CATALOGO GENERALE
GENERAL CATALOGUE
HAUPTKATALOG
CATALOGUE GENERAL
CATALOGO GENERAL

ROTEN

TENUTE MECCANICHE
MECHANICAL SEALS
GLEITRINGDICHTUNGEN
GARNITURES MECANIQUES
CIERRES MECANICOS

ROTEN s.r.l.

TENUTE MECCANICHE
MECHANICAL SEALS
GLEITRINGDICHTUNGEN
GARNITURES MECANIQUES
CIERRES MECANICOS

VIA ORTICA, 6
20134 MILANO - ITALIA
TEL. +39 02 76110157 r.a.
FAX +39 02 7385445
e-mail info@roten.it
www.roten.it

QUALITY SINCE 1945 ROTEN

QUALITY SYSTEM
CERTIFIED SINCE 1993

QUALITY SINCE 1945 ROTEN

MATERIALS CODE KEY

MATERIALS	Code ROTEN	Code ISO-DIN	APPLICATIONS (NOTIONAL)	Limit Temp. °C -	Limit Temp. °C +	SEE NOTE	COMPONENTS SPRINGS	GASKETS	BOLLOWS	SEAL RINGS	FRAMES
STEELS											
Hardened	C	D	Hydrocarbons-Lubricants-Gases-Ammonia (refrigerators) air etc.			+				●	
Springs	E		Hydrocarbons-Lubricants-Gases-Ammonia (refrigerators) air etc.			+	●				
Cr. Stainless 431	G	E	Water-Hydrocarbons-Solvents							●	●
Cr-Ni Stainless 304	H	F	Food-Nitric Acid				●		●		●
Cr-Ni-Mo Stainless 316	X	G	Acids (except halogenes and derivates)				●		●	●	●
Stainless Special	D	G	Used for shrunk carbides								●
Anticorrosion Superalloy	L	M	Acids and their corrosive solutions				●		●	●	●
Stellite Hardfacing on S.S. 316	J	K	Wear resistant			+				●	
Hardened S.S.	S	T	Wear resistant							●	
CARBON GRAPHITE											
■ Normal	V	B	Universal (except oxidatives)		180					●	
■ Special	Z	C	Acids-Hydrocarbons-Heat		280					●	
With metal SB	1	A	Hydrocarbons-Oils-Greases-Ammonia-Heat		350	+				●	
CARBIDES											
■ Brazed TC Carbides on S.S.	3	U_3	Universal Abrasives, Acids, Salts, Bases							●	
■ Solid Corr. Res. Carbides	R	U_3	Universal Abrasives, Acids, Salts, Bases							●	
■ Silicon Carbides SiC (solid)	K	Q_1	Universal Abrasives, Acids, Salts, Bases							●	
Silicon Carbides SiC Special (solid)	Q	J	Universal Abrasives, Acids, Salts, Bases, Antisticking							●	
CERAMICS											
Normal Steatite HF	9	X	Wear resistant		120					●	
■ Special Alumina	2	V	Universal wear and corrosion resistant		180					●	
ELASTOMERS											
■ Nitrile (NBR)	6	P	Water-Oils-Air-Hydrocarbons Gas and Liquid	25	90			●	●		
■ Ethylene Propylene (EPDM)	7	E	Water-Acids-Alcohols-Acetates-Steam (No Hydrocarbons)	45	150			●	●		
Chloroprene (CR)	8	N	Oils with gas (Refrigerators)	45	140			●	●		
■ Fluoro Carbon (FPM)	Y	V	Solvents, Acids - Miner.prod. (No Acetates, Chetons, Ethers)	30	180			●	●		
Silicon (MVQ)	B	S	Steam, Heat, Food	85	230			●	●		
Perfluorelastomer	W	K	Universal					●			
Coated	F	X	Fluorine Elastomer with FEP coating					●			
Coated	P	M_1	Fluorine Elastomer with double PTFE sheet coating					●			
Special Mixture	I	X	Special Fluorine mixture for High temperatures		240			●			
Special Mixture	M	X	Special Fluorine Mixture for methanol gasoline		140			●			
NON ELASTOMERS											
Gasket without asbestos	A	Y	Universal (except Nitric Acid >20%)	70	350			●			
Universal PTFE	5	T	Acids-Solvents-Medicinal Prod.-Food		240			●	●		
Universal PTFE Glass filled	0	Y_1	Acids-Solvents-Medicinal Prod.-Food		240			●		●	●
Universal PTFE Red glass filled	4	Y_1	Acids-Solvents-Medicinal Prod.-Food		240			●		●	●
OTHER											
Bronze, antifriction BS Pb 20	N	N	Lubricant Oils with Gases (Refrigerators) No Ammonia			+				●	
Cast iron, acid resistant	α	R	Lubricant Oils with Gases (Refrigerators)			+				●	
Titanium	T	T	Universal				●			●	●

ACIDS-SALT Are subject to crystal formation
ADHESIVES Varnish, Glue, Liquid Resins, Enamel, paint may dry out
ABRASIVES Liquids having solids in suspension reduce considerably performance life

Use dual arrangement with flush

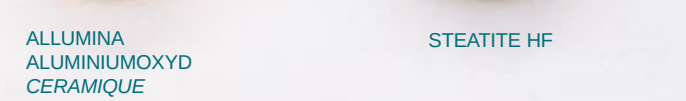
We advise dual arrangement when handling liquids that could emit vapours into the atmosphere

CORROSIVES Water, Food, Medicinal Prod. are considered corrosives
NOTE + Materials marked + are not compatible with food and medicinal products
■ These materials may be delivered with a Suitability Certification for Pharmaceutic and Food use

FACE MATERIAL COMBINATIONS

Anelli di tenuta
Seal rings
Dichtringe
Faces de friction

Combinazione materiali
Materials combination
Materialzusammensetzung
Materiaux

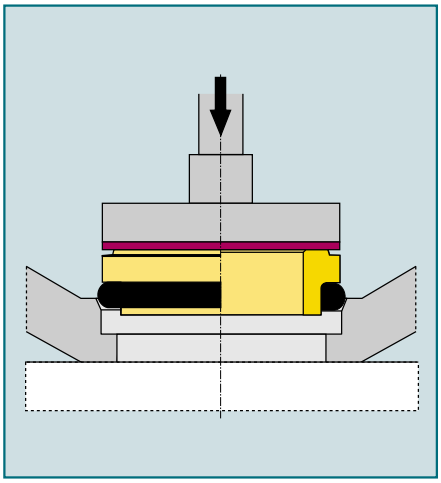


SOME SAMPLES OF MATERIALS COMBINATIONS.

CHOICE AND MOUNTING MECHANICAL SEALS

Mounting of the stationary part

- ➤ Always accurately control the size and tolerance of the seal housing.
- ➤ Make sure that both stationary gasket and seal housing are free from all machine marks.
- ➤ Moisten slightly the seal housing and the gasket with alcohol, glycerine or other elastomer-compatible liquid.
- ➤ Press the stationary part into the housing using a little hand press or a pillar of a drilling machine (protect the part that touches the lapped face with a plastic material such as PVC, PTFE, PVDF etc.).



Mechanical seal components may be supplied as spare parts

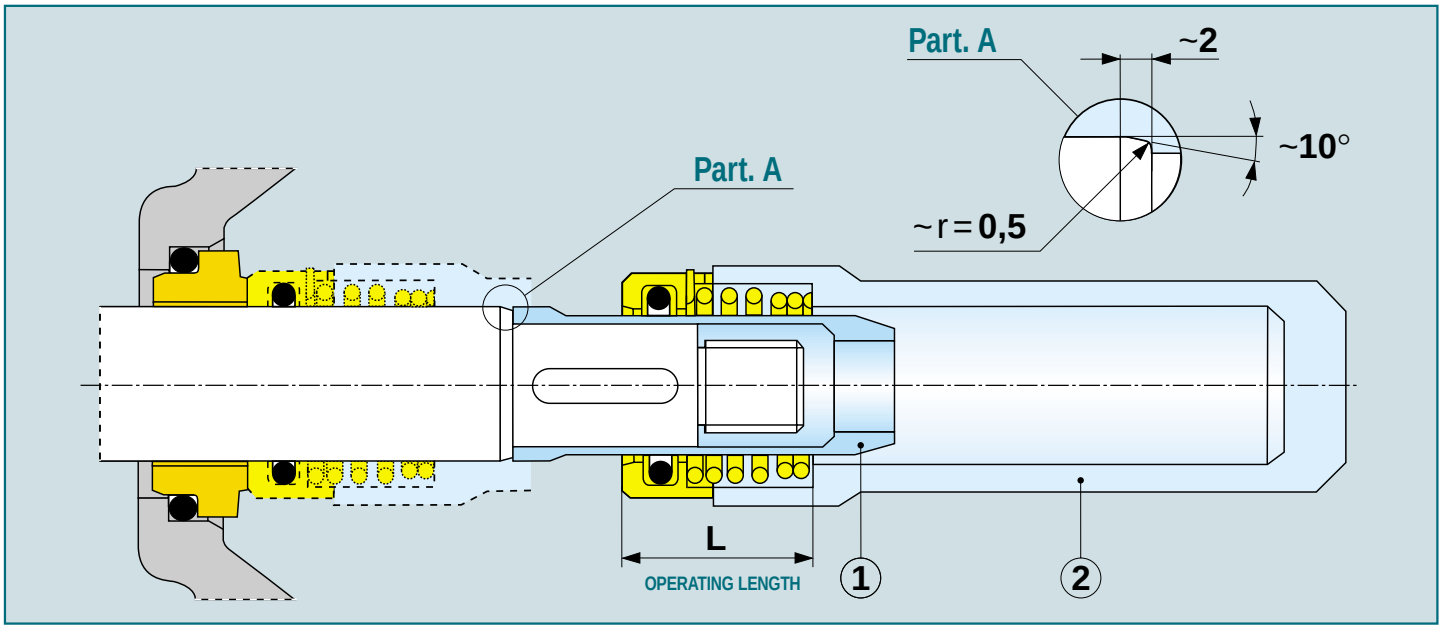
We supply mechanical seals under the name **ROTEN** according to our own mounting sizes, while under the name **UNITEN** we supply them according to **DIN 24960 - ISO 3069** mounting dimensions.

EXAMPLE OF MECHANICAL SEAL DESIGNATION

Version	**RO o UN**
Model	**2**
Diameter	**38**
Components code	
*① Spring	**X**
*② Shaft gasket (O-Ring)	**6**
*③ Rotary ring	**G**
*④ Stationary ring	**V**
*⑤ Stationary gasket (O-Ring)	**6**
Rotation	**R o L**

RO = Roten
UN = Uniten
R = clockwise rotation as seen from the motor side
L = anticlockwise rotation as seen from the motor side

*In every drawing components are numbered and the sequence maintained to define, through the materials code table key, the accordingly chosen material.



Mounting of the rotary part

- ➤ Make sure that the shaft is polished, clean and free of all sharp edges.
- ➤ If necessary, polish the shaft by fine emery paper (400 ca.)
- ➤ After having moistened the shaft slightly with alcohol, glycerine or any other compatible liquid, mount the rotary part turning the mechanical seal by a gentle movement opposite to the spring coiling.
- ➤ For series mountings use the sleeve (1) and the mounting pushing tool (2).
- ➤ Make sure that both lapped faces are together.
- ➤ **You could cause damage by inserting grease, oils or other similar substances between the seal faces, which must be kept extremely clean.**

During the mounting of mechanical seals with PTFE or FEP gaskets, we further advise:

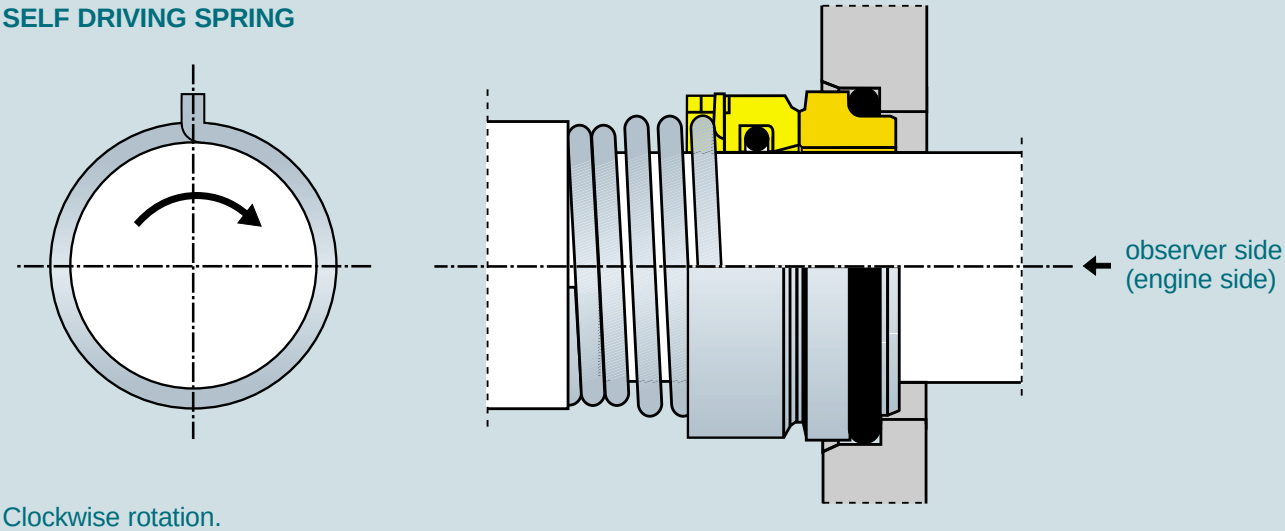
- ➤ The housing of the stationary part must be well finished and polished. The ring may be slightly heated (in water, so as to help its introduction).
- ➤ The shaft surface must be polished, with a mounting f acility (see item A), just like the sleeve (1).

While mounting, the lapped surfaces shall not touch on the working surface and they shall not be kept with their faces turned upwards.

We advise not to have the mechanical seals working when dry.

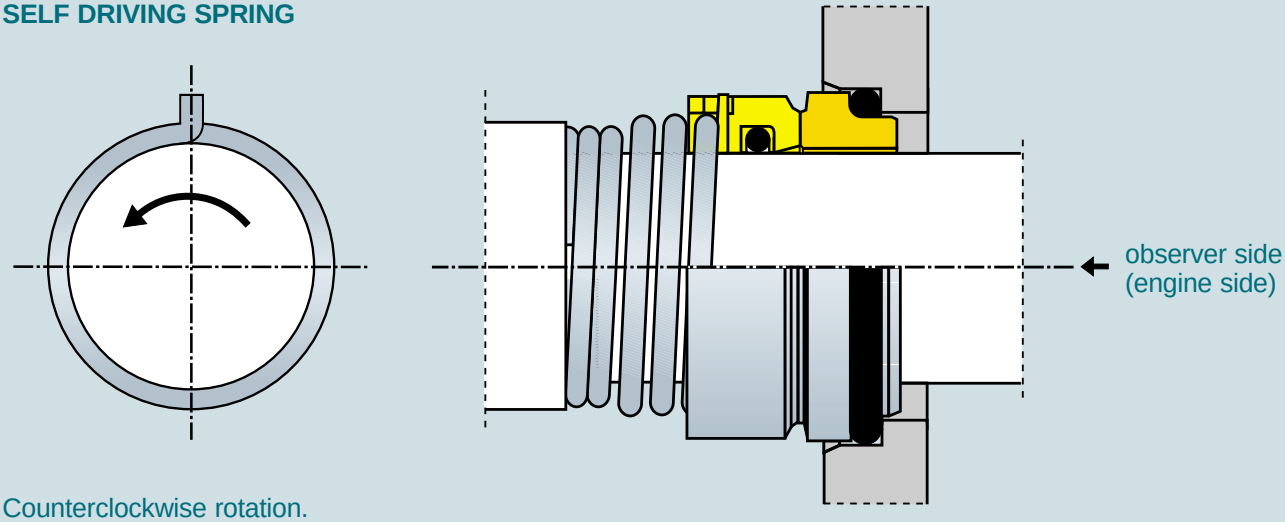
SELF DRIVING SPRING ROTATION SELECTION

RIGHT ROTATION “R”
SELF DRIVING SPRING



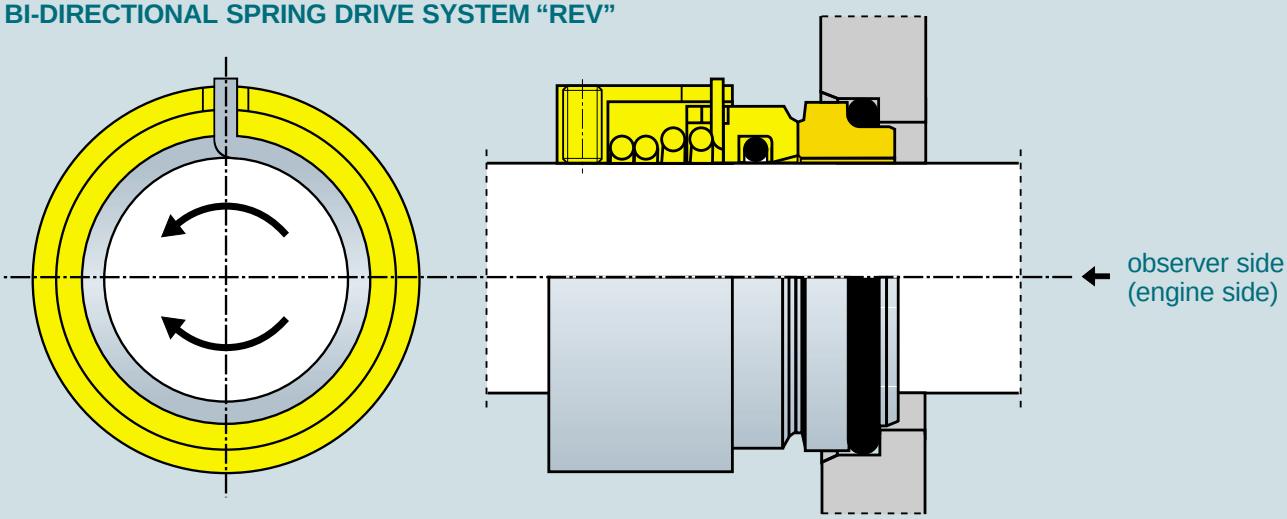
Clockwise rotation.
Right spring “R”.

LEFT ROTATION “L”
SELF DRIVING SPRING



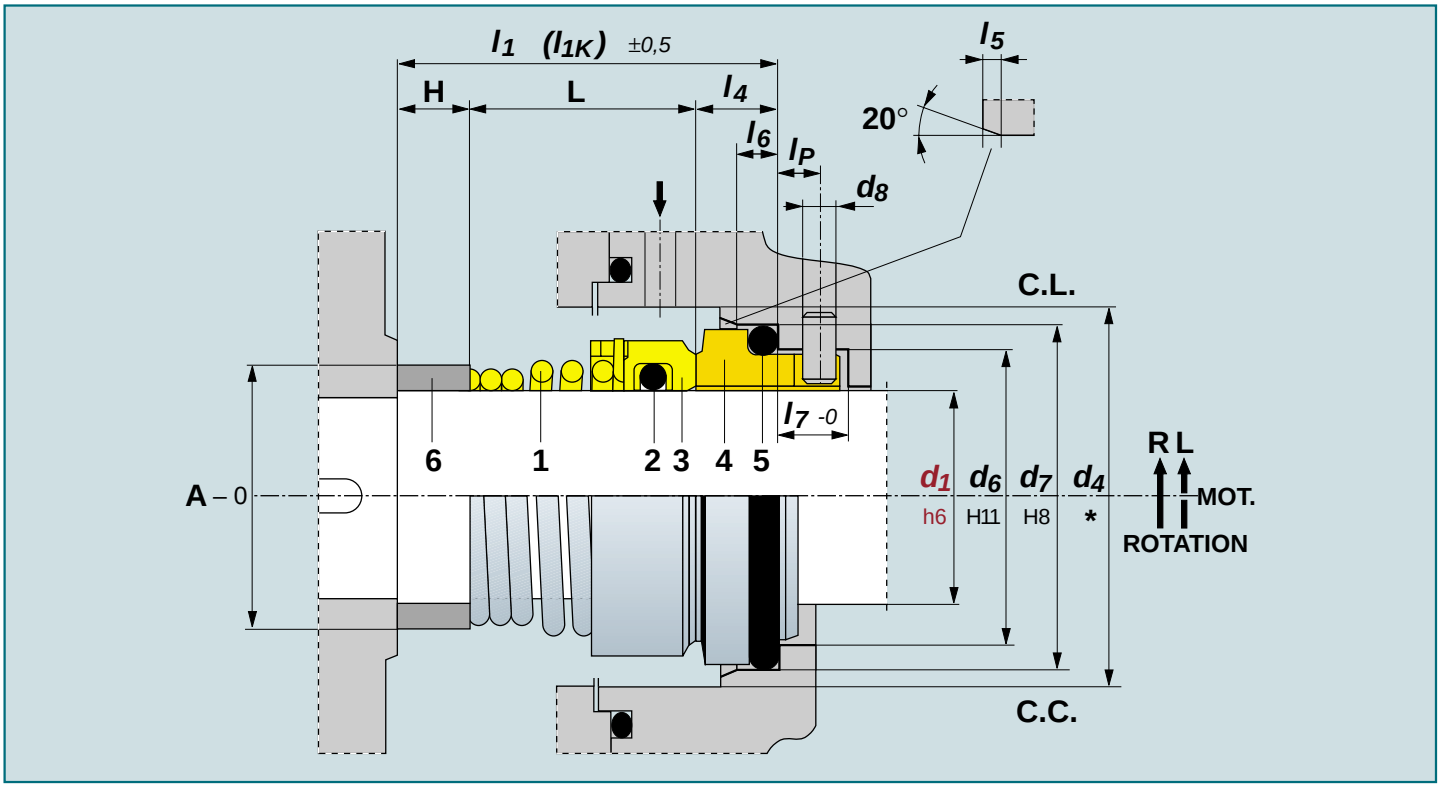
Counterclockwise rotation.
Left spring “L”.

BI-DIRECTIONAL SPRING DRIVE SYSTEM “REV”

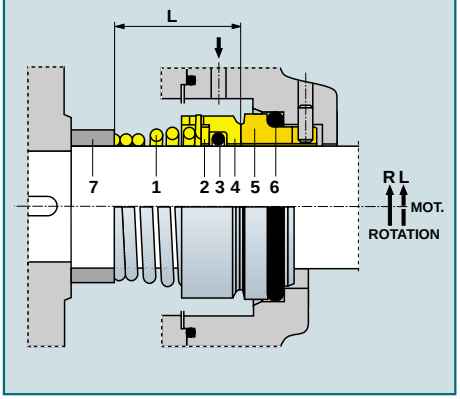


Bi-directional seal “REV”.
The spring does not drive, only gives compression.

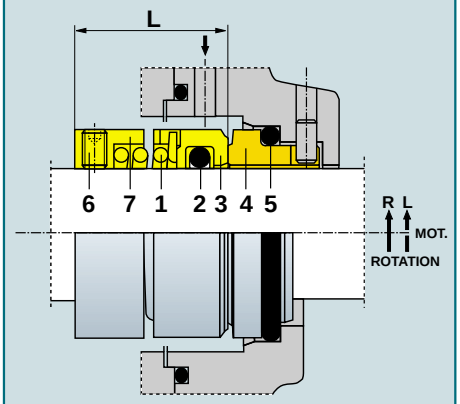
TYPE 2



TYPE 2 with open cave



TYPE U2 with driving sleeve



Type 2 is a mechanical seal, registrated as Italian patent nr. 573771, 26/6/57.
It is a seal for general uses, such as water, food, chemical products, hydrocarbons etc.
Produced since 1957 and sold in the whole world in millions, it is still widely used.
Particularly economic and versatile, of easy mounting, it may be supplied in different versions and with different combinations, as the chart below shows.

POS. TYPE 2 2MC 2K	POS. TYPE 2 CAN. AP.	POS. TYPE U2	COMPONENTS	STANDARD MATERIALS							
1	1	1	Self-driving spring	E	X	L					
	2		Washer	G	H	X					
2	3	2	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
3	4	3	Rotary seal ring	G	X	J	3	L			
4	5	4	Stationary seal ring	V	Z	1	3	4	K	R	
5	6	5	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
6	7		Spacer (if required)	G	H	X					
		6	Grub screws	H	X	L					
		7	Driving “U” sleeve	X	L						

C.C. = stationary seal ring with short tail.

C.L. = stationary seal ring with extended tail and slot.

CAN. AP. = rotating seal ring with open cave

2MC = model with shorter spring.

2K = UNITEN 2 model with working length according to DIN norm K

UN2 LRO2 = UNITEN 2 model with working length “L” as ROTEN 2

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	12 bar
t =	–35 ÷ 180°C
v ≤	15 m/s

ROTEN

TYPE 2 2H U2												2MC	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_1	L
6	10,6	13,1	16	19,5	15	4,5	2	1,2	2	6	3,5	—	—
7÷9	13	17,1	20	20,5	15	5,5	2,8	1,2	2	6,2	3,5	15,5	10
10	14	18,1	21	20,5	15	5,5	2,8	1,2	2	6,2	3,5	17,5	12
11÷12	16,5	20,6	24	23,5	18	5,5	2,8	1,2	2	6,2	3,5	19,5	14
13÷14	19	23,1	27	28	22	6	2,8	1,2	2	6,7	4	23	17
15	21	26,9	31	29	22	7	3,7	1,3	2,5	7,6	4	24	17
16÷17	21	26,9	31	30	23	7	3,7	1,3	2,5	7,6	4	25	18
18	25	30,9	36	32	24	8	3,7	1,3	3	8,5	4,5	26	18
19÷20	25	30,9	36	33	25	8	3,7	1,3	3	8,5	4,5	28	20
21÷22	30	35,4	41	33	25	8	3,7	1,8	3,5	8,5	5	28	20
23÷24	30	35,4	41	35	27	8	3,7	1,8	3,5	8,5	5	30	22
25÷27	33	38,2	45	35,5	27	8,5	3,7	1,8	4	9,1	5	29,5	21
28	38	43,3	50	38	29	9	3,7	1,8	4	9,6	6	31	22
29÷32	38	43,3	50	39	30	9	3,7	1,8	4	9,6	6	32	23
33÷34	45	53,5	60	50,5	39	11,5	5,4	2,1	5	12	7,5	41,5	30
35÷37	45	53,5	60	50,5	39	11,5	5,4	2,1	5	12	7,5	41,5	30
38÷43	52	60,5	68	50,5	39	11,5	5,4	2,1	5	12	7,5	41,5	30
44÷49	57	65,5	72	52,5	41	11,5	5,4	2,1	5	13	8,5	42,5	31
50	64	72,5	80	56,5	45	11,5	5,4	2,1	5	13	8,5	46,5	35
55	64	72,5	80	58,5	47	11,5	5,4	2,1	5	13	8,5	48,5	37
60	72	79,3	87	60,5	49	11,5	5,4	2,1	5	13,5	8,5	48,5	37
65	77	84,5	92	62,5	51	11,5	5,4	2,1	5	13,5	8,5	50,5	39
70	82	89,5	97	62,5	51	11,5	5,4	2,1	5	13,5	8,5	50,5	39
75	87	94,5	102	68,5	57	11,5	5,4	2,1	5	13,5	8,5	57,5	46
80	92	99,5	107	70,5	59	11,5	5,4	2,1	5	13,5	8,5	59,5	48
85	98	105,5	113	72,5	59	13,5	5,4	2,6	5	13,5	8,5	59,5	46
90	105	111,5	120	75,5	62	13,5	5,4	2,6	5	13,5	8,5	62,5	49
95	110	116,5	130	75,5	62	13,5	5,4	2,6	5	13,5	8,5	64,5	51
100	114	119,5	136	88,5	75	13,5	5,4	2,6	5	13,5	8,5	78,5	65
110	124	132,2	150	92,5	75	17,5	7,1	3,9	5	13,5	8,5	78,5	61
120	134	142,2	160	102,5	85	17,5	7,1	3,9	5	13,5	8,5	90,5	73
130	145	153,2	172	112,5	95	17,5	7,1	3,9	5	13,5	8,5	99,5	82
135	152	161,2	180	113,5	95	18,5	7,1	3,9	5	13,5	8,5	101,5	83
140	157	164,3	185	118,5	100	18,5	7,1	3,9	5	13,5	8,5	108,5	90
150	167	174,2	200	128,5	110	18,5	7,1	3,9	5	13,5	8,5	118,5	100
160	188	195	220	141	120	21	9,1	3,9	5	15,5	8,5	121	100

NB: The spacer is never to be considered for ROTEN 2.

UNITEN

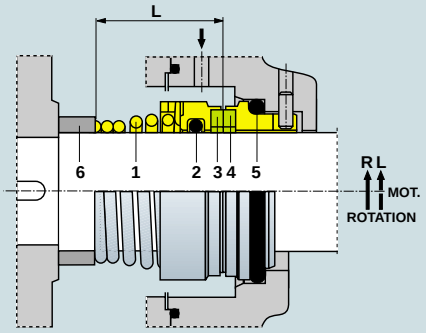
EN 12756 — ISO 3069

TYPE 2 2H U2														2K 2KH	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	H	A	d_8	l_7	l_p	l_{1k}	L
10	17	21	22	40	15	7	4	1,5	18	13	3	8,5	5	32,5	25,5
12	19	23	24	40	18	7	4	1,5	15	15	3	8,5	5	32,5	25,5
14	21	25	26	40	22	7	4	1,5	11	18	3	8,5	5	35	28
16	23	27	28	40	23	7	4	1,5	10	20	3	8,5	5	35	28
18	27	33	34	45	24	10	5	2	11	22	3	9	5	37,5	27,5
20	29	35	36	45	25	10	5	2	10	25	3	9	5	37,5	27,5
22	31	37	38	45	25	10	5	2	10	27	3	9	5	37,5	27,5
24	33	39	40	50	27	10	5	2	13	29	3	9	5	40	30
25	34	40	41	50	27	10	5	2	13	30	3	9	5	40	30
28	37	43	44	50	29	10	5	2	11	34	3	9	5	42,5	32,5
30	39	45	46	50	30	10	5	2	10	36	3	9	5	42,5	32,5
32	42	48	48	55	30	10	5	2	15	38	3	9	5	42,5	32,5
33	42	48	49	55	39	10	5	2	6	40	3	9	5	42,5	32,5
35	44	50	51	55	39	10	5	2	6	42	3	9	5	42,5	32,5
38	49	56	58	55	42	13	6	2	—	45	4	9	5	45	32
40	51	58	60	55	42	13	6	2	—	47	4	9	5	45	32
43	54	61	63	60	47	13	6	2	—	51	4	9	5	45	32
45	56	63	65	60	47	13	6	2	—	53	4	9	5	45	32
48	59	66	68	60	47	13	6	2	—	56	4	9	5	45	32
50	62	70	70	60	46	14	6	2,5	—	59	4	9	5	47,5	33,5
53	65	73	73	70	56	14	6	2,5	—	62	4	9	5	47,5	33,5
55	67	75	75	70	56	14	6	2,5	—	64	4	9	5	47,5	33,5
58	70	78	83	70	56	14	6	2,5	—	68	4	9	5	52,5	38,5
60	72	80	85	70	56	14	6	2,5	—	70	4	9	5	52,5	38,5
63	75	83	88	70	56	14	6	2,5	—	73	4	9	5	52,5	38,5
65	77	85	90	80	66	14	6	2,5	—	76	4	9	5	52,5	38,5
68	81	90	93	80	64	16	7	2,5	—	79	4	9	5	52,5	36,5
70	83	92	95	80	64	16	7	2,5	—	81	4	9	5	60	44
75	88	97	104	80	64	16	7	2,5	—	86	4	9	5	60	44
80	95	105	109	90	72	18	7	3	—	92	4	9	5	60	42
85	100	110	114	90	72	18	7	3	—	98	4	9	5	60	42
90	105	115	119	90	72	18	7	3	—	103	4	9	5	65	47
95	110	120	124	90	72	18	7	3	—	108	4	9	5	65	47
100	115	125	129	90	72	18	7	3	—	114	4	9	5	65	47

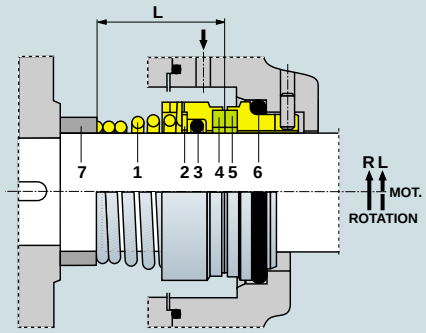
*The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

TYPE 2

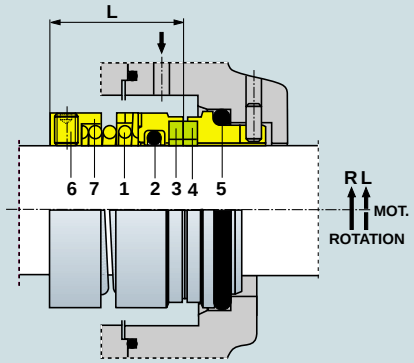
TYPE 2 with hard metal brazed faces



TYPE 2 with open cave and hard metal brazed faces



TYPE U2 with driving sleeve and hard metal brazed faces



POS. TYPE 2 2MC 2K	POS. TYPE 2 CAN. AP.	POS. TYPE U2	COMPONENTS	STANDARD MATERIALS							
1	1	1	Self-driving spring	E	X	L					
	2		Washer	G	X						
2	3	2	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
3	4	3	Rotary seal ring	3							
4	5	4	Stationary seal ring	V	Z	1	3	4	K	R	
5	6	5	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
6	7		Spacer (if required)	G	H	X					
		6	Grub screws	H	X	L					
		7	Driving “U” sleeve	X	L						

Model 2 with hard metal rings code “3” is suitable for dirty, charged or very viscous liquids. Code “3” is anticorrosion tungsten carbide brazed with high silver content alloy on AISI 316 stainless steel.

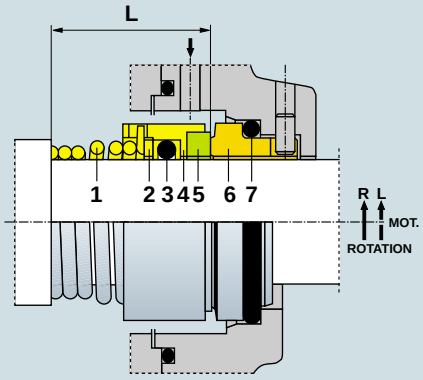
MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

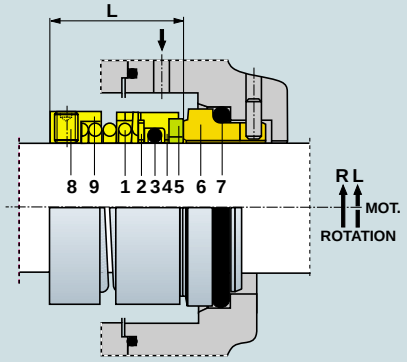
p ≤	16 bar
t =	–35 ÷ 180°C
v ≤	15 m/s

Model 2H has the rotary seal ring shrunk in a frame with open cave. The materials used for this version are: silicon carbide, tungsten carbide and carbon, which are shrunk in a stainless steel frame.

TYPE 2H with open cave and shrunk-in rotary seal ring



TYPE U2H with driving sleeve, open cave and shrunk-in rotary seal ring



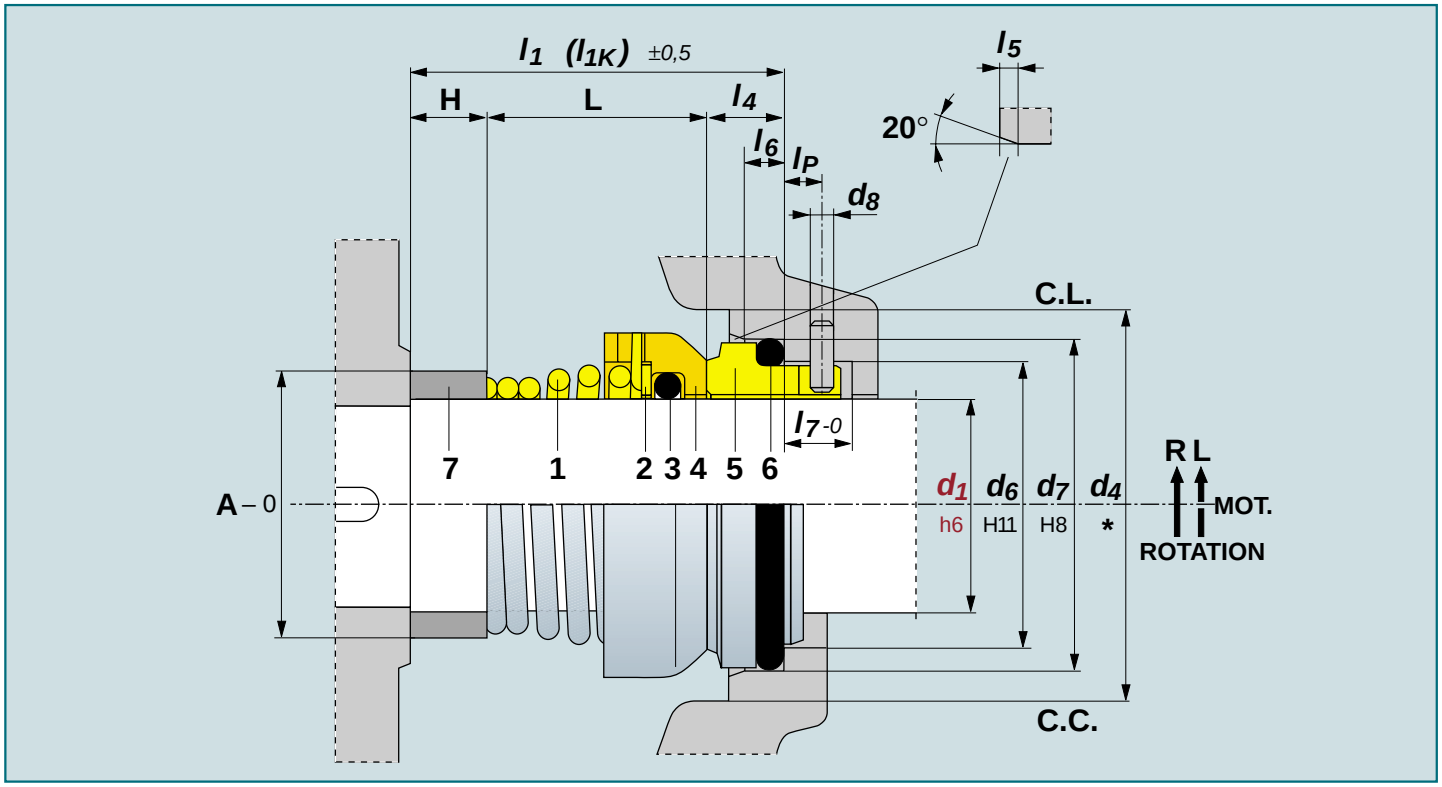
POS. TYPE 2H 2MCH 2KH	POS. TYPE U2H	COMPONENTS	STANDARD MATERIALS							
1	1	Self-driving spring	E	X	L					
2	2	Washer	G	X						
3	3	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
4	4	Frame	G	X	D					
5	5	Rotary seal ring	K	R	Z					
6	6	Stationary seal ring	V	Z	1	3	4	K	R	
7	7	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
	8	Grub screws	H	X	L					
	9	Driving “U” sleeve	X	L						

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to br sealed.

p ≤	16 bar
t =	–20 ÷ 150°C
v ≤	15 m/s

TYPE 22



Type 22 derives from our type 2 (which has been protected by the Italian patent nr. 57331 in 1957), from which it has overtaken the concept of the self-driving spring that directly clenches the wedge and of the driving radial hook.
The rotary ring position 4 in of massive material, it may be hard carbon, ceramic material, silicon carbide or anticorrosion tungsten carbide, etc..
Initially called KEROTEN (a still registered trade mark of ours), it may be built with the materials quoted in the table.
This model may be manufactured, at specific clients' request, in non-standard sizes.

POS. TYPE 22 22K 22MC	COMPONENTS	STANDARD MATERIALS						
1	Self-driving spring	E	X	L				
2	Washer	G	H	X				
3	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B
4	Rotary seal ring	V	Z	1	K	R	2	
5	Stationary seal ring	G	X	3	4	K	R	2
6	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B
7	Spacer (if required)	G	H	X	L			

C.C. = stationary seal ring with short tail

C.L. = stationary seal ring with extended tail and slot

22MC = model with shorter spring

22K = UNITEN 2 model with working length "L" according to DIN norm K

MAX. WORKING CONDITIONS

These depend on : ø shaft, pressure, speed, temperature and fluid to be sealed

p ≤	12 bar
t =	–35 ÷ 200°C
v ≤	15 m/s

ROTEN

TYPE 22												22 MC	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_1	L
10	14	18,1	21	20,5	15	5,5	2,8	1,2	2	6,2	3,5	17,5	12
12	16,5	20,6	24	23,5	18	5,5	2,8	1,2	2	6,2	3,5	19,5	14
14	19	23,1	27	28	22	6	2,8	1,2	2	6,7	4	23	17
16	21	26,9	31	30	23	7	3,7	1,3	2,5	7,6	4	25	18
18	25	30,9	36	32	24	8	3,7	1,3	3	8,5	4,5	26	18
20	25	30,9	36	33	25	8	3,7	1,3	3	8,5	4,5	28	20
22	30	35,4	41	33	25	8	3,7	1,8	3,5	8,5	5	28	20
24	30	35,4	41	35	27	8	3,7	1,8	3,5	8,5	5	30	22
25	33	38,2	45	35,5	27	8,5	3,7	1,8	4	9,1	5	29,5	21
28	38	43,3	50	38	29	9	3,7	1,8	4	9,6	6	31	22
30	38	43,3	50	39	30	9	3,7	1,8	4	9,6	6	32	23
32	38	43,3	50	39	30	9	3,7	1,8	4	9,6	6	32	23
33	45	53,5	60	50,5	39	11,5	5,4	2,1	5	12	7,5	41,5	30
35	45	53,5	60	50,5	39	11,5	5,4	2,1	5	12	7,5	41,5	30
38	52	60,5	68	50,5	39	11,5	5,4	2,1	5	12	7,5	41,5	30
40	52	60,5	68	50,5	39	11,5	5,4	2,1	5	12	7,5	41,5	30

NB: The spacer is never to be considered for ROTEN 22

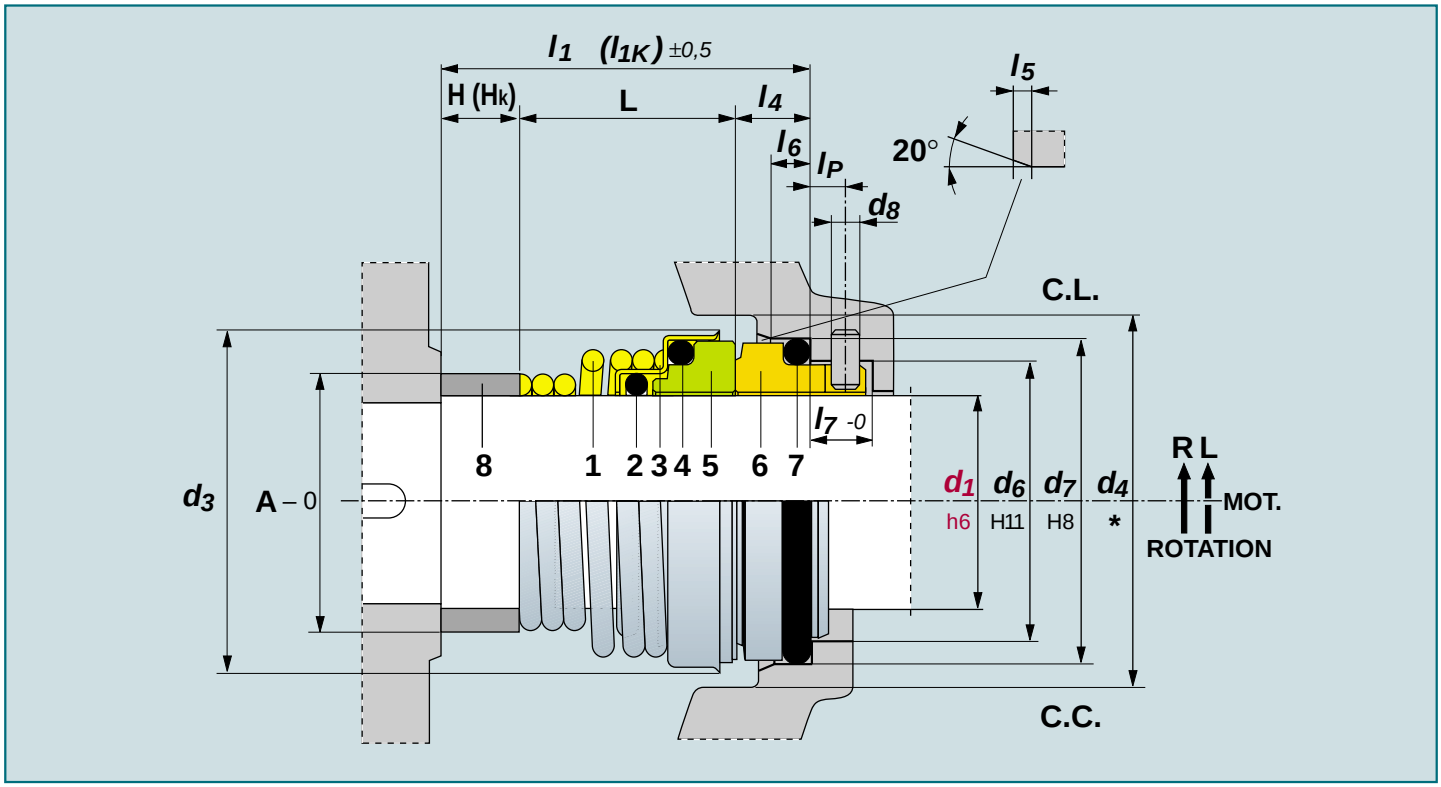
UNITEN

EN 12756 — ISO 3069

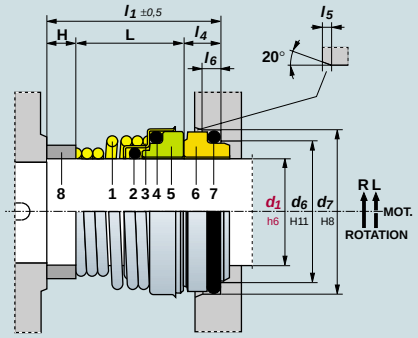
TYPE 22															22 K	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	H	A	d_8	l_7	l_p	l_{1k}	L
10	17	21	22	40	15	7	4	1,5	18	13	3	8,5	5	32,5	25,5
12	19	23	24	40	18	7	4	1,5	15	15	3	8,5	5	32,5	25,5
14	21	25	26	40	22	7	4	1,5	11	18	3	8,5	5	35	28
16	23	27	28	40	23	7	4	1,5	10	20	3	8,5	5	35	28
18	27	33	34	45	24	10	5	2	11	22	3	9	5	37,5	27,5
20	29	35	36	45	25	10	5	2	10	25	3	9	5	37,5	27,5
22	31	37	38	45	25	10	5	2	10	27	3	9	5	37,5	27,5
24	33	39	40	50	27	10	5	2	13	29	3	9	5	40	30
25	34	40	41	50	27	10	5	2	13	30	3	9	5	40	30
28	37	43	44	50	29	10	5	2	11	34	3	9	5	42,5	32,5
30	39	45	48+	50	30	10	5	2	10	36	3	9	5	42,5	32,5
32	42	48	49+	55	30	10	5	2	15	38	3	9	5	42,5	32,5
33	42	48	51+	55	39	10	5	2	6	40	3	9	5	42,5	32,5
35	44	50	54+	55	39	10	5	2	6	42	3	9	5	42,5	32,5
38	49	56	58	55	42	13	6	2	—	45	4	9	5	45	32
40	51	58	60	55	42	13	6	2	—	47	4	9	5	45	32

+ This size is larger than the minumum prescribed by the DIN norm.
∗ The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

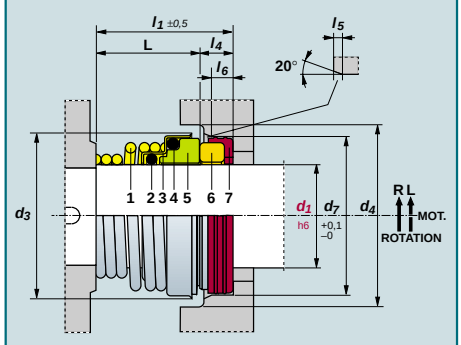
TYPE 3



TYPE 3S with special sizes



TYPE 3Q with square seat and cup gasket



This is a particularly economic mechanical seal, highly valuable and with interchangeable components. The basic pairing Ceramic-Carbon provides type 3 with a vast field of applications also with non-limpid liquids. The possibility of replacing the wearing rings alone after their common working period keeps maintenance costs low, in as far as it eliminates the change of the whole seal apparatus.
Its metallic parts are in stainless steel and the gaskets may be in various kinds of elastomer, which again widens the range of possible applications. It is produced in large amounts for the most usual shaft diameters, from 10 to 40 mm.
Pump manufacturers as well as installators and users appreciate its technical and construction features and its vast field of applications.

POS. TYPE 3 3K	POS. TYPE 3S	POS. TYPE 3Q	COMPONENTS	STANDARD MATERIALS							
1	1	1	Self-driving spring	E	X						
2	2	2	Shaft gasket (O-Ring)	6	7	8	Y	W	B		
3	3	3	Frame	H*	X						
4	4	4	Rotary gasket (O-Ring)	6	7	8	Y	W	B		
5	5	5	Rotary seal ring	2	9*	K	R	V	Z		
6	6	6	Stationary seal ring	V	Z	1	3	4	K	R	
7	7	7	Stationary gasket (O-Ring)	6	7	8	Y	W	B		
8	8		Spacer (if required)	G	H	X					

∗ Available up to ø 25 included.

C.C. = stationary seal ring with short tail.

C.L. = stationary seal ring with extended tail and slot.

3K = UNITEN 3K model with working length “L” according to DIN norm K.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	16 bar
t =	–35 ÷ 180°C
v ≤	15 m/s

ROTEN

TYPE 3

d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
10	14	18,1	20	21	20,5	15	5,5	2,8	1,2	2	6,2	3,5
11÷12	16,5	20,6	22	24	23,5	18	5,5	2,8	1,2	2	6,2	3,5
13÷14	19	23,1	25	27	28	22	6	2,8	1,2	2	6,7	4
15	21	26,9	26	31	29	22	7	3,7	1,3	2,5	7,6	4
16÷17	21	26,9	26	31	30	23	7	3,7	1,3	2,5	7,6	4
18	25	30,9	33	36	32	24	8	3,7	1,3	3	8,5	4,5
19÷20	25	30,9	33	36	33	25	8	3,7	1,3	3	8,5	4,5
21÷22	30	35,4	36	41	33	25	8	3,7	1,8	3,5	8,5	5
23÷24	30	35,4	38	41	35	27	8	3,7	1,8	3,5	8,5	5
25	33	38,2	40	45	35,5	27	8,5	3,7	1,8	4	9,1	5
28	38	43,3	42	50	38	29	9	3,7	1,8	4	9,6	6
29÷32	38	43,3	46	50	39	30	9	3,7	1,8	4	9,6	6
33	45	53,5	48	54	50,5	39	11,5	5,4	2,1	5	12	7,5
35	45	53,5	50	56	50,5	39	11,5	5,4	2,1	5	12	7,5
38	52	60,5	56	62	50,5	39	11,5	5,4	2,1	5	12	7,5
40	52	60,5	58	64	50,5	39	11,5	5,4	2,1	5	12	7,5

NB: The spacer is never to be considered for ROTEN 3.

UNITEN

EN 12756 — ISO 3069

TYPE 3 — 3K

d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	H	A	d_8	l_7	l_p	l_{1k}	L	H_k
10	17	21	20	22	40	15	7	4	1,5	18	13	3	8,5	5	32,5	15	10,5
12	19	23	22	24	40	18	7	4	1,5	15	15	3	8,5	5	32,5	18	7,5
14	21	25	25	26	40	22	7	4	1,5	11	18	3	8,5	5	35	22	6
16	23	27	26	28	40	23	7	4	1,5	10	20	3	8,5	5	35	23	5
18	27	33	33	34	45	24	10	5	2	11	22	3	9	5	37,5	27,5	—
20	29	35	33	36	45	25	10	5	2	10	25	3	9	5	37,5	27,5	—
22	31	37	36	38	45	25	10	5	2	10	27	3	9	5	37,5	27,5	—
24	33	39	38	40	50	27	10	5	2	13	29	3	9	5	40	30	—
25	34	40	40	41	50	27	10	5	2	13	30	3	9	5	40	30	—
28	37	43	42	44	50	29	10	5	2	11	34	3	9	5	42,5	32,5	—
30	39	45	46	48+	50	30	10	5	2	10	36	3	9	5	42,5	32,5	—
32	42	48	46	48	55	30	10	5	2	15	38	3	9	5	42,5	32,5	—
33	42	48	48	49	55	39	10	5	2	6	42	3	9	5	42,5	32,5	—
35	44	50	50	51	55	39	10	5	2	6	42	3	9	5	42,5	32,5	—
38	49	56	56	58	55	42	13	6	2	—	46	4	9	5	45	32	—
40	51	58	58	60	55	42	13	6	2	—	48	4	9	5	45	32	—

+ This size is larger than the minumum prescribed by the DIN norm.
* The size d4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

ROTEN

TYPE 3S

d_1	d_6	d_7	l_1	L	l_4	l_6	l_5	H
9	15,8	20	23,4	17,7	5,7	3,5	1,2	—
10	15,5	19,2	22,6	16,6	6	3,8	1,2	—
12	16,5	21,5	24,3	18	6,3	3,8	1,2	—
16	21	26	29,5	23	6,3	3,7	1,3	—
18	25	30,9	38	30	8	3,7	1,3	—
20	28	33,6	45	25	8	5	1,5	12
25	30,4	36	33,5	26	7,5	5	1,5	—
30	39,2	45	35,5	25,5	10	5	1,5	—
40	52,2	58	45,5	32,5	13	5	1,5	—

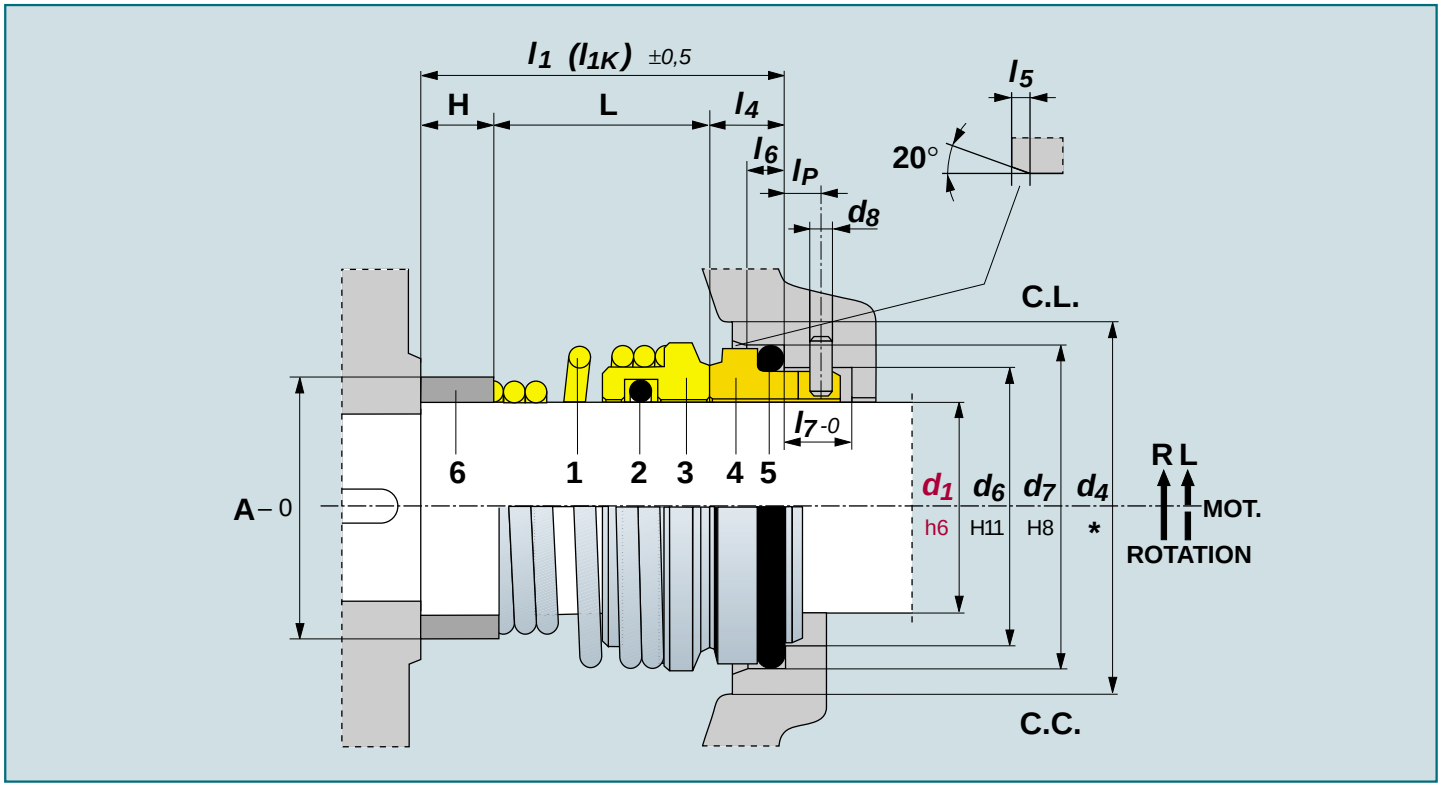
The mechanical seal ROTEN 3S is supplied in particular sizes at the request of some of our important clients.

ROTEN

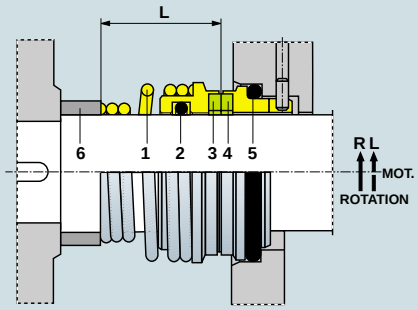
TYPE 3Q

d_1	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5
10	26	20	28	19	12,3	6,7	6	2
12	26	22	28	26	17,8	8,2	6	2
14 LW	26	25	28	21	16,5	4,5	4,5	1,5
16 LW	29,5	29	31	31,2	23	8,2	6	2
17	42	29	44	31	22,8	8,2	6	2
18	42	33	44	31	22,8	8,2	6	2
19	42	33	44	31	22,8	8,2	6	2
20	42	33	44	31	22,8	8,2	6	2
24	50	38	52	34	25	9	6	3
25	50	40	52	34	25	9	6	3

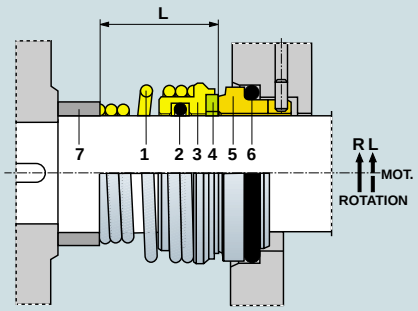
TYPE 33



TYPE 33 with hard metal brazed faces



TYPE 33H with shrunk-in rotary seal ring



Type 33 derives from our type 3 (which has been protected by the Italian patent nr.899590 in 1971). Doing without the pressed sheet-stainless part, the rotary ring is build of hard materials that resist to corrosion and abrasion.
Thus it may work with loaded liquids or where an easy cleaning of the spring in necessary (food stuffs).
The standard building materials for the components are those quoted in the table below. This model may be manufactured, at specific clientís request, in non-standard sizes.

POS. TYPE 33 33K	POS. TYPE 33H 33KH	COMPONENTS	STANDARD MATERALS									
1	1	Self-driving spring	E	X	L							
2	2	Shaft gasket (O-Ring)	6	7	8	Y	W	B				
	3	Frame	X	D								
3		Rotary seal ring	X	G	L	3	K	R	2			
	4	Shrank-in rotary seal ring	K	R	Z	V	1					
4	5	Stationary seal ring	G	X	3	4	K	R	2	V	Z	1
5	6	Stationary gasket (O-Ring)	6	7	8	Y	W	B				
6	7	Spacer (if required)	G	H	X							

C.C. = Stationary seal ring with short tail

C.L. = Stationary seal ring with extended tail and slot

33K = UNITEN 33 model with working length according to DIN norm K

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	16 bar
t =	–35 ÷ 200°C
v ≤	15 m/s

ROTEN

TYPE 33 33H

d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
10	14	18,1	21	20,5	15	5,5	2,8	1,2	2	6,2	3,5
12	16,5	20,6	24	23,5	18	5,5	2,8	1,2	2	6,2	3,5
14	19	23,1	27	28	22	6	2,8	1,2	2	6,7	4
16	21	26,9	31	30	23	7	3,7	1,3	2,5	7,6	4
18	25	30,9	36	32	24	8	3,7	1,3	3	8,5	4,5
20	25	30,9	36	33	25	8	3,7	1,3	3	8,5	4,5
22	30	35,4	41	33	25	8	3,7	1,8	3,5	8,5	5
24	30	35,4	41	35	27	8	3,7	1,8	3,5	8,5	5
25	33	38,2	45	35,5	27	8,5	3,7	1,8	4	9,1	5
28	38	43,3	50	38	29	9	3,7	1,8	4	9,6	6
30	38	43,3	50	39	30	9	3,7	1,8	4	9,6	6
32	38	43,3	50	39	30	9	3,7	1,8	4	9,6	6
33	45	53,5	60	50,5	39	11,5	5,4	2,1	5	12	7,5
35	45	53,5	60	50,5	39	11,5	5,4	2,1	5	12	7,5
38	52	60,5	68	50,5	39	11,5	5,4	2,1	5	12	7,5
40	52	60,5	68	50,5	39	11,5	5,4	2,1	5	12	7,5
43	52	60,5	68	50,5	39	11,5	5,4	2,1	5	12	7,5
45	57	65,5	72	52,5	41	11,5	5,4	2,1	5	13	8,5
48	57	65,5	72	52,5	41	11,5	5,4	2,1	5	13	8,5
50	64	72,5	80	56,5	45	11,5	5,4	2,1	5	13	8,5
55	64	72,5	80	58,5	47	11,5	5,4	2,1	5	13	8,5
60	72	79,3	87	60,5	49	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	92	62,5	51	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	97	62,5	51	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	102	68,5	57	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	107	70,5	59	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	113	72,5	59	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	120	75,5	62	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	130	75,5	62	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	136	88,5	75	13,5	5,4	2,6	5	13,5	8,5

NB: The spacer is never to be considered for ROTEN 33

UNITEN

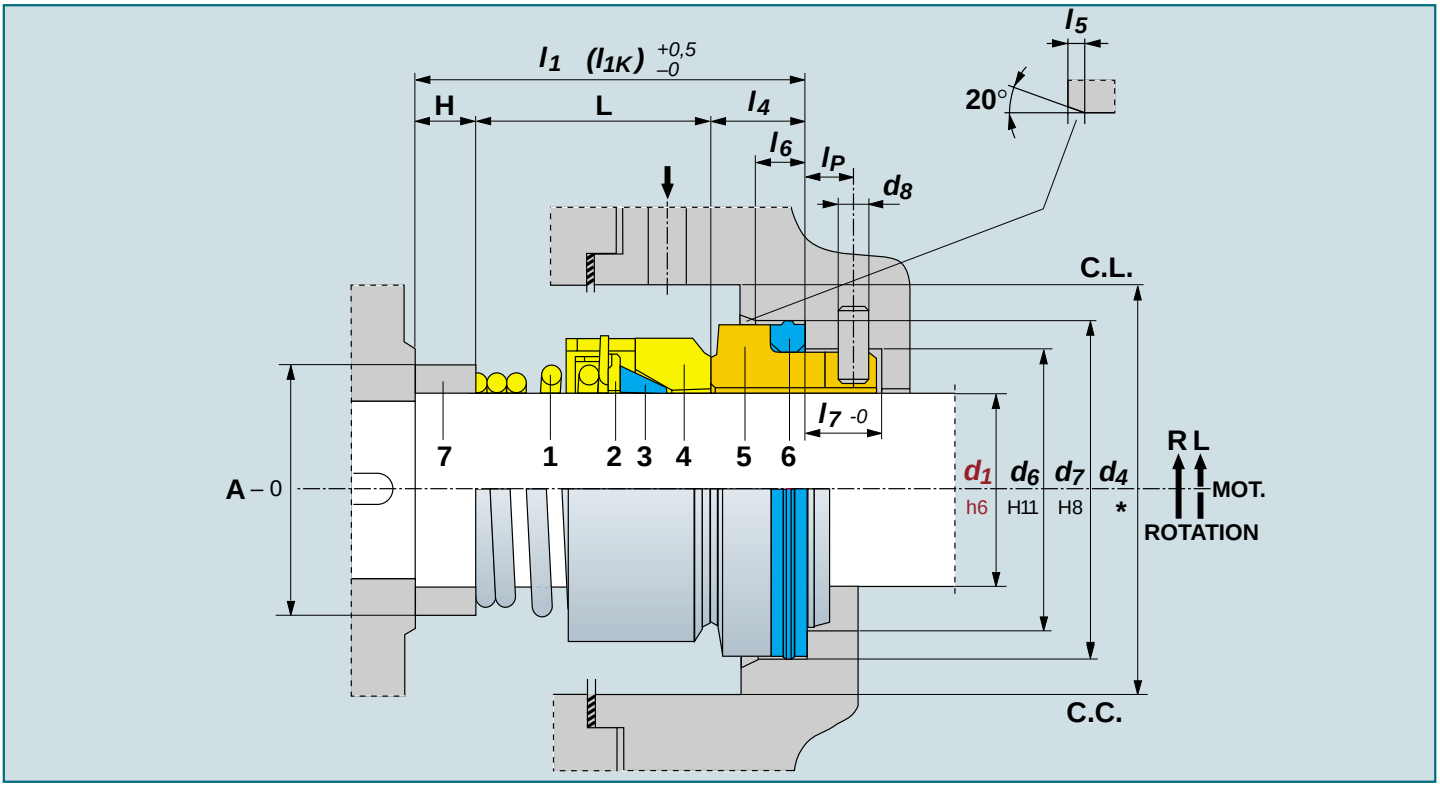
EN 12756 — ISO 3069

TYPE 33 33H — 33K 33KH

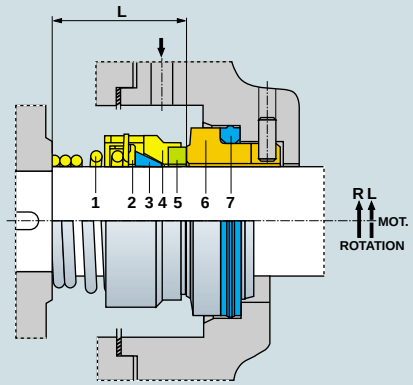
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	H	A	d_8	l_7	l_p	l_{1k}	L
10	17	21	24+	40	15	7	4	1,5	18	13	3	8,5	5	32,5	25,5
12	19	23	26+	40	18	7	4	1,5	15	15	3	8,5	5	32,5	25,5
14	21	25	28+	40	22	7	4	1,5	11	18	3	8,5	5	35	28
16	23	27	30+	40	23	7	4	1,5	10	20	3	8,5	5	35	28
18	27	33	35+	45	24	10	5	2	11	22	3	9	5	37,5	27,5
20	29	35	37+	45	25	10	5	2	10	25	3	9	5	37,5	27,5
22	31	37	39+	45	25	10	5	2	10	27	3	9	5	37,5	27,5
24	33	39	41+	50	27	10	5	2	13	29	3	9	5	40	30
25	34	40	43+	50	27	10	5	2	13	30	3	9	5	40	30
28	37	43	46+	50	29	10	5	2	11	34	3	9	5	42,5	32,5
30	39	45	48+	50	30	10	5	2	10	36	3	9	5	42,5	32,5
32	42	48	50+	55	30	10	5	2	15	38	3	9	5	42,5	32,5
33	42	48	52+	55	39	10	5	2	6	40	3	9	5	42,5	32,5
35	44	50	54+	55	39	10	5	2	6	42	3	9	5	42,5	32,5
38	49	56	58	55	42	13	6	2	—	45	4	9	5	45	32
40	51	58	60	55	42	13	6	2	—	47	4	9	5	45	32
43	54	61	64+	60	47	13	6	2	—	51	4	9	5	45	32
45	56	63	66+	60	47	13	6	2	—	53	4	9	5	45	32
48	59	66	69+	60	47	13	6	2	—	56	4	9	5	45	32
50	62	70	71+	60	46	14	6	2,5	—	59	4	9	5	47,5	33,5
53	65	73	74+	70	56	14	6	2,5	—	62	4	9	5	47,5	33,5
55	67	75	77+	70	56	14	6	2,5	—	64	4	9	5	47,5	33,5
58	70	78	83	70	56	14	6	2,5	—	68	4	9	5	52,5	38,5
60	72	80	85	70	56	14	6	2,5	—	70	4	9	5	52,5	38,5
63	75	83	88	70	56	14	6	2,5	—	73	4	9	5	52,5	38,5
65	77	85	90	80	66	14	6	2,5	—	76	4	9	5	52,5	38,5
68	81	90	93	80	64	16	7	2,5	—	79	4	9	5	52,5	36,5
70	83	92	95	80	64	16	7	2,5	—	81	4	9	5	60	44
75	88	97	104	80	64	16	7	2,5	—	86	4	9	5	60	44
80	95	105	109	90	72	18	7	3	—	92	4	9	5	60	42
85	100	110	117+	90	72	18	7	3	—	98	4	9	5	60	42
90	105	115	122+	90	72	18	7	3	—	103	4	9	5	65	47
95	110	120	127+	90	72	18	7	3	—	108	4	9	5	65	47
100	115	125	132+	90	72	18	7	3	—	114	4	9	5	65	47

+ This size is larger than the minumum prescribed by the DIN norm.
* The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

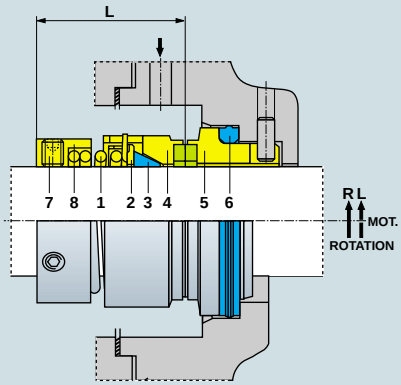
TYPE 4



TYPE 4H with shrunk-in rotary seal ring



TYPE U4 with driving sleeve and hard metal brazed faces



This seal is fitted with PTFE gaskets and can be used for most fluids provided that the operating conditions are within the design limits and the face materials are compatible.
The standard version contains stainless steel, PTFE and Carbon, but to take full advantage of the characteristics of PTFE, the seal can be supplied with hard faces, hard metal inserts, special anticorrosion alloys, special carbons, glass-filled PTFE and special faces shrunk-fit into the frame.
The seal is suitable for most solvents, pharmaceutical and chemical products at elevated temperatures.

POS. TYPE 4 4K	POS. TYPE 4H 4KH	POS. TYPE U4	COMPONENTS	STANDARD MATERIALS							
1	1	1	Self-driving spring	X	L						
2	2	2	Gasket thrust washer	X	L						
3	3	3	Wedge shaft gasket (PTFE)	5	4**	0**					
	4		Frame	X	D						
4	5*	4	Rotary seal ring	X	J	3	L	K*	R*	Z*	
5	6	5	Stationary seal ring	V	Z	1	3	4	K	R	
6	7	6	Stationary gasket (PTFE)	5	F	4**	0**				
7			Spacer (if required)	X	L						
		7	Grub screws	H	X	L					
		8	Driving “U” sleeve	X							

*** SHRUNK FIT**

****** For particular operating conditions the wedge and stationary gasket may be manufactured also in the codes 0 and 4.

C.C. = stationary ring with short tail
C.L. = stationary ring with extended tail and slot
4K = UNITEN 4 model with working length according to DIN norm K up to ø 55 included

MAX.WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed

p ≤	12 bar
t =	10 ÷ 180°C
v ≤	15 m/s
For TYPE 4H	
t =	-20 ÷ 150°C

ROTEN

TYPE 4 4H U4

d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
6	10,6	13,1	20	19,5	15	4,5	2	1,2	2	6	3,5
7÷9	13	17,1	23	20,5	15	5,5	2,8	1,2	2	6,2	3,5
10	14	18,1	24	20,5	15	5,5	2,8	1,2	2	6,2	3,5
11÷12	16,5	20,6	27	23,5	18	5,5	2,8	1,2	2	6,2	3,5
13÷14	19	23,1	30	28	22	6	2,8	1,2	2	6,7	4
15	21	26,9	31	29	22	7	3,7	1,3	2,5	7,6	4
16÷17	21	26,9	34	30	23	7	3,7	1,3	2,5	7,6	4
18	25	30,9	37	32	24	8	3,7	1,3	3	8,5	4,5
19÷20	25	30,9	39	33	25	8	3,7	1,3	3	8,5	4,5
21÷22	30	35,4	42	33	25	8	3,7	1,8	3,5	8,5	5
23÷24	30	35,4	44	35	27	8	3,7	1,8	3,5	8,5	5
25÷27	33	38,2	48	35,5	27	8,5	3,7	1,8	4	9,1	5
28	38	43,3	50	38	29	9	3,7	1,8	4	9,6	6
29÷32	38	43,3	53	39	30	9	3,7	1,8	4	9,6	6
33÷34	45	53,5	64	50,5	39	11,5	5,4	2,1	5	12	7,5
35÷37	45	53,5	64	50,5	39	11,5	5,4	2,1	5	12	7,5
38÷43	52	60,5	69	50,5	39	11,5	5,4	2,1	5	12	7,5
44÷45	57	65,5	76	52,5	41	11,5	5,4	2,1	5	13	8,5
46÷49	57	65,5	80	52,5	41	11,5	5,4	2,1	5	13	8,5
50	64	72,5	82	56,5	45	11,5	5,4	2,1	5	13	8,5
55	64	72,5	87	58,5	47	11,5	5,4	2,1	5	13	8,5
60	72	79,3	93	60,5	49	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	102	62,5	51	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	107	62,5	51	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	113	68,5	57	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	117	70,5	59	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	126	72,5	59	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	131	75,5	62	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	138	75,5	62	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	144	88,5	75	13,5	5,4	2,6	5	13,5	8,5
110	124	132,2	168	92,5	75	17,5	7,1	3,9	5	13,5	8,5
120	134	142,2	178	102,5	85	17,5	7,1	3,9	5	13,5	8,5
130	145	153,2	190	112,5	95	17,5	7,1	3,9	5	13,5	8,5
135	152	161,2	201	113,5	95	18,5	7,1	3,9	5	13,5	8,5
140	157	164,3	206	118,5	100	18,5	7,1	3,9	5	13,5	8,5
150	167	174,2	219	128,5	110	18,5	7,1	3,9	5	13,5	8,5
160	188	195	239	141	120	21	9,1	3,9	5	15,5	8,5

NB: The spacer is never to be considered for ROTEN 4.

UNITEN

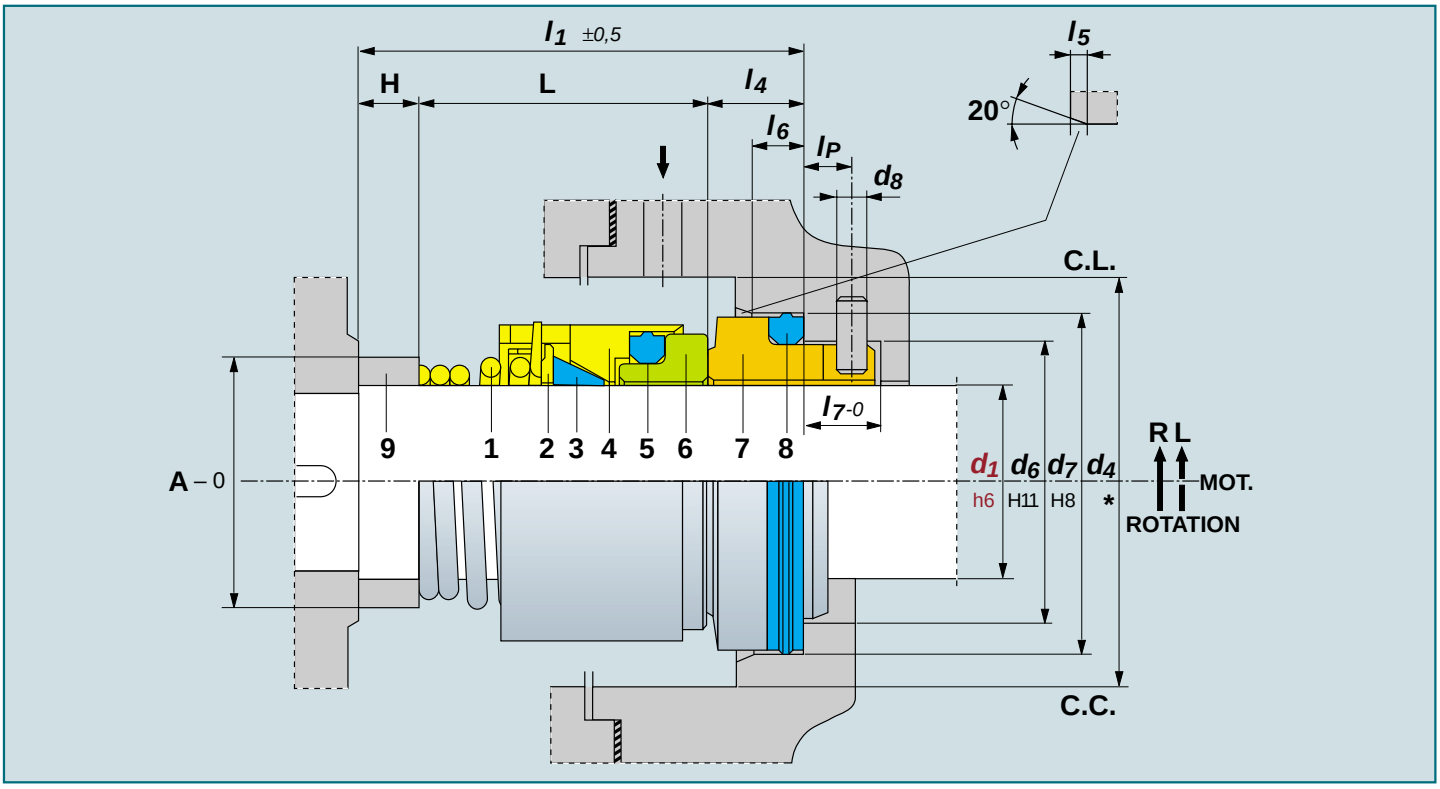
EN 12756 — ISO 3069

TYPE 4 4H U4 — 4K 4KH

d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	H	A	d_8	l_7	l_p	l_{1k}	L
10	17	21	22	40	15	7	4	1,5	18	13	3	8,5	5	32,5	25,5
12	19	23	24	40	18	7	4	1,5	15	15	3	8,5	5	32,5	25,5
14	21	25	26	40	22	7	4	1,5	11	18	3	8,5	5	35	28
16	23	27	28	40	23	7	4	1,5	10	20	3	8,5	5	35	28
18	27	33	34	45	24	10	5	2	11	22	3	9	5	37,5	27,5
20	29	35	36	45	25	10	5	2	10	25	3	9	5	37,5	27,5
22	31	37	38	45	25	10	5	2	10	27	3	9	5	37,5	27,5
24	33	39	40	50	27	10	5	2	13	29	3	9	5	40	30
25	34	40	41	50	27	10	5	2	13	30	3	9	5	40	30
28	37	43	44	50	29	10	5	2	11	34	3	9	5	42,5	32,5
30	39	45	48+	50	30	10	5	2	10	36	3	9	5	42,5	32,5
32	42	48	48	55	30	10	5	2	15	38	3	9	5	42,5	32,5
33	42	48	54+	55	39	10	5	2	6	40	3	9	5	42,5	32,5
35	44	50	54+	55	39	10	5	2	6	42	3	9	5	42,5	32,5
38	49	56	58	55	42	13	6	2	—	45	4	9	5	45	32
40	51	58	60	55	42	13	6	2	—	47	4	9	5	45	32
43	54	61	63	60	47	13	6	2	—	51	4	9	5	45	32
45	56	63	65	60	47	13	6	2	—	53	4	9	5	45	32
48	59	66	73+	60	47	13	6	2	—	56	4	9	5	45	32
50	62	70	75+	60	46	14	6	2,5	—	59	4	9	5	47,5	33,5
53	65	73	73	70	56	14	6	2,5	—	62	4	9	5	47,5	33,5
55	67	75	80+	70	56	14	6	2,5	—	64	4	9	5	47,5	33,5
58	70	78	83	70	56	14	6	2,5	—	68	4	9	5	—	—
60	72	80	85	70	56	14	6	2,5	—	70	4	9	5	—	—
63	75	83	88	70	56	14	6	2,5	—	73	4	9	5	—	—
65	77	85	90	80	66	14	6	2,5	—	76	4	9	5	—	—
68	81	90	93	80	64	16	7	2,5	—	79	4	9	5	—	—
70	83	92	95	80	64	16	7	2,5	—	81	4	9	5	—	—
75	88	97	104	80	64	16	7	2,5	—	86	4	9	5	—	—
80	95	105	109	90	72	18	7	3	—	92	4	9	5	—	—
85	100	110	114	90	72	18	7	3	—	98	4	9	5	—	—
90	105	115	119	90	72	18	7	3	—	103	4	9	5	—	—
95	110	120	131+	90	72	18	7	3	—	108	4	9	5	—	—
100	115	125	137+	90	72	18	7	3	—	114	4	9	5	—	—

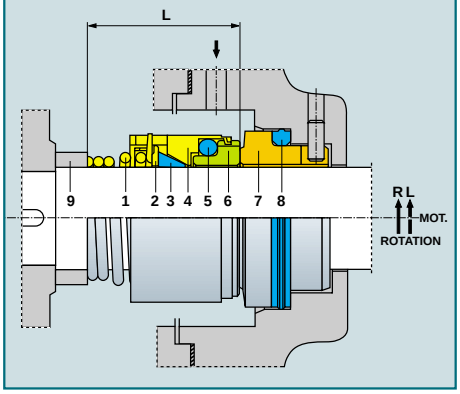
+ This size is larger than the minumum prescribed by the DIN norm.
* The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

TYPE 45



TYPE 45TRCL

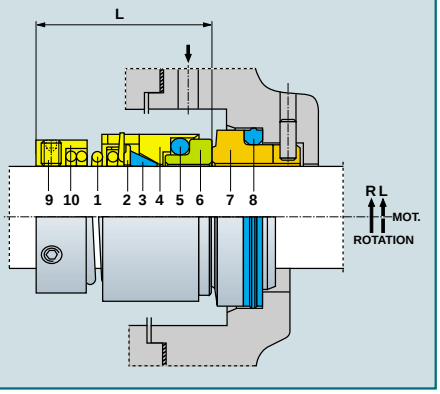
positive drive and stationary seal ring with extended tail and slot.



This seal combines all the features of the ROTEN TYPE 5 with the added versatility of PTFE gaskets. The seal faces and metallic components are from the TYPE 5 with PTFE gaskets from the TYPE 4. The range of application is therefore extended to most fluids.

TYPE U45

with driving sleeve.



POS. TYPE 45 45TRCL	POS. TYPE U45	COMPONENTS	STANDARD MATERIALS							
1	1	Self-driving spring	X	L						
2	2	Gasket thrust washer	X	L						
3	3	Wedge shaft gasket (PTFE)	5	4**	0**					
4	4	Frame	X	L						
5	5	Rotary gasket (PTFE÷O-Ring)	5	4**	0**	F	W			
6	6	Rotary seal ring	2	R	K					
7	7	Stationary seal ring	V	Z	R	K	4	0		
8	8	Stationary gasket (PTFE÷O-Ring)	5	4**	0**	F	W			
9		Spacer (if required)	X	L						
	9	Grub screws	H	X	L					
	10	Driving “U” sleeve	X	L						

C.C. = stationary seal ring with short tail.

C.L. = stationary seal ring with extended tail and slot.

UN U45 = UNITEN U45 model is manufactured with the same working length as ROTEN U45.

MAX.WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	16 bar
t =	10 ÷ 200°C
v ≤	15 m/s

** For particular operating conditions, the wedge and stationary gaskets may be supplied also in the codes 0 and 4.

ROTEN

TYPE 45 45TRCL												U45	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_1	L
10	14	18,1	22	25,5	20	5,5	2,8	1,2	2	6,2	3,5	27,5	22
11	16,5	20,6	25	27,5	22	5,5	2,8	1,2	2	6,2	3,5	29,5	24
12	16,5	20,6	25	27,5	22	5,5	2,8	1,2	2	6,2	3,5	29,5	24
13	19	23,1	27	33	27	6	2,8	1,2	2	6,7	4	36	30
14	19	23,1	27	33	27	6	2,8	1,2	2	6,7	4	36	30
15	21	26,9	32	34	27	7	3,7	1,3	2,5	7,6	4	37	30
16	21	26,9	32	35	28	7	3,7	1,3	2,5	7,6	4	38	31
17	21	26,9	32	35	28	7	3,7	1,3	2,5	7,6	4	38	31
18÷20	25	30,9	36	38	30	8	3,7	1,3	3	8,5	4,5	42	34
21	30	35,4	41	38	30	8	3,7	1,8	3,5	8,5	5	42	34
22	30	35,4	41	38	30	8	3,7	1,8	3,5	8,5	5	42	34
23	30	35,4	41	40	32	8	3,7	1,8	3,5	8,5	5	44	36
24	30	35,4	41	40	32	8	3,7	1,8	3,5	8,5	5	44	36
25÷27	33	38,2	45	41,5	33	8,5	3,7	1,8	4	9,1	5	45,5	37
28	38	43,3	50	45	36	9	3,7	1,8	4	9,6	6	50	41
29÷32	38	43,3	50	46	37	9	3,7	1,8	4	9,6	6	51	42
33÷37	45	53,5	62	59,5	48	11,5	5,4	2,1	5	12	7,5	66,5	55
38÷43	52	60,5	70	59,5	48	11,5	5,4	2,1	5	12	7,5	66,5	55
44÷49	57	65,5	75	62,5	51	11,5	5,4	2,1	5	13	8,5	68,5	57
50	64	72,5	83	66,5	55	11,5	5,4	2,1	5	13	8,5	74,5	63
55	64	72,5	83	68,5	57	11,5	5,4	2,1	5	13	8,5	76,5	65
60	72	79,3	90	72,5	61	11,5	5,4	2,1	5	13,5	8,5	81,5	70
65	77	84,5	96	74,5	63	11,5	5,4	2,1	5	13,5	8,5	83,5	72
70	82	89,5	101	74,5	63	11,5	5,4	2,1	5	13,5	8,5	83,5	72
75	87	94,5	106	79,5	68	11,5	5,4	2,1	5	13,5	8,5	89,5	78
80	92	99,5	111	81,5	70	11,5	5,4	2,1	5	13,5	8,5	93,5	82
85	98	105,5	125	85,5	72	13,5	5,4	2,6	5	13,5	8,5	97,5	84
90	105	111,5	130	88,5	75	13,5	5,4	2,6	5	13,5	8,5	99,5	86
95	110	116,5	137	88,5	75	13,5	5,4	2,6	5	13,5	8,5	99,5	86
100	114	119,5	143	98,5	85	13,5	5,4	2,6	5	13,5	8,5	110,5	97
110	124	132,2	166	106,5	89	17,5	7,1	3,9	5	13,5	8,5	119,5	102
120	134	142,2	176	114,5	97	17,5	7,1	3,9	5	13,5	8,5	127,5	110
130	145	153,2	190	125,5	108	17,5	7,1	3,9	5	13,5	8,5	137,5	120
140	157	164,3	210	128,5	110	18,5	7,1	3,9	5	13,5	8,5	145,5	127
150	167	174,2	220	138,5	120	18,5	7,1	3,9	5	13,5	8,5	155,5	137

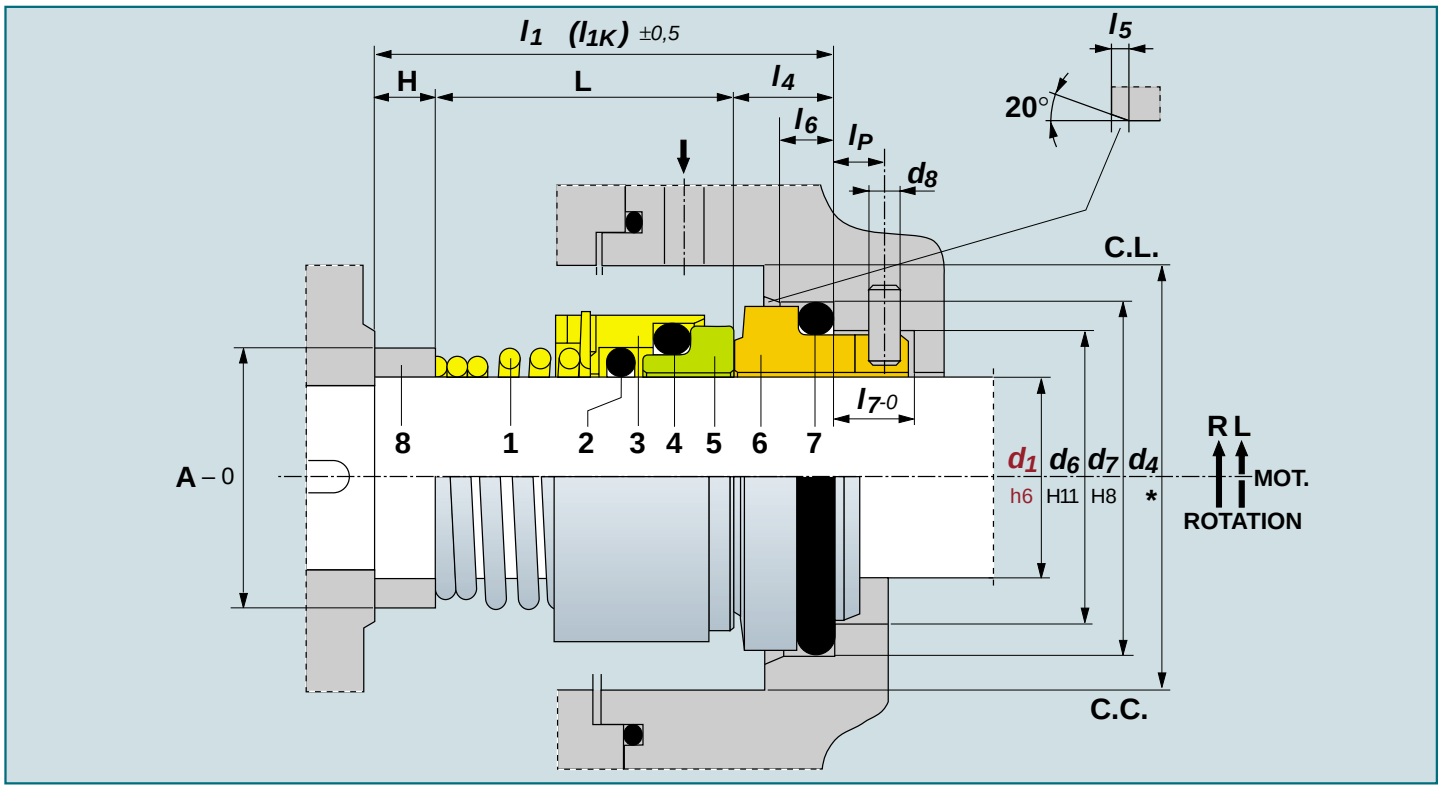
NB: The spacer is never to be considered for ROTEN 45

EN 12756 **UNITEN** ISO 3069

TYPE 45 45TRCL													
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	H	A	d_8	l_7	l_p
10	17	21	22	40	20	7	4	1,5	13	13	3	8,5	5
12	19	23	24	40	22	7	4	1,5	11	15	3	8,5	5
14	21	25	26	40	27	7	4	1,5	6	18	3	8,5	5
16	23	27	30+	40	28	7	4	1,5	5	20	3	8,5	5
18	27	33	34	45	30	10	5	2	5	22	3	9	5
20	29	35	36	45	30	10	5	2	5	25	3	9	5
22	31	37	38	45	30	10	5	2	5	27	3	9	5
24	33	39	40	50	32	10	5	2	8	29	3	9	5
25	34	40	41	50	33	10	5	2	7	30	3	9	5
28	37	43	48+	50	36	10	5	2	4	34	3	9	5
30	39	45	48+	50	37	10	5	2	3	36	3	9	5
32	42	48	48	55	37	10	5	2	8	38	3	9	5
33	42	48	58+	58+	48+	10	5	2	—	40	3	9	5
35	44	50	58+	58+	48+	10	5	2	—	42	3	9	5
38	49	56	65+	61+	48+	13	6	2	—	45	4	9	5
40	51	58	65+	61+	48+	13	6	2	—	47	4	9	5
43	54	61	65+	61+	48+	13	6	2	—	51	4	9	5
45	56	63	70+	64+	51+	13	6	2	—	53	4	9	5
48	59	66	70+	64+	51+	13	6	2	—	56	4	9	5
50	62	70	76+	69+	55+	14	6	2,5	—	59	4	9	5
53	65	73	76+	71+	57+	14	6	2,5	—	62	4	9	5
55	67	75	77+	71+	57+	14	6	2,5	—	64	4	9	5
58	70	78	85+	75+	61+	14	6	2,5	—	68	4	9	5
60	72	80	85	75+	61+	14	6	2,5	—	70	4	9	5
63	75	83	90+	77+	63+	14	6	2,5	—	73	4	9	5
65	77	85	90	80	63	14	6	2,5	3	76	4	9	5
68	81	90	95+	80	64	16	7	2,5	—	79	4	9	5
70	83	92	95	80	64	16	7	2,5	—	81	4	9	5
75	88	97	104	84+	68+	16	7	2,5	—	86	4	9	5
80	95	105	109	90	70	18	7	3	2	92	4	9	5
85	100	110	114	90	72	18	7	3	—	98	4	9	5
90	105	115	119	93+	75+	18	7	3	—	103	4	9	5
95	110	120	124	93+	75+	18	7	3	—	108	4	9	5
100	115	125	129	103+	85+	18	7	3	—	114	4	9	5

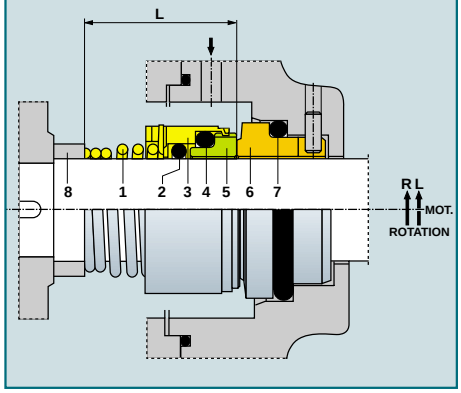
+This size is larger to the minumum prescribed by the DIN norm.
*The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

TYPE 5

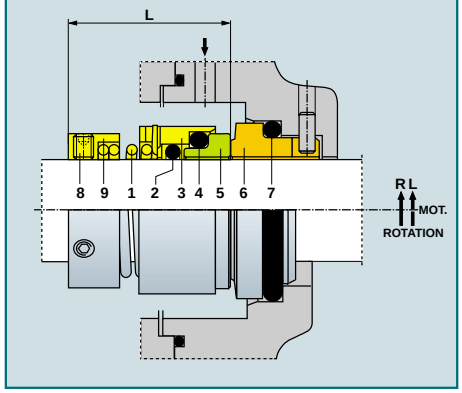


TYPE 5 TRCL

positive drive and stationary seal ring with extended tail and slot.



TYPE U5 with driving sleeve.



The principal advantage of this seal is the possibility to replace only the wearing faces during overhauls. They can be supplied in materials such as pure alumina ceramic, solid corrosion resistant tungsten carbide and silicon carbide, normal carbon, metalised carbon, filled PTFE etc. Metallic parts are in stainless steel or in corrosion resistant superalloys and "O" rings can be supplied in any kind of rubber; the seal design is very resilient compared to other seal types reducing the effects of vibration and misalignment of the machine on which it is installed. These features also give it great versatility particularly for heavy duties.

POS. TYPE 5 5TRCL	POS. TYPE U5	COMPONENTS	STANDARD MATERIALS							
1	1	Self-driving spring	X	L						
2	2	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
3	3	Frame	X	L	U					
4	4	Rotary gasket (O-Ring)	6	7	8	Y	F	W	B	
5	5	Rotary seal ring	2	R	K					
6	6	Stationary seal ring	V	Z	R	K	4	0	1	
7	7	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
8		Spacer (if required)	X	L						
	8	Grub screws	H	X	L					
	9	Driving "U" sleeve	X	L						

C.C. = Stationary seal ring with short tail.
C.L. = Stationary seal ring with extended tail and slot.
5H2 = Model with working length as ROTEN 2.
5K = UNITEN 5 model with working length as recommended by Din norm K length.
UN5 LRO2 = UNITEN 5 with working length as ROTEN 2.
UN U5 = model with working length as ROTEN U5.

MAX.WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed

p ≤	16 bar
t =	–45 ÷ 200°C
v ≤	15 m/s

ROTEN

TYPE 5 5TRCL U5												5H2	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_1	L
10	14	18,1	22	25,5	20	5,5	2,8	1,2	2	6,2	3,5	20,5	15
11	16,5	20,6	25	27,5	22	5,5	2,8	1,2	2	6,2	3,5	23,5	18
12	16,5	20,6	25	27,5	22	5,5	2,8	1,2	2	6,2	3,5	23,5	18
13	19	23,1	27	33	27	6	2,8	1,2	2	6,7	4	28	22
14	19	23,1	27	33	27	6	2,8	1,2	2	6,7	4	28	22
15	21	26,9	32	34	27	7	3,7	1,3	2,5	7,6	4	29	22
16	21	26,9	32	35	28	7	3,7	1,3	2,5	7,6	4	30	23
17	21	26,9	32	35	28	7	3,7	1,3	2,5	7,6	4	30	23
18	25	30,9	36	38	30	8	3,7	1,3	3	8,5	4,5	32	24
19÷20	25	30,9	36	38	30	8	3,7	1,3	3	8,5	4,5	33	25
21÷22	30	35,4	41	38	30	8	3,7	1,8	3,5	8,5	5	33	25
23÷24	30	35,4	41	40	32	8	3,7	1,8	3,5	8,5	5	35	27
25÷27	33	38,2	45	41,5	33	8,5	3,7	1,8	4	9,1	5	35,5	27
28	38	43,3	50	45	36	9	3,7	1,8	4	9,6	6	38	29
29÷32	38	43,3	50	46	37	9	3,7	1,8	4	9,6	6	39	30
33÷37	45	53,5	62	59,5	48	11,5	5,4	2,1	5	12	7,5	50,5	39
38÷43	52	60,5	70	59,5	48	11,5	5,4	2,1	5	12	7,5	50,5	39
44÷49	57	65,5	75	62,5	51	11,5	5,4	2,1	5	13	8,5	52,5	41
50	64	72,5	83	66,5	55	11,5	5,4	2,1	5	13	8,5	56,5	45
55	64	72,5	83	68,5	57	11,5	5,4	2,1	5	13	8,5	58,5	47
60	72	79,3	90	72,5	61	11,5	5,4	2,1	5	13,5	8,5	60,5	49
65	77	84,5	96	74,5	63	11,5	5,4	2,1	5	13,5	8,5	62,5	51
70	82	89,5	101	74,5	63	11,5	5,4	2,1	5	13,5	8,5	62,5	51
75	87	94,5	106	79,5	68	11,5	5,4	2,1	5	13,5	8,5	68,5	57
80	92	99,5	111	81,5	70	11,5	5,4	2,1	5	13,5	8,5	70,5	59
85	98	105,5	125	85,5	72	13,5	5,4	2,6	5	13,5	8,5	72,5	59
90	105	111,5	130	88,5	75	13,5	5,4	2,6	5	13,5	8,5	75,5	62
95	110	116,5	137	88,5	75	13,5	5,4	2,6	5	13,5	8,5	75,5	62
100	114	119,5	143	98,5	85	13,5	5,4	2,6	5	13,5	8,5	88,5	75
110	124	132,2	166	106,5	89	17,5	7,1	3,9	5	13,5	8,5	92,5	75
120	134	142,2	176	114,5	97	17,5	7,1	3,9	5	13,5	8,5	102,5	85
130	145	153,2	190	125,5	108	17,5	7,1	3,9	5	13,5	8,5	112,5	95
140	157	164,3	210	128,5	110	18,5	7,1	3,9	5	13,5	8,5	118,5	100
150	167	174,2	220	138,5	120	18,5	7,1	3,9	5	13,5	8,5	128,5	110

NB: The spacer is never to be considered for ROTEN 5

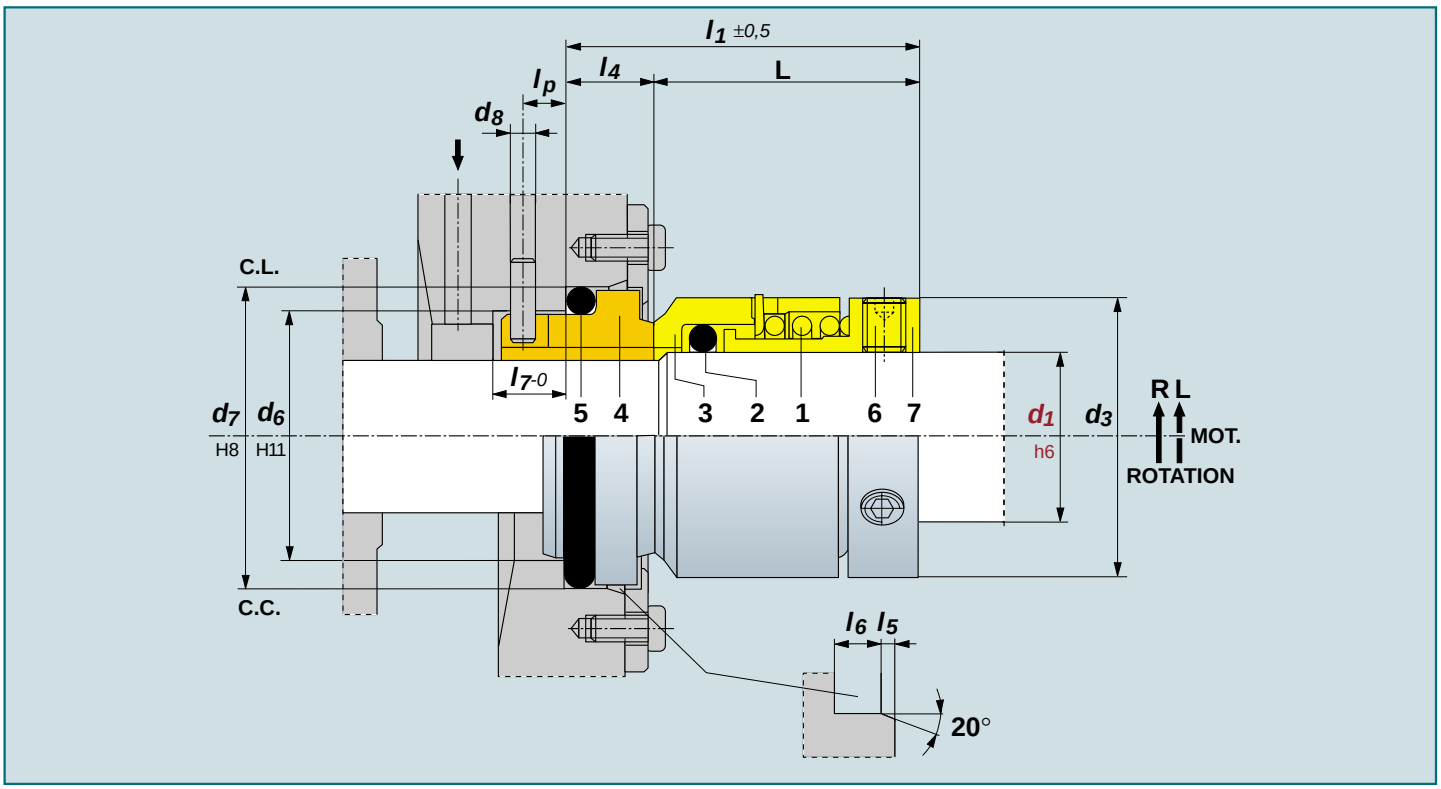
UNITEN

EN 12756 — ISO 3069

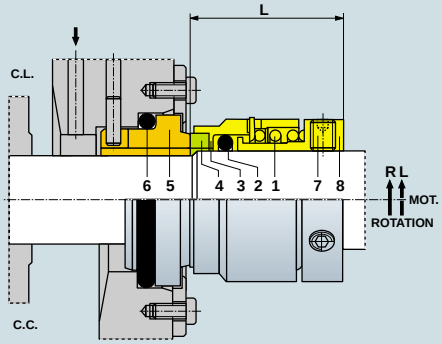
TYPE 5 5TRCL														5K	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	H	A	d_8	l_7	l_p	l_{1k}	L
10	17	21	22	40	15	7	4	1,5	18	13	3	8,5	5	32,5	25,5
12	19	23	24	40	18	7	4	1,5	15	15	3	8,5	5	32,5	25,5
14	21	25	26	40	22	7	4	1,5	11	18	3	8,5	5	35	28
16	23	27	30+	40	23	7	4	1,5	10	20	3	8,5	5	35	28
18	27	33	34	45	24	10	5	2	11	22	3	9	5	37,5	27,5
20	29	35	36	45	25	10	5	2	10	25	3	9	5	37,5	27,5
22	31	37	38	45	25	10	5	2	10	27	3	9	5	37,5	27,5
24	33	39	40	50	27	10	5	2	13	29	3	9	5	40	30
25	34	40	41	50	27	10	5	2	13	30	3	9	5	40	30
28	37	43	48+	50	29	10	5	2	11	34	3	9	5	42,5	32,5
30	39	45	48+	50	30	10	5	2	10	36	3	9	5	42,5	32,5
32	42	48	48	55	30	10	5	2	15	38	3	9	5	42,5	32,5
33	42	48	49	55	39	10	5	2	6	40	3	9	5	42,5	32,5
35	44	50	58+	55	39	10	5	2	6	42	3	9	5	42,5	32,5
38	49	56	65+	55	42	13	6	2	—	45	4	9	5	45	32
40	51	58	65+	55	42	13	6	2	—	47	4	9	5	45	32
43	54	61	65+	60	47	13	6	2	—	51	4	9	5	45	32
45	56	63	70+	60	47	13	6	2	—	53	4	9	5	45	32
48	59	66	70+	60	47	13	6	2	—	56	4	9	5	45	32
50	62	70	76+	60	46	14	6	2,5	—	59	4	9	5	47,5	33,5
53	65	73	76+	70	56	14	6	2,5	—	62	4	9	5	47,5	33,5
55	67	75	75	70	56	14	6	2,5	—	64	4	9	5	47,5	33,5
58	70	78	83	70	56	14	6	2,5	—	68	4	9	5	52,5	38,5
60	72	80	85	70	56	14	6	2,5	—	70	4	9	5	52,5	38,5
63	75	83	88	70	56	14	6	2,5	—	73	4	9	5	52,5	38,5
65	77	85	90	80	66	14	6	2,5	—	76	4	9	5	52,5	38,5
68	81	90	93	80	64	16	7	2,5	—	79	4	9	5	52,5	36,5
70	83	92	95	80	64	16	7	2,5	—	81	4	9	5	60	44
75	88	97	104	80	64	16	7	2,5	—	86	4	9	5	60	44
80	95	105	109	90	72	18	7	3	—	92	4	9	5	60	42
85	100	110	114	90	72	18	7	3	—	98	4	9	5	60	42
90	105	115	119	90	72	18	7	3	—	103	4	9	5	65	47
95	110	120	124	90	72	18	7	3	—	108	4	9	5	65	47
100	115	125	129	90	72	18	7	3	—	114	4	9	5	65	47

+ This size is larger to the minumum prescribed by the DIN norm.
*The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

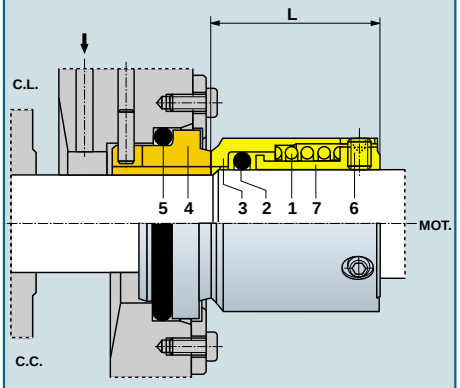
TYPE 7



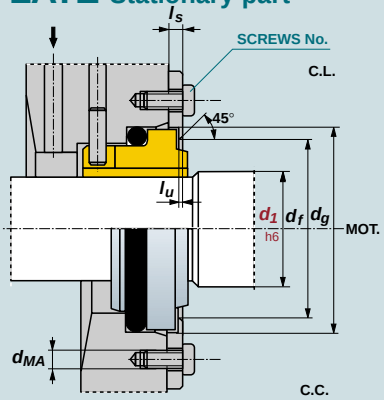
TYPE 7H with shrunk-in faces



TYPE 7R Bidirectional



STATIONARY RETAINING PLATE Stationary part



POS. TYPE 7 7R	POS. TYPE 7H 7HR	COMPONENTS	STANDARD MATERIALS							
1	1	Self-driving spring	X							
2	2	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
	3	Frame	X	D						
	4	Shrank-in rotary seal ring	K	R	Z					
3		Rotary seal ring	G	X	J	3	L	2	K	R
4	5	Stationary seal ring	V	Z	1	3	4	K	R	
5	6	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
6	7	Grub screws	H	X	L					
7	8	Driving sleeve	G	X	L					

N.B.: The seal plate and its fixing screws are not supplied with the mechanical seal.

MAX.WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed

p ≤ 12 bar; **t** = -35 ÷180°C **v** ≤ 15 m/s

For Type 7H **t** = -20 ÷150°C

The Roten mechanical seal type 7 is designed for external mounting. The spring and sleeve are not in contact with the pumped liquid (foods, chemicals, corrosives, etc.) and unlike some other external seals it can work against internal pressure.
These seals are avaiable in an extensive range of materials including all stainless steels, anticorrosion superalloys, alumina ceramic, hard facings, brazed or massive anticorrosion hard metal, solid silicon carbide, normal and special carbon, filled PTFE, etc.
"O" rings can be supplied in all types of rubber. We always advise the mounting of the seal plate for the conditions under which the seal is operating. It is ideal with high or pulsing counterpressure or with viscous or sticky fluids.

C.C. = Stationary seal ring with short tail
C.L. = Stationary seal ring with extended tail and slot

ROTEN

TYPE 7 7R 7H

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	d_f	d_g	l_S	l_U	N° SCR.	d_{MA}
10	14	18,1	22	27,5	22	5,5	2,8	1,2	2	6,2	3,5	16,5	18,1	1,5	0,5	3	3
11÷12	16,5	20,6	24	29,5	24	5,5	2,8	1,2	2	6,2	3,5	19	20,6	1,5	0,5	3	3
13	19	23,1	26	30	24	6	2,8	1,2	2	6,7	4	21	23,1	1,5	0,5	3	3
14	19	23,1	27	32	26	6	2,8	1,2	2	6,7	4	21	23,1	1,5	0,5	3	3
15	21	26,9	28	33	26	7	3,7	1,3	2,5	7,6	4	24	26,9	1,5	0,5	3	3
16÷17	21	26,9	31	34	27	7	3,7	1,3	2,5	7,6	4	24	26,9	1,5	0,5	3	3
18	25	30,9	33	36	28	8	3,7	1,3	3	8,5	4,5	28	30,9	2	0,5	3	4
19	25	30,9	36	38	30	8	3,7	1,3	3	8,5	4,5	28	30,9	2	0,5	3	4
20	25	30,9	37	39	31	8	3,7	1,3	3	8,5	4,5	28	30,9	2	0,5	3	4
21÷22	30	35,4	39	39	31	8	3,7	1,8	3,5	8,5	5	33	35,4	2	0,5	3	4
23	30	35,4	42	40	32	8	3,7	1,8	3,5	8,5	5	33	35,4	2	0,5	3	4
24	30	35,4	42	42	34	8	3,7	1,8	3,5	8,5	5	33	35,4	2	0,5	3	4
25÷27	33	38,2	43	43,5	35	8,5	3,7	1,8	4	9,1	5	36	38,2	2,5	0,5	4	4
28	38	43,3	47	46	37	9	3,7	1,8	4	9,6	6	41,8	43,3	3	0,5	4	4
29÷32	38	43,3	52	48	39	9	3,7	1,8	4	9,6	6	41,8	43,3	3	0,5	4	4
33÷37	45	53,5	56	55,5	44	11,5	5,4	2,1	5	12	7,5	49	53,5	3	0,5	6	4
38÷43	52	60,5	69	58,5	47	11,5	5,4	2,1	5	12	7,5	56	60,5	3	0,5	6	4
44÷48	57	65,5	74	62,5	51	11,5	5,4	2,1	5	13	8,5	61	65,5	3	0,5	6	4
50	64	72,5	77	65,5	54	11,5	5,4	2,1	5	13	8,5	68,5	72,5	3,5	1	6	5
55	64	72,5	83	68,5	57	11,5	5,4	2,1	5	13	8,5	68,5	72,5	3,5	1	6	5
60	72	79,3	89	68,5	57	11,5	5,4	2,1	5	13,5	8,5	76	79,3	3,5	1	6	5
65	77	84,5	97	71,5	60	11,5	5,4	2,1	5	13,5	8,5	80,5	84,5	3,5	1	6	5
70	82	89,5	104	71,5	60	11,5	5,4	2,1	5	13,5	8,5	86,5	89,5	4	1,5	6	5
75	87	94,5	100	91,5	80	11,5	5,4	2,1	5	13,5	8,5	91,5	94,5	4	1,5	6	5
80	92	99,5	106	96,5	85	11,5	5,4	2,1	5	13,5	8,5	96,5	99,5	4	1,5	6	5
85	98	105,5	115	101,5	88	13,5	5,4	2,6	5	13,5	8,5	101,5	105,5	5	1,5	6	6
90	105	111,5	118	106,5	93	13,5	5,4	2,6	5	13,5	8,5	106,5	111,5	5	1,5	6	6
95	110	116,5	128	110,5	97	13,5	5,4	2,6	5	13,5	8,5	111,5	116,5	5	1,5	6	6
100	114	119,5	137	121,5	108	13,5	5,4	2,6	5	13,5	8,5	116,5	119,5	5	1,5	6	6
110	124	132,2	152	130,5	113	17,5	7,1	3,9	5	13,5	8,5	128	132,2	6	1,5	8	6
120	134	142,2	165	137,5	120	17,5	7,1	3,9	5	13,5	8,5	138	142,2	6	1,5	8	6
130	145	153,2	176	142,5	125	17,5	7,1	3,9	5	13,5	8,5	149	153,2	6	1,5	8	6
135	152	161,2	183	155,5	137	18,5	7,1	3,9	5	13,5	8,5	155	161,2	7	2	8	6
140	157	164,3	188	165,5	147	18,5	7,1	3,9	5	13,5	8,5	160	164,3	7	2	10	6
150	167	174,2	200	165,5	147	18,5	7,1	3,9	5	13,5	8,5	170	174,2	7	2	10	6

UNITEN

EN 12756 — ISO 3069

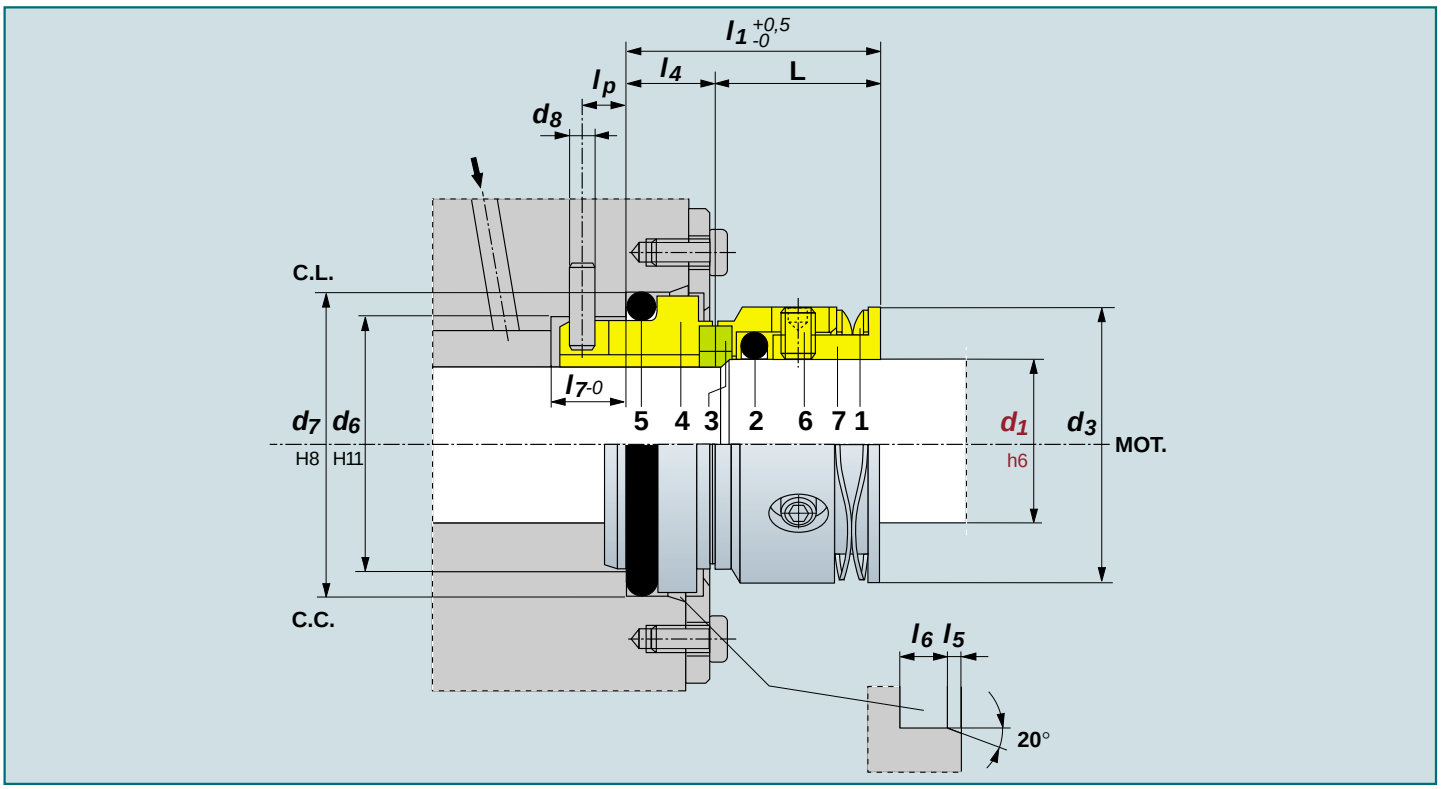
TYPE 7 7R 7H

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	d_f	d_g	l_S	l_U	N° SCR.	d_{MA}
10	17	21	22	29	22	7	4	1,5	3	8,5	18	21	1,2	0,6	3	3
12	19	23	24	31	24	7	4	1,5	3	8,5	20	23	1,2	0,6	3	3
14	21	25	27	33	26	7	4	1,5	3	8,5	22	25	1,2	0,6	3	3
16	23	27	31	34	27	7	4	1,5	3	8,5	23	27	1,2	0,6	3	4
18	27	33	33	38	28	10	5	2	3	9	29	33	2,5	0,6	3	4
20	29	35	37	41	31	10	5	2	3	9	31	35	2,5	0,6	4	4
22	31	37	39	41	31	10	5	2	3	9	33	37	2,5	0,6	4	4
24	33	39	42	44	34	10	5	2	3	9	35	39	2,5	0,6	4	4
25	34	40	43	45	35	10	5	2	3	9	36	40	2,5	0,6	6	4
28	37	43	47	47	37	10	5	2	3	9	39	43	2,5	0,6	6	4
30	39	45	50	49	39	10	5	2	3	9	41	45	2,5	0,6	6	4
32	42	48	52	49	39	10	5	2	3	9	44	48	2,5	0,6	6	5
33	42	48	54	54	44	10	5	2	3	9	44	48	2,5	0,6	6	5
35	44	50	56	54	44	10	5	2	3	9	46	50	2,5	0,6	6	5
38	49	56	62	60	47	13	6	2	4	9	52	56	4,2	0,6	6	5
40	51	58	64	60	47	13	6	2	4	9	54	58	4,2	0,6	6	5
43	54	61	69	60	47	13	6	2	4	9	57	61	4,2	0,6	6	5
45	56	63	71	64	51	13	6	2	4	9	59	63	4,2	0,6	6	6
48	59	66	74	64	51	13	6	2	4	9	62	66	4,8	0,6	6	6
50	62	70	77	68	54	14	6	2,5	4	9	66	70	4,8	0,7	6	6
53	65	73	83	71	57	14	6	2,5	4	9	69	73	4,8	0,7	6	6
55	67	75	83	71	57	14	6	2,5	4	9	71	75	4,8	0,7	8	6
58	70	78	89	71	57	14	6	2,5	4	9	74	78	4,8	0,7	8	6
60	72	80	89	71	57	14	6	2,5	4	9	76	80	4,8	0,7	8	6
63	75	83	97	74	60	14	6	2,5	4	9	79	83	4,8	0,7	8	6
65	77	85	97	74	60	14	6	2,5	4	9	81	85	4,8	0,7	10	6
68	81	90	104	76	60	16	7	2,5	4	9	86	90	5,5	0,7	10	6
70	83	92	104	76	60	16	7	2,5	4	9	88	92	5,5	0,7	10	6
75	88	97	100	96	80	16	7	2,5	4	9	93	97	5,5	0,7	10	6
80	95	105	106	103	85	18	7	3	4	9	101	105	7	0,8	10	6
85	100	110	115	106	88	18	7	3	4	9	106	110	7	0,8	10	6
90	105	115	118	111	93	18	7	3	4	9	111	115	7	0,8	10	6
95	110	120	128	115	97	18	7	3	4	9	116	120	7	0,8	10	6
100	115	125	137	126	108	18	7	3	4	9	121	125	7	0,8	10	6

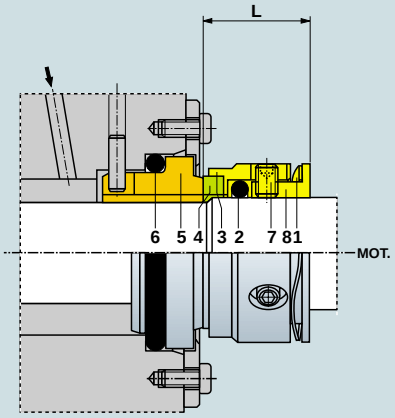
Dimension l_p = 5 for all d_1

d_3 = depends on the material of which the rotary ring is built (for the UNITEN series lp=5). The indicated value is the maximum for this quote.

TYPE 7K

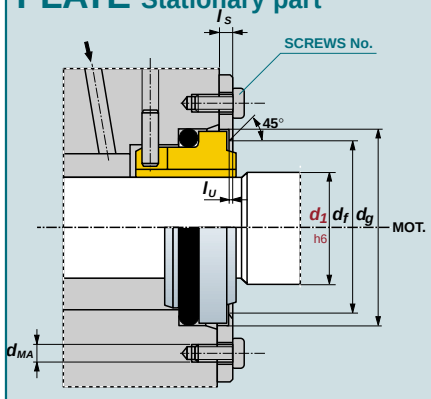


TYPE 7KH with shrunk-in seal ring



The 7K mechanical seal is BIDIRECTIONAL and is characterized by a short axial length. It allows both internal and external mounting, even against pressure just like TYPE 7. It is manufactured in all steels, special alloys, hard facings and hard metals,solid silicon carbide. We always advise the mounting details of the seal plate for the conditions under which the seal is operating. It is ideal with high or pulsing counterpressure or with viscous or sticky fluids.

STATIONARY RETAINING PLATE Stationary part



POS. TYPE 7K	POS. TYPE 7KH	COMPONENTS	STANDARD MATERIALS							
1	1	Self-driving spring	X							
2	2	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
	3	Frame	X	D						
3	4*	Rotary seal ring	X	J	3	L	K*	R*	Z*	
4	5	Stationary seal ring	V	Z	1	3	4	K	R	
5	6	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
6	7	Grub screws	H	X						
7	8	Driving sleeve	X							

C.C. = Stationary seal ring with short tail.

C.L. = Stationary seal ring with extended tail and slot.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	12 bar
t =	-35 ÷ 180°C
v ≤	15 m/s

For Type 7KH

t =	-20 ÷ 150°C

*** SHRUNK FIT**

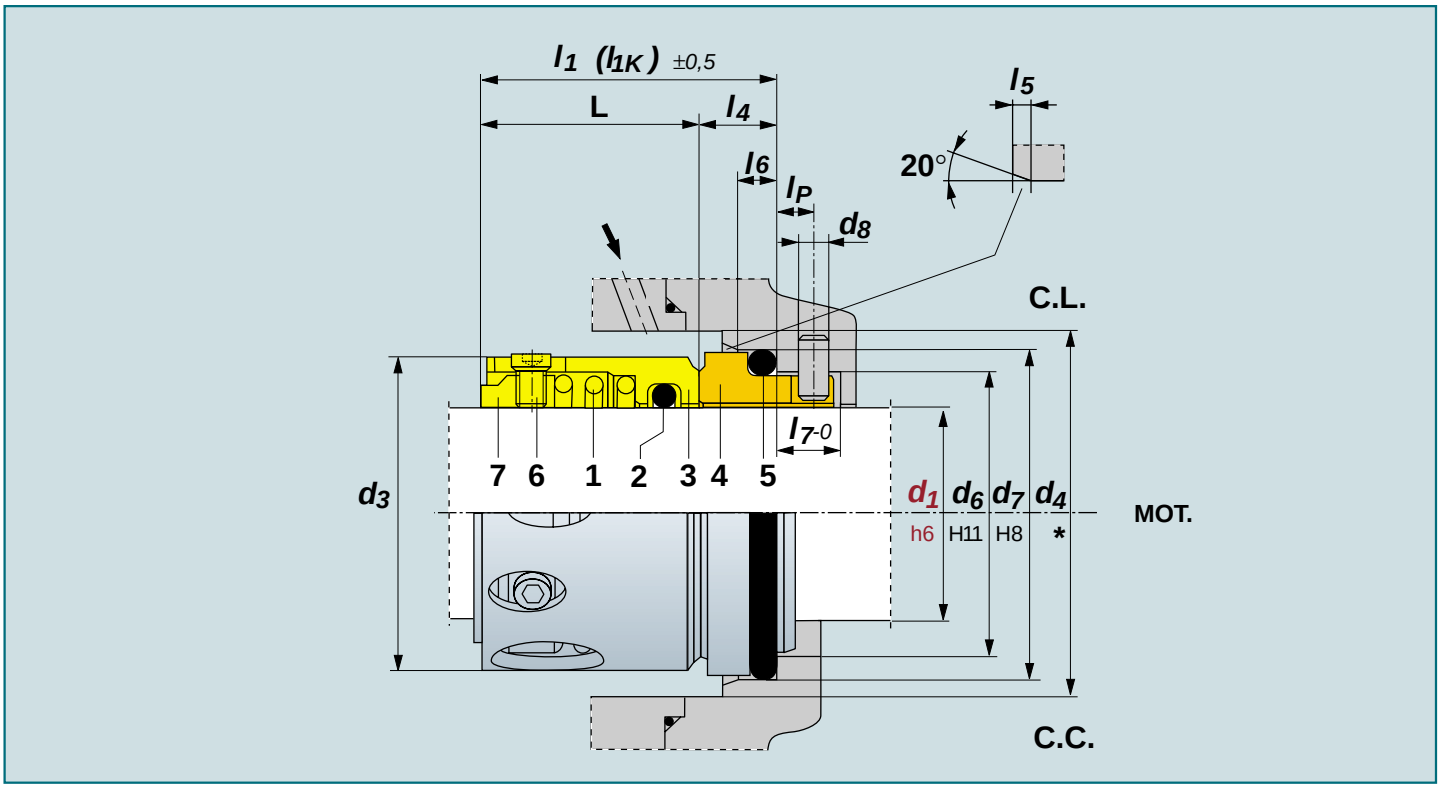
N.B.: The seal plate and its fixing screws are not supplied with the seal.

ROTEN																	UNITEN														
TYPE 7K 7KH																	TYPE 7K 7KH														
d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	d_f	d_g	l_S	l_U	N° SCR.	d_{MA}	d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	d_f	d_g	l_S	l_U	N° SCR.	d_{MA}
10	14	18,1	21	23,5	18	5,5	2,8	1,2	2	6,2	3,5	16,5	18,1	1,5	0,5	3	3	10	17	21	21	25	18	7	4	1,5	3	8,5	18	21	1,2	0,6	3	3
11÷12	16,5	20,6	23	23,5	18	5,5	2,8	1,2	2	6,2	3,5	19	20,6	1,5	0,5	3	3	12	19	23	23	25	18	7	4	1,5	3	8,5	20	23	1,2	0,6	3	3
13	19	23,1	25	24	18	6	2,8	1,2	2	6,7	4	21	23,1	1,5	0,5	3	3	14	21	25	25	25	18	7	4	1,5	3	8,5	22	25	1,2	0,6	3	3
14	19	23,1	25	24	18	6	2,8	1,2	2	6,7	4	21	23,1	1,5	0,5	3	3	16	23	27	26	26,1	19,1	7	4	1,5	3	8,5	23	27	1,2	0,6	3	4
15	21	26,9	26	26,1	19,1	7	3,7	1,3	2,5	7,6	4	24	26,9	1,5	0,5	3	3	18	27	33	29	29,1	19,1	10	5	2	3	9	29	33	2,5	0,6	3	4
16÷17	21	26,9	29	26,1	19,1	7	3,7	1,3	2,5	7,6	4	24	26,9	1,5	0,5	3	3	20	29	35	32	29,1	19,1	10	5	2	3	9	31	35	2,5	0,6	4	4
18	25	30,9	29	27,1	19,1	8	3,7	1,3	3	8,5	4,5	28	30,9	2	0,5	3	4	22	31	37	35	29,1	19,1	10	5	2	3	9	33	37	2,5	0,6	4	4
19	25	30,9	32	27,1	19,1	8	3,7	1,3	3	8,5	4,5	28	30,9	2	0,5	3	4	24	33	39	37	29,1	19,1	10	5	2	3	9	35	39	2,5	0,6	4	4
20	25	30,9	32	27,1	19,1	8	3,7	1,3	3	8,5	4,5	28	30,9	2	0,5	3	4	25	34	40	37	29,1	19,1	10	5	2	3	9	36	40	2,5	0,6	6	4
21÷22	30	35,4	35	27,1	19,1	8	3,7	1,8	3,5	8,5	5	33	35,4	2	0,5	3	4	28	37	43	41	29,1	19,1	10	5	2	3	9	39	43	2,5	0,6	6	4
23	30	35,4	37	27,1	19,1	8	3,7	1,8	3,5	8,5	5	33	35,4	2	0,5	3	4	30	39	45	43	29,1	19,1	10	5	2	3	9	41	45	2,5	0,6	6	4
24	30	35,4	37	27,1	19,1	8	3,7	1,8	3,5	8,5	5	33	35,4	2	0,5	3	4	32	42	48	47	29,1	19,1	10	5	2	3	9	44	48	2,5	0,6	6	5
25÷27	33	38,2	41	27,6	19,1	8,5	3,7	1,8	4	9,1	5	36	38,2	2,5	0,5	4	4	33	42	48	48	29,1	19,1	10	5	2	3	9	44	48	2,5	0,6	6	5
28	38	43,3	41	28,1	19,1	9	3,7	1,8	4	9,6	6	41,8	43,3	3	0,5	4	4	35	44	50	49	29,1	19,1	10	5	2	3	9	46	50	2,5	0,6	6	5
29÷32	38	43,3	47	28,1	19,1	9	3,7	1,8	4	9,6	6	41,8	43,3	3	0,5	4	4	38	49	56	53	34,1	21,1	13	6	2	4	9	52	56	4,2	0,6	6	5
33	45	53,5	48	30,6	19,1	11,5	5,4	2,1	5	12	7,5	49	53,5	3	0,5	6	4	40	51	58	55	34,1	21,1	13	6	2	4	9	54	58	4,2	0,6	6	5
35	45	53,5	49	30,6	19,1	11,5	5,4	2,1	5	12	7,5	49	53,5	3	0,5	6	4	43	54	61	60	34,1	21,1	13	6	2	4	9	57	61	4,2	0,6	6	5
38	52	60,5	53	32,6	21,1	11,5	5,4	2,1	5	12	7,5	56	60,5	3	0,5	6	4	45	56	63	60	34,1	21,1	13	6	2	4	9	59	63	4,2	0,6	6	6
40	52	60,5	55	32,6	21,1	11,5	5,4	2,1	5	12	7,5	56	60,5	3	0,5	6	4	48	59	66	65	34,1	21,1	13	6	2	4	9	62	66	4,8	0,6	6	6
43	52	60,5	60	32,6	21,1	11,5	5,4	2,1	5	12	7,5	56	60,5	3	0,5	6	4	50	62	70	65	35,1	21,1	14	6	2,5	4	9	66	70	4,8	0,7	6	6
44	57	65,5	60	32,6	21,1	11,5	5,4	2,1	5	13	8,5	61	65,5	3	0,5	6	4	53	65	73	74	36,1	22,1	14	6	2,5	4	9	69	73	4,8	0,7	6	6
45	57	65,5	60	32,6	21,1	11,5	5,4	2,1	5	13	8,5	61	65,5	3	0,5	6	4	55	67	75	74	36,1	22,1	14	6	2,5	4	9	71	75	4,8	0,7	8	6
48	57	65,5	65	32,6	21,1	11,5	5,4	2,1	5	13	8,5	61	65,5	3	0,5	6	4	58	70	78	79	39,8	25,8	14	6	2,5	4	9	74	78	4,8	0,7	8	6
50	64	72,5	65	32,6	21,1	11,5	5,4	2,1	5	13	8,5	68,5	72,5	3,5	1	6	5	60	72	80	79	39,8	25,8	14	6	2,5	4	9	76	80	4,8	0,7	8	6
55	64	72,5	74	33,6	22,1	11,5	5,4	2,1	5	13	8,5	68,5	72,5	3,5	1	6	5	63	75	83	87	39,8	25,8	14	6	2,5	4	9	79	83	4,8	0,7	8	6
60	72	79,3	79	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5	76	79,3	3,5	1	6	5	65	77	85	87	39,8	25,8	14	6	2,5	4	9	81	85	4,8	0,7	10	6
65	77	84,5	87	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5	80,5	84,5	3,5	1	6	5	68	81	90	93	41,8	25,8	16	7	2,5	4	9	86	90	5,5	0,7	10	6
70	82	89,5	93	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5	86,5	89,5	4	1,5	6	5	70	83	92	93	41,8	25,8	16	7	2,5	4	9	88	92	5,5	0,7	10	6
75	87	94,5	98	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5	91,5	94,5	4	1,5	6	5	75	88	97	98	41,8	25,8	16	7	2,5	4	9	93	97	5,5	0,7	10	6
80	92	99,5	104	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5	96,5	99,5	4	1,5	6	5	80	95	105	104	43,8	25,8	18	7	3	4	9	101	105	7	0,8	10	6
85	98	105,5	108	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5	101,5	105,5	5	1,5	6	6	85	100	110	108	43,8	25,8	18	7	3	4	9	106	110	7	0,8	10	6
90	105	111,5	113	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5	106,5	111,5	5	1,5	6	6	90	105	115	113	43,8	25,8	18	7	3	4	9	111	115	7	0,8	10	6
95	110	116,5	118	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5	111,5	116,5	5	1,5	6	6	95	110	120	118	43,8	25,8	18	7	3	4	9	116	120	7	0,8	10	6
100	114	119,5	123	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5	116,5	119,5	5	1,5	6	6	100	115	125	123	43,8	25,8	18	7	3	4	9	121	125	7	0,8	10	6

EN 12756 — ISO 3069

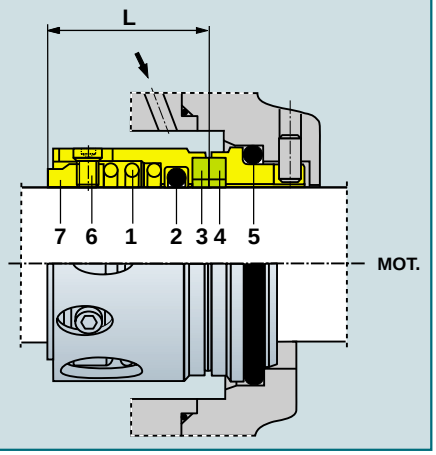
Dimension l_p = 5 for all d_1

TYPE 82



TYPE 82

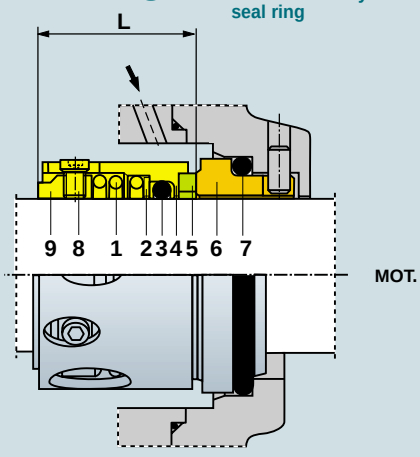
with hard shrunk-in seal faces



The ROTEN TYPE 82 is a BIDIRECTIONAL seal and is therefore unaffected by the direction of shaft rotation. The drive is positively made by the screws (item 6 for TYPE 82 and item 8 for TYPE 82H), which lock onto the shaft; the spring only has the function of holding the seal faces in contact. The materials employed and the applications are similar to those of ROTEN TYPE 2; the seal has a limited axial length and compact shape for fitting well into confined spaces.

TYPE 82H

with open cave and shrunk-in rotary seal ring



POS. TYPE 82 82K	POS. TYPE 82H 82KH	COMPONENTS	STANDARD MATERIALS							
1	1	Spring	E	X	L					
	2	Washer	G	H	X					
2	3	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
	4	Frame	X	D						
3	5*	Rotary seal ring	G	X	J	3	L	K*	R*	Z*
4	6	Stationary seal ring	V	Z	1	3	4	K	R	
5	7	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
6	8	Grub screws	H	X	L					
7	9	Drive ring	X	L						

C.C. = Stationary seal ring with short tail.

C.L. = Stationary seal ring with extended tail and slot.

82K = UNITEN 82 model with working length according to DIN norm K.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	12 bar
t =	-35 ÷ 180°C
v ≤	15 m/s

For Type 82H

t =	-20 ÷ 150°C

*** SHRUNK-IN FIT.**

ROTEN

TYPE 82 82H

d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
10	14	18,1	21	24	20,5	15	5,5	2,8	1,2	2	6,2	3,5
11	16,5	20,6	21	24	23,5	18	5,5	2,8	1,2	2	6,2	3,5
12	16,5	20,6	22	24	23,5	18	5,5	2,8	1,2	2	6,2	3,5
14	19	23,1	24	27	28	22	6	2,8	1,2	2	6,7	4
16	21	26,9	26	31	30	23	7	3,7	1,3	2,5	7,6	4
18	25	30,9	29	35	32	24	8	3,7	1,3	3	8,5	4,5
19	25	30,9	30	36	33	25	8	3,7	1,3	3	8,5	4,5
20	25	30,9	30	36	33	25	8	3,7	1,3	3	8,5	4,5
22	30	35,4	34	40	33	25	8	3,7	1,8	3,5	8,5	5
24	30	35,4	35	41	35	27	8	3,7	1,8	3,5	8,5	5
25	33	38,2	37	43	35,5	27	8,5	3,7	1,8	4	9,1	5
28	38	43,3	42	47	38	29	9	3,7	1,8	4	9,6	6
29	38	43,3	42	47	38	29	9	3,7	1,8	4	9,6	6
30	38	43,3	45	50	38	29	9	3,7	1,8	4	9,6	6
32	38	43,3	45	50	38	29	9	3,7	1,8	4	9,6	6
33	45	53,5	48	55	44,5	33	11,5	5,4	2,1	5	12	7,5
35	45	53,5	50	57	46,5	35	11,5	5,4	2,1	5	12	7,5
38	52	60,5	54	62	46,5	35	11,5	5,4	2,1	5	12	7,5
40	52	60,5	56	64	46,5	35	11,5	5,4	2,1	5	12	7,5
42	52	60,5	59	67	46,5	35	11,5	5,4	2,1	5	12	7,5
43	52	60,5	60	68	46,5	35	11,5	5,4	2,1	5	12	7,5
44	57	65,5	60	68	48,5	37	11,5	5,4	2,1	5	13	8,5
45	57	65,5	64	72	48,5	37	11,5	5,4	2,1	5	13	8,5
48	57	65,5	67	72	48,5	37	11,5	5,4	2,1	5	13	8,5
50	64	72,5	69	75	50,5	39	11,5	5,4	2,1	5	13	8,5
55	64	72,5	74	80	50,5	39	11,5	5,4	2,1	5	13	8,5
60	72	79,3	80	87	51,5	40	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	87	92	52,5	41	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	92	97	52,5	41	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	97	102	55,5	44	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	102	107	59,5	48	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	110	113	61,5	48	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	117	120	61,5	48	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	122	130	66,5	53	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	127	136	69,5	56	13,5	5,4	2,6	5	13,5	8,5
110	124	132,2	143	150	81,5	64	17,5	7,1	3,9	5	13,5	8,5
120	134	142,2	155	160	97,5	80	17,5	7,1	3,9	5	13,5	8,5
130	145	153,2	166	172	97,5	80	17,5	7,1	3,9	5	13,5	8,5

UNITEN

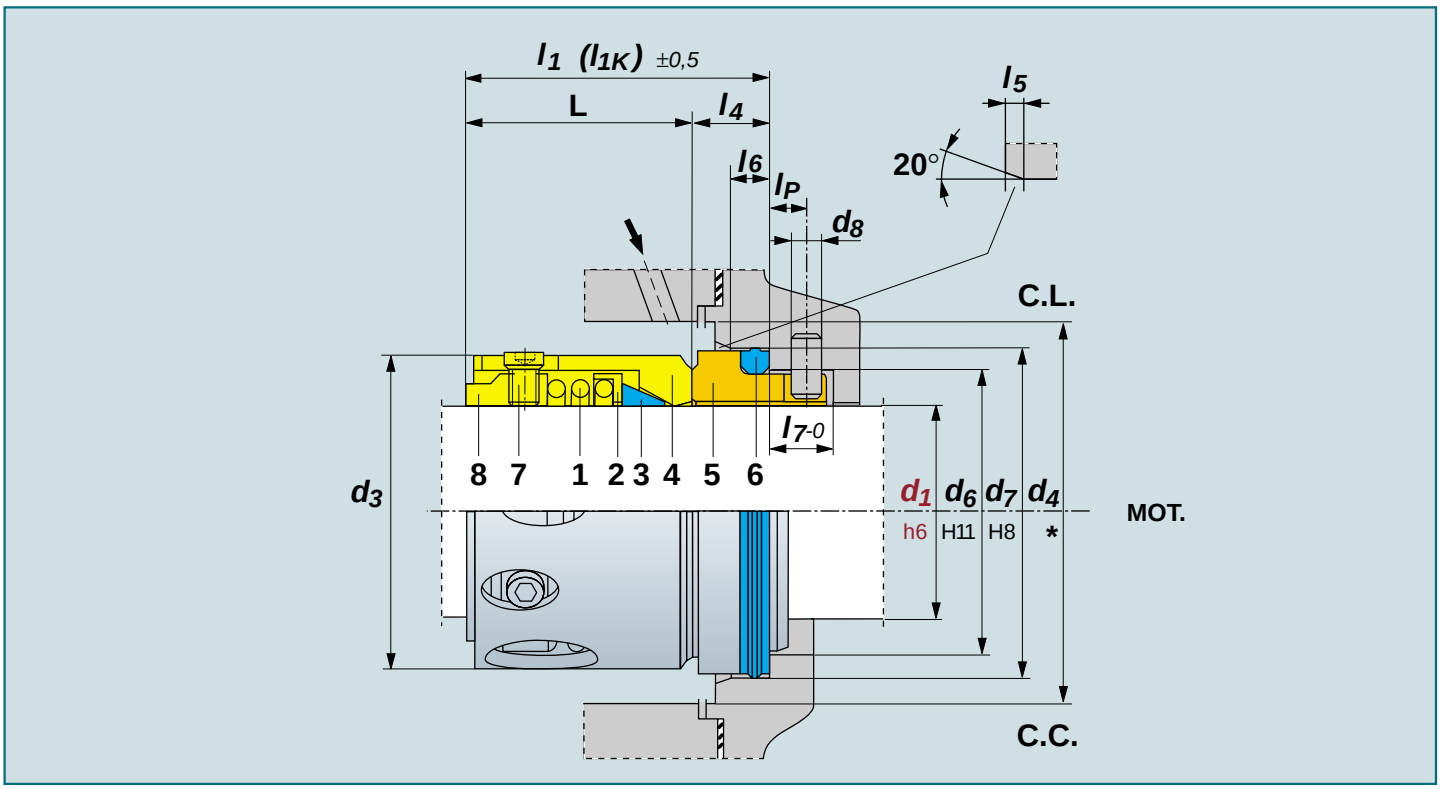
EN 12756 — ISO 3069

TYPE 82 82H — 82K 82KH

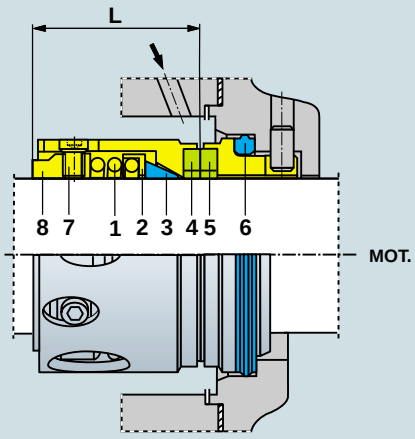
d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_{1k}	L
10	17	21	21	22	22	15	7	4	1,5	3	8,5	5	32,5	25,5
12	19	23	22	24	25	18	7	4	1,5	3	8,5	5	32,5	25,5
14	21	25	24	26	29	22	7	4	1,5	3	8,5	5	35	28
16	23	27	26	28	30	23	7	4	1,5	3	8,5	5	35	28
18	27	33	29	34	34	24	10	5	2	3	9	5	37,5	27,5
20	29	35	30	36	35	25	10	5	2	3	9	5	37,5	27,5
22	31	37	34	38	35	25	10	5	2	3	9	5	37,5	27,5
24	33	39	35	40	37	27	10	5	2	3	9	5	40	30
25	34	40	37	41	37	27	10	5	2	3	9	5	40	30
28	37	43	42	44	39	29	10	5	2	3	9	5	42,5	32,5
30	39	45	45	46	39	29	10	5	2	3	9	5	42,5	32,5
32	42	48	45	48	39	29	10	5	2	3	9	5	42,5	32,5
33	42	48	48	49	43	33	10	5	2	3	9	5	42,5	32,5
35	44	50	50	51	45	35	10	5	2	3	9	5	42,5	32,5
38	49	56	54	58	48	35	13	6	2	4	9	5	45	32
40	51	58	56	60	48	35	13	6	2	4	9	5	45	32
43	54	61	60	63	48	35	13	6	2	4	9	5	45	32
45	56	63	64	65	50	37	13	6	2	4	9	5	45	32
48	59	66	67	68	50	37	13	6	2	4	9	5	45	32
50	62	70	69	70	53	39	14	6	2,5	4	9	5	47,5	33,5
53	65	73	74	73	53	39	14	6	2,5	4	9	5	47,5	33,5
55	67	75	74	75	53	39	14	6	2,5	4	9	5	47,5	33,5
58	70	78	80	83	54	40	14	6	2,5	4	9	5	52,5	38,5
60	72	80	80	85	54	40	14	6	2,5	4	9	5	52,5	38,5
63	75	83	87	88	55	41	14	6	2,5	4	9	5	52,5	38,5
65	77	85	87	90	55	41	14	6	2,5	4	9	5	52,5	38,5
68	81	90	92	93	57	41	16	7	2,5	4	9	5	52,5	36,5
70	83	92	92	95	57	41	16	7	2,5	4	9	5	60	44
75	88	97	97	104	60	44	16	7	2,5	4	9	5	60	44
80	95	105	102	109	66	48	18	7	3	4	9	5	60	42
85	100	110	110	114	66	48	18	7	3	4	9	5	60	42
90	105	115	117	119	66	48	18	7	3	4	9	5	65	47
95	110	120	122	124	71	53	18	7	3	4	9	5	65	47
100	115	125	127	129	74	56	18	7	3	4	9	5	65	47

*The size d_4 is considered the minimum dimension for the stuffing box diameter. When possible, it is better to have a larger dimension or a conical stuffing box.

TYPE 84

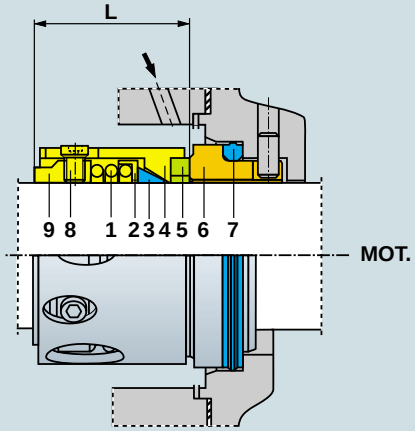


TYPE 84 with hard metal brazed faces



This seal is BIDIRECTIONAL as type 82, but with PTFE gaskets. Applications and materials are similar to those of the seal TYPE 4. It presents a particularly reduced axial length, has a compact shape and allows easy mounting.

TYPE 84H with shrunk-in seal ring



POS. 84 84K	POS. TYPE 84H 84KH	COMPONENTS	STANDARD MATERIALS							
1	1	Spring	X	L						
2	2	Gasket thrust washer	X	L						
3	3	Wedge gasket (PTFE)	5	4**	0**					
	4	Frame	X	D						
4	5*	Rotary seal ring	X	J	3	L	K*	R*	Z*	
5	6	Stationary seal ring	V	Z	1	3	4	K	R	
6	7	Stationary gasket (PTFE)	5	F	4**	0**				
7	8	Grub screws	H	X	L					
8	9	Drive ring	X							

C.C. = Stationary seal ring with short tail.

C.L. = Stationary seal ring with extended tail and slot.

84K = UNITEN 84 model with working length according to DIN norm K.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	12 bar
t =	10 ÷ 180°C
v ≤	15 m/s

For Type 84H

t =	-20 ÷ 150°C

*** MATERIALS FOR SHRUNK FIT**

**** For particular operating conditions, the wedge and stationary gasket may be supplied with the codes 0 or 4.**

ROTEN

TYPE 84 84H

d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
16	21	26,9	26	31	30	23	7	3,7	1,3	2,5	7,6	4
18	25	30,9	29	35	32	24	8	3,7	1,3	3	8,5	4,5
19	25	30,9	30	36	33	25	8	3,7	1,3	3	8,5	4,5
20	25	30,9	30	36	33	25	8	3,7	1,3	3	8,5	4,5
22	30	35,4	34	40	33	25	8	3,7	1,8	3,5	8,5	5
24	30	35,4	35	41	35	27	8	3,7	1,8	3,5	8,5	5
25	33	38,2	37	43	35,5	27	8,5	3,7	1,8	4	9,1	5
28	38	43,3	42	47	38	29	9	3,7	1,8	4	9,6	6
29	38	43,3	42	47	38	29	9	3,7	1,8	4	9,6	6
30	38	43,3	45	50	38	29	9	3,7	1,8	4	9,6	6
32	38	43,3	45	50	38	29	9	3,7	1,8	4	9,6	6
33	45	53,5	48	55	44,5	33	11,5	5,4	2,1	5	12	7,5
35	45	53,5	50	57	46,5	35	11,5	5,4	2,1	5	12	7,5
38	52	60,5	54	62	46,5	35	11,5	5,4	2,1	5	12	7,5
40	52	60,5	56	64	46,5	35	11,5	5,4	2,1	5	12	7,5
42	52	60,5	59	67	46,5	35	11,5	5,4	2,1	5	12	7,5
43	52	60,5	60	68	46,5	35	11,5	5,4	2,1	5	12	7,5
44	57	65,5	60	68	48,5	37	11,5	5,4	2,1	5	13	8,5
45	57	65,5	64	72	48,5	37	11,5	5,4	2,1	5	13	8,5
48	57	65,5	67	72	48,5	37	11,5	5,4	2,1	5	13	8,5
50	64	72,5	69	75	50,5	39	11,5	5,4	2,1	5	13	8,5
55	64	72,5	74	80	50,5	39	11,5	5,4	2,1	5	13	8,5
60	72	79,3	80	87	51,5	40	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	87	92	52,5	41	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	92	97	52,5	41	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	97	102	55,5	44	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	102	107	59,5	48	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	110	113	61,5	48	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	117	120	61,5	48	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	122	130	66,5	53	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	127	136	69,5	56	13,5	5,4	2,6	5	13,5	8,5
110	124	132,2	143	150	81,5	64	17,5	7,1	3,9	5	13,5	8,5
120	134	142,2	155	160	97,5	80	17,5	7,1	3,9	5	13,5	8,5
130	145	153,2	166	172	97,5	80	17,5	7,1	3,9	5	13,5	8,5

UNITEN

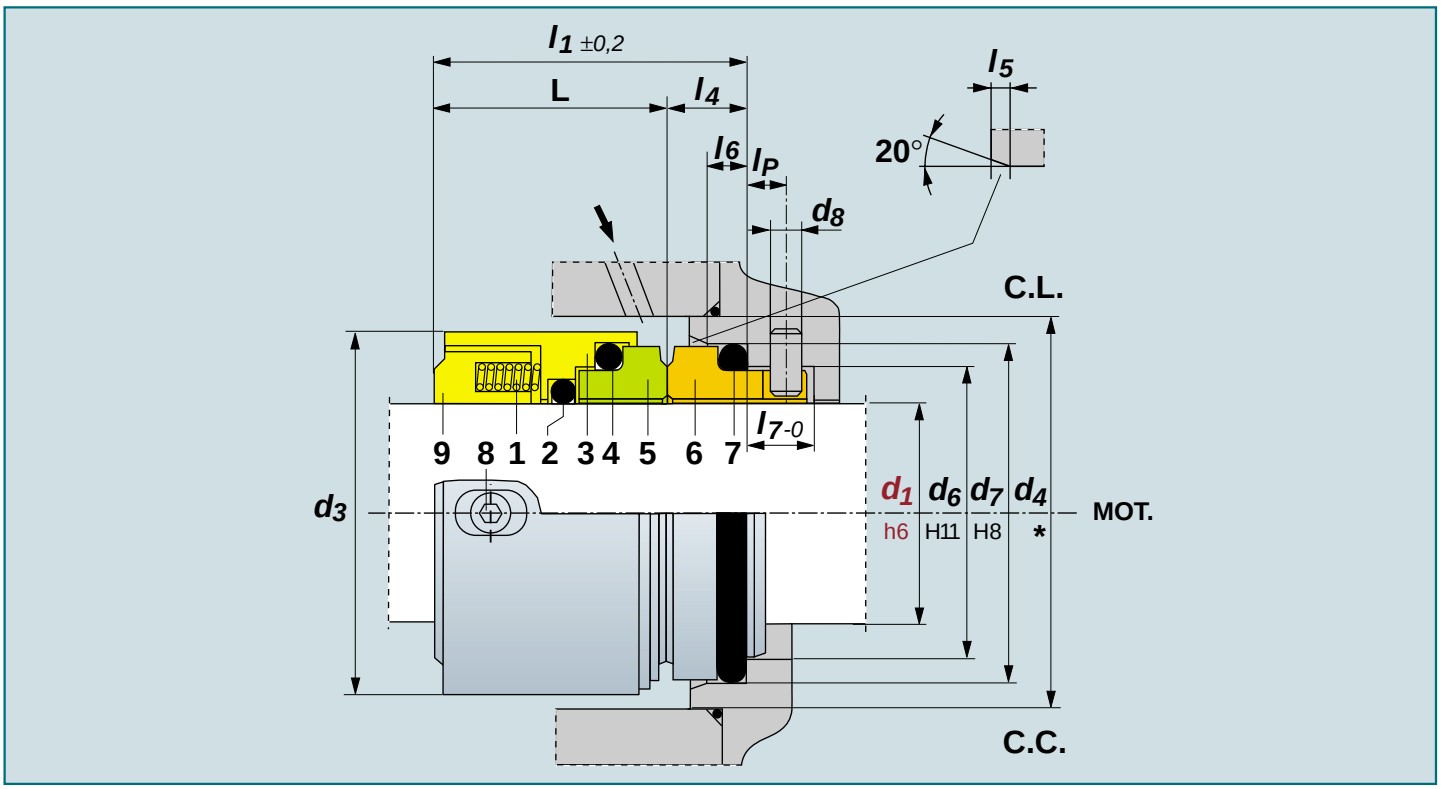
EN 12756 — ISO 3069

TYPE 84 84H — 84K 84KH

d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_{1k}	L
16	23	27	26	28	30	23	7	4	1,5	3	8,5	5	35	28
18	27	33	29	34	34	24	10	5	2	3	9	5	37,5	27,5
20	29	35	30	36	35	25	10	5	2	3	9	5	37,5	27,5
22	31	37	34	38	35	25	10	5	2	3	9	5	37,5	27,5
24	33	39	35	40	37	27	10	5	2	3	9	5	40	30
25	34	40	37	41	37	27	10	5	2	3	9	5	40	30
28	37	43	42	44	39	29	10	5	2	3	9	5	42,5	32,5
30	39	45	45	46	39	29	10	5	2	3	9	5	42,5	32,5
32	42	48	45	48	39	29	10	5	2	3	9	5	42,5	32,5
33	42	48	48	49	43	33	10	5	2	3	9	5	42,5	32,5
35	44	50	50	51	45	35	10	5	2	3	9	5	42,5	32,5
38	49	56	54	58	48	35	13	6	2	4	9	5	45	32
40	51	58	56	60	48	35	13	6	2	4	9	5	45	32
43	54	61	60	63	48	35	13	6	2	4	9	5	45	32
45	56	63	64	65	50	37	13	6	2	4	9	5	45	32
48	59	66	67	68	50	37	13	6	2	4	9	5	45	32
50	62	70	69	70	53	39	14	6	2,5	4	9	5	47,5	33,5
53	65	73	74	73	53	39	14	6	2,5	4	9	5	47,5	33,5
55	67	75	74	75	53	39	14	6	2,5	4	9	5	47,5	33,5
58	70	78	80	83	54	40	14	6	2,5	4	9	5	52,5	38,5
60	72	80	80	85	54	40	14	6	2,5	4	9	5	52,5	38,5
63	75	83	87	88	55	41	14	6	2,5	4	9	5	52,5	38,5
65	77	85	87	90	55	41	14	6	2,5	4	9	5	52,5	38,5
68	81	90	92	93	57	41	16	7	2,5	4	9	5	52,5	36,5
70	83	92	92	95	57	41	16	7	2,5	4	9	5	60	44
75	88	97	97	104	60	44	16	7	2,5	4	9	5	60	44
80	95	105	102	109	66	48	18	7	3	4	9	5	–	–
85	100	110	110	114	66	48	18	7	3	4	9	5	–	–
90	105	115	117	119	66	48	18	7	3	4	9	5	–	–
95	110	120	122	124	71	53	18	7	3	4	9	5	–	–
100	115	125	127	129	74	56	18	7	3	4	9	5	–	–

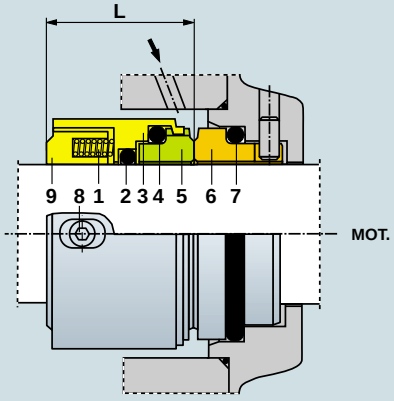
*The size d_4 is considered the minimum dimension for the stuffing box diameter. When possible, it is better to have a larger dimension or a conical stuffing box.

TYPE 85



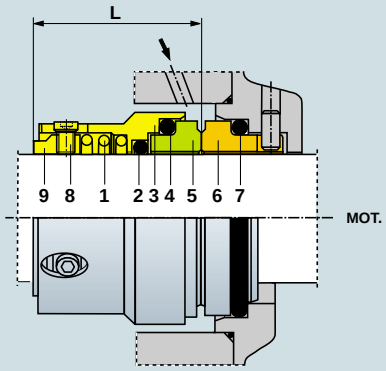
TYPE 85TRCL

with positive drive rotary ring and stationary ring with extended tail and slot.



TYPE 85M

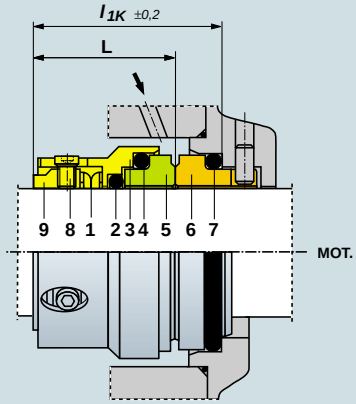
with cylindrical spring. Also available TRCL



Also available as TRCL

TYPE 85N

with sinusoidal wave spring. Also available TRCL



Also available as TRCL

POS. TYPE 85 85M 85K	COMPONENTS	STANDARD MATERIALS							
1	Spring	X	L						
2	Wedge shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
3	Frame	X	L						
4	Rotary gasket (O-Ring)	6	7	8	Y	F	W	B	
5	Rotary seal ring	2	R	K					
6	Stationary seal ring	V	Z	R	K	4	0	1	
7	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
8	Grub screws	H	X	L					
9	Drive ring	X	L						

This mechanical seal combines the advantage of interchangeable seal faces as in ROTEN 5 with bidirectional rotation, compactness and minimal axial length. The large range of materials is similar to that of TYPE 5.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	16 bar
t =	-45 ÷ 200°C
v ≤	15 m/s

C.C. = Stationary seal ring with short tail.
C.L. = Stationary seal ring with extended tail and slot.

ROTEN

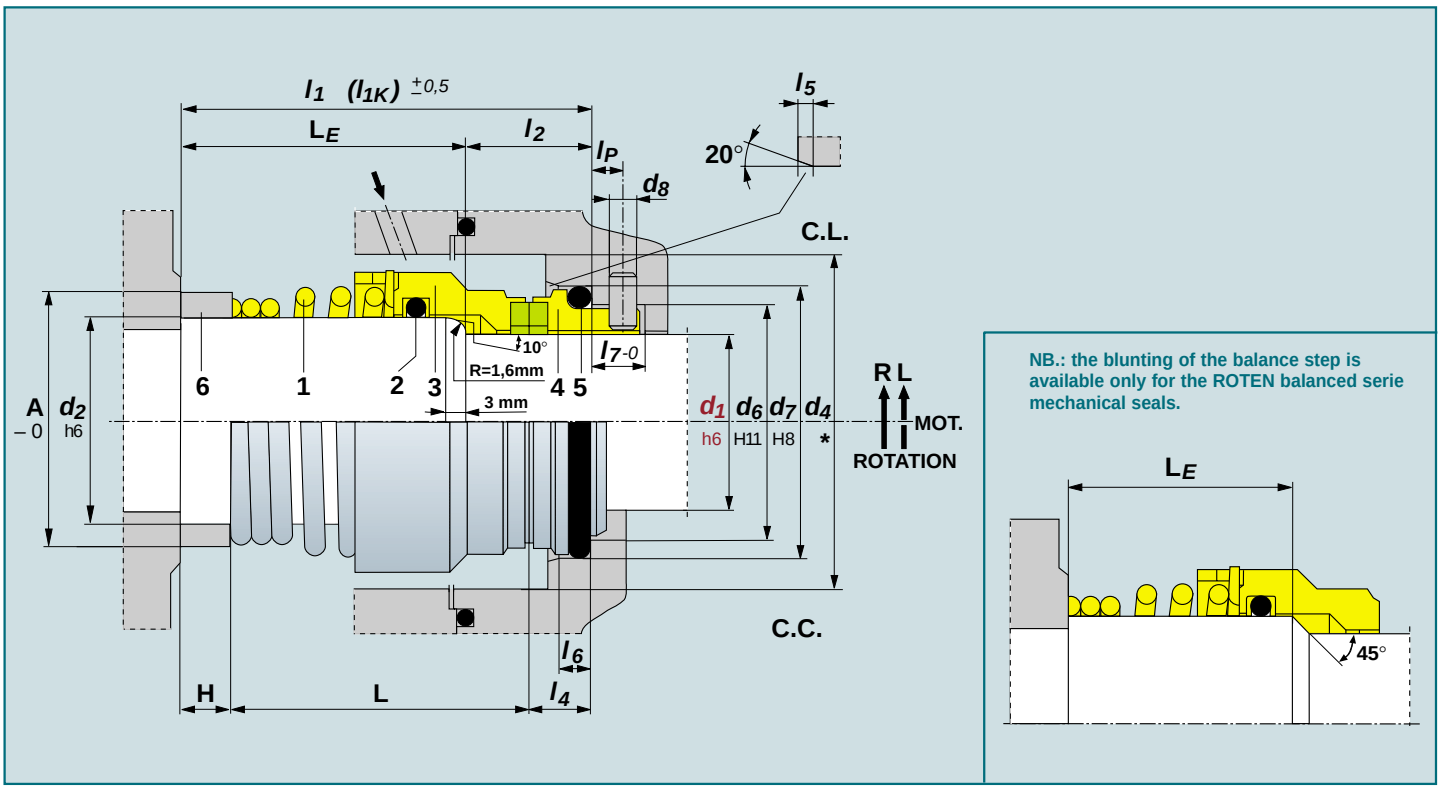
TYPE 85 85TRCL													85M	
d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_1	L
12	16,5	20,6	22,5	24	23,5	18	5,5	2,8	1,2	2	6,2	3,5	26,5	21
14	19	23,1	24,5	27	28	22	6	2,8	1,2	2	6,7	4	32,5	26,5
16	21	26,9	28,5	31	30	23	7	3,7	1,3	2,5	7,6	4	35,5	28,5
18	25	30,9	32,5	36	32	24	8	3,7	1,3	3	8,5	4,5	37,5	29,5
19	25	30,9	32,5	36	33	25	8	3,7	1,3	3	8,5	4,5	39	31
20	25	30,9	32,5	36	33	25	8	3,7	1,3	3	8,5	4,5	39	31
22	30	35,4	37	41	33	25	8	3,7	1,8	3,5	8,5	5	39	31
24	30	35,4	37	41	33	25	8	3,7	1,8	3,5	8,5	5	41	33
25	33	38,2	41	45	34,5	26	8,5	3,7	1,8	4	9,1	5	42,5	34
28	38	43,3	47	50	35	26	9	3,7	1,8	4	9,6	6	45	36
29	38	43,3	47	50	35	26	9	3,7	1,8	4	9,6	6	45	36
30	38	43,3	47	50	35	26	9	3,7	1,8	4	9,6	6	45	36
32	38	43,3	47	50	35	26	9	3,7	1,8	4	9,6	6	45	36
33	45	53,5	48	62	41,5	30	11,5	5,4	2,1	5	12	7,5	52,5	41
35	45	53,5	57	62	41,5	30	11,5	5,4	2,1	5	12	7,5	56,5	45
38	52	60,5	64	70	43,5	32	11,5	5,4	2,1	5	12	7,5	56,5	45
40	52	60,5	64	70	43,5	32	11,5	5,4	2,1	5	12	7,5	56,5	45
42	52	60,5	64	70	43,5	32	11,5	5,4	2,1	5	12	7,5	56,5	45
43	52	60,5	64	70	43,5	32	11,5	5,4	2,1	5	12	7,5	56,5	45
44	57	65,5	69	75	43,5	32	11,5	5,4	2,1	5	13	8,5	57,5	46
45	57	65,5	69	75	43,5	32	11,5	5,4	2,1	5	13	8,5	57,5	46
48	57	65,5	69	75	43,5	32	11,5	5,4	2,1	5	13	8,5	58,5	47
50	64	72,5	75	83	45	33,5	11,5	5,4	2,1	5	13	8,5	60	48,5
55	64	72,5	75	83	45	33,5	11,5	5,4	2,1	5	13	8,5	60	48,5
60	72	79,3	83	90	50	38,5	11,5	5,4	2,1	5	13,5	8,5	63,5	52
65	77	84,5	88	96	50	38,5	11,5	5,4	2,1	5	13,5	8,5	64,5	53
70	82	89,5	93	101	55,5	44	11,5	5,4	2,1	5	13,5	8,5	64,5	53
75	87	94,5	98	106	55,5	44	11,5	5,4	2,1	5	13,5	8,5	66,5	55
80	92	99,5	104	111	53,5	42	11,5	5,4	2,1	5	13,5	8,5	70,5	59
85	98	105,5	110	125	55,5	42	13,5	5,4	2,6	5	13,5	8,5	74,5	61
90	105	111,5	116	130	60,5	47	13,5	5,4	2,6	5	13,5	8,5	74,5	61
95	110	116,5	123	137	60,5	47	13,5	5,4	2,6	5	13,5	8,5	79,5	66
100	114	119,5	127	143	60,5	47	13,5	5,4	2,6	5	13,5	8,5	80,5	67

UNITEN

EN 12756													ISO 3069	
TYPE 85 85TRCL													85N	
d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_{1k}	L
12	19	23	22,5	24	25	18	7	4	1,5	3	8,5	5	32,5	25,5
14	21	25	24,5	26	29	22	7	4	1,5	3	8,5	5	35	28
16	23	27	28,5	28	30	23	7	4	1,5	3	8,5	5	35	28
18	27	33	32,5	34	34	24	10	5	2	3	9	5	37,5	27,5
20	29	35	32,5	36	35	25	10	5	2	3	9	5	37,5	27,5
22	31	37	37	38	35	25	10	5	2	3	9	5	37,5	27,5
24	33	39	37	40	35	25	10	5	2	3	9	5	40	30
25	34	40	41	42+	36	26	10	5	2	3	9	5	40	30
28	37	43	47	48+	36	26	10	5	2	3	9	5	42,5	32,5
30	39	45	47	48+	36	26	10	5	2	3	9	5	42,5	32,5
32	42	48	47	48	36	26	10	5	2	3	9	5	42,5	32,5
33	42	48	48	49	40	30	10	5	2	3	9	5	42,5	32,5
35	44	50	57	58+	40	30	10	5	2	3	9	5	42,5	32,5
38	49	56	64	65+	45	32	13	6	2	4	9	5	45	32
40	51	58	64	65+	45	32	13	6	2	4	9	5	45	32
43	54	61	64	65+	45	32	13	6	2	4	9	5	45	32
45	56	63	69	70+	45	32	13	6	2	4	9	5	45	32
48	59	66	69	70+	45	32	13	6	2	4	9	5	45	32
50	62	70	75	76+	47,5	33,5	14	6	2,5	4	9	5	47,5	33,5
53	65	73	75	76+	47,5	33,5	14	6	2,5	4	9	5	47,5	33,5
55	67	75	75	76+	47,5	33,5	14	6	2,5	4	9	5	47,5	33,5
58	70	78	83	84+	52,5	38,5	14	6	2,5	4	9	5	52,5	38,5
60	72	80	83	85	52,5	38,5	14	6	2,5	4	9	5	52,5	38,5
63	75	83	88	89+	52,5	38,5	14	6	2,5	4	9	5	52,5	38,5
65	77	85	88	90	52,5	38,5	14	6	2,5	4	9	5	52,5	38,5
68	81	90	93	94+	60	44	16	7	2,5	4	9	5	52,5	36,5
70	83	92	93	95	60	44	16	7	2,5	4	9	5	60	44
75	88	97	98	104	60	44	16	7	2,5	4	9	5	60	44
80	95	105	104	109	60	42	18	7	3	4	9	5	60	42
85	100	110	110	114	60	42	18	7	3	4	9	5	60	42
90	105	115	116	119	65	47	18	7	3	4	9	5	65	47
95	110	120	123	124	65	47	18	7	3	4	9	5	65	47
100	115	125	127	129	65	47	18	7	3	4	9	5	65	47

+ This size is superior to the minumum prescribed by the DIN norm.
*The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

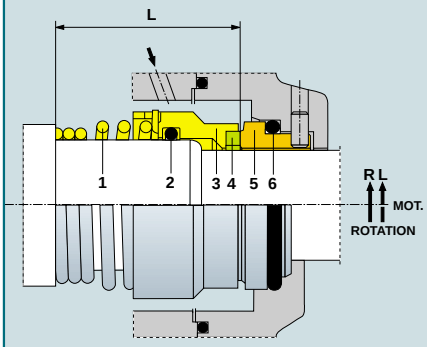
TYPE E



NB.: the blunting of the balance step is available only for the ROTEN balanced serie mechanical seals.

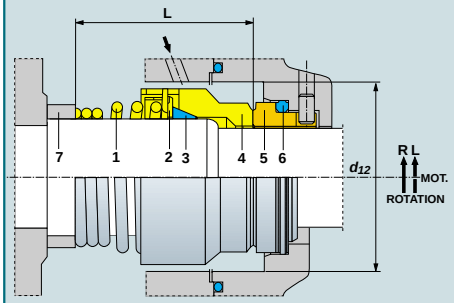
TYPE EH

with shrunk-in rotary seal ring



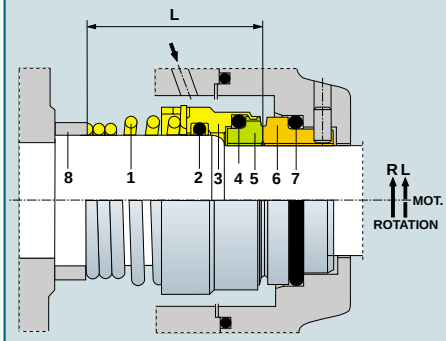
TYPE E4

with PTFE gaskets



TYPE E5TRCL

with driven rotary ring and stationary ring with extended tail and slot



POS. TYPE E EK	EH EHK	E4 E4K	E5 E5K	COMPONENTS	STANDARD MATERIALS									
1	1	1	1	Self-driving spring	X	L								
		2		Gasket thrust washer	X	L								
2	2	3	2	Wedge shaft gasket	0•	4•	5	6	7	8	Y	F	W	B
	3		3	Frame	X	D								
			4	Rotary gasket	0•	4•	5	6	7	8	Y	F	W	B
3	4*	4	5	Rotary seal ring	G	X	J	3	L	K*	R*	Z*		
4	5	5	6	Stationary seal ring	V	Z	1	3	4	K	R			
5	6	6	7	Stationary gasket	0•	4•	5	6	7	8	Y	F	W	B
6		7	8	Spacer (if required)	G	H	X							

*** SHRUNK FIT**

• For particular operating conditions, wedge and stationary gaskets may be supplied also in the codes 0 and 4.

C.C. = Stationary seal ring with short tail.
C.L. = Stationary seal ring with extended tail and slot

We recommend to consult our technical department for all applications involving balanced seals.

Roten TYPE E is a balanced seal for high pressure fluids and is manufactured in the same range of materials as ROTEN TYPE 2. Version E4 is supplied with PTFE gaskets. Version E5 allows to replace the wearing faces (items 5 and 6) during overhauls, this being its main characteristic. We recommend to consult our tecnical department for any application of balanced seals.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	40 bar
t =	-35 ÷ 180°C
v ≤	10 m/s

For Type EH - EHK

t =	-20 ÷ 150°C

ROTEN

TYPE E EH E4 E5

d_1	d_2	d_6	d_7	d_4	d_{12}	l_1	L	L_E	l_4	l_6	l_5	d_8	l_7	l_P
10	13	14	18,1	27	30	35,5	30	22	5,5	2,8	1,2	2	6,2	3,5
12	15	16,5	20,6	31	31	35,5	30	22	5,5	2,8	1,2	2	6,2	3,5
13	16	19	23,1	31	34	37	31	23	6	2,8	1,2	2	6,7	4
14	17	19	23,1	31	34	37	31	23	6	2,8	1,2	2	6,7	4
15	18	21	26,9	36	37	39	32	24	7	3,7	1,3	2,5	7,6	4
16	19	21	26,9	36	39	41	34	25	7	3,7	1,3	2,5	7,6	4
18	21	25	30,9	41	42	42	34	25	8	3,7	1,3	3	8,5	4,5
19	22	25	30,9	41	42	42	34	25	8	3,7	1,3	3	8,5	4,5
20	23	25	30,9	41	44	44	36	27	8	3,7	1,3	3	8,5	4,5
22	26	30	35,4	45	48	45	37	27	8	3,7	1,8	3,5	8,5	5
23	27	30	35,4	45	48	45	37	27	8	3,7	1,8	3,5	8,5	5
24	28	30	35,4	50	50	47	39	29	8	3,7	1,8	3,5	8,5	5
25	29	33	38,2	50	53	48,5	40	30	8,5	3,7	1,8	4	9,1	5
28	32	38	43,3	50	53	49	40	30	9	3,7	1,8	4	9,6	6
30	34	38	43,3	60	64	58	49	39	9	3,7	1,8	4	9,6	6
32	36	38	43,3	60	64	58	49	39	9	3,7	1,8	4	9,6	6
35	39	45	53,5	68	69	62,5	51	39	11,5	5,4	2,1	5	12	7,5
38	42	52	60,5	68	69	62,5	51	39	11,5	5,4	2,1	5	12	7,5
40	44	52	60,5	72	76	64,5	53	41	11,5	5,4	2,1	5	12	7,5
42	46	52	60,5	72	80	64,5	53	41	11,5	5,4	2,1	5	12	7,5
43	47	52	60,5	72	80	64,5	53	41	11,5	5,4	2,1	5	12	7,5
44	48	57	65,5	72	80	65,5	54	41	11,5	5,4	2,1	5	13	8,5
45	49	57	65,5	72	80	65,5	54	41	11,5	5,4	2,1	5	13	8,5
50	54	64	72,5	80	87	70,5	59	45	11,5	5,4	2,1	5	13	8,5
55	60	64	72,5	87	93	75,5	64	49	11,5	5,4	2,1	5	13	8,5
60	65	72	79,3	92	102	77,5	66	51	11,5	5,4	2,1	5	13,5	8,5
65	70	77	84,5	97	107	77,5	66	51	11,5	5,4	2,1	5	13,5	8,5
70	75	82	89,5	102	113	83,5	72	57	11,5	5,4	2,1	5	13,5	8,5
75	80	87	94,5	107	117	86,5	75	59	11,5	5,4	2,1	5	13,5	8,5
80	85	92	99,5	113	126	86,5	75	59	11,5	5,4	2,1	5	13,5	8,5
85	90	98	105,5	120	131	91,5	78	62	13,5	5,4	2,6	5	13,5	8,5
90	95	105	111,5	130	138	91,5	78	62	13,5	5,4	2,6	5	13,5	8,5
95	100	110	116,5	136	144	104,5	91	75	13,5	5,4	2,6	5	13,5	8,5
100	106	114	119,5	150	164	106,5	93	75	13,5	5,4	2,6	5	13,5	8,5
110	116	124	132,2	160	174	122,5	105	85	17,5	7,1	3,9	5	13,5	8,5
120	126	134	142,2	172	186	133,5	116	95	17,5	7,1	3,9	5	13,5	8,5
130	136	145	153,2	185	202	133,5	116	95	17,5	7,1	3,9	5	13,5	8,5
135	141	152	161,2	190	207	140,5	122	100	18,5	7,1	3,9	5	13,5	8,5
140	146	157	164,3	200	215	151,5	133	110	18,5	7,1	3,9	5	13,5	8,5
150	156	167	174,2	210	225	151,5	133	110	18,5	7,1	3,9	5	13,5	8,5
160	166	188	195	230	245	164	143	120	21	9,1	3,9	5	15,5	8,5

UNITEN

EN 12756 — ISO 3069

TYPE E EH E4 E5

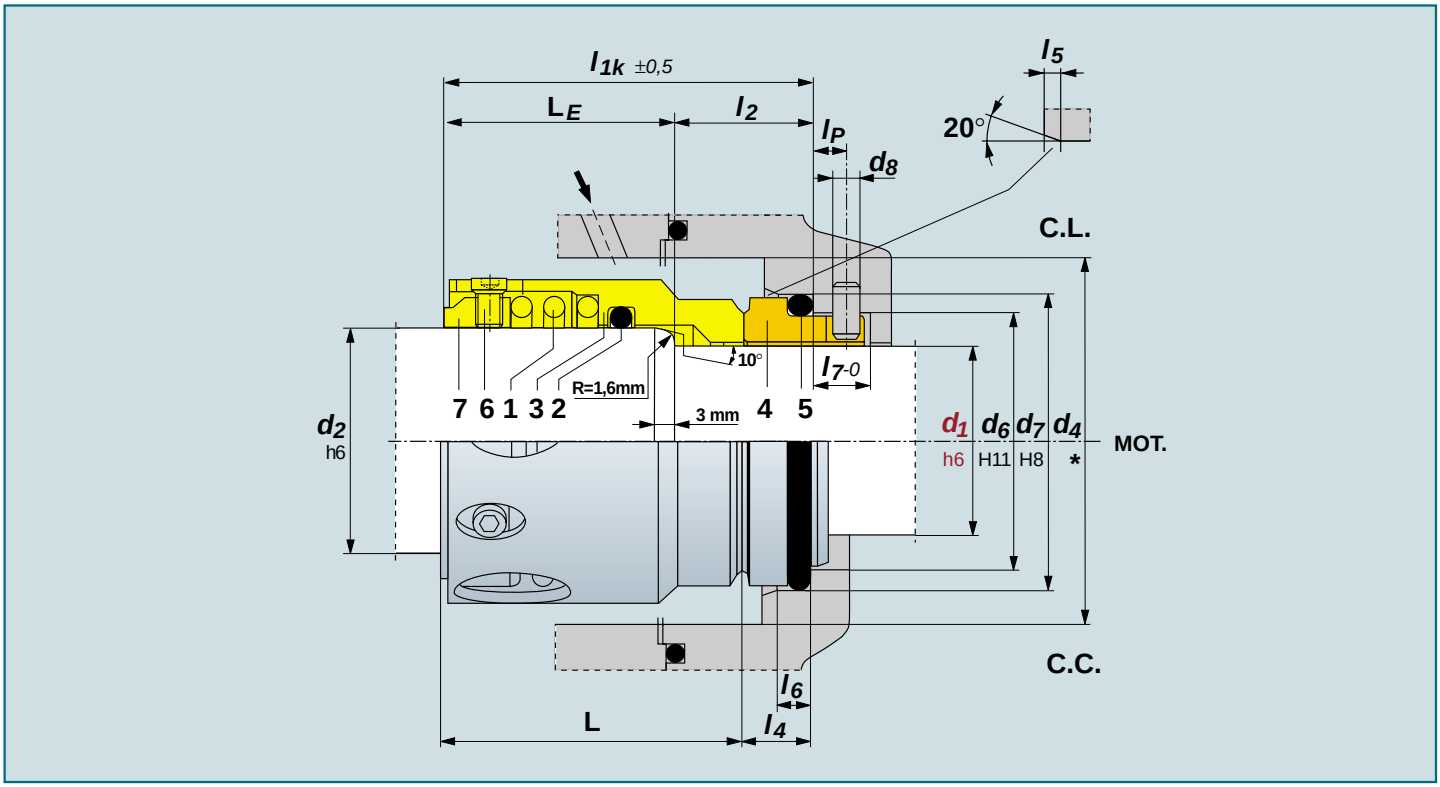
EK EKH E4K E5K

d_1	d_2	d_6	d_7	d_4	d_{12}	l_1	l_2	L	L_E	l_4	l_6	l_5	H	A	d_8	l_7	l_P	l_{1K}	L	LE
10	14	17	21	26	26	50	18	43	32	7	4	1,5	–	–	3	8,5	5	40	33	22
12	16	19	23	28	28	50	18	43	32	7	4	1,5	–	–	3	8,5	5	40	33	22
14	18	21	25	34	34	55	18	39	37	7	4	1,5	9	22	3	8,5	5	42,5	35,5	24,5
16	20	23	27	36	36	55	18	40	37	7	4	1,5	8	25	3	8,5	5	42,5	35,5	24,5
18	22	27	33	38	38	55	20	41	35	10	5	2	4	27	3	9	5	45	35	25
20	24	29	35	40	40	60	20	43	40	10	5	2	7	29	3	9	5	45	35	25
22	26	31	37	42	42	60	20	43	40	10	5	2	7	31	3	9	5	45	35	25
24	28	33	39	44	44	60	20	50	40	10	5	2	–	–	3	9	5	47,5	37,5	27,5
25	30	34	40	46	48+	60	20	50	40	10	5	2	–	–	3	9	5	47,5	37,5	27,5
28	33	37	43	49	54+	65	20	55	45	10	5	2	–	–	3	9	5	50	40	30
30	35	39	45	51	54+	65	20	55	45	10	5	2	–	–	3	9	5	50	40	30
32	38	42	48	58	58	65	20	55	45	10	5	2	–	–	3	9	5	50	40	30
33	38	42	48	58	58	65	20	55	45	10	5	2	–	–	3	9	5	50	40	30
35	40	44	50	60	60	65	20	55	45	10	5	2	–	–	3	9	5	50	40	30
38	43	49	56	63	63	75	23	62	52	13	6	2	–	–	4	9	5	52,5	39,5	29,5
40	45	51	58	65	67+	75	23	62	52	13	6	2	–	–	4	9	5	52,5	39,5	29,5
43	48	54	61	68	73+	75	23	62	52	13	6	2	–	–	4	9	5	52,5	39,5	29,5
45	50	56	63	70	75+	75	23	62	52	13	6	2	–	–	4	9	5	52,5	39,5	29,5
48	53	59	66	73	73	85	23	72	62	13	6	2	–	–	4	9	5	52,5	39,5	29,5
50	55	62	70	75	80+	85	25	71	60	14	6	2,5	–	–	4	9	5	57,5	43,5	32,5
53	58	65	73	83	83	85	25	71	60	14	6	2,5	–	–	4	9	5	57,5	43,5	32,5
55	60	67	75	85	85	85	25	71	60	14	6	2,5	–	–	4	9	5	57,5	43,5	32,5
58	63	70	78	88	88	85	25	71	60	14	6	2,5	–	–	4	9	5	62,5	48,5	37,5
60	65	72	80	90	90	95	25	81	70	14	6	2,5	–	–	4	9	5	62,5	48,5	37,5
63	68	75	83	93	93	95	25	81	70	14	6	2,5	–	–	4	9	5	62,5	48,5	37,5
65	70	77	85	95	95	95	25	81	70	14	6	2,5	–	–	4	9	5	62,5	48,5	37,5
70	75	83	92	104	104	95	28	79	67	16	7	2,5	–	–	4	9	5	70	54	42
75	80	88	97	109	109	105	28	89	77	16	7	2,5	–	–	4	9	5	70	54	42
80	85	95	105	114	117+	105	28	87	77	18	7	3	–	–	4	9	5	70	52	42
85	90	100	110	119	122+	105	28	87	77	18	7	3	–	–	4	9	5	75	57	47
90	95	105	115	124	131+	105	28	87	77	18	7	3	–	–	4	9	5	75	57	47
95	100	110	120	129	137+	105	28	87	77	18	7	3	–	–	4	9	5	75	57	47
100	105	115	125	134	142+	105	28	87	77	18	7	3	–	–	4	9	5	75	57	47

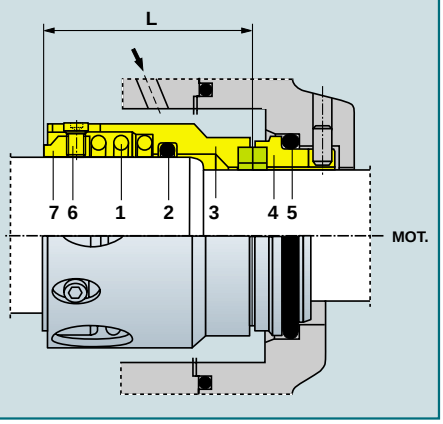
+ This size is superior to the minumum prescribed by the DIN norm.

*The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box

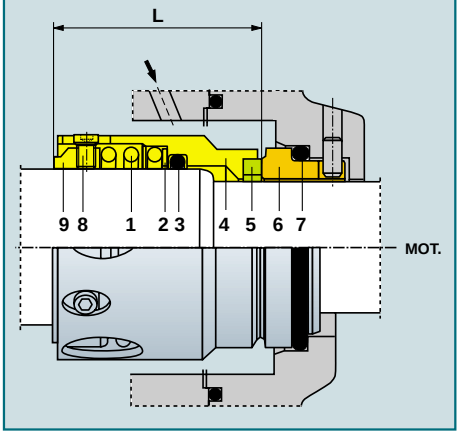
TYPE 8E



TYPE 8E with brazed hard metal faces



TYPE 8EH with open cave and shrunk-in rotaryseal ring



C.C. = Stationary seal ring with short tail.

C.L. = Stationary seal ring with extended tail and slot.

POS. TYPE 8E	POS. TYPE 8EH	COMPONENTS	STANDARD MATERIALS							
1	1	Spring	E	X	L					
	2	Washer	G	H	X					
2	3	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
	4	Frame	X	D						
3	5*	Rotary seal ring	G	X	J	3	L	K*	R*	Z*
4	6	Stationary seal ring	V	Z	1	3	4	K	R	
5	7	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
6	8	Grub screws	H	X	L					
7	9	Drive ring	X	L						

*** SHRUNK FIT**

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	40 bar
t =	-35 ÷ 180°C
v ≤	15 m/s

For Type 8EH

t =	-20 ÷ 150°C

It is a balanced mechanical seal BIDIRECTIONAL with positive drive through grub screws. Its large choice of materials make it extremely versatile. It is particularly compact and it is realized on UNITEN dimensions (DIN 24960), K norm length.

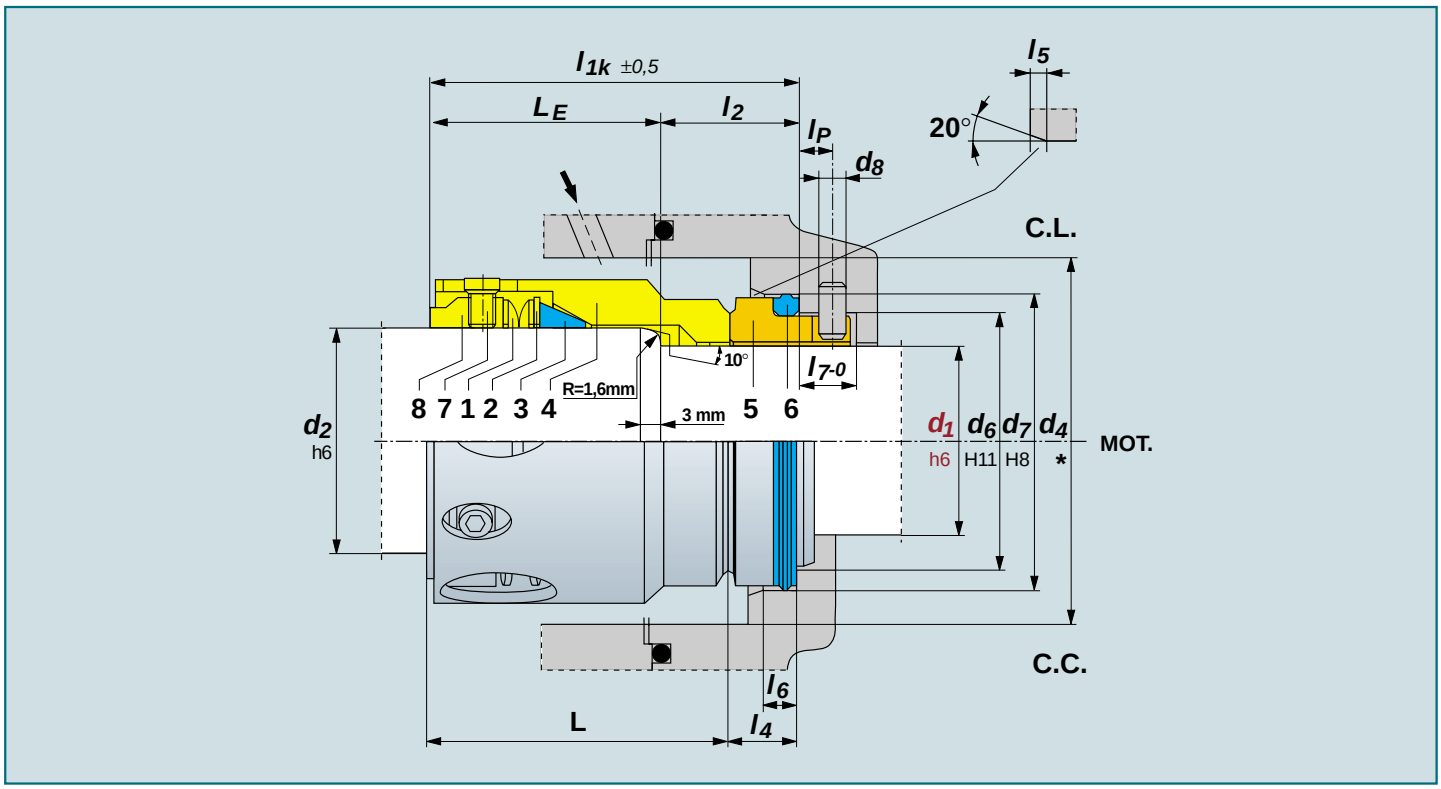
We recommend to consult our technical department for all applications involving balanced seals.

NB.: This model can be supplied with stationary part in ROTEN dimentions.

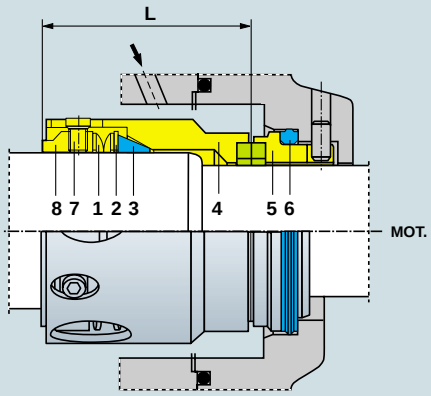
EN 12756					UNITEN								ISO 3069	
TYPE 8E 8EH														
d_1	d_2	d_6	d_7	d_4	l_{1k}	l_2	L	L_E	l_4	l_6	l_5	d_8	l_7	l_p
10	14	17	21	26	40	18	33	22	7	4	1,5	3	8,5	5
12	16	19	23	28	40	18	33	22	7	4	1,5	3	8,5	5
14	18	21	25	34	42,5	18	35,5	24,5	7	4	1,5	3	8,5	5
16	20	23	27	36	42,5	18	35,5	24,5	7	4	1,5	3	8,5	5
18	22	27	33	38	45	20	35	25	10	5	2	3	9	5
20	24	29	35	40	45	20	35	25	10	5	2	3	9	5
22	26	31	37	42	45	20	35	25	10	5	2	3	9	5
24	28	33	39	44	47,5	20	37,5	27,5	10	5	2	3	9	5
25	30	34	40	46	47,5	20	37,5	27,5	10	5	2	3	9	5
28	33	37	43	49	50	20	40	30	10	5	2	3	9	5
30	35	39	45	51	50	20	40	30	10	5	2	3	9	5
32	38	42	48	58	50	20	40	30	10	5	2	3	9	5
33	38	42	48	58	50	20	40	30	10	5	2	3	9	5
35	40	44	50	60	50	20	40	30	10	5	2	3	9	5
38	43	49	56	63	52,5	23	39,5	29,5	13	6	2	4	9	5
40	45	51	58	65	52,5	23	39,5	29,5	13	6	2	4	9	5
43	48	54	61	68	52,5	23	39,5	29,5	13	6	2	4	9	5
45	50	56	63	70	52,5	23	39,5	29,5	13	6	2	4	9	5
48	53	59	66	73	52,5	23	39,5	29,5	13	6	2	4	9	5
50	55	62	70	75	57,5	25	43,5	32,5	14	6	2,5	4	9	5
53	58	65	73	83	57,5	25	43,5	32,5	14	6	2,5	4	9	5
55	60	67	75	85	57,5	25	43,5	32,5	14	6	2,5	4	9	5
58	63	70	78	88	62,5	25	48,5	37,5	14	6	2,5	4	9	5
60	65	72	80	90	62,5	25	48,5	37,5	14	6	2,5	4	9	5
63	68	75	83	93	62,5	25	48,5	37,5	14	6	2,5	4	9	5
65	70	77	85	95	62,5	25	48,5	37,5	14	6	2,5	4	9	5
70	75	83	92	104	70	28	54	42	16	7	2,5	4	9	5
75	80	88	97	109	70	28	54	42	16	7	2,5	4	9	5
80	85	95	105	114	70	28	52	42	18	7	3	4	9	5
85	90	100	110	119	75	28	57	47	18	7	3	4	9	5
90	95	105	115	124	75	28	57	47	18	7	3	4	9	5
95	100	110	120	129	75	28	57	47	18	7	3	4	9	5
100	105	115	125	134	75	28	57	47	18	7	3	4	9	5

*The size d_4 is considered the minimum limit for the stuffing box diameter.
Where possible, it is appropriate to choose a larger size or a conical stuffing box.

TYPE 8E4

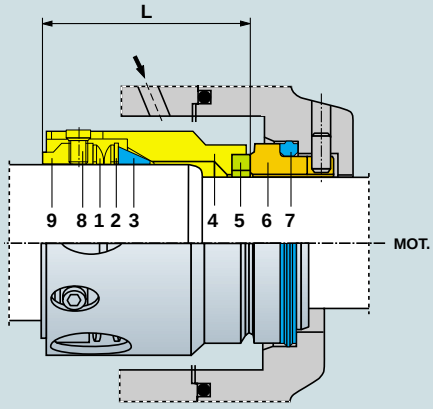


TYPE 8E4 with brazed hard metal faces



C.C. = Stationary seal ring with short tail.
C.L. = Stationary seal ring with extended tail and slot.

TYPE 8E4H with shrunk-in rotary seal ring



POS. TYPE 8E4	POS. TYPE 8E4H	COMPONENTS	STANDARD MATERIALS							
1	1	Spring		X	L					
2	2	Gasket thrust washer			X	L				
3	3	Wedge gasket (PTFE)	5	4**	0**					
	4	Frame	X	D						
4	5*	Rotary seal ring	X	J	3	L	K*	R*	Z*	
5	6	Stationary seal ring	V	Z	1	3	4	K	R	
6	7	Stationary gasket (PTFE)	5	F	4**	0**				
7	8	Grub screws	H	X	L					
8	9	Drive ring	X							

*** MATERIAL FOR SHRUNK FIT**

**** For particular operating conditions, the wedge and stationary gasket may be supplied with the codes 0 or 4**

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	40 bar
t =	-20 ÷ 180°C
v ≤	15 m/s

For type 8E4H

t =	-20 ÷ 150°C

Balanced seal, bi-directional like the type 8E, but with PTFE gaskets.
A wide range of materials give to this seal the better suitability for most applications.
The application and the materials are the same of type 4.

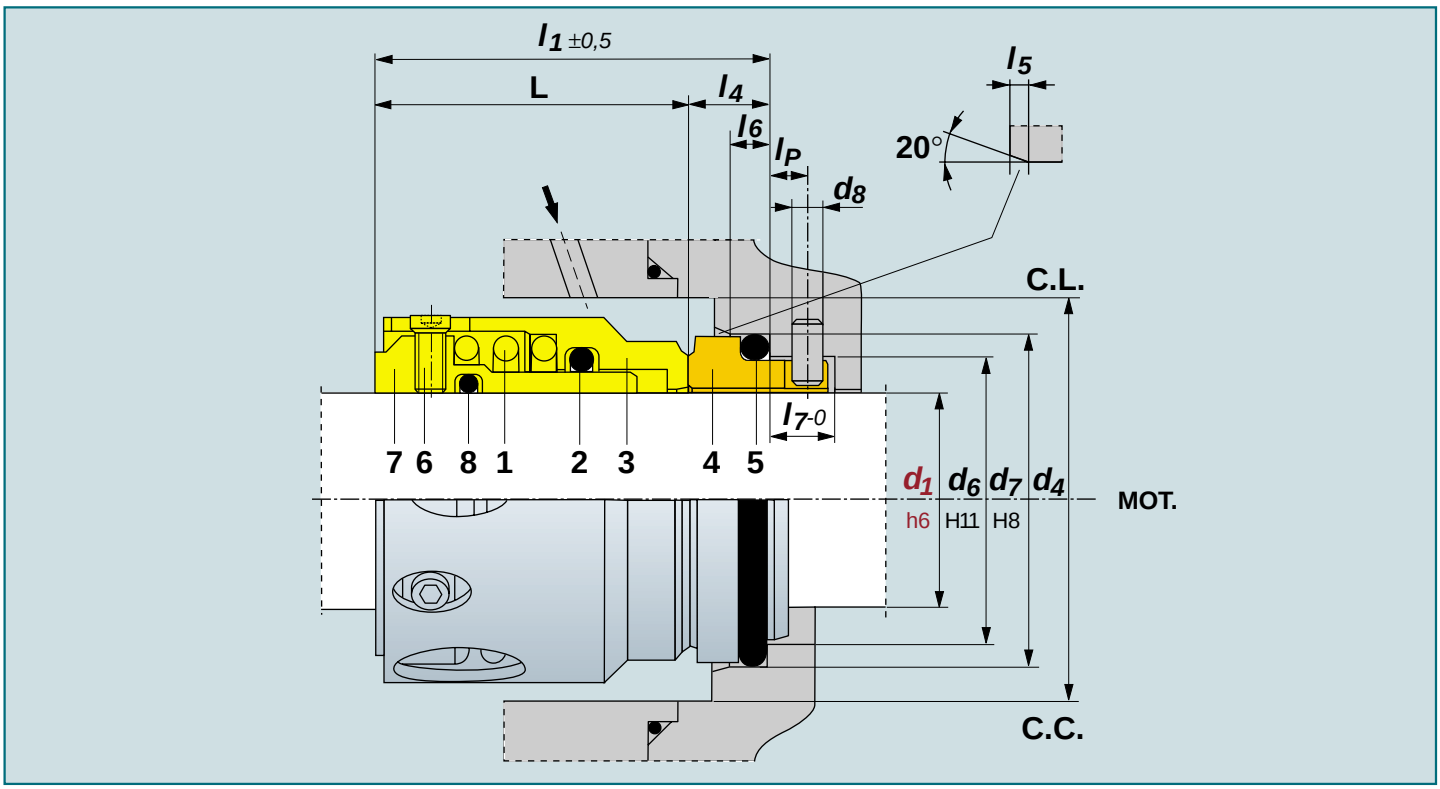
We recommend to consult our technical department for all applications involving balanced seals.

NB.: This model can be supplied with stationary part in ROTEN dimensions.

EN 12756					UNITEN							ISO 3069		
TYPE 8E4 8E4H														
d_1	d_2	d_6	d_7	d_4	l_{1k}	l_2	L	L_E	l_4	l_6	l_5	d_8	l_7	l_p
10	14	17	21	26	40	18	33	22	7	4	1,5	3	8,5	5
12	16	19	23	28	40	18	33	22	7	4	1,5	3	8,5	5
14	18	21	25	34	42,5	18	35,5	24,5	7	4	1,5	3	8,5	5
16	20	23	27	36	42,5	18	35,5	24,5	7	4	1,5	3	8,5	5
18	22	27	33	38	45	20	35	25	10	5	2	3	9	5
20	24	29	35	40	45	20	35	25	10	5	2	3	9	5
22	26	31	37	42	45	20	35	25	10	5	2	3	9	5
24	28	33	39	44	47,5	20	37,5	27,5	10	5	2	3	9	5
25	30	34	40	46	47,5	20	37,5	27,5	10	5	2	3	9	5
28	33	37	43	49	50	20	40	30	10	5	2	3	9	5
30	35	39	45	51	50	20	40	30	10	5	2	3	9	5
32	38	42	48	58	50	20	40	30	10	5	2	3	9	5
33	38	42	48	58	50	20	40	30	10	5	2	3	9	5
35	40	44	50	60	50	20	40	30	10	5	2	3	9	5
38	43	49	56	63	52,5	23	39,5	29,5	13	6	2	4	9	5
40	45	51	58	65	52,5	23	39,5	29,5	13	6	2	4	9	5
43	48	54	61	68	52,5	23	39,5	29,5	13	6	2	4	9	5
45	50	56	63	70	52,5	23	39,5	29,5	13	6	2	4	9	5
48	53	59	66	73	52,5	23	39,5	29,5	13	6	2	4	9	5
50	55	62	70	75	57,5	25	43,5	32,5	14	6	2,5	4	9	5
53	58	65	73	83	57,5	25	43,5	32,5	14	6	2,5	4	9	5
55	60	67	75	85	57,5	25	43,5	32,5	14	6	2,5	4	9	5
58	63	70	78	88	62,5	25	48,5	37,5	14	6	2,5	4	9	5
60	65	72	80	90	62,5	25	48,5	37,5	14	6	2,5	4	9	5
63	68	75	83	93	62,5	25	48,5	37,5	14	6	2,5	4	9	5
65	70	77	85	95	62,5	25	48,5	37,5	14	6	2,5	4	9	5
70	75	83	92	104	70	28	54	42	16	7	2,5	4	9	5
75	80	88	97	109	70	28	54	42	16	7	2,5	4	9	5
80	85	95	105	114	70	28	52	42	18	7	3	4	9	5
85	90	100	110	119	75	28	57	47	18	7	3	4	9	5
90	95	105	115	124	75	28	57	47	18	7	3	4	9	5
95	100	110	120	129	75	28	57	47	18	7	3	4	9	5
100	105	115	125	134	75	28	57	47	18	7	3	4	9	5

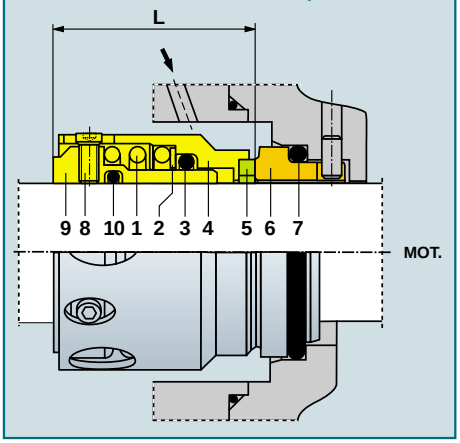
*The size d_4 is considered the minimum limit for the stuffing box diameter.
Where possible, it is appropriate to choose a larger size or a conical stuffing box.

TYPE 82E



TYPE 82EH

with shrunk-in seal ring and open cave

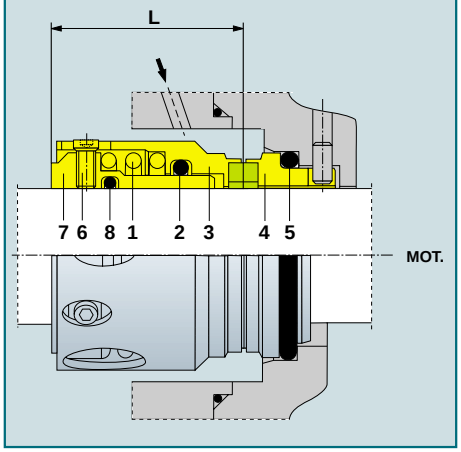


The mechanical drive of this BIDIRECTIONAL balanced seal is realized by grub screws. It is supplied in balanced and particularly compact form. It is realized in ROTEN as well as UNITEN mounting sizes (DIN 24960). Its form also allows it to fit onto a normal shaft without any balancing step. The large range of materials which can be used makes it very versatile.

We always advise to consult our technical department for all applications involving balanced seals.

TYPE 82E

with hard metal brazed faces



POS. 82E	TYPE 82EH	COMPONENTS	STANDARD MATERIALS							
1	1	Spring	E	X	L					
	2	Washer	G	X						
2	3	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
	4	Frame	X	D						
3	5*	Rotary seal ring	G	X	J	3	L	K*	R*	Z*
4	6	Stationary seal ring	V	Z	1	3	4	K	R	
5	7	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
6	8	Grub screws	H	X	L					
7	9	Balanced sleeve	G	X						
8	10	Sleeve gasket (O-Ring)	6	7	8	Y	F	W	B	

*** SHRUNK FIT**

C.C. = Stationary seal ring with short tail

C.L. = Stationary seal ring with extended tail and slot

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	40 bar
t =	-35 ÷ 180°C
v ≤	15 m/s
For Type 82EH	
t =	-20 ÷ 150°C

ROTEN

TYPE 82E 82EH

d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
20	25	30,9	44	43	35	8	3,7	1,3	3	8,5	4,5
22	30	35,4	47	43	35	8	3,7	1,8	3,5	8,5	5
24	30	35,4	50	45,5	37,5	8	3,7	1,8	3,5	8,5	5
25	33	38,2	52	46	37,5	8,5	3,7	1,8	4	9,1	5
28	38	43,3	54	49	40	9	3,7	1,8	4	9,6	6
30	38	43,3	56	49	40	9	3,7	1,8	4	9,6	6
32	38	43,3	62	49	40	9	3,7	1,8	4	9,6	6
33	45	53,5	62	51,5	40	11,5	5,4	2,1	5	12	7,5
35	45	53,5	65	51,5	40	11,5	5,4	2,1	5	12	7,5
38	52	60,5	68	51	39,5	11,5	5,4	2,1	5	12	7,5
40	52	60,5	70	51	39,5	11,5	5,4	2,1	5	12	7,5
43	52	60,5	73	51	39,5	11,5	5,4	2,1	5	12	7,5
45	57	65,5	75	51	39,5	11,5	5,4	2,1	5	13	8,5
48	57	65,5	78	51	39,5	11,5	5,4	2,1	5	13	8,5
50	64	72,5	80	55	43,5	11,5	5,4	2,1	5	13	8,5
55	64	72,5	90	55	43,5	11,5	5,4	2,1	5	13	8,5
60	72	79,3	95	60	48,5	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	100	60	48,5	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	109	65,5	54	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	114	65,5	54	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	119	63,5	52	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	124	70,5	57	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	129	70,5	57	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	134	70,5	57	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	140	70,5	57	13,5	5,4	2,6	5	13,5	8,5

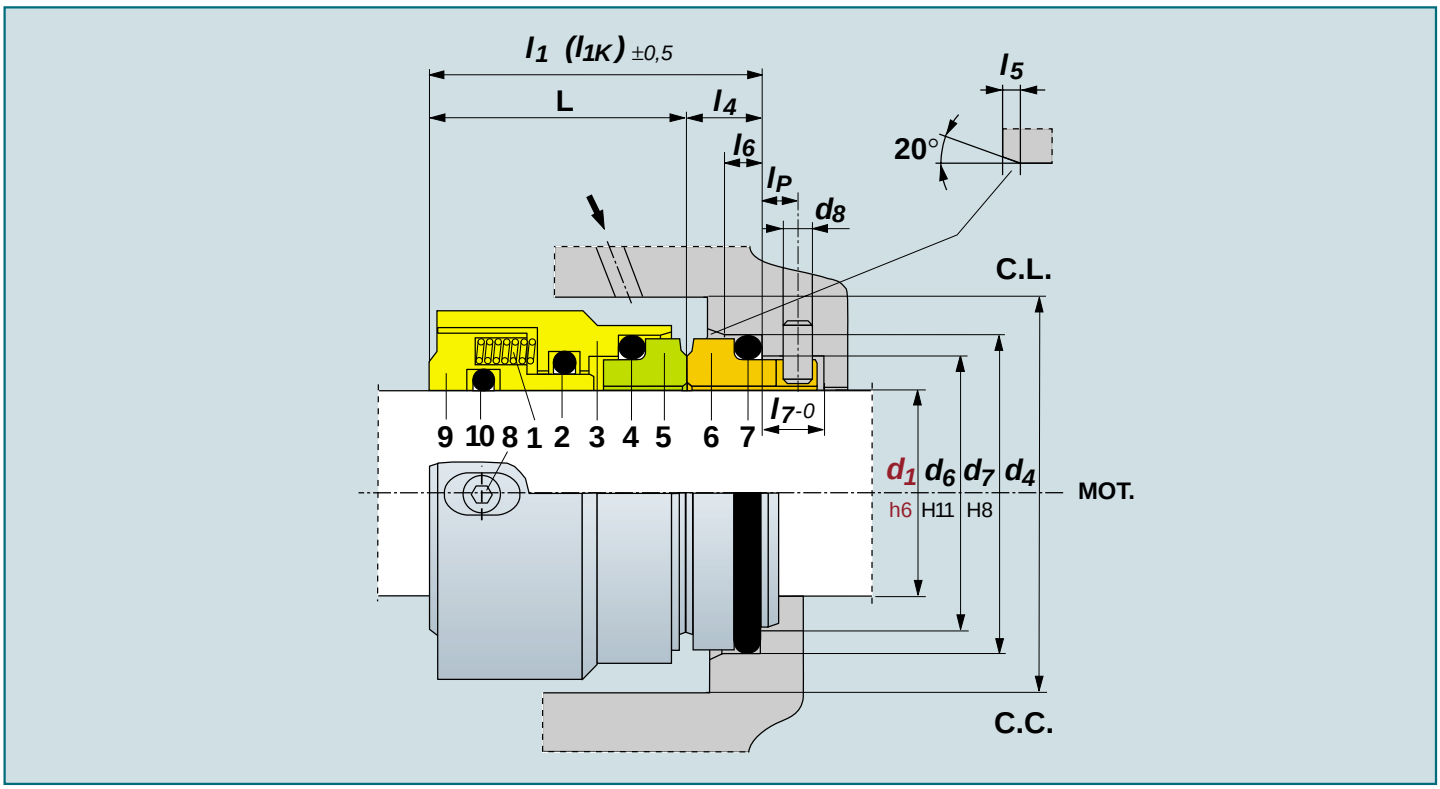
EN 12756 **UNITEN** ISO 3069

TYPE 82E 82EH

d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
20	29	35	44+	45	35	10	5	2	3	9	5
22	31	37	47+	45	35	10	5	2	3	9	5
24	33	39	50+	47,5	37,5	10	5	2	3	9	5
25	34	40	52+	47,5	37,5	10	5	2	3	9	5
28	37	43	54+	50	40	10	5	2	3	9	5
30	39	45	56+	50	40	10	5	2	3	9	5
32	42	48	62+	50	40	10	5	2	3	9	5
33	42	48	62+	50	40	10	5	2	3	9	5
35	44	50	65+	50	40	10	5	2	3	9	5
38	49	56	68+	52,5	39,5	13	6	2	4	9	5
40	51	58	70+	52,5	39,5	13	6	2	4	9	5
43	54	61	73+	52,5	39,5	13	6	2	4	9	5
45	56	63	75+	52,5	39,5	13	6	2	4	9	5
48	59	66	78+	52,5	39,5	13	6	2	4	9	5
50	62	70	80+	57,5	43,5	14	6	2,5	4	9	5
53	65	73	88+	57,5	43,5	14	6	2,5	4	9	5
55	67	75	90+	57,5	43,5	14	6	2,5	4	9	5
58	70	78	93+	62,5	48,5	14	6	2,5	4	9	5
60	72	80	95+	62,5	48,5	14	6	2,5	4	9	5
63	75	83	98+	62,5	48,5	14	6	2,5	4	9	5
65	77	85	100+	62,5	48,5	14	6	2,5	4	9	5
70	83	92	109+	70	54	16	7	2,5	4	9	5
75	88	97	114+	70	54	16	7	2,5	4	9	5
80	95	105	119+	70	52	18	7	3	4	9	5
85	100	110	124+	75	57	18	7	3	4	9	5
90	105	115	129+	75	57	18	7	3	4	9	5
95	110	120	134+	75	57	18	7	3	4	9	5
100	115	125	140+	75	57	18	7	3	4	9	5

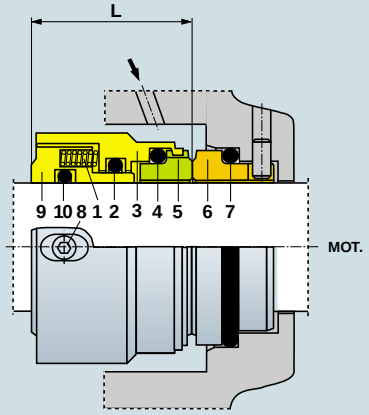
+ This dimension is larger than the minimum dimension indicated by DIN norm.

TYPE 85E



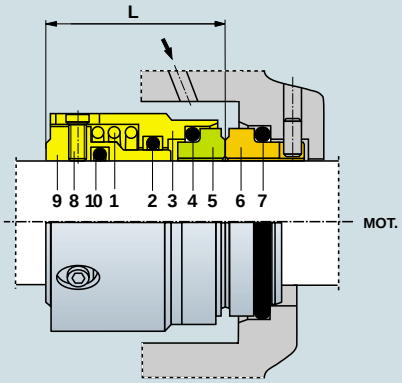
TYPE 85E TRCL

with driven rotary ring and stationary ring with extended tail and slot.



TYPE 85EM

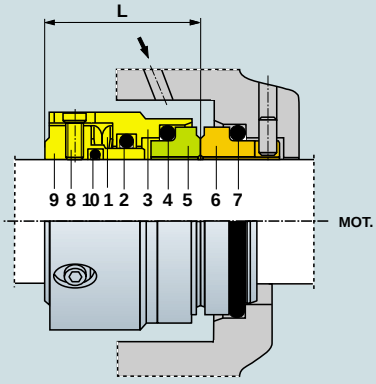
with cylindrical spring.



Also available as TRCL

TYPE 85EN

with sinusoidal spring.



Also available as TRCL

POS. TYPE 85E 85EM 85EK	COMPONENTS	STANDARD MATERIALS							
1	Spring	X	L						
2	Shaft gasket (O-ring)	6	7	8	Y	F	W	B	
3	Frame	X	L						
4	Rotary gasket (O-ring)	6	7	8	Y	F	W	B	
5	Rotary seal ring	2	R	K					
6	Stationary seal ring	V	Z	R	K	4	0	1	
7	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
8	Grub screws	H	X	L					
9	Balanced sleeve	X	L						
10	Sleeve gasket (O-Ring)	6	7	8	Y	F	W	B	

This is a mechanical seal, supplied in balance form without shaft steps, that combines features of interchangeability of seal faces with BIDIRECTIONAL rotation, compactness and minimal axial length. The large range of materials that can be used is similar to that of TYPE E5.

We always advise to consult our technical department for all applications involving balanced seals.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 40 bar; **t** = -45 ÷200°C **v** ≤ 15 m/s

C.C. = Stationary seal ring with short tail.
C.L. = Stationary seal ring with extended tail and slot

ROTEN

TYPE 85E 85EN 85ETRCL												85EM	
d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p	l_1	L
20	25	30,9	44	35,5	27,5	8	3,7	1,3	3	8,5	4,5	43	35
22	30	35,4	47	35,5	27,5	8	3,7	1,8	3,5	8,5	5	43	35
24	30	35,4	50	38	30	8	3,7	1,8	3,5	8,5	5	45,5	37,5
25	33	38,2	52	38,5	30	8,5	3,7	1,8	4	9,1	5	46	37,5
28	38	43,3	54	41,5	32,5	9	3,7	1,8	4	9,6	6	49	40
30	38	43,3	56	41,5	32,5	9	3,7	1,8	4	9,6	6	49	40
32	38	43,3	62	41,5	32,5	9	3,7	1,8	4	9,6	6	49	40
35	45	53,5	65	44	32,5	11,5	5,4	2,1	5	12	7,5	51,5	40
38	52	60,5	68	43,5	32	11,5	5,4	2,1	5	12	7,5	51	39,5
40	52	60,5	70	43,5	32	11,5	5,4	2,1	5	12	7,5	51	39,5
43	52	60,5	73	43,5	32	11,5	5,4	2,1	5	12	7,5	51	39,5
45	57	65,5	75	43,5	32	11,5	5,4	2,1	5	13	8,5	51	39,5
48	57	65,5	78	43,5	32	11,5	5,4	2,1	5	13	8,5	51	39,5
50	64	72,5	80	45	33,5	11,5	5,4	2,1	5	13	8,5	55	43,5
55	64	72,5	90	45	33,5	11,5	5,4	2,1	5	13	8,5	55	43,5
60	72	79,3	95	50	38,5	11,5	5,4	2,1	5	13,5	8,5	60	48,5
65	77	84,5	100	50	38,5	11,5	5,4	2,1	5	13,5	8,5	60	48,5
70	82	89,5	109	55,5	44	11,5	5,4	2,1	5	13,5	8,5	65,5	54
75	87	94,5	114	55,5	44	11,5	5,4	2,1	5	13,5	8,5	65,5	54
80	92	99,5	119	53,5	42	11,5	5,4	2,1	5	13,5	8,5	63,5	52
85	98	105,5	124	55,5	42	13,5	5,4	2,6	5	13,5	8,5	70,5	57
90	105	111,5	129	60,5	47	13,5	5,4	2,6	5	13,5	8,5	70,5	57
95	110	116,5	134	60,5	47	13,5	5,4	2,6	5	13,5	8,5	70,5	57
100	114	119,5	140	60,5	47	13,5	5,4	2,6	5	13,5	8,5	70,5	57

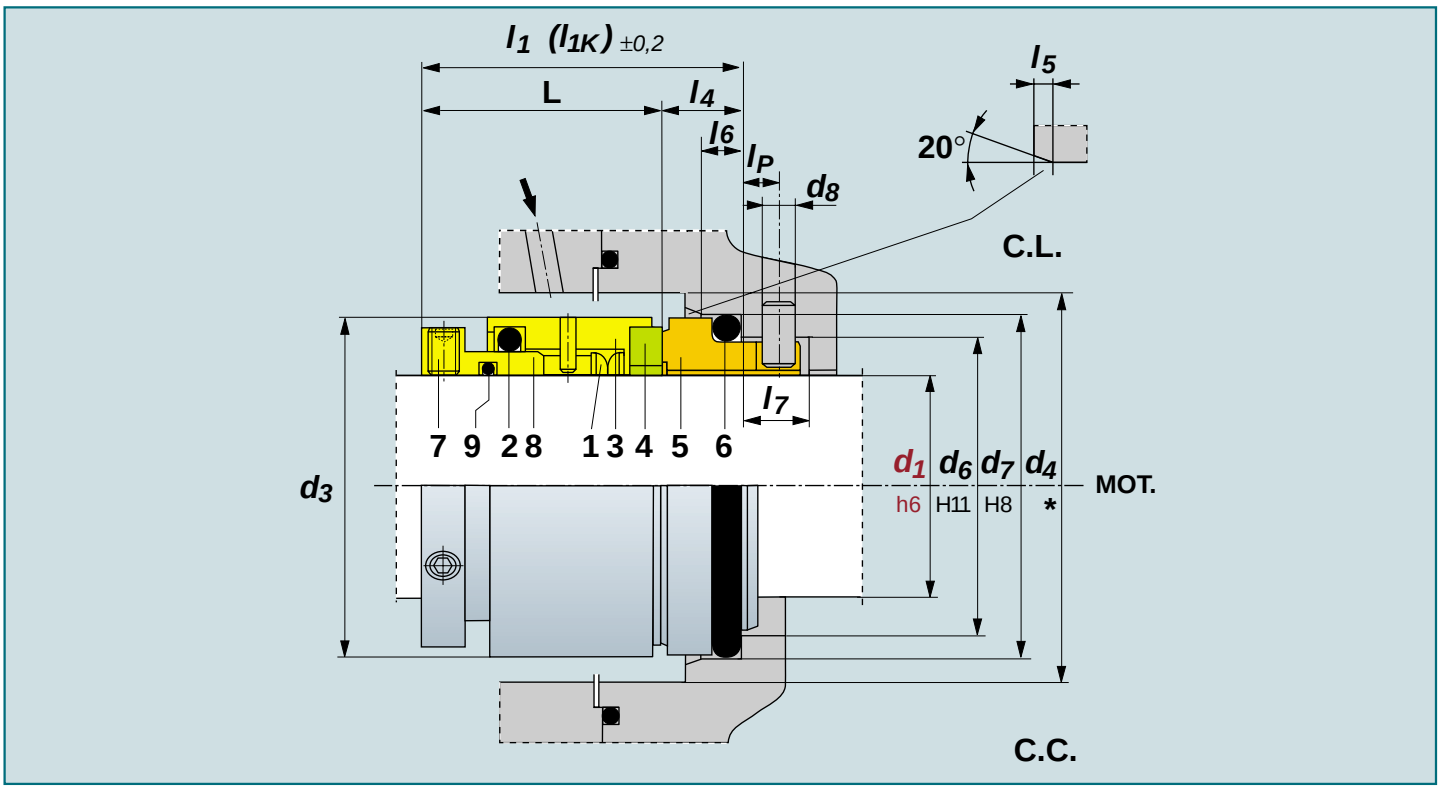
UNITEN

EN 12756 — ISO 3069

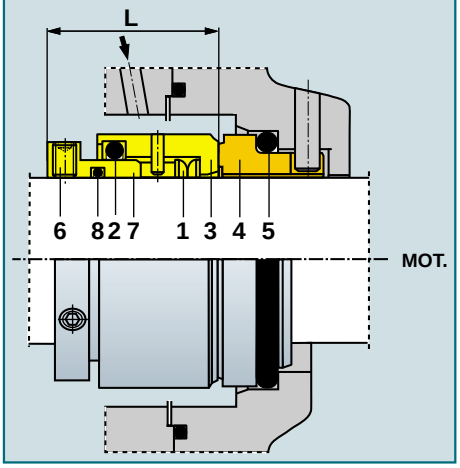
TYPE 85E 85EN 85ETRCL												85EM	
d_1	d_6	d_7	d_4	l_{1K}	L	l_4	l_6	l_5	d_8	l_7	l_p	l_1	L
20	29	35	44+	37,5	27,5	10	5	2	3	9	5	45	35
22	31	37	47+	37,5	27,5	10	5	2	3	9	5	45	35
24	33	39	50+	40	30	10	5	2	3	9	5	47,5	37,5
25	34	40	52+	40	30	10	5	2	3	9	5	47,5	37,5
28	37	43	54+	42,5	32,5	10	5	2	3	9	5	50	40
30	39	45	56+	42,5	32,5	10	5	2	3	9	5	50	40
32	42	48	62+	42,5	32,5	10	5	2	3	9	5	50	40
33	42	48	62+	42,5	32,5	10	5	2	3	9	5	50	40
35	44	50	65+	42,5	32,5	10	5	2	3	9	5	50	40
38	49	56	68+	45	32	13	6	2	4	9	5	52,5	39,5
40	51	58	70+	45	32	13	6	2	4	9	5	52,5	39,5
43	54	61	73+	45	32	13	6	2	4	9	5	52,5	39,5
45	56	63	75+	45	32	13	6	2	4	9	5	52,5	39,5
48	59	66	78+	45	32	13	6	2	4	9	5	52,5	39,5
50	62	70	80+	47,5	33,5	14	6	2,5	4	9	5	57,5	43,5
53	65	73	88+	47,5	33,5	14	6	2,5	4	9	5	57,5	43,5
55	67	75	90+	47,5	33,5	14	6	2,5	4	9	5	57,5	43,5
58	70	78	93+	52,5	38,5	14	6	2,5	4	9	5	62,5	48,5
60	72	80	95+	52,5	38,5	14	6	2,5	4	9	5	62,5	48,5
63	75	83	98+	52,5	38,5	14	6	2,5	4	9	5	62,5	48,5
65	77	85	100+	52,5	38,5	14	6	2,5	4	9	5	62,5	48,5
70	83	92	109+	60	44	16	7	2,5	4	9	5	70	54
75	88	97	114+	60	44	16	7	2,5	4	9	5	70	54
80	95	105	119+	60	42	18	7	3	4	9	5	70	52
85	100	110	124+	60	42	18	7	3	4	9	5	75	57
90	105	115	129+	65	47	18	7	3	4	9	5	75	57
95	110	120	134+	65	47	18	7	3	4	9	5	75	57
100	115	125	140+	65	47	18	7	3	4	9	5	75	57

+ This dimension is larger than the minimum dimension indicated by DIN norm.

TYPE EHS



TYPE EHS standard



The major feature of the EHS mechanical seal is that the spring is not in contact with the pumped medium. It is balanced and BIDIRECTIONAL. It is suitable for high-pressure and with dirty or viscous liquids. It is also very easy to clean by washing which makes it particularly advantageous for use in food, sanitary and pharmaceutical applications.
It is extremely appropriate when sterilization is mandatory.

We always advise to consult our technical department for all applications involving balanced seals.

FOR STERILE USES

POS.	TYPE EHS	COMPONENTS	STANDARD MATERIALS							
1	1	Spring	X							
2	2	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B	
3		Frame	X	D						
4*	3	Rotary seal ring	X	J	3	Z*	R*	K*		
5	4	Stationary seal ring	V	Z	R	K	4	0	1	2
6	5	Stationary gasket (O-Ring)	6	7	8	Y	F	W	B	
7	6	Grub screws	H	X						
8	7	Balanced sleeve	X							
9	8	Sleeve gasket (O-Ring)	6	7	8	Y	F	W	B	

*** SHRUNK FIT**

C.C. = Stationary seal ring with short tail.

C.L. = Stationary seal ring with extended tail and slot.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	40 bar
t =	-35 ÷ 230°C
v ≤	15 m/s

For type EHS with shrunk-in fit seal rings

t =	-20 ÷ 150°C

ROTEN

TYPE EHS

d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
16	21	26,9	31	33	35	28	7	3,7	1,3	2,5	7,6	4
18	25	30,9	36	40	35,5	27,5	8	3,7	1,3	3	8,5	4,5
19	25	30,9	38	42	35,5	27,5	8	3,7	1,3	3	8,5	4,5
20	25	30,9	38	42	35,5	27,5	8	3,7	1,3	3	8,5	4,5
22	30	35,4	39	43	35,5	27,5	8	3,7	1,8	3,5	8,5	5
24	30	35,4	40	44	38	30	8	3,7	1,8	3,5	8,5	5
25	33	38,2	40	44	38,5	30	8,5	3,7	1,8	4	9,1	5
28	38	43,3	44	48	41,5	32,5	9	3,7	1,8	4	9,6	6
30	38	43,3	44	48	41,5	32,5	9	3,7	1,8	4	9,6	6
32	38	43,3	47	52	41,5	32,5	9	3,7	1,8	4	9,6	6
35	45	53,5	50	55	44	32,5	11,5	5,4	2,1	5	12	7,5
38	52	60,5	55	60	43,5	32	11,5	5,4	2,1	5	12	7,5
40	52	60,5	58	63	43,5	32	11,5	5,4	2,1	5	12	7,5
43	52	60,5	62	67	43,5	32	11,5	5,4	2,1	5	12	7,5
45	57	65,5	64	69	43,5	32	11,5	5,4	2,1	5	13	8,5
48	57	65,5	67	72	43,5	32	11,5	5,4	2,1	5	13	8,5
50	64	72,5	70	75	45	33,5	11,5	5,4	2,1	5	13	8,5
55	64	72,5	78	83	45	33,5	11,5	5,4	2,1	5	13	8,5
60	72	79,3	82	88	50	38,5	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	89	95	50	38,5	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	94	100	55,5	44	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	103	109	55,5	44	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	108	114	53,5	42	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	113	119	55,5	42	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	118	124	60,5	47	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	120	129	60,5	47	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	128	134	60,5	47	13,5	5,4	2,6	5	13,5	8,5

EN 12756 **UNITEN** ISO 3069

TYPE EHS

d_1	d_6	d_7	d_3	d_4	l_{1K}	L	l_4	l_6	l_5	d_8	l_7	l_p
16	23	27	31	33+	35	28	7	4	1,5	3	8,5	5
18	27	33	36	40+	37,5	27,5	10	5	2	3	9	5
20	29	35	38	42+	37,5	27,5	10	5	2	3	9	5
22	31	37	39	43+	37,5	27,5	10	5	2	3	9	5
24	33	39	40	44+	40	30	10	5	2	3	9	5
25	34	40	40	44+	40	30	10	5	2	3	9	5
28	37	43	44	48+	42,5	32,5	10	5	2	3	9	5
30	39	45	44	48+	42,5	32,5	10	5	2	3	9	5
32	42	48	47	52+	42,5	32,5	10	5	2	3	9	5
33	42	48	48	53+	42,5	32,5	10	5	2	3	9	5
35	44	50	50	55+	42,5	32,5	10	5	2	3	9	5
38	49	56	55	60+	45	32	13	6	2	4	9	5
40	51	58	58	63+	45	32	13	6	2	4	9	5
43	54	61	62	67+	45	32	13	6	2	4	9	5
45	56	63	64	69+	45	32	13	6	2	4	9	5
48	59	66	67	72+	45	32	13	6	2	4	9	5
50	62	70	70	75+	47,5	33,5	14	6	2,5	4	9	5
53	65	73	74	79+	47,5	33,5	14	6	2,5	4	9	5
55	67	75	78	83+	47,5	33,5	14	6	2,5	4	9	5
58	70	78	80	85+	52,5	38,5	14	6	2,5	4	9	5
60	72	80	82	88+	52,5	38,5	14	6	2,5	4	9	5
63	75	83	87	93+	52,5	38,5	14	6	2,5	4	9	5
65	77	85	89	95+	52,5	38,5	14	6	2,5	4	9	5
70	83	92	94	100+	60	44	16	7	2,5	4	9	5
75	88	97	103	109+	60	44	16	7	2,5	4	9	5
80	95	105	108	114+	60	42	18	7	3	4	9	5
85	100	110	113	119+	60	42	18	7	3	4	9	5
90	105	115	118	124+	65	47	18	7	3	4	9	5
95	110	120	123	129+	65	47	18	7	3	4	9	5
100	115	125	128	134+	65	47	18	7	3	4	9	5

+ This dimension is larger than the minimum dimension indicated by DIN norm.

* The size d_4 is considered the minimum limit for the stuffing box diameter. Where possible, it is appropriate to choose a larger size or a conic stuffing box.

HYGIENIC SEALS

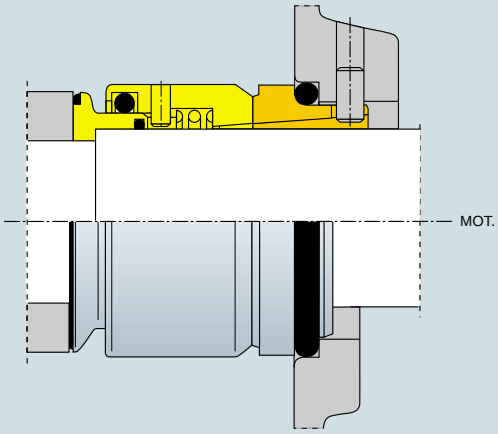
The types shown on these pages are suitable for hygienic, pharmaceutical, sterile and food application due to the following important characteristics:

- Spring outside of the media - no contact with the sealed fluid.
- Bi-directional rotation.
- Open design for easier CIP/SIP process.
- Possibility of shrunk faces.
- Surface finish accuracy (Ra < 0,8µm).
- Possibility to get clean profile secondary gaskets to reduce at minimum closed zones difficult to be cleaned.
- Wide flexibility to customize the installation dimensions according to the customer need.
- Internal balenced seal or external mounted suitable to work with pressure.
- Wide range of materials for faces an gaskets, including hi-tech hard facing. FDA, WRC, BAM, NFS approved materials under requirement.
- Possibility to supply metal parts in titanium.

For more information and technical support for the use of these models please contact our technical department.

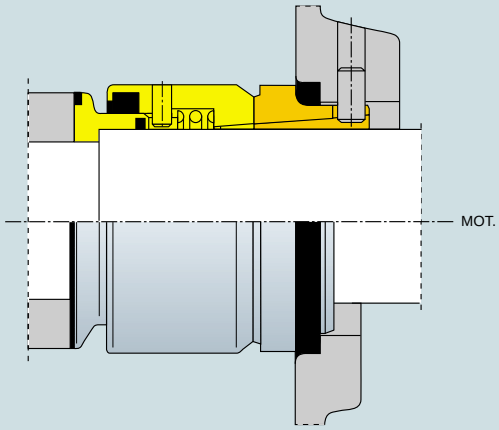
EHS3

Internal seal with driving between the shaft step and the impeller.



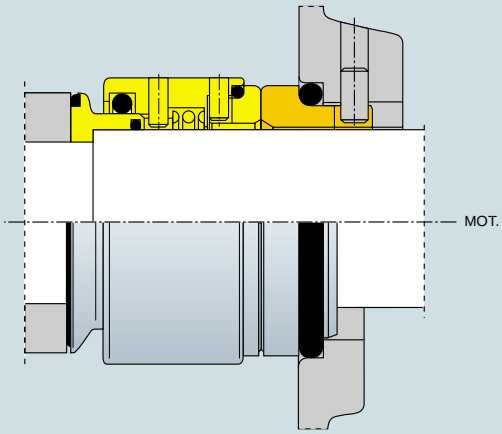
EHS3

Internal seal with special gasket design and with driving between the shaft step and the impeller.



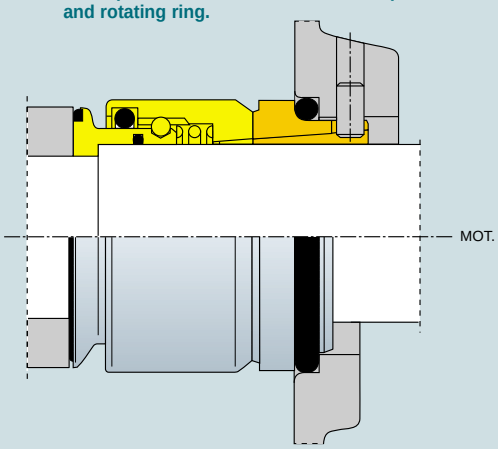
EH5

Internal seal with interchangeable faces and with driving between the shaft step and the impeller.



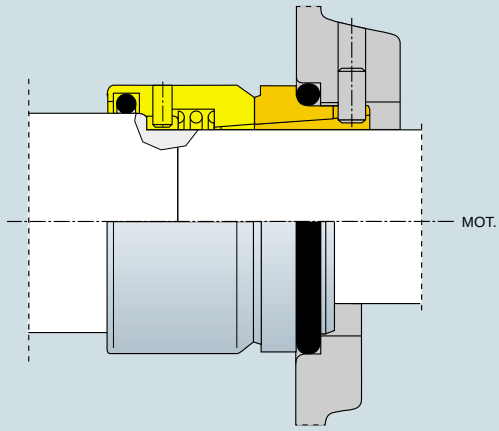
EBD

Internal seal with driving between the shaft step and the impeller and ball to trasmit the torque between sleeve and rotating ring.



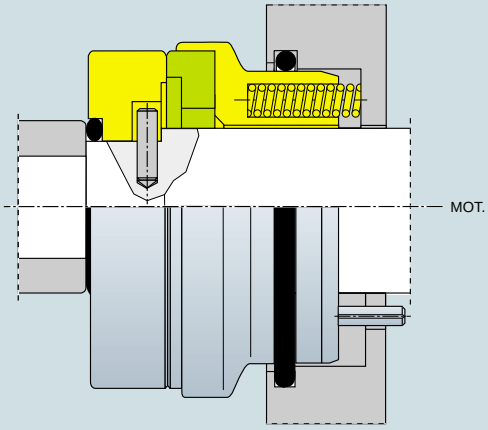
EHSR

Internal seal with pin drive in a shaft slot.



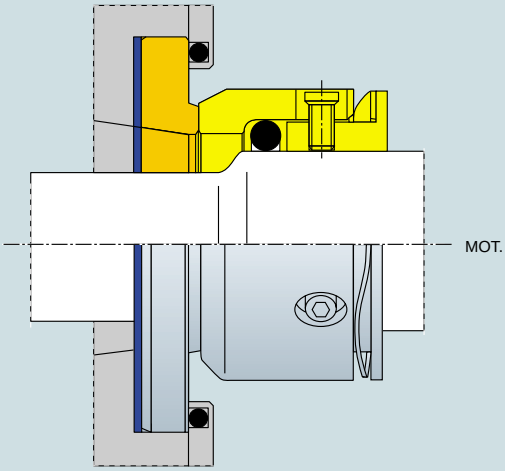
S

Internal seal with extenal spring and drive with pin on the shaft.



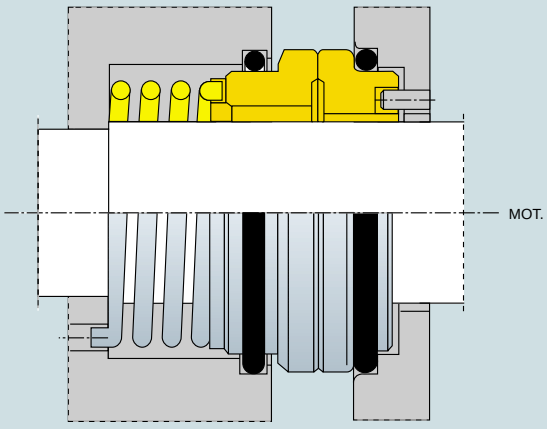
7KF

External seal.

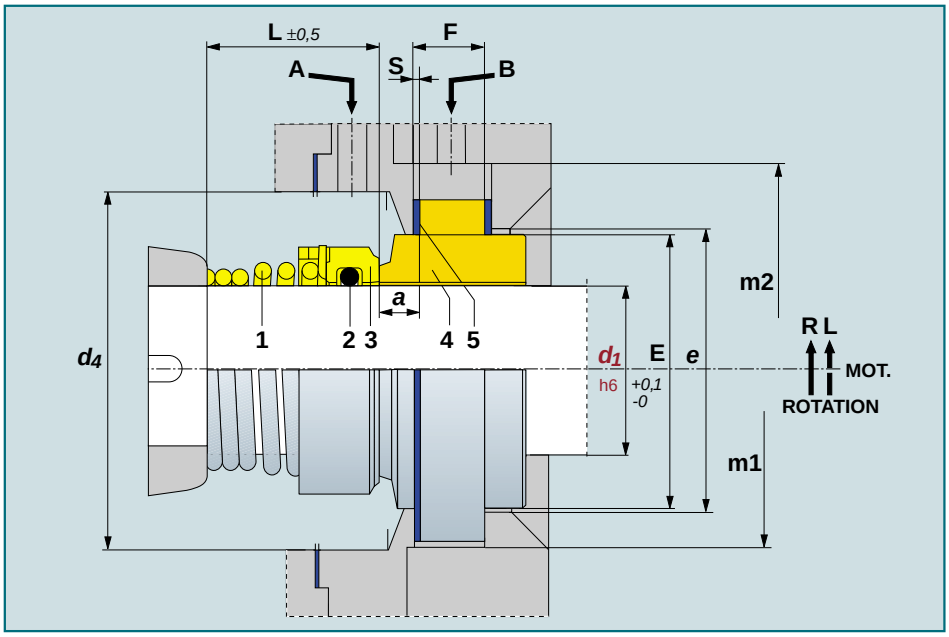


S2

Internal seal with external spring.

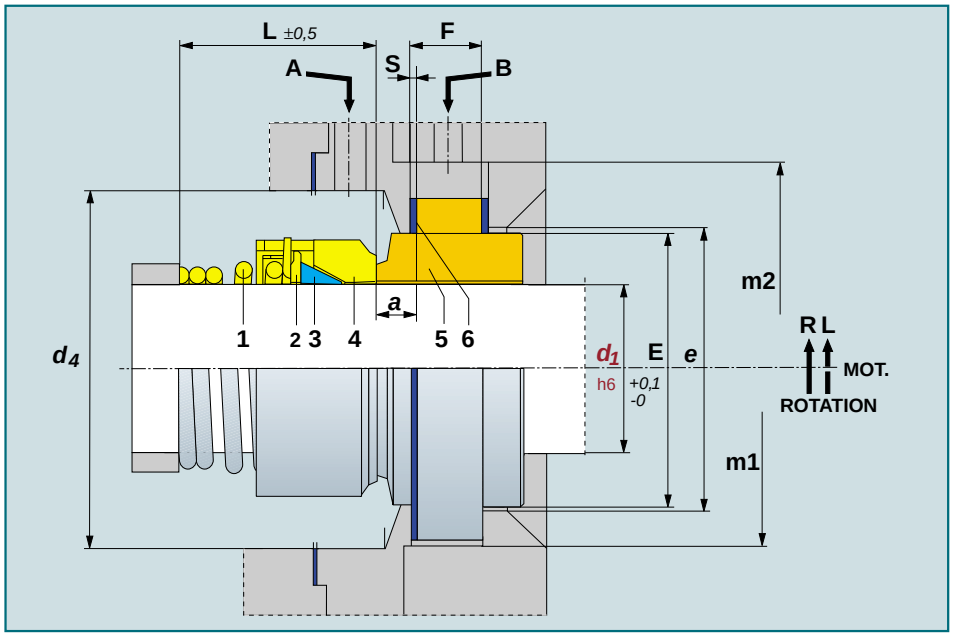


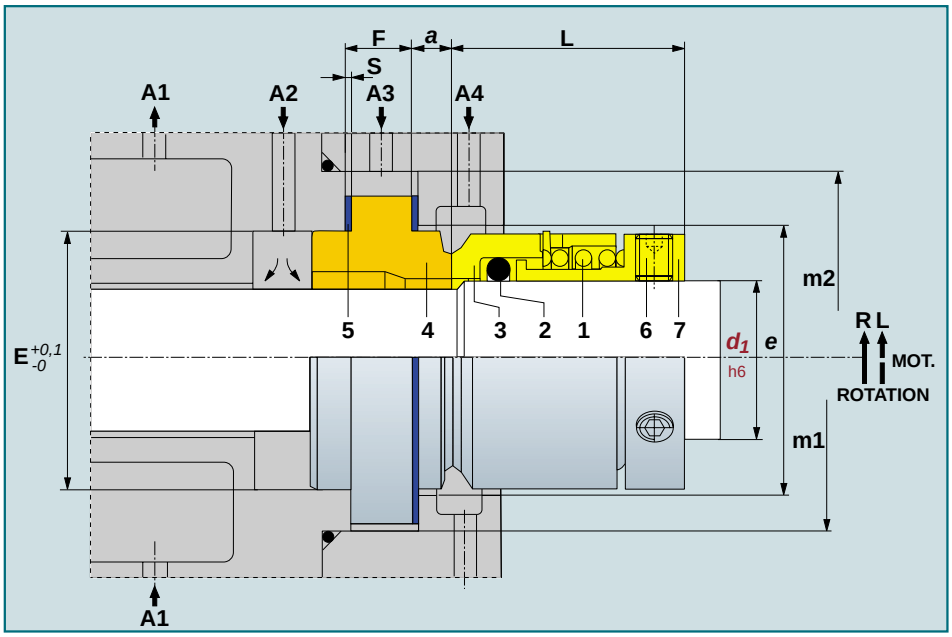
TYPE 2F 4F 7F



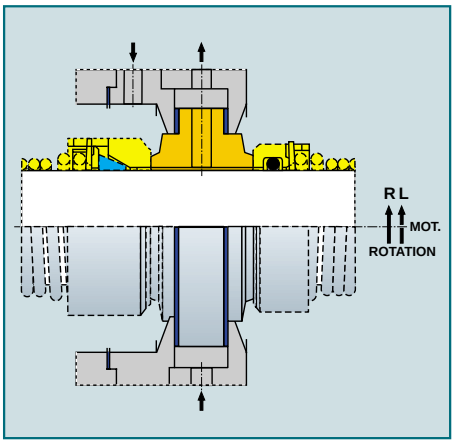
Type 2F
This model is different from TYPE 2 only in the stationary face with flat gaskets and mechanical tightening. By this technical solution it is possible to further extend the field of applications to products that solidify, polymerize or to high temperature fluids. With this seal type, cooling or heating are also possible without the help of particular additional plants.
A Delivery pumped fluid recirculation (Plan 11, API 682), eventually cooled (Plan 21, API 682).
B Cooling or heating of the stationary ring and of the eventual external seal box jacket by auxiliary circuit independent of the pumped medium.

Type 4F
This model is different from type 4 only in the stationary face with flat gaskets and mechanical tightening. By this technical solution it is possible to furtherly extend the field of applications to products that solidify, polymerize or high temperature fluids. With this seal type cooling or heating are also possible without the help of particular additional equipment.
A Delivery pumped fluid recirculation (Plan 11, API 682), eventually cooled (Plan 21, API 682).
B Cooling or heating of the stationary ring and of the eventual external seal box jacket by auxiliary circuit independent of the pumped medium.





Type 7F
This type combines all characteristics of type 7 with the possibility of flushing, cooling or heating offered by the stationary face as shown in the drawing.
A1 Cooling or heating circuit of the stuffing box jacket (Symbol C, API 682).
A2 Recirculation of the cooled or heated delivery pumped fluid (API 682, plan 11, 12, 21, 22, 31, 41).
A3 Heating or cooling circuit of the stationary seal ring that may be connected in parallel to A1 (API 682, symbol C, Q).
A4 External seal quench (API 682, plan 62).



In a stationary face we can operate one or more holes for cooling or flushing for sterile uses with installation of a double (DUAL) face-to-face seal.

The materials in which the stationary face can be delivered are: Z, 1, 3, 4.
The flat gaskets can be delivered in the following codes: 5, A and other special materials (under request).
As to the compatibility of the various rotary parts please refer to the pages concerning types 2, 4, 45, 7, 7K etc.

NB.: The amount of the drive screws of the stationary face should not be less than: 4 till ø 20 mm, 6 till ø 28 mm, 8 till ø 60 mm, 12 till ø 160 mm.

NB.: The stationary face ring is normally supplied with one gasket only.

ROTEN

TYPE 2F 4F

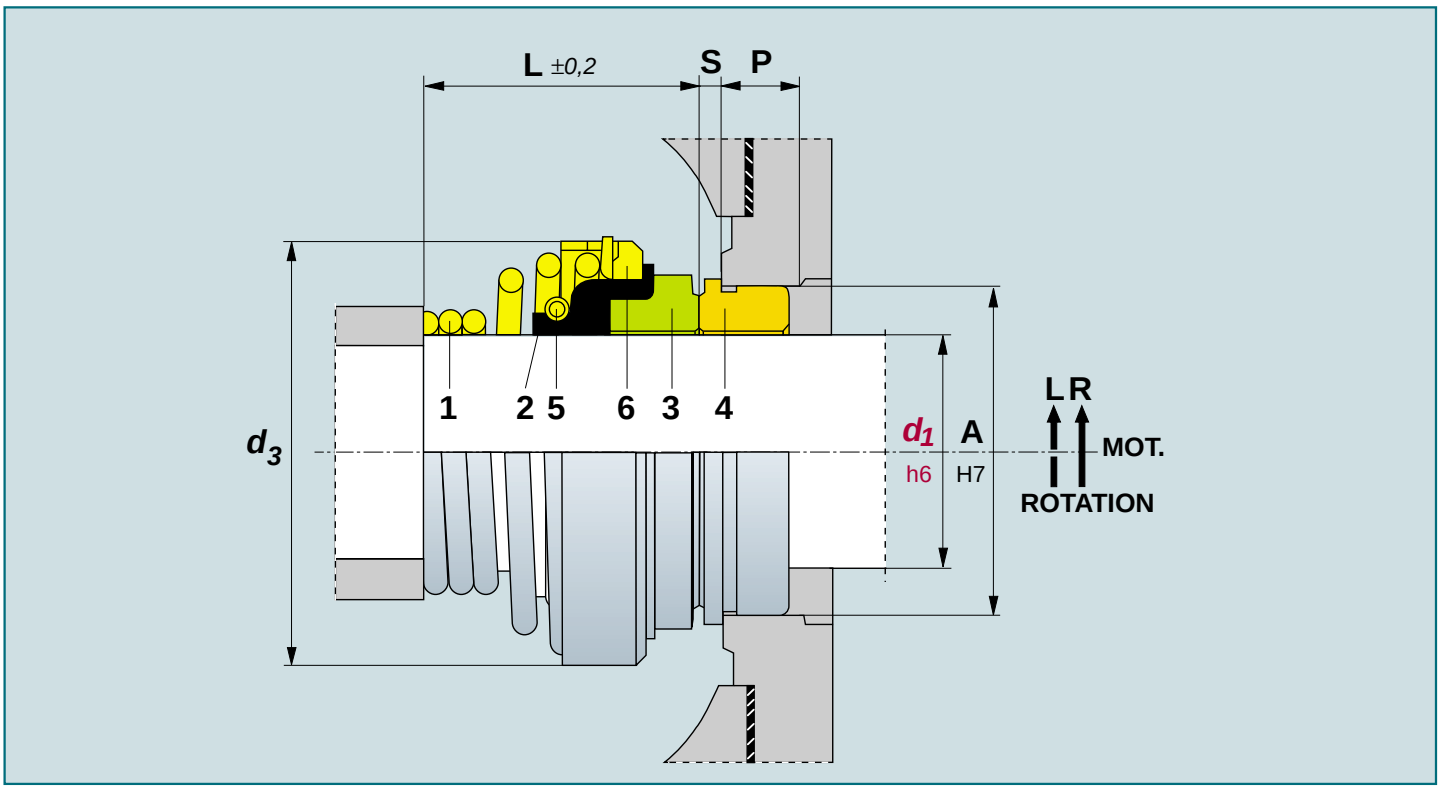
d_1	L	E	F	a	S	d_4	e	m1	m2
10	15	26	9	5	1	24	27,6	36,6	44
12	18	29	9	5	1	27	30,6	39,6	47
13÷15	22	29	9	5	1	31	30,6	39,6	47
16÷17	23	33	9	5	1	34	34,6	43,6	51
18	24	36	9	5	1	37	37,6	47,6	56
19	25	36	9	5	1	39	37,6	47,6	56
20	25	36	10	6	1	39	37,6	47,6	56
22	25	39	10	6	1	42	40,6	50,6	59
24	27	39	10	6	1	44	40,6	50,6	59
25÷26	27	42	10	6	1	48	43,6	53,6	62
28	29	46	12	7	1	50	48	60	70
30	30	46	12	7	1	53	48	60	70
32	30	50	12	7	1	53	52	65	76
33÷37	39	53	12	7	1	64	55	68	79
38	39	56	13	9	1	69	58	71	82
40÷43	39	63	13	9	1	69	65	78	89
44÷45	41	66	13	9	1	76	68	81	92
48	41	69	13	9	1	80	71	84	95
50	45	72	13	9	1	82	74	87	101
55	47	82	15,5	9	1,5	87	84,4	100,4	114
60	49	85	15,5	9	1,5	93	87,4	103,4	117
65	51	91	15,5	9	1,5	102	93,4	109,4	124
70	51	95	15,5	9	1,5	107	97,4	113,4	127
75	57	99	15,5	9	1,5	113	101,4	117,4	131
80	59	103	16,5	10	1,5	117	105,4	121,4	135
85	59	111	16,5	10	1,5	126	113,4	129,4	143
90	62	117	16,5	10	1,5	131	119,4	135,4	149
95	62	120	16,5	10	1,5	138	122,4	138,4	152
100	75	126	16,5	10	1,5	144	130	146	158
110	75	136	16,5	10	1,5	168	140	156	168
120	85	158	17,5	11	1,5	178	162	184	202
130	95	168	17,5	11	1,5	190	172	194	212
140	100	180	17,5	11	1,5	206	184	207	226
150	110	189	18,5	12	1,5	219	193	216	235
160	120	202	18,5	12	1,5	239	206	232	254

ROTEN

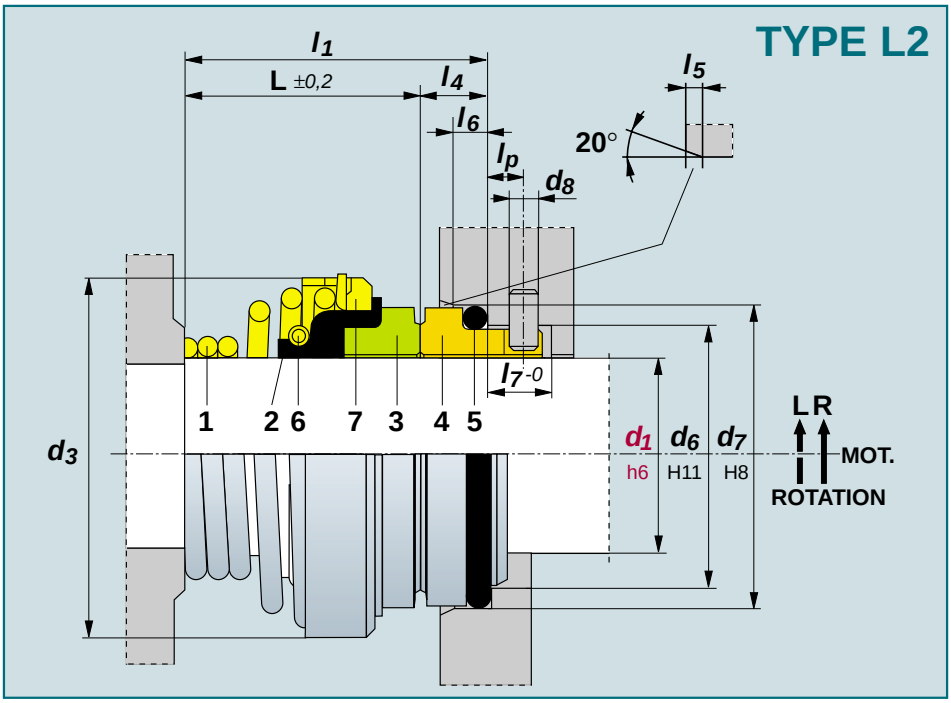
TYPE 7F

d_1	L	E	F	a	S	e	m1	m2
10	22	26	9	5	1	27,6	36,6	44
12÷13	24	29	9	5	1	30,6	39,6	47
14÷15	26	29	9	5	1	30,6	39,6	47
16÷17	27	33	9	5	1	34,6	43,6	51
18	28	36	9	5	1	37,6	47,6	56
19	30	36	9	5	1	37,6	47,6	56
20	31	36	10	6	1	37,6	47,6	56
22	31	39	10	6	1	40,6	50,6	59
24	34	39	10	6	1	40,6	50,6	59
25÷26	35	42	10	6	1	43,6	53,6	62
28	37	46	12	7	1	48	60	70
30	39	46	12	7	1	48	60	70
32	39	50	12	7	1	52	65	76
33÷35	44	53	12	7	1	55	68	79
38	47	56	13	9	1	58	71	82
40÷43	47	63	13	9	1	65	78	89
44÷45	51	66	13	9	1	68	81	92
48	51	69	13	9	1	71	84	95
50	54	72	13	9	1	74	87	101
55	57	82	15,5	9	1,5	84,4	100,4	114
60	57	85	15,5	9	1,5	87,4	103,4	117
65	60	91	15,5	9	1,5	93,4	109,4	124
70	60	95	15,5	9	1,5	97,4	113,4	127
75	80	99	15,5	9	1,5	101,4	117,4	131
80	85	103	16,5	10	1,5	105,4	121,4	135
85	88	111	16,5	10	1,5	113,4	129,4	143
90	93	117	16,5	10	1,5	119,4	135,4	149
95	97	120	16,5	10	1,5	122,4	138,4	152
100	108	126	16,5	10	1,5	130	146	158
110	113	136	16,5	10	1,5	140	156	168
120	120	158	17,5	11	1,5	162	184	202
130	125	168	17,5	11	1,5	172	194	212
140	147	180	17,5	11	1,5	184	207	226
150	147	189	18,5	12	1,5	193	216	235

TYPE L



TYPE L2



This model differs from others because of the lip type shaft seal and the press-fitted stationary seat (H7 - n6) without seal gaskets. It is particularly suited for applications with products or work conditions which O-Rings-gaskets are not able to satisfy (food, particularly viscous fluids or that tend to hinder the seal movement on the shaft or to form deposits between shaft and O-Ring). The L2-model can be delivered with both ROTEN and UNITEN stationary part with O-Ring stationary gasket.

Type L stationary ring mounting
Press the stationary seal ring into its housing with the help of a hand press (eventually after smearing it with suitable rubber-glue solution); during this operation take good care that the seal seat is protected by a plastic material round washer (PVC, PTFE, PVDF etc.).

POS. TYPE L	POS. TYPE L2	COMPONENTS	STANDARD MATERIALS							
1	1	Self-driving spring	E	X	L					
2	2	Lip rubber shaft gasket	6	7	8	Y				
3	3	Rotary seal ring	V	Z	1	3	4	K	R	2
	4	Stationary seal ring	V	Z	1	3	4	K	R	
4		Stationary gasket (O-Ring)	G	X	J	L	R			
	5	Garter spring	6	7	8	Y				
5	6	Garter spring	X							
6	7	Frame	G	X	L					

C.C. = stationary seal ring with short tail.

C.L. = stationary seal ring with extended tail and slot.

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	12 bar
t =	-35 ÷ 180 °C
v ≤	15 m/s

ROTEN

TYPE L

d_1	A	d_3	L	P	S
6	16	16	16	6	2
8	16	20	16	6	2
10	18	22	19	6	2
12	20	24	20,5	6,5	2,5
13	20	27	20,5	6,5	2,5
14	20	27	20,5	6,5	2,5
15	23	28	20,5	6,5	2,5
16	23	30	20,5	6,5	2,5
18	28	36	25,5	6,5	2,5
19	28	37	27	6,5	2,5
20	30	37	27,5	6,5	2,5
22	35	41,5	29,5	7,5	2,5
23	35	41,5	29,5	7,5	2,5
25	35	44,6	29,5	7,5	2,5
28	40	51,5	34	9,5	3
30	42	59	35	9,5	3
32	45	59	35	9,5	3
35	46	59	38,5	9,5	3,5
38	50	68	38,5	9,5	3,5
40	52	68	40	9,5	4
42	55	68	40	9,5	4
45	58	70	41	9,5	4
50	60	78	45	9,5	4
55	68	93	47	9,5	4
60	75	93	49	11	5
65	80	100	51	11	5
70	85	107	51	11	5

ROTEN

TYPE L2

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
6	10,6	13,1	16	20,5	16	4,5	2	1,2	2	6	3,5
8	13	17,1	20	21,5	16	5,5	2,8	1,2	2	6,2	3,5
10	14	18,1	22	24,5	19	5,5	2,8	1,2	2	6,2	3,5
12	16,5	20,6	24	26	20,5	5,5	2,8	1,2	2	6,2	3,5
13	19	23,1	27	26,5	20,5	6	2,8	1,2	2	6,7	4
14	19	23,1	27	26,5	20,5	6	2,8	1,2	2	6,7	4
15	21	26,9	28	27,5	20,5	7	3,7	1,3	2,5	7,6	4
16	21	26,9	30	27,5	20,5	7	3,7	1,3	2,5	7,6	4
18	25	30,9	36	33,5	25,5	8	3,7	1,3	3	8,5	4,5
19	25	30,9	37	35	27	8	3,7	1,3	3	8,5	4,5
20	25	30,9	37	35,5	27,5	8	3,7	1,3	3	8,5	4,5
22	30	35,4	41,5	37,5	29,5	8	3,7	1,8	3,5	8,5	5
23	30	35,4	41,5	37,5	29,5	8	3,7	1,8	3,5	8,5	5
25	33	38,2	44,6	38	29,5	8,5	3,7	1,8	4	9,1	5
28	38	43,3	51,5	43	34	9	3,7	1,8	4	9,6	6
30	38	43,3	59	44	35	9	3,7	1,8	4	9,6	6
32	38	43,3	59	44	35	9	3,7	1,8	4	9,6	6
35	45	53,5	59	50	38,5	11,5	5,4	2,1	5	12	7,5
38	52	60,5	68	50	38,5	11,5	5,4	2,1	5	12	7,5
40	52	60,5	68	51,5	40	11,5	5,4	2,1	5	12	7,5
42	52	60,5	68	51,5	40	11,5	5,4	2,1	5	12	7,5
45	57	65,5	70	52,5	41	11,5	5,4	2,1	5	13	8,5
50	64	72,5	78	56,5	45	11,5	5,4	2,1	5	13	8,5
55	64	72,5	93	58,5	47	11,5	5,4	2,1	5	13	8,5
60	72	79,3	93	60,5	49	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	100	62,5	51	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	107	62,5	51	11,5	5,4	2,1	5	13,5	8,5

EN 12756 UNITEN ISO 3069

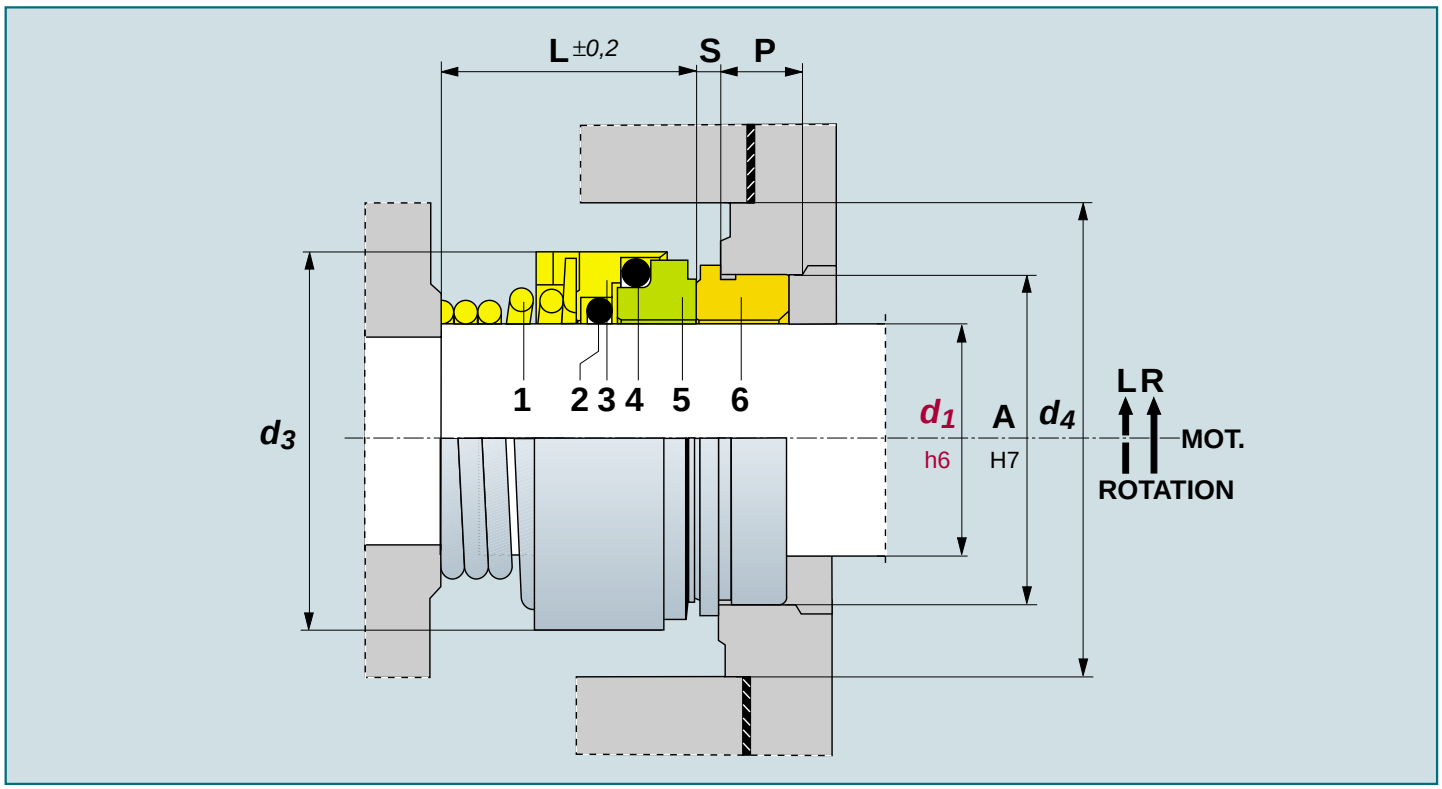
TYPE L2

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_p
10	17	21	22	26	19	7	4	1,5	3	8,5	5
12	19	23	24	27,5	20,5	7	4	1,5	3	8,5	5
14	21	25	27	27,5	20,5	7	4	1,5	3	8,5	5
16	23	27	30	27,5	20,5	7	4	1,5	3	8,5	5
18	27	33	36	35,5	25,5	10	5	2	3	9	5
20	29	35	37	37,5	27,5	10	5	2	3	9	5
22	31	37	41,5	39,5	29,5	10	5	2	3	9	5
24	33	39	41,5	39,5	29,5	10	5	2	3	9	5
25	34	40	44,6	39,5	29,5	10	5	2	3	9	5
28	37	43	51,5	44	34	10	5	2	3	9	5
30	39	45	59	45	35	10	5	2	3	9	5
32	42	48	59	45	35	10	5	2	3	9	5
33	42	48	59	48,5	38,5	10	5	2	3	9	5
35	44	50	59	48,5	38,5	10	5	2	3	9	5
38	49	56	68	51,5	38,5	13	6	2	4	9	5
40	51	58	68	53	40	13	6	2	4	9	5
43	54	61	70	54	41	13	6	2	4	9	5
45	56	63	70	54	41	13	6	2	4	9	5
48	59	66	78	59	45	14	6	2	4	9	5
50	62	70	78	59	45	14	6	2,5	4	9	5
53	65	73	93	61	47	14	6	2,5	4	9	5
55	67	75	93	61	47	14	6	2,5	4	9	5
58	70	78	93	63	49	14	6	2,5	4	9	5
60	72	80	93	63	49	14	6	2,5	4	9	5
63	75	83	100	65	51	14	6	2,5	4	9	5
65	77	85	100	65	51	14	6	2,5	4	9	5
68	81	90	107	67	51	16	7	2,5	4	9	5
70	83	92	107	67	51	16	7	2,5	4	9	5

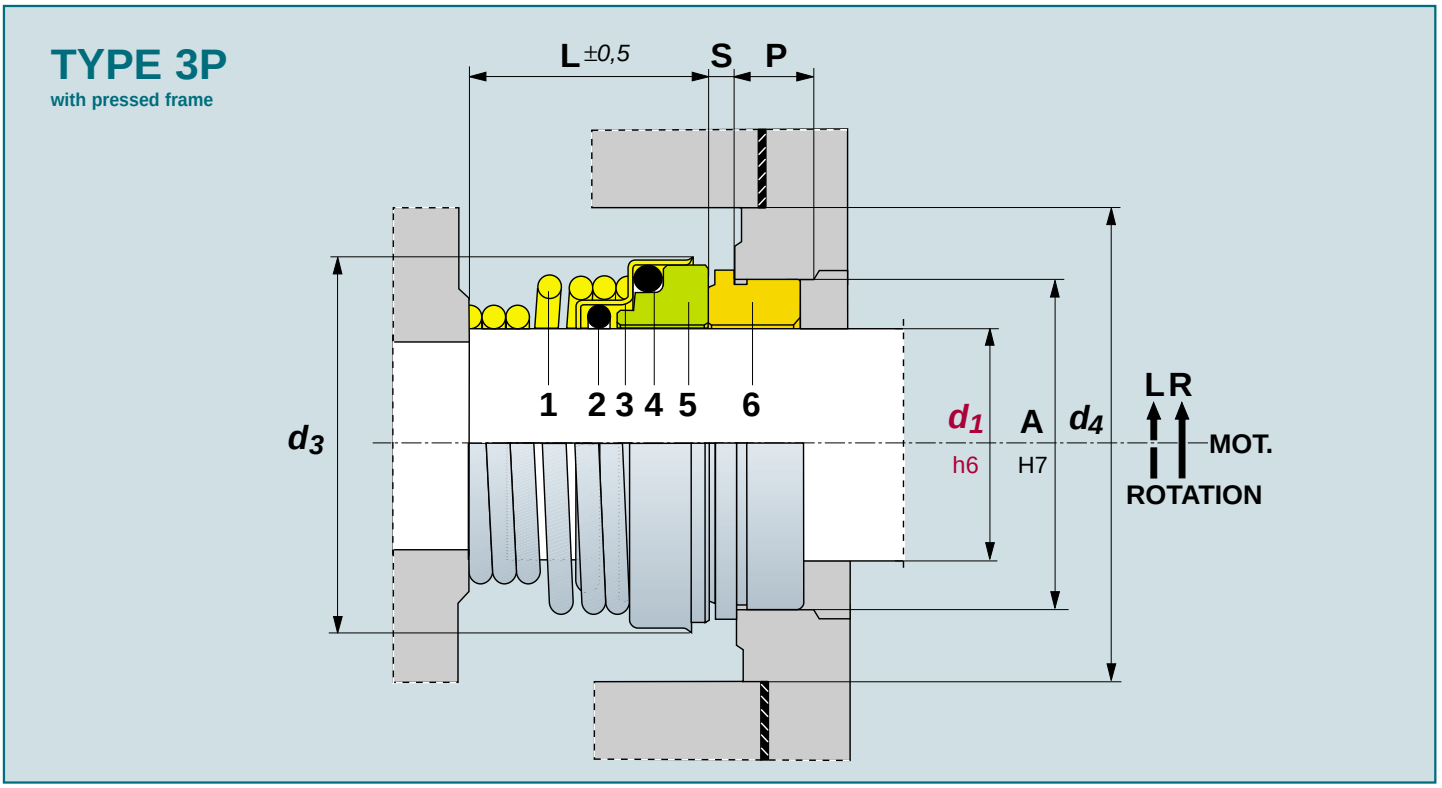
The UNITEN L2 seal only has the stationary part according to the DIN norm.

The LS version can be also supplied with a cylindrical spring and axial tang, and version UL2 with driving sleeve.

TYPE P



TYPE 3P
with pressed frame



POS. TYPE P 3P	COMPONENTS	STANDARD MATERIALS						
1	Self-driving spring	E	X	L				
2	Shaft gasket (O-Ring)	6	7	8	Y	F	W	B
3*	Frame	G	H*	X*	L			
4	Rotary gasket (O-Ring)	6	7	8	Y	F	W	B
5	Rotary seal ring	V	Z	1	4			
6	Stationary seal ring	G	X	L	J	R		

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	12 bar
t =	-35 ÷ 180°C
v ≤	10 m/s

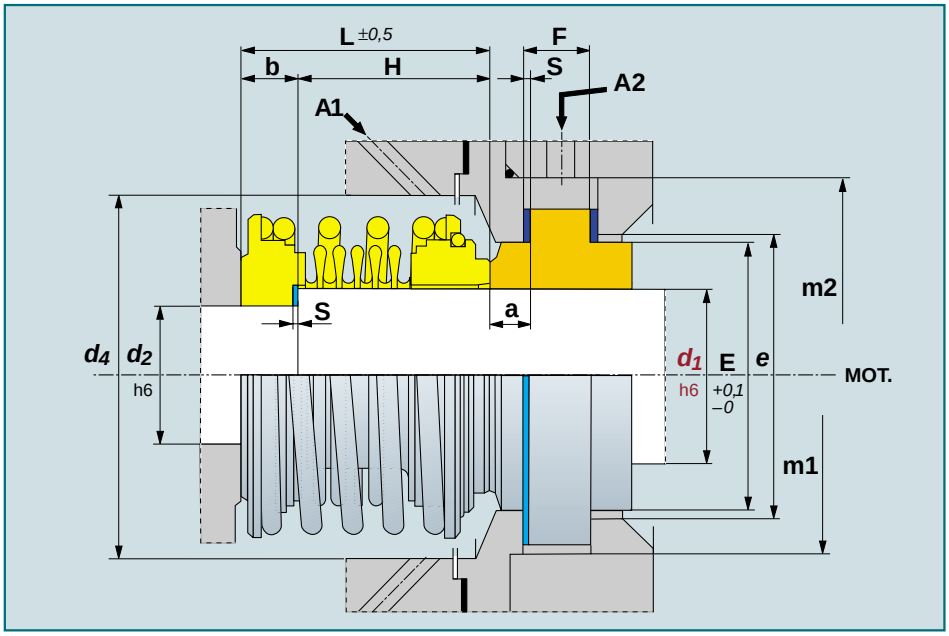
***** Type 3P: Code H up to ø 25
Code X up to ø 40
Code H not available for type P

This gasket-free mounting of the stationary seat favours the transmission of the temperature created by the rotating seal faces.

Stationary ring mounting
Press the stationary seal ring into its housing with the help of a hand press (eventually after smearing it with suitable rubber-glue solution); during this operation take good care that the seal seat is protected by a plastic material round washer (PVC, PTFE, PVDF etc.).

ROTEN								
TYPE P							3P	
d_1	A	d_3	d_4	L	P	S	d_3	L
6	16	14,8	22	16	6	2	-	-
8	16	18,3	24	16	6	2	-	-
10	18	19,3	28	19	6	2	20	19
12	20	22	28	20,5	6,5	2,5	22	20,5
13	20	24,4	30	20,5	6,5	2,5	25	20,5
14	20	24,4	30	20,5	6,5	2,5	25	20,5
15	23	29	32	20,5	6,5	2,5	29	20,5
16	23	28,2	34	20,5	6,5	2,5	29	20,5
18	28	33	40	25,5	6,5	2,5	33	25,5
19	28	32,5	40	27	6,5	2,5	33	27
20	30	32,5	44	27,5	6,5	2,5	33	27,5
22	35	37	48	29,5	7,5	2,5	38	29,5
23	35	37	49	29,5	7,5	2,5	38	29,5
25	35	40,5	49	29,5	7,5	2,5	40	29,5
28	40	45,6	57	34	9,5	3	46	34
30	42	47	60	35	9,5	3	46	35
32	45	46,5	60	35	9,5	3	46	35
35	46	56,5	68	38,5	9,5	3,5	50	38,5
38	50	63,5	68	38,5	9,5	3,5	56	38,5
40	52	63,5	70	40	9,5	4	58	40
42	55	63,5	74	40	9,5	4	-	-
45	58	68,5	74	41	9,5	4	-	-
50	60	74,7	84	45	9,5	4	-	-
55	68	74,7	98	47	9,5	4	-	-
60	75	90	105	49	11	5	-	-
65	80	88,1	110	51	11	5	-	-
70	85	107	115	51	11	5	-	-
75	90	98,1	120	57	11	5	-	-
80	98	103,5	128	59	11	5	-	-
85	103	109,5	135	59	11	5	-	-
90	108	115,5	148	62	11	5	-	-
95	113	123	154	62	11	5	-	-
100	120	136,5	167	75	13	6	-	-
110	130	142	178	75	13	6	-	-
120	140	-	182	85	13	6	-	-
130	150	166	193	95	13	6	-	-
135	155	-	200	95	13	6	-	-
140	160	178	210	100	13	6	-	-
150	170	188	215	110	13	6	-	-

TYPE RF



A metal bellow type seal suitable for very high or very low temperatures and other applications where elastomer or PTFE gaskets could cause problems.
A1 Delivery pumped fluid recirculation, cooled or heated (API 682, plan 11, 12, 21, 22, 31, 41).
A2 Cooling or heating of the clamped stationary seat (API 682, symbol C, Q).

MAX. WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	8 bar
t =	-70 ÷ 350 °C
v ≤	10 m/s

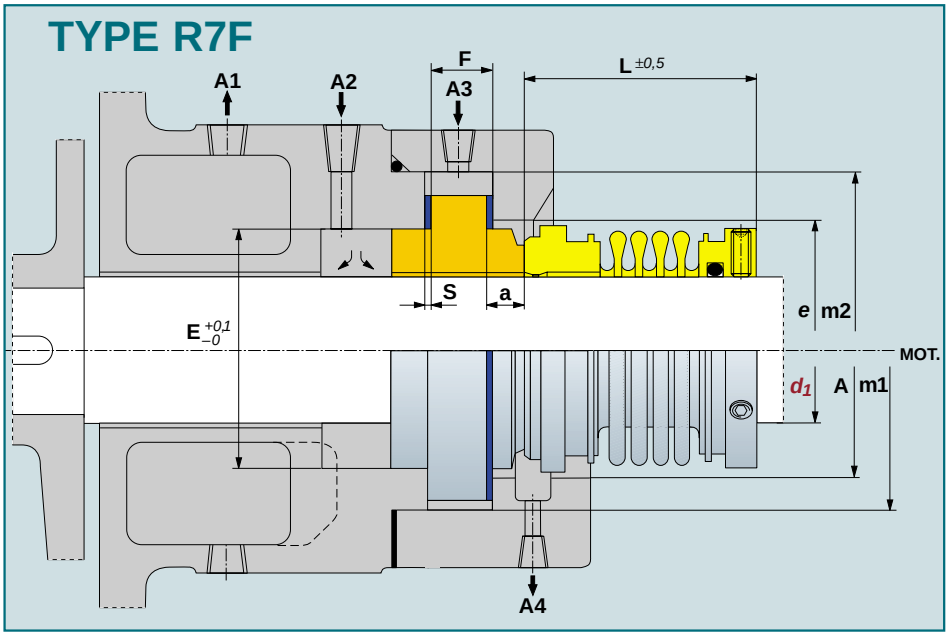
COMPONENTS	STANDARD MATERIALS			
Metallic parts	X			
Rotary seal ring	3	J		
Stationary seal ring	3	V	Z	1
Gaskets	A	5		

N.B.: The tightening of the stationary lip seal ring must be done with the maximum care, operating on the screws by progressive actions. The drive screws amount of the stationary face should not be less than: 4 till ø 20 mm, 6 till ø 28 mm, 8 till ø 60, 12 till ø 160 mm.

The cooling circuits shown in the two drawings must be used according to the requirements of the application.

ROTEN R7F is a bellow type seal for external mounting.
A1 Independent main cooling box (symbol C, API 682).
A2 Indispensable flushing, drainage and cooling circuit derived from the pump delivery(Plan 11,12,21,22,31,41, API 682)
A3 Separated cooling box of the stationary face; it can be in series with the A1-box(symbol C,Q, API 682).
A4 Eventual waste-pipe (Plan 62 API 682).

TYPE R7F



MAX.WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	8 bar
t =	-50 ÷ 250 °C
v ≤	10 m/s

ROTEN

TYPE RF

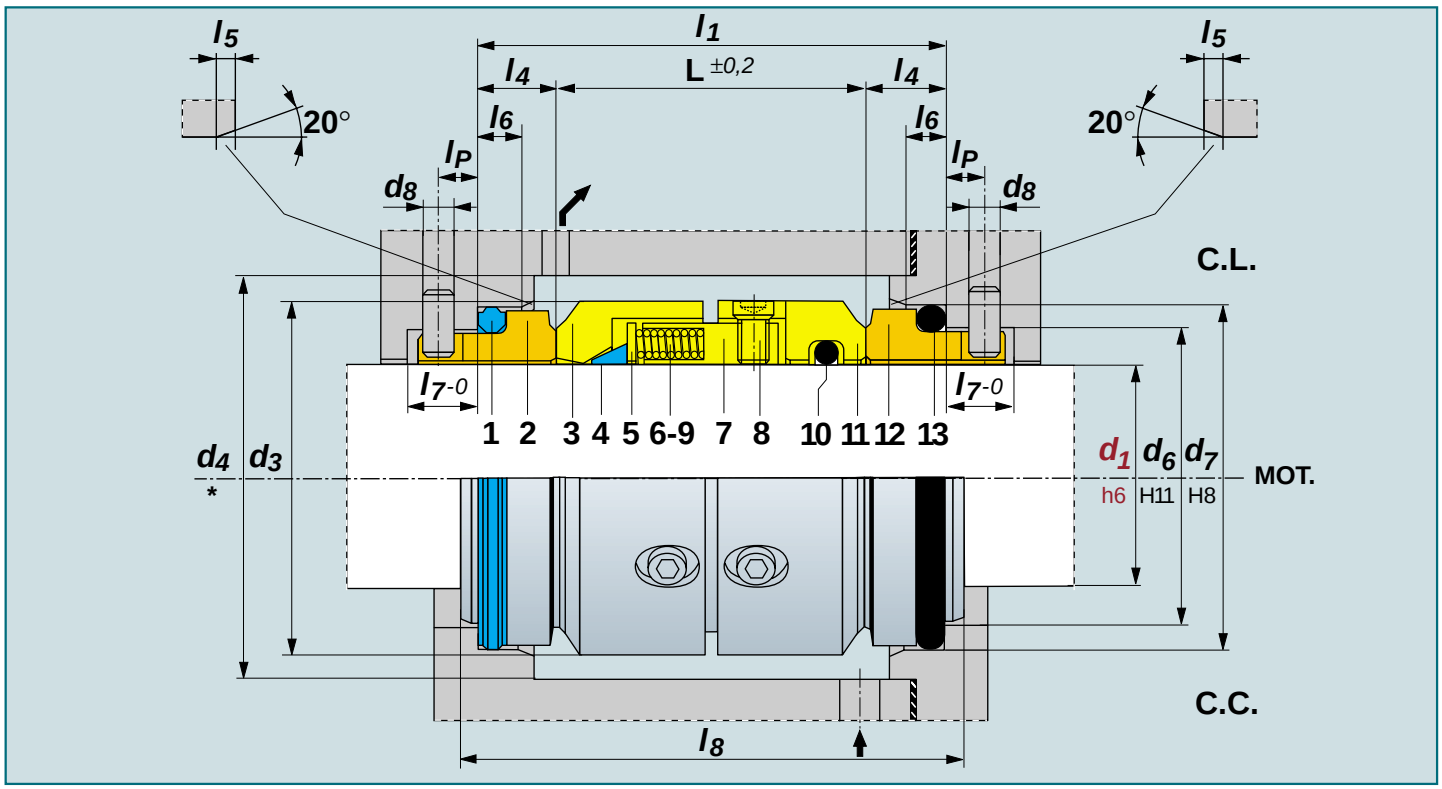
d_1	d_2	L	H	b	E	F	a	S	e	m1	m2	d_4
18	12	32	25	7	36	9	5	1	37,6	47,6	56	48
20	14	34	27	7	36	10	6	1	37,6	47,6	56	48
22	16	38	29	9	39	10	6	1	40,6	50,6	59	52
24	16	40	31	9	39	10	6	1	40,6	50,6	59	52
25	18	40	31	9	42	10	6	1	43,6	53,6	62	52
28	20	43	32	11	46	12	7	1	48	60	70	65
30	24	43	32	11	46	12	7	1	48	60	70	65
32	26	47	34	13	50	12	7	1	52	65	76	70
35	28	47	34	13	53	12	7	1	55	68	79	70
38	30	48	34	14	56	13	9	1	58	71	82	80
40	32	50	35	15	63	13	9	1	65	78	89	90
42	33	50	35	15	63	13	9	1	65	78	89	90
45	35	50	35	15	66	13	9	1	68	81	92	90
48	40	55	40	15	69	13	9	1	71	84	95	100
50	40	55	40	15	72	13	9	1	74	87	101	100
55	45	55	37	18	82	15,5	9	1,5	84,4	100,4	114	100
60	50	55	37	18	85	15,5	9	1,5	87,4	103,4	117	120
65	55	60	40	20	91	15,5	9	1,5	93,4	109,4	124	120
70	60	65	45	20	95	15,5	9	1,5	97,4	113,4	127	130
75	65	65	45	20	99	15,5	9	1,5	101,4	117,4	131	130

ROTEN

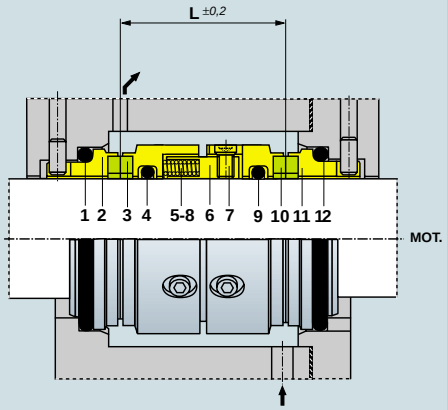
TYPE R7F

d_1	L	E	F	a	S	A	e	m1	m2
18	38	36	9	5	1	36	37,6	47,6	56
20	38	36	10	6	1	36	37,6	47,6	56
22	39,5	39	10	6	1	38,5	40,6	50,6	59
24	39,5	39	10	6	1	38,5	40,6	50,6	59
25	39,5	42	10	6	1	38,5	43,6	53,6	62
28	46	46	12	7	1	47	48	60	70
30	46	46	12	7	1	47	48	60	70
32	48	50	12	7	1	50	52	65	76
35	48	53	12	7	1	55	55	68	79
38	50	56	13	9	1	58	58	71	82
40	50	63	13	9	1	61	65	78	89
43	53	63	13	9	1	64	65	78	89
45	53	66	13	9	1	68	68	81	92
48	55	69	13	9	1	70	71	84	95
50	55	72	13	9	1	74	74	87	101
55	58	82	15,5	9	1,5	76	84,4	100,4	114
60	58	85	15,5	9	1,5	81	87,4	103,4	117
65	60	91	15,5	9	1,5	87	93,4	109,4	124
70	65	95	15,5	9	1,5	92	97,4	113,4	127
75	68	99	15,5	9	1,5	98	101,4	117,4	131

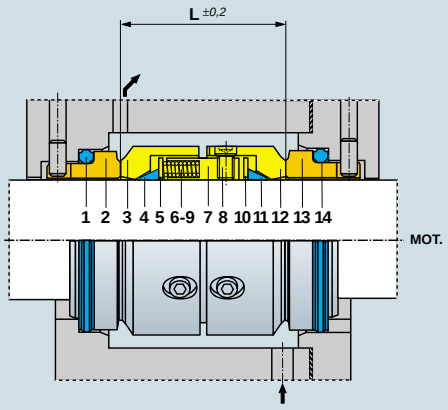
TYPE 842



TYPE 822



TYPE 844



It is a double pressurized back-to-back compact and BIDIRECTIONAL multi-spring seal. Of easy mounting, it may be supplied in materials that are available to types 2 and 4.

In the 822 version all gaskets are in elastomer (O-Rings), while in the 844 version they are all in PTFE.

In order to use this model, you must provide an auxiliary liquid circulation with higher pressure than that of the sealed fluid.

POS. TYPE 822	POS. TYPE 842	POS. TYPE 844	COMPONENTS	STANDARD MATERIALS									
1	1	1	Stationary gasket	0*	4*	5	6	7	8	Y	F	W	B
2	2	2	Stationary seal ring	V	Z	1	3	4	K	R			
3	3	3	Rotary seal ring	G	X	J	3	L					
4	4	4	Shaft gasket	0*	4*	5	6	7	8	Y	F	W	B
	5	5	Gasket thrust washer	X	L								
5	6	6	Spring	X	L								
6	7	7	Sleeve	X	L								
7	8	8	Grub screws	H	X	L							
8	9	9	Spring	X	L								
		10	Gasket thrust washer	X	L								
9	10	11	Shaft gasket	0*	4*	5	6	7	8	Y	F	W	B
10	11	12	Rotary seal ring	G	X	J	3	L					
11	12	13	Stationary seal ring	V	Z	1	3	4	K	R			
12	13	14	Stationary gasket	0*	4*	5	6	7	8	Y	F	W	B

C.C. = stationary seal ring with short tail

C.L. = stationary seal ring with extended tail and slot

***** = For particular conditions, the shaft and stationary gaskets may be delivered also in codes 0 and 4 (only for types 842 and 844).

MAX.WORKING CONDITIONS

These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤	16 bar
t =	-35 ÷ 180 °C
v ≤	15 m/s

ROTEN

TYPE 822 842 844

d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_8	l_p
22	30	35,4	36	41	53	37	8	3,7	1,8	3,5	8,5	55,4	5
24	30	35,4	39	41	53	37	8	3,7	1,8	3,5	8,5	55,4	5
25	33	38,2	40	45	54	37	8,5	3,7	1,8	4	9,1	57	5
28	38	43,3	43	48	57	39	9	3,7	1,8	4	9,6	61	6
30	38	43,3	46	50	60	42	9	3,7	1,8	4	9,6	64	6
32	38	43,3	46,5	50	60	42	9	3,7	1,8	4	9,6	64	6
33	45	53,5	53	60	68	45	11,5	5,4	2,1	5	12	73,4	7,5
35	45	53,5	53	60	68	45	11,5	5,4	2,1	5	12	73,4	7,5
38	52	60,5	56	63	75	52	11,5	5,4	2,1	5	12	80,4	7,5
40	52	60,5	58	65	75	52	11,5	5,4	2,1	5	12	80,4	7,5
42	52	60,5	61	68	75	52	11,5	5,4	2,1	5	12	80,4	7,5
43	52	60,5	61	68	75	52	11,5	5,4	2,1	5	12	80,4	7,5
44	57	65,5	66	72	78	55	11,5	5,4	2,1	5	13	80,4	8,5
45	57	65,5	66	72	78	55	11,5	5,4	2,1	5	13	85,4	8,5
48	57	65,5	69	75	78	55	11,5	5,4	2,1	5	13	85,4	8,5
50	64	72,5	71	80	80	57	11,5	5,4	2,1	5	13	89,4	8,5
55	64	72,5	76	83	85	62	11,5	5,4	2,1	5	13	92,4	8,5
60	72	79,3	88	95	95	72	11,5	5,4	2,1	5	13,5	108,4	8,5
65	77	84,5	93	100	95	72	11,5	5,4	2,1	5	13,5	108,4	8,5
70	82	89,5	98	105	95	72	11,5	5,4	2,1	5	13,5	108,4	8,5
75	87	94,5	100	107	101	78	11,5	5,4	2,1	5	13,5	114,4	8,5
80	92	99,5	105	112	101	78	11,5	5,4	2,1	5	13,5	114,4	8,5
85	98	105,5	118	125	109	82	13,5	5,4	2,6	5	13,5	122,4	8,5
90	105	111,5	120	127	109	82	13,5	5,4	2,6	5	13,5	122,4	8,5
95	110	116,5	126	133	114	87	13,5	5,4	2,6	5	13,5	127,4	8,5
100	114	119,5	132	140	119	92	13,5	5,4	2,6	5	13,5	132,4	8,5
110	124	132,2	150	158	129	94	17,5	7,1	3,9	5	13,5	143	8,5
120	134	142,2	160	168	136	101	17,5	7,1	3,9	5	13,5	150	8,5
130	145	153,2	175	183	136	101	17,5	7,1	3,9	5	13,5	150	8,5
135	152	161,2	180	188	142	105	18,5	7,1	3,9	5	13,5	156	8,5
140	157	164,3	185	193	147	110	18,5	7,1	3,9	5	13,5	161	8,5
150	167	174,2	195	203	147	110	18,5	7,1	3,9	5	13,5	161	8,5

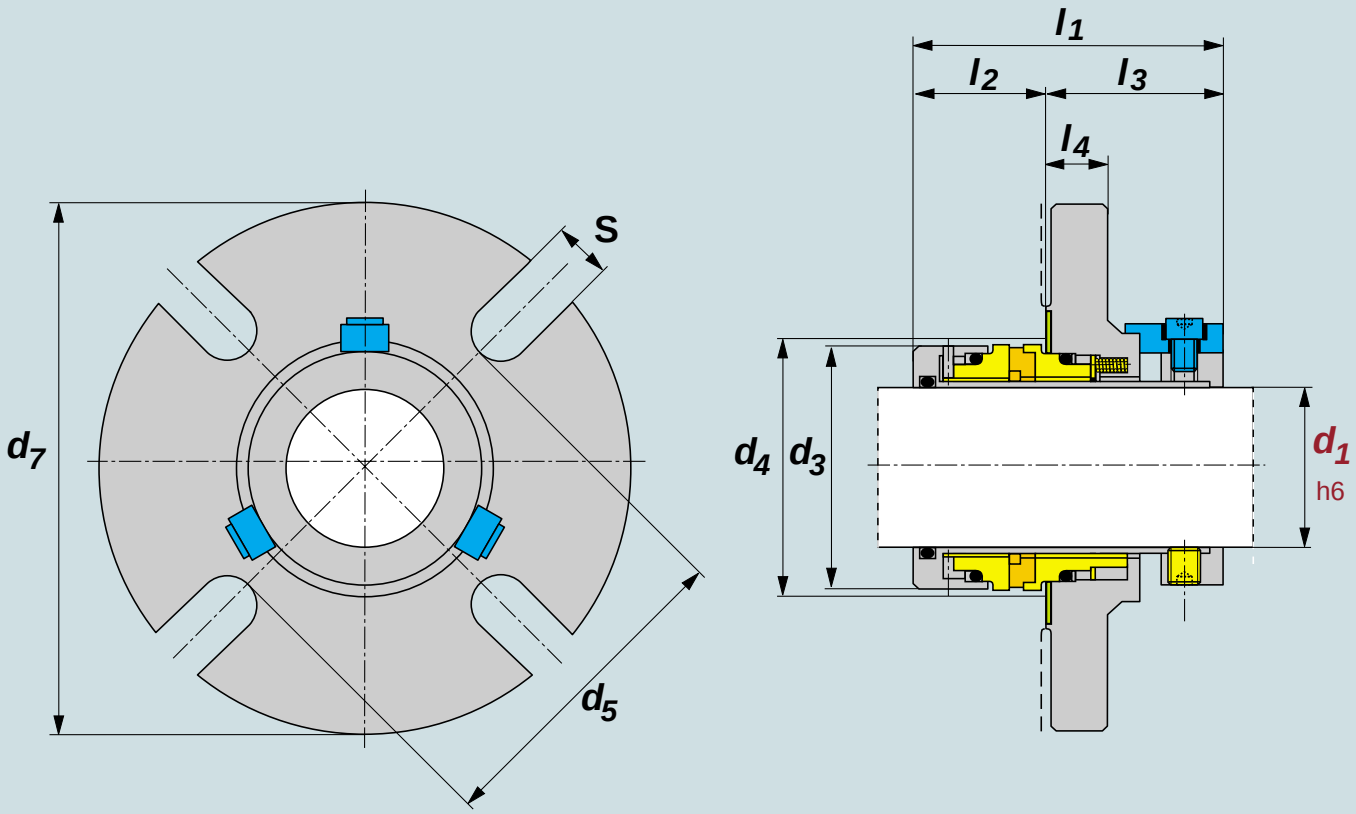
EN 12756 **UNITEN** ISO 3069

TYPE 822 842 844

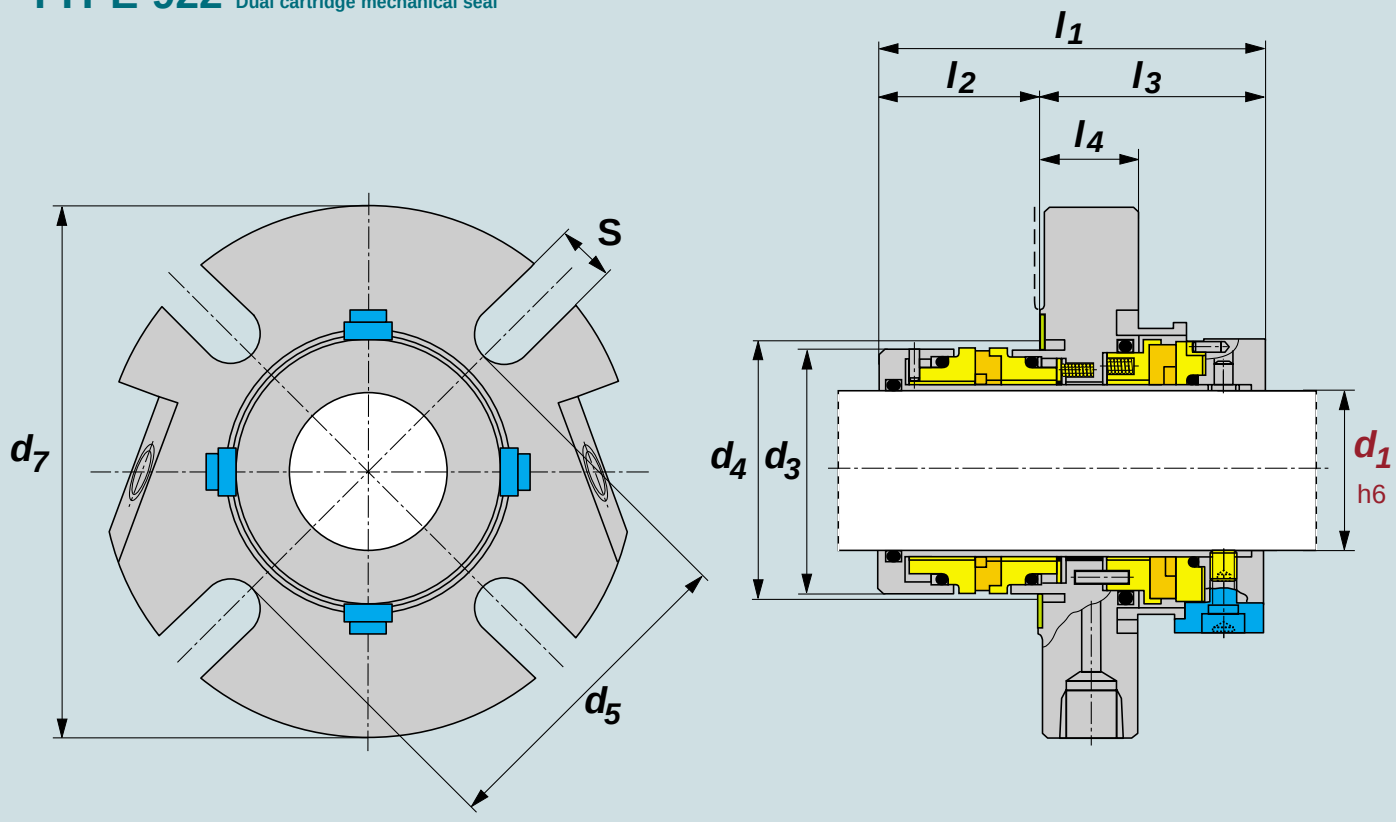
d_1	d_6	d_7	d_3	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_8	l_p
22	31	37	36	38	57	37	10	5	2	3	9	62	5
24	33	39	39	40	57	37	10	5	2	3	9	62	5
25	34	40	40	41	57	37	10	5	2	3	9	62	5
28	37	43	43	44	59	39	10	5	2	3	9	64	5
30	39	45	45	46	62	42	10	5	2	3	9	67	5
32	42	48	46,5	48	62	42	10	5	2	3	9	67	5
33	42	48	53	55+	65	45	10	5	2	3	9	70	5
35	44	50	53	55+	65	45	10	5	2	3	9	70	5
38	49	56	56	58	78	52	13	6	2	4	9	83	5
40	51	58	58	60	78	52	13	6	2	4	9	83	5
43	54	61	61	63	78	52	13	6	2	4	9	83	5
45	56	63	66	68+	81	55	13	6	2	4	9	86	5
48	59	66	69	71+	81	55	13	6	2	4	9	86	5
50	62	70	71	73+	85	57	14	6	2,5	4	9	90	5
53	65	73	74	76+	90	62	14	6	2,5	4	9	95	5
55	67	75	76	78+	90	62	14	6	2,5	4	9	95	5
58	70	78	88	90+	100	72	14	6	2,5	4	9	105	5
60	72	80	88	90+	100	72	14	6	2,5	4	9	105	5
63	75	83	93	97+	100	72	14	6	2,5	4	9	105	5
65	77	85	93	97+	100	72	14	6	2,5	4	9	105	5
68	81	90	98	102+	104	72	16	7	2,5	4	9	109	5
70	83	92	98	102+	104	72	16	7	2,5	4	9	109	5
75	88	97	100	104	110	78	16	7	2,5	4	9	115	5
80	95	105	105	109	114	78	18	7	3	4	9	118	5
85	100	110	118	122+	118	82	18	7	3	4	9	122	5
90	105	115	120	124+	118	82	18	7	3	4	9	122	5
95	110	120	132	136+	123	87	18	7	3	4	9	127	5
100	115	125	132	136+	128	92	18	7	3	4	9	132	5

+ This size is larger than the minumum prescribed by the DIN norm.
⋆ The size d_4 is considered the minimum dimension for the stuffing box diameter. Where possible, it is better to have a larger dimension or a conical stuffing box.

TYPE 902 Cartridge mechanical seal



TYPE 922 Dual cartridge mechanical seal



ROTEN

TIP0 902

d_1	d_3	d_4 min	d_4 max	l_1	l_2	l_3	l_4	d_5	d_7	S
25	43	44	52	68	29,5	38,5	21	64	102	12,5
28	46	47	55	68	29,5	38,5	21	67	105	12,5
30	48	49	57	68	29,5	38,5	21	67	105	12,5
32	50	52	60	68	29,5	38,5	21	70	110	12,5
33	51	52	60	68	29,5	38,5	21	70	110	12,5
35	53	54	62	68	29,5	38,5	21	72	115	12,5
38	56	59	67	68	29,5	38,5	21	75	125	12,5
40	58	59	67	68	29,5	38,5	21	75	125	12,5
43	60	64	72	68	29,5	38,5	21	82	141	14
45	63	64	72	68	29,5	38,5	21	82	141	14
48	66	69	77	68	29,5	38,5	21	87	150	14
50	68	69	77	68	29,5	38,5	21	87	150	14
55	73	74	82	68	29,5	38,5	21	92	150	17,5
60	78	79	87	68	29,5	38,5	21	102	157	17,5
65	87	88	97	70	31	39	22	109	168	17,5
70	92	93	102	70	31	39	22	118	168	17,5
75	99,5	100,5	116	83	39	44	22	128,5	190	17,5
80	104,5	105,5	123	83	39	44	22	135	190	17,5
85	109,5	110,5	127	83	39	44	22	139	210	20,5
90	114,5	115,5	131	83	39	44	22	143	210	20,5
95	119,5	120,5	135	83	39	44	22	147,5	210	20,5
100	124,5	125,5	141	83	39	44	22	153,5	218	20,5

If required, it is possible to manufacture some seals with Customers dimensions.

ROTEN

TYPE 922

d_1	d_3	d_4 min	d_4 max	l_1	l_2	l_3	l_4	d_5	d_7	S
28	46	47	55	85,1	35,5	49,6	21	67	105	12,5
30	48	49	57	85,1	35,5	49,6	21	67	105	12,5
32	50	52	60	85,1	35,5	49,6	21	70	110	12,5
33	50	52	60	85,1	35,5	49,6	21	70	110	12,5
35	53	54	62	85,1	35,5	49,6	21	72	115	12,5
38	56	59	67	85,1	35,5	49,6	21	77	125	12,5
40	58	59	67	85,1	35,5	49,6	21	77	125	14,7
43	60	64	72	85,1	35,5	49,6	21	82	133	14,7
45	63	64	72	85,1	35,5	49,6	21	82	141	14,7
48	66	69	77	85,1	35,5	49,6	21	87	141	14,7
50	68	69	77	85,1	35,5	49,6	21	87	150	14,7
55	73	74	82	85,1	35,5	49,6	21	92	150	17,5
60	78	79	87	86,1	36,5	49,6	21	102	157	17,5
65	87	88	97	85	36	49	22	109	165	17,5
70	92	93	102	85	36	49	22	118	180	17,5
75	99,5	100,5	116	110,5	51,5	59	22	128,5	190	17,5
80	104,5	105,5	123	110,5	51,5	59	22	135	190	17,5
85	109,5	110,5	127	110	51	59	22	139	210	20,5
90	114,5	115,5	131	110	51	59	22	143	210	20,5
95	119,5	120,5	135	110	51	59	22	147,5	210	20,5
100	124,5	125,5	141	110	51	59	22	153,5	218	20,5

If required, it is possible to manufacture some seals with Customers dimensions.

This kind of mechanical seal with interchangeable components “Type 900” single or double, can be utilized for many application without any modification of the pump or of the equipment.
The possibility to change the single component, indipendently of each other, makes this mechanical seal very appreciated and of easy application.
Flanges according to ANSI - API - IPP - DIN - ISO - JIS - can be accepted.
Considering the special nature of these mechanical “cartridge” seals, we suggest to ask always our technical department for the most suitable materials.

SPECIAL VERSIONS

Type 877

Type 8E5

Type SP

We can realize special mechanical seals not shown in this catalogue or according customers drawing, if requested.

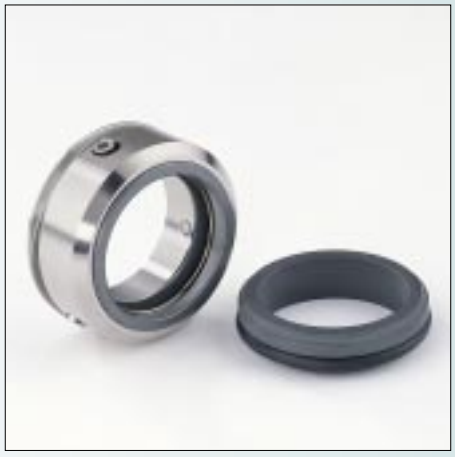
TITANIUM MECHANICAL SEALS

Corrosion resitant material, light, with good mechanical carachteristics. Suitable for applications were the S.S. cannot be used.

In comparision with the super-alloys has a better cost/performance ratio. Particularly suitable for pharmaceutical and food applications.

Types 33H, EHS, EH5, EBDH, EBD5. We can produce also other types not shown in this page.

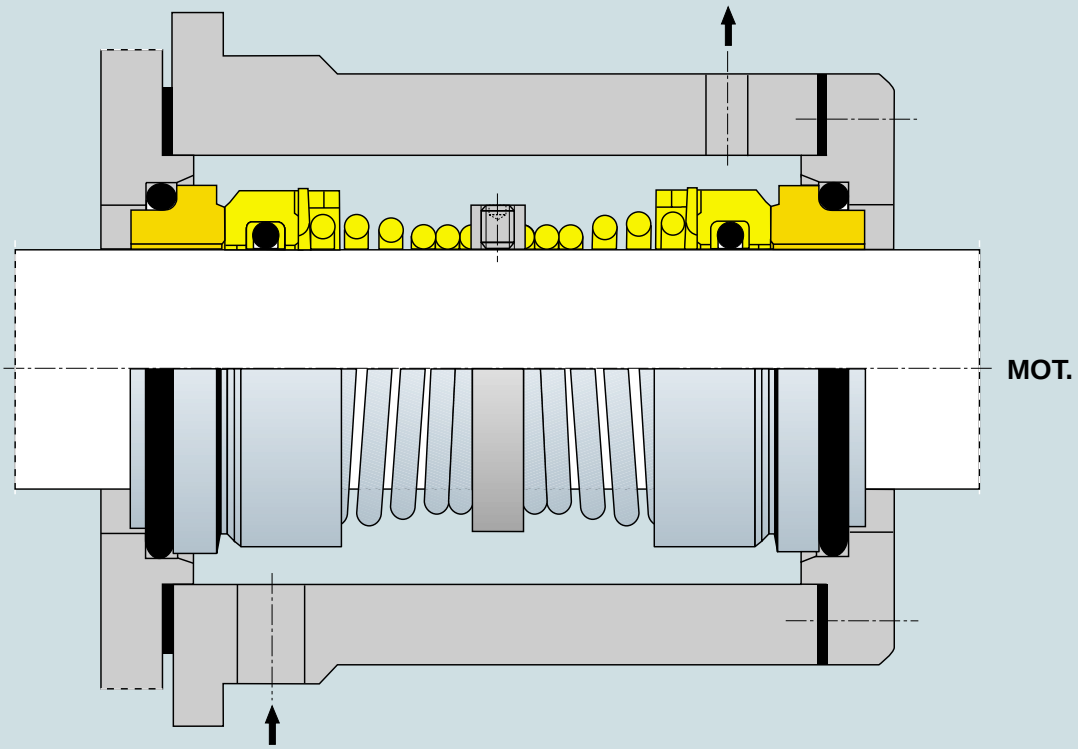
Type 33H, all material parts are in titanium including the self driving spring. Shrunk-in SiC ring and massive stationary SiC ring.



External mounting seal type 7KH.

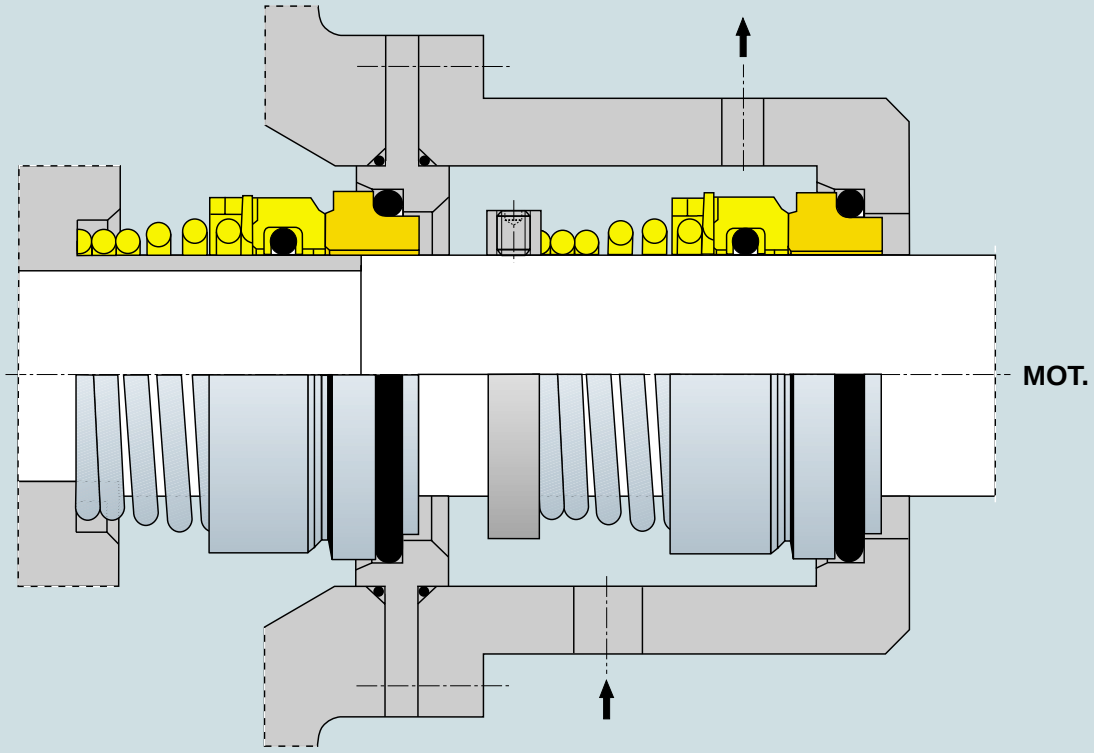
Balanced seal type 82EH for high pressure, bi-directional, all metal parts in titanium with SiC faces.

DUAL CONFIGURATION



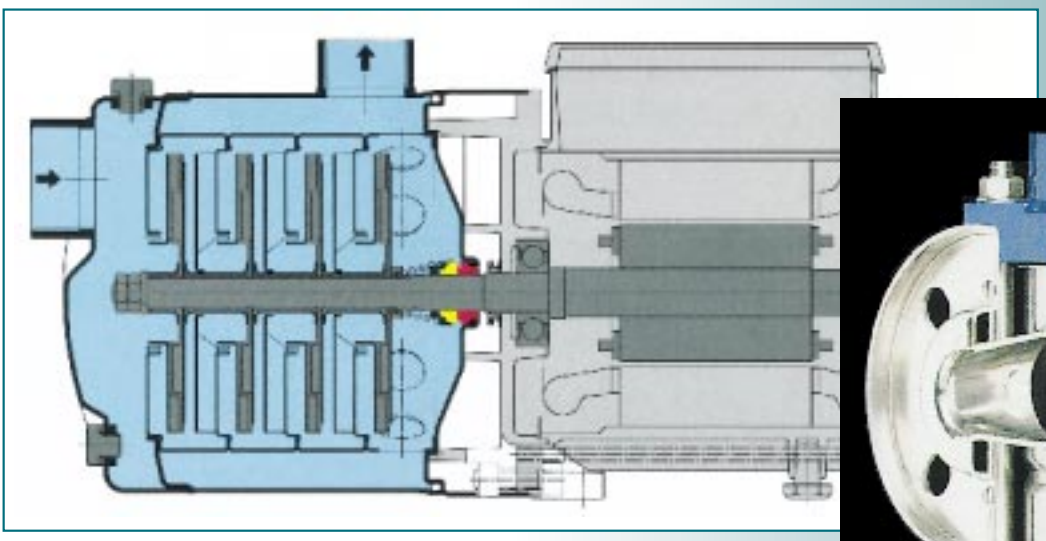
DUAL PRESSURIZED (ex. back-to-back)

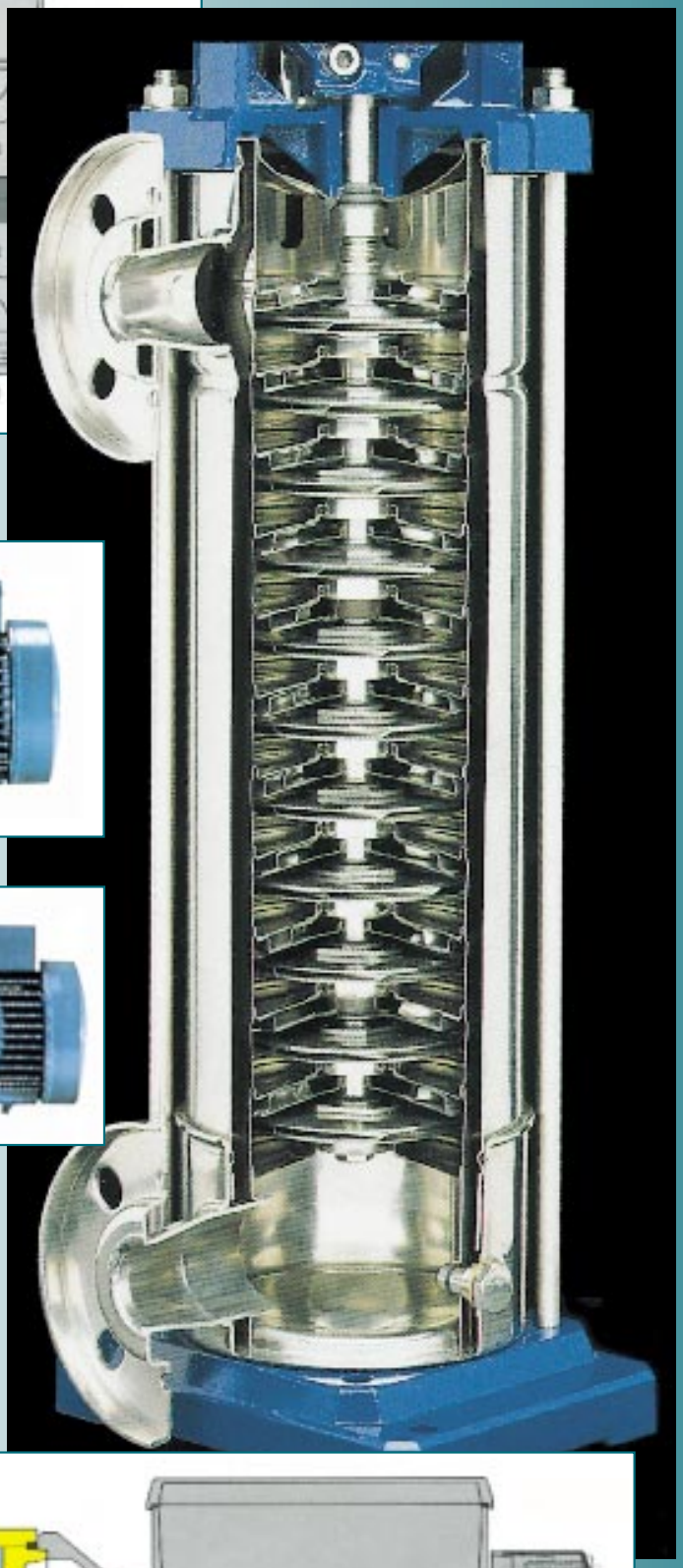
The double back-to-back mounting is indicated for adhesive, hot liquids or for those tending to form crystals, gas, etc. By this kind of mounting the contact between spring and pumped medium is avoided. The cooling-flushing is obtained by the circulation of an auxiliary liquid, compatible with the pumped medium. The former must have a pressure at least 0,5 bar higher than the fluid inside the pump body.

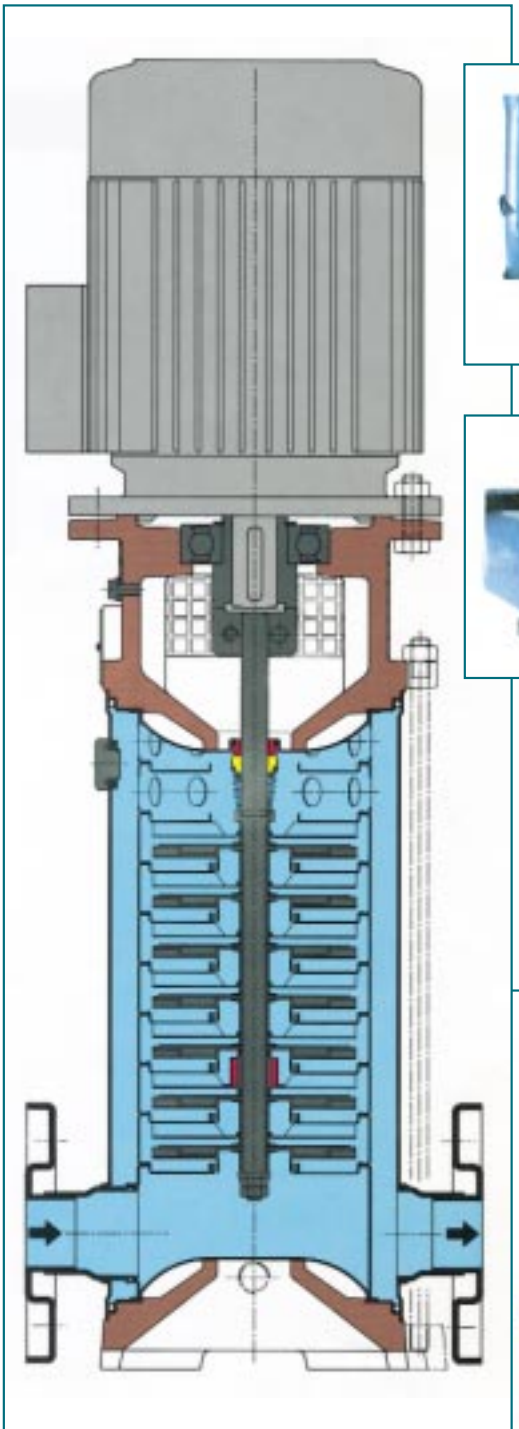


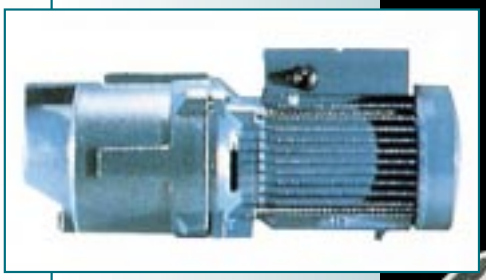
DUAL NON-PRESSURIZED (ex. tandem)

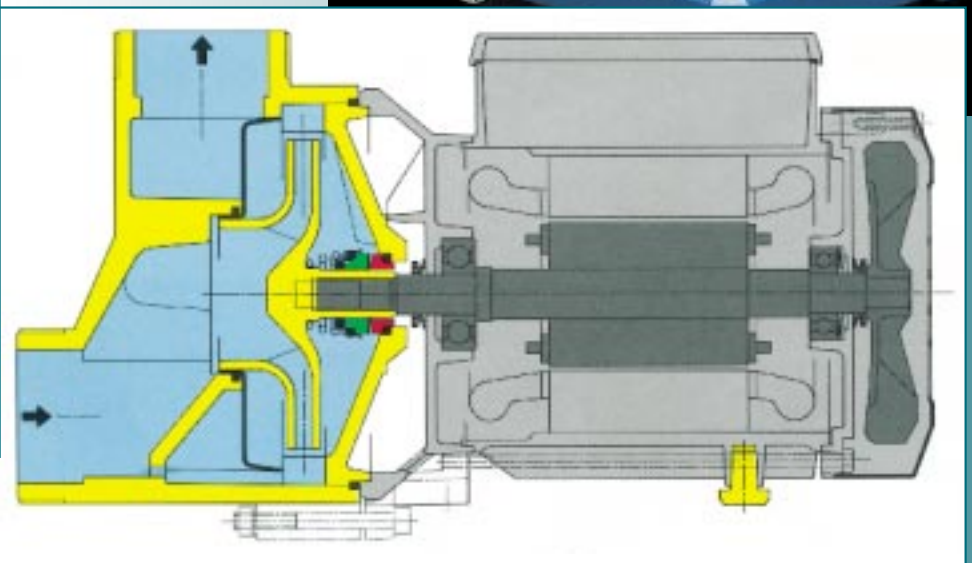
The double in series mounting is needed when a cooling and flushing liquid is not available under pressure. By this kind of mounting the liquid may vary its pressure independently from the auxiliary one, while the latter does not have to be at a higher pressure than the fluid inside the body of the pump.

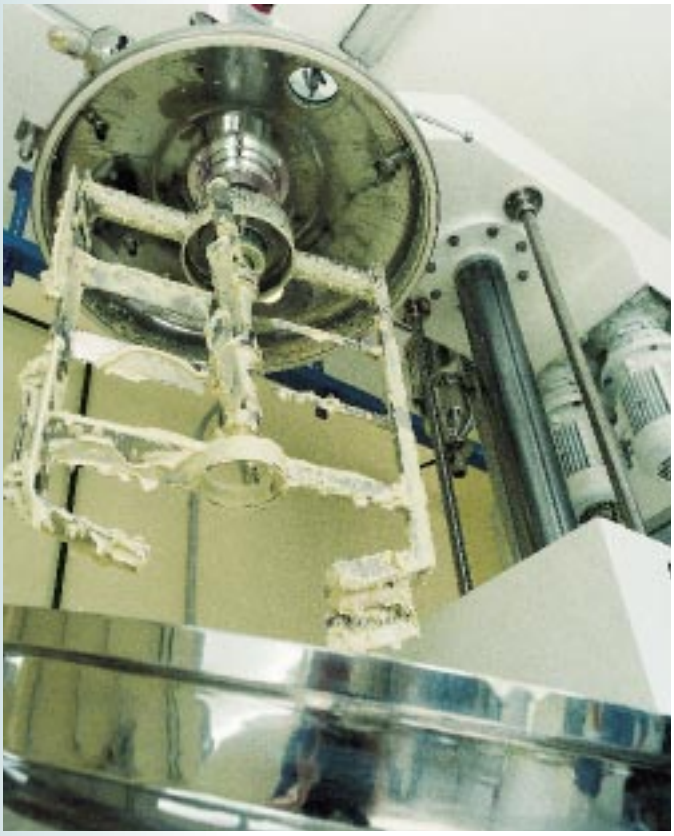


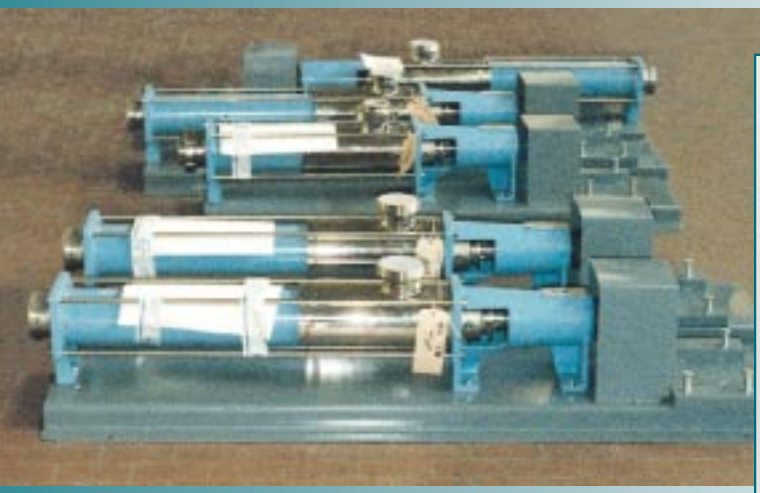


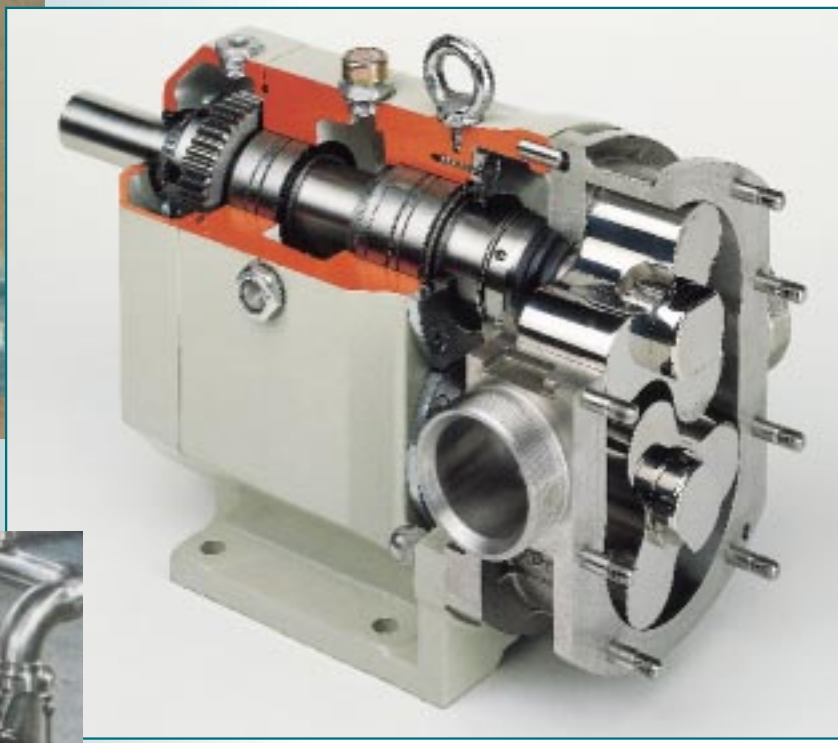


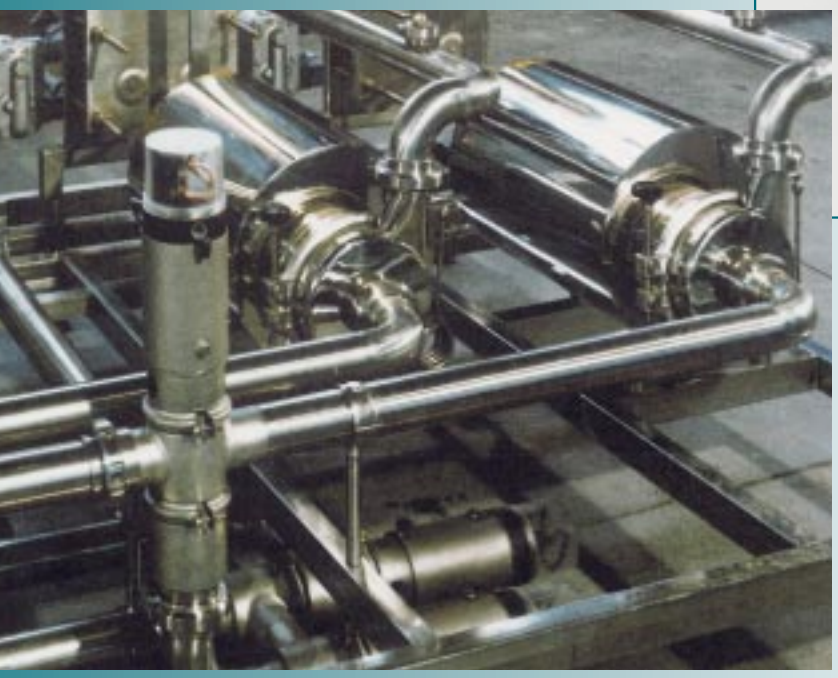


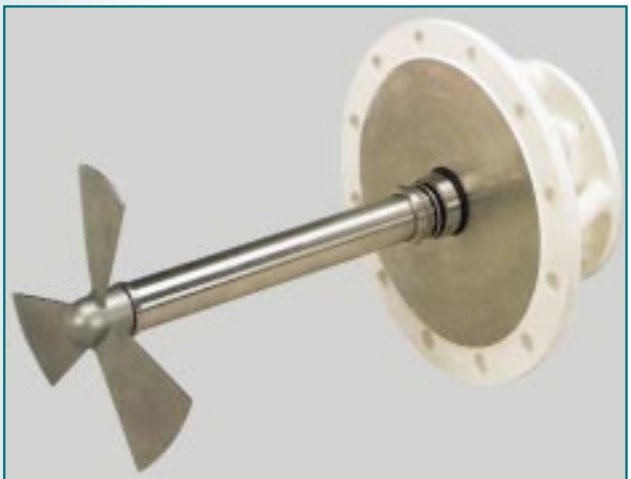


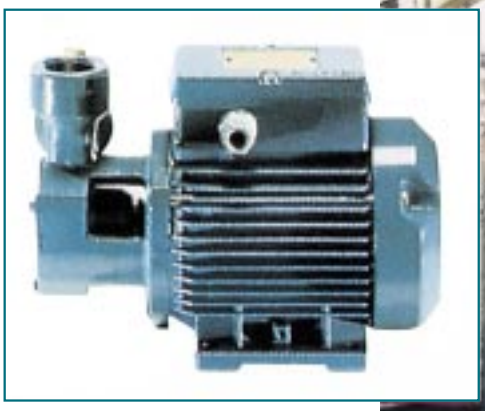


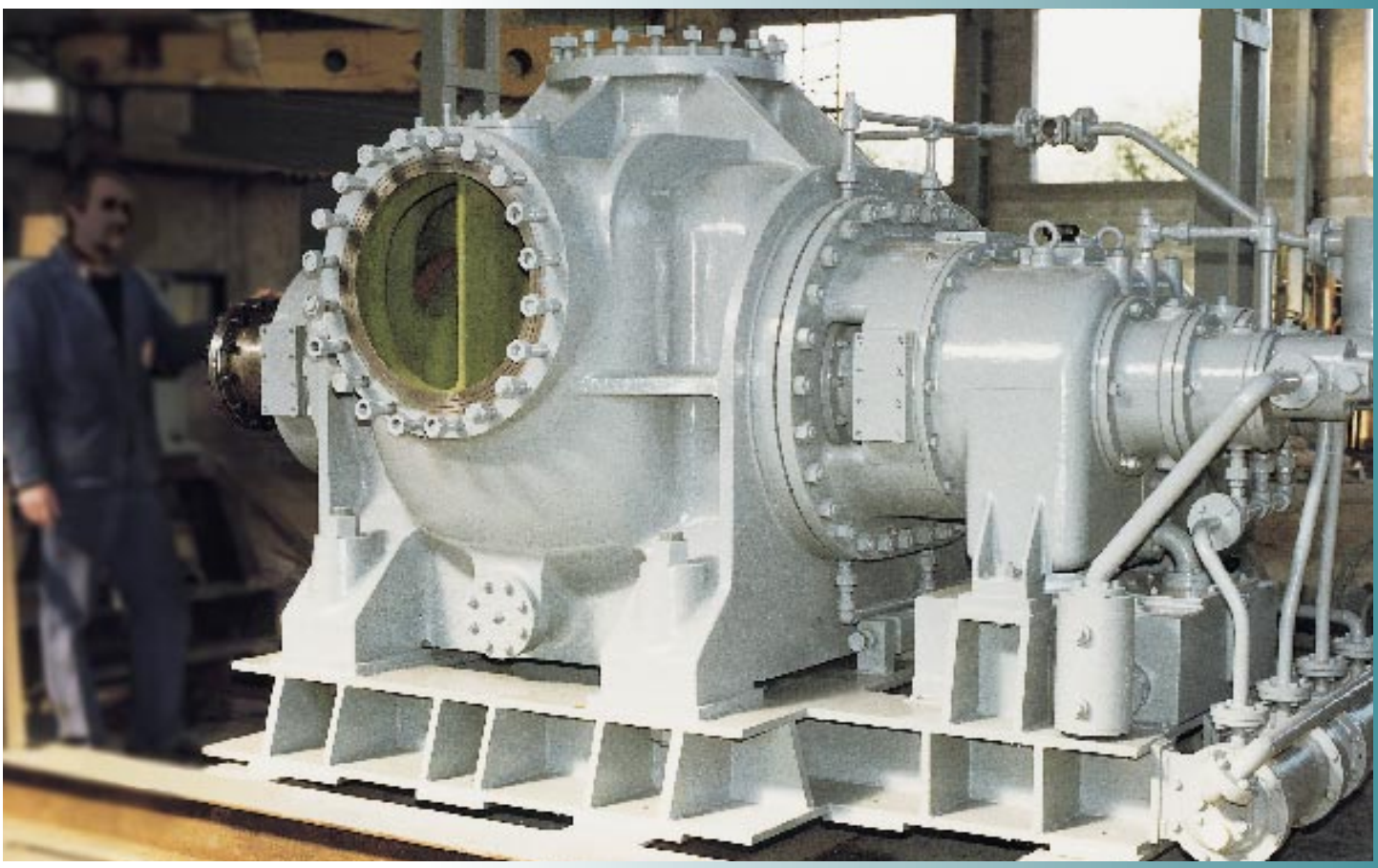


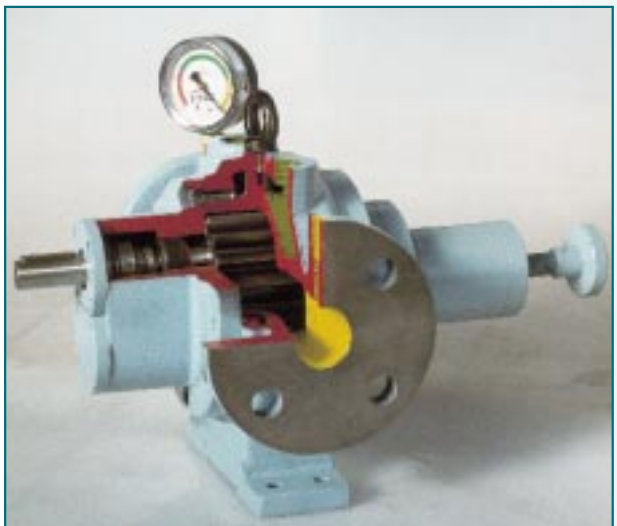




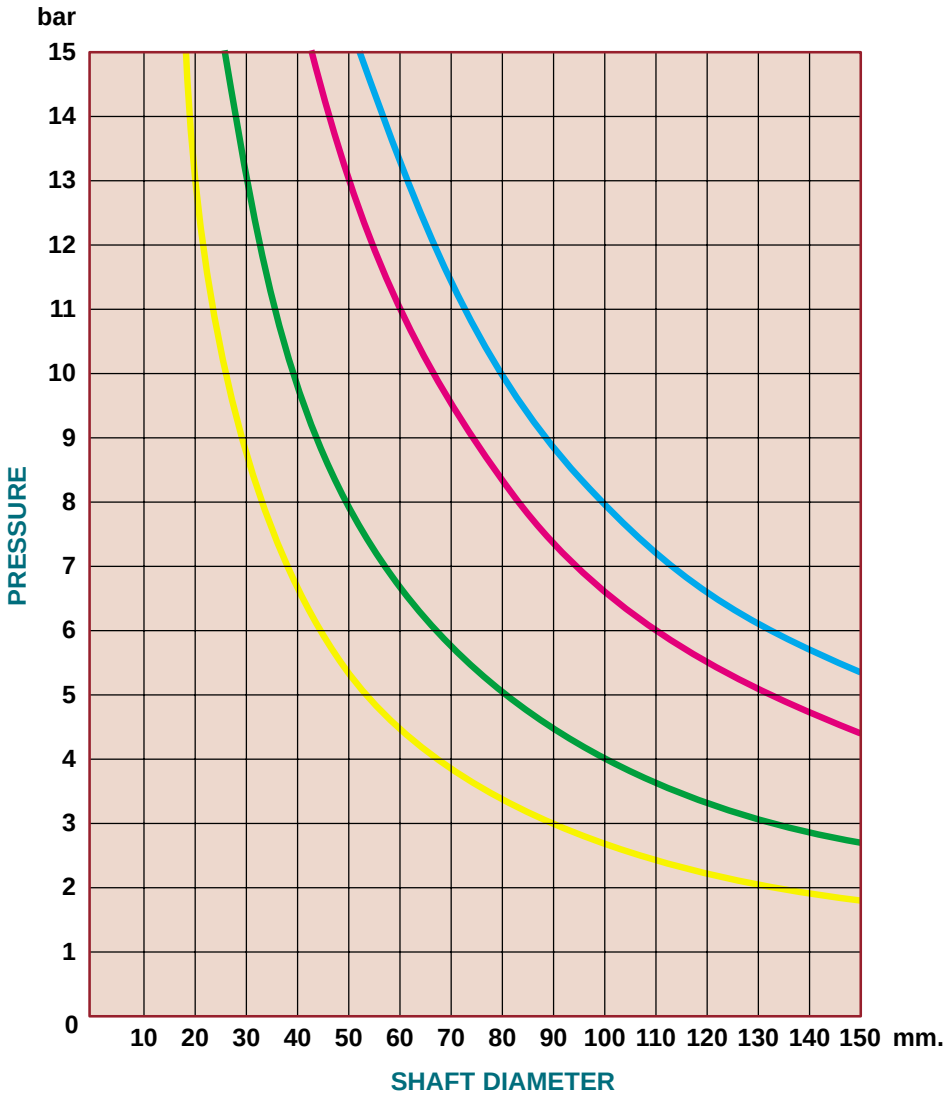








PERFORMANCE CURVE



N.B.: Curves for shafts at 2900 r.p.m.

Performance curves for the working conditions of the non-balanced ROTEN and UNITEN seals with clean water at 20°C

Legend

- INOX-CARBON
- ALUMINA-CARBON
- WC/Carbon-SIC/Carbon
- WC/WC-SIC/SIC

ABSORBED POWER DIAGRAM

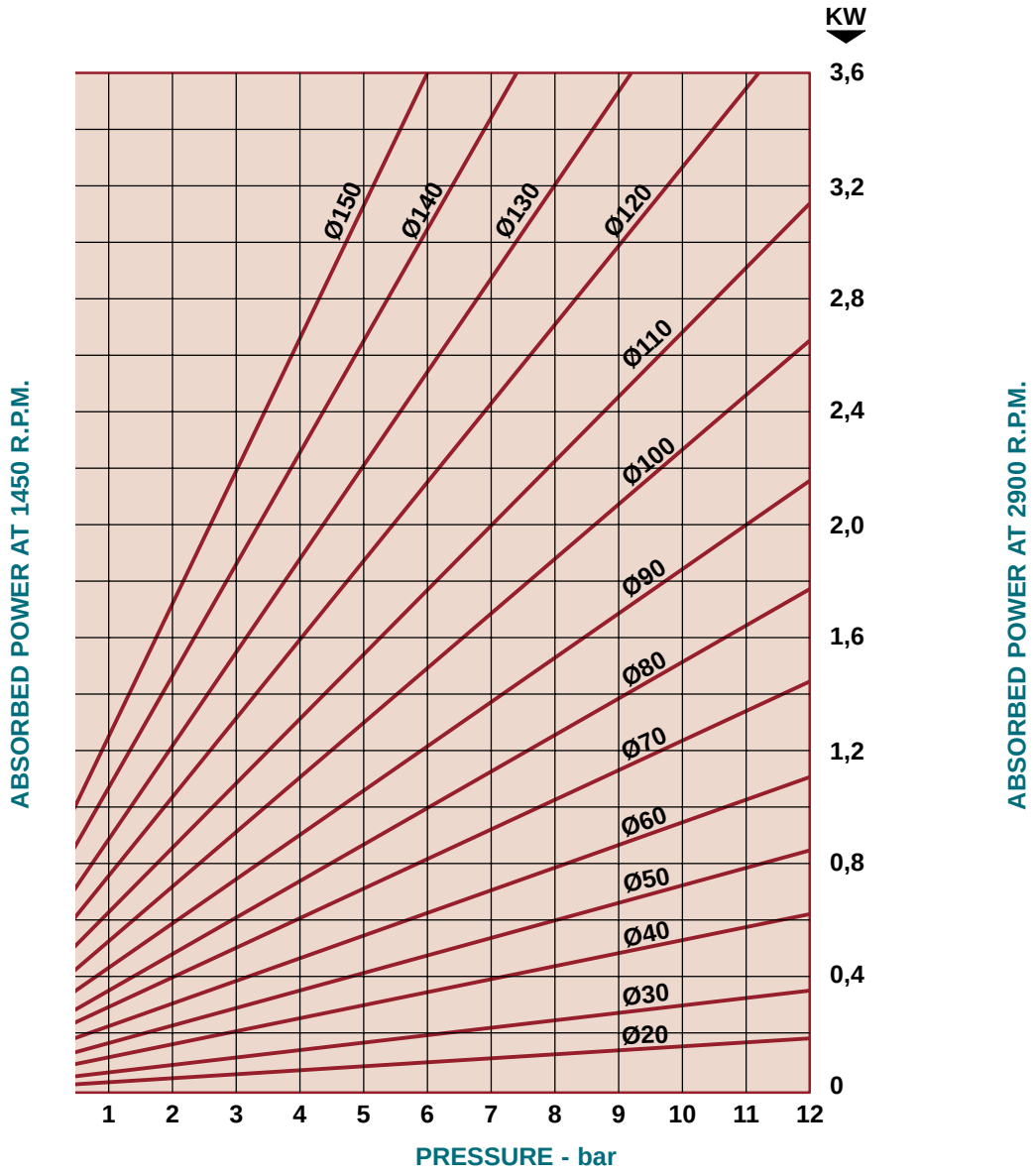


Diagram of the power absorbed by ROTEN and UNITEN non-balanced seals, depending on their working pressure.

The mentioned values shall be increased or decreased of 20÷30% according to the features of the treated medium.

The values of the test chart refer to steel/carbon seals with clean water at 20 °C.

We advise to consider the following test correcting coefficients for different pairings (experimental):

SIC/CARBON	x 0,85
CERAMIC/CARBON	x 0,9
WC/CARBON	x 0,9
WC/SIC	x 2,3
WC/WC	x 2,5
SIC/SIC	x 2,8

DELIVERY CAPACITY DIAGRAM

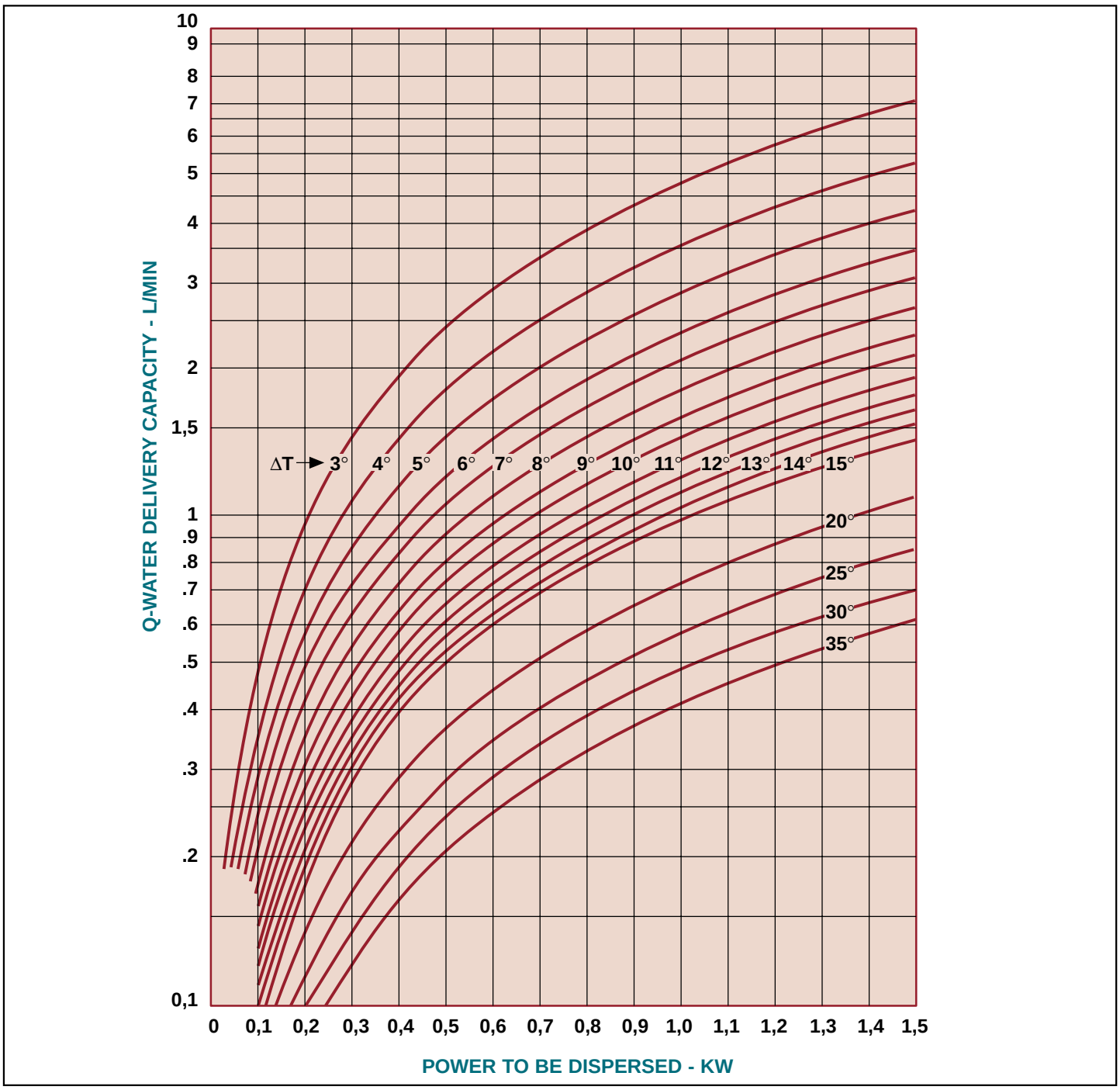


Diagram of the water delivery capacities depending on the heat that has to be lost.

Diagram to determine the minimum indispensable water quantity to lose heat developed by the mechanical seal.

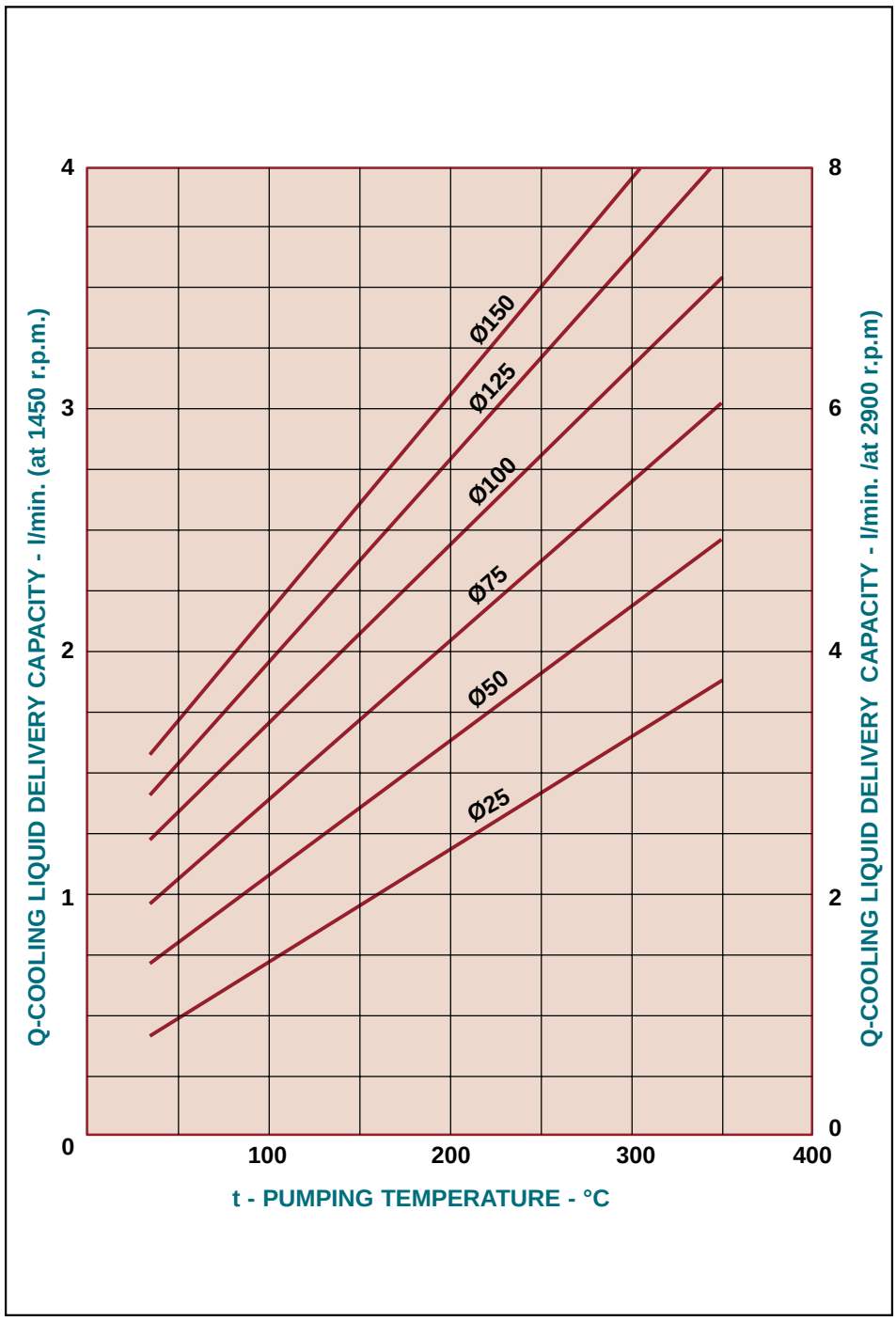
After having obtained the absorbed power relating to the used seal out of the preceding diagram. estimate the necessary delivery capacity, depending from the difference in temperature (ΔT) of in-flowing and out-flowing water.

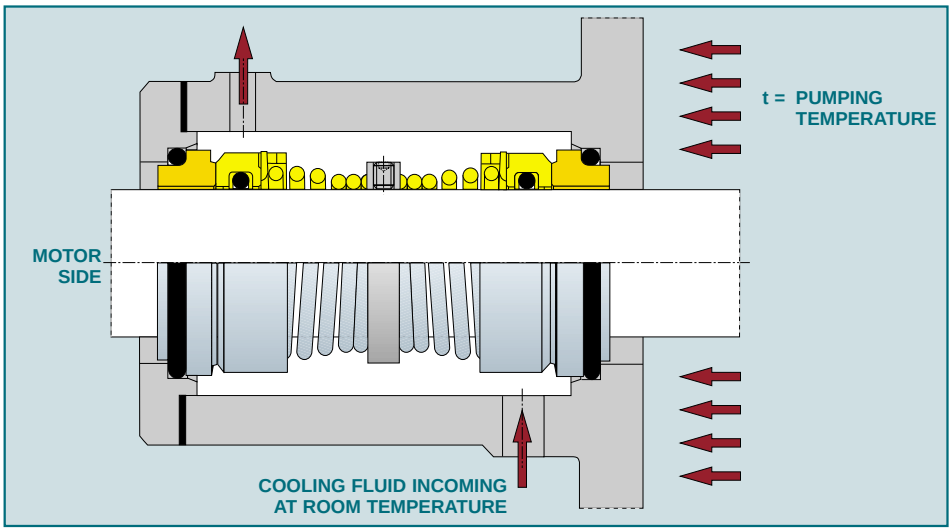
N.B.: In-flowing water temperature must be inferior or equal to that of the external environment.

DELIVERY CAPACITY - temperature diagram (Q-t)

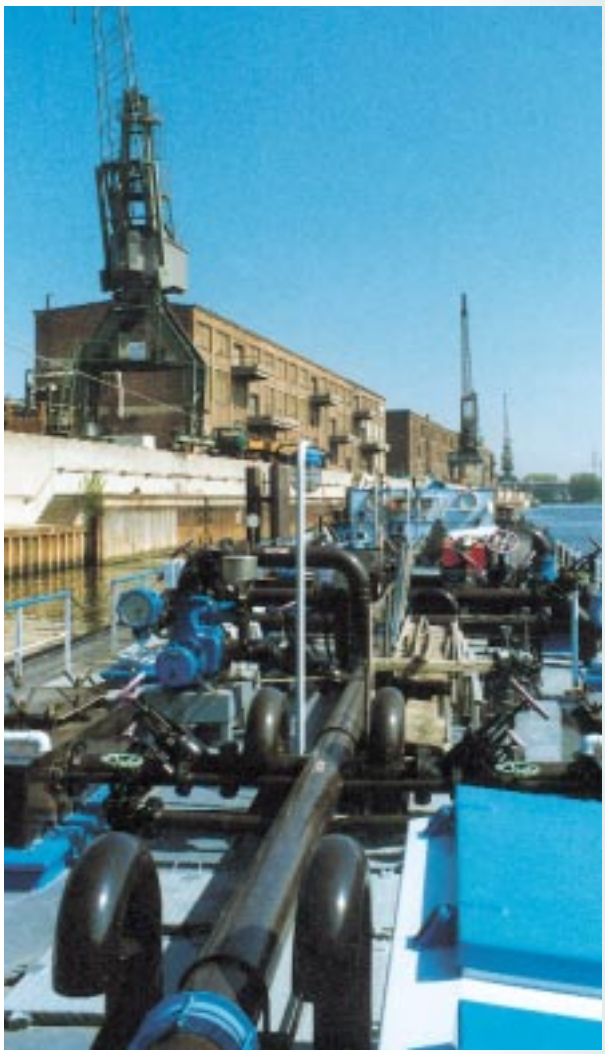
Diagram to determine the cooling fluids delivery capacity depending on the temperature of the pumped medium for DUAL pressurised applications.

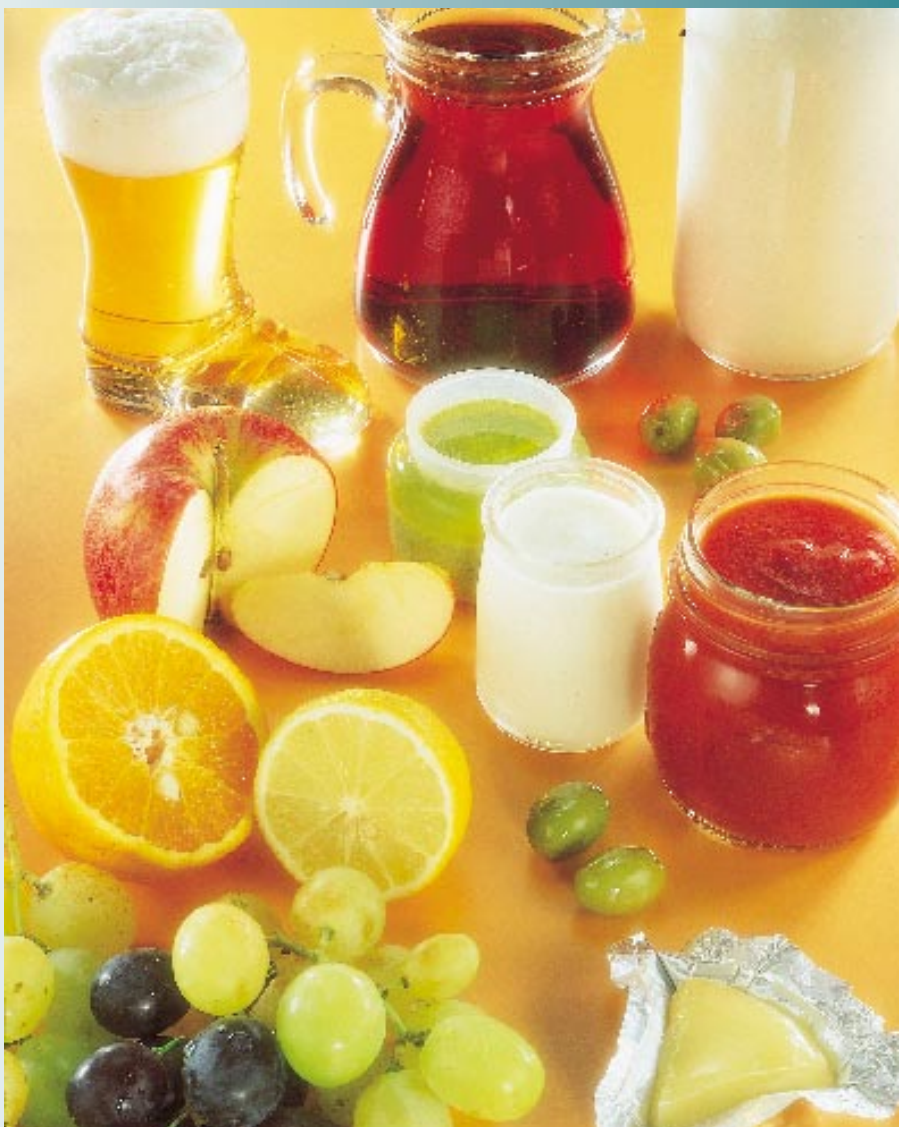
These delivery capacities must be added to those necessary for the dispersion of the heat generated by the mechanical seal.





N.B.: The present test chart serves purely as a guideline.





NOTES

GUIDE TO MECHANICAL SEALS SELECTION

ROTEN S.r.l. 20134 Milano - Via Ortica, 6 - Tel. +39 02 76110157 r.a. - Fax +39 02 7385445 - e-mail info@roten.it - www.roten.it

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
A															
Acetic Acid	CH_3 CO OH	40	70	2	X7XV7	GBEGG		1				1.05			Liq. Mix. H_2O, Alcohol, Ether, Glycerine; SCALDING
Acetic Aldehyde	CH_3 CHO	100	90	4	XX5XV5	GBTGG		2				0.78	-123.5	20.2	Liq. mix. H_2O, Alcohol, Ether, Toluol, Benzene, Naphtha; INFLAMMABLE
Acetic Anhydride	$(CH_3$ CO$)_2$ O	Conc.	20	4	XX5XV5	GBTGG		2	2			1.08	-73.1	140	Liq. mix. Alcohol, Ether, Acetic Acid; SCALDING
Acetone (Propanone)	CH_3 CO CH_3	100	55	2	X7XV7	GBEGG		1				0.79	- 94.3	56	Liq. Mix. H_2O, Alcohol, Ether, Chlorophorm; VOLATILE, INFLAMMABLE
Acetyl chloride	CH_3 CO Cl	100	40	4	XX5XZ5	GCTGG						1.1		51,8	Liquid; Mix. Benzol, Toluol, Chlorophorm, Acetic acid; Inflammable; NO H_2O, Alcohol
Acetylene (Gas)	C_2 H_2	100	20	5 Dual	X7X7RZ7	U_3CEGG	1	1	2	1	1	0.91 air =1	- 81.8	- 84	EXPLOSIVE, TOXIC Gas
Acetyl-Saucylic Acid	CH_3 $COOC_6$ H_4 COOH	Sat.	90	5	X7X72Z7	VCEGG		1					135		Powder or crystals sol. Alcohol, Ether, Chlorophorm, H_2O
Acid Fats (Except Acetic Acid)		100	80	5	XYXY2ZY	VCVGG	2		2	1					Do not solidify if refined
Acid Fats (Except Acetic Acid)		100	160	5	XYXYKRY	Q_1U_2VGG	2		2	1					Solidify according to temperature
Acid Molasse Must		100	140	5	X7X7KR7	Q_1U_2EGG		1							
Acid Solvents		100	90	4	XX5XZ5	GCTGG									
Acrylic Acid	CH_2 H_4 O_2	Conc.	>20	4 Dual	XX5DKK5	Q_1Q_1TGG						1.06	13	141	Polymerises at T>30 °C and with O. Corrosive ; Crystalises at T<12 °C , sol. H_2O, Alcohol, Acetone
Acrylic Resins		100	140	4 Dual	XX5335	U_3U_3TGG									Washing with solvent
Adipic acid	COOH $(CH_2)_4$ COOH	20	120	5	X7X7KZ7	Q_1CEGG		1				1.36	152		Crystals sol., Alcohol, Acetone
Air Compressed		100	60	2 Dual	X6GV6	EBPGG	1	1	1	1	1				
Air Compressed and Oil		100	80	5	X6X6RZ6	U_2CPGG	1		1	1	1				
Air Gas		100	50	2 Dual	X6GZ6	ECPGG	1			1	1				Mixture of Gas N + CO + CO_2; COMBUSTIBLE (Gas-producer Gas, Siemens Gas)
Albumen		100	20	5 Dual	X7X7KR7	Q_1U_2EGG	1	1		1		1.04			
Alcohol and Lubricating Oils			90	2	X6GZ6	ECPGG	1			1					
Alcohol and Sulfonated Fats		10	120	5	XYXY2ZY	VCVGG				1					
Alcohol Polyhydric (Pollol)	CH_2 OH(CHOH)n CH_2 OH	100	40	2	X7XV7	GBEGG		1							n = from 2 to 5 - Liq. containing Glycerine, reatting with Aldehydes and Ketones
Alcohol, Denaturated Alcohol	C_2 H_5 OH	100	70	2	X7XZ7	ECEGG	1	1	1			0.81	-118	78.3	Liq. sol. H_2O, Ether, Chlorophorm; VOLATILE, INFLAMMABLE
Alcohol, Dyaceton Alcohol	CH_3 $COCH_2$ $C(CH_3)_2$ OH		30	5	X7X7KK7	Q_1Q_1EGG		1				0.94	-42.8	169	Liq. mix. H_2O, Alcohol, Esters; INFLAMMABLE
Alcohol, Ethyl Alcohol (Ethanol)	C_2 H_5 OH	100	70	2	X6XV6	GBPGG	1	1	1			0.81	-118	78.3	Liq. sol. H_2O, Ether, Chlorophorm; INFLAMMABLE, VOLATILE
Alcohol, Furfural Alcohol	C_4 H_3O • CH_2 OH	100	110	4	XX5335	U_3U_3TGG		2				1.13		170	Liq. sol. Alcohol, Ether, Chlorop., Benzene; POISONOUS
Alcohol, Isobutyl Alcohol	$(CH_3)_2$ CH CH_2 OH	100	80	2	X7GV7	EBEGG	2	1	1	1		0.8	-108	107	Liq. sol. H_2O, Alcohol, Ether; INFLAMMABLE
Alcohol, Isopropyl Alcohol	$(CH_3)_2$ CH OH	100	80	2	X7XZ7	GCEGG	2	1	2	1		0.78	-86	82.4	Liq. sol. H_2O, Ether, Alcohol; INFLAMMABLE
Alcohol, Methyl Alcohol	CH_3 OH	100	60	2	X7XZ7	GCEGG	1	1	1			0.79	-98	64.5	Liq. sol. H_2O, Alcohol, Ether; VOLATILE, POISONOUS, INFLAMMABLE
Alcohol, Octylic Alcohol	CH_3 $(CH_2)_6$ CH_2 OH	100	70	2	X7GZ7	ECEGG	2	1	2	1		0.82	-16	194	Liq. mix. Alcohol, Chlorophorm, Mineral Oil
Alcohols		100	70	2	X7XZ7	GCEGG		1							
Alcohols			-70	RF	XJZA	TCYGG									
Aldehydes				4 Dual	XX5335	U_3U_3TGG									
Alginates		100	90	2 Dual	X6336	U_3 U_3PGG	1	1		1					
Alizarine in Methyl Alcohol		0.1	50	5	X6X62V6	VBPGG	1								
Alkali		10	100	5	X7X7KR7	Q_1U_2EGG		1							They form salts with acids
Alkaline Hypochlorite		70	80	5	LYLYKKY	Q_1Q_1VMM				1					
Alkane (Paraffin)	Cn H_{2n+2}		130	5	XYXYKKY	Q_1Q_1VGG				1	1	0,9	60		

The data shown can be changed to reflect any improvement whitout notice. **Legend : "the material number codes 6, 7, 8, Y ,1" - 1 = Recomended , 2 = Suitable,** If not indicated, insufficient data or not suitable

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Alkyl Benzene		100	90	2	XYGVY	EBVGG				1					
Alkyl Resins		100	140	2 Dual	XY33Y	U_2U_2VGG				1					Washing with solvent
Alkylate (light)		100	70	2	XYGVY	EBVGG				1					
Alkylphenol		100	80	4 Dual	XX5335	U_2U_2TGG				1					Viscous, oily liquid (300 Cps)
Allile Chloride	CH_2 CH CH_2 Cl	100	80	4	LL5LZ5	MCTMM						0.93	-134.5	45	Liq. mix. alcohol, Chlorophorm; INFLAMMABLE, POISONOUS
Alum (Al Ammonium)		10	20	5	X6X6RR6	U_2U_2PGG	1	1	1	1					
Alum (Al Sulphate)	$Al_2(SO_4)_3$	30	140	5	X7X7KR7	Q_1U_2EGG	1	1	1	1		2.71		770	H_2O sol. crystals
Aluminium Chloride	Al Cl_3	25	18	5	LYLYKKY	Q_1Q_1VMM	1	1	1	1		2.44	190		H_2O sol. Crystals. It frees HCl
Aluminium Fluoride	Al F_3	20	20	5	LYLYKKY	Q_1Q_1VMM	1	1	1	1		2.88			Hardly H_2O sol. crystals
Aluminium Hydroxyde	$Al(OH)_3$	10	90	5	X7X7RZ7	U_1CEGG		1				2.42			Powder Sol. Min. Acids, Caustic Soda
Aluminium Nitrate	$Al(NO_3)_3 \cdot 9H_2O$	10	20	5	XYXYKZY	Q_1CVGG	1	1	1	1			73		Crystals sol. Alcohol, Acetone, H_2O
Aluminium Sulphate (Alum)	$Al_2(SO_4)_3$	30	140	5	X7X7KR7	Q_1U_2EGG	1	1	1	1		2.71		770	H_2O Sol. crystals
Aluminium Sulphide	Al_2 S_3	10	20	5	L7L72Z7	VCEMM		1				2.02	1100		It decomposes in H_2O
Amine		Conc.	90	4	XX5XZ5	GCTGG		2	2						
Amino Acids		10	20	4	XX5335	U_2U_2TGG		2							
Amino Benzene (Aniline)	C_6 H_5 NH_2	Conc.	90	4	XX5XZ5	GCTGG		2				1.02	-6.2	184.4	Oily liq. sol. Alcohol, Ether, Benzene; POISONOUS
Amino Butane	C_4 H_9 NH_2	Conc.	75	4	XX5XZ5	GCTGG						0.73	-49	77.1	VOLATILE, INFLAMMABLE liq.
Amino Ethanol (MEA)	NH_2 CH_2 CH_2 OH	Conc.	70	4	XX5XZ5	GCTGG	2	2	2			1.01	10.5	170.5	Liq. lightly viscous, mix. H_2O, sol. Alcohol, Chlorophorm, Carb. Tatrachl.
Ammonia	NH_3	100	-30	5	X7X7RZ7	U_1CEGG		1	1			liq. 0.77	-77.7	-33.5	Gas. it liquefies at 8,5 Bar (20 °C)
Ammonia - Copper Solution + HNO3		Sat.	60	45	XX5X52Z5	VCTGG									
Ammonia and Oil		3	70	2	X8G28	ECNGG	1		1						
Ammonia and Water	NH_4 OH	30	70	2	X7GV7	EBEGG	1	1	1						Gas solution in H_2O
Ammonia Gas	NH_3	100	>-33	5 Dual	X7X7RZ7	U_1CEGG	1	1	1			0.59 Aria 1	-77.7	-33.5	Gas
Ammonia Solution		Sat.	20	2	X7XV7	GBEGG	1	1	1						
Ammonium Acetate	$NH_4(C_2$ H_3 $O_2)$	30	20	2	X7XV7	GBEGG	1	1				1.07	114		H_2O, Alcohol-sol. crystals
Ammonium Azotate		Conc.	20	5	X7X7RZ7	U_1CEGG		1							
Ammonium Bifluoride	NH_4 HF_2	10	70	5	L7L7KK7	Q_1Q_1EMM		1				1.2			H_2O; Alcohol- Sol. crystals; POISONOUS
Ammonium Bisulphide	NH_4 HS	10	30	5	X6X62V6	VBPGG	1	1	1						
Ammonium Bromide	NH_4 Br	5	20	5	X6X62V6	VBPGG	1					2.43			H_2O; Alcohol, Sol. crystals
Ammonium Carbonate	$(NH_4)HCO_3(NH_4)CO_2$ NH_2	10	70	5	X7X7RZ7	U_1CEGG		1	1						H_2O, Sol. crystals
Ammonium Chlorate	NH_4ClO_3	10	30	5	L7L72Z7	VCEMM		1							Oxidizer - Explosive
Ammonium Chloride	NH_4 CL	10	30	5	L7L72Z7	VCEMM	1	1	1			1.54			H_2O, Glycerol, Sol. crystals
Ammonium Citrate	$(NH_4)_3$ HC_6 H_5 O_7	10	40	5	X7X7RZ7	U_1CEGG		1							H_2O sol.Grains
Ammonium Fluoride	NH_4 F	Sat.	20	5	X7X72Z7	VCEGG		1				1.31			H_2O - Sol. Crystals; POISONOUS
Ammonium Hydroxyde	NH_4 OH	30	70	2	X7GV7	EBEGG	1	1	1						Up to 30% Ammonia Solution
Ammonium Nitrate	NH_4 NO_3	Sat.	80	5	X7X7KZ7	Q_1CEGG	1	1	1			1.72	169	210	H_2O; Sol. crystals, Alcohol, Alkali; EXPLOSIVE
Ammonium Oxalate	$(NH_4)_2$ C_2 $O_4 \cdot H_2O$	5	20	5	X7X72V7	VBEGG	1	1	1			1.5			H_2O; Sol. crystals; POISONOUS
Ammonium Perchlorate (AP)	NH_4 Cl O_4	10	20	4	XX5XZ5	GCTGG						1.95			H_2O; Sol. crystals; EXPLOSIVE

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/cm³	Melting Point °C	Boiling Point °C	Notes
Ammonium Persulphate	$(NH_4)_2 S_2 O_8$	10	20	5	X7X72V7	VBEGG		1	1			1.98			H_2O; Sol. crystals
Ammonium Phosphate,mono., Bi, Tri		10	50	5	X7X7KZ7	Q_1CEGG	1	1	1			1.8			H_2O, Sol. crystals
Ammonium Sulphate	$(NH_4)_2 SO_4$	100	80	5	X7X7KR7	Q_1U_2EGG	1	1	1			1.77	513		H_2O; Sol. crystals
Ammonium Sulphate	$(NH_4)_2 SO_3 \cdot H_2O$	Sat.	80	5	X7X72V7	VBEGG	1	1	1						H_2O; Sol. crystals
Ammonium Sulphate + H2SO4 (5%)		100	20	5	L7L7KK7	Q_1Q_1EMM		1							
Ammonium Sulphide	$(NH_4)_2 S$	Sat.	80	5	X7X7KZ7	Q_1CEGG	1	1	1			1.41		150	It sublimates. H_2O; Alkali ;Alcohol, Sol. crystals; TOXIC
Ammonium Sulphocyanate	NH_4 SCN	10	70	5	X7X72V7	VBEGG		1				1.3	149.6		H_2O; Sol. crystals, Acetone, Alcohol, Ammonia
Ammonium Bicarbonate	$NH_4 HCO_3$	10	70	5	X7X7RZ7	U_1CEGG		1	1			1.58			H_2O-Sol. crystals
Amyl Acetate	$CH_3 COOC_5 H_{11}$	Conc.	110	5	X7X72V7	VBEGG		1				0.86		148	INFLAMMABLE oil
Amyl Alcohol (Pentanol)	$CH_3 (CH_2)_4$ OH	100	70	2	X7GV7	EBEGG	2	1	2	2		0.8	-78.9	137.8	Liq. mix. Alcohol, Ether
Amyl Benzoate	$C_6 H_5 COOC_5 H_{11}$	Conc.	110	5	X7X72V7	VBEGG		1				0.98		260	Alcohol sol. liq.
Amyl Butirrate	$C_5 H_{11}$ OOCC$_3$ H_7	Conc.	110	5	X7X72V7	VBEGG		1				0.86		150 - 160	Alcohol; Ether, Sol. liq.
Amyl Chloride	$C_5 H_{11}$ Cl	Conc.	90	5	XYXYRZY	U_2CVGG				1		0.89		99.7	Alcohol; Ether, Sol. liq.
Amyl Formiate	$HCOOC_5 H_{11}$	Conc.	110	5	X7X72Z7	VCEGG		1				0.88		123.5	Liq. mix. Hydrocarbons, Oils, Ketones, Alcohol; INFLAMMABLE
Amyl Nitrate	$(CH_3)_2$ CH CH_2 CH_2 NO_3	Conc.	90	5	X7XZ2Z7	VCEGG		1				0.87		96	Alcohol sol. liq.; INFLAMMABLE
Amyl Phthalate		Conc.	80	5	X7X7RZ7	U_1CEGG		1							
Amyl Propionate	$CH_3 CH_2 COOC_5 H_{11}$	Conc.	90	5	X7X7RZ7	U_2CEGG		1				0.87			Liq. mix. with many organic solvents
Aniline	$C_6 H_5 NH_2$	Conc.	20	4	X05XZ5	GCTGG		2				1.02	-6.2	184.4	Oily liq. sol. Alcohol, Benzene, Ether; POISONOUS
Aniline - Hydrochloride	$C_6 H_5 NH_2$ HCl	20	20	4	LL5LZ5	MCTMM		2		2		1.22	198	245	Crystals sol. Ether, Alcohol, Benzene, H_2O; POISONOUS
Anisole	$C_6H_5OCH_3$	Conc.	110	4	X05XV5	GBTGG						1	-37,8	155	Liq. sol. Alcohol, Ether
Anthracene	$C_6 H_4(CH)_2 C_6 H_4$	Conc.	>220	RF	X33A	U_2U_2YGG						1.24	217	355	Crystals sol. Hot toluol
Anthranilic Acid	$C_6 H_4 (NH_2)(CO_2H)$	Sat.	80	5	XYXYRZY	U_2CVGG				1			144		Crystals Sol. Hot H_2O, Alcohol, Ether; IT SUBLIMATES
Anti incrustator		10	120	5	X7X7KZ7	Q_1CEGG		1							Filming
Antibiotics		30	90	5	XYXYKRY	Q_1U_2VGG				1					
Apirol		Conc.	130	2	XYGZY	ECVGG	1		2	1	1				
Aqua regia (1 HNO3 + 4 HCl)		100	20	45	LL5L5KK5	Q_1Q_1TMM									Volatile Liquid
Aragonite (Calcium Carbonate)	Ca CO_3	Sat.	20	5	XYXYKRY	Q_1U_2VGG	1	1	1	1		2.9			Crystals or powder sol. in acids
Argon Gas	Ar	100	20	2 Dual	XYGZY	ECVGG	1			1	1	1.38 Aria.1	-189	-185.8	INERT Gas
Aromatic Products		100	140	5	XYXYKZY	Q_1CVGG				1					
Aromatic Solvents		100	90	5	XYXYRZY	U_2CVGG				1					
Arsenic Trichloride	As Cl_3	Conc.	70	7	XY2ZYHX	VCVGG				1		2.1	-18	130	Oily liq. sol. HCL concentrate, org. liquids
Arsenic Trisulphide	As S_3	Sat.	70	5	L7L7KK7	Q_1Q_1EMM		1				3.43	300		Crystals. POISONOUS
Ascorbic Acid (Vitamin C)	$C_6 H_8 O_6$	Sat	90	5	X7X72Z7	VCEGG		1				1.65	192		H_2O - Sol. crystals
Ash Wood Gas		100	60	2 Dual	X8QZ6	ECPGG	1			1	1				
Asphalt			<180	2	XY33Y	U_2U_2VGG	2		2	1					
B															
Bacon-Fat (Animal Fat)		100	80	5	X6X6RZ6	U_2CPGG	1	2	2	1					
Barium Chlorate	$Ba(ClO_3)_2 \cdot H_2O$	20	20	5	L7L7KZ7	Q_1CEMM		1				3.18	414		H_2O sol. crystals; INFLAMMABLE, EXPLOSIVE, POISONOUS

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Barium Chloride	$BaCl_2 \cdot 2H_2O$	Sat.	50	5	LYLYKZY	Q_1CVMM	1	1	1	1		3.1	960		H_2O sol. crystals; POISONOUS
Barium Hydrate	$Ba(OH)_2$	Sat.	70	5	X7X7KZ7	Q_1CEGG	1	1	1	1					H_2O, Eter, Alcohol sol. crystals, POISONOUS
Barium Nitrate	$Ba(NO_3)_2$	Sat.	60	5	X6X6KR6	Q_1U_2PGG	1	1	1	1		3.2	575		H_2O sol. crystals; POISONOUS
Barium Salts		Sat.	60	5	LYLYKZY	Q_1CVMM	1	1	1	1					POISONOUS
Barium Sulphate	$Ba\ SO_4$	Sat.	40	5	X7X7KK7	Q_1Q_1EGG		1				4.5			H_2SO4 concentrate sol. powder
Barium Sulphide	Ba S	Sat.	90	5	X7X7KZ7	Q_1CEGG	1	1	1	1		4.25			H_2O sol. powder; POISONOUS
Beer		100	90	5	X7X7KV7	Q_1BEGG	1	1		1		1.03			
Beer Must		100	90	5	X7X7KR7	Q_1U_2EGG		1							
Beer Yeast		Sat.	60		X7X7KR7	Q_1U_2EGG		1							
Beet - Sugar Juice		100	70	5	X6X6KZ5	Q_1CPGG	1	1	2	1					
Benzene Alkyl		100	90	2	XYGVY	EBVGG				1					
Benzene Chloride (DOW E)		100	>180	RF	X33A	U_3U_3YGG				1			177		
Benzene Dimethyl (orto meta para Xilene)	$C_6\ H_4(CH_3)_2$	100	120	5	XYXYKZY	Q_1CVGG				1		0.86		138.2	Alcohol, Ether sol. liq.; INFLAMMABLE, TOXIC
Benzene Divinyl (orto meta para)	$C_6\ H_4(CH\ CH_2)_2$	100	140	4 Dual	XX5335	U_2U_3TGG				2		0.92	-67	199	Liq. sol. Methanol, Ether; IT POLYMERIZES
Benzene Dodecyl	$C_{12}\ H_{25}\ C_6\ H_5$	100	60	2	XYGVY	EBVGG				1					
Benzene Isopropyl (Cumene)	$C_6\ H_5\ C(CH_3)_2$	100	80	2	XYXZY	GCVGG				1		0.86	-96	152.7	Liq. sol. Alcohol, Ether, Benzene, Carbon Tetrachloride
Benzene Methyl (Toluol)	$CH_3\ C_6\ H_5$	100	90	5	XYXYRZY	U_2CVGG				1		0.86	-94.5	110.7	Liq. sol. Alcohol, Ether, Bezene. INFLAMMABLE
Benzene Monochlorine	$C_6\ H_5\ Cl$	100	70	2	XYXVY	GBVGG				1		1.1	-45	131.6	Liq. mix. org. solvents; VOLATILE, INFLAMMABLE, NO PTFE
Benzene Ortodichlorine	$C_6\ H_4\ Cl_2$	100	80	2	XYXZY	GCVGG				1		1.3	-20	180	Liq. VOLATILE, IRRITATING
Benzene Phenyl		100	70	2	XYXVY	GBVGG				1					
Benzenecarboxylic Acid	$C_6\ H_5\ COOH$	Sat.	90	5	XYXY2ZY	VCVGG				1		1.26	121	249	Crystals sol. Alcohol, Ether, Benzene, Chloroph., Carbon Tetrachl.
Benzil Chloride	$C_6\ H_5\ CH_2\ Cl$	100	40	5	LYLYKZY	Q_1CVMM				1		1.1	-43	179	Liq. sol. H_2O, Ether; SCALDING
Benzil Chloride (Stabilized)	$C_6\ H_5\ CH_2\ CL$	100	80	2	XYXYKZY	Q_1CVGG				1		1.1	-43	179	Liq. sol. H_2O, Ether; SCALDING
Benzoic Acid	$C_6\ H_5\ COOH$	Sat	70	5	XYXY2ZY	VCVGG				1		1.26	121	249	Crystals sol. Alcohol, Ether, Benzene, Chlorophorm, Carbontetrachl.
Benzoic Aldehyde	$C_6\ H_5\ CHO$	100	90	2	X7XZ7	GCEGG		1				1.04	-56	178	Oil mix. Alcohol, Ether; VOLATILE
Benzol (Benzene)	$C_6\ H_6$	100	>60	4	XX5XV5	GBTGG						0.88	5.5	80	Liq. mix. Alcohol, Acetone, Ether, Acetic Acid, INFLAMMABLE
Benzol (Benzene)	$C_6\ H_6$	100	<60	2	XYGVY	EBVGG				1		0.88	5.5	80	Liq. mix. Alcohol, Acetone, Ether, Acetic Acid, INFLAMMABLE
Benzol and Gas Mixture			<60	5	XYXYRZY	U_2CVGG				1					INFLAMMABLE liquid
Benzol Crude	$C_6\ H_6$	100	<30	2	XYGVY	EBVGG				1					Liq. mix. Alcohol, Acetone, Ether, Acetic Acid; INFLAMMABLE
Benzol Ethyl (Ethylbenzene)	$C_6\ H_5\ C_2\ H_3$	100	110	2	XYGVY	EBVGG		1		1		0.86	-95	136	Liq. sol. Alcohol, Benzene, Ether, Carbon Tetrachloride
Bitumen		100	>130	RF	X33A	U_3U_3YGG				1	1				
Black Liquor		100	85	4 Dual	XX5335	U_2U_3TGG		2							Abrasive solution (Cellulose Paper Industry)
Blast Furnace Gas		100	120	2 Dual	XYGZY	GCVGG				1	1				
Blue Vitriol (Copper Phosphate)	$Cu\ SO_4 \cdot 5H_2O$	Sat.	80	5	X6X6KR6	Q_1U_2PGG	1	1	1	1		2.28			Crystals soluble in H_2O, Methanol; POISONOUS
Bonder		10	80	5	XYXYKKY	Q_1Q_1VGG				1					PK1 = Zink Phosphate + Potassium Phosphate, PH=1
Borate Tricresyl	$(CH_3\ C_6\ H_4)_3\ BO_3$	100	120	4	XX5XZ5	GCTGG						1.06		390	Liq. solub. Acetone, Chlorophorm, Benzene
Borax solution (Sodium Tetraborate)	$Na_2\ B_4\ O_7 \cdot 10H_2O$	Sat.	140	5	X7X7KR7	Q_1U_2EGG	1	1	1	1		1.75			H_2O sol. crystals
Boric Acid	$H_3\ BO_3$	Sat.	80	5	X7X7KR7	Q_1U_2EGG	1	1	1	1		1.43			H_2O; Alcohol - Sol. powder

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Boric Anhydride	B_2O_3	Sat.	140	5	XYXYKRY	Q_1U_3VGG				1		1.8			Powder sol. hot H_2O, Alcohol
Brine (Calcium Chloride)	$CaCl_2$	Sat.	-40	5	X7X7RZ7	U_3CEGG	1	1	1	1		2.15			H_2O, Alcohol sol. Crystals
Brine (Sodium Chloride)	NaCl	Sat.	-40	5	X7X7RZ7	U_3CEGG	1	1	1	1		2.16			H_2O, Glycerol sol. Crystals
Brines		Sat.	-40	5	X7X7RZ7	U_3CEGG		1							
Bromide		Sat.	35	4	LL5LZ5	MCTMM									Gas or crystals, POISONOUS
Bromine (Anhydrous Bromine)	Br	100	40	5 Dual	LYLYKKY	Q_2Q_2VMM				1		3.11	-7.3	58.8	Liq. sol. H_2O, Alcohol; POISONOUS
Bromine Methane (Gas or liquid)	CH_3Br	100	20	2 Dual	XYGZY	ECVGG	2			1		1.73	-94	3.46	Liq. VOLATILE, POISONOUS, SCALDING
Bromine Water Solution	$Br+H_2O$	Sat.	20	5	LYLYKKY	Q_2Q_2VMM				1					
Broth - Food		100	90	5	X7X7ZV7	VBEGG	1	1		1					
Butadiene	$H_2C\,CHHC\,CH_2$	100	20	5 Dual	X7X7KZ7	Q_1CEGG		1	2	1		liq. 0.6	-108.9	-4.41	Liq. gas sol. Alcohol, Ether; INFLAMMABLE. It polymerizes at 20 C-1,26 Bar
Butane	C_4H_{10}	100	20	2	X8GV6	EBPGG	1		1	1	1	liq. 0.6	-138	-0.5	INFLAMMABLE liquid
Butanol	$CH_3(CH_2)_2\,CH_2\,OH$	100	80	2	X8GV6	EBPGG	1	2	1	1		0.81	-89	117.7	Liq. sol. H_2O, Mix Ether, Oils, Alcohol; IRRITATING
Butanon (Methyl-Ethyl-Ketone)	$CH_3\,COC_2\,H_5$	100	60	2	X7GV7	EBEGG		1				0.82	-86.4	79.6	Liq. sol. H_2O, Alcohol, Ether, mix. Oils; INFLAMMABLE
Butter - Animal fat		100	60	5	X7X7KV7	Q_1BEGG	1	1	2	1					
Butter Cocoa		100	80	5	X8X6RZ8	U_3CPGG	1								
Butter Whey		100	60	5	XYXYKVY	Q_1BVGG				1					
Butyl Acetate	$CH_3\,COOCH_2\,CH_2\,CH_2\,CH_3$	100	80	4	XX5335	U_3U_3TGG		2				0.88	-75	126.3	Liq. sol. Alcohol, Ether, Hydrocarbons; INFLAMMABLE
Butyl Acrylate	$CH_2\,CHCOOC_4\,H_9$	100	70	4 Dual	XX5335	U_3U_3TGG						0.9	-64	145	Liq. It polymerizes with heat
Butyl Alcohol	$CH_3\,(CH_2)_2\,CH_2\,OH$	100	70	2	X8GV6	EBPGG	1	2	1	1		0.81	-89	117.7	Liq. sol. H_2O; Mix. eter, Alcohol
Butyl Ammine (Ammino Butane)	$C_4\,H_9\,NH_2$	100	90	4	XX5XV5	GBTGG						0.73	-49	77.1	Liq. VOLATILE, INFLAMMABLE
Butyl Benzoate	$C_6\,H_5\,COOC_4\,H_9$	100	90	2	X7GZ7	ECEGG		1		1		1.0	-22	247.3	Oily liq. mix. Alcohol, Ether
Butyl Butyrate	$CH_3(CH_2)_2\,COOC_4\,H_9$	100	90	2	X7GZ7	ECEGG		1		1		0.87	-91.5	165.7	Liq. sol. Alcohol, Ether
Butyl Carbitol	$C_4\,H_9\,OCH_2\,CH_2\,OCH_2\,CH_2\,OH$	100	120	5	X7X72Z7	VCEGG		1			1	0.95	-68	238.6	Liq. sol. Oils, H_2O
Butyl Carbitol	$C_4\,H_9\,OCH_2\,CH_2\,OCH_2\,CH_2\,OH$	100	-30	RF	X33A	U_3U_3YGG					1	0.95	-68	238.6	Liq. sol. Oils, H_2O
Butyl Formiate	$HCOOC_4\,H_9$	100	90	2	X7GV7	EBEGG		1				0.9	-90	107	Liq. mix. Alcohol, Ether, Oils, H_2O,Hydrocarbons; INFLAMMABLE
Butyl Lactate	$CH_3\,CHOHCOOC_4\,H_9$	100	70	2	X7GV7	EBEGG		1				0.98	-43	188	Liq. sol. Oils, solvents
Butyl Maleate		Sat.	40	4	XX5XV5	GBTGG									
Butyl Oxytol	$HOCH_2\,OC_4\,H_9$	100	70	2	X7GV7	EBEGG		1				0.90		171	Liq. mix. H_2O, Hydrocarbons
Butyl Phosphate		Sat.	70	2	X7GV7	EBEGG		1							
Butyl Phthalate		100	70	2	X7GV7	EBEGG		1							
Butyl Propionate	$C_2\,H_5\,CO_2\,C_4\,H_9$	100	70	2	X7GV7	EBEGG		1				0.87	-89	146	Liq. sol. Alcohol, Ether, Hydrocarbons
Butylcellosolve	$CH_2\,OH\,CH_2\,OC_4\,H_9$	100	20	4	XX5335	U_3U_3TGG		2				0.9		171	Liq. sol. mineral Oils, H_2O
Butylene (Butene 1)	$CH_2\,CH\,CH_2\,CH_3$	100	20	2	XYGVY	EBVGG	2			1	1	liq. 0.59	-185	-6.3	Liq. Gas sol. org. solvents; VOLATILE, INFLAMMABLE
Butyric Acid	$CH_3\,CH_2\,CH_2\,COOH$	100	70	4	XX5XZ5	GCTGG		2		2		0.95	-5, -8	163.5	Liq. Mix. Alcohol, Ether
C															
Cadmium Nitrate	$Cd(NO_3)_2 \cdot 4H_2O$	Sat.	80	5	XBX8KR6	Q_1U_3PGG	1					2.45	59.5	132	H_2O, Alcohol sol. Crystals
Calcite	$CaCO_3$	Sat.	20	5	X7X7KR7	Q_1U_3EGG	1	1	1	1		2.9			Powder or crystals Acid sol.
Calcium Bisulphite	$Ca(HSO_3)_2$	10	20	5	XYXYKZY	Q_1CVGG	1		1	1		1.06			

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Calcium Carbonate	$Ca\,CO_3$	Sat.	20	5	XYXYKRY	Q_1U_1VGG	1	1	1	1		2.9			Powder or crystals sol. in acids
Calcium Chloride	$Ca\,Cl_2$	Sat.	140	5	X7X7RZ7	U_1CEGG	1	1	1	1		2.15			H_2O, Alcohol sol. crystals
Calcium Fluoride	CaF_2	10	70	5	XYXYKRY	Q_1U_1VGG				1		3.18			Powder non sol. in H_2O
Calcium Hydrate (Hydroxide)	$Ca(OH)_2$	Sat.	80	5 Dual	X7X7KR7	Q_1U_1EGG	1	1	2	1		2.23			Powder sol. in Glycerine, less in H_2O
Calcium Hypochlorite	$Ca(OCl)_2$	Sat.	60	5	XYXYKKY	Q_1Q_1VGG		1		1		2.35			H_2O, sol. crystals
Calcium Nitrate	$Ca(NO_3)_2 \cdot 4H_2O$	Sat.	50	5	XYXYKRY	Q_1U_1VGG	1	1	1	1		1.82			Solid subst. sol. H_2O, Alcohol, Acetone
Calcium Phosphate (Meta, mono, bi, tri)		Sat.	60	5	XYXYKRY	Q_1U_1VGG	1	1	2	1					
Calcium Sulphate	$Ca\,SO_4 \cdot {}_2H_2O$	Sat.	80	5 Dual	X7X7KR7	Q_1U_1EGG		1				2.9			Sol. powder
Calcium Sulphide (Lime)	$Ca\,S$	Sat.	80	5	X7X7KR7	Q_1U_1EGG	1	1	1	1		2.8			Powder sol. in Acids, Less in H_2O
Calcium Sulphite	$Ca\,SO_3 \cdot {}_2H_2O$	Sat.	80	5 Dual	X7X7KR7	Q_1U_1EGG	1	1	1	1					Sulphurons Acid sol. powder, less in H_2O
Camphor	$C_{10}\,H_{16}\,O$	10	90	4	XX5335	U_1U_1TGG						0.99	179		Crystals sol. in Alcohol, Ether, Chlorophorm
Cane - Sugar Juice		100	70	5	X6X6KZ6	Q_1CPGG	1	1	1	1					
Caprolactam	$CH_2(CH_2)_5\,NHCO$	100	>60	4	XX5335	U_1U_1TGG		2				1,1	69		Kristals sol. in H_2O, chlorate solvents, petroleum derivates
Carbamide (Urea)	$CO(NH_2)_2$	100	140	4 Dual	XX5335	U_1U_1TGG		1				1.33	132.7		H_2O, sol. crystals, Alcohol, Benzene
Carbinol (Methilic Alcohol)	$CH_3\,OH$	100	70	2	X7XZ7	GCEGG	1	1	1			0.79	-98	64.5	Liq. sol. H_2O, Alcohol, Ether; VOLATILE, INFLAMMABLE, POISONOUS
Carbinol Dimethil (Isopropylic Alc.)	$(CH_3)_2\,CHOH$	100	80	2	X7XZ7	GCEGG	2	1	2	1		0.78	-86	82.4	Liq. sol. H_2O, Alcohol, Ether; INFLAMMABLE
Carbitol (Various)		100	70	4	XX5XV5	GBTGG	2	2	2	2		1			Liquids
Carbolic Acid (Benzophenol)	$C_6\,H_5\,OH$	Sat.	80	5	XYXY2ZY	VCVGG		2		1		1.07	43	182	Crystals sol. H_2O, Alcohol, Ether, Chlorophorm; POISONOUS, Scalding
Carbon Bioxyde Gas	CO_2	100	70	5 Dual	X7X72V7	VBEGG	1	2	2	2		1.53 aria 1			Sol. H_2O, Alcohol, Acetone
Carbon Bioxyde liq.	CO_2	100	-25	5	X7X7RZ7	U_1CEGG	1	2	2	2		1.1 (-37)	-56.6 *		* 5.2 Bar; Sol. H_2O, Alcohol, Acetone
Carbon Bisulphide	CS_2	100	30	5	XYXYKZY	Q_1CVGG				1		1.26	-111	46.2	Liq. sol. Alcohol, Ether, Benzene; POISONOUS, INFLAMMABLE
Carbon Bisulphide and Sulphur		100	30	5	XYXYKKY	Q_1Q_1VGG				1					
Carbon Dioxide	CO_2	100	70	5 Dual	X7X72V7	VBEGG	2	1	1	1		1.53 Aria.1			Gas sol. H_2O, Alcohol, Acetone
Carbon Oxyde (Gas)	CO	100	30	2 Dual	XYGZY	ECVGG	1	1	2	1		0.96 aria 1	-207	-190	Sol. H_2O, Alcohol; POISONOUS, INFLAMMABLE
Carbon Tetrachloride	$C\,CL_4$	100	20	5	LYLYKZY	Q_1CVMM	2			1		1.58	-23	76	Liq. mix. Alcohol, Benzene, Ether, Naphtha, Chlorophorm; POISONOUS
Carbonic Acid	$H_2\,CO_3$	Sat.	30	5	X7X72V7	VBEGG	2	1	1	1					
Carbonic Anhydride (Gas)	CO_2	100	70	5 Dual	X7X72V7	VBEGG	1	1	2	2		1.53 Aria 1			Gas sol. H_2O, Alcohol, Acetone
Carbowax (Polyethylene Glycol)		100	140	5	X7X7RZ7	U_1CEGG		1							
Carboxylic Acid		20	70	5	XYXY2ZY	VCVGG				1					
Castor Oil (Ricinus oil)		100	60	5	X6X6RZ6	U_1CPGG	1	2	1	1		0.96	-10		Sol. in Alcohol, Ethere, Benzene, Chloroph.; It may POLYMERIZE
Caustic Soda	Na OH	10	70	5	X7X72Z7	VCEGG	2	1	2	2		2.13			H_2O, Alcohol, Glycerol sol. cristals
Caustic Soda	Na OH	Sat.	90	5	L7L7KK7	Q_1Q_1EMM		1				2.13			H_2O, Alcohol, Glycerol sol. cristals
Caustic Soda	Na OH	30	70	5	X7X7KR7	Q_1U_1EGG	2	1	2	2		2.13			
Caustic Solution		3	70	5	X7X72Z7	VCEGG	2	1	2	2					
Cellosolve		100	20	4	XX5335	U_1U_1TGG		2							
Cellulose Acetate		100	80	4	XX5XV5	GBTGG									
Cellulose Lake		100	20	4 Dual	XX5335	U_1U_1TGG									
Cellulose Mixtures		100	20	4 Dual	XX5335	U_1U_1TGG									

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Cellulose Nitrate (Nitrocellulose)	$C_6 H_7 O_2(ONO_2)_3$	100	20	4 Dual	XX5335	U_3U_3TGG									Paste sol. in Ether, Acetone, Alcohol; INFLAMMABLE - EXPLOSIVE
Cellulose Solvent		100	40	4	XX5XV5	GBTGG									
Chloracetic Acid	CH_2 Cl COOH	Sat.	20	45	LL5L5KK5	Q_1Q_1TMM		2				1.37	63	190	H_2O; Alcohol, Ether, Sol. Crystals; CAUSTIC
Chloral (Trichloracetaldehyde)	C Cl_3 CHO	100	90	4	XX5XV5	GBTGG						1.5	-57	97.7	Oily liq. sol. Alcohol, Ether, Chloroph.; DANGEROUS VAPOURS
Chlorate Solvents		100	90	5	XYXYKZY	Q_1CVGG				1					
Chlorbenzene (Benzene Monochlor.)	$C_6 H_5$ Cl	100	70	2	XYXVY	GBVGG				1		1.1	- 45	131.6	Liq. mix. org. solventes; VOLATILE, INFLAMMABLE (no PTFE)
Chlorethylene (Vinylchloride)	CH_2 CH Cl	100	30	5	XYXYRZY	U_3CVGG				1		liq. 0.91	-159.7	-13.9	Liq. gas sol. Alcohol, Ether; INFLAMABLE; liq. at 3 Bar
Chlorhydrin	CH_2 OHCHOH CH_2 Cl	100	80	2	XYGZY	ECVGG				1		1.3	-40	213	H_2O sol. liq.
Chloridate Solvents		100	80	4	XX5XV5	GBTGG				2					
Chlorine (Anhydrous Gas)	Cl	100	20	5 Dual	XYXYKKY	Q_1Q_1VGG				1		2.49 aria 1		-40	POISONOUS
Chlorine (Active Chlorine Liq. >6 - 8 Bar)	Cl	100	20	5	LYLYKKY	Q_1Q_1VMM				1		liq. 1.46	-101	-34.5	Gas or liq. sol. H_2O, Alkali; POISONOUS
Chlorine (Dry Gas)	Cl	100	20	5 Dual	XYXYKKY	Q_1Q_1VGG				1		2.49 Aria.1		-40	POISON Gas
Chlorine (Liquid)	Cl	20	20	5	LYLYKKY	Q_1Q_1VMM				1		1.46	-101	34.5	Liq. sol. H_2O, Alkali; POISONOUS
Chlorine Bioxyde	Cl O_2	100	<10	5	LYLYKKY	Q_1Q_1VMM				1			-59.5	10	Gas or liq. sol. H_2O; EXPLOSIVE
Chlorine Diphenyl	Cl $C_6 H_4$ SO_2 $C_6 H_3$	Sat.	90	2	XYXZY	GCVGG				1					Crystals sol. org. solvents
Chlorine Hexane		100	70	2	X6GV6	EBPGG	1			1					
Chlorine Leather Tanning		100	90	5	XYXYKZY	Q_1CVGG				1					
Chlorit	Na Cl O_2	Sat.	90	5	XYXYKKY	Q_1Q_1VGG				1			200		H_2O sol. Crystals
Chloromethane (Methylchloride)	CH_3 Cl	100	20	2 Dual	XYGVY	GBVGG				1		liq. 0.92	-97.6	-23.7	Liq. gas sol. Benzene, Alcohols, H_2O, Chloroph., Acetic Acid; POISONOUS
Chlorophorm (Methantrichlor.)	CH Cl_3	100	40	5	XYXYRZY	U_3CVGG				1		1.48	-63.5	61.2	Solvent liq. mix. Alcohol, Ether, Benzene, Naphtha ; VOLATILE
Chloroprene (Chlorobutadiene)	H_2 C:CHCCl:CH_2	100	<50	5	XYXY2ZY	VCVGG		2		1		0.95		59.4	Liq. sol. Alcohol, less in H_2O
Chlorosulphonic Acid	Cl SO_2 OH	100	40	45	LL5L5KK5	Q_1Q_1TMM						1.77	-80	158	Liq. POISONOUS, SCALDING in H_2O = H_2SO_4 + HCL
Chlorotene (Trichlorethane 1.1.1.)	CH_3 C Cl_2	100	70	5	XYXYRZY	U_3CVGG				1		1.3		75	Liq. sol. Alcohol, Ether
Chlorethane (Ethyl Chloride)	$C_2 H_5$ Cl	100	20	2	X6GV6	EBPGG	1	1	1	1		liq. 0.92	-140	12.5	Liq. mix. common solvents; VOLATILE, INFLAMMABLE
Chocolate		100	90	2 Dual	X7337	U_3U_3EGG		1							
Chromates (Solutions)		Sat.	60	5	LYLYKKY	Q_1Q_1VMM		2		1					
Chrome Alum	Cr $K(SO_4)_2$ • $12H_2O$	Sat.	80	5	XYXYKRY	Q_1U_3VGG	1	1	1	1		1.8	89		Crystals sol. H_2O
Chrome Hydrate	$Cr(OH)_3$	Sat.	60	5	X6X6KR6	Q_1U_3PGG	1								Crystals sol. in Acids and very alkaline solutions
Chrome Hydrate + Stalked Lime		Sat.	60	5	X6X6KR6	Q_1U_3PFG	1								
Chrome Oxyde	Cr_2 O_3	30	100	5 Dual	XYXYKRY	Q_1U_3VGG		2		1		5.04			Non soluble Powder
Chrome Solution		Sat.	70	5	XYXYKRY	Q_1U_3VGG		2		1					
Chrome Sulphate (a,b,c)	Cr_2 $(SO_4)_3$	Sat.	80	5	XYXY2ZY	VCVGG				1		3 - 1.7			H_2O, Alcohol sol. crystals
Chromic Acid	H_2 Cr O_4	Sat.	70	5	XYXYKRY	Q_1U_3VGG		2		1		2.8	196		Crystals sol. H_2O, Alcohol, Min. Acids; It existx only as solution; SCALDING
Chromic Anhydride	Cr O_3	Sat.	70	5	XYXYKRY	U_3Q_1VGG		2		1		2.8	196		Crystals sol. H_2O, Alcohol, Min. Acids; SCALDING
Citrates		Sat.	110	5	X7X7KR7	Q_1U_3EGG	1	1	1	1					
Citric Acid (Vinegar)	$C_6 H_8 O_7$	5	25	2	X7XV7	GBEGG	1	1	1	1		1.54	153		H_2O; Alcohol - Sol. crystals
Coalgas		100	30	2 Dual	XYGZY	ECVGG				1	1				
Coca Cola		100	20	5	X7X72V7	VBEGG		1		1					

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Coca Cola (Syrup)		100	20	5 Dual	X7X7KR7	Q_1U_1EGG		1		1					
Cod-liver Oil		100	80	5	X8X62Z8	VCPGG	1	1	2	1					
Coffee (cream)		100	90	5	X7X72Z7	VCEGG		1		1					
Coffee (cream, sugar)		100	90	5	X7X7KZ7	Q_1CEGG		1		1					
Collodion (Nitrocellulose + Ether + Alcohol)		100	30	4	XX5XV5	GBTGG									Liq. mix. H_2O; INFLAMMABLE
Colofony (Rosin - Pineresin)		100	30	2 Dual	XY33Y	U_3U_3VGG	1			1		1.08	100 - 150		Flakes sol. Alcohol, Benzene, Oils, Ether, Acetic Acid
Copper Chloride	$Cu\ Cl_2 \cdot {}_2H_2O$	Sat.	20	7	XYRRYHX	U_2U_2VGG	1	1	2	1		2.54			Crystals sol. H_2O, Alcohol; POISONOUS
Copper Cyanide	$Cu(CN)_2$	Sat.	60	5	XYXYK0XY	Q_1Q_1VGG	1	1	1	1					Powder sol. Acids, Alkali; POISONOUS
Copper Nitrate	$Cu(NO_3)_2 \cdot 3H_2O$	Sat.	80	5	X8X8KK8	Q_1Q_1PGG	1					2.32	114.5		Crystals sol. H_2O, Alcohol; POISONOUS, STRONG OXYDATING
Copper Oxyde	CuO	10	30	5	X8X62V8	VBPGG	1					6.32			Acids soluble Crystals; TOXIC
Copper Salts		10	30	5	X8X6KR8	Q_1U_2PGG	1	1	1	1					Cristals
Copper Sulphate	$Cu\ SO_4 \cdot 5H_2O$	50	80	5	X8X6KR8	Q_1U_2PGG	1	1	1	1		2.28			H_2O, Methanol sol. Crystals; POISONOUS
Copper Sulphate + 10% H2 SO4		50	20	5	XYXYKZY	Q_1CVGG				1					
Cream - Beauty		100	60	5	X8X6RR6	U_1PGG	1			1					
Creoline		100	70	2	XYXVY	GBVGG				1					
Creosole (Meta, Orto, Para)	$CH_3\ C_6\ H_4\ OH$	Conc.	90	5	XYXYRZY	U_1CVGG				1		1.04	30 - 35	203	Liq. or crystals sol. Alcohol, Ether, Chloroph.; POISONOUS, SCALDING
Creosote		100	140	2	XY33Y	U_3U_3VGG	1		2	1	1	1.08		203	Oily liq. mix. Alcohol, Ether
Creosote + light Oil		100	140	2	XY33Y	U_3U_3VGG	1		2	1	1				
Cresylic Acid	$CH_3\ C_6\ H_4\ OH$	Conc.	90	5	XYXYRZY	U_1CVGG				1		1.04	30-35	203	Liq. crystals sol. H_2O, Alcohol, Ether, Chloroph; POISONOUS, SCALDING
Crotonic Aldehyde	$CH_3\ CH = CHCHO$	100	80	2	XYXVY	GBVGG				1		0.85		102	Liq. mix. Alcohol, Ether, Toluol, Benzene, Naphtha; INFLAMMABLE
Crotonic Aldehyde + Butanol		100	80	5	XYXYKZY	Q_1CVGG				1					
Cumene	$C_6H_5C(CH_3)_2$	100	70	2	XYXZY	GCVGG				1		0.86	-96	152.7	Liq. sol Alchohol, Eter, Benzene, Carb. Tetracl.
Cumene Hydroperoxyde	$C_6\ H_5\ C(CH_3)_2\ OOH$	100	70	2	XYXZY	GCVGG				1					Liq. sol. Alcohol, Acetone, Hydrocarbons, Esters
Cyanides		Sat.	40	5	X7X72Z7	VCEGG		1							POISONOUS
Cyclohexane	$C_6\ H_{12}$	100	80	2	X8GV6	EBPGG	1			1		0.78	6.3	80.7	Liq. mix. Buthylic Alcohol, Toluol, Xylol; INFLAMMABLE
Cyclohexanon	$C_6\ H_{10}\ O$	100	90	4	XX5X2S	GCTGG		2				0.95	-47	156.7	Liq. mix. Solvents
Cyclopentadiene	C_5H_6	100	80	2	X8GV6	EBPGG	1					0.8		42.5	Liq. sol. Alcohol, Ether, Benzene
Cymene	$CH_3\ C_6\ H_4\ CH(CH_3)_2$	100	80	2	XYXVY	GBVGG				1		0.87			Liq. sol. Alcohol, Ether, Chlorophorm
D															
DDT (Dichlorodiphenyltrichloroethane)	$(ClC_6H_4)_2\ CHCCl_3$	100	140	4	XX5336	U_3U_3TGG							109		Crist. sol. Kerosene, Benzene, Ether, Acetone, Carb. Tetrachl.
DEA solution	$(HOCH_2\ CH_2)_2\ NH$	Sat.	110	4	XX5336	U_3U_3TGG	2	2	2						Liq. or crystals sol. H_2O, Alcohol
Decylene	$H_2C = CH(CH_2)_7\ CH_3$	100	120	2	XYGVY	EBVGG				1		0.73	-66.3	172	Liq. sol. Alcohol
Detergents		100	90	5	X7X7RZ7	U_1CEGG		1							
Deuterium (Heavy Water)	D_2O	100	140	5	X7X7KZ7	Q_1CEGG		1		1					
Diacetonealcohol (Diacetone)	$CH_3\ COCH_2\ C(CH_3)_2\ OH$	100	130	5	X7X7KK7	Q_1Q_1EGG		1				0.94	-42.8	169	Liq. mix. Alcohol, H_2O, Esters; INFLAMMABLE
Dialysis Liquid		100	40	5	X7X72Z7	VCEGG		1		1					
Dibromotetrafluorethane		100	30	4	XX5XV5	GBTGG				2					FIRE- FIGHTING
Dichlorethane (Ethylene Chloride)	$Cl\ CH_2 CH_2\ Cl$	100	60	4	XX5XV5	GBTGG				2		1.25	-35	83.5	Oily liquid, mix. common solvents; INFLAMMABLE

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Dichloromethane (Methylene Chloride)	$CH_2 Cl_2$	100	40	4	XX5XV5	GBTGG				2		1.3	-97	48.1	Liq. sol. Alcohol, Ether; VOLATILE, POISONOUS
Dichlorpropane (Propylenechloride)	$CH_3 CICHCICH_2 Cl$	100	30	4	XX5XZ5	GCTGG						1.15	-80	96.3	Sol. in common solvents, NOT in H_2O
Diesel - Fuel (Diesel Oil)		100	110	2	XYGZY	ECVGG				1	1				
Diesel Fuel		100	110	2	XYGZY	ECVGG				1	1				
Diethanolammine (DEA)	$(HOCH_2 CH_2)_2 NH$	Sat.	110	4	XX5335	U_3U_3TGG	2	2	2			1.09	28	217	Liq. or crystals sol. H_2O, Alcohol
Diethylammine	$(C_2 H_5)_2 NH$	100	90	4	XX5XV5	GBTGG	2	2	2			0.7	-49.8	55.5	Liq. mix. H_2O, Alcohol, org. Solvents; INFLAMMABLE
Diethylcarbonate	$(C_2 H_5)_2 CO_3$	100	90	5	X7X72V7	VBEGG		1				0.97	-43	126	Liq. mix. Ketones, Alcohol, Esters, arom. Hydrocarbons; COMBUSTIBLE
Diethylene Glicol	$CH_2 OH CH_2 OCH_2 CH_2 OH$	100	140	5	X7X7RZ7	U_3CEGG		1	2	1		1.11	-8	245	Liq. mix. H_2O, Ether, Acetone
Diethylmaleate	$C_2H_5OOCCH : CHCOOC_2H_5$	100	80	2	XYXZY	GCVGG				1		1.06	-11.5	225	Liq. sol. Alcohol, Organic Solvents, Hydrocarbons, less in H_2O
Dimethyl Sulphur Oxyde (DMSO)	$(CH_3)_2 SO$	100	30	4	XX5XZ5	GCTGG						1.1	18.5	189	Liq. mix. H_2O
Dimethylammine (DMA)	$(CH_3)_2 NH$	100	20	4	XX5XV5	GBTGG						0.68	-92.2	6.9	Gas at ordinary temp. Sol. H_2O, Ether, Alcohol; INFLAMMABLE
Dimethylphormamide (DMF)	$HCON(CH_3)_2$	100	180	4	XX5335	U_3U_3TGG		2				0.95	-61	152.8	Liq. mix. H_2O, org. Solvents
Dimethylphormamide+Acrylnitr.+Methylenchloride		100	80	4 Dual	XX5335	U_3U_3TGG									Dimethylphormamide + Acrylnitrile + Methylenchloride
Dimethylteraphtalate (DMT)	$C_6H_4(COOCH_3)_2$	100	140	5	XYXYKRY	Q_1U_3VGG				1			140		Crystals sol. Alcohol, Ether
Dinitrochlorobenzene	$C_6 H_3(NO_2)_2 Cl$	100	>60	2	XYGZY	ECVGG				1		1.69	27-53	315	Alcohol sol. crystals
Dinitrochlorobenzene + Stirol		100	110	5	XYXYKRY	Q_1U_2VGG				1					
Dioctylphtalate (DOP)	$C_6H_4(COOCH_2CH(C_2H_5)C_4H_9)_2$	100	110	4	XX5XV5	GBTGG		2	2	2		0.98		231	Min. oil sol. liquid
Dioktylamine	$[C_4 H_9 CH(C_2 H_5)CH_2]_2 NH$	100	90	2	X6GV6	EBPGG	1					0.8		261	Hydrocarbons sol. liq.
Dioxine (TCDD)		100	30	4	XX5XZ5	GCTGG						1			
Diphenil + Diph. Oxyde (DOW. A)		100	350	RF	X33A	U_3U_3YGG				1	1				
Diphenyl	$C_6 H_5 C_6 H_5$	Sat.	80	4	XX5XZ5	GCTGG						1	70	225	Alcohol, Ether sol. crystals
Diphenyl Chloro	$ClC_6 H_4 SO_2 C_6 H_5$	Sat.	80	2	XYXYY	GBVGG				1					Org. Solvents sol. Crystals
Diphyl DT		100	180	2	XY3ZY	U_2CVGG				1	1				
Divinyl (Butadiene)	$H_2 C:CH HC:CH_2$	100	20	5 Dual	X7X7KZ7	Q_1CEGG		1	2	1		Liq. 0.62	-109	-4.4	Liq. Gas sol. Alcohol, Ether; at 0 °C=1,2 Bar. INFLAMMABLE, IT POLYMERIZES
Doctor Solution (Na - Plumbite)	$Na_2 Pb O_2$	Sat.	80	2	X6XV6	GBPGG	1								
Dodecyl Mercaptan	$C_{12} H_{25} SH$	100	70	2	X7GV7	EBEGG		1				0.85	-7.5	143	Liq. sol. Methanol, Ether, Benzene, Acetone, Petrol, Ethylacetate
Dowanol		100	80	4	XX5XZ5	GCTGG									
Dowtherm 209		100	90	2	X6GV6	EBPGG	1		2		1			99	
Dowtherm A and E		100	250	RF	X33A	U_3U_3YGG				1	1			(*)	(*) A = 258 C; E = 177 °C
Dowtherm various		100	150	4	XX5325	U_7CTGG					1				
Dye liquor		100	90	5	X7X72Z7	VCEGG		1		2					
Dye liquor		100	140	5	X7X7KR7	Q_1U_3EGG		1		2					
E															
EDTA (Ethylenediamine Tetraacetic Acid)	$(HOOCCH_2)_2 N_2C_2H_4 (CH_2 COOH)_2$	Conc.	90	5	X7X7KZ7	Q_1CEGG		1							Hardly sol. crystals in H_2O
Egg Yolk		100	20	5	X7X7KZ7	Q_1CEGG	1	1		1					
English Salt (Bitter Salt)		Sat.	90	5	X6X6RV6	U_3BPGG	1								Compound Magnesium Sulphate
Epichlorhydrin	$CH_2 OCH CH_2 Cl$	30	50	4	XX5XV5	GBTGG		2				1.17	-58.1	115.2	Liq. mix. org. Solvents; VOLATILE, NARCOTIC
Epichlorhydrin		Sat.	90	4	LL5LZ5	MCTMM		2							Liq. mix. org. Solvents; VOLATILE, NARCOTIC

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Epoxy Resins		100	140	4 Dual	XX5335	U_3U_3TGG				2					Washing with solvent
Estheres - Phtalate Estheres		100	80	5	X7X72Z7	VCEGG		1							
Ethane (Dimethyl)	C_2H_6	100	90	2 Dual	X6GZ6	ECPGG	1		2	1	1	Liq. 0.44	-183	-88.6	INFLAMMABLE Gas
Ethane Dibrome	$Br\,CH_2\,CH_2\,Br$	100	70	4 Dual	XX5XZ5	GCTGG						2.18	9.1	131	Solvents sol. liq.
Ethane Dichl. (Ethylene Chloride)	$Cl\,CH_2 : CH_2\,Cl$	100	70	4	XX5XV5	GBTGG				2		1.25	-35	83.5	Oily liq. mix. common solvents; INFLAMMABLE
Ethane Dichlortetrafluor	$C\,Cl\,F_2\,C\,Cl\,F_2$	100	40	2	XYGZY	ECVGG	1	1	1	1	1		-94	3.55	Liq. Gas
Ethane Tchachlordiphenyl (TDE)	$(Cl\,C_6\,H_4)_2\,CHCHCl_2$	100	140	4	XX5335	U_3U_3TGG							110		Org. solvents sol. crystals similar to DDT
Ethane Tetrachlore	$CH\,Cl_2\,CH\,Cl_2$	100	90	5	XYXY2ZY	VCVGG				1		1.59	-43	146.5	Liq. sol. Alcohol, Ether, TOXIC, VAPOURS
Ethane Trichlor 1,1,1 Inhibited	$CH_3\,CCl_3$	100	40	5	XYXYRZY	U_2CVGG				1		1.3		75	Liq. sol. Alcohol, Ether
Ethane Trichlore Trifluor (F 113)	$C\,Cl_2\,F\,CClF_2$	100	40	2	X6GZ6	ECPGG	1		1	2		1.42	-36.4	47.6	Liq. VOLATILE, INERT
Ethanol (Ethil Alcohol)	$C_2H_5\,OH$	Conc.	70	2	X6XV6	GBPGG	1	1	1			0.81	-118	78.3	Liq. VOLATILE, INFLAMABLE, sol. Ether, H_2O, Chlorophorm
Ethanolammines (M E A)	$NH_2\,CH_2\,CH_2\,OH$	Conc.	90	4	XX5XZ5	GCTGG	2	2	2			1.01	10.5	170.5	Slightly viscous liq. mix. H_2O, sol. Alcohol, Chloroph., Carb. Tetrachl.
Ether Acetic (Ethyl Acetate)	$CH_3\,COOC_2\,H_5$	Conc.	70	4	XX5XV5	GBTGG		2				0.89	-83.6	77	Liq. sol. Alcohol, Ether, Chloroph. INFLAMMABLE
Ether Isopropylic	$(CH_3)_2\,CHOCH(CH_3)_2$	100	20	4	XX5XV5	GBTGG	2					0.72	-88	67.5	VOLATILE, INFLAMMABLE liq.
Ether Petroleum (Ligroine)		100	80	2	X6GV6	EBPGG	1		2	1				20 - 135	Solvent; VOLATILE, INFLAMABLE, TOXIC
Ether Sulphur (Ethylic)	$(C_2H_5)\,O$	100	20	4	XX5XV5	GBTGG						0.7	-116	34.5	Liq. sol. Naphtha, Alcohols, Oils, Benzene, Chlorophorm; INFLAMMABLE, VOLATILE, EXPLOSIVE
Ethyl Acetate (Ether Acetic)	$CH_3\,COOC_2\,H_5$	Conc.	70	4	XX5XV5	GBTGG		2				0.89	-83.6	77	Liq. sol. Alcohol, Ether, Chlorophorm; INFLAMMABLE
Ethyl Acrylate	$CH_2 : CHCOOC_2\,H_5$	100	90	4	XX5XV5	GBTGG		2				0.92	-72	99.4	Liq.; IRRITATING, INFLAMMABLE, IT POLYMERIZES
Ethyl Benzoate (Niobe Oil)	$C_6\,H_5\,CO_2\,C_2\,H_5$	100	90	2	XYXZY	GCVGG				1		1.04	-32.7	213	Liq. sol. Alcohol, Ether
Ethyl Butirrate	$C_3\,H_7\,CO_2\,C_2\,H_5$	Conc.	110	2	X7XV7	GBEGG		1				0.87	-93.3	120.6	Liq. sol. Alcohol, Ether; VOLATILE, INFLAMMABLE
Ethyl Carbinol (Diethyl Carbinol)	$CH_3\,CH_2\,CHOHCH_2\,CH_3$	Conc.	100	2	XYXZY	GCVGG	1	1	1	1	1	0.82	-75	115.6	Liq. sol. Alcohol, Ether
Ethyl Carbonate (Diethyl Carbonate)	$(C_2\,H_5)_2\,CO_3$	100	90	5	X7X72V7	VBEGG		1				0.97	-43	126	Liq. mix. Alcohols, Ketones, Esthers, Aromatic Hydrocarbons
Ethyl Chloride (Chlorethane)	$C_2\,H_5\,Cl$	100	20	2	X6GV6	EBPGG	1	1	1	1		Liq. 0.92	-140	12.5	Mix. common solvents; VOLATILE, INFLAMMABLE
Ethyl Chlorophormiate (Chlorecarb.)	$Cl\,COOC_2\,H_5$	100	20	5 Dual	XYXYKZY	Q_1CVGG				1		1.13		95	Liq. sol. Alcohol, Benzene, Ether, Chlorophorm; POISONOUS, INFLAMMABLE
Ethyl Ethylene (Butene 1)	$CH_2\,CH\,CH_2\,CH_3$	100	20	2	XYGVY	EBVGG	2			1		Liq. 0.59	-185	-6.3	Liq. Gas sol. Org. Solvents; INFLAMMABLE, VOLATILE
Ethyl Hexanol (Octyl. Alcohol)	$CH_3(CH_2)_5\,CH_2\,OH$	100	70	2	X7XZ7	GCEGG	2	1	2	1		0.82	-16	194	Liq. mix. Alcohol, Chlorophorm; Min. Oil
Ethyl Phormiate	$HCOOC_2\,H_5$	100	40	5	XYXYRZY	U_2CVGG		2	2	1		0.92	-80.5	54.3	Liq. mix. Benzene, Ether, H_2O, Alcohol; INFLAMMABLE
Ethyl Phthalate (DEP)	$C_6\,H_4(CO_2\,C_2\,H_5)_2$	100	90	2	X7XZ7	GCEGG		1				1.12	-40.5	298	Liq. mix. Alcohol, Ketones, Esthers, Aromatic Hydrocarbons
Ethyl Propionate	$C_2\,H_5\,COOC_2\,H_5$	100	90	2	X7XZ7	GCEGG		1				0.89	-73	99	Liq. sol. Alcohol, Ether; INFLAMMABLE
Ethyl Silicate	$(C_2\,H_5)_4\,Si\,O_4$	Conc.	70	5	X7X7KZ7	Q_1CEGG	1	1	1	1		0.93	-77	168.1	Liq. sol. Alcohol; INFLAMMABLE
Ethyl Sulphate	$(C_2\,H_5)_2\,SO_4$	Conc.	70	5	X7X7KZ7	Q_1CEGG		1				1.18	-24.4	208	Liq. sol. Alcohol, Ether
Ethylene (Ethene)	$H_2\,C : CH_2$	Conc.	20	2 Dual	X6GZ6	ECPGG	1				1	Liq. 0.6	-169	-102.5	INFLAMMABLE, EXPLOSIVE Gas
Ethylene Chlore (Vinyl Chloride)	$CH_2 : CH\,Cl$	100	30	5	XYXYRZY	U_2CVGG				1		Liq. 0.91	-159.7	-13.9	Liq. Gas sol. Alcohol, Ether; INFLAMMABLE - Liq. at 3 Bar
Ethylene Chloride (Monochl., Dichl. Ethane)	$Cl\,CH_2 : CH_2\,Cl$	Conc.	70	4	XX5XV5	GBTGG				2		1.25	-35	83.5	Oily liq. mix. common Solvents; INFLAMMABLE
Ethylene Dimethyl	$(CH_3)_2\,CCH_2$	Conc.	20	2	XYGVY	EBVGG	2			1		0.6	-139	-6.9	Gas sol. Org. Solvents; VOLATILE, INFLAMMABLE
Ethylene Glicol	$CH_2\,OH\,CH_2\,OH$	Conc.	120	5	X7X7KZ7	Q_1CEGG	1	1	1	1	1	1.1	-13.5	197	Liq. sol. in H_2O, Ether, Alcohol
Ethylene Oxyde (ETO)	$CH_2\,CH_2\,O$	Conc.	20	4	XX5XV5	GBTGG						Liq. 0.87	-111.3	10.7	Gas sol. H_2O, common solvents , INFLAMMABLE
Ethylenebichloride (Dichlore)	$Cl\,HC : CH\,Cl$	100	20	2	XYGVY	EBVGG				1		1.25		47 - 60	Liq. sol. Organic Solvents; TOXIC

The data shown can be changed to reflect any improvement whitout notice. **Legend : "the material number codes 6, 7, 8, Y ,1" - 1 = Recomended , 2 = Suitable,** If not indicated, insufficient data or not suitable

X

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Ethylenediamine	$NH_2\ CH_2\ CH_2\ NH_2$	Conc.	40	2	X7XZ7	GCEGG	1	1				0.89	8.5	117	Alkaline liq. sol. H_2O, Alcohol; VOLATILE
Ethylenediamine Tetraacetic Acid (EDTA)	$(HOOCCH_2)_2\ N_2C_2H_4\ (CH_2\ COOH)_2$	Conc.	90	5	X7X7KZ7	Q_1CEGG		1							Hardly sol. crystals in H_2O
Ethyleneperchl. (Tetrachl.)	$Cl_2\ C : C\ Cl_2$	Conc.	70	5	XYXY2VY	VBVGG				1		1.6	-22.4	121	Liq. mix. Alcohol, Ether, Oils; TOXIC
F															
Fats		100	80	5	X6X6RZ6	U_2CPGG	1			1					
Fats - Animal Fats		100	160	5	XYXYKRY	Q_1U_2VGG	1	2	2	1					
Fats - Mineral Fats		100	80	2	X6GZ6	ECPGG	1		2	1	1				
Fats - Silicone Fats		100	80	2	X7GZ7	ECEGG	1	1	1	1	1				
Fats - Vegetal Fats		100	80	2	X6GZ6	ECPGG	1	1	2	1					
Ferric Phosphate	$Fe\ PO_4 + 4H_2O$	Sat.	70	5	X7X7RZ7	U_2CEGG		1							H_2O non sol. powder; sol. in mineral acids
Ferric Chloride	$Fe\ Cl_3$	Sat.	20	7	XY24YHX	VY_1VGG	1	1	2	1		2.89	300		Solid sol. H_2O, Alcohol, Glycerol, Methanol, Ether
Ferric Chloride and Aniline		Sat.	20	7	X7247HX	VY_1VGG		1							
Ferric Sulphate	$Fe(SO_4)_3 \cdot 9H_2O$	Sat.	100	5	X7X72V7	VBEGG		1				2.09			H_2O sol. powder
Ferric Sulphate + Lime		Sat.	100	5	X7X7RZ7	U_2CEGG		1							Powder sol. H_2O
Ferrous Sulphate	$Fe\ SO_4\ 7H_2O$	Sat.	110	5	X7X72V7	VBEGG		1				1.89	64		Crystals sol. H_2O
Ferrous Sulphur	Fe S	10	60	5	X7X72Z7	VCEGG		1				4.75	1195		Grains sol. Acids
Ferrous Sulphur + HCl		Sat.	30	5	LYLYKKY	Q_1Q_1VMM				1					
Fertilizers		Sat.	60	5	XYXYKRY	Q_1U_2VGG				1					
Fixing Bath (Photogr.)		100	40	7	X7247HX	VY_1EGG		1							
Fluid Silicon		100	90	4	X05XV5	GBTGG									
Fluoborate Acid Solution		10	30	5	X6X62V6	VBPGG	1	2							
Fluoboric Acid	HF	48	20	5 Dual	LYLYKKY	Q_1Q_1VMM		1		1		0.99	-83	19.5	Liq. mix. H_2O, Alcohol
Fluobrene		100	70	4	X05XV5	GBTGG				2					FIRE - FIGHTING
Fluosilicic Acid	$H_2\ Si\ F_6$	5	50	5	LYLYKZY	Q_1CVMM	2	1	2	1					Liq. sol. H_2O, POISONOUS
Foam Extinguisher		100	70	2 Dual	X6336	U_2U_2PGG	1								
Food - Oxtail Broth		100	100	5	X7X72V7	VBEGG	1	1		1					
Food Medium Fermentators		20	40	5	X7X7KR7	Q_1U_2EGG		1		1					
Formaldehyde (Formol)	HCHO	Sat.	30	4	X05XZ5	GBTGG		2				1.06 Aria 1	-118	-19	Liq. Gas sol. H_2O, Ether, Alcohol; POISONOUS, IT POLYMERIZES
Formalin	HCHO al 37%	100	30	4	X05XZ5	GBTGG		2				1.07		98	Contains Methylic Alcohol to avoid polymerisation
Formamide	$HCONH_2$	100	120	5	X7X7KZ7	Q_1CEGG		1				1.14 -	2.5	200	Oily liq. sol. H_2O, Alcohol
Formic Acid	HCOOH	10	50	5	L7L7KZ7	Q_1CEMM		1							Liq. sol. H_2O, Alcohol, Ether; CAUSTIC , EXPLOSIVE VAPOURS
Formic Acid	HCOOH	1	20	5	X7X7RZ7	U_2CEGG		1				1.22	8.3	100.8	Liq. sol. H_2O, Alcohol, Ether; CAUSTIC, EXPLOSIVE VAPOURS
Formic Aldehyde (Liq. gas)	H C OH	Sat.	30	4	X05335	U_2U_2TGG		2				1.05 air = 1	-118	-19	Gas sol. H_2O, Ether, Alcohol; POISONOUS, IT POLYMERIZES
Fossil Meal		10	80	2	X7337	U_2U_2EGG	1	1		1					Diatom Silica
Freon 11 (Trichlorofluormethane)	$C\ Cl_3\ F$	100	60	4	XX532S	U_2CTGG	2			2	1	1.5	-111	23.7	Extinguishing liq.; VOLATILE
Freon 12 (Dichlorodifluormethane)	$C\ Cl_2\ F_2$	100	40	2	X8GZ8	ECNGG	1	2	1	1	1	Liq. 1.4	-158	-29.8	Liq. Gas sol. org. solvents. Less in H_2O
Freon 13 (Chlorotrifluormethane)	$C\ Cl\ F_3$	100	40	2	X83Z8	U_2CNGG	1	1	1	1	1		-181	-81	Liq. Gas
Freon 14 (Tetrafluormethane)	$C\ F_4$	100	40	2	X83Z8	U_2CNGG	1	1	1	1	1	Liq. 1.96	-184	-128	Liq. Gas

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Freon 21 (Dichlorofluoromethane)	$CH Cl_2 F$	100	40	4	XX53Z5	U_3CTGG			2			Liq.1.42	-135	8.9	Liquid Gas sol. Alcohol, Ether
Freon 22 (Chlorodifluoromethane)	$CH Cl F_2$	100	40	2	X8GZ8	ECNGG		1	1		1		-160	-40.8	Liq. Gas
Freon 31		100	40	2	X8GZ8	ECNGG		1	1						
Freon 32		100	40	2	X8GZ8	ECNGG	1	1	1						
Freon 112	$C Cl_2 FCCl_2 F$	100	40	2	XYGZY	ECVGG	2		2	1					
Freon 113 (Trichlorotrifluoroethane)	$C Cl_2 FCClF_2$	100	40	2	X8GZ6	ECPGG	1		1	2		Liq. 1.42	-36.4	47.6	VOLATILE INERT liquid
Freon 114 (Dichlorotetrafluoroethane)	$C Cl F_2 C Cl F_2$	100	40	2	XYGZY	ECVGG	1	1	1	1			-94	3.55	Liq. Gas
Freon 115 (Chloropentafluoroethane)	$C Cl F_2 CF_3$	100	40	2	XYGZY	ECVGG	1	1	1	1			-106	-38.7	Liq. Gas sol. Alcohol, Ether
Freon 502		100	40	2	X8GZ8	ECNGG									
Freon and refrigerating oil		100	-20	2	X8GZ8	ECNGG			1	2	1				
Freon and refrigerating oil		100	-70	RF	XJZA	KCYGG					1				
Freon C318 (Octafluorocyclobutane)	$C_4 F_8$	100	40	2	X8GZ8	ECNGG	1	1	1	2	1	Liq. 1.81	-41.4	6.04	Liq. Gas
Freon TF (Freon 113)	$C Cl_2 FCClF_2$	100	40	2	X8GZ6	ECPGG	1		1	2		Liq. 1.42	-36.4	47.6	VOLATILE INERT liquid
Freon TMS		100	40	4	XX53Z5	U_3CTGG						1.48		39.7	Mixture of F113 + Methylalcohol
Fruit Juice		100	80	5	X7X72V7	VBEGG	1	1		1					
Fruit Juice + Sulph. Anhydride		100	80	5	X7X72V7	VBEGG		1							
Fuel - Aromatic		100	140	5	XYXYKZY	Q_1CVGG	1		2	1	1				
Fuel - Gas		100	30	2 Dual	X8GZ6	ECPGG	1			1	1				
Fuel - Jet Aricraft (JP)		100	50	2	XYGZY	ECVGG				1	1				
Fullers Earth		10	180	2	XY33Y	U_3U_3VGG				1					
Fumaric Acid	$C_4 H_4 O_4$	Sat.	60	5	XYXYKZY	Q_1CVGG	1		2	1		1.63	287		Cryst. sol. H_2O, Alcohol
Fuming Sulfuric Acid (Oleum)	$H_2 SO_4 \cdot SO_3$	100	40	5	LYLYKY	Q_1Q_1VMM				1					Oily liq. - mix. H_2O with hexothermic reaction - SCALDING
Fungicide		Sat.	30	5	XYXYKRY	Q_1U_3VGG				1					
Furfural (Furole)	C_4H_3OCHO	100	140	4	XX5335	U_3U_3TGG		2				1.16	-36.5	161.7	Liquid sol. up to 8.3% in H_2O, Alcohol, Benzene, Ether
Furfural Aldehyde	$C_4 H_3 OCOH$	100	140	4	XX5335	U_3U_3TGG		2				1.16	-36.5	161.7	Liq. sol. Alcohol, Ether, Benzene, at 8.3% in H_2O
G															
Gallic Acid	$C_7 H_6 O_5 \cdot H_2O$	Sat.	70	5	XYXY2ZY	VCVGG	2	2	2	1		1.69	222		Cryst. sol. Alcohol, Glycerol
Galvanic Solutions		Sat.	40	5	XYXY24Y	VY_1VGG				1					
Gas Oil		100	110	2	XYGZY	ECVGG				1	1				
Gasolene		100	30	2	XYGZY	ECVGG	1		2	1	1	0.68		40	
Glacial Acetic Acid	$CH_3 CO OH$	99.8	>17	4	XX5XZ5	GCTGG		2				1.055	16.6	118	Acetic Acid 99,8%; SCALDING
Glauber Salt (Sodium Solfate Decahydrate)	$Na_2 SO_4 \cdot 10H_2O$	Sat.	70	5	XYXYKRY	Q_1U_3VGG		2	2	1		1.46	33		H_2O, Glycerine sol. Crystals
Glicols		100	140	5	X7X7RZ7	U_3CEGG	1	1	1	1	1				
Glucose (20% H20)	$C_6 H_{12} O_6 \cdot H_2O$	20	90	5	X7X7KR7	Q_1U_3EGG	1	1	1	1					Liq. sol. H_2O, Glycerine
Glue		100	30	4 Dual	XX5335	U_3U_3TGG									
Glutamic Acid	$C_5 H_9 NO_4$	20	80	5	L7L72Z7	VCEMM		1				1.5	225		Cryst. sol. H_2O
Glutamic Acid + HCl traces		20	80	7	X72Z7HX	VCEGG		1							
Glutaric Acid	$C_5 H_8 O_4$	Sat.	70	5	X8X8KZ8	Q_1CPGG	1						97	302	Cryst. sol. H_2O, Alcohol, Ether

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Glycerine (Glycerol)	$C_3H_5(OH)_3$	100	140	5	XYXYRZY	U_3CVGG	1	1	1	1	1	1.26	18	290	H_2O and Alcohol sol. liq.
Glycerol-Phthalmic Resins		100	120	2 Dual	X7337	U_3U_3EGG		1							Washing with solvent
Grappa Brandy		100	40	2	X7XV7	GBEGG	1	1	1	1					
Green Vitriol (Iron Sulphate)	$Fe\ SO_4 \cdot 7H_2O$	Sat.	60	5	X7X72Z7	VCEGG		1				1.89	64		Crystals soluble in H_2O
H															
Heating water	H_2O	100	90	5	X7X72V7	VBEGG	1	1	2	1	1				With Polisphosphates, filming Amines
Helium (Gas)	He	100	20	5 Dual	X7X7KZ7	Q_1CEGG	1	1	1	1	1	0.38 aria 1	-272	-269	Inert Gas
Heptane	$CH_3(CH_2)_5\ CH_3$	100	70	2	X8GZ8	ECPGG	1		2	1	1	0.68	-90.5	98.4	Liq. sol. Alcohol, Ether, Chlorophorm; VOLATILE, INFLAMMABLE
Heptene	$C_7\ H_{14}$	100	70	2	X8GZ8	ECPGG	1				1	0.69	-119.2	93.3	Liq. sol. Alcohol, Acetone, Petroleum, Ether, Hydroc.
Herbicides Liquids		Sat.	20	4	LL5LZ5	MCTMM									
Hexachloracetone		100	40	45	LL5L5K45	Q_1Y_1TMM									
Hexane	$CH_3(CH_2)_4\ CH_3$	100	30	2	X8GZ8	ECPGG	1		2	1	1	0.65	-95	68.7	Liq. sol. Alcohol, Ether, Acetone; VOLATILE, INFLAMABLE
Hexone (Methyl Isobutyl Chetone)	$(CH_3)_2\ CH\ CH_2\ CO\ CH_3$	100	40	4	XX5335	U_3U_3TGG						0.8	-80.4	115.8	Liq. mix organic solvents INFLAMMABLE
Hydrazine	$H_2\ N\ NH_2$	100	70	2	X7XV7	GBEGG	2	1	2			1.004	2.0	113.5	Liquid mixable with H_2O, Alkohol; TOXIC VAPOURS
Hydrobromic Acid	H Br	48	40	5	LYLYKKY	Q_1Q_1VMM		1		1		2,7 air = 1	-86	-66.4	Water solution - HBr 48% in H_2O
Hydrobromic Acid with Bromo		48	40	5	LYLYKKY	Q_1Q_1VMM				1					
Hydrocarbons - Aliphatic		100	90	2	X8GZ8	ECPGG	1		2		1				
Hydrocarbons - Aromatic		100	30	2	XYGZY	ECVGG				1	1				
Hydrochloric Acid	H Cl	Sat.	37	7	XY2ZYHX	VCVGG				1		1.1 air = 1	-114	-85	Gas sol. H_2O, Alcohol, Ether; POISONOUS, CAUSTIC
Hydrochloric Acid (Muriatic)	H Cl	38	37	7	XY2ZYHX	VCVGG				1		1.2 air = 1	-114	-85	Gas in 38% H_2O - Solution; POISONOUS, CAUSTIC
Hydrocyanic Acid	H CN	99	<25	5 Dual	X7X7KZ7	Q_1CEGG	2	1	2	1		0.69	-13	26	Liq. sol. H_2O, Ether, Alcohol; EXPLOSIVE, POISONOUS
Hydrocyanic Acid (Prussic)	H CN	99	<25	5 Dual	X7X7KZ7	Q_1CEGG	2	1	2	1		0.69	-13	26	Liq. sol. H_2O, Alcohol, Ether; EXPLOSIVE, POISONOUS VAPOURS
Hydrocyanite		100	80	5	X8X62Z6	VCPGG	1								
Hydrofluoric Acid	$H\ B\ F_4$	20	30	5 Dual	LYLYKKY	Q_1Q_1VMM				1		1.84		130	Liq. or gas sol. H_2O, POISONOUS, SCALDING
Hydrogen	H	100	20	5 Dual	X7X7KK7	Q_1Q_1EGG	1	1	1	1		0.07 Aria.1	-259	-252	Hardly sol. Gas in H_2O; INFLAMMABLE - EXPLOSIVE
Hydrogen and Water (20 + 80)		100	70	5	X7X72V7	VBEGG	1	1	2	1					
Hydrogen Chloride (HCl)	H Cl	Sat.	37	7	XY2ZYHX	VCVGG				1		1.2 Aria.1	-114	-85	Gas sol. H_2O, Alcohol, Ether; POISONOUS, CAUSTIC
Hydrogen Cyanide (Hydrocyanic acid)	H CN	99	<25	5 Dual	X7X7KZ7	Q_1CEGG	2	1	2	1		Liq. 0.69	-13	26	Liquid sol. in H_2O, Alcohol, Ether; EXPLOSIVE, POISONOUS VAPOURS
Hydrogen fluoride (Hydrofluoric acid)	HF	48	20	5 Dual	LYLYKKY	Q_1Q_1VMM		1		1		Liq. 0.99	-83	19.5	Liq. or Gas sol. in H_2O; INFLAMMABLE, POISONOUS
Hydrogen Peroxide	H_2O_2	90	30	5	XYXYKKY	Q_1Q_1VGG				1		1,45	-2	150	Liq. sol. H_2O, Alcohol; SCALDING
Hydrogen Peroxyde	H_2O_2	100	30	5	XYXYKKY	Q_1Q_1VGG				1		Anid. 1.4	-2	158	Liq. sol. in H_2O, Alcohol; SCALDING
Hydrogen Sulphurate (Sulphide)	H_2S	100	20	5 Dual	X7X7KK7	Q_1Q_1EGG		1	2			1.2 Aria.1	-84	-60	Gas sol. in H_2O, Alcohol; POISONOUS, INFLAMABLE, EXPLOSIVE
Hydroquinone	$C_6H_4(OH)_2$	Sat.	80	4	XX5335	U_3U_3TGG				2		1.33	170	286	Cristals sol. in H_2O, Alcohol, Eter
Hydrosulphuric Acid	H_2S	100	20	5 Dual	X7X7KK7	Q_1Q_1EGG		1	2			1.2 air = 1	-84	-60	Gas solub. H_2O, Alcohol; EXPLOSIVE, INFLAMMABLE, POISONOUS
I															
Ice Cream		100	20	5	X7X7KK7	Q_1Q_1EGG		1		1					
Illuminating Gas		100	20	2 Dual	XYGZY	ECVGG				1	1	0.45 Aria.1			Mixture of Gas H + CO +N + Methane
Inert Gas		100	40	2 Dual	X8GZ8	ECPGG	1			1	1				

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Ink for ballpoint pen		100	30	4	XX53Z5	U_2CTGG									
Ink, Alcohol Ink		100	30	5	X7X72V7	VBEGG		1							
Ink, Waterink		100	30	5	XYXY2VY	VBVGG				1					
Insecticide		100	70	5	XYXYKKY	Q_1Q_1VGG				1					
Iodine - Dry Iodine		10	80	5 Dual	XYXYKKY	Q_1Q_1VGG	2	2		1		4.98	113.5	184	Flakes sol. in Glycerol, Alcohol, Ether, C. Disulphide; POISONOUS
Iodine - Tincture of Iodine		100	30	5	XYXYKKY	Q_1Q_1VGG				1					I + Na Jodure solution in Alcohol
Iodophorm	CHI_3	10	90	4 Dual	XX5XZ5	GCTGG						4.1	115		Powder sol. in Alcohol, Chlorophorm, Glycerol; less in H_2O
Isobutane (Liquid Gas)	$(CH_3)_2$ CH CH_3	100	30	2	X8GZ8	ECPGG	1			1	1	Liq. 0.55	-159.6	-11.7	Liq. Gas sol. Ether; INFLAMMABLE
Isobutilmethylketone		100	70	4	XX5335	U_3U_3TGG			2						
Isobutirric Aldehyde	$(CH_3)_2$ CH CHO	100	60	4	XX5XV5	GBTGG		2				0.79	-66	64	Liq. sol. Alcohol; Ether
Isobutylene (Dimethylethylene)	$(CH_3)_2$ C CH_2	Conc.	20	2	XYGVY	EBVGG	2			1		0.6	-139	-6.9	Liq. sol. in Organic solvents; VOLATILE, INFLAMMABLE
Isocyanates - Organic Isocyanates		100	70	2 Dual	XY33Y	U_3U_3VGG				1					BECOMES SOLID IN AIR
Isopentane	$(CH_3)_2$ $CHCH_2$ CH_3	100	30	2	X8GZ8	ECPGG	1				1	0.61	-160	27.8	Liq. sol. Hydrocarbons, Oils, Ether; VOLATILE, INFLAMMABLE
Isophorone	C_9 H_{14} O	100	40	2	X7XV7	GBEGG		1				0.92	- 8.1	215	Liq. solvent for vinylic resins. Low sol. in H_2O
Isopropanol (Isopropyl Alcohol)	$(CH_3)_2$ CHOH	100	80	2	X7XZ7	GCEGG	2	1	2	1		0.78	-86	82.4	Liq. sol. H_2O, Alcohol, Ether; INFLAMMABLE
Isopropylacetate	CH_3 $COOCH(CH_3)_2$	100	80	4	XX5XV5	GBTGG						0.86	-73.4	89.4	Liquid mix. org. solvents; INFLAMMABLE
Isopropylamine		100	30	4	XX5XZ5	GCTGG						0.7	-111	39	
Isopropylnitrate	$(CH_3)_2$ CH NO_3	100	90	4	XX5XZ5	GCTGG								102	INFLAMMABLE liquid
J															
J.P. 3-4-5-6		100	50	2	XYGZY	ECVGG	1		2	1	1	0.81		156 - 300	
Jelly		100	140	5	XYXYKRY	Q_1U_3VGG	1	1	1	1					
Jet Fuel		100	50	2	XYGZY	ECVGG	1		2	1	1	0.81		150 - 300	
K															
Kerosene		100	50	2	XYGZY	ECVGG	1		2	1	1	0.81		150 - 300	
Ketchup		100	90	5	XYXYKRY	Q_1U_3VGG	1	1		1					
Ketones		100	70	2	X7XV7	GBEGG		1							
Kraftgas (Producer gas)		100	50	2 Dual	X8GZ8	ECPGG	1		2	1	1				Mixture 3/4 Airgas + 1/4 Water Gas
L															
Lactams		100	130	4	XX5335	U_3U_3TGG		2	2						
Lactic Acid	C_3 H_6 O_3	100	80	2	XYXVY	GBVGG				1		1.2	18	122	Liq. mix. H_2O, Alcohol, Glycerine
Lake Solvents		100	90	4	XX5XZ5	GCTGG									
Lanolin		100	80	5	XYXYRZY	U_2CVGG				1					
Latex		100	20	4 Dual	XX5335	U_3U_3TGG									
Lauric Acid	C_{12} H_{24} O_2	Sat.	50	45	XX5X52Z5	VCTGG						1.41	44	225	Powder. sol. Alcohol, Ether, no H_2O
Lead Nitrate	Pb $(NO_3)_2$	Sat.	80	5	XYXYKZY	Q_1CVGG	1	1	1	1		4.53			Crystals sol. in H_2O, Alcohol; POISONOUS
Lead Tetraethil	$Pb(C_2H_5)_4$	100	80	2	XYGZY	ECVGG	2		2	1		1.65	-136	200	Oily liquid; POISONOUS
Leaving agents		100	40	5 Dual	X7X7KR7	Q_1U_3EGG		1							
Lecithin		100	120	4	XX53Z5	U_2CTGG									

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Light Petrol		100	50	2	XYGZY	ECVGG	1			1	1				Liq. VOLATILE, INFLAMMABLE
Ligroine (Petroleum Ether)		100	80	2	X6GV6	EBPGG	1		2	1				20 - 135	Solvent liquid VOLATILE, INFLAMMABLE, TOXIC
Lime (Dirty)		Sat.	80	5 Dual	X7X7KR7	Q_1U_2EGG	1	1	2	1					
Lime (Slaked)	$Ca(OH)_2$	Sat.	80	5 Dual	X7X7KR7	Q_1U_2EGG	1	1	2	1		2.23			Powder sol. in Glycerine, less in H_2O
Lime and Water	$Ca(OH)_2$	10	80	5	X7X7KR7	Q_1U_2EGG	1	1	2	1		2.34			
Lime Milk		Sat.	80	5 Dual	X7X7KR7	Q_1U_2EGG	1	1	2	1					
Liqueurs		100	60	2	X6XV6	GBPGG	1	1	1	1					
Liquid Carbon Dioxyde	CO_2	100	-25	5	X7X7RZ7	U_2CEGG	1	1	2	2		1.1 (-37 C)	-56.6°		°5.3 BAR - Sol. H_2O, Alcohol, Acetone
Liquid Gas (GPL) (Dimethylmethane)	C_2H_6	100	30	2	XYGZY	ECVGG	1		2	1	1	Liq. 0.5	-190	-42.5	Liq. sol. Ether, Alcohol; INFLAMMABLE, at 20 C - 8.4 Bar
Liquid Soap		100	140	5	X7X7RZ7	U_2CEGG	1	1	2	1					
Lithium Bromide	Li Br	Sat.	40	5	L6L6KZ6	Q_1CPMM	1					3.4	547		H_2O, Ether sol. Crystals
Lithium Chloride	Li Cl	40	30	5	LYLYKZY	Q_1CVMM				1		2.06	614		H_2O, Ether sol. Crystals
Lockeed Liquid		100	80	2	X7GZ7	ECEGG		1			1				
Lubricants, Animal Lubricants		100	80	2	X6GZ6	ECPGG	1	2	2	1					
Lubricants, Mineral Lubricants		100	80	2	X6GZ6	ECPGG	1		2	1	1				
Lubricants, Vegetal Lubricants		100	80	2	X6GZ6	ECPGG	1	1	2	1	1				
Lye (not caustic)		Sat.	70	5	X7X7KZ7	Q_1CEGG	1	1	1	2					
Lye P3		5	70	5	X7X7KZ7	Q_1CEGG	1	1	1	2					
Lysophorm		100	40	4	XX5XZ5	GCTGG		2							
M															
Magnesium and Lime		50	60	5 Dual	X6X6KR6	Q_1U_2PGG	1	1	2	1					
Magnesium Chloride	$Mg\ Cl_2 \cdot 6H_2O$	5	20	5	X6X62V6	VBPGG	1	1	1	1		1.56	116		H_2O, Alcohol sol. Crystals
Magnesium Chloride	$Mg\ Cl_2 \cdot 6H_2O$	Sat.	40	5	L6L62V6	VBPMM	1	1	1	1		1.56	116		H_2O, Alcohol sol. Crystals
Magnesium Hydroxyde	$Mg(OH)_2$	Sat.	70	5	X7X72V7	VBEGG	2	1	2	1		2.3	350		Powder sol. Ammonium Salts solutions, diluted Acids
Magnesium Nitrate	$Mg\ (NO_3)_2 \cdot 6H_2O$	10	20	5	X6X62V6	VBPGG	1					1.6	89		Crystals sol. H_2O, Alcohol; STRONGLY OXYDATING
Magnesium Sulphate	$Mg\ SO_4 \cdot 7H_2O$	Sat.	20	5	X6X6RZ6	U_2CPGG	1	1	1	1		1.67			Crystals sol. H_2O, Glycerol
Maize Wheat + H2O		30	40	2	X6336	U_2U_2PGG	1	1	1	1					
Malathion		100	30	5 Dual	XYXY2ZY	VCVGG	2			1		1.2	2.85	156	Liq. TOXIC VAPOURS, IRRITATING
Maleic Acid	$C_4H_4O_4$	Sat.	70	5	XYXYKRY	Q_1U_2VGG				1		1.59	150		H_2O, Alcohol, Sol. crystals
Maleic Anhydride	$C_4H_2O_3$	Sat.	120	5	XYXYKRY	Q_1U_2VGG				1		0.93	53	200	White powder sol. Acetone, Hydrocarbons, Ether, Chlorophorm
Malic Acid	$C_4H_6O_5$	Conc.	90	5	XYXY2ZY	VCVGG	1		2	1		1.6	128	150	H_2O, Alcohol, Sol. crystals
Malonic Acid	$CH_2(COOH)_2$	Sat.	40	5	X6X62V6	VBPGG	1					1.63	134		H_2O, Alcohol, Ether, Sol. crystals
Malt		100	60	5	X6X6KR6	Q_1U_2PGG	1	1							
Manganese Chloride	$Mn\ Cl_2 \cdot 4H_2O$	50	30	5	XYXY2VY	VBVGG				1		1.9		87.5	H_2O sol. Crystals
Manganese Phosphate	$Mn_3(PO_4)_2 \cdot 7H_2O$	Sat.	60	5	XYXYKRY	Q_1U_2VGG				1					Powder sol. mineral Acids
Manganese Sulphate	$Mn\ SO_4 \cdot 4H_2O$	Sat.	20	5	XYXYRZY	U_2CVGG				1		2.1	30		Crystals sol. in H_2O
Mayonnaise		100	20	5	X6X6KZ6	Q_1CPGG	1	1		1					
Melted Cheese		100	140	L2	XYKRYHX	Q_1U_2VGG		1		1					

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Mercaptan		100	80	2	XYXVY	GBVGG				1					
Mercurous Nitrate, Hydrated	$Hg(NO_3) \cdot {}_2H_2O$	Sat.	30	5	XYXYKXY	Q_1Q_1VGG				1		4.78	70		Hardly sol. in H_2O Crystals; POISONOUS
Mercury Bichlorate	$Hg_2 (ClO_3)_2$	Sat.	80	5 Dual	LYLYKKY	Q_1Q_1VMM			0	1		6.4	250		Crystals sol: H_2O, Alcohol, Acetic acid; EXPLOSIVE IN AIR
Mercury Chloride	$Hg Cl_2$	10	60	5	LYLY2ZY	VCVGG	1	1	1	1		5.4		303	Crystals sol. H_2O, Alcohol, Glycerine, Ether; POISONOUS
Mercury Metal	Hg	100	60	5 Dual	XYXYKRY	Q_1U_1VGG	1	1	1	1		13.6	-38.8	356	H_2SO4, HNO_3 sol.; POISONOUS
Mercury Nitrate	$Hg(NO_3)_2 \cdot H_2O$	5	20	5	XYXY24Y	VY_1VGG				1					H_2SO4, HNO_3 sol.; POISONOUS
Mesityl Oxide	$C_6 H_{10} O$	100	110	4	XX5XV5	GBTGG		2				0.85		130	Oily liq. mix Alcohol, Ether
Metanoic Acid (Formic Ac.)	H COOH	10	60	5	L7L7KZ7	Q_1CEMM		1				1.22	8.3	100.8	Liq. sol. H_2O, Alcohol, Ether; CAUSTIC, EXPLOSIVE VAPOURS
Methane Dichlorfluor (F21)	$CH Cl_2 F$	100	40	4	XX53Z5	U_1CTGG			2			Liq: 1.42	-135	8.9	Liq. Gas sol. Alcohol, Ether
Methane Gas	CH_4	100	20	2 Dual	X8GZ8	ECPGG	1	2		1	1	0.65 Aria = 1	-184	- 164	INFLAMMABLE Gas
Methane Monochlorediffluor (F22)	$CH Cl F_2$	100	40	2	X8GZ8	GCNGG		1	1		1		-160	-40.8	Liq. Gas
Methane Monochlorotrifluor	$C Cl F_3$	100	40	2	X83Z8	U_1CNGG	1	1	1	1	1		-181	-81	Liq. Gas
Methanedichlore (Methylenechloride)	$CH_2 Cl_2$	100	30	4	XX5XV5	GBTGG				2		1.3	-97	40.1	Liq. sol. Alcohol, Ether; VOLATILE, POISONOUS
Methanetetrachl. (Carbontetrachloride)	$C Cl_4$	100	20	5	LYLYKZY	Q_1CVMM	2			1		1.58	-23	76	Liq. mix Alcohol, Ether, Benzene, Naphtha, Chlorophorm; POISONOUS
Methanetrichlore (Chlorophorm)	$CH Cl_3$	100	40	5	XYXYRZY	U_1CVGG				1		1.48	-63.5	61.2	Solvent liq. mix Alcohol, Ether, Benzene, Naphtha ; VOLATILE
Methanetrichlore (mono) Fluor	$C Cl_3 F$	100	60	4	XX53Z5	U_1CTGG	2			2		1.5	-111	23.7	Extinguishing liq.; VOLATILE
Methanetrimethyl (Isobutane)	$(CH_3)_3 CH CH_3$	100	30	2	X8GZ8	ECPGG	1			1	1	Liq. 0.55	-159.6	-11.7	Gas or Liquid, sol. Ether; INFLAMMABLE
Methanol (Methyl Alcohol)	$CH_3 OH$	100	70	2	X7XZ7	GCEGG	1	1	1			0.79	-98	64.5	Liquid sol. H_2O, Ether, Alcohol; POISONOUS, VOLATILE, INFLAMMABLE
Methilacetic Acid (Propionic)	$CH_3CH_2CO_2H$	100	30	45	XX5X5245	VY_1TGG						0.99	-21	141	Liq. sol. H_2O, Alcool, Ether, Clorophorm
Methyl Acetate	$CH_3 CO_2 CH_3$	100	50	4	XX5XV5	GBTGG		2	2			0.92	-98	54	Liq. mix. Hydrocarbons; VOLATILE, INFLAMMABLE
Methyl Acrylate	$CH_2 \cdot CHCOOCH_3$	100	70	4	XX5XV5	GBTGG		2	2			0.95	-76.5	80.5	Liq. VOLATILE, INFLAMABLE, IT POLYMERIZES
Methyl Benzene (Toluene)	$CH_3 C_6 H_5$	100	40	2	XYGVY	EBVGG				1		0.86	-94.5	110.7	Liq. sol. Alcohol, Ether, Benzene; INFLAMMABLE
Methyl Benzoate	$C_6 H_5 CO_2 CH_3$	100	90	2	XYXZY	GCVGG				1		1.06	-12.3	198.6	Oily liquid sol. Alcohol, Ether
Methyl Bromide	$CH_3 Br$	100	20	2 Dual	XYXVY	GBVGG	2			1		Liq. 1.7	-94	3.46	Liquid Gas mix. org. solventes; VOLATILE, POISONOUS
Methyl Butyrate	$CH_3 CH_2 CH_2 COOCH_3$	100	40	2	XYGVY	EBVGG				1		0.89		102	Liquid solvent for Ethylcellulose; INFLAMMABLE
Methyl Chlorophorm (Chlorothene)	$CH_3 C Cl_3$	100	70	5	XYXYRZY	U_1CVGG				1		1.3		75	Liquid sol. Alcohol, Eter
Methyl Ethyl Ketone	$CH_3 CO C_2 H_5$	100	60	2	X7GV7	EBEGG		1				0.82	-86.4	79.6	Liquid sol. H_2O, Alcohol, Ether, Olimic; INFLAMMABLE
Methyl Isobuthyl - Ketone	$(CH_3)_2 CHCH_2 COCH_3$	100	20	4	XX5335	U_1U_1TGG						0.8	-80.4	115.8	Liquid mix. org. solvents; INFLAMMABLE
Methyl Metakrylate	$CH_2 \cdot C(CH_3)COOCH_3$	100	70	4	XX5345	U_1Y_1TGG						0.9	-48.2	101	Liquid mix. org. solvents; INFLAMMABLE VOLATILE
Methyl Phormiate	$HCOOCH_3$	100	20	4	XX5XV5	GBTGG		2	2			0.95	-99.8	31.8	Liq. sol. H_2O, Alcohol, Ether; VOLATILE INFLAMMABLE
Methyl Phthalate		100	30	5	X7X72V7	VBEGG		1							
Methyl Propionate	$CH_3 CH_2 COOCH_3$	100	50	2	X7GV7	EBEGG		1				0.9			Liq. sol. org. solvents; INFLAMMABLE
Methylamine	$CH_3 NH_2$	Sat.	20	4	XX5XV5	GBTGG						Liq. 0.69	-92.5	-6.8	Liq. Gas sol. H_2O; VOLATILE, INFLAMMABLE
Methylchloride (Chloromethane)	$CH_3 Cl$	100	20	2 Dual	XYGVY	EBVGG				1		Liq. 0.92	-97.8	-23.7	Liq. Gas sol. Alcohol, Chlorophorm, H_2O, Benzene, Acetic Acid; INFLAMMABLE
Methylene Chloride (Chl. Hydrate)	$CH_2 Cl_2$	100	30	4	XX5XV5	GBTGG				2		1.3	-97	40.1	Liq. sol. Alcohol, Ether; VOLATILE POISON
Methylethylcarbinol	$CH_3 CH_2 CH OH CH_3$	100	60	2	X8GV6	EBPGG	1					0.8	-114.7	99.5	Liquid mix. Alcohol, Ether; EYES IRRITATING
Methylpropanol	$(CH_3)_2 CH CH_2 OH$	100	40	2	X8GV6	GBPGG	1					0.8	-108	107	Liq. sol. H_2O, Alcohol, Ether; INFLAMMABLE
Microwax		100	80	5	XYXYRZY	U_1CVGG				1	1				BECOMES SOLID

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Milk		100	90	5	X7X72V7	VBEGG	1	1	1	1		1.03			
Milk - Condensed Milk		100	80	2	X7337	U_3U_3EGG	1	1	1	1					
Milk - Sterile Milk		100	149	5	X7X7RZ7	U_2CEGG		1		2					
Mineral Spirit		100	60	2	X6GZ6	ECPGG	1				1				
Molasses		100	80	5	X6X6KR6	Q_1U_3PGG	1	1		1					
Monoethanolammine (MEA)	NH_2 CH_2 CH_2 OH	Conc.	90	4	XX5XZ5	GCTGG	2	2	2			1.01	10.5	170.5	Slightly viscous liq.; sol. Alcohol, Chlorophorm,Carbontetrachloride, mix. H_2O
Monomethylammine	CH_3 NH_2	100	30	4 Dual	XX5XV5	GBTGG							-92.5	-6.6	Liq. Gas sol. H_2O, Alcohol, Ether; INFLAMMABLE
Mud		100	40	2 Dual	X6336	U_3U_3PGG	1	1		1					
Mud (Thermal Mud)		100	40	2 Dual	XY33Y	U_3U_3VGG		1		1					
Muriatic Acid (HCl 39%)	H Cl	100	37	7	XY2ZYHX	VCVGG				1		1.2 air = 1			Gas in 38% -H_2O- Solution; POISONOUS, CAUSTIC
Mustard		100	30	5	X6X6KR6	Q_1U_3PGG	1	1							
N															
Naphta		100	110	2	XYGZY	ECVGG	2			1	1	0.76			
Naphta - Acid Naphta		100	110	5	XYXYKZY	Q_1CVGG				1					
Naphta - Diesel		100	110	2	XYGZY	ECVGG				1	1				
Naphta - V.P.M.		100	110	2	XYGZY	ECVGG				1	1				
Naphta - Virgin		100	110	5	XYXYKZY	Q_1CVGG				1	1				
Naphta - Virgin (Benzinone)		100	110	5	XYXYKZY	Q_1CVGG				1	1				
Naphthalin (Naphthalene)	C_{10} H_8	100	>80	5	XYXYKRY	Q_1U_3VGG				1		1.14	80.2	218	Crystals sol. Benzene, Alcohol, Ether
Naphthilammin	C_{10} H_7 NH_2	100	>60	2	X6GZ6	ECPGG	1					1.1	50/110	306	Flakes sol. Alcohol, Ether
Natural Gas		100	30	2 Dual	X6GZ6	ECPGG	1		1	1	1				
Nickel Acetate	$Ni(OOCCH_3)_2 \cdot 4H_2O$	Sat.	70	5	X7X72V7	VBEGG	2	1	2			1.74			Crystals sol. H_2O, Alcohol
Nickel Chloride	$NiCl_2$	Sat.	20	5	XYXY2ZY	VCVGG	1	1	1	1		3.55			Flakes sol. H_2O, Alcohol, Ammonium Hydrate
Nickel Salts		Sat.	60	5	X6X6KR6	Q_1U_3PGG	1	1	2	1					
Nickel Sulphate	$NiSO_4 \cdot 6H_2O$	Sat.	30	5	X6X62V6	VBPGG	1	1	1	1		2.03			Crystals sol. Alcohol
Nickel-Chrom Plating Bath		100	30	5	XYXY24Y	VY_1VGG		1		1					
Nicotine Sulphate	$(C_{10}$ H_{14} $N_2)_2$ H_2 SO_4	Sat.	50	5	XYXY2ZY	VCVGG				1					Crystals sol. H_2O, Alcohol, Ether; POISONOUS
Nitric Acid	HNO_3	98	20	5	XYXYKKY	Q_1Q_1VGG				1					Liq. mix. H_2O; POISONOUS, SCALDING
Nitric Acid	HNO_3	65	80	5	LYLY9KY	Q_1Q_1VMM				1		1.5	-41.6	86	Liq. mix. H_2O; POISONOUS, SCALDING
Nitric Acid	HNO_3	20	70	5	XYXY2ZY	VCVGG		2		1					Liq. mix. H_2O; POISONOUS, SCALDING
Nitric Solutions		100	20	5	XYXYKKY	Q_1Q_1VGG				1					
Nitrile Acetic	CH_3 CN	100	60	4	XX5XZ5	GCTGG						0.78	-41	82	Liquid sol. H_2O, Alcohol, INFLAMMABLE POISONOUS
Nitrile Acrylic (ACN - Vinyl Cianyde)	H_2 C CH CN	100	60	4	XX5335	U_3U_3TGG						0.8	-83	77.4	Liq. sol. organic solvents. INFLAMMABLE - TOXIC
Nitro Solvents		100	60	4	XX5XV5	GBTGG									
Nitrobaryte (Barium Nitrate)	$Ba(NO_3)_2$	Sat.	60	5	X6X6KR6	Q_1PGG	1	1	1	1		3.2	575		Crystals sol. H_2O; POISONOUS
Nitrobenzol (Oil of Mirbane)	C_6 H_5 NO_2	100	60	4	XX5XZ5	GCTGG				2		1.2	5.7	210	Oily liquid sol. Alcohol, Ether, Benzene; POISONOUS
Nitrocellulose (Cellulose Nitrate)	C_6 H_7 $O_2(O$ $NO_2)_3$	100	20	4 Dual	XX5335	U_3U_3TGG									Paste sol. Acetone, Alcohol, Ether, INFLAMMABLE - EXPLOSIVE
Nitrogen (Gas)	N	100	60	5 Dual	X6X62Z6	VCPGG	1	1	1	1	1	0.96 Aria 1	-210	-195	H_2O soluble

The data shown can be changed to reflect any improvement whitout notice.

Legend : "the material number codes 6, 7, 8, Y ,1" - 1 = Recomended , 2 = Suitable. If not indicated, insufficient data or not suitable

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Nitrogen Dioxyde	NO_2	100	40	4	XX5XZ5	GCTGG						Liq. 1.45	-11.2	21	It solves in H_2O and forms Nitric Acid
Nitromethane	$CH_3 NO_2$	100	40	45	XX5X5245	VY$_1$TGG		2				1.14	-29	101	Liquid sol. H_2O
Nitrosulphuric Acid	$ONOSO_3 H+H_2 SO_4$	100	40	5	LYLYKKY	Q$_1$Q$_1$VMM				1					Liq. 40% HNO_3 + 54% H_2SO_4
Nitrous Gas		100	30	5 Dual	XYXYKKY	Q$_1$Q$_1$VGG				1					
Nonylphenol	$C_9 H_{19} C_6 H_4 OH$	100	90	5	XYXYRZY	U$_3$CVGG				1		0.95	-10	315	Viscous liq. sol. organic solvents
O															
Octanole	$CH_3(CH_2)_6 CH_2 OH$	100	70	2	X7GZ7	ECEGG	2	1	2	1		0.82	-16	194	Liquid mixable Alcohol, Chlorophorm; Mineral Oil
Octyl Adipate		100	40	2	X8GV6	EBPGG	1								
Oil - Absorption Oil		100	90	2	X8GZ6	ECPGG	1			1	1				
Oil - Acid Oil		100	140	5	XYXYKZY	Q$_1$CVGG	1			1					
Oil - Angamol Oil		Conc.	90	2	X8GZ6	ECPGG	1				1				
Oil - Aniline Oil (Aniline)	$C_6 H_5 NH_2$	Conc.	20	4	XX5XZ5	GCTGG		2				1.02	-6.2	184.4	Oily liquid sol. Alcohol, Ether, Benzene; POISONOUS
Oil - Anthracene Oil		Conc.	140	5	XYXYRZY	U$_3$CVGG				1	1			270 ÷ 360	
Oil - Apiezon Oil		Conc.	90	2	X8GZ6	ECPGG	1			1	1				
Oil - Apiezon-H Oil		Conc.	250	7F	XYJZAHX	XCVGG				1	1				
Oil - Ash-tree Oil		100	70	2	X8GZ6	ECPGG	1			1	1				
Oil - Asphalt Oil		Conc.	180	2	XY33Y	U$_3$U$_3$VGG				1					
Oil - Castor Oil (Ricinus oil)		100	60	5	X6X6RZ6	U$_2$CPGG	1	2	1	1		0.96	-10		Sol. in Alcohol, Ether, Benzene, Chlorophorn ; it may polymerize
Oil - China Wood Oil (Tung)		100	90	2	X8GZ6	ECPGG	1		2	1	1				
Oil - Coconut Oil		100	80	5	X6X6RZ6	U$_2$CPGG	1	1		1		0.92	24		
Oil - Cottonseeds Oil		100	140	5	XYXYRZY	U$_3$CVGG	1			1					
Oil - Creosote Oil (Tar Oil)		100	140	2	XY33Y	U$_3$U$_3$VGG	1		2	1	1	1.08		203	Oily liquid mix. Alcohol, Ether
Oil - Crude		100	180	5	XYXYKRY	Q$_1$U$_3$VGG	2			1	1				
Oil - Crude Corrosive		100	140	5	XYXYKRY	Q$_1$U$_3$VGG				1					
Oil - Diathermic Oil		100	180	5	XYXYKRY	Q$_1$U$_3$VGG				1					
Oil - Diathermic Oil		100	350	RF	X33A	U$_3$U$_3$YGG									
Oil - Diesel Oil		100	90	2	XYGZY	ECVGG	1			1	1				
Oil - Domestic Fuel Oil		100	140	5	XYXYRZY	U$_3$CVGG	1			1	1				
Oil - Essential Oil		100	80	2	X7XZ7	GCEGG		1							
Oil - Extinguishing Oil		100	80	2	X8GZ6	ECPGG	1				1				
Oil - Food - Vegetable and Animal Oil		100	80	5	X6X62Z6	VCPGG	1			1					
Oil - Fuel Oil		100	140	5	XYXYRZY	U$_3$CVGG	1			1	1				
Oil - Fuel Oil and Gas		100	140	5	XYXYRZY	U$_3$CVGG	1			1	1				
Oil - Heavy Oil		100	80	5	X6X6RZ6	U$_2$CPGG	1			1	1				
Oil - Hydraulic Brakes Oil (Vegetable)		100	80	2	X7GZ7	ECEGG		1		2	1				
Oil - Hydraulic Oil (Petroleum Base)		100	80	2	XYGZY	ECVGG	1		2	1	1				
Oil - Hydraulic Oil (Vegetable)		100	80	2	X7GZ7	ECEGG		1	2		1				
Oil - Insulating Oil		100	140	2	XYGZY	ECVGG	1		2	1	1				

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Oil - Light Oil		100	80	2	X6GZ6	ECPGG	1			1	1				
Oil - Linseed Oil		100	80	2	X6XV6	GBPGG	1		2	1		0.94			
Oil - Lubricating Oil		100	80	2	X6GZ6	ECPGG	1			1	1				
Oil - Lubricating Oil with Alcohol		100	80	2	X6GZ6	ECPGG	1			1	1				
Oil - Medium Oil		100	80	2	X6GZ6	ECPGG	1			1	1				
Oil - Mineral Oil		100	80	2	X6GZ6	ECPGG	1		2	1	1	0.94			
Oil - Naphtaline Oil		100	90	2	XYXZY	GCVGG				1					
Oil - Niobe (Methylbenzoate)	$C_6 H_5 CO_2 CH_3$	100	90	2	XYXZY	GCVGG				1		1.08	-12.3	198.6	Oily liquid sol. Alcohol, Ether
Oil - Olive Oil		100	80	5	X6X62Z6	VCPGG	1	2	2	1		0.91			
Oil - Palm Oil		100	140	5	XYXYKRY	Q_1U_3VGG	1	1		1		0.92	30		
Oil - Paraffin Oil		100	110	5	XYXY2ZY	VCVGG				1					
Oil - Peanut		100	80	5	X6X62Z6	VCPGG	1		2	1					
Oil - Peanut		100	180	5	XYXYKRY	Q_1U_3VGG	1		2	1					
Oil - Peanut (With Seeds)		100	180	5	XYXYKRY	Q_1U_3VGG	1		2	1					
Oil - Petroleum Oil		100	80	2	X6GZ6	ECPGG	1		2	1	1				
Oil - Pine Oil		100	80	2	XY3VY	U_3BVGG	1			1		0.86			
Oil - Plasticizer Oil		100	160	2	XY33Y	U_3U_3VGG				1					
Oil - Rapeseed Oil		100	80	5	X6X62Z6	VCPGG	1					0.91	0		
Oil - Reclaimed Oil		100	80	2	X6GZ6	ECPGG	1			1	1				
Oil - Silicone		100	80	2	X7GZ7	ECEGG	1	1	1	1	1				
Oil - Soluble Oil (Cut Emulsion)		100	120	2	XY33Y	U_3U_3VGG	1		2	1	1				
Oil - Soybean Oil		100	80	5	X6X62Z6	VCPGG	1		2	1		0.92	22		
Oil - Steel Hardening Oil		100	180	5	XYXYKRY	Q_1U_3VGG	1			1	1				
Oil - Sulphunate		100	90	5	XYXYKZY	Q_1CVGG				1					
Oil - Sulphurate		100	70	5	X6X62Z6	VCVGG	1								
Oil - Transformer Oil		100	140	2	XYGZY	ECVGG	1		2	1	1				
Oil - Turbo Oil (15-35)		100	90	2	XYGZY	ECVGG				1	1				
Oil - Vaseline Oil		100	80	5	X6X62Z6	VCPGG	1			1		0.85	35		
Oil - Veg. Oil and Sulphur Bioxyde		100	70	5	X7X72Z7	VCEGG		1							
Oil - Vegetable Oil		100	80	5	X6X62Z6	VCPGG	1			1					
Oil - Vegetal and Animal not eatable		100	180	5	XYXYKRY	Q_1U_3VGG	1			1	1				
Oil - Vegetal Sulphunate Oil		100	80	5	X6X62Z6	VCPGG	1			1					
Oil - Walnut Oil		100	80	5	X6X6RZ6	U_3CPGG	1	1		1		0.93			
Oil - White Pine Oil		100	80	2	XY3VY	U_3BVGG	2			1					
Oil + 3% Decolourant Earth		100	80	5	X6X6RZ6	U_3CPGG	1			1					
Oil and Ammonia			70	2	X8GZ8	ECNGG			1						
Oil and Freon			-70	RF	X33A	U_3U_3YGG					1				
Oil and Freon (Refrigerator)			-20	2	X8GZ8	ECNGG			1		1				

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Oil and Methylchloride			80	2	XYGZY	ECVGG				1					
Oil and Methylene Chloride			60	4	XX5XZ5	GCTGG									
Oktyl Phenol	$C_8 H_{17} C_6 H_4 OH$	100	80	4	XX5XV5	GBTGG						0.89	72	280	Flakes or liquid soluble in Alcohol, Acetone
Oktyl Phtalate		40	50	2	X7XV7	GBEGG		1							
Olefins	Cn H_{2n}	100	20	2	XYXZY	GCVGG				1	1				Non - saturated Hydrocarbons
Olefins Crude		100	140	5	XYXYKRY	Q_1U_3VGG				1	1				
Oleic acid	$C_{18} H_{34} O_2$	100	70	4	XX5XZ5	GCTGG				2		0.89	13.2	286	Oily liq. sol. Alcohol, Ether, Organic Solvents
Oleine	$(C_{17} H_{33} COO)_3 C_3 H_5$	100	140	5	XYXYKZY	Q_1CVGG				1		0.89	13.2	286	Oily liquid sol. Chlorophorm, Ether, Carbon Tetrachlor.
Oleum (Fuming Sulfuric Acid)	$H_2 S_2 O_7$	100	40	5	LYLYKKY	Q_1Q_1VMM				1					Oily Hygroscopic liq.; mix. H_2O it gives heat - SCALDING
Oligomer (+H2O+CH2 Cl2)		100	60	4 Dual	XX5335	U_3U_3TGG									Polymerizes at low polym. degree, it is formed by few monomeres
Orange Juice		100	90	5	X7X72V7	VBEGG	1	1		1					
Oxalic Acid	$C_2 H_2 O_4 \cdot 2H_2O$	40	70	5	X7X72Z7	VCEGG	2	1	2	1		1.65	187		Cryst. sol. H_2O, Alcohol, Ether; POISONOUS, IRRITATING
Oxygen	O_2	100	<20	5 Dual	XYXYKKY	Q_1Q_1VGG	2	1	1	1		1.1 Aria1	-218	Liq. - 183	
Oxygenated Solvents (Ethers)		100	60	4	XX5XZ5	GCTGG		2							
Oxygenated Solvents (Ketones)		100	60	5	X7X7RZ7	U_3CEGG		1							
Oxygenated Solvets (Esteres)		100	60	5	X7X7RZ7	U_3CEGG		1							
Ozone	O_3	100	30	5 Dual	X7X7KK7	Q_1Q_1EGG		1		1		Liq. 1.6	-192	-112	Gas sol. in H_2O; more oxidating than O_2
P															
Palmitic Acid	$CH_3(CH_2)_{14} COOH$	Sat.	80	5	X6X62V6	VBPGG	1	2	2	1		0.84	63	352	Cryst. sol. Alcohol, Ether
Paper (Pulp)		100	80	2 Dual	X6336	U_3U_3PGG	1	1		1		0.7 - 1.2			
Paper Pulp		100	80	2 Dual	X6336	U_3U_3PGG	1	1		1					
Paracymene		100	80	2	XYXZY	GCVGG				1		0.85	-73	176.5	Liq. soluble Alcohol, Ether Chloroform
Paraffin	Cn H_{2n+2}	100	80	5	XYXYRZY	U_3CVGG				1	1				
Paraffin (melthed)		100	140	5	XYXYKRY	Q_1U_3VGG				1	1	0.88	65		Sol. Benzene, hot Alcohol, Chlorophorm, Ligroine
Paraffin Chlorated		100	80	5	XYXYKRY	Q_1U_3VGG				1					Liquid sol. Benzene, hot Alcohol, Chlorophorm, Ligroine
Paratoluolsulphon Acid	$C_6 H_4(SO_3 H)(CH_3)$	Sat.	30	5	LYLY2ZY	VCVMM				1			107	140	Flakes sol. H_2O, Alcohol, Ether
Pastry (Dough)		100	30	2 Dual	X6336	U_3U_3PGG	1	1		1					
Pectin		100	40	2	X7337	U_3U_3EGG	1	1							GELATINIZING EFFECT
Pectine Liquor		100	60	2	X6XZ6	GCPGG	1								
Penicillin (Broth) and Steril Steam		100	110	5	XYXYKRY	Q_1U_3VGG				1					
Pentaeritrosol	$C(CH_2OH)_4$	Sat	30	45	XX5X5RZ5	U_3CTGG						1.4	262	276	Cristal powder sol. in H_2O
Pentane	$CH_3(CH_2)_3 CH_3$	100	30	2	X6GZ6	ECPGG	1		2	1	1	0.63	-129.7	36	Liquid sol. Hydrocarbons, Oils, Ether; INFLAMMABLE
Pentanol (Amylicalcohol)	$CH_3(CH_2)_4 OH$	100	70	2	X7GV7	EBEGG	2	1	2	2		0.8	-78.9	137.8	Liquid mixable Alcohol, Eter
Pentanol Acetate		100	20	4	XX5XV5	GBTGG		2	2						
Permanganate Potassium	$KMn O_4$	10	90	5	X7X7KK7	Q_1Q_1EGG		1				2.7			Crystals sol. in H_2O, Methanol, Strongly oxydating
Petrol - Aromatic		100	50	2	XYGZY	ECVGG				1	1				Liq. VOLATILE, INFLAMMABLE
Petrol - Gasoline		100	50	2	XYGZY	ECVGG				1	1	0,75		60 - 200	Liq. VOLATILE, INFLAMMABLE
Petrol and Mercaptane		100	60	2	XYXZY	GCVGG				1	1				Liq. VOLATILE, INFLAMMABLE

The data shown can be changed to reflect any improvement whitout notice. **Legend : "the material number codes 6, 7, 8, Y ,1" - 1 = Recomended , 2 = Suitable**, If not indicated, insufficient data or not suitable

XX

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Petrol and Sulphur Hydrogen		100	50	2	X6X26	EBPGG	1								Liq. VOLATILE, INFLAMMABLE
Petrol for cars		100	50	2	XYGZY	ECVGG	1			1	1				Liq. VOLATILE, INFLAMMABLE
Petrol with Acetone		100	60	4	XX5XZ5	GCTGG									Liq. VOLATILE, INFLAMMABLE
Petrol with Methanol (<20%)		100	50	2	XMGVM	EBXGG					1				Liq. VOLATILE, INFLAMMABLE
Petroleum		100	60	2	X6GZ6	ECPGG	1		2	1	1	0.8			
Petroleum Spirit		100	90	2	XYGZY	ECVGG	1			1	1				VOLATILE, INFLAMMABLE liquid
Phenic Acid (Phenol)	C_6H_5OH	Sat.	70	5	XYXYKZY	Q_1CVGG				1		1.1	43	182	Crystals sol. H_2O, Alcohol, Ether, Chlorophorm,Glycerol, POISONOUS, SCALDING
Phenil Propane		100	20	2	XYXVY	GBVGG				1					
Phenilacetic Acid	$C_6H_5CH_2COOH$	75	70	5	X7X72Z7	VCEGG		1				1.08	78	262	Crystals sol. Alcohol, Ether
Phenol - Formaldeyde (Mixture)		Sat.	70	4	XX5XV5	GBTGG									
Phenol (Benzolphenol)	C_6H_5OH	Sat.	70	5	XYXYKZY	Q_1CVGG		2		1		1.07	43	182	H_2O sol. crystals, Alcohol, Ether, Chlorophorm; POISONOUS - SCALDING
Phenol Alkilate		100	80	4 Dual	XX5335	U_3U_3TGG				1					Viscous oily liq. (300 cps)
Phenol and Water		10	70	2	XYXVY	GBVGG				1					
Phenol Dodacyl	$C_{12}H_{25}C_6H_4OH$	100	40	2	XYXVY	GBVGG				1		0.94		310	Liq. solvent sol. org. solvents
Phenol Paraterbutyl		Sat.	>85	4	XX5335	U_3U_3TGG							85		t < 85 C it precipitates; sol. in Eptane
Phenol Pentachlore	C_6Cl_5OH	Sat.	80	4	XX5XV5	GBTGG						1.97	190	310	Crystals sol. Alcohol, Ether, Acetone, Methanol, Carbitol, Cellosolve
Phenolic Resins		100	140	2 Dual	XY33Y	U_3U_3VGG				1					Washing with solvent
Phenyl Chloride (Chlorebenzene)	C_6H_5Cl	100	70	2	XYXVY	GBVGG				1		1.1	-4.5	131.6	Liq. mix. org. solvents; INFLAMMABLE,VOLATILE, NO PTFE
Phenyl Ethilene (Styrol)	$C_6H_5CH:CH_2$	100	140	4 Dual	XX5335	U_3U_3TGG				2		0.9	-30.6	145.2	Oily liq. sol. Alcohol, Ether
Phenyl Methane (Toluol)	$CH_3C_6H_5$	100	40	2	XYGVY	EBVGG				1		0.86	-94.5	110.7	Liq. sol. Alcohol,Ether, Benzene; INFLAMMABLE
Phoron	$(CH_3)_2COCHCO$	100	40	2	X7XV7	GBEGG		1							
Phosphatating media		10	80	5	XYXYKKY	Q_1Q_1VGG				1					
Phosphates		10	80	5	XYXYKKY	Q_1Q_1VGG				1					
Phosphoric Acid	H_3PO_4	Conc.	80	5	LYLYKKY	Q_1Q_1VMM		2		1		1.83	42		Crystals sol. H_2O, Alcohol; IRRITATING
Phosphoric Acid	H_3PO_4	10	20	5	X7X7KK7	Q_1Q_1EGG		1		1					Crystals sol. H_2O, Alcohol; IRRITATING
Phosphorous Acid (Ortophosph.)	H_3PO_3	Conc.	80	5	X7X7R27	U_3CEGG		1		1		1.65	70	200	Crystals sol. H_2O, Alcohol; IRRITATING
Phosphorous Pentoxide	P_2O_5	Sat.	20	5	LYLY24Y	VY_1VMM				1		2.38			White powder sol. H_2O; Esothermic reaction. In H_2O it forms Metaphosphoric Acid
Phosphorus - Liquid Phosphorus	P	100	>80	5	XYXYKRY	Q_1U_3VGG				1		1.74	>44.1		Paste like, sol. Carbon Disulphide; SCALDING
Phosphorus Oxychloride	$POCl_3$	100	30	5	LYLYKKY	Q_1Q_1VMM				1		1.67	-10	107	Burning liq.; sol. H_2O
Phosphorus Sesquisulphide	P_4S_3	Sat.	60	5	X7X72Z7	VCEGG		1				2	172	408	Crystals sol. Carb. Disulphide; INFLAMMABLE
Phosphorus Trichloride	PCl_3	100	30	5	LYLYKKY	Q_1Q_1VMM		1		1		1.57	-112	76	Liq. sol. Ether, Benzene, Carb. disulphide
Photo-Developing Bath		100	40	7	X7247HX	VY_1EGG		1							
Photographic Developing		100	40	7	X7247HX	VY_1EGG		1							
Phtalate Isodecilic		100	60	4	XX5XV5	GBTGG									
Phtalic Acid	$C_6H_4(CO_2H)_2$	Sat.	80	5	X7X7KZ7	Q_1CEGG		1				1.58	191		Cryst. sol. Alcohol, Less in H_2O
Phtalic Anhydride	$C_6H_4(CO)_2O$	100	140	4	XX5335	U_3U_3TGG						1.5	131.1	285	White powder sol. Alcohol
Physiologic Solutions		Sat.	40	45	XX5X5KK5	Q_1Q_1TGG									
Pickling Acid		Conc.	80	5	XYXYKKY	Q_1Q_1VGG				1					

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Picric Acid	$C_6 H_2(NO_2)_3 OH$	Sat.	40	5	XYXY22Y	VCVGG	2	2	2	1		1.76	122		Cryst. sol. H_2O, Alcohol, Ether, Benzene, Chloroph; POISONOUS, EXPLOSIVE
Pigments Caseine		Sat.	30	5	X7X7KR7	Q_2U_2EGG		1				1.25			
Pine Resin (Colofony)		100	30	2 Dual	XY33Y		1			1		1.08	100-150		Flakes sol. Alcohol, Benzene, Oils, Ether, Acetic Acid
PK1		10	80	5	XYXYKKY	Q_2Q_2VGG				1					Zinc Phosphate + Potassium Phosfate PH = 1
Plasma Blood		100	20	5	X7X7KK7	Q_2Q_2EGG		1							
Plasticizers Esther		100	130	4	XX5335	U_3U_3TGG		1							
Plastifying Esters		100	130	4	XX5335	U_3U_3TGG		1							
Plating sol. (Chrome)		100	40	5	XYXY24Y	VY_1VGG		2		1					
Plating sol. (Copper Cyanide)	$Cu(CN)_2$	100	40	5	XYXY24Y	VY_1VGG	1	1	1	1					Powder sol. Acids, Alkali; POISONOUS
Plating sol. (Copper)		100	40	5	XYXY24Y	VY_1VGG	1	1	1	1					
Plating sol. (Nichel)		100	40	5	X7X7247	VY_1EGG	1	1	1	1					
Plating solution (Cyanide)		100	40	5	X7X7247	VY_1EGG		1							POISONOUS
Pollols (Polyhydric Alcohol)	$CH_2 OH(CHOH)n CH_2 OH$	100	70	2	X7XV7	GBEGG		1							n 2 to 5 Liquid containing Glycerol; it reacts with Aldehydes and Ketones
Polivinylchloride (P.V.C.)	$(\bullet H_2 CCH Cl)n$	100	90	2 Dual	XY33Y	U_3U_3VGG		1							Powder or Grains
Polyacrylic Resins		100	120	4 Dual	XX5335	U_3U_3TGG									Washing with solvent
Polystirol Resins		100	120	4 Dual	XX5335	U_3U_3TGG				2					Washing with solvent
Polyuretane Resins		100	120	2 Dual	X7337	U_3U_3EGG		1							Washing with solvent
Polyvinil Acetate (P.V.A.)	$[CH_2 CH(OOCCH_3)]x$	100	90	2 Dual	X7337	U_3U_3EGG		1	2			1.19			Thermoplastic solid, Esthers, Benzol, Hydrocarbons, Chloroform sol.
Polyvinil Chloride (P.V.C.)	$(\bullet H_2 CCH Cl)n$	100	90	2 Dual	XY33Y	U_3U_3VGG				1					Powder or Grains
Polyvinyl Alcohol	$(CH_2 CH OH)n$	100	60	4 Dual	XX5335	U_3U_3TGG									It plastifies with Glycerine and Ethylene glicol - Sol. H_2O
Potassium Acetate	$KC_2 H_3 O_2$	10	20	5	X7X7KZ7	Q_2CEGG	2	1	2			1.57	292		H_2O, Alcohol sol. Crystals
Potassium Alum	$Al_2 (SO_4)_3 \bullet K_2 SO_4 \bullet 24H_2O$	15	50	5	X6X8KR6	Q_2U_2PGG	1					1.75	92		H_2O sol. Crystals
Potassium and Zinc Phosphate		10	80	5	XYXY2VY	VBVGG				1					
Potassium Bicarbonate	$K H CO_3$	Sat.	80	5	X6X62V6	VBPGG	1					2.17			H_2O sol. Crystals
Potassium Bichromate	$K_2 Cr_2 O_7$	20	90	5	XYXYKKY	Q_2Q_2VGG	1	1	1	1		2.67	396		H_2O sol. cristals; CAUSTIC, POISONOUS
Potassium Bitartrate	$KHC_4 H_4 O_6$	Sat.	20	5	X7X72Z7	VCEGG		1				1.98			H_2O sol. Crystals
Potassium Bromide	K Br	Sat.	70	4	XX5335	U_3U_3TGG						2.74	730		H_2O, Glycerine sol. Crystals
Potassium Carbonate	$K_2 CO_3$	50	70	5	X6X62V6	VBPGG	1					2.42			H_2O sol. Crystals
Potassium Chlorate	$K Cl O_3$	Sat.	80	5	X7X72V7	VBEGG		1				2.33	356		H_2O , Alkali sol. Crystal ; POISONOUS
Potassium Chloride	K Cl	Sat.	60	5	LYLY2ZY	VCVMM	1	1	1	1		1.98			H_2O sol.Crystals
Potassium Cyanide	K CN	Sat.	20	5	XYXY22Y	VCVGG	1	1	1	1		1.52			H_2O, Alcohol,Glycerol sol. Crystals; POISONOUS
Potassium Ferricyanide	$K_3 Fe(CN)_6$	Sat.	70	5 Dual	X7X7KK7	Q_2Q_2EGG		1				1.85			H_2O sol. Crystals; POISONOUS
Potassium Ferrocyanide	$K_4 Fe(CN)_6 \bullet 3H_2O$	10	80	7	X72Z7HX	VCEGG		1				1.85			H_2O sol. Crystals
Potassium Hydroxyde	K OH	<20	30	5	X7X72Z7	VCEGG	2	1	2						H_2O, Alcohol, Glycerine sol. Crystals; CAUSTIC
Potassium Hydroxyde	K OH	Sat.	80	5	L7L7KK7	Q_2Q_2EMM	2	1	2			2	360		H_2O, Alkohol, Glycerine sol. Crystals; CAUSTIC
Potassium Nitrate	$K NO_3$	Sat.	120	5	XYXYKRY	Q_2U_2VGG	1	1	1	1		2.1	337		H_2O sol. Crystals
Potassium Permanganate	$K Mn O_4$	10	90	5	X7X7KK7	Q_2Q_2EGG		1				2.7			H_2O, Methanol sol. Crystals; STRONGLY OXYDATING
Potassium Phosphate (DKP)	$K_2 H PO_4$	10	80	5	XYXY2VY	VBVGG				1					Crystals sol. in H_2O, Alcohol

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Potassium Silikate	$Si O_2 \cdot K_2O$	Sat.	70	5	X6X6KR6	Q_1U_2PGG	1								H_2O solved powder
Potassium Sulphate	$K_2 SO_4$	Sat.	70	5	X6X6KR6	Q_1U_2PGG	1	1	1	1		2.66			H_2O sol. Crystals
Potassium Tartrate	$K_2 C_4 H_4 O_5 \cdot ½H_2O$	Sat.	80	5	X6X6KR6	Q_1U_2PGG	1					1.98			H_2O sol. Crystals
Potassium Tetraoxalate	$K_2 C_2 O_4 \cdot H_2O$	15	20	5	XYXY2VY	VBVGG				1		2.08			H_2O sol. Crystals
Potassiumbisulphate	$KH SO_4$	5	20	5	XYXY2ZY	VCVGG				1		2.24	214		H_2O sol. Crystals; CAUSTIC
Potassiumchloride	K Cl	5	20	5	X6X62Z6	VCPGG	1	1	1	1		1.98			H_2O sol.Crystals
Producer Gas (Lean Gas)		100	50	2 Dual	X6G26	ECPGG	1		2	1	1				Mixture 3/4 Air Gas + 1/4 Water Gas
Propane (Dimethylmetane)	$C_3 H_8$	100	30	2	XYGZY	ECVGG	1		2	1	1	Liq. 0.53	-189.9	-42.5	Liquid Gas sol. Ether, Alcohol, at +20 C 8 Bar
Propane Gas (GPL)	$C_3 H_8$	100	30	2 I	XYGZY	ECVGG	1		2	1	1	Liq. 0.5	-190	-42.5	Liq. sol. Ether, Alcohol; INFLAMMABLE, at 20 C - 8.4 Bar
Propanole (Propyl Alcohol)	$CH_3 CH_2 CH_2 OH$	100	80	2	X6GV6	EBPGG	1	1	1	1		0.8	-127	97	H_2O, Alcohol, Ether sol. liquid
Propanone (Acetone)	CH_3COCH_3	100	55	2	X7XV7	GBEGG		1				0.79	-94.3	56.2	Liq. mix H_2O, Alcohol, Ether, Chlorophorm - VOLATILE - INFLAMMABLE
Propion Aldehyde	$C_3 H_6 CHO$	100	30	2	X7GV7	EBEGG		1				0.8		48.8	H_2O sol. liq., INFLAMMABLE
Propionic Acid (Methylac.)	$CH_3 CH_2 CO_2 H$	100	30	45	XX5X5245	VY,TGG						0.99	-21	141	Liq. sol. H_2O, Alcohol, Ether, Chlorophorm
Propionic Anhydride	$(CH_3CH_2CO)_2 O$	100	40	4	XX53Z5	U_2CTGG						1.01	-45	169	Liq. sol. Alcohol, Ether, Chlorophorm, Alkali
Propyl Acetate	$CH_3 COO \cdot CH_2 CH_2 CH_3$	100	30	45	XX5X5245	VY,TGG		2				0.88		96	Liquid mix. Alcohol, Ketones, Esthers, Oils, Hydrocarbons; INFLAMMABLE
Propyl Alcohol (Propanol)	$CH_3 CH_2 CH_2 OH$	100	80	2	X6GV6	EBPGG	1	1	1	1		0.8	-127	97	Liq. sol. H_2O, Alcohol, Ether
Propyl Benzoate		100	40	2	X7GV7	EBEGG		1							
Propyl Butyrate	$C_3 H_7 OOCC_3 H_7$	100	50	2	X7XV7	GBEGG		1				0.87	-95.2	142.7	
Propyl Glicol		5	60	4	XX53Z5	U_2CTGG									Oily liquid derived from Propylene Oxyde
Propyl Phormate	$CH_3 CH_2 CH_2 OOCH$	100	40	2	X7GV7	EBEGG		1				0.9	-92.9	81.3	Liquid mixable w. Alcohol, Ether; INFLAMMABLE
Propyl Phtalate		100	50	2	X7XV7	GBEGG		1							
Propyl Propionate	$CH_3 CH_2 COOCH_2 CH_2 CH_3$	100	40	2	X7GV7	EBEGG		1					-76	122	Liquid sol. in org. solvents
Propylene	$CH_3 CH \cdot CH_2$	100	30	2 Dual	XYGVY	EBVGG				1		Liq. 0.5	-185.2	-47.7	Gas sol. in Alcohol, Ether; INFLAMMABLE
Propylene Chloride (Dichloropropane)	$CH_3 CH CH_2 O$	100	30	4	XX5XZ5	GCTGG		2				0.83	-104.4	33.9	Liquid sol. in H_2O, Alcohol, Ether
Propylene Glicol	$C_3 H_8 O_2$	<5	60	4	XX53Z5	U_2CTGG									Oily liquid deriving from Propylene Oxyde
Propylene Oxyde	$CH_3 CHCl CH_2 Cl$	100	70	4	XX5XZ5	GCTGG						1.15	-80	96.3	Liq. soluble in common solvents, not in H_2O
Proteinal		100	40	4	XX5335	U_3U_3TGG									Liquid with cristals
Prussic Acid (Hydrogen Cyanide)	H CN	99	<25	5 Dual	X7X7KZ7	Q_2CEGG	2	1	2	1		0.69	-13	26	Liq. sol. H_2O, Ether, Alcohol; EXPLOSIVE, POISONOUS VAPOURS
Pydraul 150 A200 AC F9 625		100	80	2	XYGZY	ECVGG				1	1				
Pyridine	$N(CH_4)CH$	100	70	4	XX5XV5	GBTGG						0.97	-42	115.5	Liquid sol. in H_2O, Alcohol, Benzene, Ether, Fatty Acids; INFLAMMABLE
Pyrocatechin	$C_6H_4(OH)_2$	Sat.	140	4	XX5335	U_3U_3TGG						1.37	104	245	H_2O, Alcohol, Ether, Benzene - soluble crystals
Pyrogallic Acid	$C_6 H_3(OH)_3$	Sat.	50	5	XYXY2ZY	VCVGG				1		1.46	133	309	Cryst. sol. H_2O, Alcohol, Ether; POISONOUS, EXPLOSIVE
Pyroligneous Acid		100	80	4	XX5XZ5	GCTGG		2				1.03			Liq. containing: Acetil Acid, Methanol, Acetone, Furfurial, Alcohol, Mix. H_2O
Pyrolube		100	120	2	XYGZY	ECVGG		2		1	1				
R															
Red-fulming Nitric Acid	HNO_3	86	60	45	LL5L5245	VY,TMM									Liq. mix. H_2O; POISONOUS, SCALDING
Raffinate (of Mineral Oil)		100	50	2	XYGZY	ECVGG	1		2	1	1				
Resin Melamine		100	120	4 Dual	XX5335	U_3U_3TGG									Washing with solvent

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Resins		100	150	4 Dual	XX5335	U_3U_3TGG									Washing with solvent
Resorcin (Resorcinol)	$C_6H_4(OH)_2$	Sat.	120	5	X7X7KR7	Q_1U_3EGG		1				1.27	110.7	281	H_2O, Alcohol, Ethere, Glycerol, Benzene sol. Crystals
Rock Alum		15	50	5	X6X6KR6	Q_1U_3PGG	1								
Rockets Propellent		100	90	4	XX5XZ5	GCTGG									
Rongalite		100	60	4	XX5335	U_3U_3TGG									Formaldehyde + Sodium Hydrosolphite. Reducing, Decolourant
Rum		100	60	2	X7XV7	GBEGG	1	1	1	1					
S															
Salicylic Acid	$C_6H_4(OH)(COOH)$	Sat.	70	5	X7X72Z7	VCEGG	2	1		1		1.44	161	211	Powder sol. Acetone, Alcohol, Ether, Benzene
Salt 66 (Caprolactam)	$CH_2(CH_2)_4NHCO$	100	>60	4	XX5335	U_3U_3TGG		2				1.1	69		H_2O, Chlorate solvents, Petroleum derivates, sol. Crystals
Salt water (Calciumchloride)		Sat.	80	5	X7X7RZ7	U_3CEGG	1	1	1	1					
Salt water (Sodium Chloride)		Sat.	80	5	X7X7RZ7	U_3CEGG	1	1	1	1					
Saltpeter (Potassium Nitrate)	KNO_3	Sat.	70	5	X6X6KR6	Q_1U_3PGG	1	1	1	1		2.1	337		H_2O soluble Crystals
Silane (Monosilicomethane)	SiH_4	100	60	4	XX5XZ5	GCTGG									Comp. similar to Hydrocarbons. VOLATILE
Silicate Esteres		100	80	5	XYXYKRY	Q_1U_3VGG				1					It solve the carbon
Silver Nitrate	$Ag\ NO_3$	5	20	5	X7X7247	VY_1EGG	2	1	1	1		4.3	212		Crystals sol. in hot H_2O, Glycerole, POISONOUS
Skydrol 500-7000		100	80	2	X7GZ7	ECEGG		1			1				
Slurry		100	90	5	XYXY9RY	Q_1U_3VGG				1					
Soaps		Sat.	140	5	X7X7RZ7	U_3CEGG	1	1	2	1					
Soda, Solvay - ASH	Na_2CO_3	Sat.	<70	5	X7X72Z7	VCEGG	1	1	1	1					Powder H_2O sol.
Sodium Acetate	$Na\ C_2H_3O_2$	Sat.	90	5	X7X72V7	VBEGG	2	1	2			1.5	58		H_2O, Ether sol. Crystals
Sodium Alkylsulphate		10	70	5	XYXY2VY	VBVGG				1					
Sodium Alluminate	$Na\ Al\ O_2$	Sat.	80	5	XYXY2VY	VBVGG				1					H_2O soluble Powder
Sodium Aluminate Calcareous	$Na_2Al_2O_4$	Sat.	80	5	X6X6KR6	Q_1U_3PGG	1								H_2O sol. powder. Alkaline solution
Sodium Bicarbonate (Baking Soda)	$Na\ H\ CO_3$	Sat.	60	5	X6X62V6	VBPGG	1	1	1	1		2.15			H_2O sol. Crystals
Sodium Bichromate	$Na_2Cr_2O_7 \cdot 2H_2O$	Sat.	60	5	XYXY9KY	Q_1Q_1VGG				1		2.5	357		H_2O sol. Crystals, SCALDING
Sodium Bisulphate	$Na\ H\ SO_4$	Sat.	20	5	X6X62V6	VBPGG	1	1	1	1		2.1	58.5		H_2O sol. Crystals
Sodium Bisulphite	$Na\ H\ SO_3$	Sat.	20	5	X6X62V6	VBPGG	1	1	1	1		1.48			H_2O sol. Crystals
Sodium Borate (Borax)	$Na_2B_4O_7 \cdot 10H_2O$	Sat.	60	5	X7X7KR7	Q_1U_3EGG	1	1	1	1		1.75			H_2O sol. Crystals
Sodium Carbonate (Soda Solvay - ASH)	Na_2CO_3	Sat.	<70	5	X7X72Z7	VCEGG	1	1	1	1					H_2O sol. Crystals
Sodium Chloride	$Na\ Cl$	20	-40	5	X7X7RZ7	U_3CEGG	1	1	1	1		2.1			H_2O and Glycerol sol. Crystals
Sodium Citrate	$C_6H_5O_7Na_3 \cdot 2H_2O$	Sat.	80	5	X7X7KR7	Q_1U_3EGG	1	1	1	1			150		H_2O sol. Crystals
Sodium Cyanide	$Na\ CN$	Sat.	40	5	X6X62Z6	VCPGG	1	1	1						H_2O sol. Crystals; POISONOUS
Sodium Glutammate	$COOH(CH_2)_2CH(NH_2)COONa$	Sat.	90	5	X7X7KZ7	Q_1CEGG		1							H_2O and Alcohol sol. Crystals
Sodium Hydrosulphite	$Na_2S_2O_4$	Sat.	70	5	X7X7KK7	Q_1Q_1EGG		1					55		H_2O soluble Powder
Sodium Hydroxyde (Caustic Soda)	$Na\ OH$	10	70	5	X7X72Z7	VCEGG	2	1	2	2		2.13			H_2O, Glycerol, Alcohol soluble Crystals; CAUSTIC
Sodium Hydroxyde (Caustic Soda)	$Na\ OH$	30	Boil.	5	X7X7KR7	Q_1U_3EGG	2	1	2	2		2.13			H_2O, Glycerol, Alcohol soluble Crystals; CAUSTIC
Sodium Hydroxyde (Caustic Soda)	$Na\ OH$	Sat.	Boil.	5	L7L7KK7	Q_1Q_1EMM		1							H_2O, Glycerol, Alcohol soluble Crystals; CAUSTIC
Sodium Hypochlorite	$Na\ O\ Cl$	100	30	7F	XY24AHX	VY_1VGG	2	2		1					

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Sodium Hypochlorite	Na O Cl	20	70	5	LYLYKKY	Q_1Q_1VMM	2	2		1					
Sodium Hypoclorite (Bleaching)	(NaOCL+Na_2CO_3+Cl attivo)	100	60	5	LYLYKKY	Q_1Q_1VMM	2	2		1					Na ClO + Na_2CO_3 + Cl active
Sodium Metanylate	$NaSO_3C_6H_4NH_2$	Sat.	40	5	XYXYYRZY	U_3CVGG				1					
Sodium Metaphosphate	$(NaPO_3)n$	Sat.	40	5	X8X62V6	VBPGG	1	1	2	1					
Sodium Methylate	CH_3ON_a	Sat.	75	5	X7X7RZ7	U_2CEGG		1							Amorphic powder, soluble in Methilic - Ethilic Alcohol ; it decomposes in H_2O
Sodium Nitrate	$NaNO_3$	Sat.	60	5	X7X72Z7	VCEGG	2	1	2			2.26	308	380	H_2O, Glycerol sol. Crystals
Sodium Nitrite	$NaNO_2$	Sat.	30	5	X8X62V6	VBPGG	1					2.1	271		H_2O sol. Crystals, INFLAMMABLE
Sodium Perborate	$NaBO_3 \cdot H_2O_2 \cdot 3H_2O$	Sat.	60	5	X7X7KR7	Q_1U_2EGG	2	1	2	1			63		Hardly sol. Crystals in H_2O and Glycerol
Sodium Perchlorate	$NaClO_4$	Sat.	40	5 Dual	XYXYKKY	Q_1Q_1VGG				1		2.02	482		H_2O and Alcohol soluble Crystals, EXPLOSIVE
Sodium Peroxide	Na_2O_2	10	70	5	X7X7KZ7	Q_1CEGG	2	1	2	1		2.8			H_2O sol. Powder with hexothermic reaction
Sodium Plumbite (Doctor Solution)	Na_2PbO_2	Sat.	80	2	X8XV6	GBPGG	1								
Sodium Salicylate	HOC_6H_4COONa	Sat.	80	5	X7X72V7	VBEGG		1							H_2O, Alcohol, Glycerol soluble Crystals
Sodium Silicate		Sat.	20	2	X6336	U_2U_2PGG	1	1	1	1					H_2O soluble Crystals - IT SOLIDIFY
Sodium Sulphate	$NaSO_4$	Sat.	70	5	X6X6KR6	Q_1U_2PGG	1	1	1	1		2.6			H_2O, Glycerol sol. Crystals
Sodium Sulphide	$Na_2S \cdot 9H_2O$	Sat.	30	5	X6X62V6	VBPGG	1	1	1	1		1.42			H_2O soluble Crystals
Sodium Sulphite	$Na_2SO_3 \cdot 7H_2O$	Sat.	30	5	X8X62V6	VBPGG	1	1	1	1		1.59			H_2O soluble Crystals
Sodium Tetraborate (Borax)	$Na_2B_4O_7 \cdot 10H_2O$	Sat.	140	5	X7X7KR7	Q_1U_2EGG	1	1	1	1		1.75			H_2O soluble Crystals
Sodium Thiosulphate	$Na_2S_2O_3 \cdot 5H_2O$	Sat.	70	5	X7X72V7	VBEGG	2	1	1	1		1.73	48		H_2O soluble Crystals
Sodium Toluen Sulphunate	$CH_3C_6H_4SO_3Na$	100	60	5	XYXYRZY	U_3CVGG									Sodiumtoluene Acid + Na - salts soluble H_2O
Sodiumphosphate (mono-bi-tri)	$NaHPO_4 \cdot H_2O$	Sat.	50	5	X8X62V6	VBPGG	1	1	2	1					H_2O soluble Crystals
Solvents (Commercial)		100	90	4	XX5XV5	GBTGG									
Sorbitol	$C_6H_8(OH)_6$	Sat.	110	5	X7X7KZ7	Q_1CEGG	1	1	2	1		1.47	97		H_2O soluble powder
Starch		Sat.	90	2 Dual	X7337	U_2U_2EGG		1							
Steam	H_2O	100	180	4 Dual	XX5335	U_2U_3TGG		1			1				
Steam	H_2O	100	110	5 Dual	X7X72V7	VBEGG		1			1				
Steam	H_2O	100	145	5 Dual	X7X7KZ7	Q_1CEGG		1			1				
Stearic Acid	$CH_3(CH_2)_{16}CO_2H$	100	>75	4	XX5335	U_2U_3TGG	2	2	2			0.84	69.6	361	Wax-like substance sol. Alcohol, Ether, Chloroph
Stearine	$C_3H_5(C_{18}H_{35}O_2)_3$	100	>75	4	XX5335	U_2U_3TGG	2	2	2			0.94	71.6		Crystals soluble in Alcohol, Chlorophorm, Carb. Disulphide
Strontium Nitrate	$Sr(NO_3)_2 \cdot 4H_2O$	Sat.	60	5	X6X62V6	VBPGG	1					2.25			H_2O soluble Powder
Styrene or Styrol	$C_6H_5CH=CH_2$	100	140	4	XX5335	U_2U_3TGG				2		0.9	-30.6	145.2	Oily liquid sol. in Alcohol, Ether
Styrol + Alkril Styryl		100	140	4 Dual	XX5335	U_2U_3TGG									IT POLIMERISES
Succinic Acid	$HOOC\,CH_2\,CH_2\,COOH$	Sat.	90	5	X7X72V7	VBEGG		1				1.55	185	235	H_2O - sol. crystals
Sugar Juice		100	70	5	X6X6KZ6	Q_1CPGG	1	1	2	1					
Sugar Juices		100	90	5 Dual	X6X6RV6	U_2BPGG	1	1	2	1					
Sugar Solutions		10	80	5	X6X6RZ6	U_2CPGG	1	1	2	1					
Sugar, Beet Sugar		100	90	5 Dual	XYXYKZY	Q_1CVGG	1	1	2	1		1.58			Saccharose sol. Crystals
Sugar, Candy Sugar		100	90	5 Dual	XY33Y	U_2U_2VGG	1	1	2	1					
Sugar, Cane Sugar		100	90	5 Dual	XYXYKZY	Q_1CVGG	1	1	1	1					Saccharose sol. Crystals

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Sugar, Cooked Mass Sugar		100	90	2 Dual	XY33Y	U_3U_3VGG	1	1	2	1					
Sugarsyrup		15	70	5	X7X7RZ7	U_3CEGG	1	1	2	1					
Sulfuric Acid	H_2SO_4	3	<18	5	XYXY2ZY	VCVGG		2		1					Oily liq. - mix. H_2O with hexothermic reaction - SCALDING
Sulfuric Acid	H_2SO_4	20	50	5	LYLYKKY	Q_3Q_3VMM				1					Oily liq. - mix. H_2O with hexothermic reaction
Sulfuric Acid	H_2SO_4	96	20	5	XYXYKKY	Q_3Q_3VGG				1		1.84	10.4	>315	Oily liq. - mix. H_2O with hexothermic reaction
Sulfuric Acid	H_2SO_4	3	50	5	XYXYKZY	Q_3CVGG		2		1					Oily liq. - mix. H_2O with hexothermic reaction
Sulfurous Acid	H_2SO_3	5	20	5	LYLY2ZY	VCVMM	2	2	2	1		1.03			Water-solution of SO_2
Sulphon Acid		100	90	5	LYLYKKY	Q_3Q_3VMM				1					Benzene + SO_3
Sulphon Alcohol		100	70	2	X7GV7	EBEGG		1							
Sulphonitric Solution		100	30	5	LYLYKKY	Q_3Q_3VMM				1					
Sulphunates		100	90	5	XYXYKRY	Q_3U_3VGG				1					
Sulphur	S	Sat.	40	5	X7X7KR7	Q_3U_3EGG		1	2	1		2	115	445	Crystals sol. in Benzene, C. Tetrachlorid, C. Disulphite; INFLAMMABLE
Sulphur (Melted)		100	>112	5 Dual	XYXYKRY	Q_3U_3VGG		1	2	1					
Sulphur (Wet - Colloidal)		100	>120	5 Dual	X7X7KR7	Q_3U_3EGG		1	2	1					
Sulphur Chloride	S_2Cl_2	100	20	5	XYXY2VY	VBVGG				1		1.69	-80	138	Oily liquid soluble in Alcohol, Ether, Benzene; IRRITANT
Sulphur Dioxyde	SO_2	100	30	5	X7X7RV7	U_3BEGG		1	2	1		Liq. 1.43	-76	-10	Liquid or Gas, soluble in H_2O, Alkohol, Ether; at 20 °C - 3,2 Bar; IRRITANT
Sulphur Trioxyde	SO_3	100	40	5	LYXYKZY	Q_3CVMG		2		1			17 - 62	45	With H_2O it give H_2SO_4 with hexothermic reaction
Sulphurous Anhydride	SO_2	100	30	5	X7X72V7	VBEGG		1	2			liq. 1.43	-76	-10	Liq. or gas. At - 20 C - 3,2 BAR - Sol. Alcohol, Ether, H_2O
Sulphyric Anhydride (S.Tricoxide)	SO_3 (alfa, beta, gamma)	100	40	5	LYXYKZY	Q_3CVGM		2		1			62/17	45	With H_2O it glues H_2SO_4 with esothermic reaction
Synthetic Detergents		100	90	5	XYXYRZY	U_3CVGG				1					
Syrup		100	60	5	X6X6RZ6	U_3CPGG	1	1	2	1					
T															
Tallow		100	80	5	XYXYRZY	U_3CVGG	1	2	2	1	1	0.9			
Tannic Acid (Tannin)	$C_{76}H_{52}O_{46}$	Sat.	110	5	X7X72Z7	VCEGG	1	1	2	1			210		Powder sol. H_2O, Alcohol, Acetone
Tannic Liquor		100	60	5	X6X62Z6	VCPGG	1	1	2	1					
Tannic Solution		100	110	5	X7X72Z7	VCEGG	1	1	2	1					
Tannine (Tannic Acid)	$C_{76}H_{52}O_{46}$	Sat.	110	5	X7X72Z7	VCEGG	1	1	2	1			210		Powder soluble in H_2O, Alcohol, Acetone
Tar		100	>130	2 Dual	XY33Y	U_3U_3VGG	2			1		1.2			
Tar (Fossil carbon tar)		100	>130	2 Dual	XY33Y	U_3U_3VGG	2			1					
Tar and Ammonia		100	>130	4 Dual	XX5335	U_3U_3TGG	2								
Tar Oil		100	150	5	XYXYKRY	Q_3U_3VGG				1	1				
Tartaric Acid	$C_4H_6O_6$	50	80	5	X6X62V6	VBPGG	1	2	2	1		1.76	170		Cryst. sol. H_2O, Alcohol, Ether
Terephtalic Acid	$C_6H_4(COOH)_2$	Sat.	70	45 Dual	XX5X5KZ5	Q_3CTGG						1.51			Cryst. sol. in Alkali; Washing with demineralized water
Terpene Dicyclic		100	80	2	XYGVY	EBVGG				1	1				
Terpene Monocyclic		100	80	2	XYGVY	EBVGG				1	1				
Terpene Olephinic		100	60	2	X6GZ6	ECPGG	1			1	1				
Terphenyl		100	180	5	XYXYKRY	Q_3U_3VGG				1	1				
Testing petrol		100	50	2	X6GZ6	ECPGG	1			1	1				Liq. VOLATILE, INFLAMMABLE

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Tetracicicline (Antibiotic)		30	90	5	XYXYKRY	Q_1U_3VGG				1					Powder, Crystals, soluble in H_2O and diluted HCl
Tetraclorodifenylethane (TDE)		Sat.	160	4	XX5336	U_3U_3TGG							110		Crystals sol. in organic solvents - similar to DDT
Tetrahydrofuran	$CH_2\ CH_2\ CH_2\ CH_2\ O$	100	40	4	XX5XV5	GBTGG		2				0.88	-65	66	Liquid soluble in H_2O, Organic solvents
Tetrahydronaphtalene (Tetralin)	$C_{10}H_{12}$	100	90	5	XYXYKZY	Q_1CVGG				1		0.96	-25	206	Liquid mix. Solvents, It POLYMERIZES
Textile stiffener		Sat.	90	2	XY33Y	U_3U_3VGG				1					
Thionyl Chloride	$SO\ Cl_2$	20	40	4	LL5LZ5	MCTMM				2		1.63	-105	79	
Tinchloride	$Sn\ Cl_4$	100	70	7	XY2ZYHX	VCVGG	1	1		1		2.27	-33	114	Liquid soluble in H_2O, Alcohol, Carb. Disulphide; CAUSTIC
Titanium Bioxyd + Water	$Ti\ O_2 + H_2O$	10	40	5	XYXYKRY	Q_1U_3VGG	1	1		1		3.8			Powder soluble in hot H_2SO_4, Alkali
Titanium Tetrachloride	$Ti\ Cl_4$	100	20	5	XYXY2ZY	VCVGG	2			1		1.76	-30	136	Liquid soluble in HCl - diluted with H_2O it makes hexothermic reaction
Toluene - Diisocyanate	$CH_3\ C_6\ H_3(NCO)_2$	100	90	4	XX5XV5	GBTGG		2				1.22	21.5	251	Liquid soluble Ether, Acetone, organic solvents
Toluene Solution		100	90	5	XYXYRZY	U_3CVGG				1					
Toluensulphonic Acid (Ortho)	$C_6\ H_4(SO_3\ H)(CH_3)$	Sat.	40	5	LYLYKZY	Q_1CVMM				1			67.5	129	Cryst. sol. H_2O, Alcohol, Ether
Toluensulphonic Acid (Para)	$C_6\ H_4(SO_3\ H)(CH_3)$	Sat.	40	5	LYLYKZY	Q_1CVMM							107	140	Cryst. sol. H_2O, Alcohol, Ether
Toluidine-Ortho	$C_7\ H_9\ N$	100	220	4 Dual	XX5335	U_3U_3TGG						1.1			Liq. sol. Alcohol, Eter - COMBUSTIBLE
Toluol (Toluene)	$CH_3\ C_6\ H_5$	100	40	2	XYGVY	EBVGG				1		0.86	-94.5	110.7	Liquid sol. Alcohol, Benzene, Ether, INFLAMMABLE
Toluol (Toluene)	$CH_3\ C_6\ H_5$	100	90	5	XYXYRZY	U_3CVGG				1		0.86	-94.5	110.7	Liquid sol. Alcohol, Benzene, Ether, INFLAMMABLE
Tomato Juice - water solution		100	90	5	XYXY2VY	VBVGG	1	1		1					
Tomato Pulp - concentrate		100	90	5 Dual	XYXYKRY	Q_1U_3VGG	1	1		1					
Tomato Pulp - not concentrate		100	90	5	XYXYKRY	Q_1U_3VGG	1	1		1					
Tomato Pulp - Triconcentrate		100	90	5 Dual	XYXYKRY	Q_1U_3VGG	1	1		1					
Tomato Sauce		100	90	5	XYXYRZY	U_3CVGG	1	1		1					
Toothpaste		100	30	2 Dual	XYXYKRY	Q_1U_3VGG	1	1		1					
Trichlorethylene	$CH\ Cl = C\ Cl_2$	100	70	5	XYXYRZY	U_3CVGG				1		1.45	-73	86.7	Liquid mix. with org. solvents; POISONOUS
Trichlorethylene and Fossil Wheat (10%)	$CH\ Cl = C\ Cl_2$	100	40	5	XYXYKRY	Q_1U_3VGG				1					
Trichloro Ethylene	$CH\ Cl : C\ Cl_2$	100	70	5	XYXYRZY	U_3CVGG				1		1.45	-73	86.7	Liq. mix. org. Solvents; TOXIC
Trichloroacetaldeide (Chloral)	$C\ Cl_3\ CHO$	100	80	4	XX5XV5	GBTGG						1.5	-57	97.7	Oily liquid sol. in Alcohol, Ether, Chlorophorm; DANGEROUS VAPOURS
Tricresile Phosphate	$(CH_3C_6H_4O)_3\ PO$	100	90	5	X7X72Z7	VCEGG		1		2		1.16	-35	420	Liq. mix solvents
Tridecene	$CH_3(CH_2)_{11}\ CH_3$	100	80	2	XYGVY	EBVGG				1		0.75	-5.4	225	Alcohol sol. liquid
Triethylamine	$(C_2\ H_5)_3\ N$	100	60	5	XEX6ZV6	VBPGG	1					0.72	-115	89.7	H_2O, Alcohol, Ether mix. liquid, INFLAMMABLE
Triethylene Glicol (TEG)	$HO(C_2\ H_4\ O)_3\ H$	100	170	5	XYXYKRY	Q_1U_3VGG	1	1	1	1		1.12	-7.2	287	Colourless liq., Hygroscopic, sol. H_2O, Benzol, Toluol
Triethylphosphate	$(C_2\ H_5)_3\ PO_4$	100	60	2	X7XV7	GBEGG		1					-56.4	216	Liquid soluble in organic solvents, mix. H_2O
Trixilenol Phosphate	$[(CH_3)_2\ C_6\ H_3\ O]_3\ PO$	100	70	2	X7XV7	GBEGG		1				1.15		240	H_2O mix. liquid
Turpentine		100	70	2	X8GV6	EBPGG	1			1	1	0.9		155	
U															
Unleaded Petrol		100	60	2	XYGZY	ECVGG				1	1				Liq. VOLATILE, INFLAMMABLE
Uranyl Nitrate Radioactive	$UO_2(NO_3)_2 \cdot 6H_2O$	Sat.	20	5	XYXY2VY	VBVGG				1		2.8	60.2	118	Crystals soluble in H_2O, Alcohol, Ether
Urea (Carbamide)	$CO(NH_2)_2$	100	140	4 Dual	XX5335	U_3U_3TGG		2				1.33	132.7		Crystals soluble in H_2O, Alcohol, Benzene
Urea Resins		100	140	4 Dual	XX5335	U_3U_3TGG		2							Washing with solvent

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Urea Resins		100	140	4 Dual	XX5335	U_3U_3TGG		2							
Uric Acid	$C_5 H_4 O_3 N_4$	Sat.	70	5	X7X72Z7	VCEGG		1				1.89	250		Cryst. sol. in Alkali, Glycerol, Hot H_2SO_4
Urine		100	40	2	X7XV7	GBEGG		1							
V															
Varnish (without Ketone solv.)		100	20	2 Dual	XY33Y	U_3U_3VGG	2			1					Washing with solvent
Varnish with aromatic solvents		100	20	2 Dual	XY33Y	U_3U_3VGG				1					Washing with solvent
Varnish with Nitro solvents		100	20	4 Dual	XX5335	U_3U_3TGG									Washing with solvent
Varnish with non-aromatic solvents		100	20	4 Dual	XX5335	U_3U_3TGG									Washing with solvent
Vaseline		100	80	5	X6X06KR6	Q_1U_3PGG	1			1					
Vegetable Juice		100	70	5	X6X62V6	VBPGG	1	1		1					
Vermouth		100	80	5	X7X72V7	VBEGG	1	1	1	1					
Vinegar		100	90	2	X7XV7	GBEGG	2	1	2	2					
Vinyl Ethylene (Butadiene)	$H_2 C = CHHC = CH_2$	100	20	5 Dual	X7X7KZ7	Q_1CEGG		1	2	1		Liq. 0.6	-108.9	-4.41	Liquid Gas sol. Alcohol, Ether; at 20 °C - 1.26 Bar it POLYMERIZES, INFLAMMABLE
Vinyl Acetate	$C_4 H_6 O_2$	100	20	2 Dual	X7337	U_3U_3EGG		1	2			0.93	-92.8	73	Liq. sol. in organic solvents - INFLAMMABLE - IT POLIMERISES
Vinyl Acetate Poli (PVA)	$[CH_2 CH(OOCCH_3)]x$	100	90	2 Dual	X7337	U_3U_3EGG		1	2			1.19			Thermoplastic solid, soluble Ketones, Esters, Benzene, Chlor. Hydrocarb.
Vinyl Benzene (Poli)		100	110	4 Dual	XX5335	U_3U_3TGG				2					
Vinyl Chloride (Chloro Ethylene)	$CH_2 = CH Cl$	100	30	5	XYXYRZY	U_3CVGG				1		Liq. 0.91	-159.7	-13.9	Liquid Gas soluble in Alcohol, Ether, INFLAMMABLE, liquid at 3 BAR
Vinyl Chloride (Poli - PVC)	$(= H_2 CCH Cl)n$	100	90	2 Dual	XY33Y	U_3U_3VGG				1					Thermoplastic solid
Vinyl Cyanide (Acrylic Nitrile)	$H_2 C = CH CN$	100	140	4	XX5335	U_3U_3TGG						0.8	-83	77.4	Liquid soluble in organic solvents; INFLAMMABLE, TOXIC
Vinyl Glue		100	30	2 Dual	XY33Y	U_3U_3VGG				1					
Vinyl Resins (not Acetate)		100	90	2 Dual	XY33Y	U_3U_3VGG				1					Washing with solvent
Vinylidenechloride pure (VC)	$CH_2 C Cl_2$	100	70	5	XYXYKRY	Q_1U_3VGG				1			-122	32	VOLATILE liquid, INFLAMMABLE, it may polymerize
Viscose (Rayon)		100	60	4	XX5335	U_3U_3TGG						1.52			
W															
Water	H_2O	100	80	5	X6X62V6	VBPGG	1	1	2	1	1				
Water	H_2O	100	80	2	X6GV6	EBPGG	1	1	2	1	1	1	0	100	
Water - Cold washing	H_2O	100	30	5	X6X62V6	VBPGG	1	1		1	1				
Water - Condensate	H_2O	100	90	5	X6X62V6	VBPGG	1	1		1	1				
Water - Boiling	H_2O	100	140	5	X7X7KZ7	Q_1CEGG		1		2	1				
Water - Brackish water		100	40	5	X6X62V6	VBPGG	1	1		1					
Water - Bromine		Sat.	20	5	LYLYKKY	Q_1Q_1VMM				1					Br + H_2O - solution; CAUSTIC
Water - Dejonized	H_2O	100	70	5	X7X7KZ7	Q_1CEGG		1		1					
Water - Demineralized	H_2O	100	130	5	XYXYKZY	Q_1CVGG	1	1		1					
Water - Dirty Water			70	5	X6X6KR6	Q_1U_3PGG	1	1	2	1	1				
Water - Distilled	H_2O	100	20	5	X6X62V6	VBPGG	1	1		1					
Water - Distilled	H_2O	100	140	5	X7X7KZ7	Q_1CEGG		1							
Water - drinkable		100	90	5	X7X72V7	VBEGG	1	1		1					
Water - drinkable pit water		100	90	5	X7X72V7	VBEGG	1	1		1					

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Water - Gas		100	30	5 Dual	X6X62Z6	VCPGG	1			1	1				Mixture of Gas H + Gas CO; COMBUSTIBLE
Water - Heavy Water	D_2O	100	140	5	X7X7KZ7	Q_1CEGG	1	1	2			1,1	3,8	101,5	
Water - Mineral Waters		100	60	5	X7X72V7	VBEGG	1	1		1					
Water - Overheated		100	140	5	X7X7KZ7	Q_1CEGG		1			1				
Water - Oxydating Mine Water	H_2O	100	60	5	X7X72V7	VBEGG		1		1					
Water - Paint		100	20	2 Dual	X6336	U_3U_3PGG	1			1					Washing with demineralized H_2O
Water - Paint (Cataphorese)		100	20	2 Dual	X7337	U_3U_3EGG		1							Washing with demineralized H_2O
Water - Radioactive water	H_2O	100	90	5	X7X72V7	VBEGG	2	1	2	1					
Water - Refrigerating towers	H_2O	100	120	5	XYXYKZY	Q_1CVGG	1	1		1	1				
Water - Return water			120	5	XYXYKRY	Q_1U_3VGG				1					
Water - Sea Water		100	60	5	X6X6ZV6	VBPGG	1	1		1		1.03			
Water - Soap water			80	5	X6X6ZV6	VBPGG	1	1	2	1	1				
Water - Steam	H_2O	100	145	5 Dual	X7X7KZ7	Q_1CEGG		1			1				
Water - Steam	H_2O		180	4 Dual	XX5335	U_3U_3TGG					1				
Water - Steam	H_2O	100	110	5 Dual	X7X72V7	VBEGG		1			1				
Water - Thermal Water and mud			60	5 Dual	XYXYKRY	Q_1U_3VGG		1		1					
Water - Thermal Waters		100	60	5	XYXY2ZY	VCVGG		1		1					
Water - Waste		100	80	5	XYXYKRY	Q_1U_3VGG	1	1	2	1					
Water - without cations	H_2O	100	40	5	LYLY2ZY	VCVMM		1		1					
Water + Abrasives (5%)		100	60	2	X6336	U_3U_3PGG	1	1		1					
Water + Chlorine		Sat.	60	5	LYLYKKY	Q_1Q_1VMM				1					
Water + Detergents		Sat.	80	2	X6XV6	GBPGG	1	1		1					
Water + Glycerine		100	140	2	X7X7KZ7	Q_1CEGG	1	1	1	1	1				
Water + Mud		100	20	2	X6336	U_3U_3PGG	1	1		1					
Water + sand (5%)		100	60	2	X6336	U_3U_3PGG	1	1		1					
Water + Soda Solvay		Sat.	70	5	X7X72Z7	VCEGG	1	1	1	1					
Water + soluble oil		100	80	2	X6GZ6	ECPGG	1		2	1	1				
Wax		100	130	5	XYXYRZY	U_3CVGG				1	1	0.96			
Wax - Emulsion		100	90	5	XYXYRZY	U_3CVGG				1	1				
Wax - Paraffine Wax		100	90	2	XY33Y	U_3U_3VGG				1	1				
Whale Oil		100	80	5	X6X62Z6	VCPGG	1	2	2	1		0.93			
Whiskey		100	40	2	X6XV6	GBPGG	1	1	1						
White Spirit		100	40	2	X6XV6	GBPGG	1	1	1						
White Vitriol (Zinc Sulphate)	$Zn\ SO_4 \cdot 7H_2O$	Sat.	80	5	X6X62V6	VBPGG	1	1	1	1		1.95	100		Crystals soluble in H_2O, Glycerol
Wine		100	80	2	X6XV6	GBPGG	1	1	1	1		0.92 - 0.99			
Wine + 5% Fossil Meal		100	80	5	X6X6KR6	Q_1U_3PGG	1	1	1	1					
Wine Must		100	90	5	X7X7KR7	Q_1U_3EGG	1	1							
Wine Spirit (Ethil alcohol)	C_2H_5OH	100	80	2	X6XV6	GBPGG	1	1	1			0.81	-118	78.3	H_2O, Ether, Chlorophorm, soluble liquid, INFLAMMABLE, VOLATILE

The data shown can be changed to reflect any improvement whitout notice. **Legend : "the material number codes 6, 7, 8, Y ,1" - 1 = Recomended , 2 = Suitable.** If not indicated, insufficient data or not suitable

Fluids	Chemical Formula	Conc. %	Temp. °C	Seal Type	Materials Code	DIN Code	6	7	8	Y	1	Density Kg/dm³	Melting Point °C	Boiling Point °C	Notes
Wood Resin		100	120	2 Dual	XY33Y	U_2U_2VGG	1			1					Washing with solvent
Wood Spirit (Methyl-Alcohol)	CH_3OH	100	60	2	X7XZ7	GCEGG	1	1	1			0.79	-98	64.5	Liq. sol. H_2O, Ether, Alcohol; VOLATILE, INFLAMMABLE, POISONOUS
X															
Xylol or Xylene (Dimethylbenzene)	$C_6H_4(CH_3)_2$	100	120	5	XYXYKZY	Q_1CVGG				1		0.86		138.2	Liquid soluble Alcohol, Ether; TOXIC, INFLAMMABLE
Y															
Yogourt		100	70	5	X7X7KR7	Q_1U_1EGG	1	1							
Z															
Zinc Acetate	$Zn(C_2H_3O_2)_2+_2H_2O$	Sat.	80	5	X7X72V7	VBEGG		1				1.73	273		Crystals soluble in H_2O, Alcohol
Zinc Chloride	$ZnCl_2$	Sat.	80	5	X6X6ZV6	VBPGG	1	1	1	1		2.91	290		Crystals soluble H_2O, Alcohol, Ether, Glycerol; POISONOUS
Zinc Cyanide	$Zn(CN)_2$	Sat.	20	5	XYXYKKY	Q_1Q_1VGG	1			1		1.85	800		Soluble powder mineral Acids diluted, Alkali, POISONOUS
Zinc Nitrate	$Zn(NO_3)_2 \cdot 6H_2O$	Sat.	80	5	X6X6ZV6	VBPGG	1					2.06			Crystals soluble H_2O, Alcohol, INFLAMMABLE
Zinc Phosphate	$Zn_3(PO_4)_2$	Conc.	90	5	LYLY2ZY	VCVMM				1		3.99			Powder soluble Acids, Ammonium Hydrate
Zinc Phosphate	$Zn_3(PO_4)_2$	10	80	5	XYXY2ZY	VCVGG				1		3.99			Powder soluble Acids, Ammonium Hydrate
Zinc Phosphate and Potassium Phosphate		10	80	5	XYXY2ZY	VCVGG				1					
Zinc Salts		Sat.	20	5	X6X6KR6	Q_1U_1PGG	1	1	1	1					
Zinc Sulphate	$ZnSO_4 \cdot 7H_2O$	Sat.	80	5	X6X6ZV6	VBPGG	1	1	1	1		1.95	100		Crystals soluble in H_2O, Glycerol

The data shown can be changed to reflect any improvement whitout notice. **Legend : "the material number codes 6, 7, 8, Y ,1" - 1 = Recomended , 2 = Suitable.** If not indicated, insufficient data or not suitable

XXX

This catalogue illustrates the seal series we produce which have been in use since the very beginning of our activity.

Published in four languages (ITALIAN, ENGLISH, GERMAN and SPANISH), it presents minor differences that are necessary for the various languages, in accordance also with the appreciation our different types receive in the various countries.

We are thankful towards all those clients who allowed us to earnestly develop our work and to constantly improve our quality standards and efficiency.

ROTEN + UNITEN

are internationally registered trademarks

All reported datas in this catalogue and all information therein derive from our own experience over 50 years of activity in this field.
Thus their endurance depends on a number of various factors, our products are guaranteed because of the quality of the materials we indicate in the tables and their accurate manufacturing.

The reported measures in this catalogue are expressed in millimeters. Also note that the maximum values of working condition parameters, shall not be applied simultaneously.

The information contained herein is correct at the time of issue, but may be subject to change without prior notice.

Progetto	Roten S.r.l.
Esecuzione grafica	Augusto Zanoni
Fotografia	Roberto Mancuso
Consulenza e coordinamento	Luigi Spada
Stampa	Tipografia Spada S.n.c.

MATERIALS

	Code ROTEN	Code ISO-DIN
STEELS		
Hardened	C	D
Springs	E	
Cr. Stainless 431	G	E
Cr-Ni Stainless 304	H	F
Cr-Ni-Mo Stainless 316	X	G
Stainless Special	D	G
Anticorrosion Superalloy	L	M
Stellite Hardfacing on S.S. 316	J	K
Hardened S.S.	S	T
CARBON GRAPHITE		
■ Normal	V	B
■ Special	Z	C
With metal SB	1	A
CARBIDES		
■ Brazed TC Carbides on S.S.	3	U_3
■ Solid Corr. Res. Carbides	R	U_3
■ Silicon Carbides SiC (solid)	K	Q_1
Silicon Carbides SiC Special (solid)	Q	J
CERAMICS		
Normal Steatite HF	9	X
■ Special Alumina	2	V
ELASTOMERS		
■ Nitrile (NBR)	6	P
■ Ethylene Propylene (EPDM)	7	E
Chloroprene (CR)	8	N
■ Fluoro Carbon (FPM)	Y	V
Silicon (MVQ)	B	S
Perfluorelastomer	W	K
Coated	F	X
Coated	P	M_1
Special Mixture	I	X
Special Mixture	M	X
NON ELASTOMERS		
Gasket without asbestos	A	Y
Universal PTFE	5	T
Universal PTFE Glass filled	0	Y_1
Universal PTFE Red glass filled	4	Y_1
OTHER		
Bronze, antifriction BS Pb 20	N	N
Cast iron, acid resistant	α	R
Titanium	T	T