Na_2S	〈 30	〈 80	A	A	A	A	A	A	X	A	A	X	X	X	A	B	X
Sodium Sulfite $Na_2SO_3 7H_2O$	10	〈 100	A	A	A	A	A	A	X	A	A	A	X	A	A	B	B
Sodium Thiosulfate $Na_2S_2O_3 \cdot 5H_2O$	〈 50	〈 100	X	A	A	A	A	A	X	A	A	A	X	A	A	B	B
Sodium Hydrosulfide $NaSH_2H_2O$	〈 50	〈 80	X	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Hydrosulfite $Na_2S_2OI_4$	10	〈 100	X	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Metasilicate $Na_2OSiO_2 5H_2O$	all	〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

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		(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Sodium Nitrate	$NaNO_2$	〈70	〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Nitrite	$NaNO_2$		〈 100	X	A	X	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Silicate	Na_2SiO_3	all	〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A
Soudium Sulfate	Na_2SOI_4	〈30	〈 100	A	A	A	A	A	A	X	A	A	X	X	B	A	B	B
Stannic Chloride	$SnCL_4$		〈 100	A	A	A	A	A	A	X	A	A	X	X	X	X	X	X
Stearic Acid	$C_8H_{36}O_2$		〈 205	X	X	X	A	A	A	A	A	A	A	A	A	A	B	A
Styrene	$C_6H_5CH=CH_2$		〈 100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Succinic Acid	$COOH(CH_2)_2COOH$	50	〈 100	X	X	X	A	A	A	X	A	A	X	X	B	B	B	A
Sugar Solutions				A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sulfur Dixide	SO_2		〈 100	X	X	A	A	A	A	X	A	A	X	X	B	B	B	A
Sulfur Acid	H_2SO_4	10	25	X	X	A	A	A	A	X	A	A	A	X	X	A	X	X
Syrup			〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Tall Oil				X	X	X	A	A	A	A	A	A	A	A	B	B	A	B
Tannic Acid	$C_{76}H_{52}O_{46}$	all	〈 100	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A
Tartric Acid	$C_4H_6O_6$	〈50	〈 100	A	X	A	A	A	X	X	A	A	A	X	A	B	A	B
Tetrachloroethane	$CHCL_4CHCL_{21}$	90	〈 100	X	X	A	A	A	A	A	A	A	A	A	X	B	A	X
Tetraethyl Lead	$(C_2H_5)_4Ph$		〈 100	X	X	A	A	A	A	X	A	A	X	X	B	B	B	B
Tetranydrofurarr	C_4H_8O			X	X	X	A	A	A	X	A	A	A	X	B	X	A	A
Titanium Tetra Chlonde	$TiCL_4$		25	X	X	A	A	A	A	X	A	A	X	X	B	B	B	X
Toluene	$C_6H_5CH_3$		〈 100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Thiophene	C_4H_4S		〈 50	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Thiophenol	C_8H_5SH		〈 100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A

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	DENSITY (%)	TEMPERATURE (°C)	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Touluidine C7H9N		〈 100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Toothpaste			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Tribasic Sodium Phosphate $NaPO_4 \cdot 12H_2O$	all	〈 100	A	X	A	A	A	A	X	A	A	A	X	X	B	A	X
Trichloroacetic Acid CCl_3COOH		25	X	X	X	A	A	A	X	A	X	X	X	X	B	A	X
Trichlorobenzene $C_2H_3Cl_2$		25	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Trichloroethylene $CHClCCl_2$	90	〈 100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Tricresyl Phosphate $(CH_3C_6H_4O)_3PO$		〈 200	X	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Triethanolamine $(CH_2OHCH_2)_3N$	all	〈 100	A	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Triethylenetetramine $NH_2(C_2H_4NH)_2C_2H_4NH_2$		〈 100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Trimethylamine $(CH_3)_3N$		〈 100	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Tung Oil			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Turpentine Oil		〈 100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Urea $CO(NH_2)_2$	〈 50	〈 100	X	X	X	A	A	A	A	A	A	X	X	B	B	B	B
Urine			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Vaseline		〈 100	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Vegetable Oil			A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Vetrocoke Solution		〈 100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Vinyl Acetate $CH_3COOCHCH_2$		25	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Vinyl Chloride Monomer CH_2CHCL			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Vinyl Chloride Resin			X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
VinylEthyl Ether $CH_2CHOCC_2H_5$		25	X	X	X	A	A	A	A	A	A	A	A	A	A	A	A
Vinyl Acetate $CH_3COOCHCH_2$		25	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

A = Good as ant component
B = Good for glands, collars and compression unis
X = Not recommended

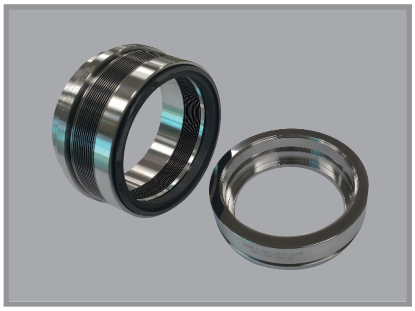
LIQUID NAME		APPLICATION		PACKING					FACES						BODY			
		(%) DENSITY	(°C) TEMPERATURE	NBR	EPR	VITON	TEFLON	KALREZ	CARBON	TUNGSTEN	SIC	CERAMIC	CERAMIC COATED	TUNGSTEN COATED	SUS316	ALLOY 20	HAS "C"	AM350
Water	H_2O			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Whisky				X	A	X	A	A	A	A	A	A	A	A	A	A	A	A
White Liquor				X	A	X	A	A	A	A	A	A	X	A	B	B	A	B
White Water				X	A	X	A	A	A	A	A	A	A	A	A	A	A	X
Wine				A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Xylene	$C_6H_4(CH_3)_2$		〈 100	X	X	A	A	A	A	A	A	A	A	A	A	A	A	A
Zinc Chloride	$ZnCl_2$		〈 100	A	A	A	A	A	A	X	A	A	A	X	X	B	A	X
Zinc Cyanide	$Zn(CN)_2$	10	25	A	A	A	A	A	A	A	A	A	A	A	B	B	A	X
Zinc Nitrate	$Zn(NO_3)_2.6H_2O$	10	〈 100	X	X	A	A	A	A	X	A	A	X	X	B	B	A	B
Zinc Phosphate	$Zn_3(PO_4)_2.4H_2O$		〈 100	X	X	X	A	A	A	X	A	A	X	X	A	X	X	X
Zinc Sulfate	$ZnSO_4.7H_2O$	〈 40	〈 100	A	A	A	A	A	A	X	A	A	X	X	B	B	B	B

KOREA SEAL LINE CO., LTD

KSL-300

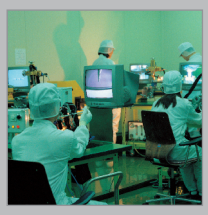
KSL-500

KSL-900



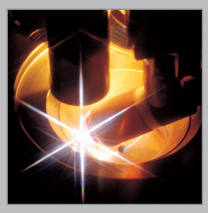
MBV-090

THANK YOU VERY MUCH.



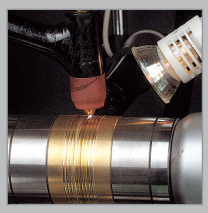
PRODUCT ITEMS

· Welded Metal Bellows Seal



· Mechanical Seal & Unit Seal

· Expension Joint



· Welded Metal Bellows Kit

· Semiconductor

· Actuator

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