ROTEN® srl
MECHANICAL SEALS

Distributeur en Tunisie

Techno Trade Group

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MILANO 1945

ROTEN® srl
MECHANICAL SEALS

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UNI EN ISO 9001
Certified Quality System since 1993

UNI EN ISO 14001
Certified Environment Management System since 2007

Under request the components of our mechanical seals can be supplied with the following conformity:

Drinking water
WRAS (BS 6920), D.M. 174, KTW, DVGW, DVGW-W270, 3A, TZW, NSF, ACS.

Pharmaceutical
USP CLASS VI.

Food zone
FDA, (EC) n. 1935 Regulation and NSF.

Explosive environment
94/9/EC Directive – for cat. 1, cat. 2 and cat. 3.

Restrictions for dangerous substances and preparations
RoHS II Directive n. 2011 (EU)
Reg. (EC) n. 1272 - CLP
Reg. (EC) n. 1907 - Reach
n. 2003 Directive (EC).

For further information: qualita@roten.it

ISO 9001 Since 1993
ISO 14001 Since 2007

GUARANTEED QUALITY SINCE MILANO 1945 ROTEN


rtica, 6 Milan
02.7385445
ail: info@roten.it
Type: ROTEN
3RF/3Z7
Year: 10/2008
BARRIER
BUFFER
A
FLUSH

INDEX

MATERIALS CODE KEY

MATERIALS	CODE		APPLICATIONS (NOTIONAL)	Limit Temp. °C		COMPONENTS					
	ROTEN	ISO - EN		+	-	SEE NOTE	SPRINGS	GASKETS	BELLOWS	SEAL RINGS	FRAMES
STEELS											
Cr. Stainless 431	G1	E	Water - Hydrocarbons - Solvents							•	•
Cr-Ni Stainless 304	H1	F	Food-Nitric Acid				•		•		•
Cr-Ni-Mo Stainless 316	X1	G	Acids (except halogenes and derivates)				•		•	•	•
Duplex Stainless	D1	G	Used for shrunk carbides								•
Anticorrosion Superalloy	L1	M	Acids and their corrosive solutions				•		•	•	•
Anticorrosion Alloy	L3	T	Corrosive solutions						•		
Stellite Hardfacing on S.S. 316	J1	K	Wear resistant							•	
Hardened S.S.	D2	T	Wear resistant							•	
Titanium	T1	T	Universal				•			•	•
SMO 254	U1	X	Sea water with temparature								•
CARBON GRAPHITE											
Normal	V1	B	Universal (except oxidatives)		180					•	
Special	V2	C	Acids - Hydrocarbons - Heat		220					•	
With metal SB	V3	A	Hydrocarbons - Oils - Greases - Ammonia - Heat		350	+				•	
Normal shrink in S.S. 316	X7	C	Acids - Hydrocarbons - Heat		150					•	
With metal SB shrink in S.S. 316	X9	A	Hydrocarbons - Oils - Greases - Ammonia - Heat		180	+				•	
CARBIDES											
Brazed Tungsten Carbide on S.S.	X3	U_1	Universal Abrasives - Acids - Salts - Bases							•	
Solid Corr. Res. Tungsten Carbide	R1	U_3	Universal Abrasives - Acids - Salts - Bases							•	
Solid Binderless Tungsten Carbide	R3	U_3	Universal Abrasives - Acids - Salts - Bases							•	
Silicon Carbide SiC (solid)	K1	Q_1	Universal Abrasives - Acids - Salts - Bases							•	
Silicon Carb. SiSiC with free Si (solid)	K2	Q_2	Universal Abrasives - Acids - Salts							•	
Silicon Carb. SiC Special PG (solid)	K3	Q_1	Universal Abrasives - Acids - Salts - Bases							•	
Silicon Carb. SiC/C (solid)	K4	Q_1	Universal Abrasives - Acids - Salts - Bases - Antisticking							•	
Silicon Carb. SiC shrink in Duplex	D5	Q_1	Universal Abrasives - Acids - Salts - Bases		150					•	
Tungsten Carbide shrink in Duplex	D6	U_3	Universal Abrasives - Acids - Salts - Bases		150					•	
Silicon Carb. SiC shrink in Titanium	T5	Q_1	Universal Abrasives - Acids - Salts - Bases		150					•	
Tungsten Carb. shrink in Titanium	T6	U_3	Universal Abrasives - Acids - Salts - Bases		150					•	
CERAMICS											
Aluminium oxyde	Z1	V	Universal wear and corrosion resistant		180					•	
ELASTOMERS											
Nitrile (NBR)	P1	P	Water - Oils - Air - Hydrocarbons Gas and Liquid	25	90			•	•		
Ethylene Propylene (EPDM)	E1	E	Water - Acids - Alcohols - Acetates - Steam (No Hydrocarbons)	150	45			•	•		
Ethyl. Prop. (EPDM) FDA USP 3A	E2	E	Food adn pharmaceutical applications	50	45			•			
Chloroprene (CR)	N1	N	Oils with gas (Refrigerators)	45	140			•			
Chloroprene (CR)	N2	N	Oils with gas CFC (Refrigerators)	45	140			•			
Fluoro Carbon (FPM)	Y1	V	Solvents - Acids - Miner. prod. (No Acetates - Chetons - Ethers)	30	180			•	•		
Fluoro Carbon (FPM) FDA USP 3A	Y2	V	Food adn pharmaceutical applications	30	180			•			
Special Mixture	Y3	X	Special Fluorine compound for High temperatures	30	240			•			
Special Mixture	Y4	X	Special Fluorine compound for methanol/gasoline mixtures	30	140			•			
Silicone (MVQ)	B1	S	Steam - Heat - Food	85	230			•			
Perfluoroelastomer	W1	K	Universal	20	220			•			
FDA+USP approved Perfluorelastomer	W4	K	Perfluorelastomer for food application					•			
Coated	F1	X	Fluorine Elastomer with FEP sheet coating	0	180			•			
NON ELASTOMERS											
Gasket without asbestos	A1	Y	Universal (except Nitric Acid >20%)	70	350			•			
Universal PTFE - TFM	C1	T	Acids - Solvents - Medicinals Prod. - Food		240			•	•		
Universal PTFE Red glass filled	C4	Y_1	Acids - Solvents - Medicinals Prod. - Food		240			•		•	•

NOTE :

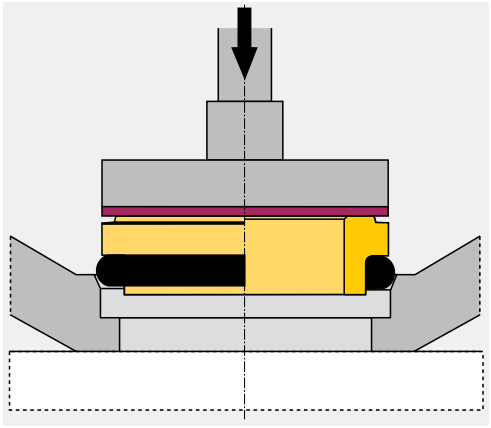
+ Materials marked + are not compatible with food and medicinal products (See page 40)
These materials may be delivered with a Suitability Certification for Pharmaceutic and Food use Others materials can be used to shrink carbides.

On request you can have atex Directive 94/9/CE Certification. For further information contact our technical department.

CHOICE AND MOUNTING OF SEALS

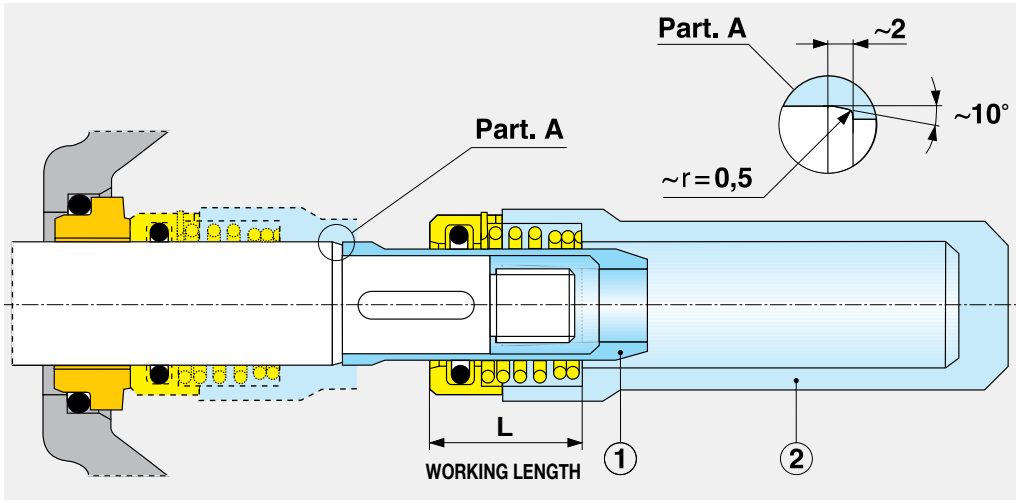
MOUNTING OF THE STATIONARY PART

- Always check with accuracy the size and tolerance of the seal housing.
- Make sure that both stationary seal housing are free from all machine marks and with correct chamfer.
- Moisten slightly the seal housing and the gasket with alcohol, glycerine or other elastomer suitable 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 can 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 **EN 12756** mounting dimensions.



EXAMPLE OF **MECHANICAL SEAL DESIGNATION**

Version	**RO o UN**
Model	**2**
Diameter	**38**

Components code*

1. Spring	**X1**
2. Shaft gasket (O-Ring)	**P1**
3. Rotary ring	**G1**
4. Stationary ring	**V1**
5. Stationary gasket (O-Ring)	**P1**

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 sharp edges.
- If necessary, polish the shaft by fine sand paper (grade 400)
- After having moistened the shaft slightly with alcohol, glycerine or any other suitable 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 tight.
- **You could cause damage by inserting grease, oils or other similar substances between the seal faces, which must be kept extremely clean.**

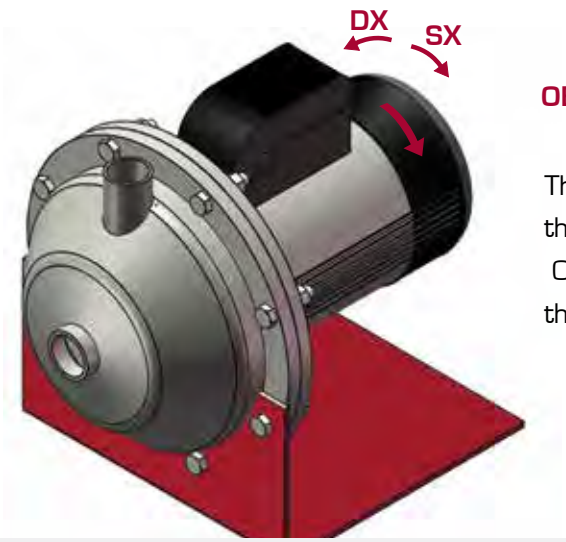
DURING THE MOUNTING OF MECHANICAL SEALS WITH **PTFE OR FEP GASKETS**, WE FURTHER ADVISE:

- 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 facility (see item A), just like the sleeve (1).

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

WE ADVISE NOT TO HAVE THE MECHANICAL SEALS WORKING DRY.

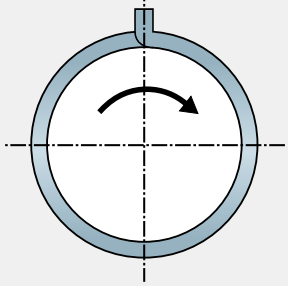
SELF DRIVING SPRING ROTATION

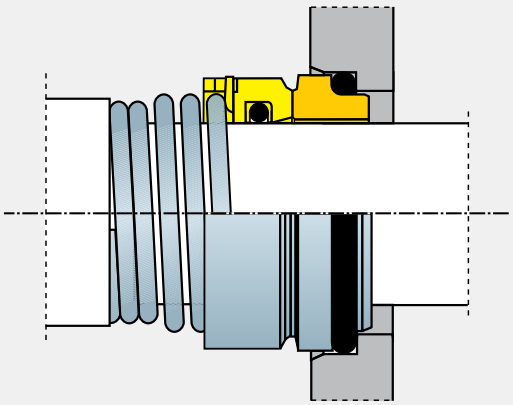


OBSERVATION SIDE

The rotation of mechanical seal is the same of the shaft view from the engine side.
On many pumps the rotation side is shown on the cover flange with an arrow.

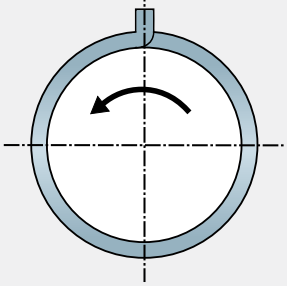
RIGHT ROTATION **"R"**
SELF DRIVING SPRING

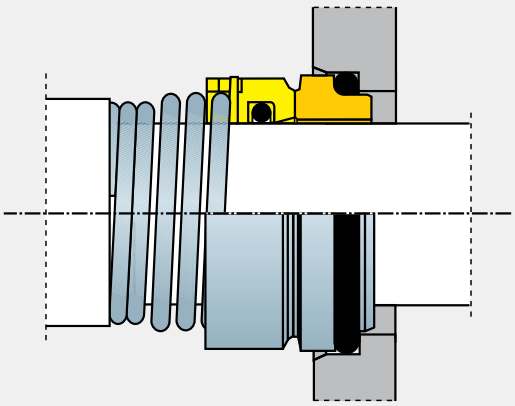




Clockwise rotation.
Right spring "R".

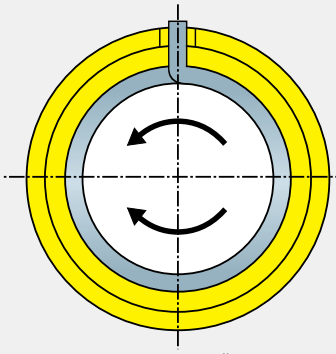
LEFT ROTATION **"L"**
SELF DRIVING SPRING

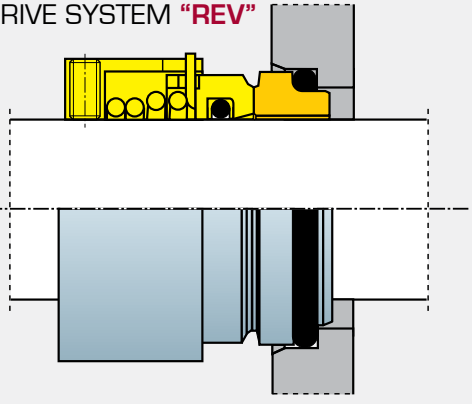




Counterclockwise rotation.
Left spring "L".

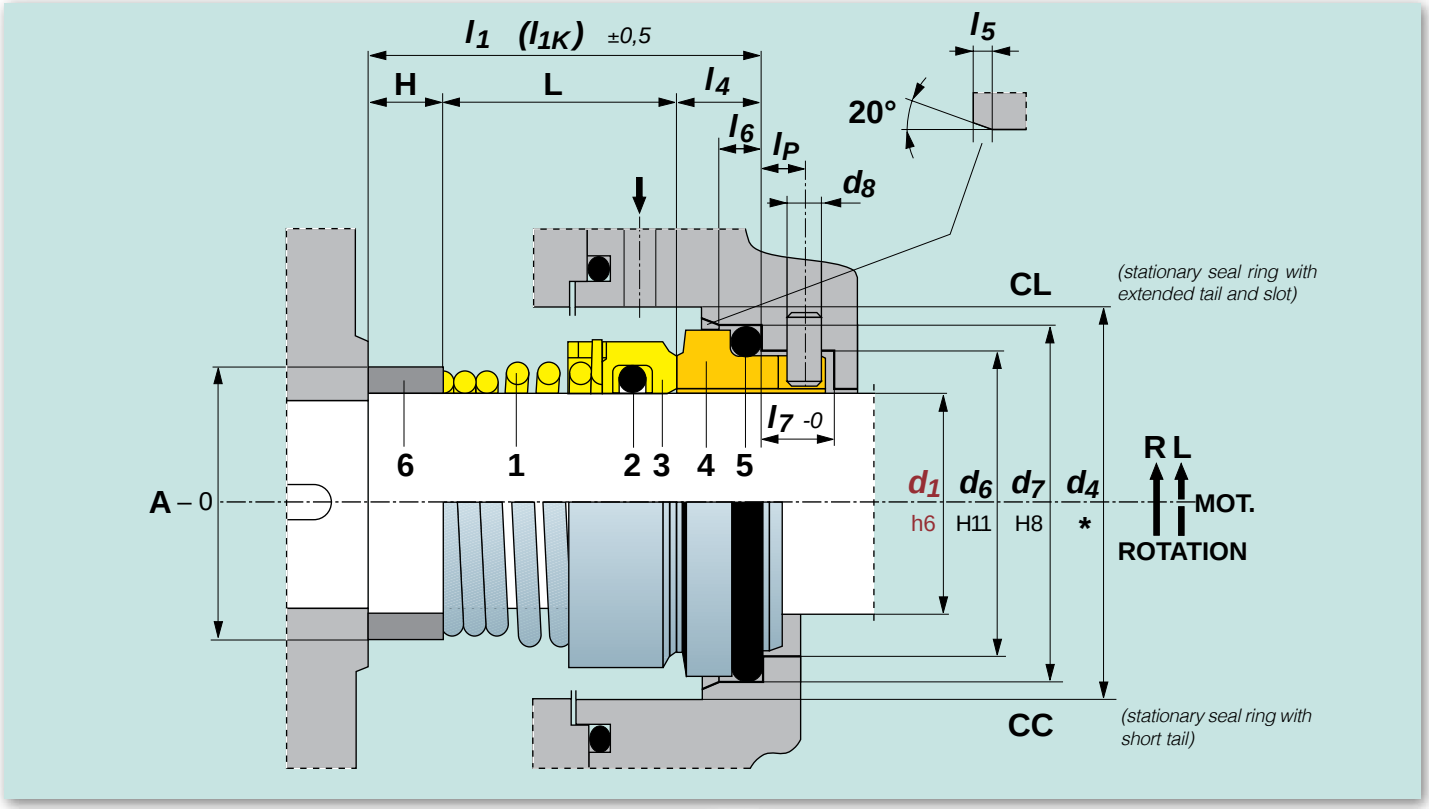
BI-DIRECTIONAL SPRING DRIVE SYSTEM **"REV"**





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

TYPE 2



ROTEN

TYPE 2 - 2H - U2 - U2H

d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_P	2MC - 2MCH l_1	2MC - 2MCH 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

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

UNITEN EN 12756

TYPE 2 - 2H

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	2K - 2KH l_{1K}	2K - 2KH 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

Dimensions in mm.
* 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.

The 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.
Model **2** with hard metal rings code "X3" is suitable for dirty, charged or very viscous liquids. Code "X3" is anticorrosion tungsten carbide brazed with high silver content alloy on AISI 316 stainless steel.

UN 2 LRO2 = UNITEN 2 model with working length "L" as ROTEN 2

UN 2MC = UNITEN 2 model with working length "L" as ROTEN 2MC

UN U2 = UNITEN 2 model with working length "L" as ROTEN 2

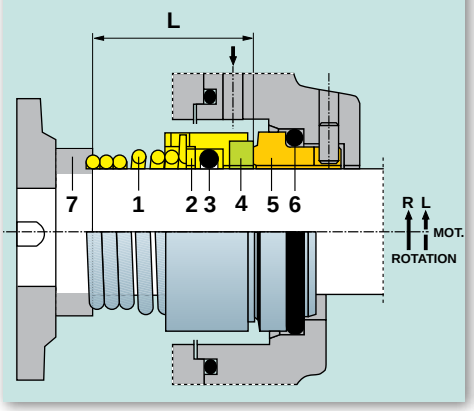
MAX. WORKING CONDITIONS

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

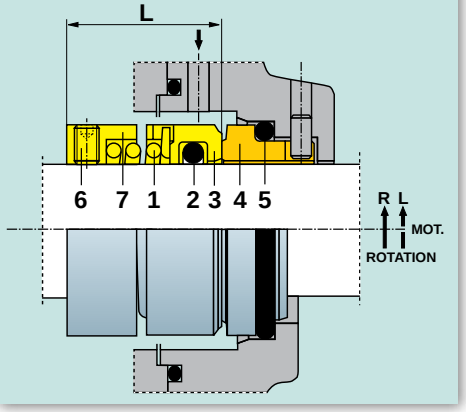
p ≤ 16 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

TYPE 2 - 2H - 2MC - 2MCH - 2K - 2KH				TYPE U2 - U2H				STANDARD MATERIALS
STANDARD		WITH OPEN CAVE (CA)		STANDARD		WITH OPEN CAVE (CA)		
POS.	COMPONENTS	POS.	COMPONENTS	POS.	COMPONENTS	POS.	COMPONENTS	
1	Self-driving spring	1	Self-driving spring	1	Spring	1	Spring	L1 X1
		2	Washer			2	Washer	G1 L1 X1
2	Shaft gasket	3	Shaft gasket	2	Shaft gasket	3	Shaft gasket	B1 E1 F1 N1 P1 W1 Y1
3	Rotary seal ring	4	Rotary seal ring	3	Rotary seal ring	4	Rotary seal ring	D5 D6 G1 J1 L1 X1 X3 X7
4	Stationary seal ring	5	Stationary seal ring	4	Stationary seal ring	5	Stationary seal ring	C4 K1 R1 V1 V2 V3 X3
5	Stationary gasket	6	Stationary gasket	5	Stationary gasket	6	Stationary gasket	B1 C1 E1 F1 N1 P1 W1 Y1
6	Spacer (if required)	7	Spacer (if required)					G1 H1 X1
				6	Grub screws	7	Grub screws	H1 L1 X1
				7	Driving "U" sleeve	8	Driving "U" sleeve	L1 X1

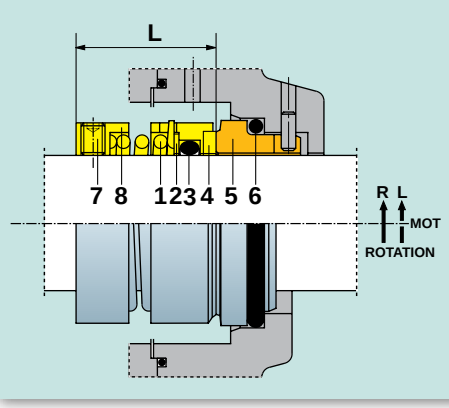
TYPE 2H CA
with open cave and shrunk-in rotary seal ring



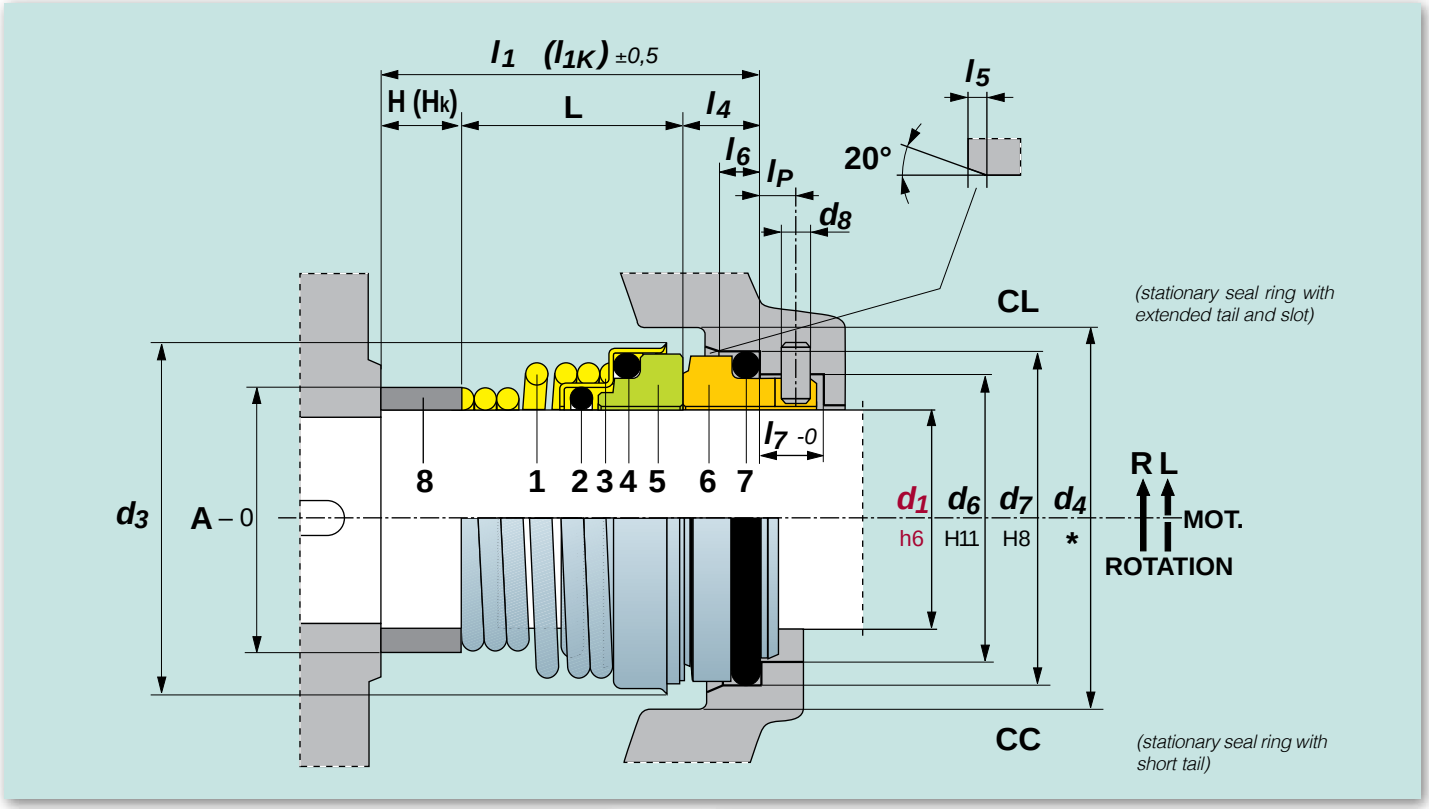
TYPE U2
with driving sleeve



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



TYPE 3



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	16,5	20,6	22	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
13	19	23,1	25	27	28	22	6	2,8	1,2	2	6,7	4
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	21	26,9	26	31	30	23	7	3,7	1,3	2,5	7,6	4
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	25	30,9	33	36	33	25	8	3,7	1,3	3	8,5	4,5
20	25	30,9	33	36	33	25	8	3,7	1,3	3	8,5	4,5
21	30	35,4	36	41	33	25	8	3,7	1,8	3,5	8,5	5
22	30	35,4	36	41	33	25	8	3,7	1,8	3,5	8,5	5
23	30	35,4	38	41	35	27	8	3,7	1,8	3,5	8,5	5
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	38	43,3	46	50	39	30	9	3,7	1,8	4	9,6	6
30	38	43,3	46	50	39	30	9	3,7	1,8	4	9,6	6
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
43	52	60,5	59	65	50,5	39	11,5	5,4	2,1	5	12	7,5
45	57	65,5	61	70	52,5	41	11,5	5,4	2,1	5	13	8,5
48	57	65,5	66	72	52,5	41	11,5	5,4	2,1	5	13	8,5
50	64	72,5	67	75	56,5	45	11,5	5,4	2,1	5	13	8,5

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

UNITEN EN 12756

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	HK
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	—
43	54	61	59	63	60	47	13	6	2	—	51	4	9	5	45	32	—
45	56	63	61	65	60	47	13	6	2	—	53	4	9	5	45	32	—
48	59	66	66	68	60	47	13	6	2	—	56	4	9	5	45	32	—
50	62	70	67	70	60	46	14	6	2,5	—	59	4	9	5	47,5	33,5	—

Dimensions in mm.
+ This size is larger than the minumum prescribed by the EN 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.

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 dirty liquids. 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 50 mm.
Pump manufacturers as well as installers and users appreciate its technical and construction features and its vast field of applications.

MAX. WORKING CONDITIONS

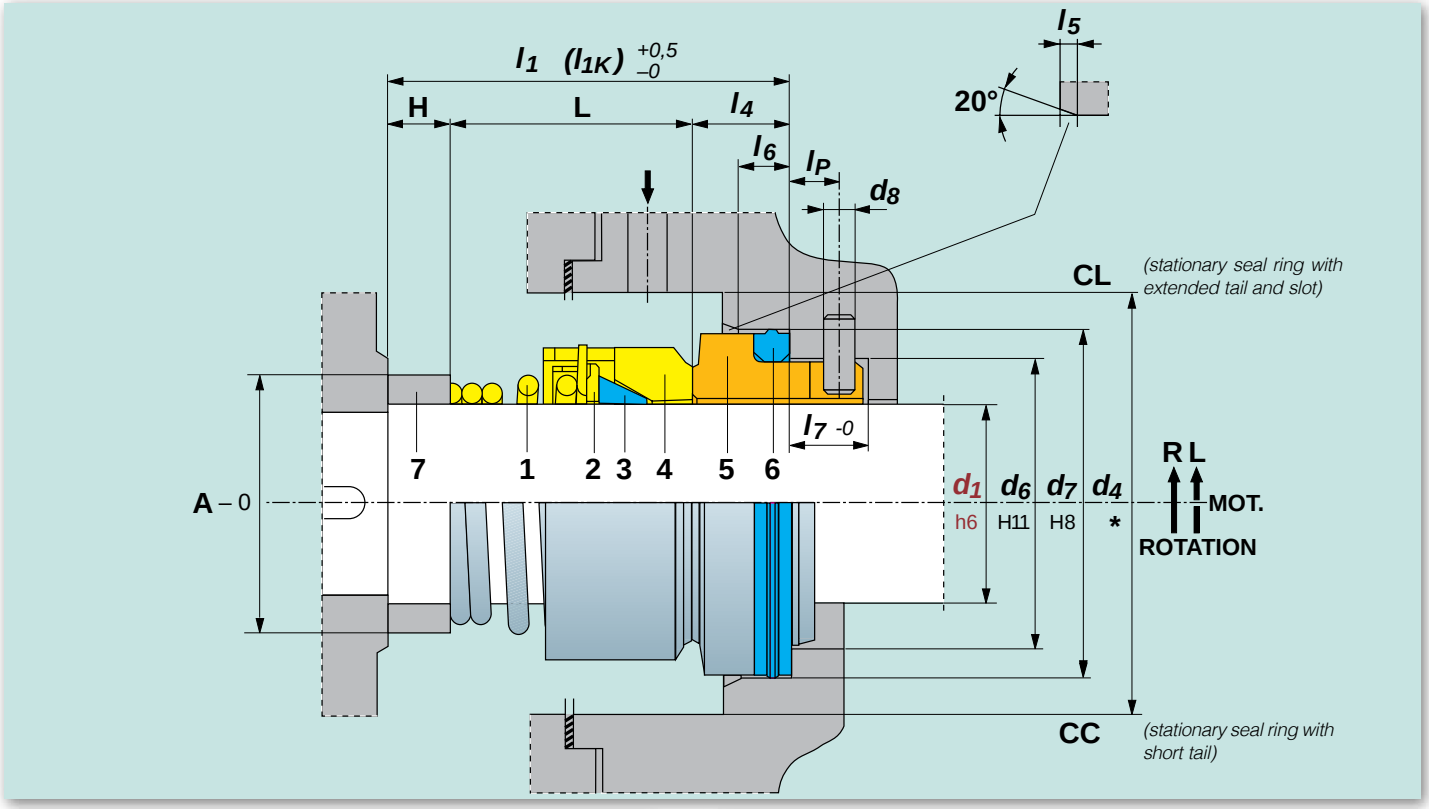
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 16 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

TYPE 3 - 3K		STANDARD MATERIALS						
POS.	COMPONENTS							
1	Self-driving spring	X1						
2	Shaft gasket	B1	E1	N1	P1	W1	Y1	
3	Frame	H1 *	X1					
4	Rotary gasket	B1	E1	N1	P1	W1	Y1	
5	Rotary seal ring	K1	K4	R1	V1	V2	V3	Z1
6	Stationary seal ring	C4	K1	V1	V2	V3	R1	X3
7	Stationary gasket	B1	E1	N1	P1	W1	Y1	
8	Spacer (if required)	G1	H1	X1				

* Available up to Ø25 included

TYPE 4



ROTEN

TYPE **4 - 4H - U4 - U4H**

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

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

UNITEN — EN 12756

TYPE **4 - 4H**

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	4K - 4KH l_{1k}	4K - 4KH 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	—	—

Dimensions in mm.
+ This size is larger than the minumum prescribed by the EN 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.

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.

UN U4 LRO4 = UNITEN 4 model with working length "L" as ROTEN 4

TYPE 4 - 4H - 4K - 4KH		TYPE U4 - U4H		STANDARD MATERIALS								
POS.	COMPONENTS	POS.	COMPONENTS									
1	Self-driving spring	1	Spring	L1	X1							
2	Gasket thrust washer	2	Gasket thrust washer	L1	X1							
3	Wedge shaft gasket (PTFE)	3	Wedge shaft gasket (PTFE)	C1	C4**							
4*	Rotary seal ring	4*	Rotary seal ring	D5	D6	G1	J1	L1	X1	X3	X7	
5	Stationary seal ring	5	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3		
6	Stationary gasket	6	Stationary gasket	B1	C1	C4**	E1	F1	N1	P1	W1	Y1
7	Spacer (if required)			G1	H1	X1						
		7	Grub screws	H1	L1	X1						
		8	Driving "U" sleeve	L1	X1							

*Version 4 AA with open slot on rotatinG

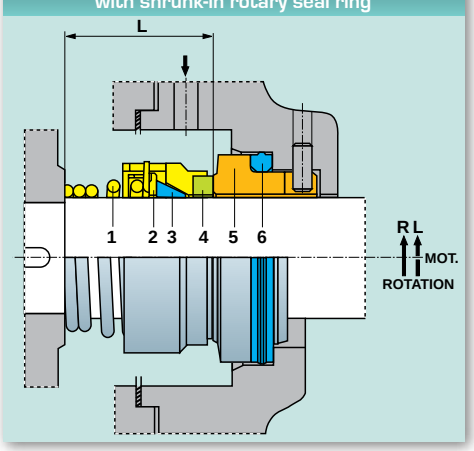
**For particular operating conditions the wedge and stationary gasket may be manufactured in the code C4

MAX. WORKING CONDITIONS

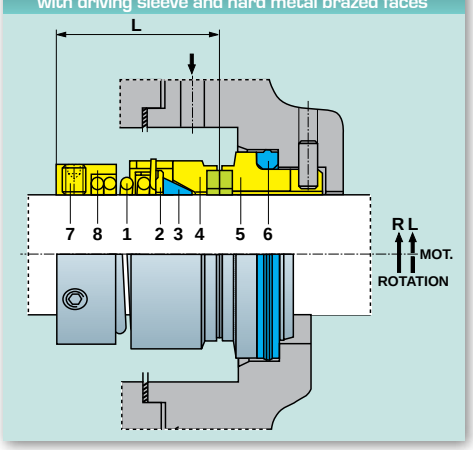
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 12 bar
t = 10 ÷ 180°C
v ≤ 15 m/s

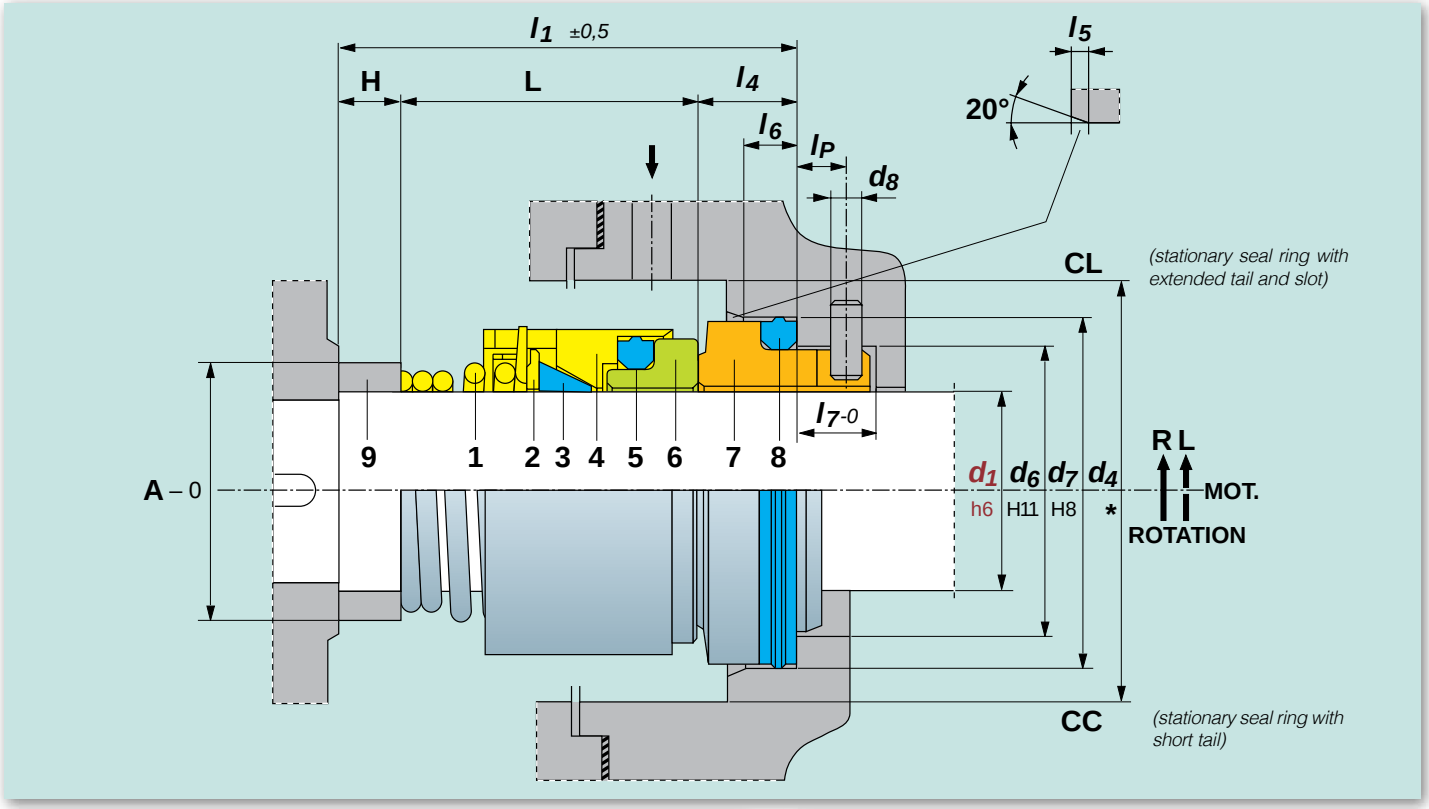
TYPE 4H
with shrunk-in rotary seal ring



TYPE U4
with driving sleeve and hard metal brazed faces



TYPE 45



ROTEN

TYPE **45**

d_1	d_6	d_7	d_4	l_1	L	l_4	l_6	l_5	d_8	l_7	l_P	U45 l_1	U45 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

Dimensions in mm.
NB: The spacer is never to be considered for ROTEN 45.

UNITEN — EN 12756

TYPE **45**

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

Dimensions in mm.
+ This size is larger than the minumum prescribed by the EN 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

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.

UN U45 LR045 = UNITEN 45 model with working length "L" as ROTEN U45

TYPE 45		TYPE U45		STANDARD MATERIALS								
POS.	COMPONENTS	POS.	COMPONENTS									
1	Self-driving spring	1	Spring	L1	X1							
2	Gasket thrust washer	2	Gasket thrust washer	L1	X1							
3	Wedge shaft gasket (PTFE)	3	Wedge shaft gasket (PTFE)	C1	C4**							
4*	Frame	4*	Frame	L1	X1							
5	Rotary gasket	5	Rotary gasket	B1	C1	C4**	E1	F1	N1	P1	W1	Y1
6	Rotary seal ring	6	Rotary seal ring	K1	K4	R1	Z1					
7	Stationary seal ring	7	Stationary seal ring	C4	V1	V2	V3	R1	K1			
8	Stationary gasket	8	Stationary gasket	B1	C1	C4**	E1	F1	N1	P1	W1	Y1
9	Spacer (if required)			G1	H1	X1						
		9	Grub screws	H1	L1	X1						
		10	Driving "U" sleeve	L1	X1							

*Version 45 AA with open slot on frame

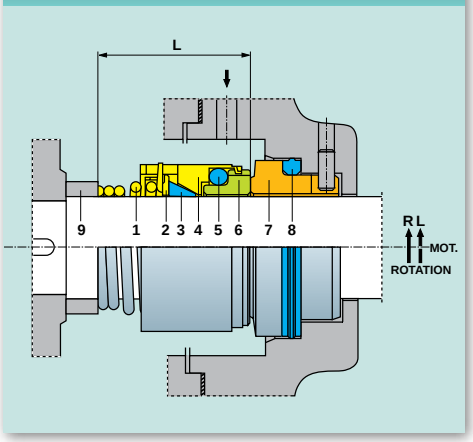
**For particular operating conditions the wedge and stationary gasket may be manufactured in the code C4

MAX. WORKING CONDITIONS

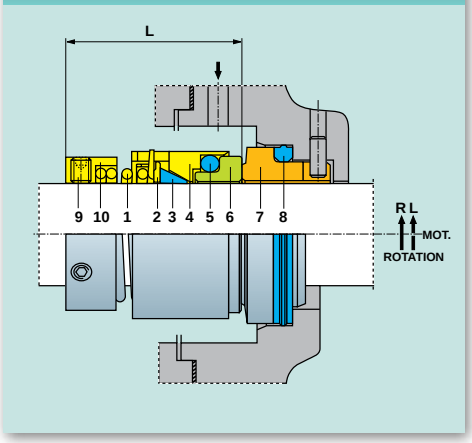
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 16 bar
t = 10 ÷ 200°C
v ≤ 15 m/s

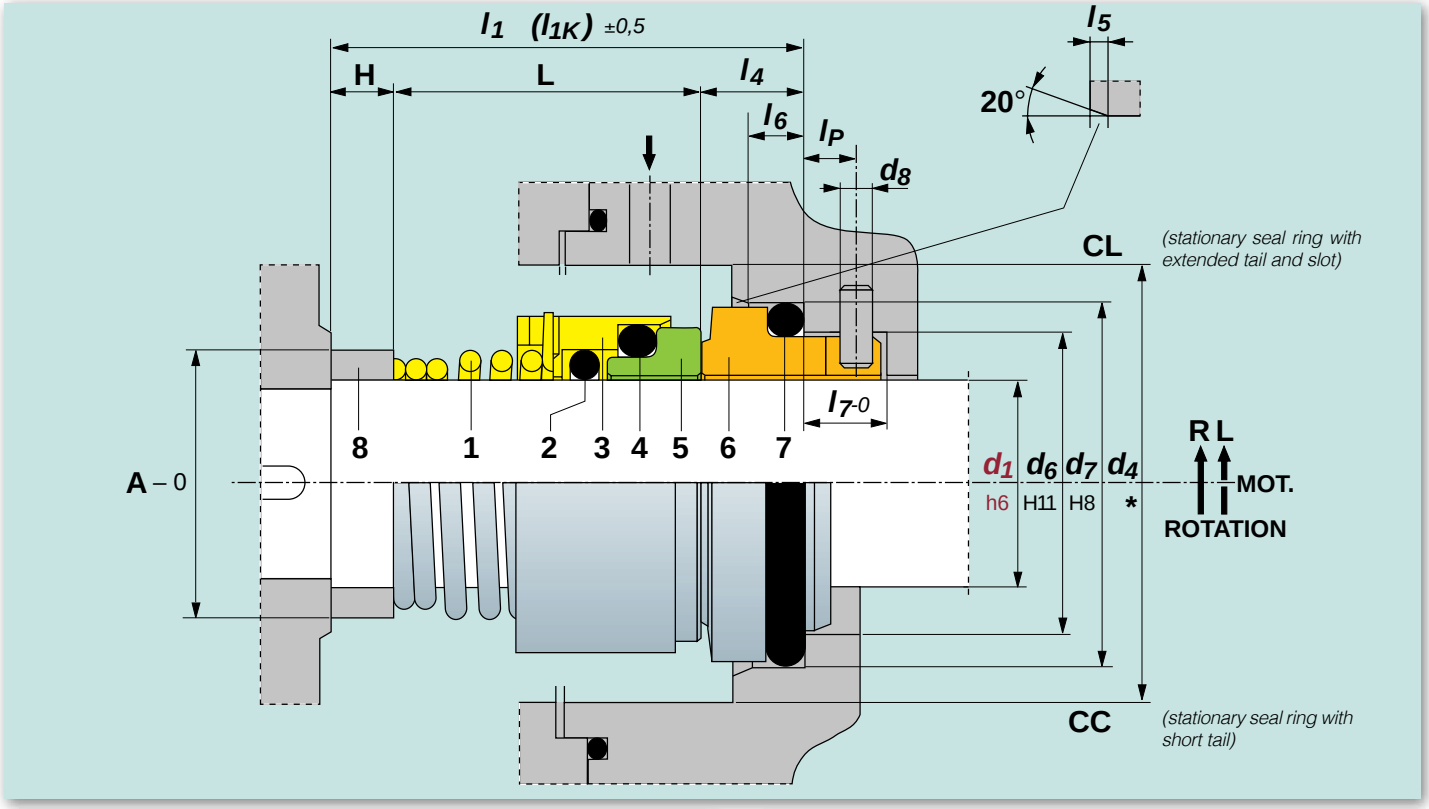
TYPE 45 TR CL
positive drive and stationary seal ring with extended tail and slot.



TYPE U45
with driving sleeve.



TYPE 5



ROTEN

TYPE **5 - 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

Dimensions in mm.
NB: The spacer is never to be considered for ROTEN 5.

UNITEN EN 12756

TYPE **5**

														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

Dimensions in mm.
+This size is larger than the minumum prescribed by the EN 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.

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.

UN 5 LRO2 = UNITEN 5 with working length "L" as ROTEN 2
UN U5 LRO5 = UNITEN 5 model with working length "L" as ROTEN U5

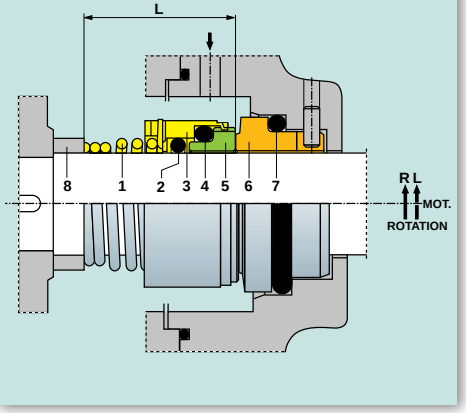
TYPE 5 - 5H2 - 5K		TYPE U5		STANDARD MATERIALS							
POS.	COMPONENTS	POS.	COMPONENTS								
1	Self-driving spring	1	Spring	L1	X1						
2	Shaft gasket	2	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1	
3	Frame	3	Frame	L1	X1						
4	Rotary gasket	4	Rotary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
5	Rotary seal ring	5	Rotary seal ring	K1	K4	R1	Z1				
6	Stationary seal ring	6	Stationary seal ring	C4	K1	R1	V1	V2	V3		
7	Stationary gasket	7	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
8	Spacer (if required)			G1	L1	X1					
		8	Grub screws	H1	L1	X1					
		9	Driving "U" sleeve	L1	X1						

MAX. WORKING CONDITIONS

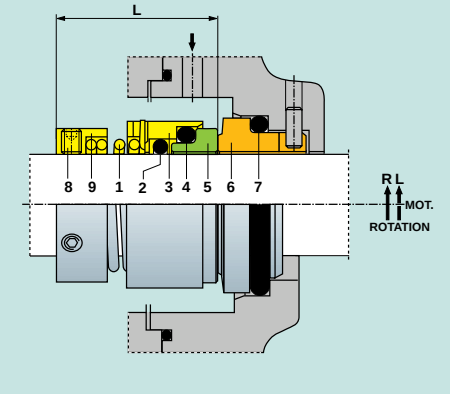
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 16 bar
t = –45 ÷ 200°C
v ≤ 15 m/s

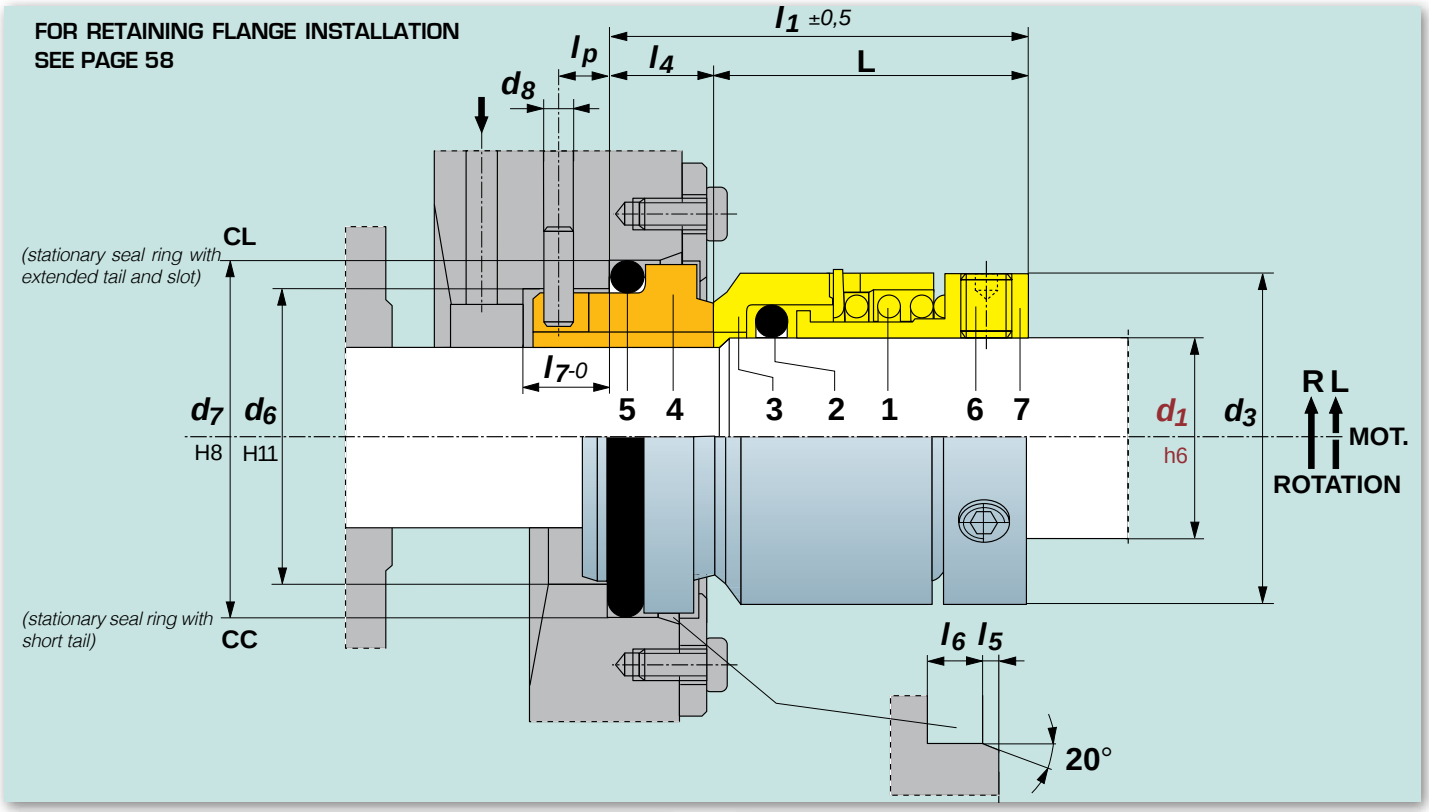
TYPE 5 TR CL
positive drive and stationary seal ring with extended tail and slot.



TYPE U5
with driving sleeve.



TYPE 7



ROTEN

TYPE **7 - 7H - 7R - 7RH**

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

Dimensions in mm.

UNITEN EN 12756

TYPE **7 - 7H - 7R - 7RH**

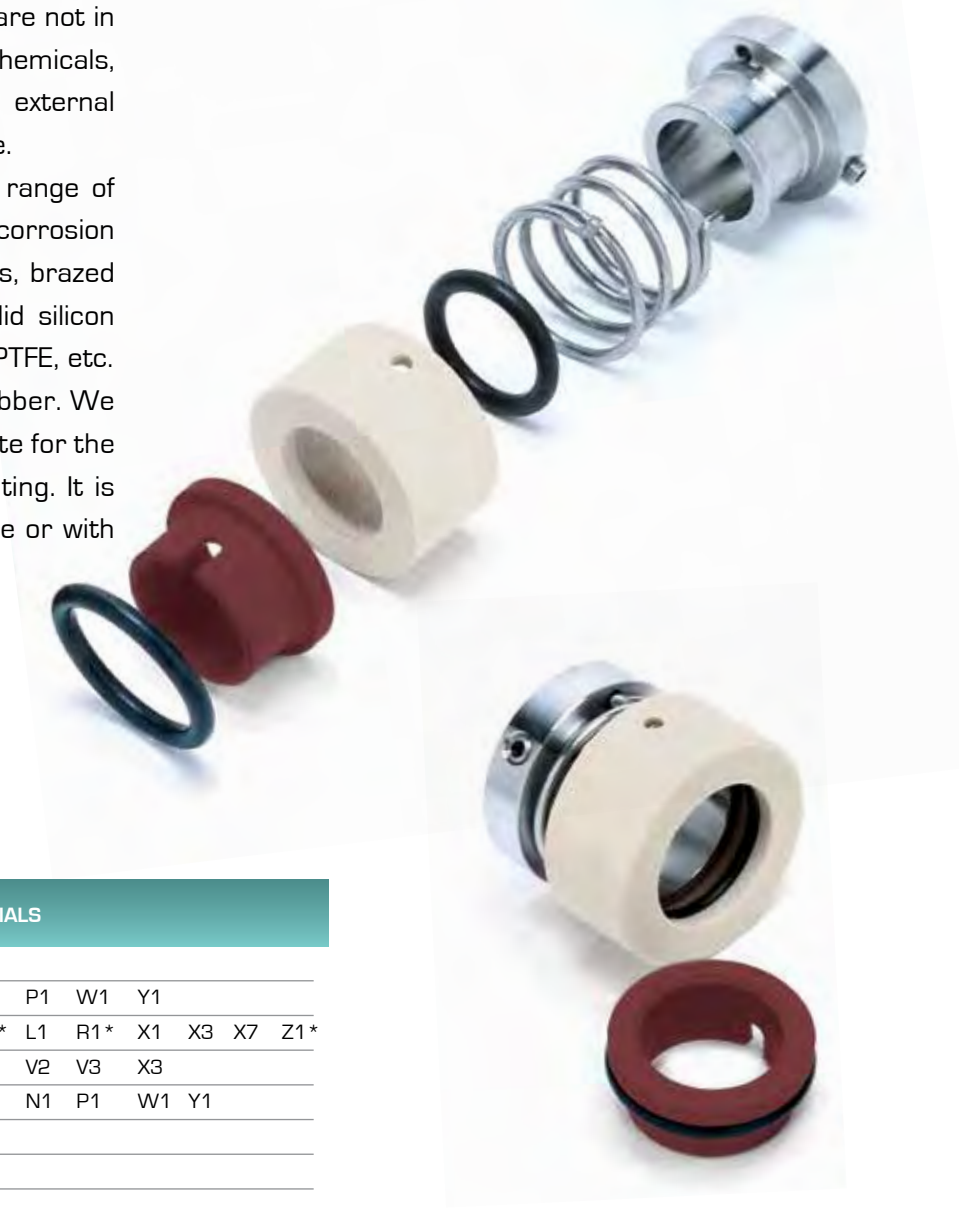
d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_P
10	17	21	22	29	22	7	4	1,5	3	8,5	5
12	19	23	24	31	24	7	4	1,5	3	8,5	5
14	21	25	27	33	26	7	4	1,5	3	8,5	5
16	23	27	31	34	27	7	4	1,5	3	8,5	5
18	27	33	33	38	28	10	5	2	3	9	5
20	29	35	37	41	31	10	5	2	3	9	5
22	31	37	39	41	31	10	5	2	3	9	5
24	33	39	42	44	34	10	5	2	3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

Dimensions in mm.

d_3 = depends on the material of which the rotary ring is built . The indicated value is the maximum for this quote.

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.



TYPE 7 - 7H - 7R - 7RH		STANDARD MATERIALS									
POS.	COMPONENTS										
1	Self-driving spring	X1									
2	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1			
3	Rotary seal ring	D5	D6	J1	K1 *	L1	R1 *	X1	X3	X7	Z1 *
4	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3			
5	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1		
6	Grub screws	H1	L1	X1							
7	Driving sleeve	X1	L1								

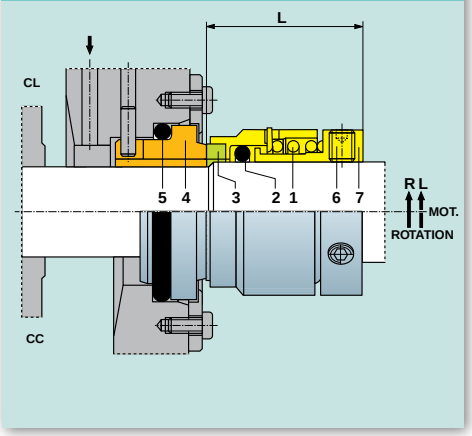
*Materials available only for type 7

MAX. WORKING CONDITIONS

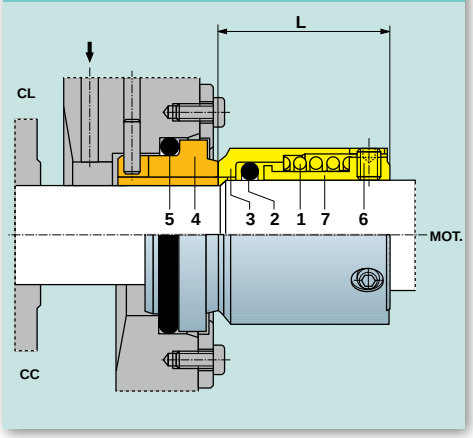
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 12 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

TYPE 7H
with shrunk-in faces

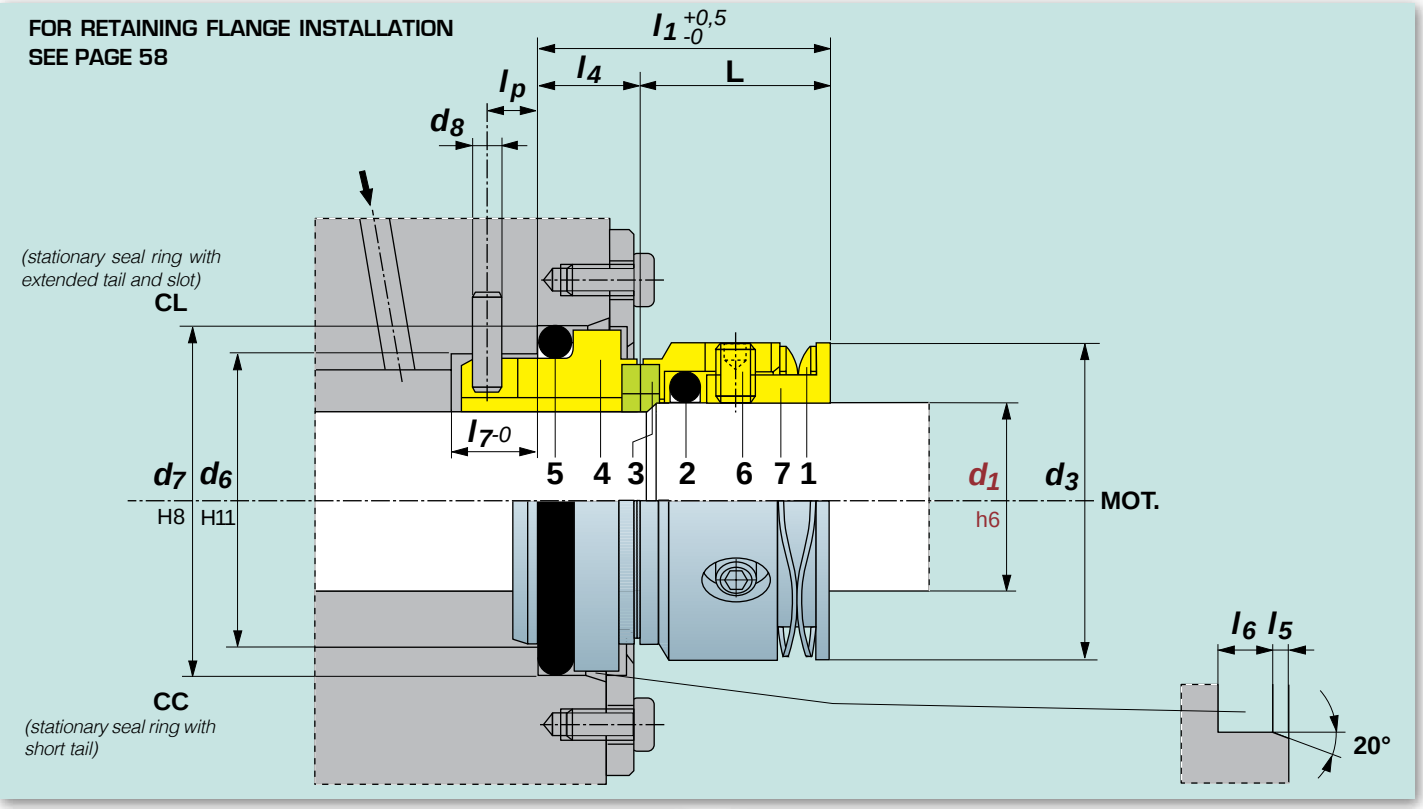


TYPE 7R
Bidirectional



TYPE 7K

FOR RETAINING FLANGE INSTALLATION
SEE PAGE 58



ROTEN

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
10	14	18,1	21	23,5	18	5,5	2,8	1,2	2	6,2	3,5
11÷12	16,5	20,6	23	23,5	18	5,5	2,8	1,2	2	6,2	3,5
13	19	23,1	25	24	18	6	2,8	1,2	2	6,7	4
14	19	23,1	25	24	18	6	2,8	1,2	2	6,7	4
15	21	26,9	26	26,1	19,1	7	3,7	1,3	2,5	7,6	4
16÷17	21	26,9	29	26,1	19,1	7	3,7	1,3	2,5	7,6	4
18	25	30,9	29	27,1	19,1	8	3,7	1,3	3	8,5	4,5
19	25	30,9	32	27,1	19,1	8	3,7	1,3	3	8,5	4,5
20	25	30,9	32	27,1	19,1	8	3,7	1,3	3	8,5	4,5
21÷22	30	35,4	35	27,1	19,1	8	3,7	1,8	3,5	8,5	5
23	30	35,4	37	27,1	19,1	8	3,7	1,8	3,5	8,5	5
24	30	35,4	37	27,1	19,1	8	3,7	1,8	3,5	8,5	5
25÷27	33	38,2	41	27,6	19,1	8,5	3,7	1,8	4	9,1	5
28	38	43,3	41	28,1	19,1	9	3,7	1,8	4	9,6	6
29÷32	38	43,3	47	28,1	19,1	9	3,7	1,8	4	9,6	6
33	45	53,5	48	30,6	19,1	11,5	5,4	2,1	5	12	7,5
35	45	53,5	49	30,6	19,1	11,5	5,4	2,1	5	12	7,5
38	52	60,5	53	32,6	21,1	11,5	5,4	2,1	5	12	7,5
40	52	60,5	55	32,6	21,1	11,5	5,4	2,1	5	12	7,5
43	52	60,5	60	32,6	21,1	11,5	5,4	2,1	5	12	7,5
44	57	65,5	60	32,6	21,1	11,5	5,4	2,1	5	13	8,5
45	57	65,5	60	32,6	21,1	11,5	5,4	2,1	5	13	8,5
48	57	65,5	65	32,6	21,1	11,5	5,4	2,1	5	13	8,5
50	64	72,5	65	32,6	21,1	11,5	5,4	2,1	5	13	8,5
55	64	72,5	74	33,6	22,1	11,5	5,4	2,1	5	13	8,5
60	72	79,3	79	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	87	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	93	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	98	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	104	37,3	25,8	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	108	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	113	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	118	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	123	39,3	25,8	13,5	5,4	2,6	5	13,5	8,5

Dimensions in mm.

UNITEN EN 12756

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
10	17	21	21	25	18	7	4	1,5	3	8,5	5
12	19	23	23	25	18	7	4	1,5	3	8,5	5
14	21	25	25	25	18	7	4	1,5	3	8,5	5
16	23	27	26	26,1	19,1	7	4	1,5	3	8,5	5
18	27	33	29	29,1	19,1	10	5	2	3	9	5
20	29	35	32	29,1	19,1	10	5	2	3	9	5
22	31	37	35	29,1	19,1	10	5	2	3	9	5
24	33	39	37	29,1	19,1	10	5	2	3	9	5
25	34	40	37	29,1	19,1	10	5	2	3	9	5
28	37	43	41	29,1	19,1	10	5	2	3	9	5
30	39	45	43	29,1	19,1	10	5	2	3	9	5
32	42	48	47	29,1	19,1	10	5	2	3	9	5
33	42	48	48	29,1	19,1	10	5	2	3	9	5
35	44	50	49	29,1	19,1	10	5	2	3	9	5
38	49	56	53	34,1	21,1	13	6	2	4	9	5
40	51	58	55	34,1	21,1	13	6	2	4	9	5
43	54	61	60	34,1	21,1	13	6	2	4	9	5
45	56	63	60	34,1	21,1	13	6	2	4	9	5
48	59	66	65	34,1	21,1	13	6	2	4	9	5
50	62	70	65	35,1	21,1	14	6	2,5	4	9	5
53	65	73	74	36,1	22,1	14	6	2,5	4	9	5
55	67	75	74	36,1	22,1	14	6	2,5	4	9	5
58	70	78	79	39,8	25,8	14	6	2,5	4	9	5
60	72	80	79	39,8	25,8	14	6	2,5	4	9	5
63	75	83	87	39,8	25,8	14	6	2,5	4	9	5
65	77	85	87	39,8	25,8	14	6	2,5	4	9	5
68	81	90	93	41,8	25,8	16	7	2,5	4	9	5
70	83	92	93	41,8	25,8	16	7	2,5	4	9	5
75	88	97	98	41,8	25,8	16	7	2,5	4	9	5
80	95	105	104	43,8	25,8	18	7	3	4	9	5
85	100	110	108	43,8	25,8	18	7	3	4	9	5
90	105	115	113	43,8	25,8	18	7	3	4	9	5
95	110	120	118	43,8	25,8	18	7	3	4	9	5
100	115	125	123	43,8	25,8	18	7	3	4	9	5

Dimensions in mm.

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, hard metals, and 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.

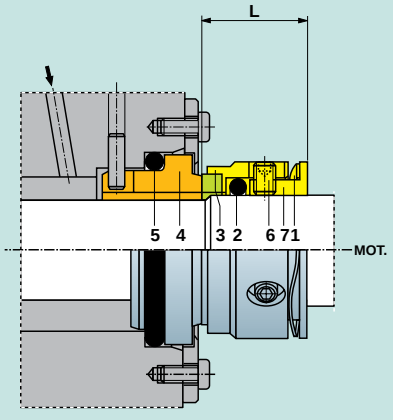
MAX. WORKING CONDITIONS

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

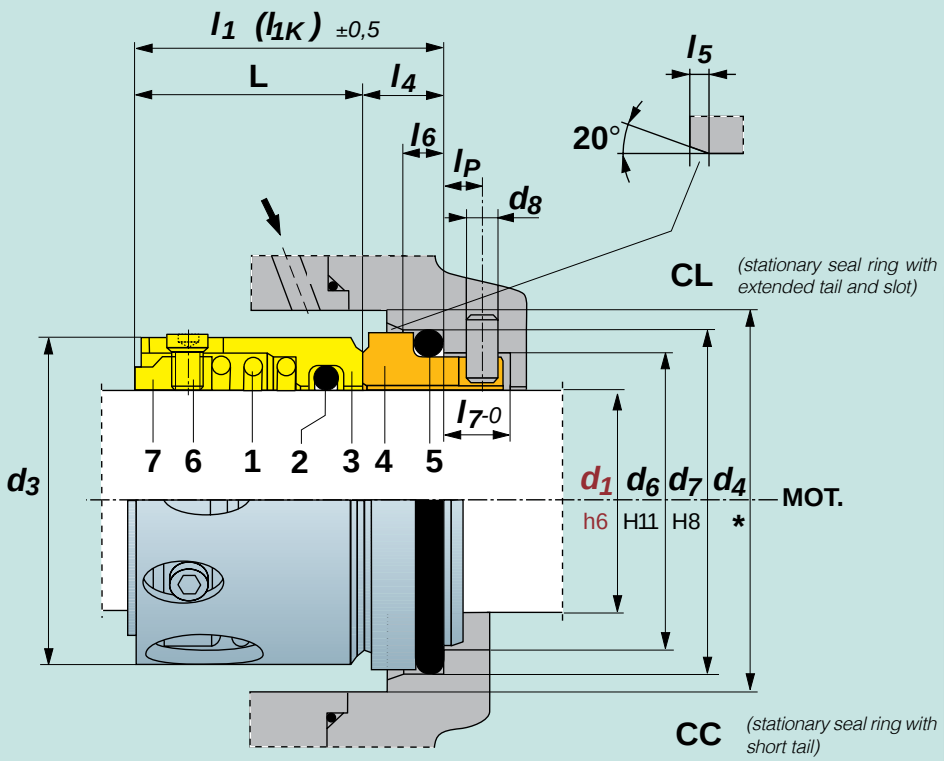
p ≤ 12 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

TYPE 7K - 7KH		STANDARD MATERIALS							
POS.	COMPONENTS								
1	Spring	X1							
2	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1	
3	Rotary seal ring	D5	D6	J1	L1	X1	X3	X7	
4	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3	
5	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
6	Grub screws	H1	L1	X1					
7	Driving sleeve	L1	X1						

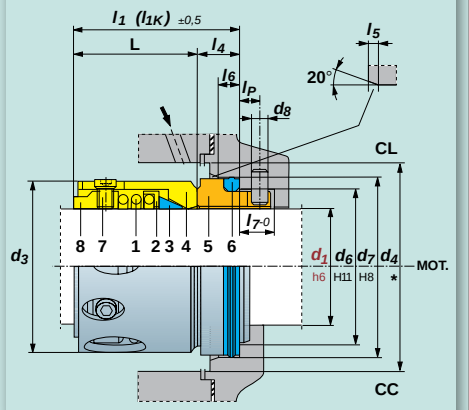
TYPE 7KH
with shrunk-in seal ring



TYPE 82-84



TYPE 84



ROTEN

TYPE **82 - 82H - 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
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

Dimensions in mm.

UNITEN EN 12756

TYPE **82 - 82H - 84 - 84H**

82K - 82KH 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
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

Dimensions in mm.

TYPE 82-84

The TYPE **82** and TYPE **84** are BIDIRECTIONAL mechanical seals and are therefore unaffected by the direction of shaft rotation.
The drive is positively made by screws, 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 TYPE **2** for TYPE **82** and of TYPE **4** for TYPE **84**. These seals have a limited axial length and compact shape for fitting well into reduced spaces.

TYPE 82 - 82H - 82K - 82KH				TYPE 84 - 84H - 84K - 84KH		STANDARD MATERIALS
STANDARD		WITH OPEN CAVE (CA)				
POS.	COMPONENTS	POS.	COMPONENTS	POS.	COMPONENTS	
1	Spring	1	Spring	1	Spring	L1 X1
		2	Washer			G1 L1 X1
				2	Gasket thrust washer	L1 X1
2	Shaft gasket	3	Shaft gasket			B1 E1 F1 N1 P1 W1 Y1
				3	Wedge shaft gasket	C1 C4*
3	Rotary seal ring	3	Rotary seal ring	4	Rotary seal ring	D5 D6 J1 L1 X1 X3 X7
4	Stationary seal ring	5	Stationary seal ring	5	Stationary seal ring	C4 K1 R1 V1 V2 V3 X3
5	Stationary gasket	6	Stationary gasket	6	Stationary gasket	B1 C1 C4* E1 F1 N1 P1 W1 Y1
6	Grub screws	7	Grub screws	7	Grub screws	H1 L1 X1
7	Drive ring	7	Drive ring	8	Drive ring	L1 X1

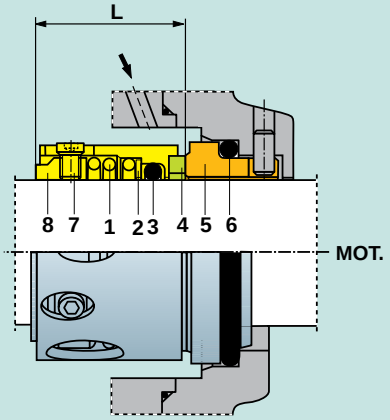
*For particular operating conditions the wedge and stationary gasket may be manufactured in the code C4

MAX. WORKING CONDITIONS

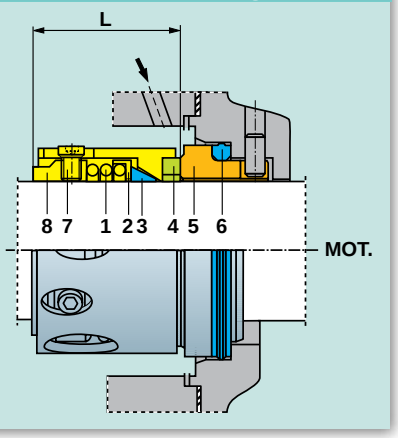
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 12 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

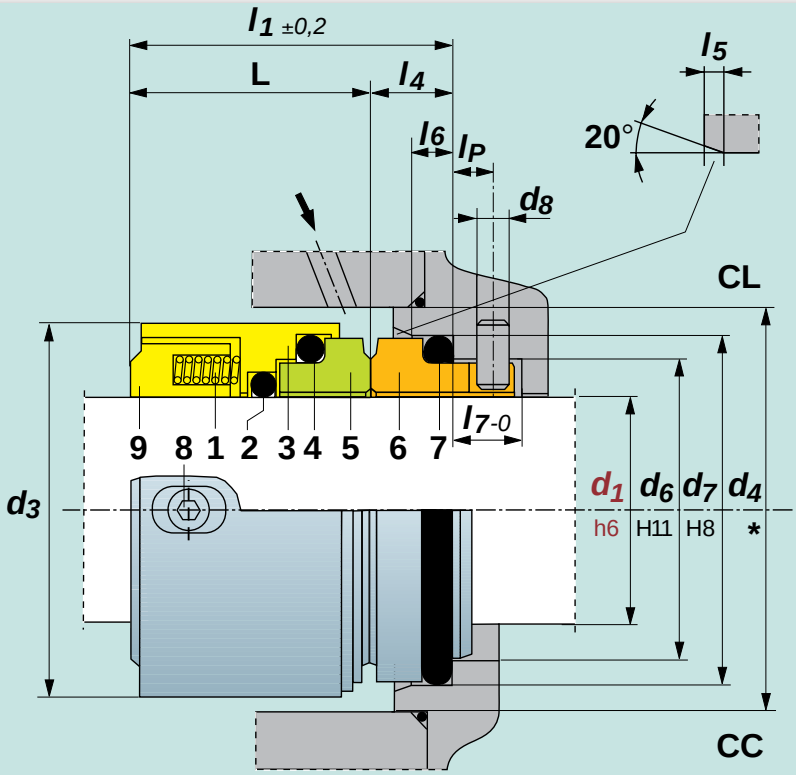
TYPE 82H CA
with open cave and shrunk-in rotary seal ring



TYPE 84H
with shrunk-in seal ring



TYPE 85



ROTEN

TYPE 85 — 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

Dimensions in mm.

UNITEN — EN 12756

TYPE 85 — 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

Dimensions in mm.
+This size is larger than the minumum prescribed by the EN 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 85

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**.

UN 85M = UNITEN 85 model with working length "L" as ROTEN 85M
RO 85N = ROTEN 85 model with working length "L" as UNITEN 85N

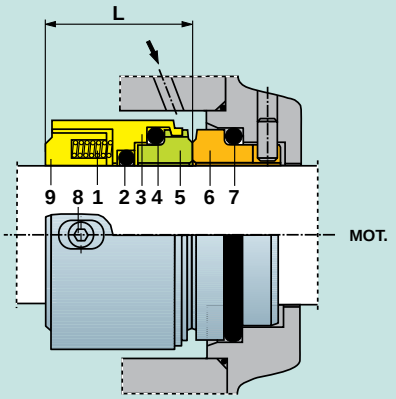
MAX. WORKING CONDITIONS

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

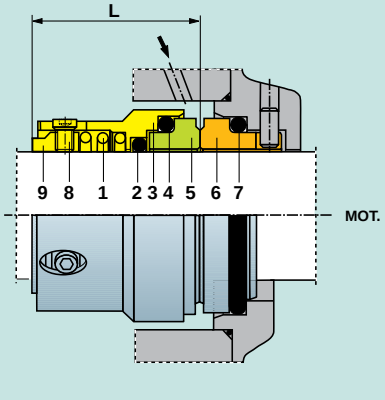
p ≤ 16 bar
t = –45 ÷ 200°C
v ≤ 15 m/s

TYPE 85 - 85M - 85N		STANDARD MATERIALS							
POS.	COMPONENTS								
1	Spring	L1	X1						
2	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1	
3	Frame	L1	X1						
4	Rotary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
5	Rotary seal ring	K1	K4	R1	V1	V2	V3	Z1	
6	Stationary seal ring	C4	K1	R1	V1	V2	V3		
7	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
8	Grub screws	H1	L1	X1					
9	Drive ring	L1	X1						

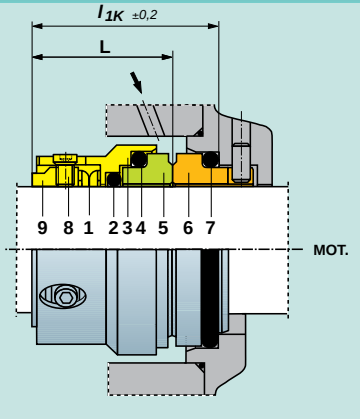
TYPE 85 TR CL
with positive drive rotary ring and stationary ring with extended tail and slot.



TYPE 85M
with cylindrical spring

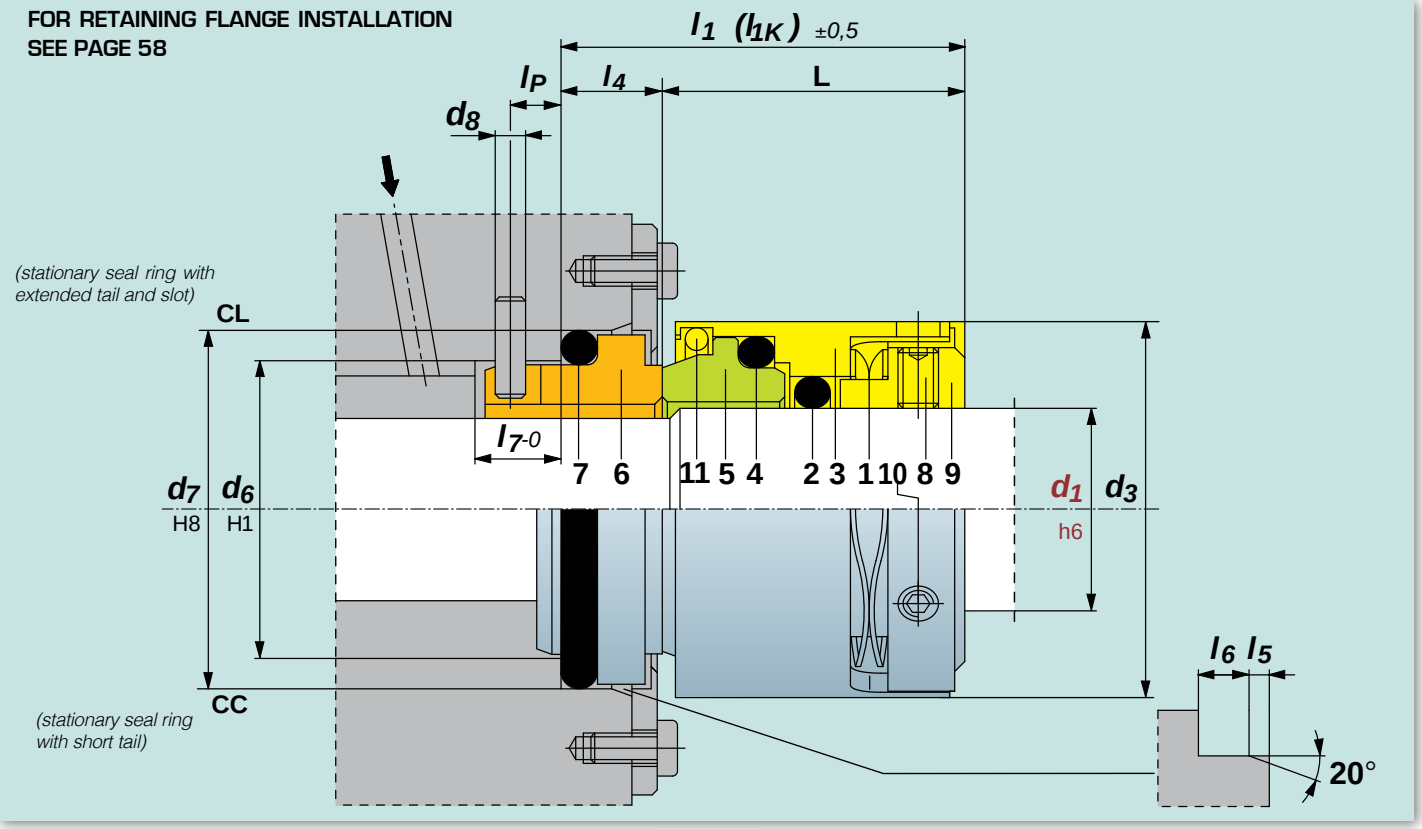


TYPE 85N
with sinusoidal wave spring



TYPE 875DT

FOR RETAINING FLANGE INSTALLATION
SEE PAGE 58



ROTEN

TYPE **875DT**

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_P
20	25	30,9	35	35,5	27,5	8	3,7	1,3	3	8,5	4,5
22	30	35,4	37	35,5	27.5	8	3,7	1,8	3,5	8,5	5
24	30	35,4	39	38	30	8	3,7	1,8	3,5	8,5	5
25	33	38,2	40	38,5	30	8,5	3,7	1,8	4	9,1	5
28	38	43,3	43	41,5	32,5	9	3,7	1,8	4	9,6	6
30	38	43,3	45	41,5	32,5	9	3,7	1,8	4	9,6	6
32	38	43,3	47	41,5	32,5	9	3,7	1,8	4	9,6	6
33	45	53,5	48	44	32,5	11,5	5,4	2,1	5	12	7,5
35	45	53,5	50	44	32,5	11,5	5,4	2,1	5	12	7,5
38	52	60,5	57	43,5	32	11,5	5,4	2,1	5	12	7,5
40	52	60,5	59	43,5	32	11,5	5,4	2,1	5	12	7,5
43	52	60,5	62	43,5	32	11,5	5,4	2,1	5	12	7,5
45	57	65,5	64	43,5	32	11,5	5,4	2,1	5	13	8,5
48	57	65,5	67	43,5	32	11,5	5,4	2,1	5	13	8,5
50	64	72,5	69	45	33,5	11,5	5,4	2,1	5	13	8,5
55	64	72,5	74	45	33,5	11,5	5,4	2,1	5	13	8,5
60	72	79,3	84	50	38,5	11,5	5,4	2,1	5	13,5	8,5
65	77	84,5	89	50	38,5	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	94	55,5	44	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	103	55,5	44	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	108	53,5	42	11,5	5,4	2,1	5	13,5	8,5

Dimensions in mm.

UNITEN EN 12756

TYPE **875DT**

d_1	d_6	d_7	d_3	l_{1k}	L	l_4	l_6	l_5	d_8	l_7	l_P
20	29	35	35	37,5	27,5	10	5	2	3	9	5
22	31	37	37	37,5	27.5	10	5	2	3	9	5
24	33	39	39	40	30	10	5	2	3	9	5
25	34	40	40	40	30	10	5	2	3	9	5
28	37	43	43	42,5	32,5	10	5	2	3	9	5
30	39	45	45	42,5	32,5	10	5	2	3	9	5
32	42	48	47	42,5	32,5	10	5	2	3	9	5
33	42	48	48	42,5	32,5	10	5	2	3	9	5
35	44	50	50	42,5	32,5	10	5	2	3	9	5
38	49	56	57	45	32	13	6	2	4	9	5
40	51	58	59	45	32	13	6	2	4	9	5
43	54	61	62	45	32	13	6	2	4	9	5
45	56	63	64	45	32	13	6	2	4	9	5
48	59	66	67	45	32	13	6	2	4	9	5
50	62	70	69	47,5	33,5	14	6	2,5	4	9	5
53	65	73	72	47,5	33,5	14	6	2,5	4	9	5
55	67	75	74	47,5	33,5	14	6	2,5	4	9	5
58	70	78	82	52,5	38,5	14	6	2,5	4	9	5
60	72	80	84	52,5	38,5	14	6	2,5	4	9	5
63	75	83	87	52,5	38,5	14	6	2,5	4	9	5
65	77	85	89	52,5	38,5	14	6	2,5	4	9	5
68	81	90	92	52,5	36,5	16	7	2,5	4	9	5
70	83	92	94	60	44	16	7	2,5	4	9	5
75	88	97	103	60	44	16	7	2,5	4	9	5
80	95	105	108	60	42	18	7	3	4	9	5

Dimensions in mm.

TYPE 875DT

This model combine the characteristics of the TYPE **85** and the TYPE **7K**. It has massive, interchangeable faces, it is bi-directional and with mechanical drive. It is very compact and can be mounted outside and inside of the media. His compact fitting dimensions are according to EN 12 756 "K" version.
The rotating ring is positive drive by a frame tooth.

MAX. WORKING CONDITIONS

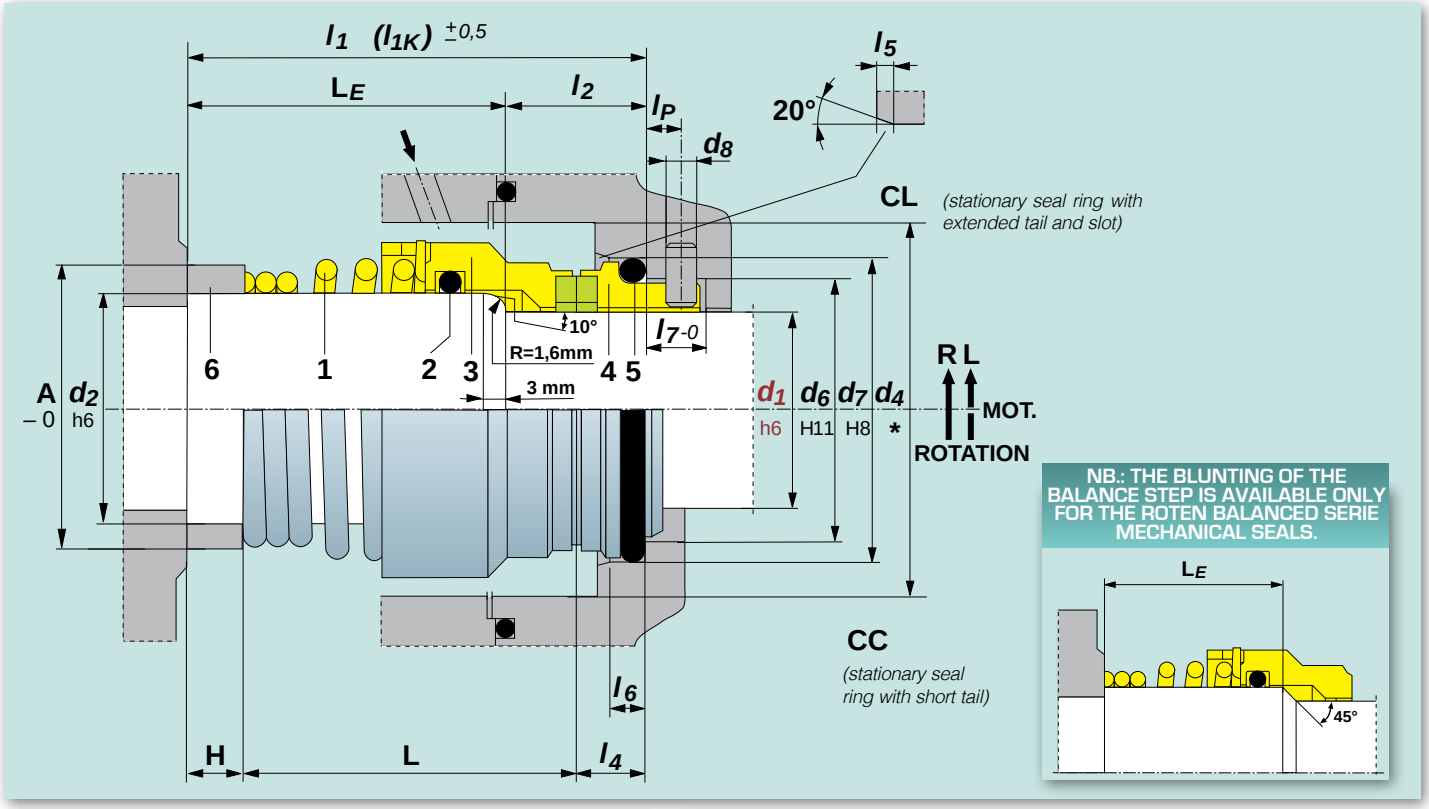
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 16 bar
t = –45 ÷ 200°C
v ≤ 15 m/s

TYPE 875DT		STANDARD MATERIALS							
POS.	COMPONENTS								
1	Spring	L1	X1						
2	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1	
3	Frame	L1	X1						
4	Rotary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
5	Rotary seal ring	K1	K4	R1	Z1				
6	Stationary seal ring	C4	K1	R1	V1	V2	V3		
7	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
8*	Retaining screws	L1	H1	X1					
9	Drive sleeve	L1	X1						
10	Grub screws	H1	L1	X1					
11	Retainer ring	L1	X1						

*These screws, when the seal is placed on the shaft, must be fixed to free the axial movement.

TYPE E



ROTEN

TYPE **E - EH - E4 - E4H - 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

Dimensions in mm.
NB: The spacer is never to be considered for ROTEN.

UNITEN EN 12756

TYPE **E - EH - E4 - E4H - E5**

EK - EKH - E4K E4KH - 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	l_E
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

Dimensions in mm.
+This size is larger than the minumum prescribed by the EN 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.

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 TECHNICAL DEPARTMENT FOR ALL APPLICATIONS INVOLVING BALANCED SEALS.

MAX. WORKING CONDITIONS

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

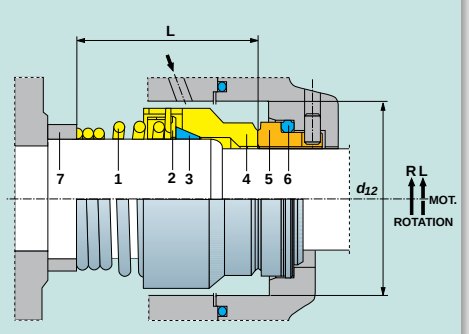
p ≤ 40 bar
t = –35 ÷ 180°C
v ≤ 10 m/s

TYPE E - EH - EK - EKH				TYPE E4 - E4HE4K - E4KH		TYPE E5 - E5K		STANDARD MATERIALS
STANDARD		WITH OPEN CAVE (CA)						
POS.	COMPONENTS	POS.	COMPONENTS	POS.	COMPONENTS	POS.	COMPONENTS	
1	Self-driving spring	1	Self-driving spring	1	Self-driving spring	1	Self-driving spring	L1 X1
		2	Washer					G1 L1 X1
				2	Gasket thrust washer			G1 L1 X1
2	Shaft gasket	3	Shaft gasket			2	Shaft gasket	B1 E1 F1 N1 P1 W1 Y1
				3	Wedge shaft gasket			C1 C4**
						3	Frame	L1 X1
						4	Rotary gasket	B1 C1 C4** E1 F1 N1 P1 W1 Y1
3	Rotary seal ring	4	Rotary seal ring	4*	Rotary seal ring			D5 D6 G1 J1 L1 X1 X3 X7
						5	Rotary seal ring	C4 K1 R1 V1 V2 V3 Z1
4	Stationary seal ring	5	Stationary seal ring	5	Stationary seal ring	6	Stationary seal ring	C4 K1 R1 V1 V2 V3 X3
5	Stationary gasket	6	Stationary gasket	6	Stationary gasket	7	Stationary gasket	B1 C1 C4** E1 F1 N1 P1 W1 Y1
6	Spacer (if required)	7	Spacer (if required)	7	Spacer (if required)	8	Spacer (if required)	G1 H1 X1

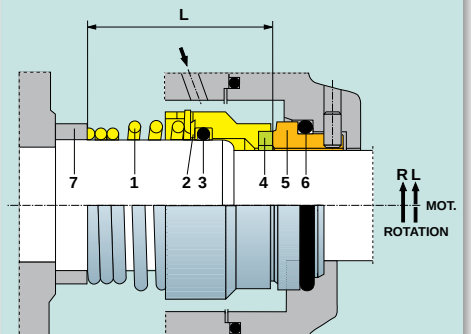
*Version E4 AA with open slot on rotating

**For particular operating conditions the wedge and stationary gasket may be manufactured in the code C4

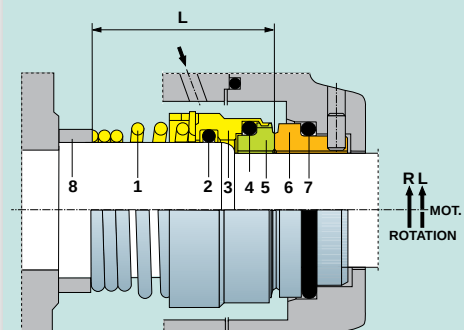
TYPE E4
with PTFE gaskets



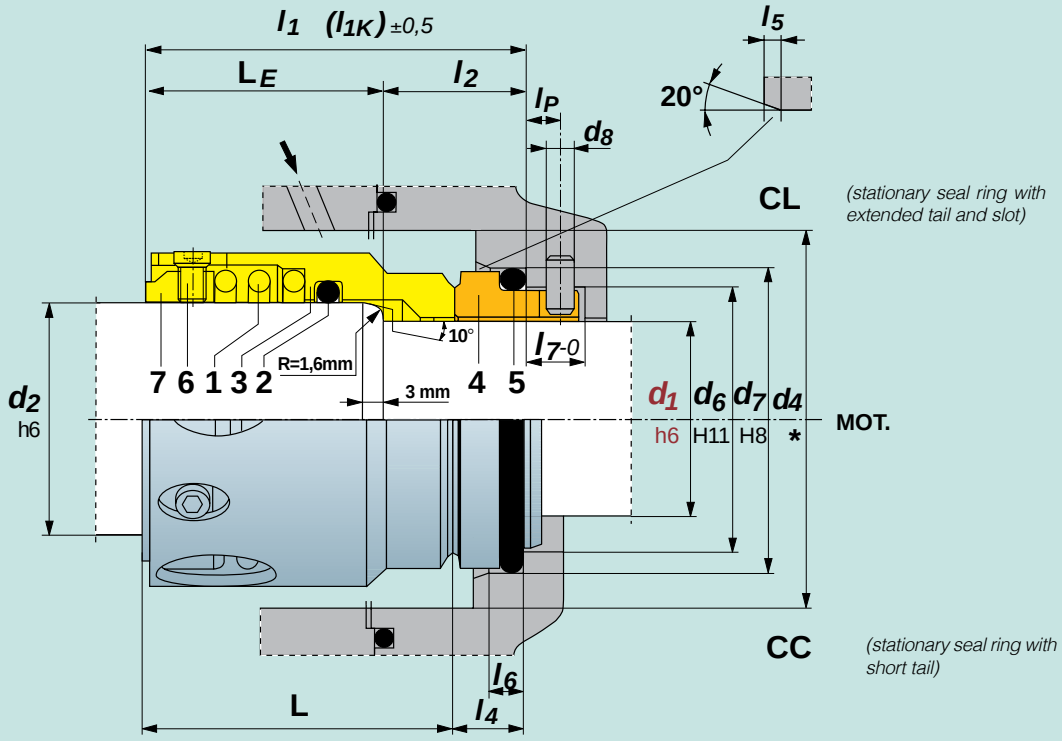
TYPE EH CA
with open cave and shrunk-in rotary seal ring



TYPE E5 TR CL
with driven rotary ring and stationary ring with extended tail and slot



TYPE 8E



ROTEN

TYPE **8E - 8EH**

d_1	d_2	d_6	d_7	d_4	l_1	l_2	L	L_E	l_4	l_6	l_5	d_8	l_7	l_P
10	14	14	18,1	26	38,5	16,5	33	22	5,5	2,8	1,2	2	6,2	3,5
12	16	16,5	20,6	28	38,5	16,5	33	22	5,5	2,8	1,2	2	6,2	3,5
14	18	19	23,1	34	41,5	17	35,5	24,5	6	2,8	1,2	2	6,7	4
16	20	21	26,9	36	42,5	18	35,5	24,5	7	3,7	1,3	2,5	7,6	4
18	22	25	30,9	38	43	18	35	25	8	3,7	1,3	3	8,5	4,5
20	24	25	30,9	40	43	18	35	25	8	3,7	1,3	3	8,5	4,5
22	26	30	35,4	42	43	18	35	25	8	3,7	1,8	3,5	8,5	5
24	28	30	35,4	44	45,5	18	37,5	27,5	8	3,7	1,8	3,5	8,5	5
25	30	33	38,2	46	46	18,5	37,5	27,5	8,5	3,7	1,8	4	9,1	5
28	33	38	43,3	49	49	19	40	30	9	3,7	1,8	4	9,6	6
30	35	38	43,3	51	49	19	40	30	9	3,7	1,8	4	9,6	6
32	38	38	43,3	58	49	19	40	30	9	3,7	1,8	4	9,6	6
33	38	45	53,5	58	51,5	21,5	40	30	11,5	5,4	2,1	5	12	7,5
35	40	45	53,5	60	51,5	21,5	40	30	11,5	5,4	2,1	5	12	7,5
38	43	52	60,5	63	51	21,5	39,5	29,5	11,5	5,4	2,1	5	12	7,5
40	45	52	60,5	65	51	21,5	39,5	29,5	11,5	5,4	2,1	5	12	7,5
43	48	52	60,5	68	51	21,5	39,5	29,5	11,5	5,4	2,1	5	12	7,5
45	50	57	65,5	70	51	21,5	39,5	29,5	11,5	5,4	2,1	5	13	8,5
48	53	57	65,5	73	51	21,5	39,5	29,5	11,5	5,4	2,1	5	13	8,5
50	55	64	72,5	75	55	22,5	43,5	32,5	11,5	5,4	2,1	5	13	8,5
55	60	64	72,5	85	55	22,5	43,5	32,5	11,5	5,4	2,1	5	13	8,5
60	65	72	79,3	90	60	22,5	48,5	37,5	11,5	5,4	2,1	5	13,5	8,5
65	70	77	84,5	95	60	22,5	48,5	37,5	11,5	5,4	2,1	5	13,5	8,5
70	75	82	89,5	104	65,5	23,5	54	42	11,5	5,4	2,1	5	13,5	8,5
75	80	87	94,5	109	65,5	23,5	54	42	11,5	5,4	2,1	5	13,5	8,5
80	85	92	99,5	114	63,5	21,5	52	42	11,5	5,4	2,1	5	13,5	8,5
85	90	98	105,5	119	70,5	23,5	57	47	13,5	5,4	2,6	5	13,5	8,5
90	95	105	111,5	124	70,5	23,5	57	47	13,5	5,4	2,6	5	13,5	8,5
95	100	110	116,5	129	70,5	23,5	57	47	13,5	5,4	2,6	5	13,5	8,5
100	105	114	119,5	134	70,5	23,5	57	47	13,5	5,4	2,6	5	13,5	8,5

Dimensions in mm.

UNITEN EN 12756

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

Dimensions in mm.

* 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.

The type TYPE **8E** is a compact, balanced, bi-directional seal with mechanical drive of the rotating part by driving screw.
The wide range of materials that we can supply for the components, makes this model very versatile and suitable for many application.
The Uniten version is full according to EN 12756 L1K.
The Roten model has the same rotating part of the Uniten model.

WE RECOMMEND TO CONSULT OUR TECHNICAL DEPARTMENT FOR ALL APPLICATIONS INVOLVING BALANCED SEALS.

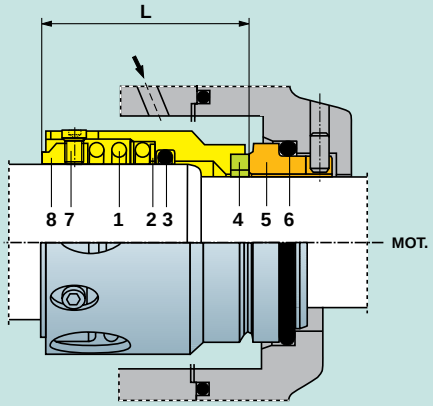
MAX. WORKING CONDITIONS

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

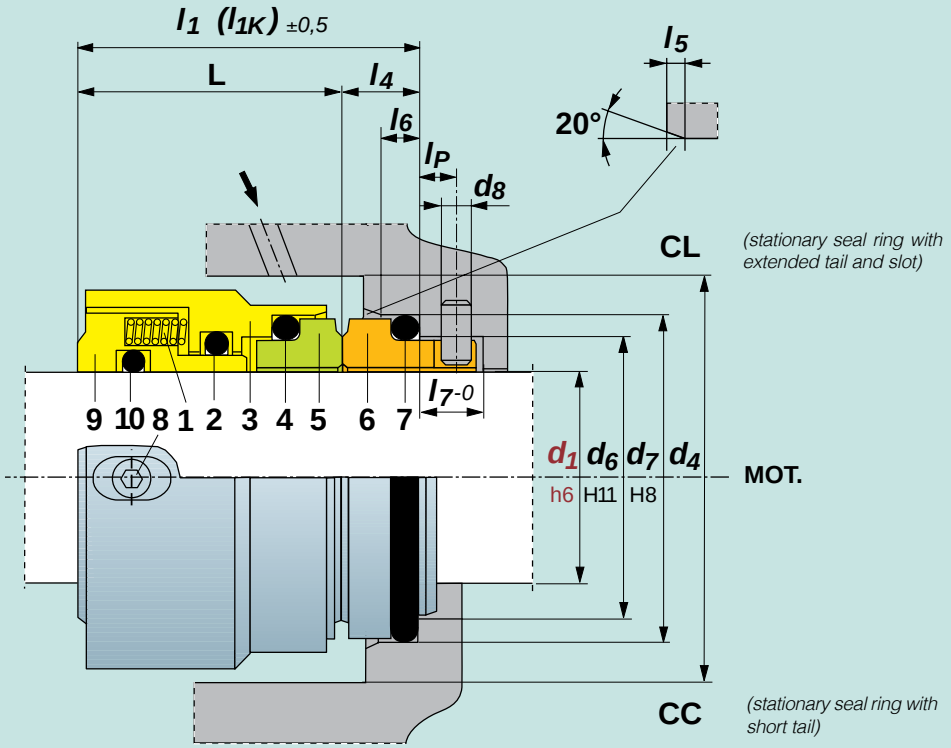
p ≤ 40 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

TYPE 8E - 8EH				STANDARD MATERIALS							
STANDARD		WITH OPEN CAVE (CA)									
POS.	COMPONENTS	POS.	COMPONENTS								
1	Spring	1	Spring	L1	X1						
		2	Washer	G1	L1	X1					
2	Shaft gasket	3	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1	
3	Rotary seal ring	4	Rotary seal ring	D5	D6	G1	J1	L1	X1	X3	X7
4	Stationary seal ring	5	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3	
5	Stationary gasket	6	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
6	Grub screws	7	Grub screws	H1	L1	X1					
7	Drive ring	7	Drive ring	L1	X1						

TYPE 8EH CA
with open cave and shrunk-in rotary seal ring



TYPE 85E



ROTEN

TYPE **85E - 85EN** | **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

Dimensions in mm.

UNITEN EN 12756

TYPE **85E - 85EN** | **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

Dimensions in mm.
+This size is larger than the minumum prescribed by the EN norm

TYPE 85E

This is a balanced mechanical seal that works on a straight shaft without balancing step. It combines features of interchangeability of seal faces with bi-directional rotation, compactness and reduced axial length.

The large range of materials that can be used is similar to that of TYPE **5**.

The TYPES **85E**, **85ETR**, **85EN** and **85ENTR** of UNITEN version are according to EN 12756 L1K.

WE ALWAYS ADVISE TO CONSULT OUR TECHNICAL DEPARTMENT FOR ALL APPLICATIONS INVOLVING BALANCED SEALS.

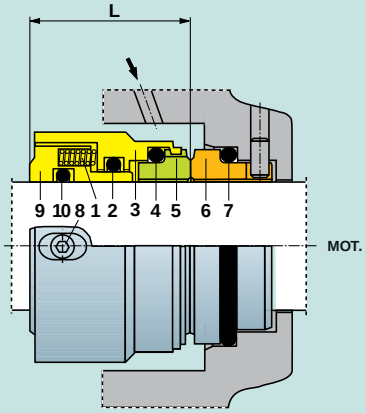
TYPE 85E - 85EM - 85EN		STANDARD MATERIALS							
POS.	COMPONENTS								
1	Spring	L1	X1						
2	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1	
3	Frame	L1	X1						
4	Rotary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
5	Rotary seal ring	K1	K4	R1	V1	V2	V3	Z1	
6	Stationary seal ring	C4	K1	R1	V1	V2	V3		
7	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
8	Grub screws	H1	L1	X1					
9	Balanced sleeve	L1	X1						
10	Sleeve gasket	B1	E1	N1	P1	W1	Y1		

MAX. WORKING CONDITIONS

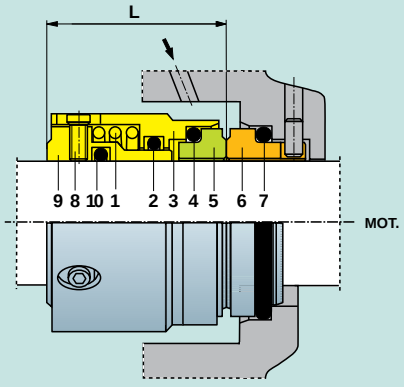
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 40 bar
t = –45 ÷ 200°C
v ≤ 15 m/s

TYPE 85E TR CL
with positive drive rotary ring and stationary ring with extended tail and slot.

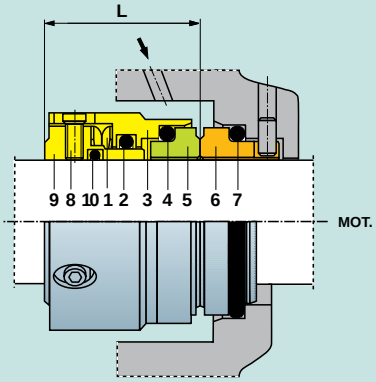


TYPE 85EM
with cylindrical spring. Also available TR CL



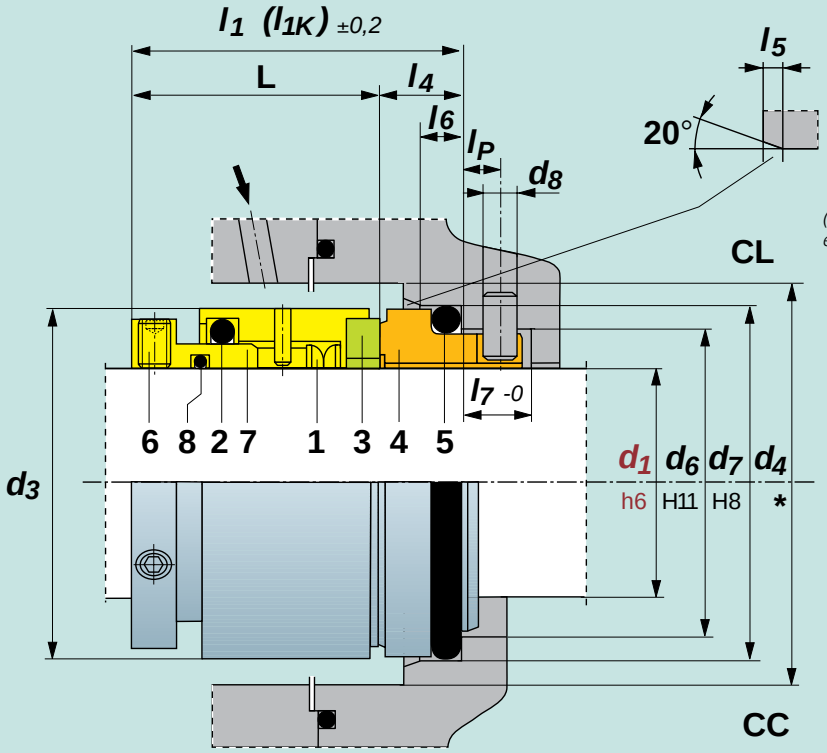
Also available as TRCL

TYPE 85EN
with sinusoidal wave spring. Also available TR CL



Also available as TRCL

TYPE EHS



ROTEN

TYPE **EHS - EHSH**

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

Dimensions in mm.

UNITEN EN 12756

TYPE **EHS - EHSH**

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

Dimensions in mm.
+ This size is larger than the minumum prescribed by the EN 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.

The most important feature of the type **EHS** is that the spring is not in contact with the sealed medium. It's a balanced and bi-directional model. The balancing design is realized through the driving sleeve and therefore it's not needed a stepped shaft.
It's suitable for high pressure and for dirty or viscous liquids. It's also easy to clean due to protected spring.
The Uniten version is full according with fitting dimensions of EN 12756 K version for unbalanced seals.

WE ALWAYS ADVISE TO CONSULT OUR TECHNICAL DEPARTMENT FOR ALL APPLICATION INVOLVING BALANCED SEALS.

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

TYPE EHS - EHSH		**STANDARD MATERIALS**							
POS.	**COMPONENTS**								
1	Spring	X1							
2	Shaft gasket	B1	E1	N1	P1	W1	Y1		
3	Rotary seal ring	D5	D6	J1	L1	X1	X3	X7	
4	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3	
5	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1
6	Grub screws	H1	L1	X1					
7	Balanced sleeve	L1	X1						
8	Sleeve gasket	B1	E1	N1	P1	W1	Y1		

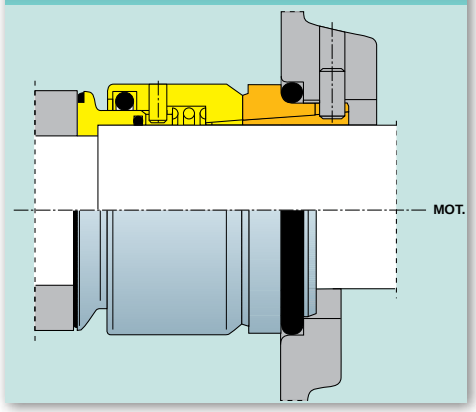
HYGIENIC-FOOD SEALS

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

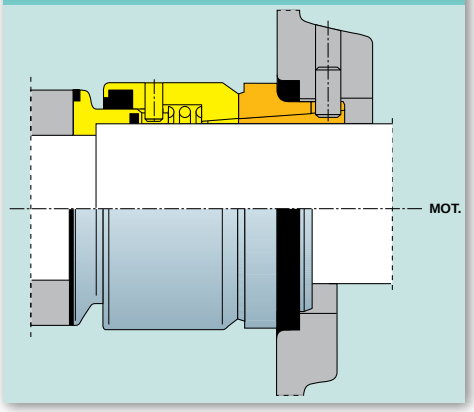
- Spring outside of the media - no contact with the sealed fluid.
- Grub screws out of the media - no contact with the sealed fluid.
- Bi-directional rotation.
- Open design for easier CIP/ SIP process.
- Possibility of shrunk faces.
- Surfaces finish accuracy (Ra < 0,8 µm standard Ra <0,5 µm under request).
- Possibility to get clean profile secondary gasket to reduce to minimum dead spaces difficult to clean.
- Wide flexibility to customize the installation dimensions according to the customer need.
- Internal balanced 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, 3A approved materials under requirement.
- Possibility to supply metals parts in titanium.

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

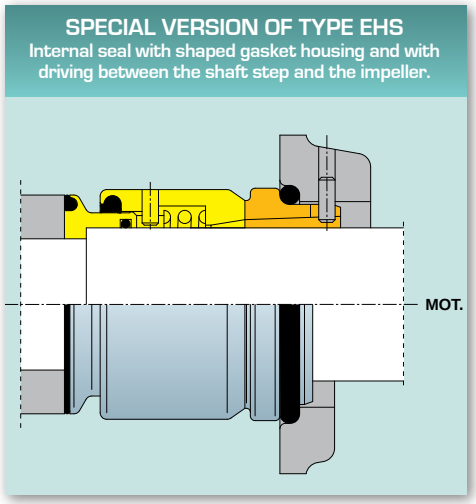
SPECIAL VERSION OF TYPE EHS
Internal seal with driving between the shaft step and impeller.



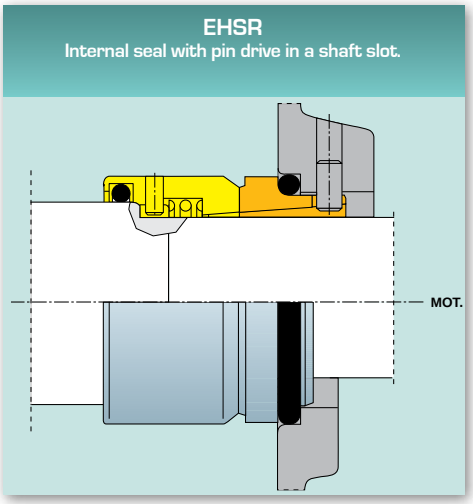
SPECIAL VERSION OF TYPE EHS
Internal seal with special design gasket and with driving between the shaft step and the impeller.



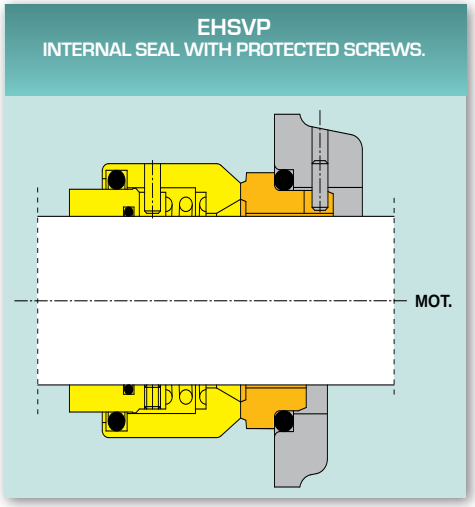
SPECIAL VERSION OF TYPE EHS
Internal seal with shaped gasket housing and with driving between the shaft step and the impeller.



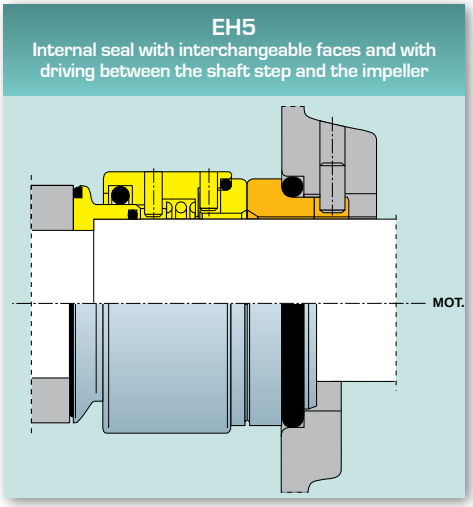
EHSR
Internal seal with pin drive in a shaft slot.



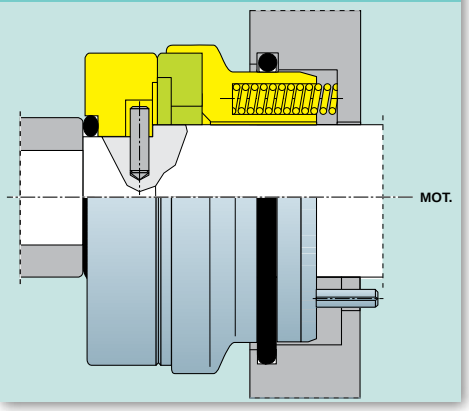
EHSVP
INTERNAL SEAL WITH PROTECTED SCREWS.



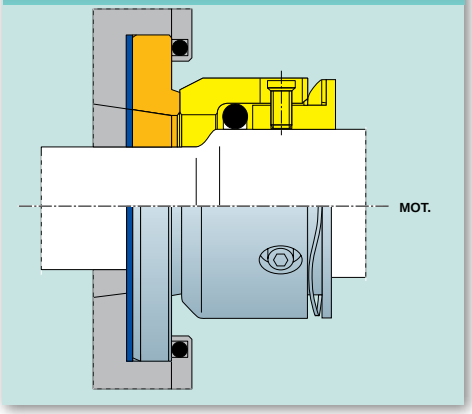
EH5
Internal seal with interchangeable faces and with driving between the shaft step and the impeller



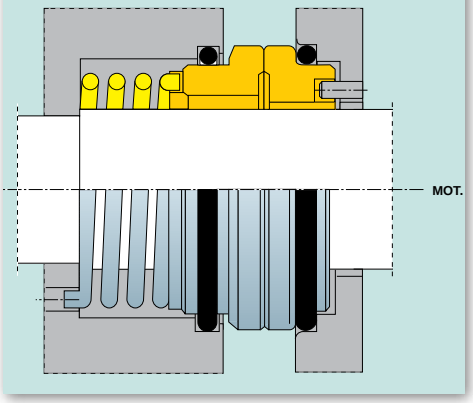
S
Internal seal with external spring and drive with pin on the shaft.



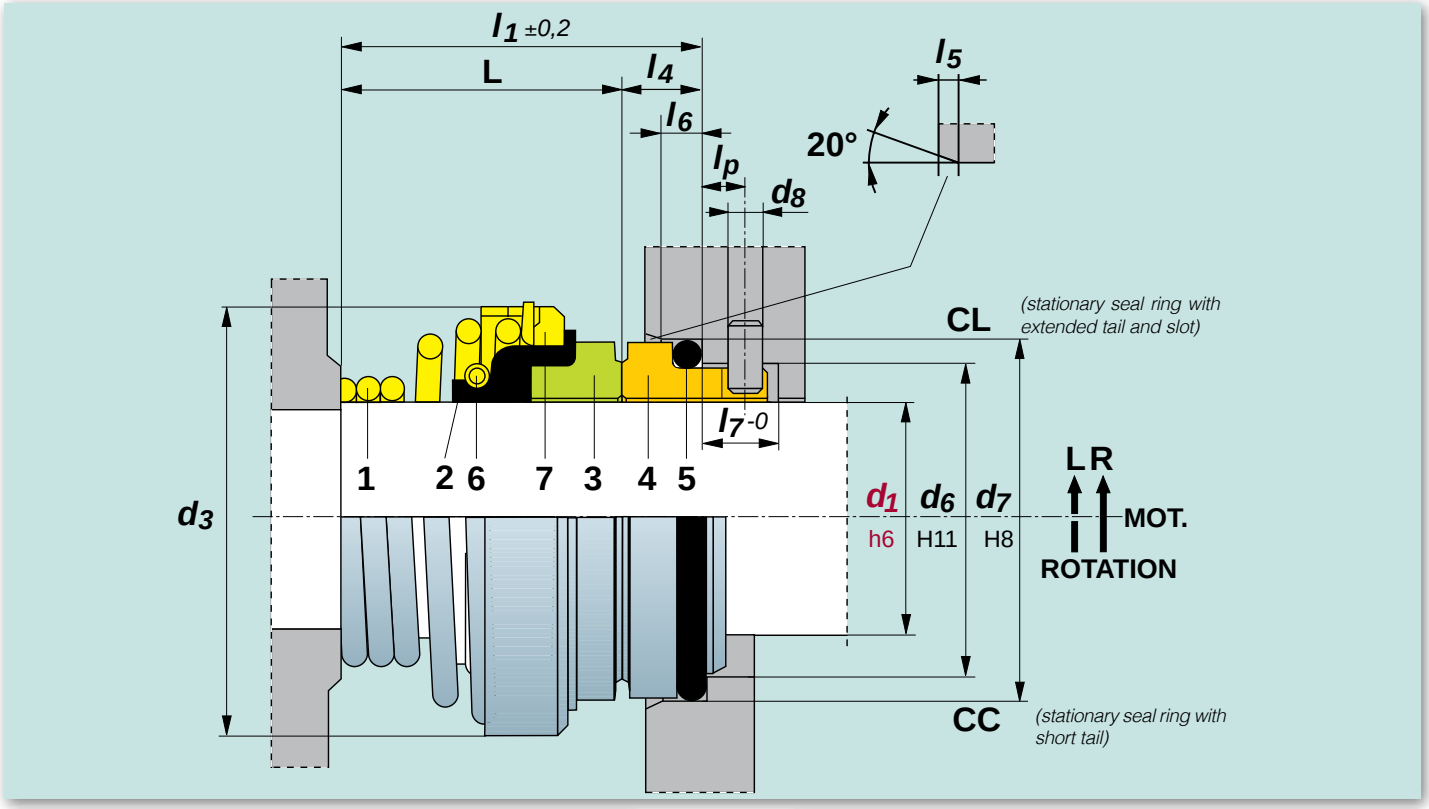
7KF
External seal



S2
Internal seal with external spring



TYPE L2



ROTEN

TYPE **L2 - L23 - UL2 - LS**

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

Dimensions in mm.

UNITEN EN 12756

TYPE **L2 - L23 - UL2 - LS**

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

Dimensions in mm.

The Roten seals series “L” are rubber bellow seals. The type **L2** has a mechanical drive through the spring, more warrantied than the drive through the rubber bellow but, therefore, dependent from the rotation side. It is unbalanced seal and It is particularly suited for applications with products or work conditions which O-Rings gaskets are not able to satisfy (food, particularly viscous or fluids that try to hinder the seal movement on the shaft or to form deposits between shaft and O-Ring).

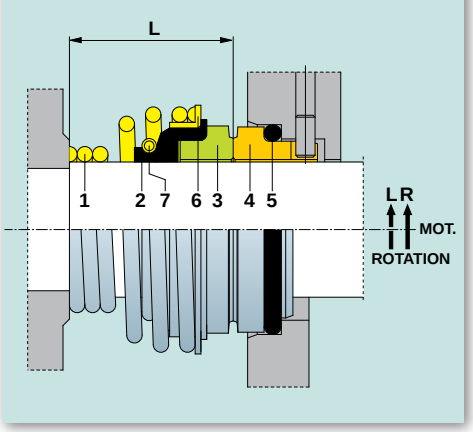
MAX. WORKING CONDITIONS

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

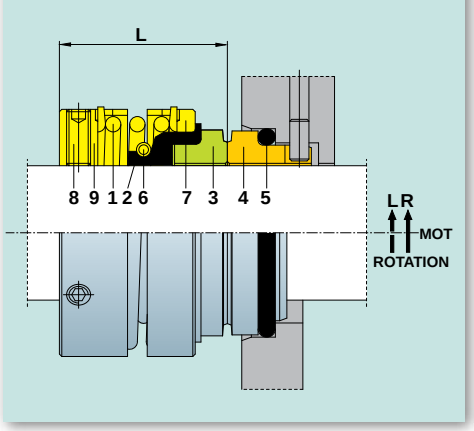
p ≤ 12 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

TYPE L2 - L23 - LS		TYPE UL2		STANDARD MATERIALS
POS.	COMPONENTS	POS.	COMPONENTS	
1	Self-driving spring	1	Spring	L1 X1
2	Lip rubber shaft gasket	2	Lip rubber shaft gasket	E1 P1 Y1
3	Rotary seal ring	3	Rotary seal ring	C4 K1 R1 V1 V2 V3 X3 Z1
4	Stationary seal ring	4	Stationary seal ring	C4 K1 R1 V1 V2 V3 X3
5	Stationary gasket	5	Stationary gasket	E1 P1 Y1
6	Garter spring	6	Garter spring	X1
7	Frame	7	Frame	G1 L1 X1
		8	Grub screws	H1 L1 X1
		9	Driving "U" sleeve	L1 X1

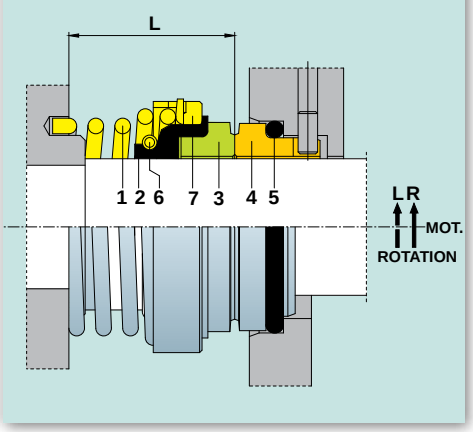
TYPE L23



TYPE UL2
with driving sleeve

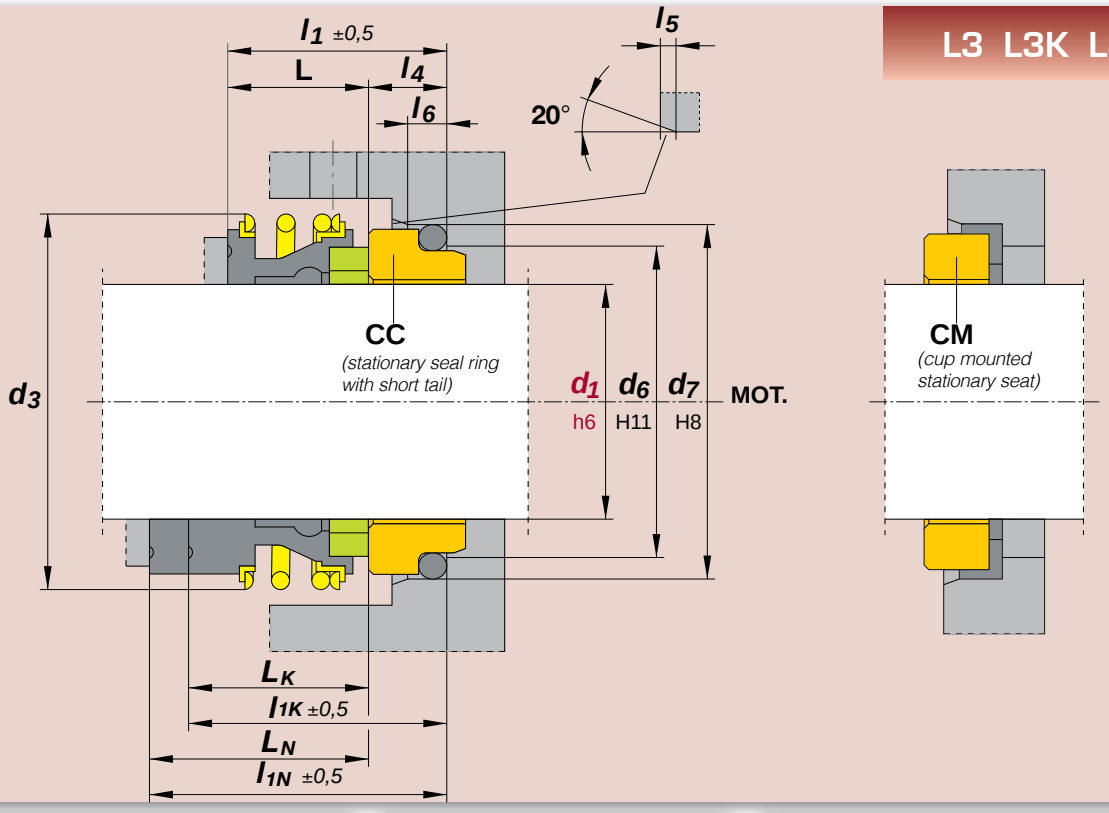


TYPE LS
with a cylindrical spring and axial tang.



TYPE L3

L3 L3K L3N



UNITEN EN 12756

TYPE L3

d1	d6	d7	d3	l1	L	l4	l6	l5	L3K l1k	L3K lk	L3N l1N	L3N lN
10	17	21	24	21,1	14,5	6,6	4	1,5	32,5	25,9	40	33,4
12	19	23	25	21,6	15	6,6	4	1,5	32,5	25,9	40	33,4
14	21	25	29	23,6	17	6,6	4	1,5	35	28,4	40	33,4
16	23	27	29	23,6	17	6,6	4	1,5	35	28,4	40	33,4
18	27	33	32	27	19,5	7,5	5	2	37,5	30	45	37,5
20	29	35	37	29	21,5	7,5	5	2	37,5	30	45	37,5
22	31	37	37	29	21,5	7,5	5	2	37,5	30	45	37,5
24	33	39	42	30	22,5	7,5	5	2	40	32,5	50	42,5
25	34	40	42	30,5	23	7,5	5	2	40	32,5	50	42,5
28	37	43	49	34	26,5	7,5	5	2	42,5	35	50	42,5
30	39	45	49	34	26,5	7,5	5	2	42,5	35	50	42,5
32	42	48	52	35	27,5	7,5	5	2	42,5	35	55	47,5
33	42	48	52	35	27,5	7,5	5	2	42,5	35	55	47,5
35	44	50	56	36	28,5	7,5	5	2	42,5	35	55	47,5
38	49	56	58	39	30	9	6	2	45	36	55	46
40	51	58	62	39	30	9	6	2	45	36	55	46
43	54	61	65	39	30	9	6	2	45	36	60	51
45	56	63	67	39	30	9	6	2	45	36	60	51
48	59	66	71	39,5	30,5	9	6	2	45	36	60	51
50	62	70	73	40	30,5	9,5	6	2,5	47,5	38	60	50,5
53	65	73	78	44	33	11	6	2,5	47,5	36,5	70	59
55	67	75	80	46	35	11	6	2,5	47,5	36,5	70	59
58	70	78	84	48	37	11	6	2,5	52,5	41,5	70	59
60	72	80	87	49	38	11	6	2,5	52,5	41,5	70	59
63	75	83	92	55	44	11	6	2,5	52,5	41,5	70	59
65	77	85	92	51	40	11	6	2,5	52,5	41,5	80	69
68	81	90	96	51,3	40	11,3	7	2,5	52,5	41,2	80	68,7
70	83	92	99	51,3	40	11,3	7	2,5	60	48,7	80	68,7
75	88	97	104	51,3	40	11,3	7	2,5	60	48,7	80	68,7
80	95	105	112	52	40	12	7	3	60	48	90	78
85	100	110	120	55	41	14	7	3	60	46	90	76
90	105	115	127	59	45	14	7	3	65	51	90	76
95	110	120	132	60	46	14	7	3	65	51	90	76
100	115	125	137	61	47	14	7	3	65	51	90	76

Dimensions in mm.

ROTEN

TYPE L3B

d1	d6	d7	d3	l1	L	l4	l6	l5
10	15,5	19,2	24	21,1	14,5	6,6	3,8	1,2
12	17,5	21,6	25	20,6	15	5,6	3,8	1,2
14	20,5	24,6	29	22,6	17	5,6	3,8	1,2
15	20,5	24,6	29	23,6	17	6,6	3,8	1,2
16	22	28	29	24,5	17	7,5	5	1,5
18	24	30	32	27,5	19,5	8	5	1,5
20	29,5	35	37	29	21,5	7,5	5	1,5
22	29,5	35	37	29	21,5	7,5	5	1,5
24	32	38	42	30	22,5	7,5	5	1,5
25	32	38	42	30,5	23	7,5	5	1,5
28	36	42	49	35,5	26,5	9	5	1,5
30	39,2	45	49	37	26,5	10,5	5	1,5
32	42,2	48	52	38	27,5	10,5	5	1,5
35	46,2	52	56	39,5	28,5	11	5	1,5
38	49,2	55	58	40,3	30	10,3	5	1,5
40	52,2	58	62	40,8	30	10,8	5	1,5
45	55,3	64	67	41,6	30	11,6	6	2
48	59,7	68,4	71	42,1	30,5	11,6	6	2
50	60,8	69,3	73	42,1	30,5	11,6	6	2
55	66,5	75,4	80	48,3	35	13,3	6	2
58	69,5	78,4	84	50,3	37	13,3	6	2
60	71,5	80,4	87	51,3	38	13,3	6	2
65	76,5	85,4	92	53	40	13	6	2
68	82,7	91,5	96	53,7	40	13,7	6	2
70	83	92	99	53	40	13	6	2
75	90,2	99	104	54	40	14	6	2
80	95,2	104	112	55	40	15	6	2

Dimensions in mm.

ROTEN

TYPE L3C

d1 mm	d1 inch	d6	d7	d3	l1	L	l4	l6	r
10	0,375"	11	24,6	24	34	25	9	7,5	1,2
12	0,500"	13,5	27,8	25	34	25	9	7,5	1,2
14		17	30,95	29	35,5	25	10,5	9	1,2
15		17	30,95	29	35,5	25	10,5	9	1,2
16	0,625"	17	30,95	29	35,5	25	10,5	9	1,5
18	0,750"	20	34,15	32	35,5	25	10,5	9	1,5
20		21,5	35,7	37	35,5	25	10,5	9	1,5
22	0,875"	23	37,3	37	35,5	25	10,5	9	1,5
24		26,5	40,5	42	35,5	25	10,5	9	1,5
25	1,000"	26,5	40,5	42	35,5	25	10,5	9	1,5
28	1,125"	29,5	47,65	49	45	33	12	10,5	1,5
30		32,5	50,8	49	45	33	12	10,5	1,5
32	1,250"	32,5	50,8	52	45	33	12	10,5	1,5
33		36,5	54	52	45	33	12	10,5	1,5
35	1,375"	36,5	54	56	45	33	12	10,5	1,5
38	1,500"	39,5	57,15	58	45	33	12	10,5	1,5
40	1,625"	42,5	60,35	62	45	33	12	10,5	1,5
43	1,750"	46	63,5	65	53	41	12	10,5	2,5
45		46	63,5	67	53	41	12	10,5	2,5
48	1,875"	49	66,7	71	53	41	12	10,5	2,5
50	2,000"	52	69,85	73	54,5	41	13,5	12	2,5
53	2,125"	55,5	73,05	78	54,5	41	13,5	12	2,5
55	2,250"	58,5	76,2	80	54,5	41	13,5	12	2,5
58		61,5	79,4	84	54,5	41	13,5	12	2,5
60	2,375"	61,5	79,4	87	54,5	41	13,5	12	2,5
63	2,500"	65	82,55	92	54,5	41	13,5	12	2,5
65	2,625"	68	92,1	92	65	49	16	14,5	2,5
68		71	95,25	96	65	49	16	14,5	2,5
70	2,750"	71	95,25	99	65	49	16	14,5	2,5
	2,875"	74,5	98,25	104	68	52	16	14,5	2,5
75	3,000"	77,5	101,6	104	68	52	16	14,5	2,5
	3,125"	80,5	111,15	112	76	56	20	18,5	2,5
80	3,250"	84	114,3	112	76	56	20	18,5	2,5
85	3,375"	87	117,5	120	76	56	20	18,5	2,5
	3,500"	90,5	120,65	127	76	56	20	18,5	2,5
90	3,625"	93,5	123,85	127	79	59	20	18,5	2,5
95	3,750"	96,5	127	132	79	59	20	18,5	2,5
	3,875"	100	130,2	137	82	62	20	18,5	2,5
100	4,000"	103	133,35	137	82	62	20	18,5	2,5

Dimensions in mm.

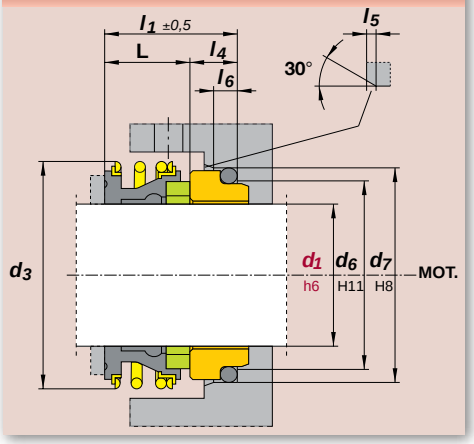
It's a rubber bellow seal with the drive of the rotating part made by the friction between the shaft and inside diameter of the rubber bellow. The common materials for the faces are SiC/SiC and Carbon/SiC. The rubber parts can be supplied with material NBR, EPDM and FPM. The metal parts are supplied in stainless steel 304 or 316. It has a great flexibility because can accept more better small shaft misalignment and small axial movement.

MAX. WORKING CONDITIONS

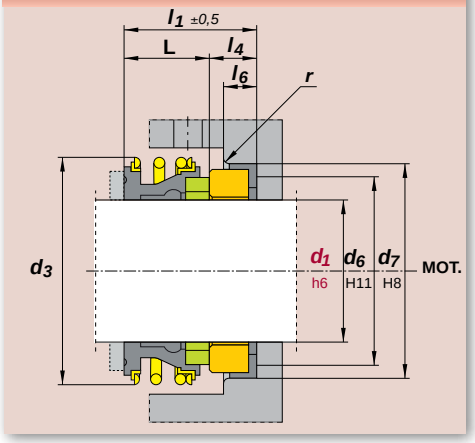
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 10 bar
t = –10 ÷ 120°C
v ≤ 10 m/s

TYPE L3B

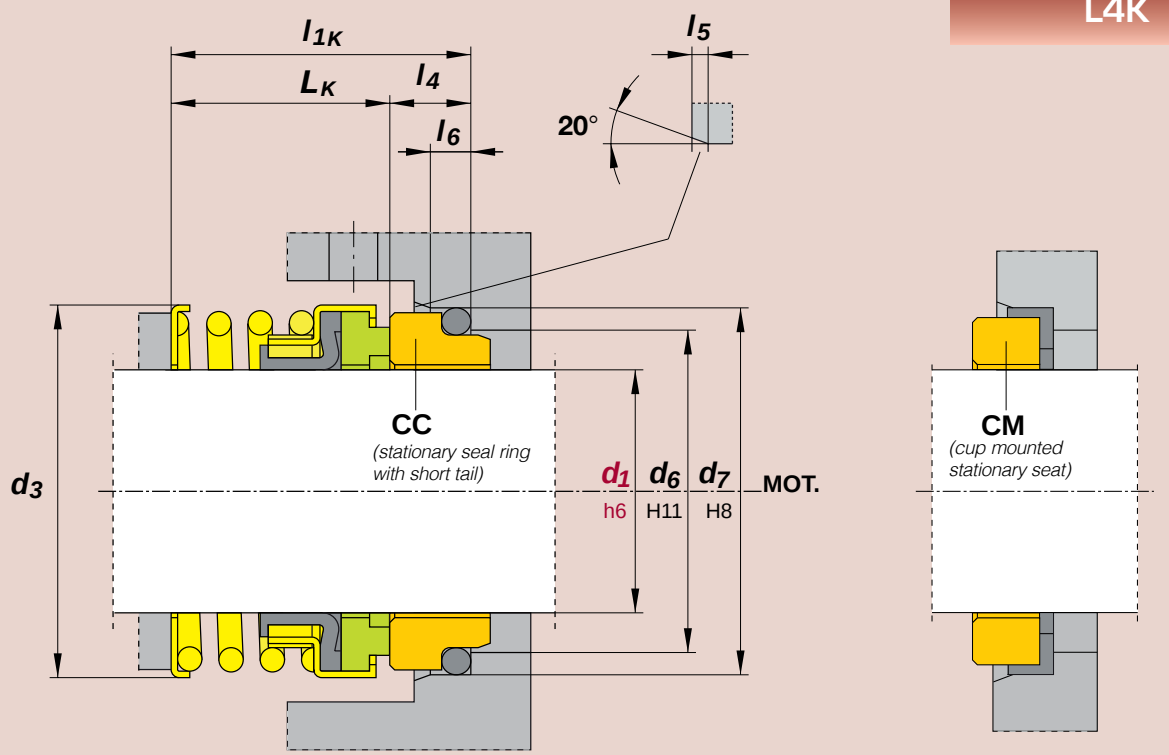


TYPE L3C



TYPE L4

L4K



UNITEN EN 12756

TYPE L4K

d_1	d_6	d_7	d_3	l_{1k}	l_k	l_4	l_6	l_5
10	17	21	23	32,5	25,9	6,6	4	1,5
12	19	23	24	32,5	25,9	6,6	4	1,5
14	21	25	28	35	28,4	6,6	4	1,5
16	23	27	28	35	28,4	6,6	4	1,5
18	27	33	32	37,5	30	7,5	5	2
20	29	35	34	37,5	30	7,5	5	2
22	31	37	34	37,5	30	7,5	5	2
24	33	39	39	40	32,5	7,5	5	2
25	34	40	40	40	32,5	7,5	5	2
28	37	43	47	42,5	35	7,5	5	2
30	39	45	48	42,5	35	7,5	5	2
32	42	48	50	42,5	35	7,5	5	2
33	42	48	50	42,5	35	7,5	5	2
35	44	50	55	42,5	35	7,5	5	2
38	49	56	56	45	36	9	6	2
40	51	58	63	45	36	9	6	2
43	54	61	63	45	36	9	6	2
45	56	63	68	45	36	9	6	2
48	59	66	72	45	36	9	6	2
50	62	70	72	47,5	38	9,5	6	2,5
53	65	73	71	47,5	36,5	11	6	2,5
55	67	75	79	47,5	36,5	11	6	2,5
58	70	78	79	52,5	41,5	11	6	2,5
60	72	80	85	52,5	41,5	11	6	2,5
63	75	83	85	52,5	41,5	11	6	2,5
65	77	85	90	52,5	41,5	11	6	2,5
68	81	90	90	52,5	41,2	11,3	7	2,5
70	83	92	95	60	48,7	11,3	7	2,5
75	88	97	97	60	48,7	11,3	7	2,5
80	95	105	104	60	48	12	7	3

Dimensions in mm.

ROTEN

TYPE L4B

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5
10	15,5	19,2	23	22,6	16	6,6	3,8	1,2
12	17,5	21,6	24	23,1	17,5	5,6	3,8	1,2
14	20,5	24,6	28	23,1	17,5	5,6	3,8	1,2
15	20,5	24,6	28	24,1	17,5	6,6	3,8	1,2
16	22	28	28	26,5	19	7,5	5	1,5
18	24	30	32	28,5	20,5	8	5	1,5
20	29,5	35	34	29,5	22	7,5	5	1,5
22	29,5	35	34	31	23,5	7,5	5	1,5
24	32	38	39	32,5	25	7,5	5	1,5
25	32	38	40	34	26,5	7,5	5	1,5
28	36	42	47	35,5	26,5	9	5	1,5
30	39,2	45	48	35,5	25	10,5	5	1,5
32	42,2	48	50	39	28,5	10,5	5	1,5
35	46,2	52	55	39,5	28,5	11	5	1,5
38	49,2	55	56	42,5	32,2	10,3	5	1,5
40	52,2	58	63	45,5	34,7	10,8	5	1,5
45	55,3	64	68	50,8	39,2	11,6	6	2
48	59,7	68,4	72	56,3	44,7	11,6	6	2
50	60,8	69,3	72	57,3	45,7	11,6	6	2
55	66,5	75,4	79	62,3	49	13,3	6	2
58	69,5	78,4	79	65,3	52	13,3	6	2
60	71,5	80,4	85	66,3	53	13,3	6	2
65	76,5	85,4	90	67,3	54,3	13	6	2
68	82,7	91,5	90	69	55,3	13,7	6	2
70	83	92	95	69,3	56,3	13	6	2
75	90,2	99	97	70,3	56,3	14	6	2
80	95,2	104	104	74,3	59,3	15	6	2

Dimensions in mm.

ROTEN

TYPE L4CS

d_1 mm	d_1 inch	d_6	d_7	d_3	l_{1CS}	l_{CS}	l_4	l_6	r	L4CL l_{1CL}	L4CL l_{CL}
10	0,375"	11	24,6	23	34	25	9	7,5	1,2	53	44
12	0,500"	13,5	27,8	24	34	25	9	7,5	1,2	53	44
14		17	30,95	28	35,5	25	10,5	9	1,2	54,4	43,9
15		17	30,95	28	35,5	25	10,5	9	1,2	54,4	43,9
16	0,625"	17	30,95	28	35,5	25	10,5	9	1,5	54,4	43,9
18	0,750"	20	34,15	32	35,5	25	10,5	9	1,5	54,4	43,9
20		21,5	35,7	34	35,5	25	10,5	9	1,5	54,4	43,9
22	0,875"	23	37,3	34	35,5	25	10,5	9	1,5	54,4	43,9
24		26,5	40,5	39	35,5	25	10,5	9	1,5	54,4	43,9
25	1,000"	26,5	40,5	40	35,5	25	10,5	9	1,5	54,4	43,9
28	1,125"	29,5	47,65	47	45	33	12	10,5	1,5	72	60
30		32,5	50,8	48	45	33	12	10,5	1,5	72	60
32	1,250"	32,5	50,8	50	45	33	12	10,5	1,5	72	60
33		36,5	54	50	45	33	12	10,5	1,5	72	60
35	1,375"	36,5	54	55	45	33	12	10,5	1,5	72	60
38	1,500"	39,5	57,15	56	45	33	12	10,5	1,5	72	60
40	1,625"	42,5	60,35	63	45	33	12	10,5	1,5	72	60
43	1,750"	46	63,5	63	53	41	12	10,5	2,5	83	71
45		46	63,5	68	53	41	12	10,5	2,5	83	71
48	1,875"	49	66,7	72	53	41	12	10,5	2,5	83	71
50	2,000"	52	69,85	72	54,5	41	13,5	12	2,5	84,5	71
53	2,125"	55,5	73,05	79	54,5	41	13,5	12	2,5	84,5	71
55	2,250"	58,5	76,2	79	54,5	41	13,5	12	2,5	84,5	71
58		61,5	79,4	79	54,5	41	13,5	12	2,5	84,5	71
60	2,375"	61,5	79,4	85	54,5	41	13,5	12	2,5	84,5	71
63	2,500"	65	82,55	85	54,5	41	13,5	12	2,5	84,5	71
65	2,625"	68	92,1	90	65	49	16	14,5	2,5	86	70
68		71	95,25	90	65	49	16	14,5	2,5	86	70
70	2,750"	71	95,25	95	65	49	16	14,5	2,5	86	70
	2,875"	74,5	98,25	97	68	52	16	14,5	2,5	89	73
75	3,000"	77,5	101,6	97	68	52	16	14,5	2,5	89	73
	3,125"	80,5	111,15	104	76	56	20	18,5	2,5	99	79
80	3,250"	84	114,3	104	76	56	20	18,5	2,5	99	79

Dimensions in mm.

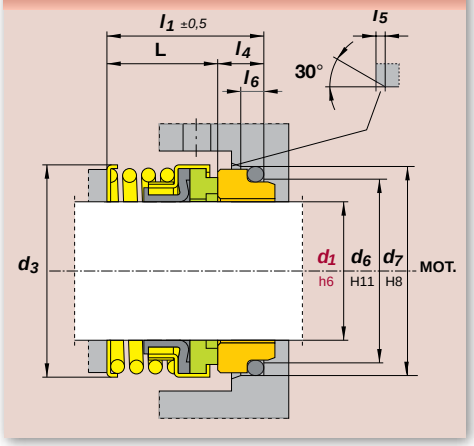
It's a rubber bellow seal with the drive of the rotating part made by the friction between the shaft and inside diameter of the rubber bellow. The common materials for the faces are SiC/SiC and Carbon/SiC. The rubber parts can be supplied with material NBR, EPDM and FPM. The metal parts are supplied in stainless steel 304 or 316. The rotating ring has a drive through frame drive system.

MAX. WORKING CONDITIONS

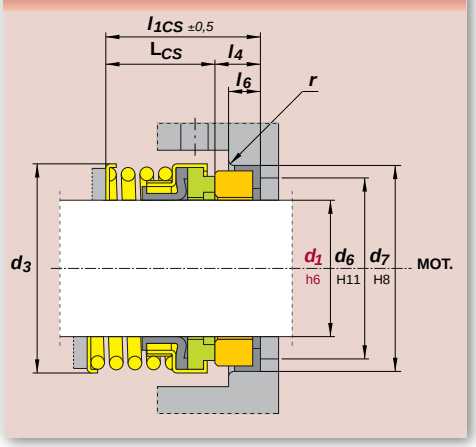
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 10 bar
t = –10 ÷ 120°C
v ≤ 10 m/s

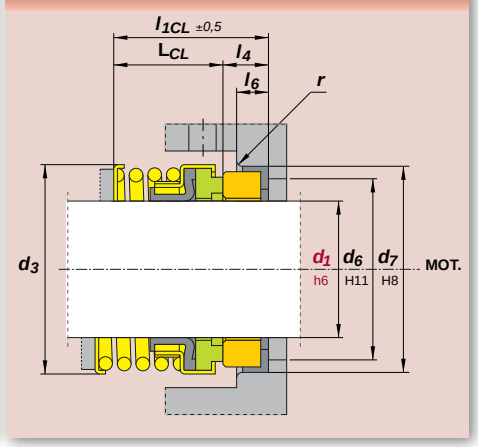
TYPE L4B



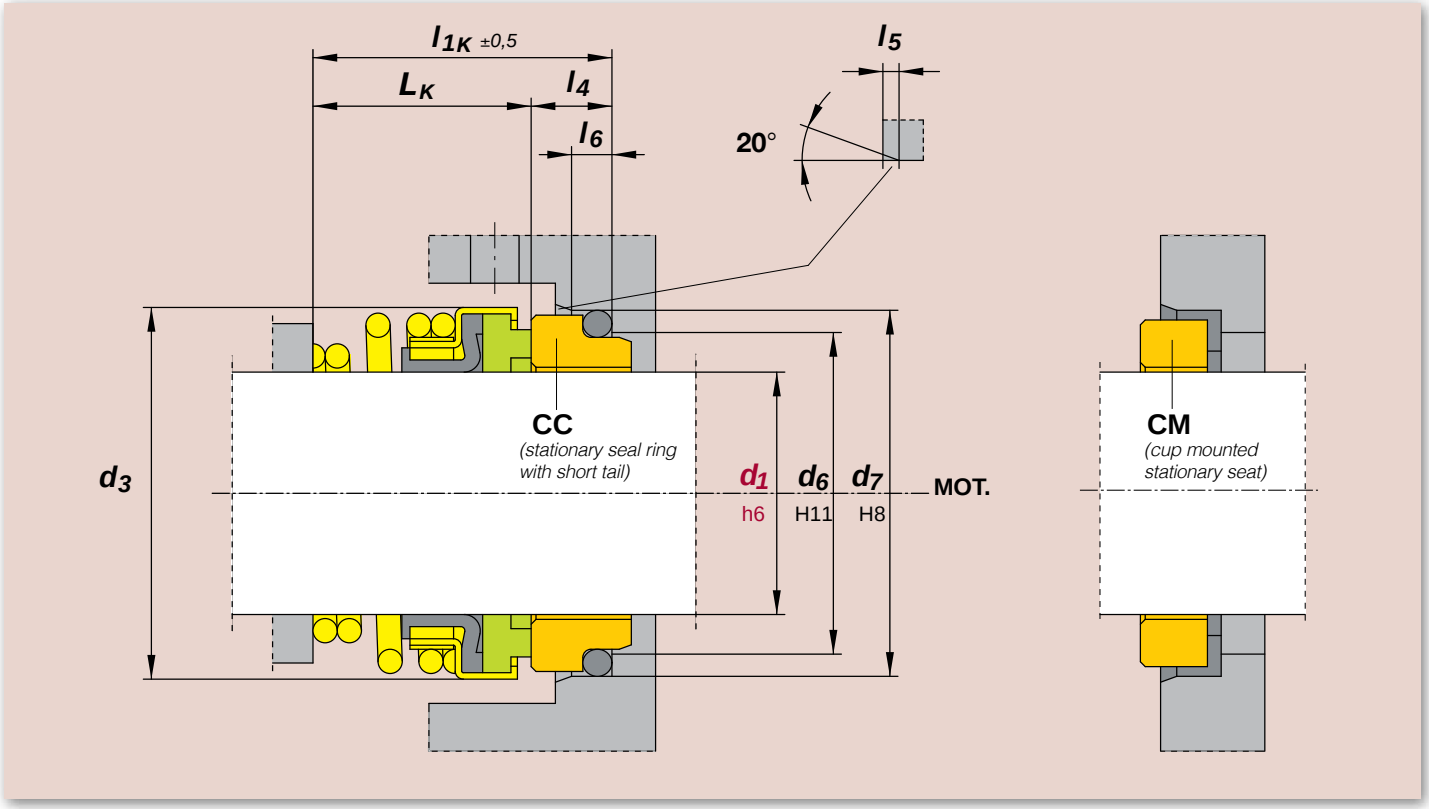
TYPE L4CS



TYPE L4CL



TYPE L4KS1



It's a rubber bellow seal with the drive of the rotating part made by the friction between the shaft and inside diameter of the rubber bellow. The common materials for the faces are SiC/SiC and Carbon/SiC. The rubber parts can be supplied with material NBR, EPDM and FPM. The metal parts are supplied in stainless steel 304 or 316.

The rotating ring has a drive through frame drive system.

MAX. WORKING CONDITIONS

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

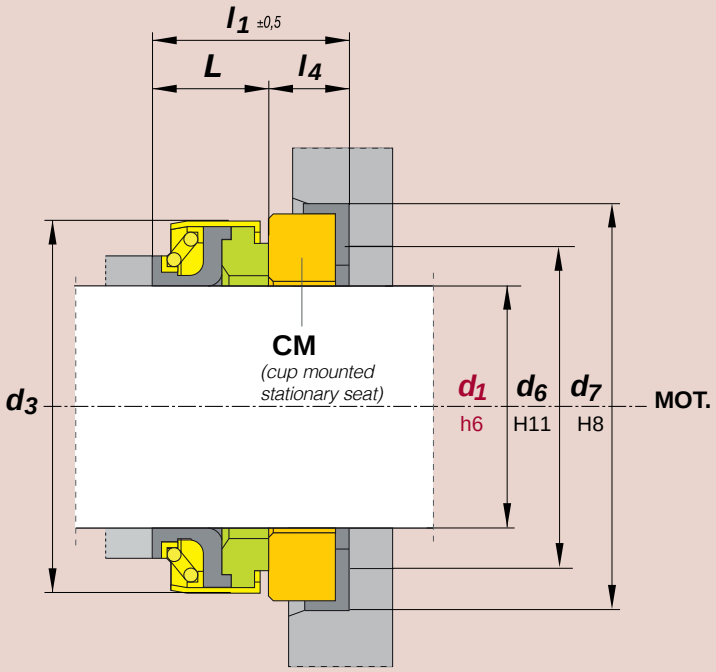
p ≤ 10 bar
t = –10 ÷ 120°C
v ≤ 10 m/s

UNITEN **EN 12756**

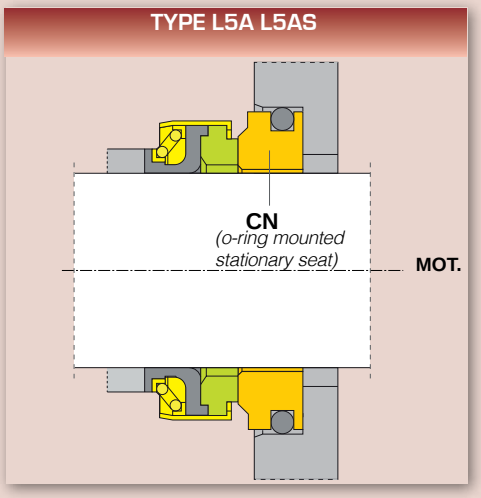
TYPE **L4KS1**

d_1	d_6	d_7	d_3	l_{1k}	l_k	l_4	l_6	l_5
10	17	21	23	32,5	25,9	6,6	4	1,5
12	19	23	24	32,5	25,9	6,6	4	1,5
14	21	25	28	35	28,4	6,6	4	1,5
16	23	27	28	35	28,4	6,6	4	1,5
18	27	33	32	37,5	30	7,5	5	2
20	29	35	34	37,5	30	7,5	5	2
22	31	37	34	37,5	30	7,5	5	2
24	33	39	39	40	32,5	7,5	5	2
25	34	40	40	40	32,5	7,5	5	2
28	37	43	47	42,5	35	7,5	5	2
30	39	45	48	42,5	35	7,5	5	2
32	42	48	50	42,5	35	7,5	5	2
33	42	48	50	42,5	35	7,5	5	2
35	44	50	55	42,5	35	7,5	5	2
38	49	56	56	45	36	9	6	2
40	51	58	63	45	36	9	6	2
43	54	61	63	45	36	9	6	2
45	56	63	68	45	36	9	6	2
48	59	66	72	45	36	9	6	2
50	62	70	72	47,5	38	9,5	6	2,5
53	65	73	71	47,5	36,5	11	6	2,5
55	67	75	79	47,5	36,5	11	6	2,5
58	70	78	79	52,5	41,5	11	6	2,5
60	72	80	85	52,5	41,5	11	6	2,5
63	75	83	85	52,5	41,5	11	6	2,5
65	77	85	90	52,5	41,5	11	6	2,5
68	81	90	90	52,5	41,2	11,3	7	2,5
70	83	92	95	60	48,7	11,3	7	2,5
75	88	97	97	60	48,7	11,3	7	2,5
80	95	105	104	60	48	12	7	3

Dimensions in mm.



TYPE L5A L5AS



It's a rubber bellow seal with the drive of the rotating part made by the friction between the shaft and inside diameter of the rubber bellow. The common materials for the faces are Carbon/Ceramic/NBR and SiC/SiC/FPM. It's used mainly on water pump for light application. The metal parts are supplied in stainless steel 304.

MAX. WORKING CONDITIONS

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

p ≤ 10 bar
t = –10 ÷ 100°C
v ≤ 10 m/s

ROTEN

TYPE **L51**

d_1	d_6	d_7	d_3	l_1	L	l_4
8	10	26	24	16,5	11	5,5
12	14	26	24	18,5	13	5,5
14	16	35	32	21	13	8
15	17	38	35	21	13	8
16	18	38	35	21	13	8
20	22	45	42	23	13	10
25	27	50	42	24	14	10

Dimensions in mm.

ROTEN

TYPE **L5L11**

d_1	d_6	d_7	d_3	l_1	L	l_4
12	14	26	24	19	11	8

Dimensions in mm.

ROTEN

TYPE **L51L11**

d_1	d_6	d_7	d_3	l_1	L	l_4
12	14	26	24	16,5	11	5,5

Dimensions in mm.

ROTEN

TYPE **L5AS**

d_1	d_6	d_7	d_3	l_1	L	l_4
25	27	50	42	22	14	8

Dimensions in mm.

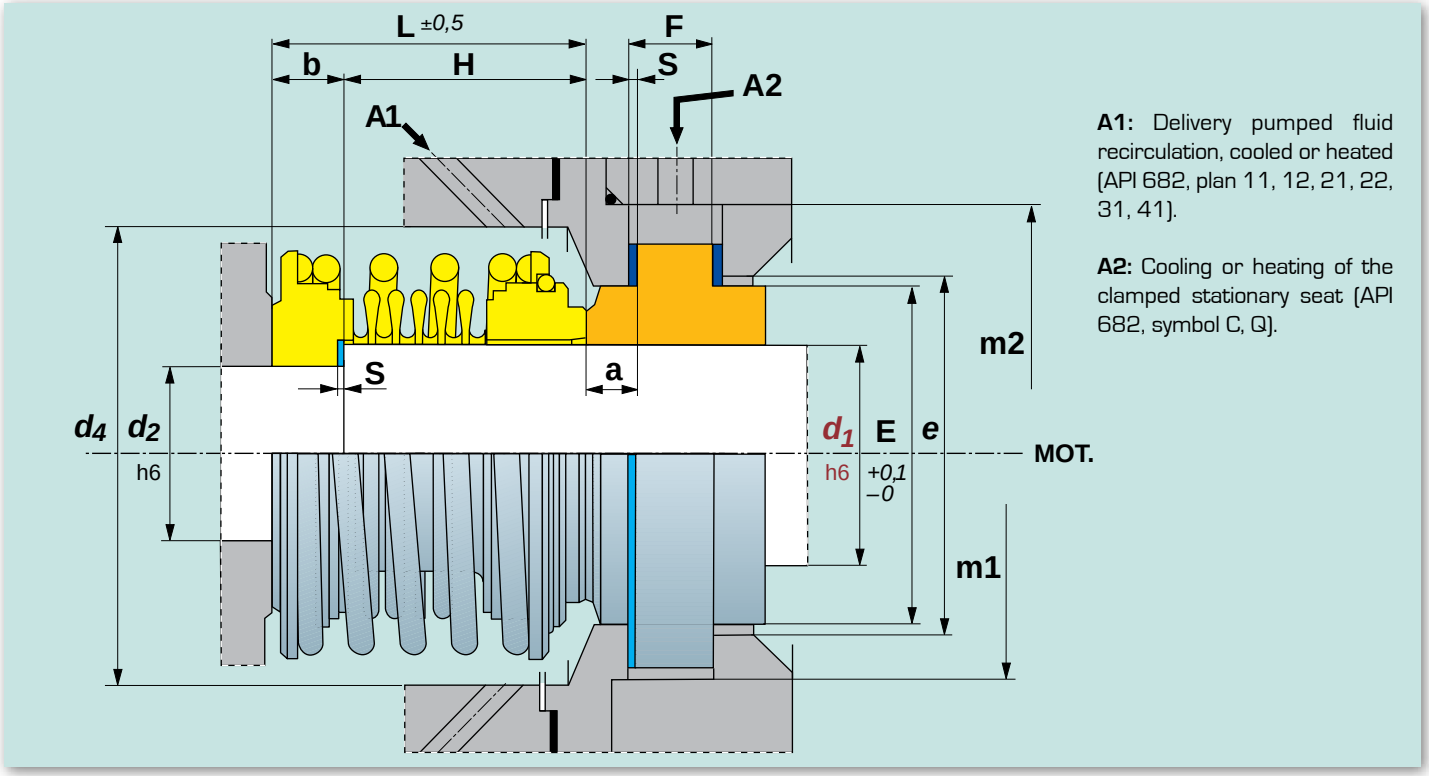
ROTEN

TYPE **L5 - L5A**

d_1	d_6	d_7	d_3	l_1	L	l_4
6	8	22	18	12	8	4
8	10	22	20	16,5	11	5,5
10	12	26	24	19	11	8
11	13	26	24	19	11	8
12	14	26	24	21	13	8
13	15	26	24	21	13	8
14	16	29,5	32	21	13	8
15	17	29,5	32	21	13	8
16	18	29,5	32	21	13	8
17	19	42	39	21	13	8
18	20	42	39	21	13	8
19	21	42	39	21	13	8
20	22	42	39	21	13	8
22	24	45	42	23	13	10
23	25	50	47	24	14	10
24	26	50	47	24	14	10
25	27	50	47	24	14	10
28	31	57	54	25	15	10
30	33	57	54	25	15	10
32	35	57	54	25	15	10
35	38	63	60	26	16	10
38	41	68	65	29	17	12
40	43	68	65	29	17	12
45	48	73	70	32	20	12
50	53	88	85	35	20	15
55	58	88	85	38	23	15
60	65	110	105	45	30	15
65	70	110	105	45	30	15
70	75	110	105	47	32	15

Dimensions in mm.

TYPE RF



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).

ROTEN

TYPE **RF**

d_1	d_2	L	H	b	E	F	a	S	e	m_1	m_2	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

Dimensions in mm.
On request, the dimension d_2 can be adjusted to the customer need.

A metal bellow type seal suitable for very high or very low temperatures and other applications where elastomer or PTFE gaskets could cause problems.

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	MATERIALS STANDARD
Metallic parts	X1
Rotary seal ring	X3 J1
Stationary seal ring	X3 V1 V2 V3
Gaskets	A1 C1

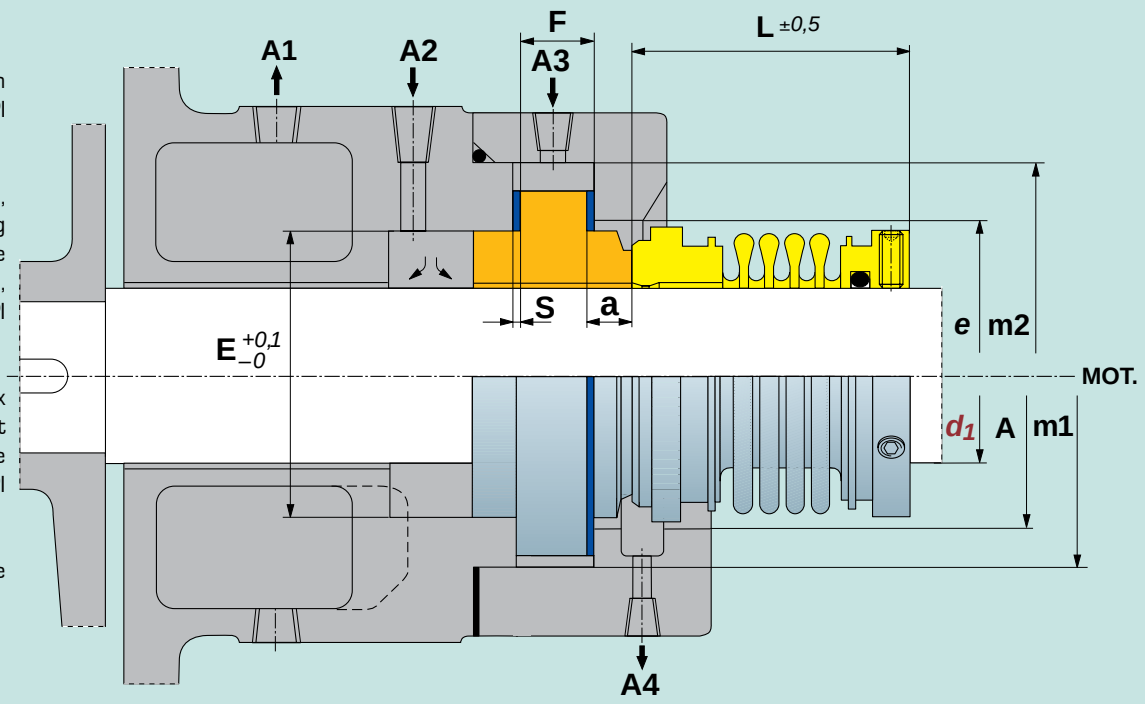
NB: To ensure the flatness of the lapped stationary ring, particular care must be taken with the locking screws on the gland plate. The number of screws is dependent on the seal size and cannot be less than : 4 till Ø20, 6 till Ø 28, 8 till Ø 60 and 12 till Ø 75. Also the screws must be tightened evenly to avoid distortion of the stationary ring. **The cooling circuits shown in the two drawings must be used according to the requirements of the application.**

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).



ROTEN **R7F** is a bellow type seal for external mounting.

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 **R7F**

d_1	L	E	F	a	S	A	e	m_1	m_2
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

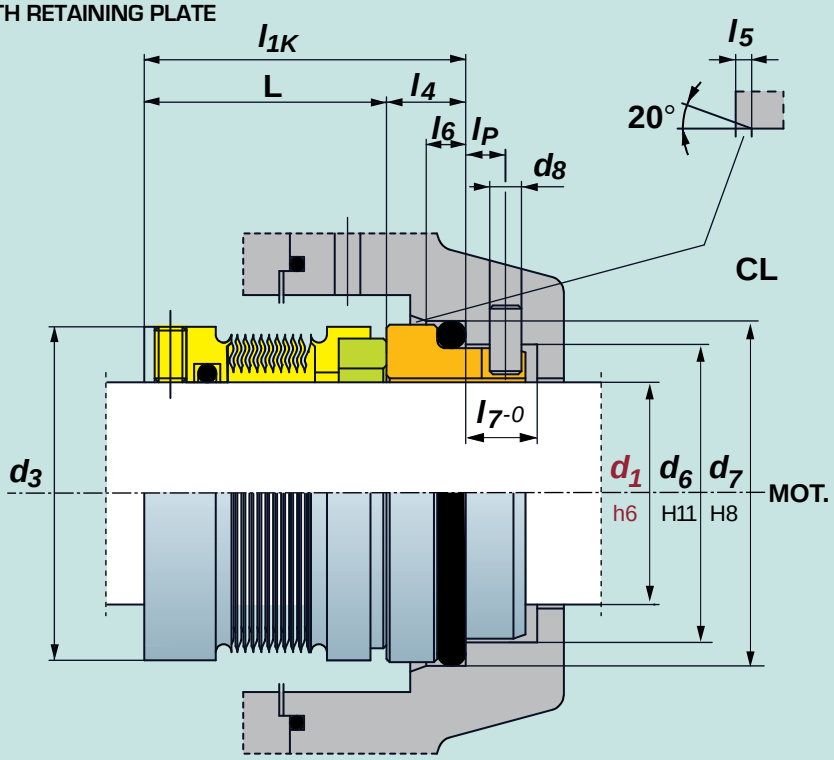
Dimensions in mm.

COMPONENTS	MATERIALS STANDARD			
Metallic parts	X1			
Rotary seal ring	X3	J1		
Stationary seal ring	X3	V1	V2	V3
Gaskets	A1	C1	Y1	E1

NB: To ensure the flatness of the lapped stationary ring, particular care must be taken with the locking screws on the gland plate. The number of screws is dependent on the seal size and cannot be less than : 4 till Ø20, 6 till Ø 28, 8 till Ø 60 and 12 till Ø 75. Also the screws must be tightened evenly to avoid distortion of the stationary ring. **The cooling circuits shown in the two drawings must be used according to the requirements of the application.**

TYPE R580

STATIONARY WITH RETAINING PLATE
SEE PAGE 58



(stationary seal ring with extended tail and slot)

UNITEN EN 12756

TYPE **R580 - R581**

d_1	d_3	d_6	d_7	d_8	l_{1K}	L	l_4	l_6	l_5	l_7	l_P
16	30.0	23	27	3	42.5	32.5	10.0	4	1.5	9	5
18	32.0	27	33	3	42.0	30.5	11.5	5	2.0	9	5
20	33.5	29	35	3	42.0	30.5	11.5	5	2.0	9	5
22	36.5	31	37	3	42.0	30.5	11.5	5	2.0	9	5
24	39.0	33	39	3	40.0	28.5	11.5	5	2.0	9	5
25	39.6	34	40	3	40.0	28.5	11.5	5	2.0	9	5
28	42.8	37	43	3	42.5	31.0	11.5	5	2.0	9	5
30	45.0	39	45	3	42.5	31.0	11.5	5	2.0	9	5
32	46.0	42	48	3	42.5	31.0	11.5	5	2.0	9	5
33	48.0	42	48	3	42.5	31.0	11.5	5	2.0	9	5
35	49.2	44	50	3	42.5	31.0	11.5	5	2.0	9	5
38	52.3	49	56	4	45.0	31.0	14.0	6	2.0	9	5
40	55.5	51	58	4	45.0	31.0	14.0	6	2.0	9	5
43	57.5	54	61	4	45.0	31.0	14.0	6	2.0	9	5
45	58.7	56	63	4	45.0	31.0	14.0	6	2.0	9	5
48	61.9	59	66	4	45.0	31.0	14.0	6	2.0	9	5
50	65.0	62	70	4	47.5	32.5	15.0	6	2.5	9	5
53	68.2	65	73	4	47.5	32.5	15.0	6	2.5	9	5
55	70.0	67	75	4	47.5	32.5	15.0	6	2.5	9	5
58	71.7	70	78	4	52.5	37.5	15.0	6	2.5	9	5
60	74.6	72	80	4	52.5	37.5	15.0	6	2.5	9	5
63	79.0	75	83	4	52.5	37.5	15.0	6	2.5	9	5
65	84.1	77	85	4	52.5	37.5	15.0	6	2.5	9	5
68	87.3	81	90	4	52.5	34.5	18.0	6	2.5	9	5
70	87.3	83	92	4	60.0	42.0	18.0	7	2.5	9	5
75	95.0	88	97	4	60.0	42.0	18.0	7	2.5	9	5
80	98.4	95	105	4	60.0	41.8	18.2	7	3.0	9	5
85	104.7	100	110	4	60.0	41.8	18.2	7	3.0	9	5
90	111.0	105	115	4	65.0	46.8	18.2	7	3.0	9	5
95	114.0	110	120	4	65.0	47.8	17.2	7	3.0	9	5
100	117.4	115	125	4	65.0	47.8	17.2	7	3.0	9	5

Dimensions in mm.

TYPE R580 COMPONENTS	STANDARD MATERIALS			
Metal Bellows	L3			
Metalic parts	X1			
Rotary seal ring	K1	R1	V2	V3
Stationary seal ring	K1	R1	V2	V3
Gaskets	E1	W1	Y1	

TYPE R581 COMPONENTS	STANDARD MATERIALS			
Metal Bellows	L1			
Metalic parts	L1			
Rotary seal ring	K1	R1	V2	V3
Stationary seal ring	K1	R1	Z1	
Gaskets	E1	W1	Y1	

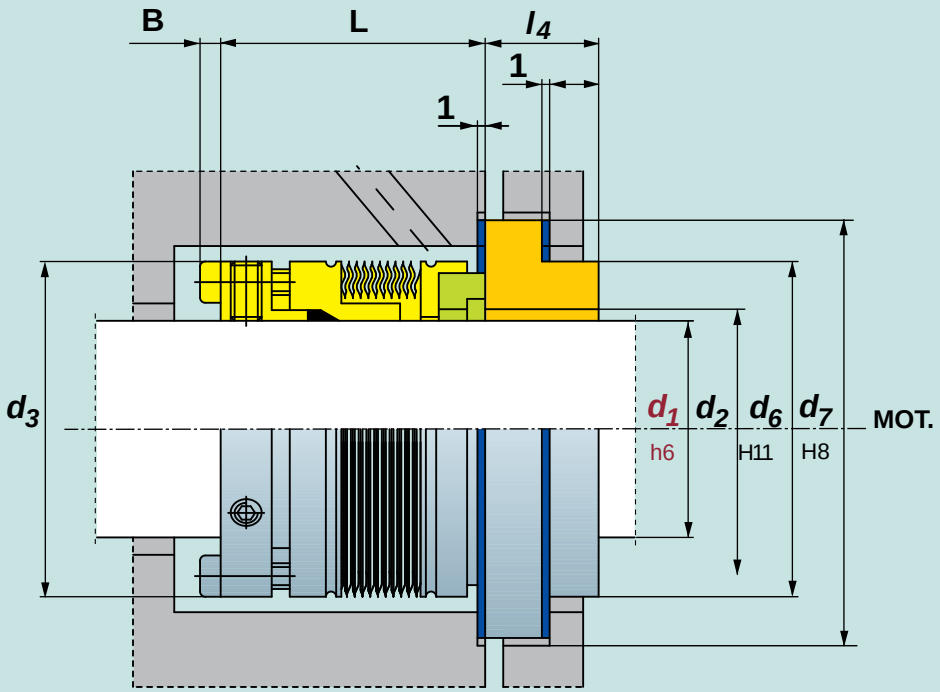
The type **580** is a welded metal bellow seal that doesn't have dynamic o-ring on shaft and can avoid the leakage problems due to the hanging of elastomer on the shaft. The bellow form gives a good balancing factor to the seal. This seal can work with high and very low temperature or viscous liquids and slurries.

MAX. WORKING CONDITIONS

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

p ≤ 20 bar
t = –50 ÷ 280°C
v ≤ 15 m/s

STATIONARY WITH RETAINING PLATE
SEE PAGE 58



The type **590** is a welded metal bellow seal that doesn't have o-ring but a special carbon packing gasket that enlarge the temperature working limits on high and low temperature. The bellow form gives a good balancing factor to the seal.

TYPE RF590 COMPONENTS	STANDARD MATERIALS
Metal Bellows	L3
Metalic parts	X1
Rotary seal ring	K1 R1 V1 V2 V3
Stationary seal ring	K1 R1
Gaskets	expanded graphite

MAX. WORKING CONDITIONS

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

p ≤ 20 bar
t = –70 ÷ 350°C
v ≤ 15 m/s

TYPE RF591 COMPONENTS	STANDARD MATERIALS
Metal Bellows	L3 DOUBLE PLY
Metalic parts	X1
Rotary seal ring	K1 R1 V1 V2 V3
Stationary seal ring	K1 R1
Gaskets	expanded graphite

UNITEN EN 12756

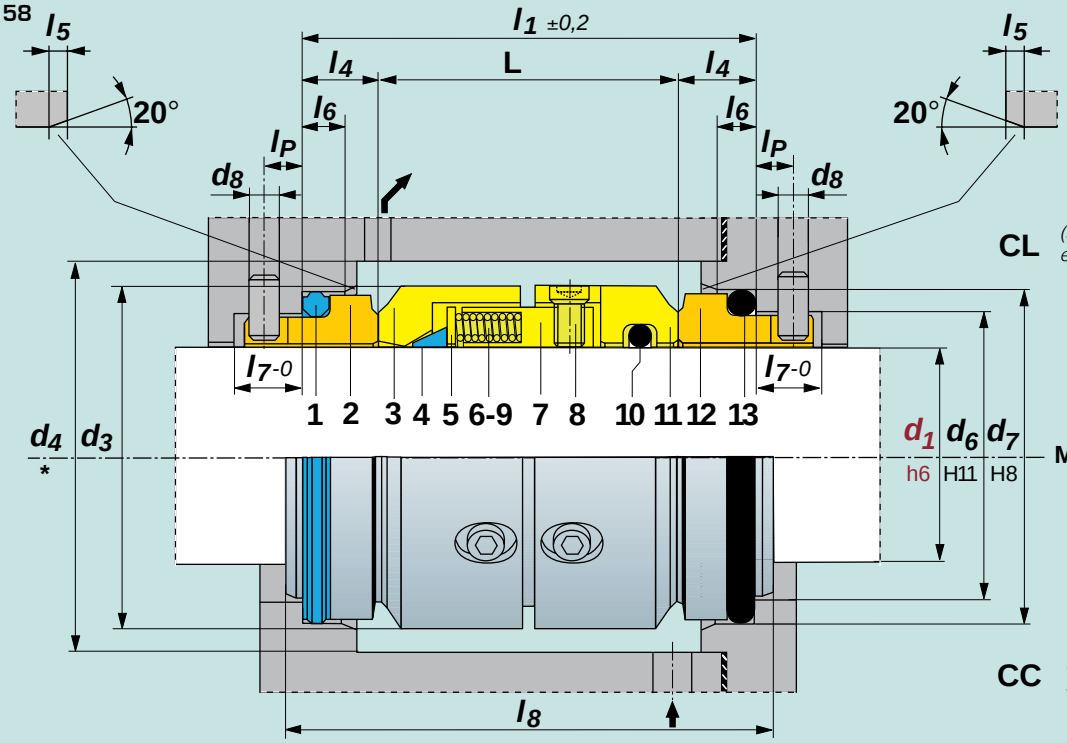
TYPE **RF590 - RF591**

d_1	L+B	d_3	d_2	d_6	d_7	l_4
25	38,9	41,3	28	41	53	16
28	39,7	44,5	31	44	56	16
32	40,5	47,7	35	48	59	16
35	40,5	50,8	38	51	61	16
38	40,5	54	41	58	68	16
40	40,5	57,2	43	60	72	16
45	41,3	60,4	48	65	78	16
48	41,3	63,5	51	68	81	16
50	42,1	66,7	53	70	82	16
55	42,1	69,9	58	75	94	16
60	43,7	76,2	63	85	98	16
65	44,5	82,6	68	90	107	16
70	45,3	88,9	73	91	111	16
75	47,7	96,9	78	94	114	16
80	47,7	101,6	83	98	116	16
85	47,7	108	88	104	124	16
90	47,7	111,2	93	110	130	16
95	47,7	117,5	98	114	133	16
100	47,7	123,9	103	123	143	16

Dimensions in mm.

TYPE 822 - 842 - 844

STATIONARY WITH RETAINING PLATE
SEE PAGE 58



CL *(stationary seal ring with extended tail and slot)*

CC *(stationary seal ring with short tail)*

ROTEN

TYPE **822 - 822H - 842 - 842H - 844 - 844H**

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

Dimensions in mm.

UNITEN EN 12756

TYPE **822 - 822H - 842 - 842H - 844 - 844H**

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

Dimensions in mm.
+ This size is larger than the minumum prescribed by the EN 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 822 - 842 - 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 TYPE **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.

TYPE 822 - 822H		TYPE 842 - 842H		TYPE 844 - 844H		STANDARD MATERIALS								
POS.	COMPONENTS	POS.	COMPONENTS	POS.	COMPONENTS									
1	Stationary gasket	1	Stationary gasket	1	Stationary gasket	B1	C1	C4*	E1	F1	N1	P1	W1	Y1
2	Stationary seal ring	2	Stationary seal ring	2	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3		
3	Rotary seal ring	3	Rotary seal ring	3	Rotary seal ring	D5	D6	G1	J1	L1	X1	X3	X7	
4	Shaft gasket					B1	E1	F1	N1	P1	W1	Y1		
		4	Wedge shaft gasket (PTFE)	4	Wedge shaft gasket (PTFE)	C1	C4*							
		5	Gasket thrust washer	5	Gasket thrust washer	L1	X1							
5	Spring	6	Spring	6	Spring	L1	X1							
6	Sleeve	7	Sleeve	7	Sleeeve	L1	X1							
7	Grub screws	8	Grub screws	8	Grub screws	H1	L1	X1						
8	Spring	9	Spring	9	Spring	L1	X1							
				10	Gasket thrust washer	L1	X1							
				11	Wedge shaft gasket (PTFE)	C1	C4*							
9	Shaft gasket	10	Shaft gasket			B1	E1	F1	N1	P1	W1	Y1		
10	Rotary seal ring	11	Rotary seal ring	12	Rotary seal ring	D5	D6	G1	J1	L1	X1	X3	X7	
11	Stationary seal ring	12	Stationary seal ring	13	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3		
12	Stationary gasket	13	Stationary gasket	14	Stationary gasket	B1	C1	C4*	E1	F1	N1	P1	W1	Y1

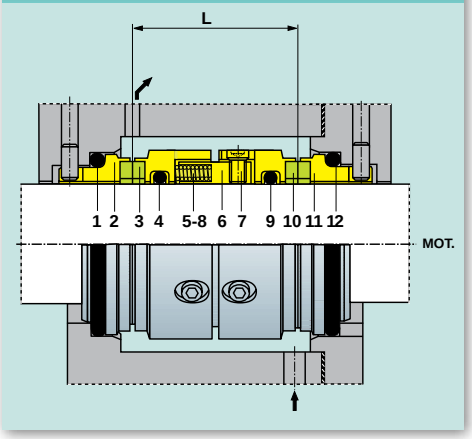
The types 822H, 842H and 844H are with shrunk-in rotary seal ring. The types 822, 822H, 842 and 842H can be with open cave (CA).
*For particular operating conditions the wedge and stationary gasket may be manufactured in the code C4 (only for type 842,842H, 844 and 844H

MAX. WORKING CONDITIONS

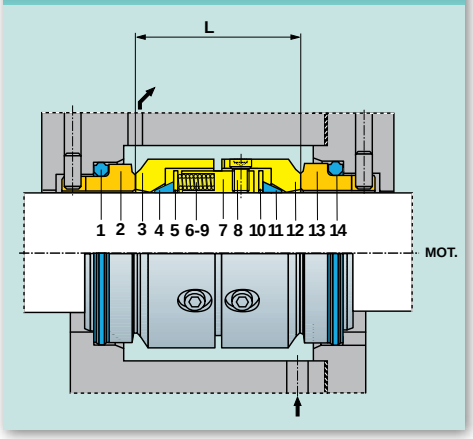
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 16 bar
t = –35 ÷ 180°C
v ≤ 15 m/s

TYPE 822

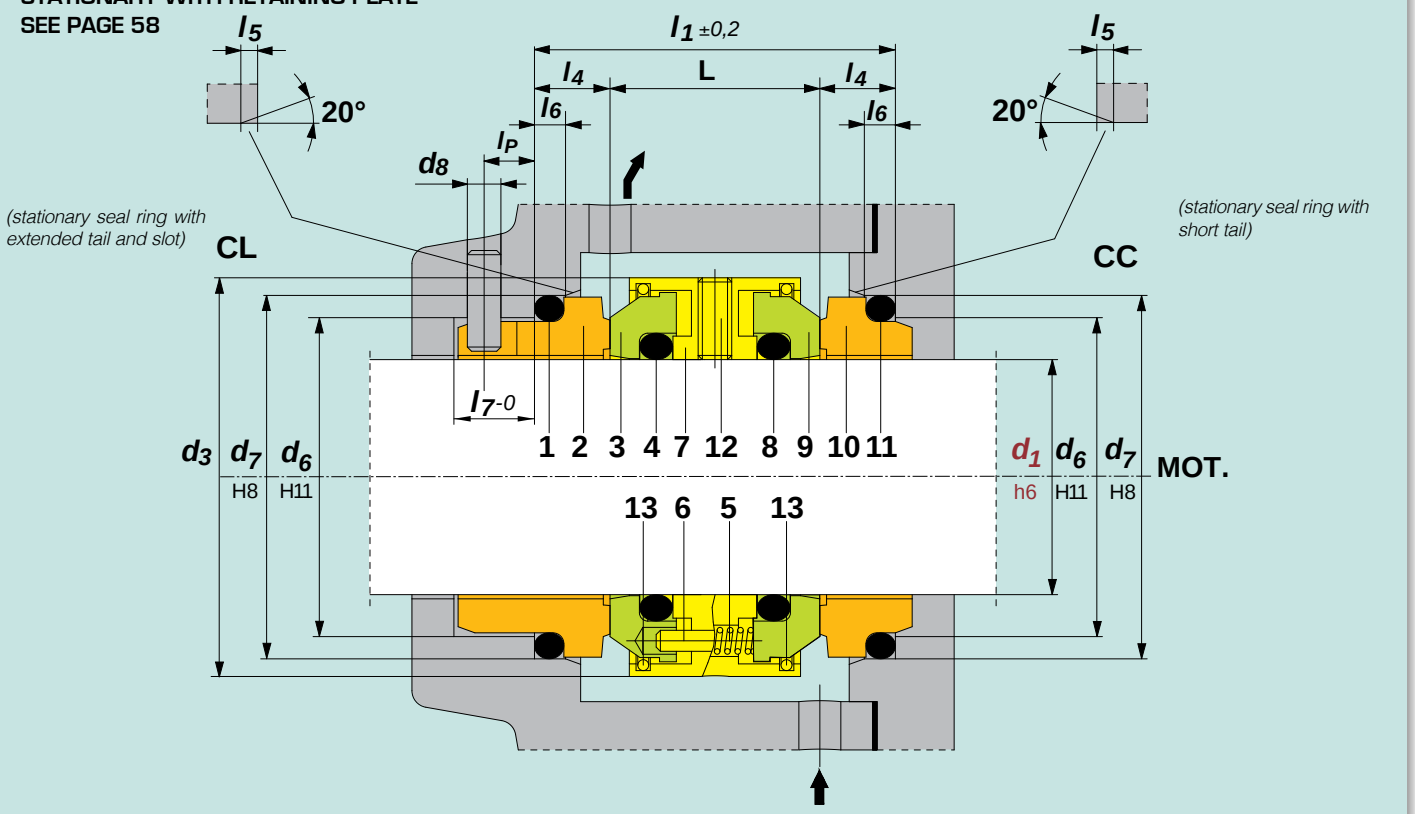


TYPE 844



TYPE 877

STATIONARY WITH RETAINING PLATE
SEE PAGE 58



ROTEN

TYPE **877 - 877H**

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_P
20	25	30,9	40	39	23	8	3,7	1,3	3	8,5	4,5
25	33	38,2	44,5	42	25	8,5	3,7	1,8	4	9,1	5
28	38	43,3	47,5	43	25	9	3,7	1,8	4	9,6	6
30	38	43,3	50	45	27	9	3,7	1,8	4	9,6	6
32	38	43,3	52	45	27	9	3,7	1,8	4	9,6	6
35	45	53,5	56	51,5	28,5	11,5	5,4	2,1	5	12	7,5
43	52	60,5	71	53	30	11,5	5,4	2,1	5	12	7,5
50	64	72,5	80	53	30	11,5	5,4	2,1	5	13	8,5
55	64	72,5	88	58	35	11,5	5,4	2,1	5	13	8,5
65	77	84,5	98	58	35	11,5	5,4	2,1	5	13,5	8,5
70	82	89,5	108	58	35	11,5	5,4	2,1	5	13,5	8,5
75	87	94,5	120	63	40	11,5	5,4	2,1	5	13,5	8,5
80	92	99,5	125	63	40	11,5	5,4	2,1	5	13,5	8,5
85	98	105,5	130	67	40	13,5	5,4	2,6	5	13,5	8,5
90	105	111,5	135	72	45	13,5	5,4	2,6	5	13,5	8,5
95	110	116,5	140	72	45	13,5	5,4	2,6	5	13,5	8,5
100	114	119,5	145	72	45	13,5	5,4	2,6	5	13,5	8,5

Dimensions in mm.

UNITEN EN 12756

TYPE **877 877H**

d_1	d_6	d_7	d_3	l_1	L	l_4	l_6	l_5	d_8	l_7	l_P
20	29	35	40	43	23	10	5	2	3	9	5
25	34	40	44,5	45	25	10	5	2	3	9	5
28	37	43	47,5	45	25	10	5	2	3	9	5
30	39	45	50	47	27	10	5	2	3	9	5
32	42	48	52	47	27	10	5	2	3	9	5
35	44	50	56	48,5	28,5	10	5	2	3	9	5
43	54	61	71	56	30	13	6	2	4	9	5
50	62	70	80	58	30	14	6	2,5	4	9	5
55	67	75	88	63	35	14	6	2,5	4	9	5
65	77	85	98	63	35	14	6	2,5	4	9	5
70	83	92	108	67	35	16	7	2,5	4	9	5
75	88	97	120	72	40	16	7	2,5	4	9	5
80	95	105	125	76	40	18	7	3	4	9	5
85	100	110	130	76	40	18	7	3	4	9	5
90	105	115	135	81	45	18	7	3	4	9	5
95	110	120	140	81	45	18	7	3	4	9	5
100	115	125	145	81	45	18	7	3	4	9	5

Dimensions in mm.

The type **877** is a compact double seal. It can work with pressurized or not pressurized external flush. It's bi-directional.
This seal has to be mounted with great care due to strict tolerances and compact dimensions.

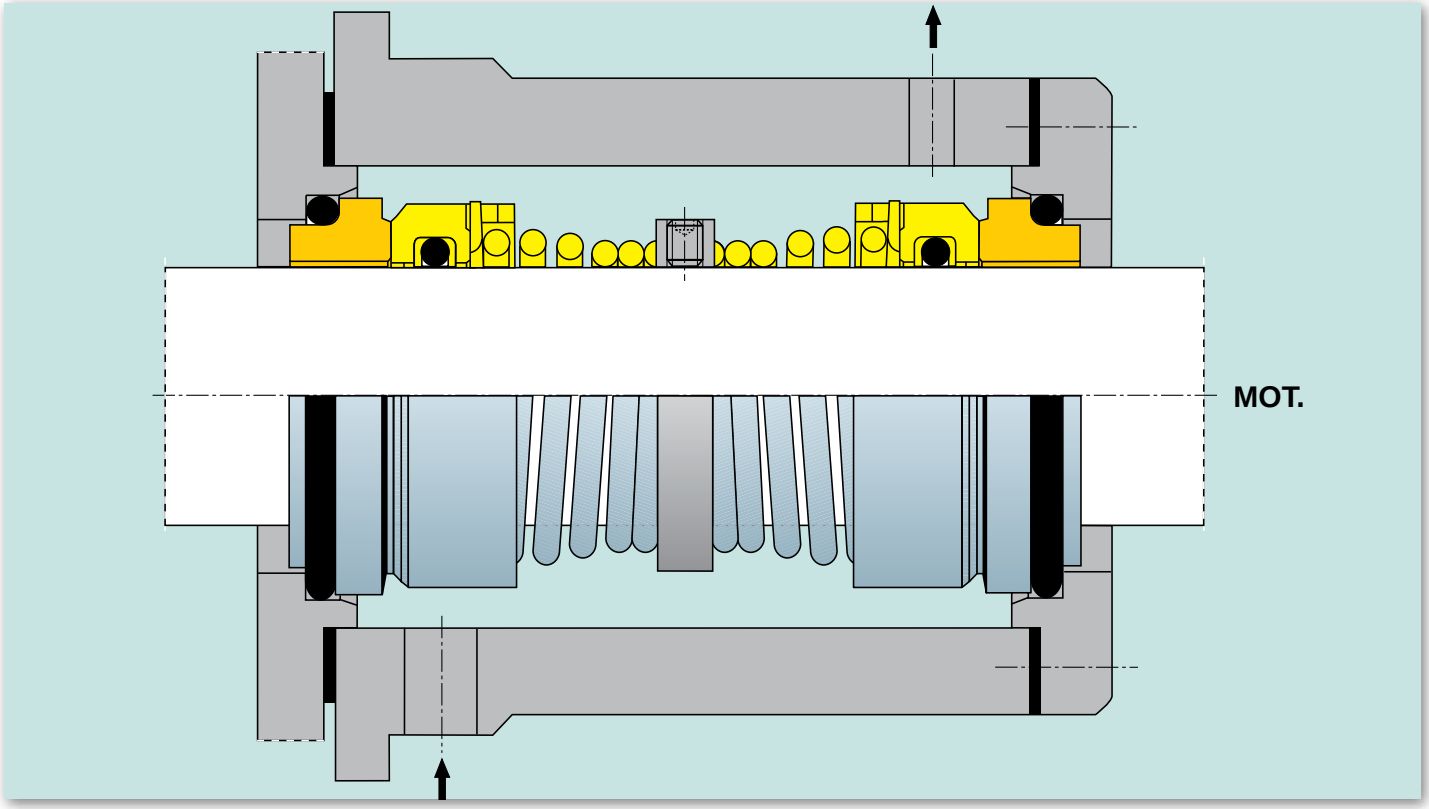
TYPE 877 - 877H										
POS.	COMPONENTS	STANDARD MATERIALS								
1	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1	
2	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3		
3	Rotary seal ring	D5	D6	J1	L1	K1	R1	X1	X3	X7
4	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1		
5	Spring	L1	X1							
6	Pins	H1								
7	Drive ring	L1	X1							
8	Shaft gasket	B1	E1	F1	N1	P1	W1	Y1		
9	Rotary seal ring	D5	D6	J1	L1	K1	R1	X1	X3	X7
10	Stationary seal ring	C4	K1	R1	V1	V2	V3	X3		
11	Stationary gasket	B1	C1	E1	F1	N1	P1	W1	Y1	
12	Grub screws	H1	L1	X1						
13	Elastic ring	L1	X1							

MAX. WORKING CONDITIONS

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

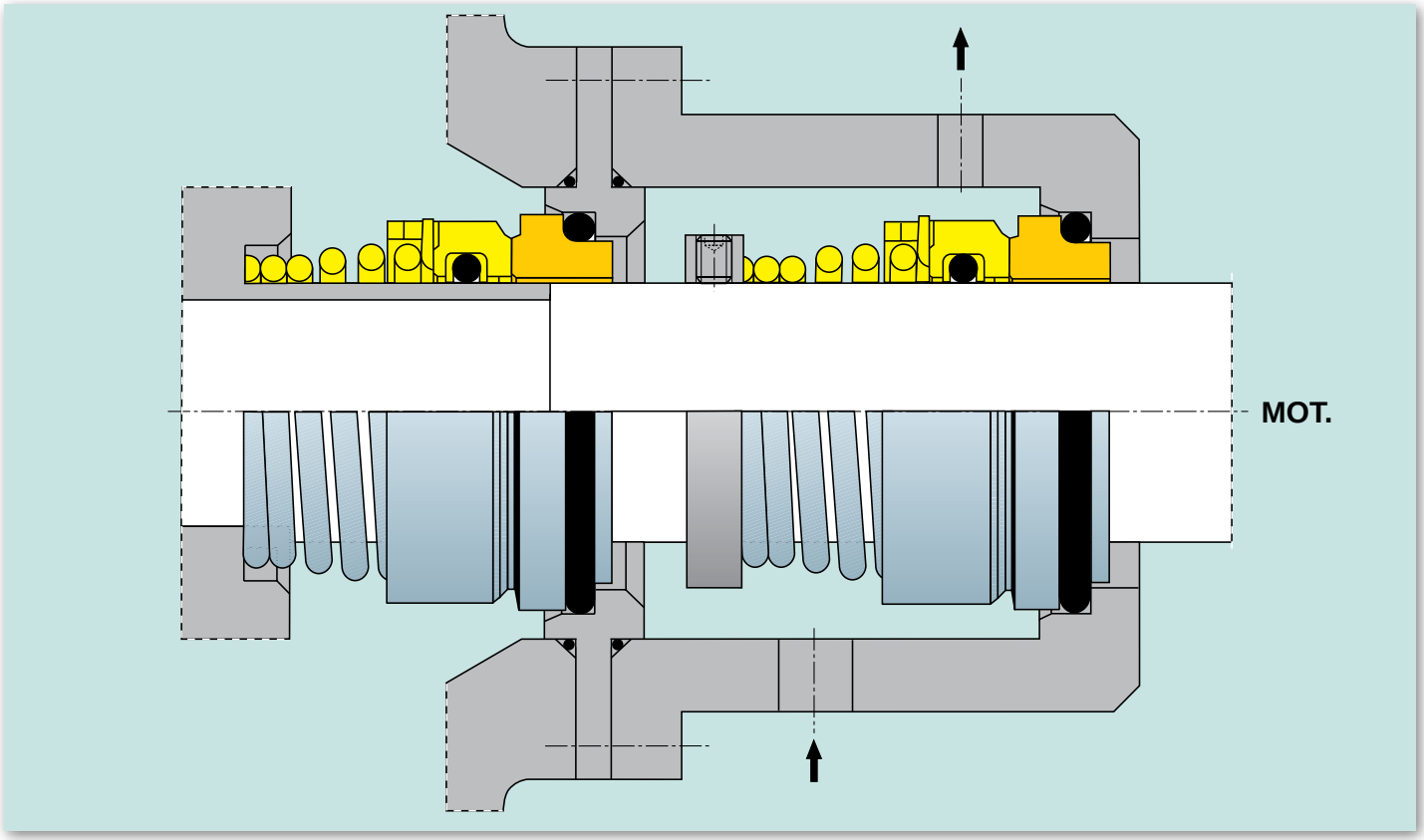
p ≤ 20 bar
t = –40 ÷ 200°C
v ≤ 15 m/s

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.

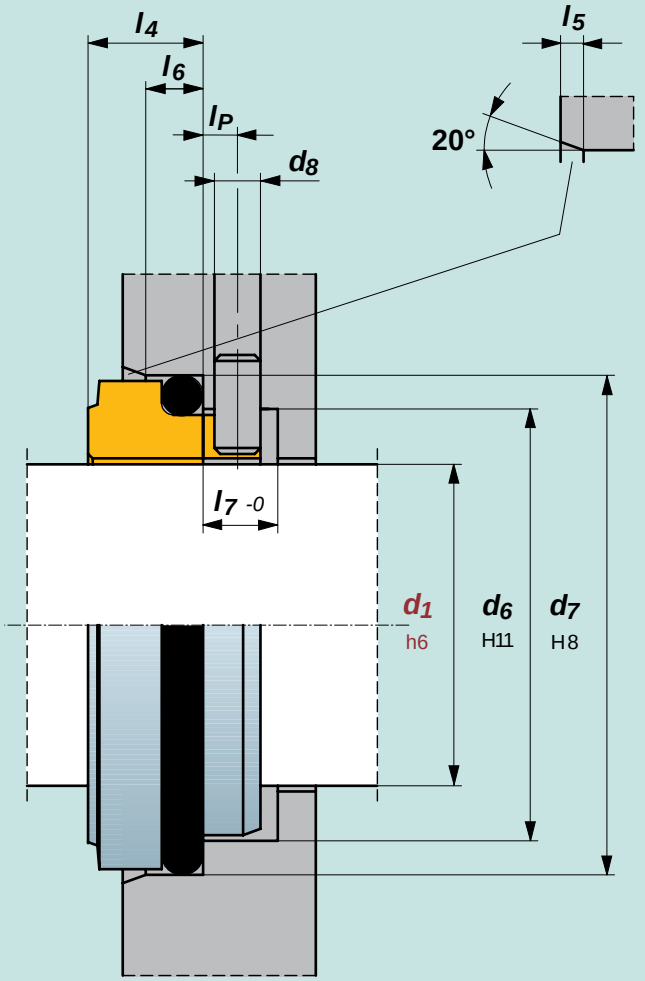


DUAL NON-PRESSURIZED (ex. tandem)

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.

SPECIAL STATIONARY SEAL RING

STATIONARY SEAL RING ROTEN C.CL

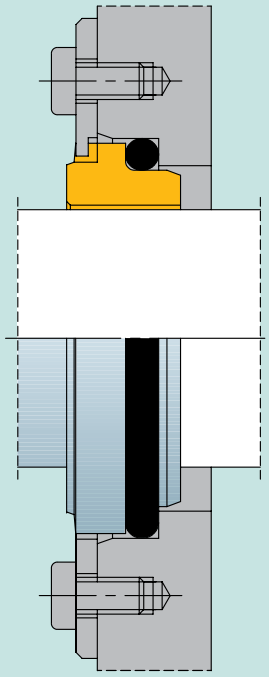


STATIONARY SEAL RING ROTEN CCL

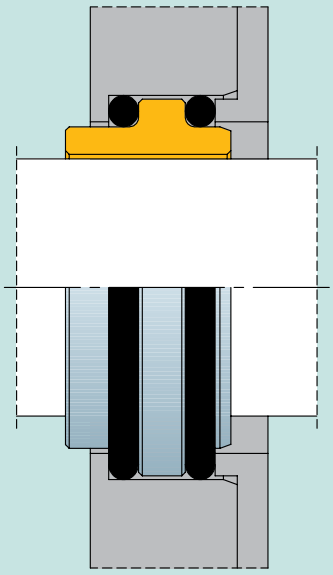
d_1	d_6	d_7	l_4	l_6	l_5	d_8	l_7	l_P
6	10,6	13,1	4,5	2	1,2	2	4	2
7÷9	13	17,1	5,5	2,8	1,2	2	4	2
10	14	18,1	5,5	2,8	1,2	2	4	2
11÷12	16,5	20,6	5,5	2,8	1,2	2	4	2
13÷14	19	23,1	6	2,8	1,2	2	4	2
15÷17	21	26,9	7	3,7	1,3	2,5	4,5	2,2
18÷20	25	30,9	8	3,7	1,3	3	5	2,5
21÷24	30	35,4	8	3,7	1,8	3,5	5,5	2,7
25÷27	33	38,2	8,5	3,7	1,8	4	6	3
28÷32	38	43,3	9	3,7	1,8	4	6	3
33÷37	45	53,5	11,5	5,4	2,1	5	7	3,5
38÷43	52	60,5	11,5	5,4	2,1	5	7	3,5
44÷49	57	65,5	11,5	5,4	2,1	5	7	3,5
50÷55	64	72,5	11,5	5,4	2,1	5	7	3,5
60	72	79,3	11,5	5,4	2,1	5	7,2	3,7
65	77	84,5	11,5	5,4	2,1	5	7,2	3,7
70	82	89,5	11,5	5,4	2,1	5	7,2	3,7
75	87	94,5	11,5	5,4	2,1	5	7,2	3,7
80	92	99,5	11,5	5,4	2,1	5	7,2	3,7
85	98	105,5	13,5	5,4	2,6	5	7,2	3,7
90	105	111,5	13,5	5,4	2,6	5	7,2	3,7
95	110	116,5	13,5	5,4	2,6	5	7,2	3,7
100	114	119,5	13,5	5,4	2,6	5	7,2	3,7
110	124	132,2	17,5	7,1	3,9	5	8	4,5
120	134	142,2	17,5	7,1	3,9	5	8	4,5
130	145	153,2	17,5	7,1	3,9	5	8	4,5
135	152	161,2	18,5	7,1	3,9	5	8	4,5
140	157	164,3	18,5	7,1	3,9	5	8	4,5
150	167	174,2	18,5	7,1	3,9	5	8	4,5
160	188	195	21	9,1	3,9	5	10	6

Dimensions in mm.

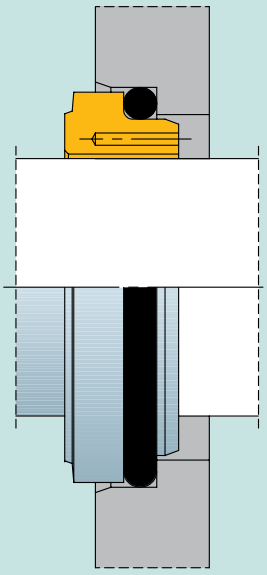
CC STATIONARY WITH RETAING AND ANTI-ROTATION FLANGE



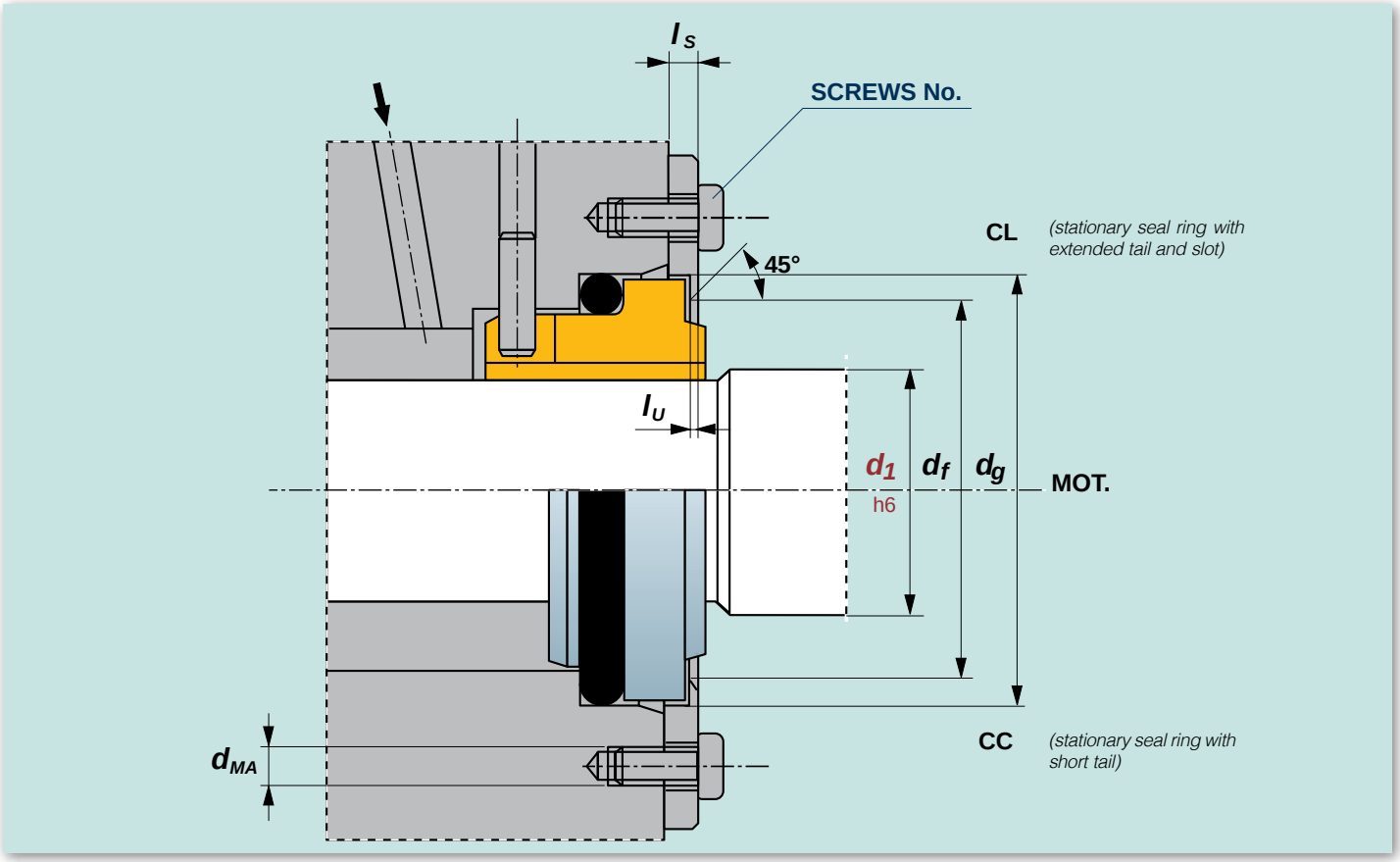
DOUBLE O-RING "T" SHAPED STATIONARY



STATIONARY WITH HOLE FOR SEAL TEMPERATURE MONITOR



STATIONARY WITH RETAINING PLATE



ROTEN

STATIONARY WITH RETAINING PLATE

d_1	d_f	d_g	l_s	l_u	$N._{SCR}$	d_{MA}
10	16,5	18,1	1,5	0,5	3	3
11÷12	19	20,6	1,5	0,5	3	3
13	21	23,1	1,5	0,5	3	3
14	21	23,1	1,5	0,5	3	3
15	24	26,9	1,5	0,5	3	3
16÷17	24	26,9	1,5	0,5	3	3
18	28	30,9	2	0,5	3	4
19	28	30,9	2	0,5	3	4
20	28	30,9	2	0,5	3	4
21÷22	33	35,4	2	0,5	3	4
23	33	35,4	2	0,5	3	4
24	33	35,4	2	0,5	3	4
25÷27	36	38,2	2,5	0,5	4	4
28	41,8	43,3	3	0,5	4	4
29÷32	41,8	43,3	3	0,5	4	4
33÷37	49	53,5	3	0,5	6	4
38÷43	56	60,5	3	0,5	6	4
44÷48	61	65,5	3	0,5	6	4
50	68,5	72,5	3,5	1	6	5
55	68,5	72,5	3,5	1	6	5
60	76	79,3	3,5	1	6	5
65	80,5	84,5	3,5	1	6	5
70	86,5	89,5	4	1,5	6	5
75	91,5	94,5	4	1,5	6	5
80	96,5	99,5	4	1,5	6	5
85	101,5	105,5	5	1,5	6	6
90	106,5	111,5	5	1,5	6	6
95	111,5	116,5	5	1,5	6	6
100	116,5	119,5	5	1,5	6	6
110	128	132,2	6	1,5	8	6
120	138	142,2	6	1,5	8	6
130	149	153,2	6	1,5	8	6
135	155	161,2	7	2	8	6
140	160	164,3	7	2	10	6
150	170	174,2	7	2	10	6

Dimensions in mm.

UNITEN EN 12756

STATIONARY WITH RETAINING PLATE

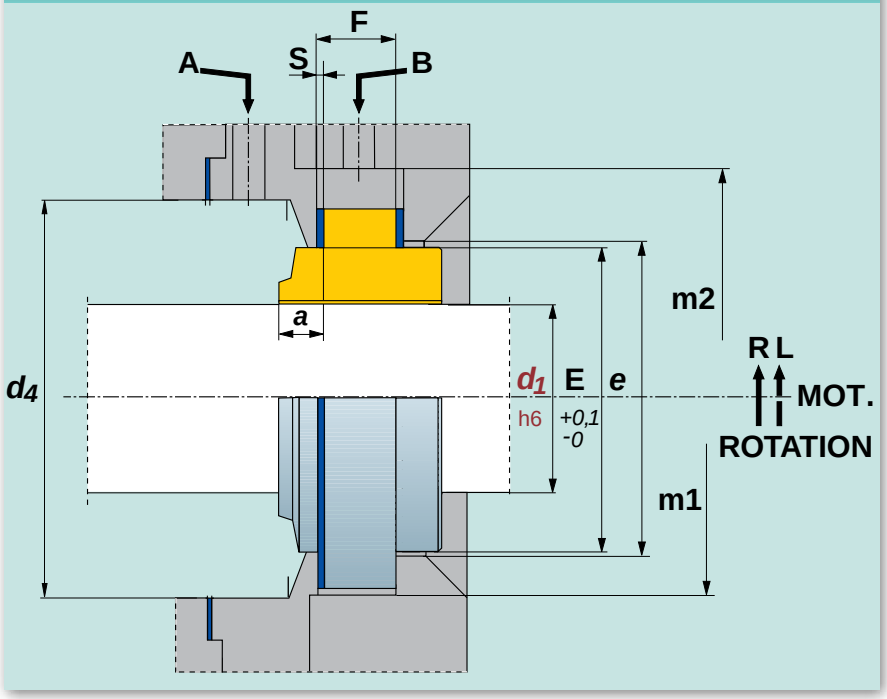
d_1	d_f	d_g	l_s	l_u	$N._{SCR}$	d_{MA}
10	18	21	1,2	0,6	3	3
12	20	23	1,2	0,6	3	3
14	22	25	1,2	0,6	3	3
16	23	27	1,2	0,6	3	4
18	29	33	2,5	0,6	3	4
20	31	35	2,5	0,6	4	4
22	33	37	2,5	0,6	4	4
24	35	39	2,5	0,6	4	4
25	36	40	2,5	0,6	6	4
28	39	43	2,5	0,6	6	4
30	41	45	2,5	0,6	6	4
32	44	48	2,5	0,6	6	5
33	44	48	2,5	0,6	6	5
35	46	50	2,5	0,6	6	5
38	52	56	4,2	0,6	6	5
40	54	58	4,2	0,6	6	5
43	57	61	4,2	0,6	6	5
45	59	63	4,2	0,6	6	6
48	62	66	4,8	0,6	6	6
50	66	70	4,8	0,7	6	6
53	69	73	4,8	0,7	6	6
55	71	75	4,8	0,7	8	6
58	74	78	4,8	0,7	8	6
60	76	80	4,8	0,7	8	6
63	79	83	4,8	0,7	8	6
65	81	85	4,8	0,7	10	6
68	86	90	5,5	0,7	10	6
70	88	92	5,5	0,7	10	6
75	93	97	5,5	0,7	10	6
80	101	105	7	0,8	10	6
85	106	110	7	0,8	10	6
90	111	115	7	0,8	10	6
95	116	120	7	0,8	10	6
100	121	125	7	0,8	10	6

Dimensions in mm.

The stationary seat with retaining plate is used for the seals for outside mounting arrangement, to avoid that the pressure coming from the back of the stationary, push out from his housing the stationary seat. This mounting arrangement can be used also for the seals mounted inside, where there's the possibility of strong vacuum, that can also pull out from his housing the stationary seat.

FLANGED STATIONARY SEAT TYPE F

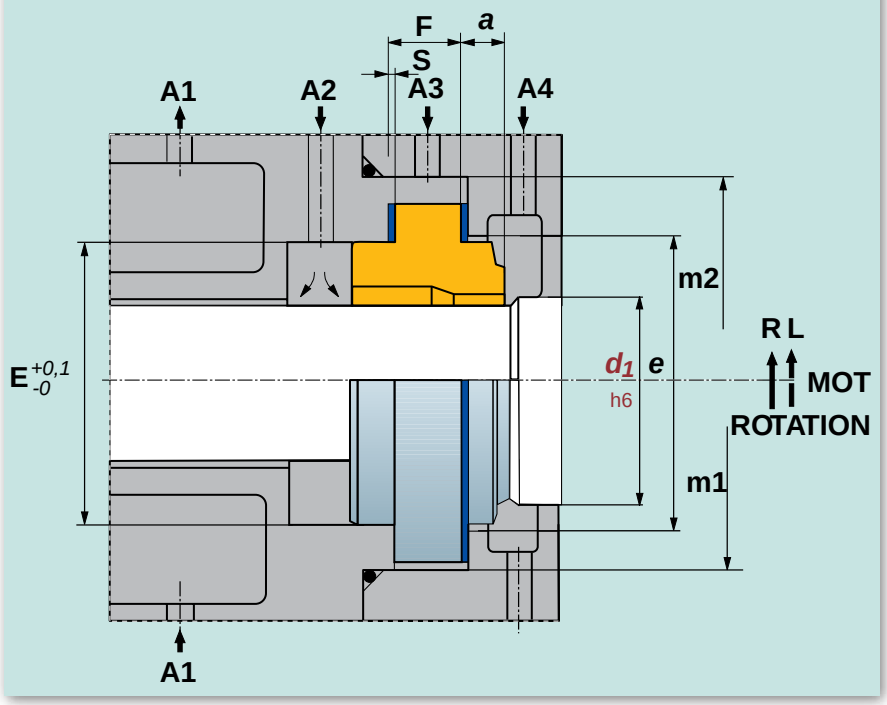
STATIONARY PART FOR INTERNAL SEALS



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 indepedent of the pumped medium

STATIONARY PART FOR EXTERNAL SEALS



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).

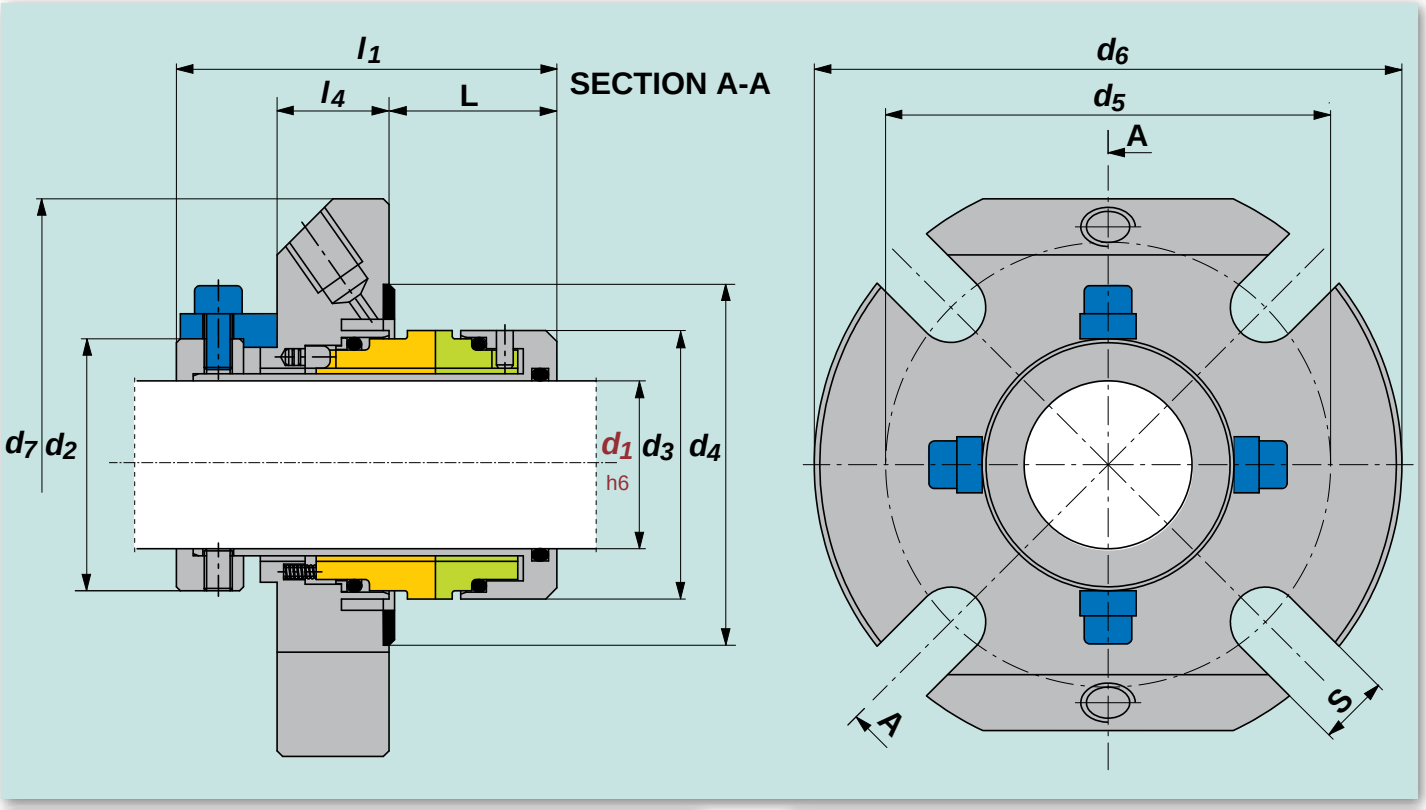
ROTEN

TYPE **F**

d_1	E	F	a	S	d_4	e	m_1	m_2
10	26	9	5	1	24	27,6	36,6	44
12	29	9	5	1	27	30,6	39,6	47
13	29	9	5	1	31	30,6	39,6	47
14	29	9	5	1	31	30,6	39,6	47
15	29	9	5	1	31	30,6	39,6	47
16	33	9	5	1	34	34,6	43,6	51
17	33	9	5	1	34	34,6	43,6	51
18	36	9	5	1	37	37,6	47,6	56
19	36	9	5	1	39	37,6	47,6	56
20	36	10	6	1	39	37,6	47,6	56
22	39	10	6	1	42	40,6	50,6	59
24	39	10	6	1	44	40,6	50,6	59
25	42	10	6	1	48	43,6	53,6	62
26	42	10	6	1	48	43,6	53,6	62
28	46	12	7	1	50	48	60	70
30	46	12	7	1	53	48	60	70
32	50	12	7	1	53	52	65	76
33	53	12	7	1	64	55	68	79
35	53	12	7	1	64	55	68	79
37	53	12	7	1	64	55	68	79
38	56	13	9	1	69	58	71	82
40	63	13	9	1	69	65	78	89
43	63	13	9	1	69	65	78	89
44	66	13	9	1	76	68	81	92
45	66	13	9	1	76	68	81	92
48	69	13	9	1	80	71	84	95
50	72	13	9	1	82	74	87	101
55	82	15,5	9	1,5	87	84,4	100,4	114
60	85	15,5	9	1,5	93	87,4	103,4	117
65	91	15,5	9	1,5	102	93,4	109,4	124
70	95	15,5	9	1,5	107	97,4	113,4	127
75	99	15,5	9	1,5	113	101,4	117,4	131
80	103	16,5	10	1,5	117	105,4	121,4	135
85	111	16,5	10	1,5	126	113,4	129,4	143
90	117	16,5	10	1,5	131	119,4	135,4	149
95	120	16,5	10	1,5	138	122,4	138,4	152
100	126	16,5	10	1,5	144	130	146	158
110	136	16,5	10	1,5	168	140	156	168
120	158	17,5	11	1,5	178	162	184	202
130	168	17,5	11	1,5	190	172	194	212
140	180	17,5	11	1,5	206	184	207	226
150	189	18,5	12	1,5	219	193	216	235
160	202	18,5	12	1,5	239	206	232	254

Dimensions in mm.
The dimension d_4 it's to be considered only for inside mounted seal.

TYPE 902



ROTEN

TYPE **902**

d_1 mm	d_1 inch	d_5	d_6	S	d_7	L	l_4	d_3	d_2	d_4	l_1
24	-	73	103	12,5	93	30	20	42,2	42,8	58	68
25	1,000	73	103	12,5	93	30	20	42,2	42,8	58	68
28	1,125	78	105	12,5	95	30	20	43	45,9	61	68
30	-	79,5	105	12,5	95	30	20	45	48	63	68
32	1,250	82,5	108	12,5	100	30	20	48,5	50	65,5	68
33	-	82,5	108	12,5	100	30	20	48,5	50	65,5	68
35	1,375	84,5	112	12,5	101	30	20	50	53	68	68
38	1,500	87	118	12,5	106	30	20	53	56	72	68
40	-	90	124	12,5	110	30	20	54,8	58	73	68
42	-	96	140	14,5	120	30	20	58	60,8	75,5	68
43	1,625	96	140	14,5	120	30	20	58	60,8	75,5	68
45	1,750	96	140	14,5	125	30	20	60	63	77,8	68
48	1,875	96	144	14,5	126	30	20	63	65,9	81	66,5
50	2,000	101	148	14,5	130	30	20	64,9	68	82,8	68
53	2,125	109,5	150	17,5	135	30	20	70	73	87	68
55	-	109,5	150	17,5	135	30	20	70	73	87	68
58	-	119,5	157	17,5	140	29,5	20,5	75	78	93	68
60	2,250	119,5	157	17,5	140	29,5	20,5	75	78	93	68
-	2,375	119,5	157	17,5	140	29,5	20,5	75	78	93	68
63	2,500	126,5	165	17,5	149	32	20	81,3	87,4	101,5	70
65	-	126,5	165	17,5	149	32	20	81,3	87,4	101,5	70
68	2,625	128,5	170	17,5	156	32	20	86,4	91,4	107	70
70	2,750	128,5	170	17,5	156	32	20	86,4	91,4	107	70
-	2,875	146	185	17,5	165	38	27	93	99,5	120,5	83
75	-	146	185	17,5	165	38	27	93	99,5	120,5	83
-	3,000	152,5	190	17,5	171	38	27	98	104,5	130	83
80	3,125	152,5	190	17,5	171	38	27	98	104,5	130	83
-	3,250	165,5	210	20,5	190	38	27	103	109,5	132,8	83
85	3,375	165,5	210	20,5	190	38	27	103	109,5	132,8	83
90	3,500	170,5	210	20,5	190	38	27	108	114,5	140,8	83
-	3,625	172	215	20,5	185	38	27	113	119,5	140,8	83
95	3,750	172	215	20,5	185	38	27	113	119,5	140,8	83
100	3,875	177	220	20,5	190	37	27	118,5	124,5	146,5	82

Dimensions in mm.

MAX. WORKING CONDITIONS

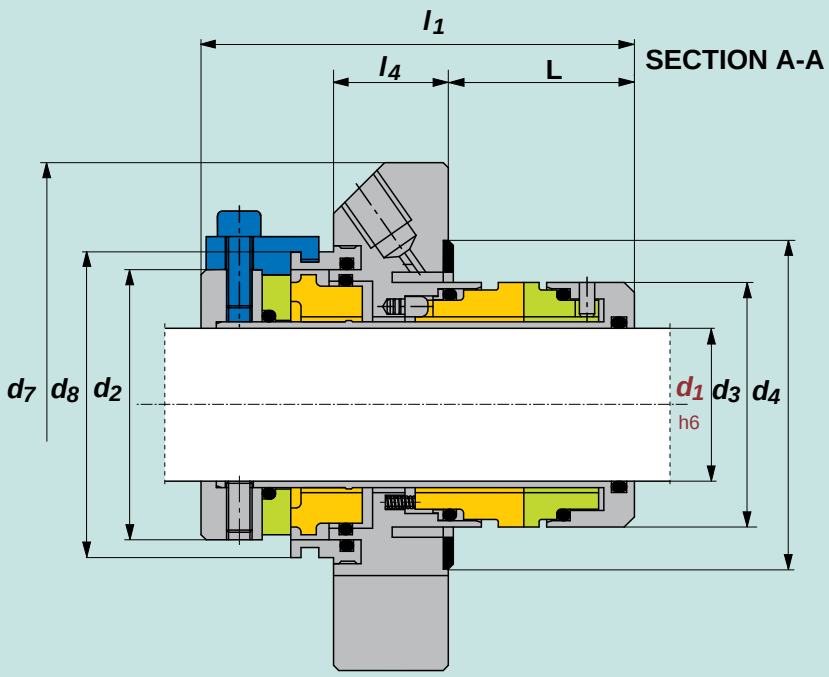
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

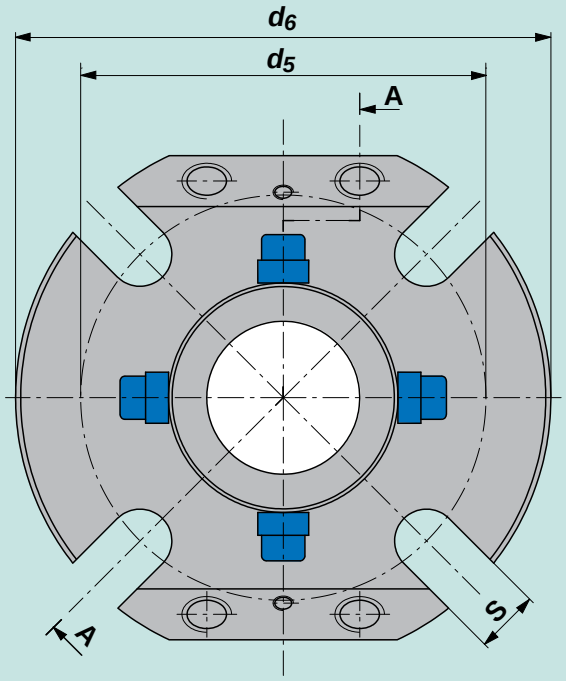
p ≤ 30 bar
t = –35 ÷ 200°C
v ≤ 15 m/s

Single cartridge balanced seal with flush.
Can be used to substitute the packing in the old pumps. It's very simple to install without necessity to check the installation dimensions. The springs are out of the media and this ensure no – clogging troubles free operation. The outside surface polished insure an easy clean of the part.

COMPONENTS	STANDARD MATERIALS
Housing, sleeve, drive ring, flanges	L1 X1
Faces	K1 R1 V1 V2 V3
Gaskets	B1 E1 F1 N1 P1 W1 Y1

TYPE 922





ROTEN

TYPE **922**

d_1 mm	d_1 inch	d_5	d_6	S	d_7	L	l_4	d_8	d_3	d_4	d_2	l_1
24	-	73	103	12,5	93	36,5	22,5	56	42,9	58	49	85
25	1,000	73	103	12,5	93	36,5	22,5	56	42,9	58	49	85
28	1,125	78	105	12,5	95	36,5	22,5	59	45,9	61	52	85
30	-	79,5	105	12,5	95	36,5	22,5	60	48	63	53	85
32	1,250	82,5	108	12,5	100	36,5	22,5	63	50	65,5	56	85
33	-	82,5	108	12,5	100	36,5	22,5	63	50	65,5	56	85
35	1,375	84,5	112	12,5	101	36,5	22,5	65	53	68	58	85
38	1,500	87	118	12,5	106	36,5	22,5	68	56	72	61	85
40	-	90	124	12,5	110	36,5	22,5	70	58	73	63	85
42	-	96	140	14,5	120	36,5	22,5	73	60,8	75,5	66	85
43	1,625	96	140	14,5	120	36,5	22,5	73	60,8	75,5	66	85
45	1,750	96	140	14,5	125	36,5	22,5	75	63	77,8	68	85
48	1,875	101	144	14,5	130	36,5	22,5	80	68	82,8	73	85
50	2,000	101	144	14,5	130	36,5	22,5	80	68	82,8	73	85
53	2,125	109,5	150	17,5	135	36,5	22,5	85,7	73	87	78,7	85
55	-	109,5	150	17,5	135	36,5	22,5	85,7	73	87	78,7	85
58	-	119,5	157	17,5	140	36,5	22,5	90	78	93	83	85
60	2,250	119,5	157	17,5	140	36,5	22,5	90	78	93	83	85
-	2,375	119,5	157	17,5	140	36,5	22,5	90	78	93	83	85
63	2,500	126,5	165	17,5	149	38,5	22,5	96	87,4	101,5	89	87
65	-	126,5	165	17,5	149	38,5	22,5	96	87,4	101,5	89	87
68	2,625	128,5	170	17,5	156	38,5	22,5	101	92	107	94	87
70	2,750	128,5	170	17,5	156	38,5	22,5	101	92	107	94	87
-	2,875	146	185	17,5	165	48	27	112,9	99,5	120,5	106	122,2
75	-	146	185	17,5	165	48	27	112,9	99,5	120,5	106	122,2
-	3,000	152,5	190	17,5	171	50,6	27	117	104,5	130	110	114,6
80	3,125	152,5	190	17,5	171	50,6	27	117	104,5	130	110	114,6
-	3,250	162	195	17,5	176	50,7	27	124	109,5	132,8	117	113,7
85	3,375	162	195	17,5	176	50,7	27	124	109,5	132,8	117	113,7
90	3,500	170,5	210	20,5	179,2	48,5	27	126,9	114,5	140,8	120	114
-	3,625	174	218,8	20,5	190	44,8	30	138	124,5	146,5	131	113,3
95	3,750	174	218,8	20,5	190	44,8	30	138	124,5	146,5	131	113,3
100	3,875	174	218,8	20,5	190	44,8	30	138	124,5	146,5	131	113,3

Dimensions in mm.

MAX. WORKING CONDITIONS

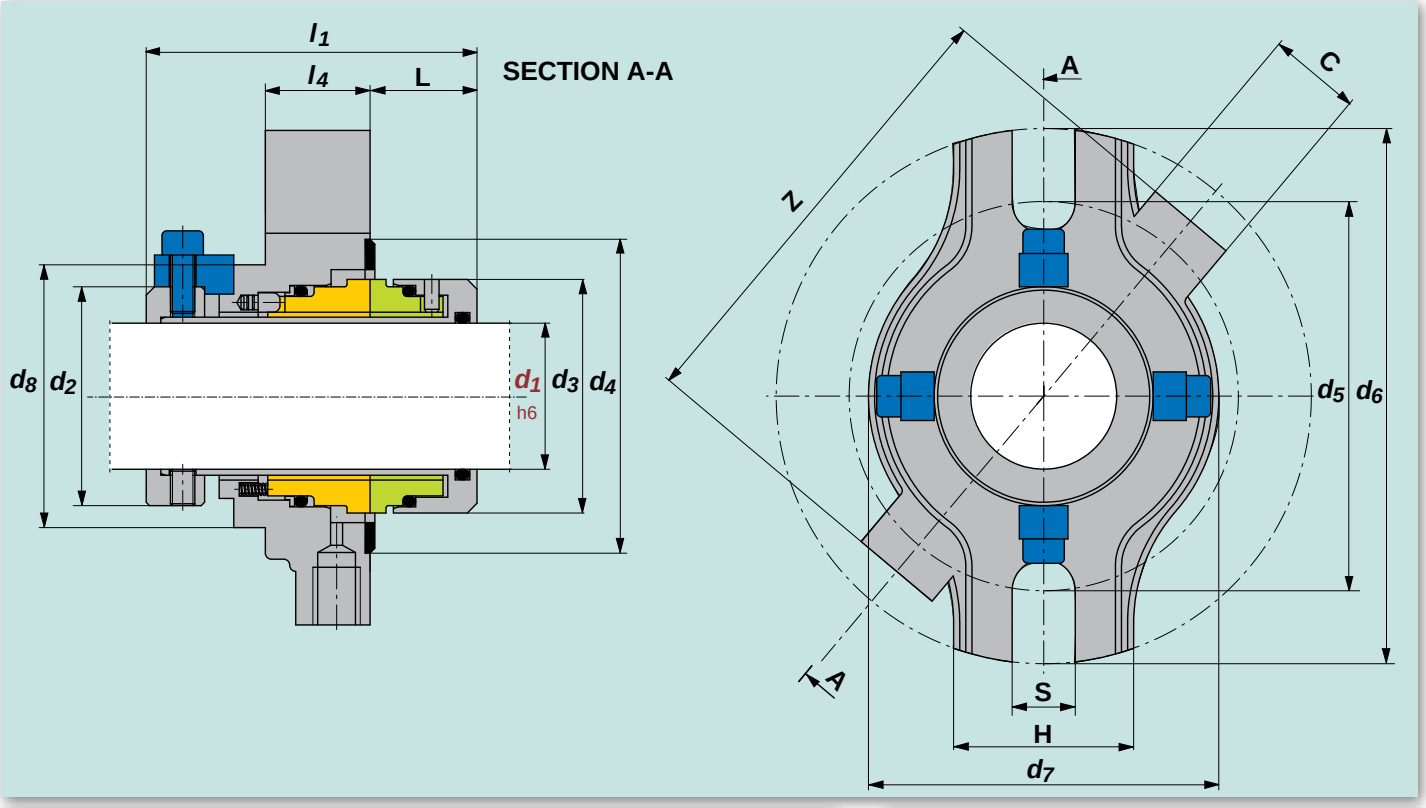
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 30 bar
t = –35 ÷ 200°C
v ≤ 15 m/s

Double cartridge balanced seal with flush barrier fluid capabilities. Can be used on all critical application where a double seal is needed (i.e. gluing media, hot or very dirt fluids...). It's very compact and very simple to install, without necessity to check the installation dimensions. The springs are out of the media and this ensure no – clogging troubles free operation. The outside surface polished insure an easy clean of the part.

COMPONENTS	STANDARD MATERIALS
Housing, sleeve, drive ring, flanges	L1 X1
Faces	K1 R1 V1 V2 V3
Gaskets	B1 E1 F1 N1 P1 W1 Y1

TYPE 942



ROTEN

TYPE **942**

d_1 mm	d_1 inch	d_7	d_5	d_6	S	H	C	Z	d_8	L	l_4	d_2	d_3	d_4	l_1
24	-	67	76	104	13	35	19	90	50	22	21,5	42,2	42,8	58	68
25	1,000	67	76	104	13	35	19	90	50	22	21,5	42,2	42,8	58	68
28	1,125	67	76	104	13	35	19	90	50	22	21,5	43	45,9	61	68
30	-	72	80	110	13	37	19	94	54	22	21,5	45	48	63	68
32	1,250	72	80	110	13	37	19	94	54	22	21,5	48,5	50	65,5	68
33	-	72	80	110	13	37	19	94	54	22	21,5	48,5	50	65,5	68
35	1,375	81	89	128	13	37	19	102	60	22	21,5	50	53	68	68
38	1,500	81	89	128	13	37	19	102	60	22	21,5	53	56	72	68
40	-	81	89	128	13	37	19	102	60	22	21,5	54,8	58	73	68
42	-	86	100	142	14	38	19	106	66	22	21,5	58	60,8	75,5	68
43	1,625	86	100	142	14	38	19	106	66	22	21,5	58	60,8	75,5	68
45	1,750	86	100	142	14	38	19	106	66	22	21,5	60	63	77,8	68
48	1,875	95	106	154	17	43	19	116	76	22	21,5	63	65,9	81	66,5
50	2,000	95	106	154	17	43	19	116	76	22	21,5	64,9	68	82,8	68
53	2,125	104	120	172	17	45	19	124	80	22	21,5	70	73	87	68
55	-	104	120	172	17	45	19	124	80	22	21,5	70	73	87	68
58	-	104	120	172	17	45	19	124	82	22	21,5	75	78	93	68
60	2,250	104	120	172	17	45	19	124	82	22	21,5	75	78	93	68
-	2,375	104	120	172	17	45	19	124	82	22	21,5	75	78	93	68
63	2,500	124	128,5	180	17	53	19	148	88	24	21,5	81,3	87,4	101,5	70
65	-	124	128,5	180	17	53	19	148	88	24	21,5	81,3	87,4	101,5	70
68	2,625	124	128,5	180	17	53	19	148	94	24	21,5	86,4	91,4	107	70
70	2,750	124	128,5	180	17	53	19	148	94	24	21,5	86,4	91,4	107	70
-	2,875	136	148	200	19	57,5	19	168	104	37	28,5	93	99,5	120,5	83
75	-	136	148	200	19	57,5	19	168	104	37	28,5	93	99,5	120,5	83
-	3,000	136	148	200	19	57,5	19	168	104	35	28,5	98	104,5	130	83
80	3,125	136	148	200	19	57,5	19	168	104	35	28,5	98	104,5	130	83
-	3,250	150	160	220	20	68	19	170	-	33	32	103	109,5	132,8	83
85	3,375	150	160	220	20	68	19	170	-	33	32	103	109,5	132,8	83
90	3,500	150	160	220	20	68	19	170	-	38	27	108	114,5	140,8	83
-	3,625	164	176	240	20	74	19	182	-	32	34	113	119,5	140,8	83
95	3,750	164	176	240	20	74	19	182	-	32	34	113	119,5	140,8	83
100	3,875	164	176	240	20	74	19	182	-	30	34	118,5	124,5	146,5	82

Dimensions in mm.

MAX. WORKING CONDITIONS

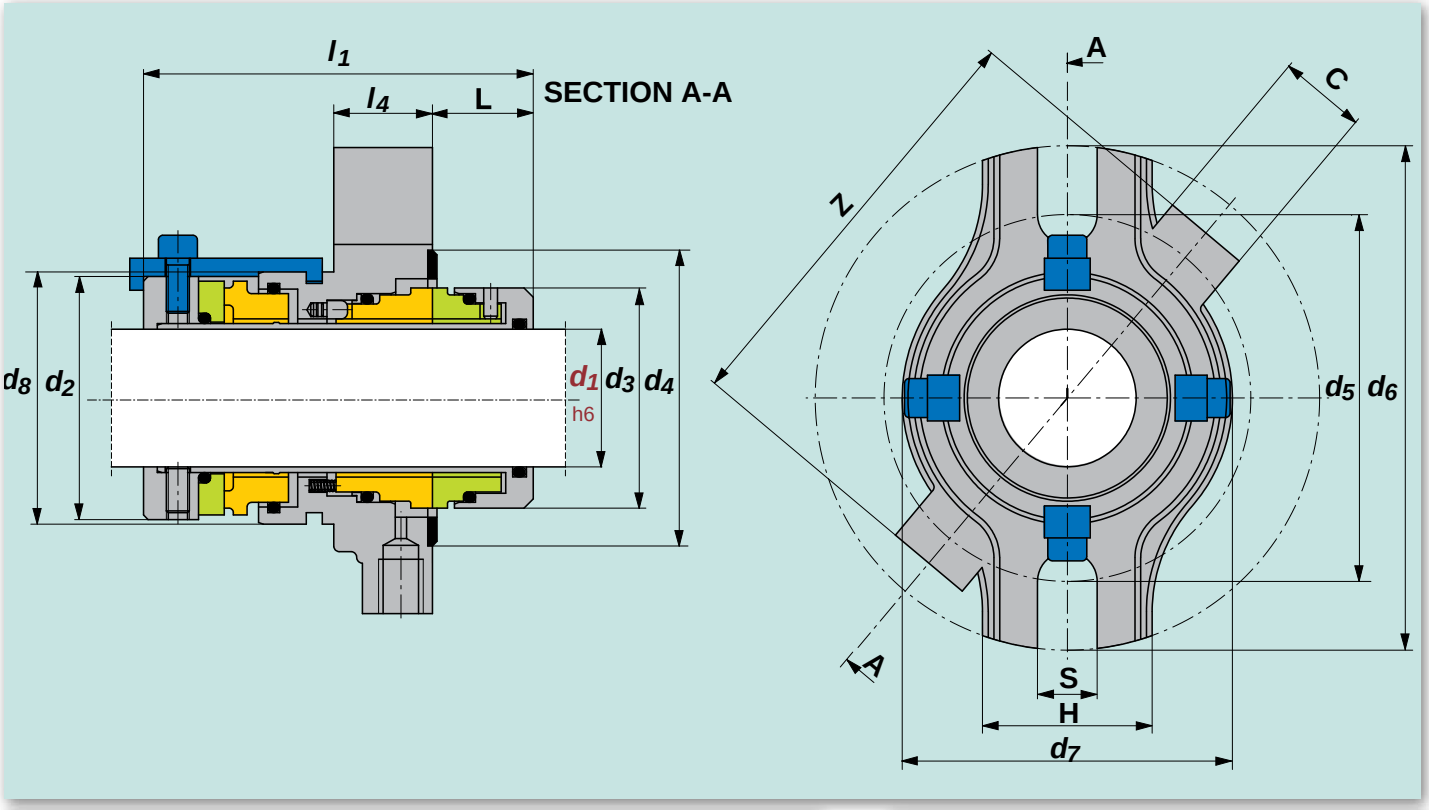
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 30 bar
t = –35 ÷ 200°C
v ≤ 15 m/s

COMPONENTS	STANDARD MATERIALS
Housing, sleeve, drive ring, flanges	L1 X1
Faces	K1 R1 V1 V2 V3
Gaskets	B1 E1 F1 N1 P1 W1 Y1

Single cartridge balanced seal with flush and reduced flange.
Can be used to substitute the packing in the old pumps. It's very simple to install without necessity to check the installation dimensions. It's very compact and with a good cost/performance ratio. The spring is out of the media and this ensure no – clogging troubles free operation.

TYPE 972



ROTEN

TYPE **972**

d_1 mm	d_1 inch	d_7	d_5	d_6	d_8	S	H	C	Z	d_4	d_2	d_3	l_1	L	l_4
24	-	67	76	104	51	13	35	19	90	58	49	42,9	85	22	21,5
25	1,000	67	76	104	51	13	35	19	90	58	49	42,9	85	22	21,5
28	1,125	67	76	104	53,8	13	35	19	90	61	52	45,5	85	22	21,5
30	-	72	80	110	55	13	37	19	94	63	53	48	85	22	21,5
32	1,250	72	80	110	58	13	37	19	94	65,5	56	50	85	22	21,5
33	-	72	80	110	58	13	37	19	94	65,5	56	50	85	22	21,5
35	1,375	72	80	110	60	13	37	19	94	68	58	53	85	22	21,5
38	1,500	81	89	128	63	13	37	19	102	72	61	56	85	22	21,5
40	-	81	89	128	65	13	37	19	102	73	63	58	85	22	21,5
42	-	86	100	142	68	14	38	19	106	75,5	66	60,8	85	22	21,5
43	1,625	86	100	142	68	14	38	19	106	75,5	66	60,8	85	22	21,5
45	1,750	86	100	142	70	14	38	19	106	77,8	68	63	85	22	21,5
48	1,875	95	106	154	75	17	43	19	116	82,8	73	68	85	22	21,5
50	2,000	95	106	154	75	17	43	19	116	82,8	73	68	85	22	21,5
53	2,125	95	106	154	80,7	17	43	19	116	87	78,7	73	85	22	21,5
55	-	95	106	154	80,7	17	43	19	116	87	78,7	73	85	22	21,5
58	-	104	120	172	85	17	45	19	124	93	83	78	85	22	21,5
60	2,250	104	120	172	85	17	45	19	124	93	83	78	85	22	21,5
-	2,375	104	120	172	85	17	45	19	124	93	83	78	85	22	21,5
63	2,500	124	128,5	180	91	17	53	19	148	101,5	89	87,4	87	24	21,5
65	-	124	128,5	180	91	17	53	19	148	101,5	89	87,4	87	24	21,5
68	2,625	124	128,5	180	96	17	53	19	148	107	94	92	87	24	21,5
70	2,750	124	128,5	180	96	17	53	19	148	107	94	92	87	24	21,5
-	2,875	136	148	200	110	19	57,5	19	168	120,5	106	99,5	122,2	34	28,5
75	-	136	148	200	110	19	57,5	19	168	120,5	106	99,5	122,2	34	28,5
-	3,000	136	148	200	114	19	57,5	19	168	130	110	104,5	114,6	35	28,5
80	3,125	136	148	200	114	19	57,5	19	168	130	110	104,5	114,6	35	28,5
-	3,250	150	160	220	124	20	68	19	170	132,8	117	109,5	113,7	38	27
85	3,375	150	160	220	124	20	68	19	170	132,8	117	109,5	113,7	38	27
90	3,500	150	160	220	124	20	68	19	170	140,8	120	114,5	114	38	27
-	3,625	164	176	240	135	20	74	19	182	146,5	131	124,5	113,3	33	30
95	3,750	164	176	240	135	20	74	19	182	146,5	131	124,5	113,3	33	30
100	3,875	164	176	240	135	20	74	19	182	146,5	131	124,5	113,3	33	30

Dimensions in mm.

MAX. WORKING CONDITIONS

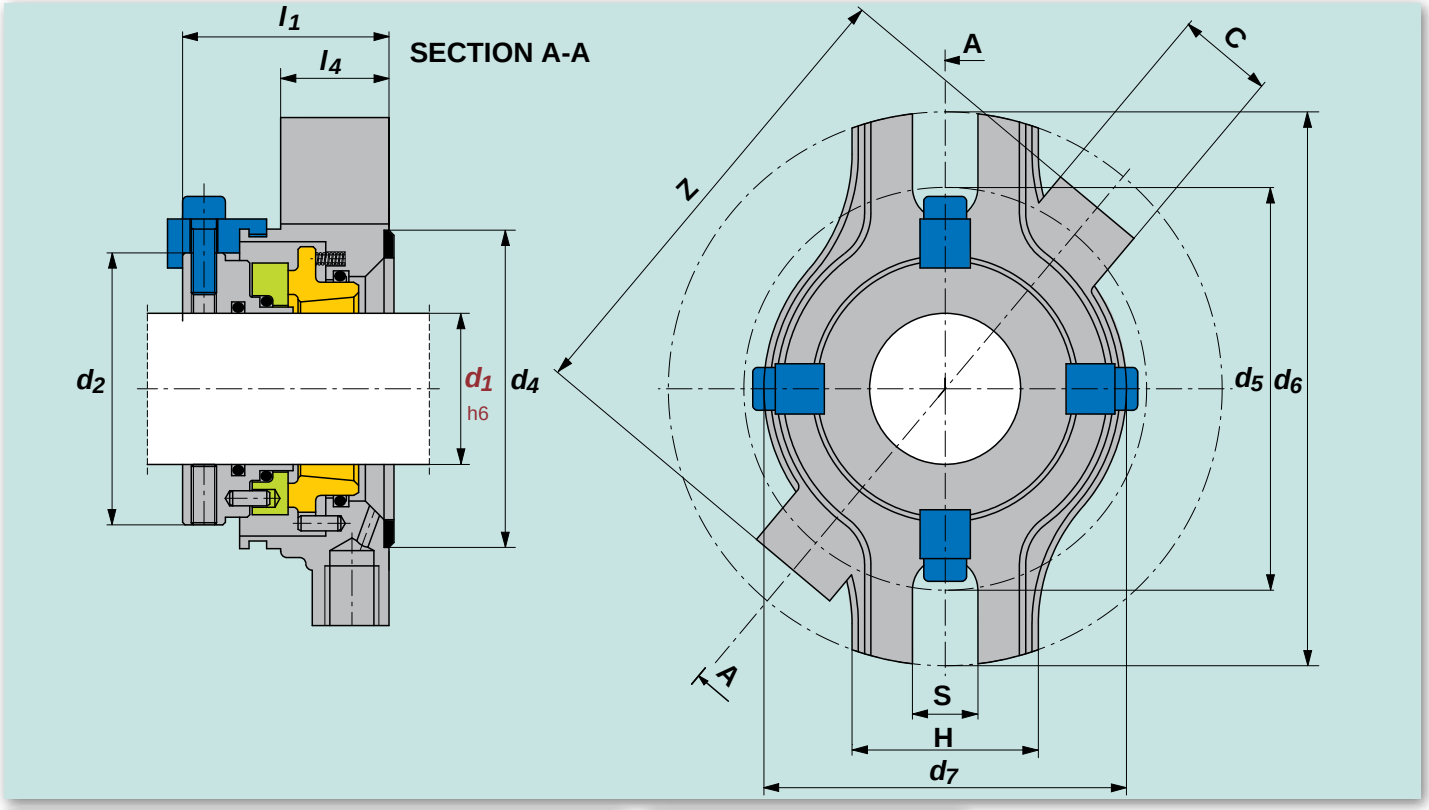
These depend on: ø shaft, pressure, speed, temperature and fluid to be sealed.

p ≤ 30 bar
t = –35 ÷ 200°C
v ≤ 15 m/s

COMPONENTS	STANDARD MATERIALS						
Housing, sleeve, drive ring, flanges	L1	X1					
Faces	K1	R1	V1	V2	V3		
Gaskets	B1	E1	F1	N1	P1	W1	Y1

Double cartridge balanced seal with flush barrier fluid capabilities and reduced flange. Can be used on all critical application where a double seal is needed (i.e. gluing media, hot or very dirt fluids...). It's very compact and very simple to install, without necessity to check the installation dimensions. The springs are out of the media and this ensure no – clogging troubles free operation. The reduced flange give the possibility to install the seal also when available space are limited.

TYPE 600SL



ROTEN

TYPE **600SL**

d_1	d_2	d_4	d_7	d_5	d_6	l_1	l_4	C	H	S	Z
24	42	58	67	76	104	41	22,5	19	35	13	90
25	42	58	67	76	104	41	22,5	19	35	13	90
28	42	61	67	76	104	41	23	19	35	13	90
30	54	63	72	80	110	41	21,5	19	37	13	94
32	54	65,5	72	80	110	41	21,5	19	37	13	94
33	54	65,5	72	80	110	41	21,5	19	37	13	94
35	61	68	81	89	128	41	21,5	19	37	13	102
38	61	70	81	89	128	41	21,5	19	37	13	102
40	61	72,8	81	89	128	41	21,5	19	37	13	102
42	65	75	86	100	142	41	21,5	19	38	14	106
43	65	75	86	100	142	41 2	1,5	19	38	14	106
45	65	77,8	86	100	142	41	21,5	19	38	14	106
48	74	82,8	95	106	154	41	21,5	19	43	17	116
50	74	82,8	95	106	154	41	21,5	19	43	17	116
53	74	87	95	106	154	41	21,5	19	43	17	116
55	80	87	104	120	172	41	21,5	19	45	17	124
58	80	93	104	120	172	41	21,5	19	45	17	124
60	80	93	104	120	172	41	21,5	19	45	17	124
65	87	101,5	124	134	180	45	26,5	19	53	17	136
70	87	107	124	134	180	50	26,5	19	53	17	136
75	113	120,5	136	148	200	55	26,5	19	59	19	148
80	114	130	136	148	200	55	26,5	19	59	19	148
85	123	135	150	160	220	55	26,5	19	68	20	160
90	123	141	150	160	220	55	26,5	19	68	20	160
95	134	141	164	176	240	55	26,5	19	74	20	172
100	134	152	164	176	240	55	26,5	19	74	20	172
105	134	152	164	176	240	55	26,5	19	74	20	172

Dimensions in mm.

MAX. WORKING CONDITIONS

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

p ≤ 30 bar
t = –35 ÷ 200°C
v ≤ 15 m/s

COMPONENTS	STANDARD MATERIALS
Housing, sleeve, drive ring, flanges	L1 X1
Faces	K1 R1 V1 V2 V3
Gaskets	B1 E1 F1 N1 P1 W1 Y1

Single cartridge balanced seal with flush.

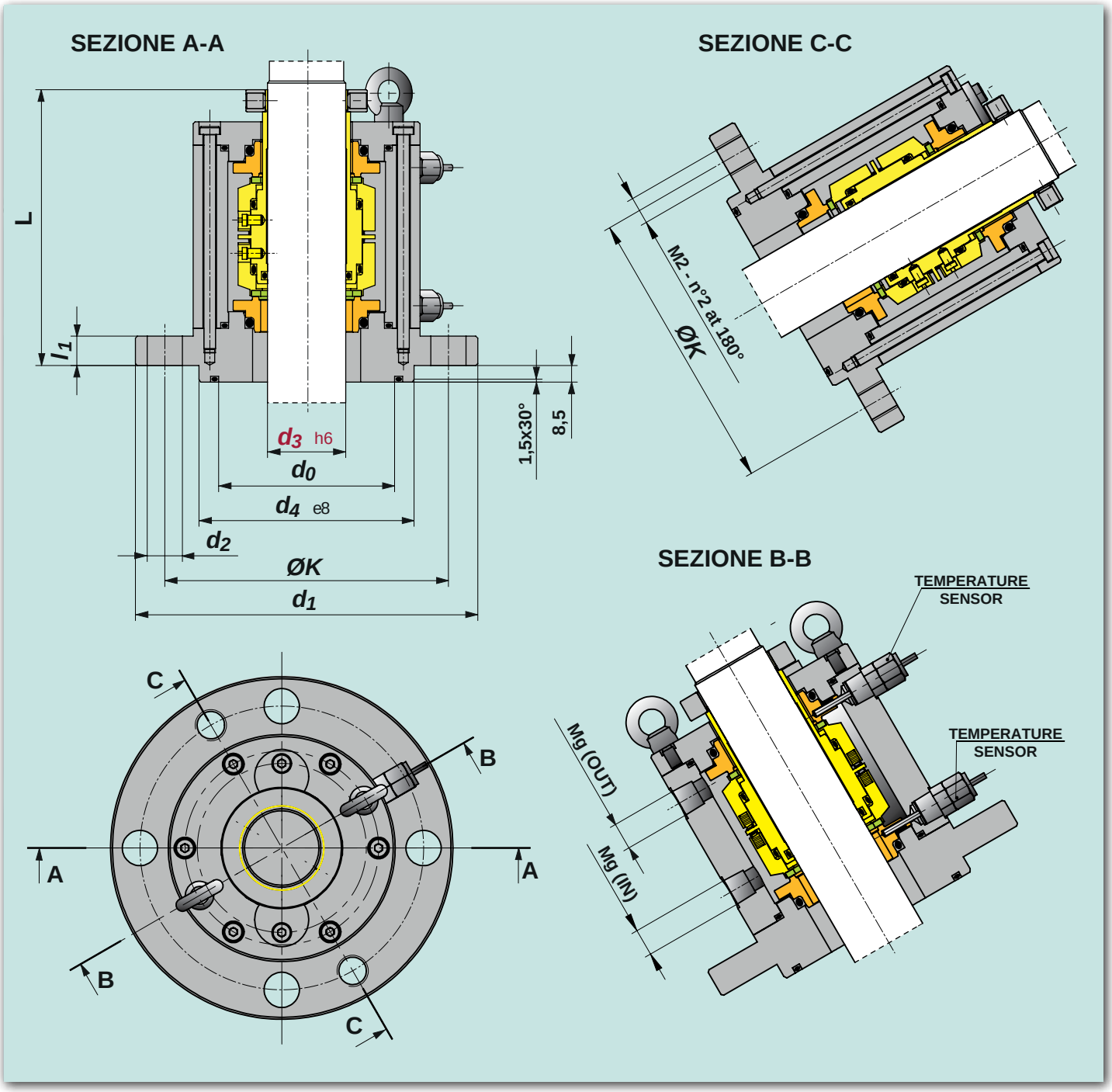
It's a cartridge seal without sleeve that give great flexibility to this seal. It's very simple to install without necessity to check the installation dimensions. The springs are out of the media and this ensure no – clogging troubles free operation. The conical form of the stationary seat increase the flush capabilities of the media. It has a good cost/performance ratio. All seal parts are out of stuffing box and this gives more fluid circulation on the seal area.

TYPE 977-977A

The cartridge **977** has been certified by TÜV North (Certificate TÜV 08 ATEX 353470 X) for applications in Category 1 Atex. With the installed thermocouples it is possible to monitor the temperature close to the faces. This is the area where heat is generated. The materials of the seal faces are dependant on the barrier fluid, which can be water or inert gas and these determine the application limits. The table shows the dimensions of the standard seal but we can produce the seal to customer dimensions if required by the application.
The type 977A has the bearing integrated on the seal.

The cartridge type 977 can be also supplied without Atex certification.

TYPE 977



ROTEN

TYPE **977**

d_3	d_1	d_4	d_0	L	l_1	ØK	n x d2	M2	Mg
40	175	110	90	170	15	145	4x18	M16	G 3/8
60	240	176	135	185	17	210	8x18	M16	G 3/8
80	275	204	155	200	20	240	8x22	M20	G1/2
100	305	234	190	210	20	270	8x22	M20	G1/2
120	330	260	215	240	20	295	8x22	M20	G1/2
140	395	313	250	255	20	350	12x22	M20	G1/2
160	395	313	265	260	25	350	12x22	M20	G1/2
180	445	364	310	275	25	400	12x22	M20	G1/2
200	445	364	310	290	25	400	12x22	M20	G1/2
220	505	422	340	320	25	460	16x22	M20	G1/2

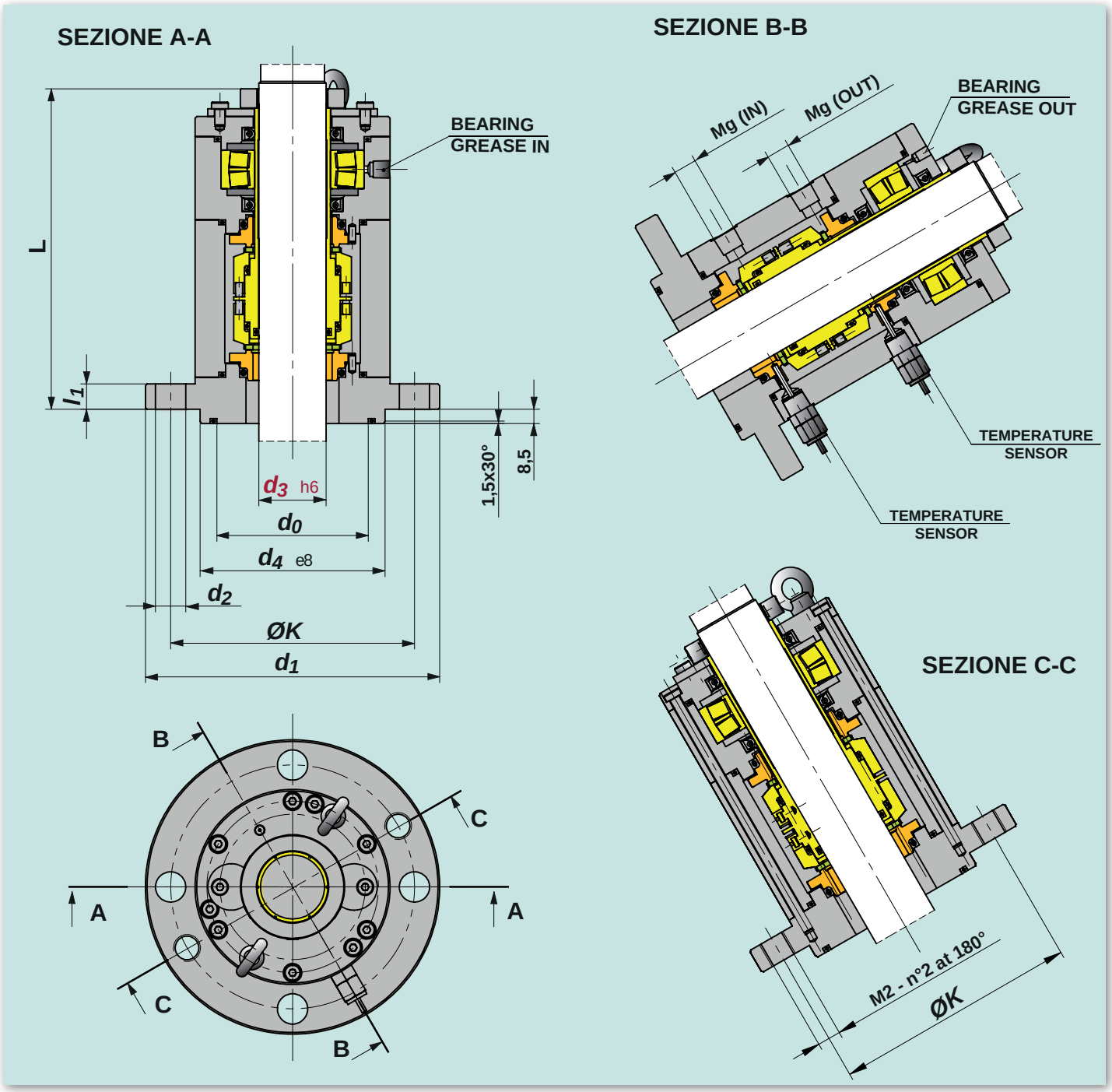
Dimensions in mm. Additional sizes on request.

MAX. WORKING CONDITIONS

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

p ≤ 40 bar
t = –50 ÷ 300°C
v ≤ 0-5 m/s

COMPONENTS	STANDARD MATERIALS
Housing, sleeve, drive ring, flanges	L1 X1
Faces	K1 R1 V1 V2 V3
Gaskets	B1 E1 F1 N1 P1 W1 Y1



ROTEN

TYPE **977A with bearing**

d_3	d_1	d_4	d_0	L	l_1	ØK	n x d2	M2	Mg
40	175	110	90	210	15	145	4x18	M16	G 3/8
60	240	176	135	230	17	210	8x18	M16	G 3/8
80	275	204	155	270	20	240	8x22	M20	G1/2
100	305	234	190	270	20	270	8x22	M20	G1/2
120	330	260	215	300	20	295	8x22	M20	G1/2
140	395	313	250	315	20	350	12x22	M20	G1/2
160	395	313	265	315	25	350	12x22	M20	G1/2
180	445	364	310	330	25	400	12x22	M20	G1/2
200	445	364	310	350	25	400	12x22	M20	G1/2
220	505	422	340	370	25	460	16x22	M20	G1/2

Dimensions in mm. Additional sizes on request.

MAX. WORKING CONDITIONS

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

p ≤ 40 bar
t = –50 ÷ 300°C
v ≤ 0-5 m/s

COMPONENTS	STANDARD MATERIALS
Housing, sleeve, drive ring, flanges	L1 X1
Faces	K1 R1 V1 V2 V3
Gaskets	B1 E1 F1 N1 P1 W1 Y1

TITANIUM MECHANICAL SEALS

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

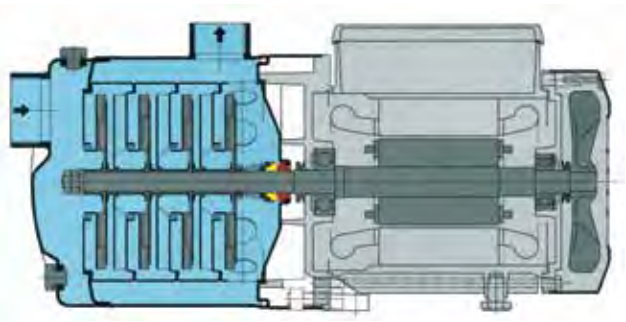
The **TITANIUM** seals are used in very aggressive application where the stainless steel it's no more enough to resist to corrosion.
The titanium it's a not easy to work material. However Roten with his long experience and modern technology was able to produce seals with Titanium parts.

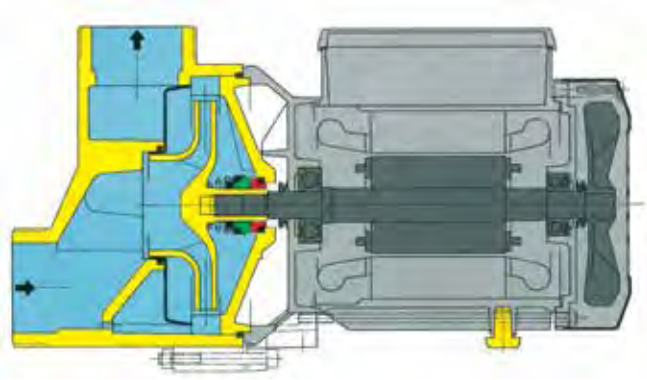
External mounting seal type **7KH**.

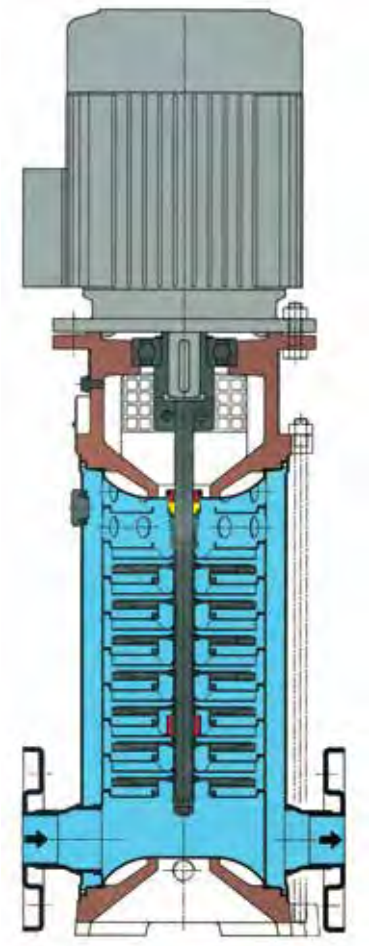
Balanced seal type **82EH** for high pressure, bi-directional, all metal parts in titanium with SiC faces.

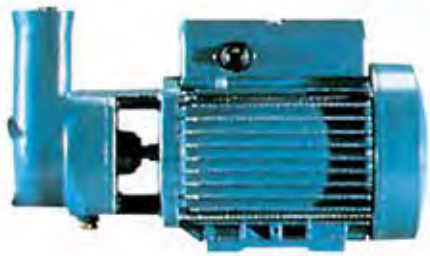
ROTEN s.r.l.

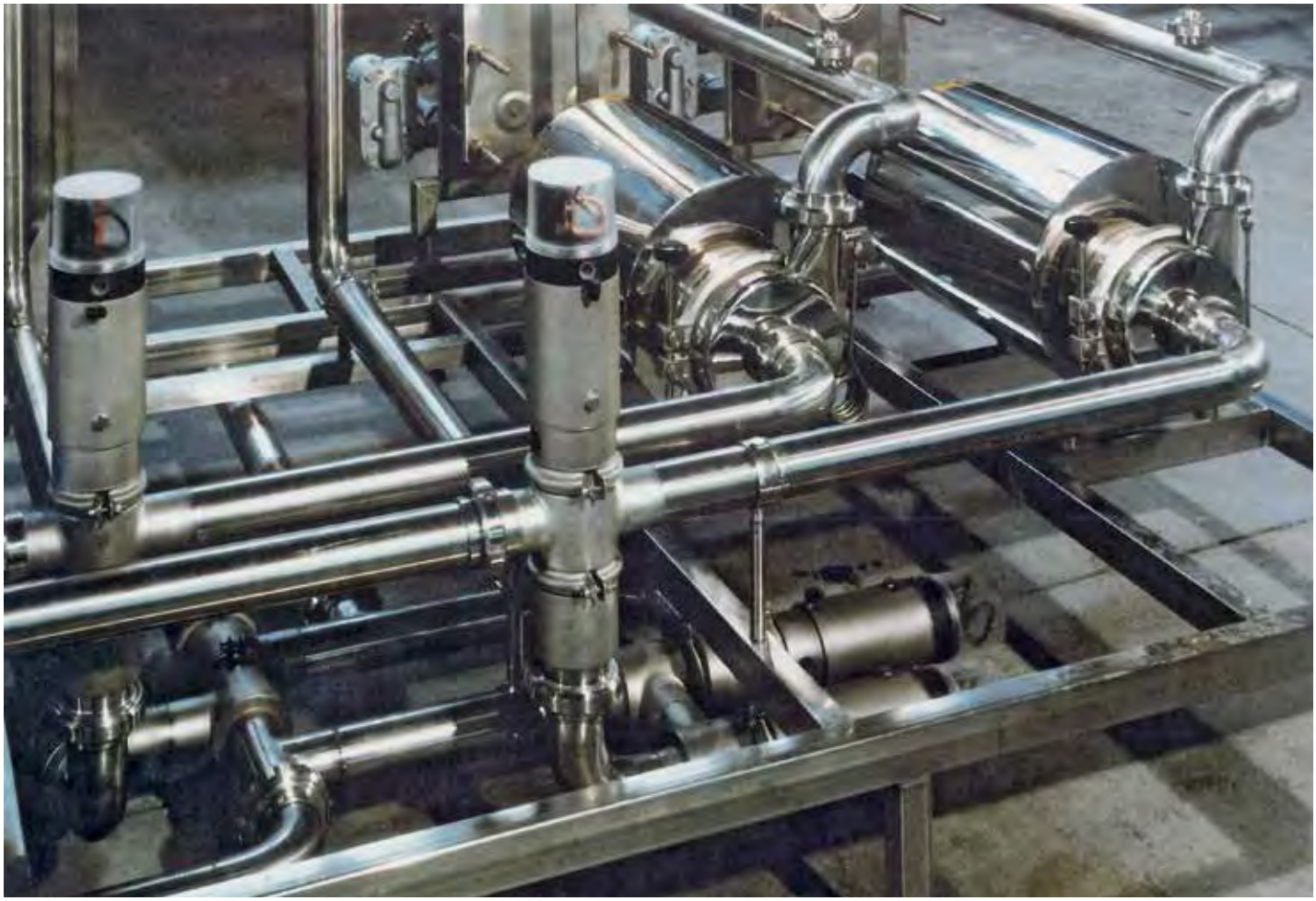
APPLICATIONS



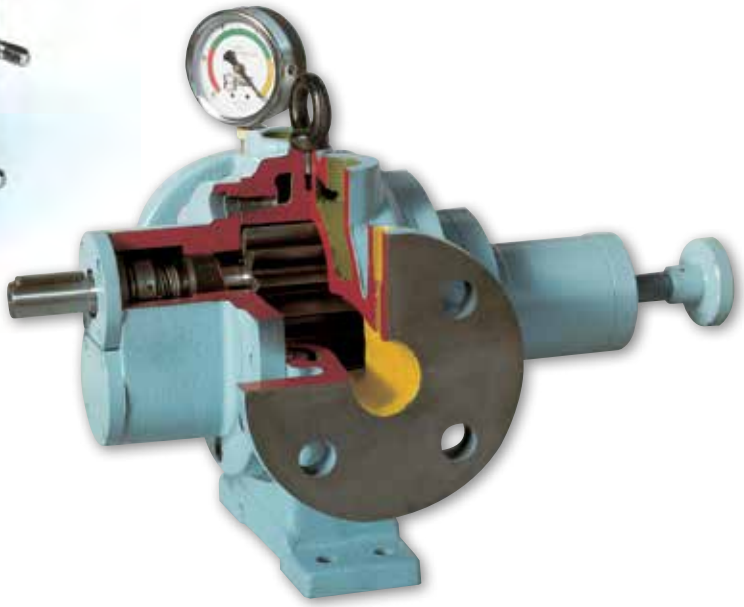


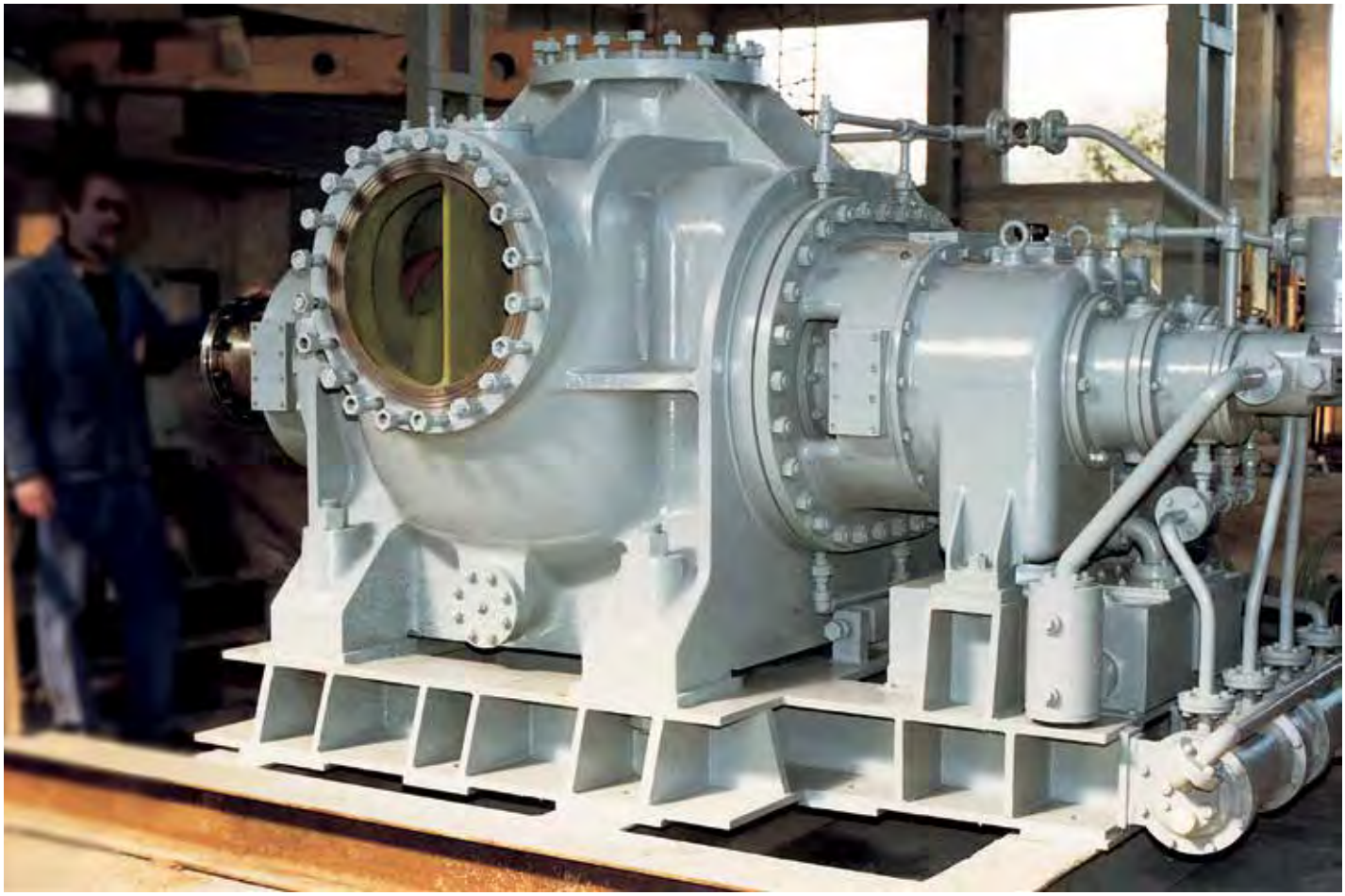


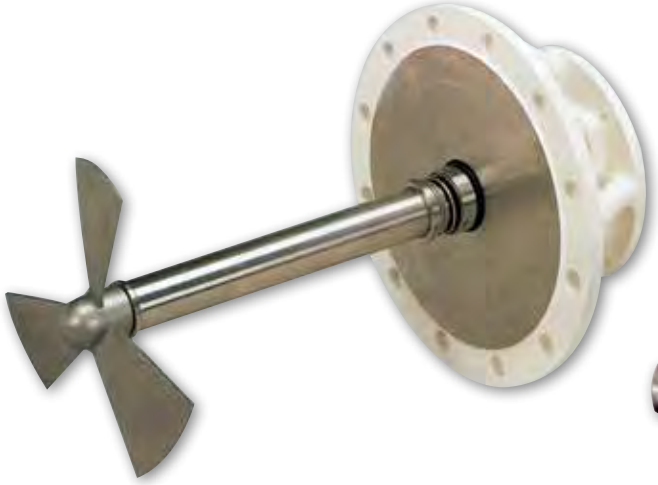




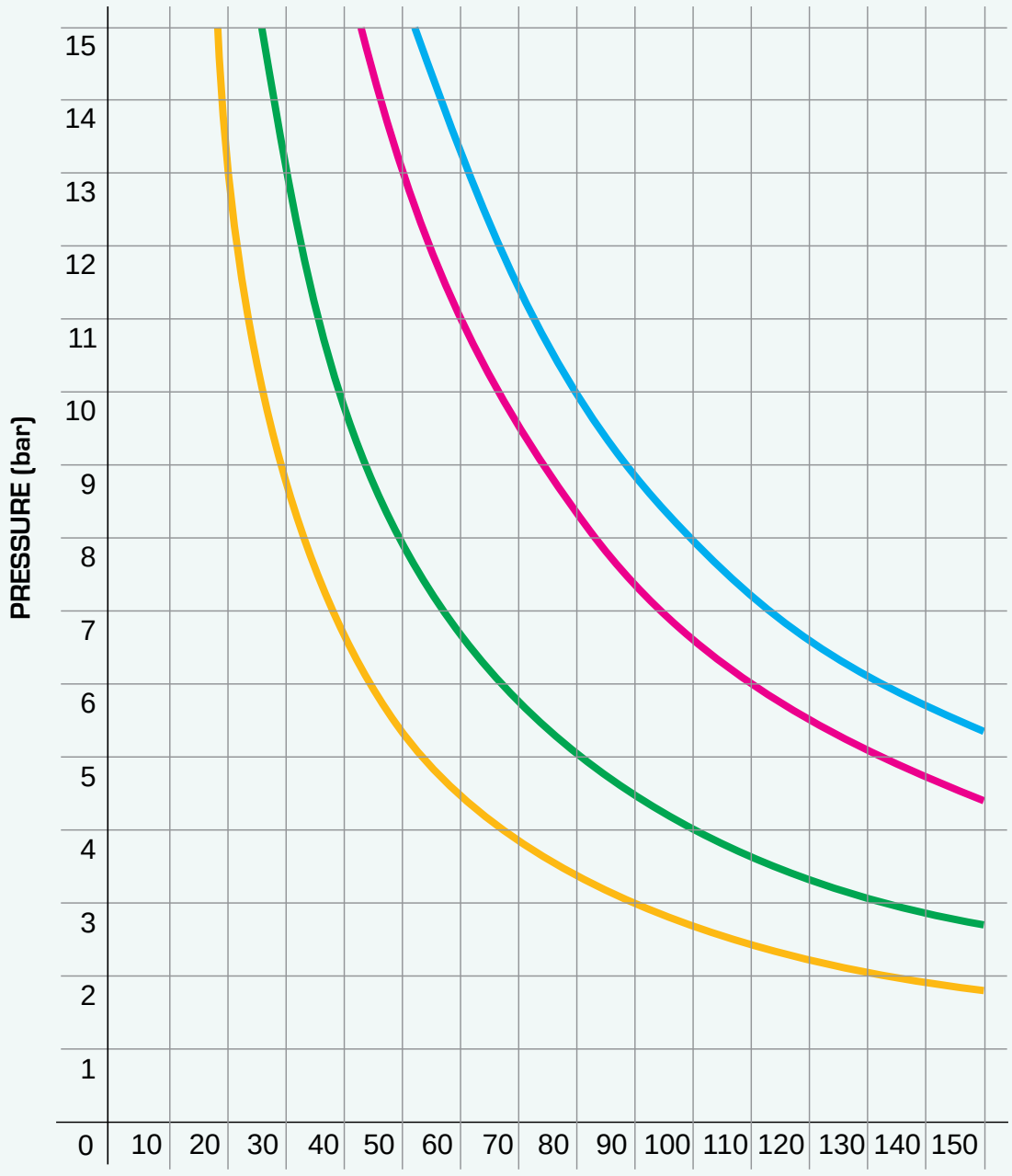
APPLICATIONS







PERFORMANCE CURVE



Performance curves for working conditions of unbalanced ROTEN and UNITEN seals with clean water at 20°C.

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

ABSORBED POWER DIAGRAM

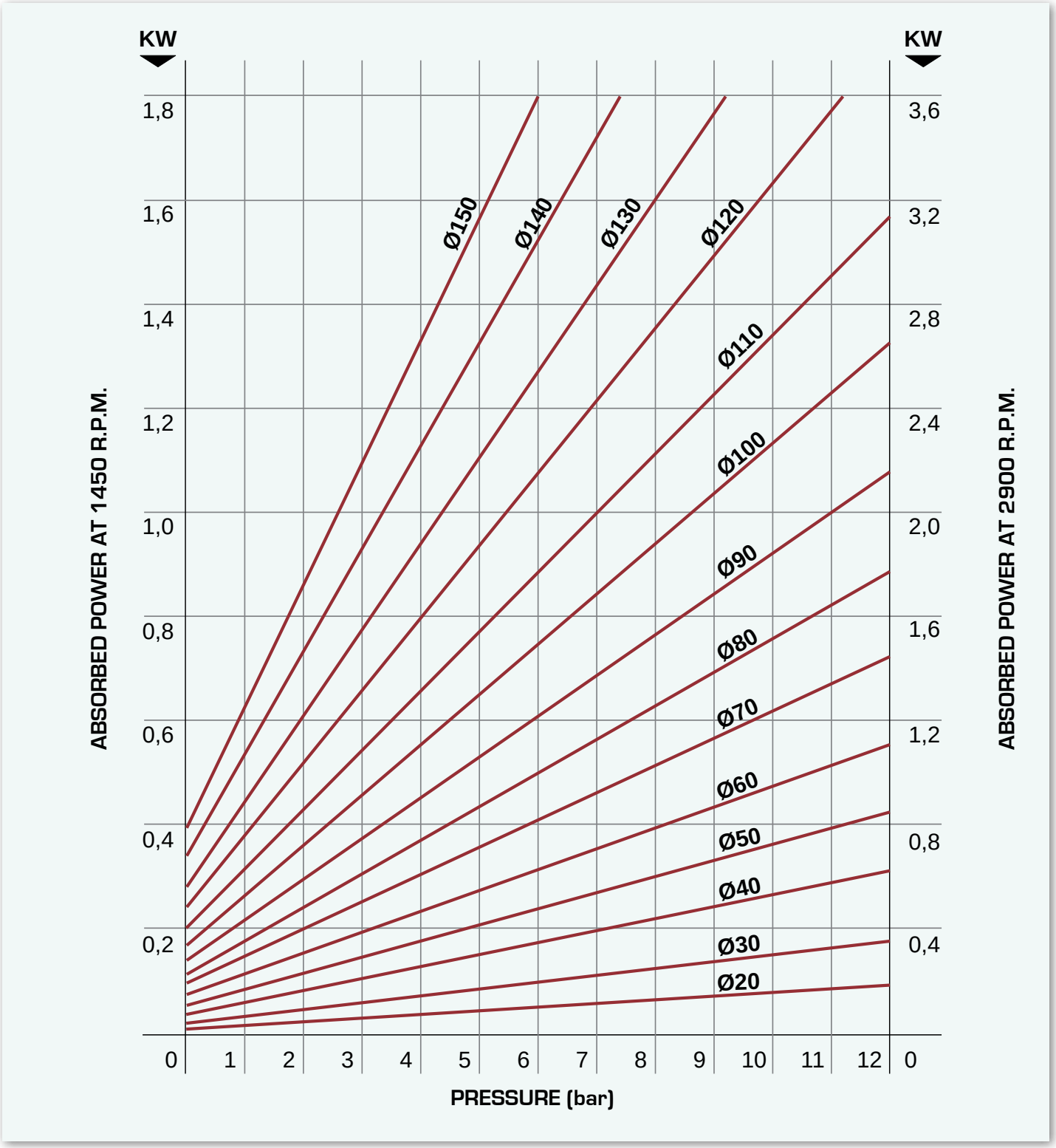


Diagram of absorbed power by ROTEN and UNITEN unbalanced seals, depending on working pressure.

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	0,90
WC/CARBON	x	0,90
WC/SIC	x	2,30
WC/WC	x	2,50
SIC/SIC	x	2,80

DELIVERY CAPACITY DIAGRAM

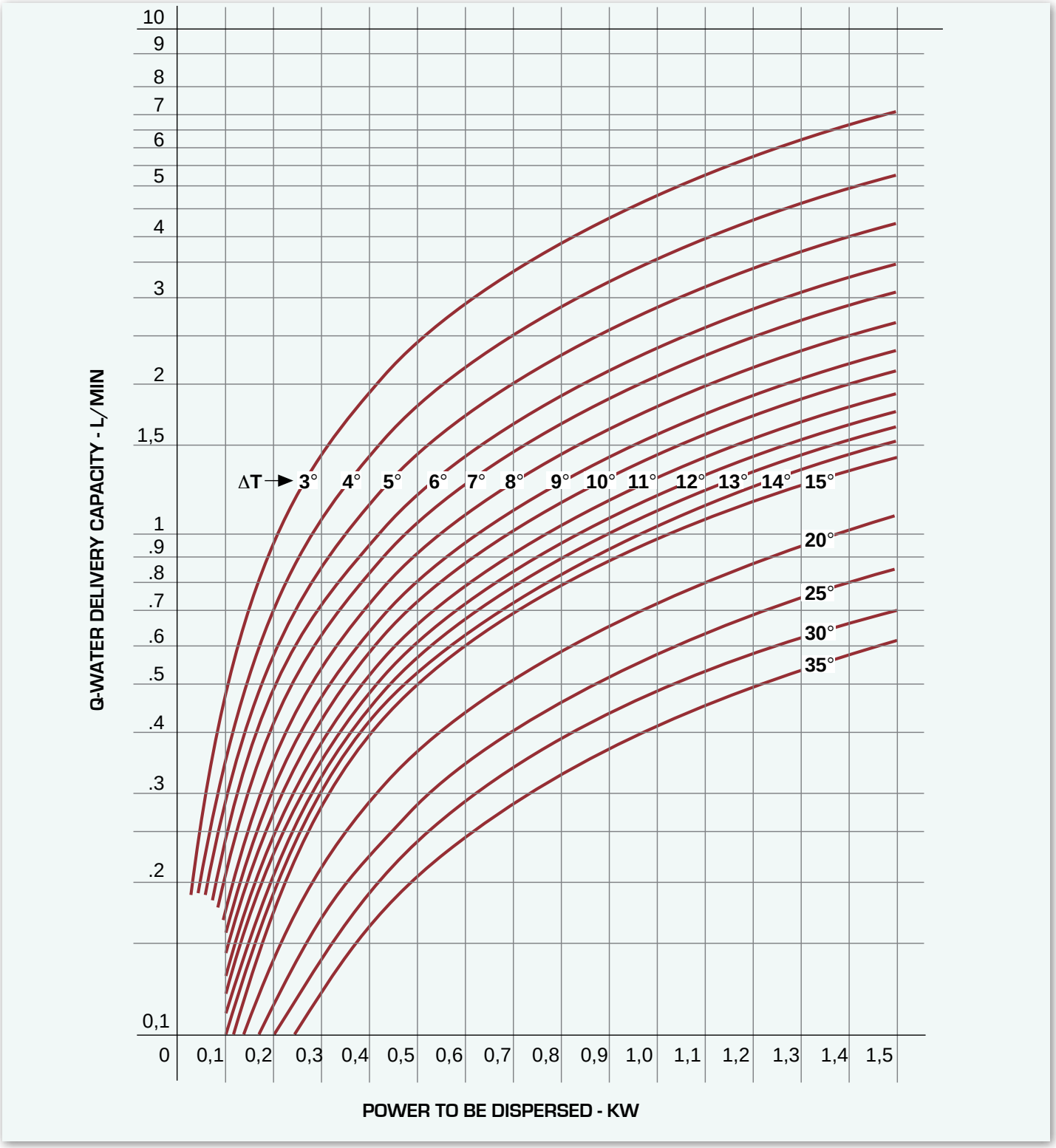


Diagram of the water delivery capacities depending on the heat that has to be lost.

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.

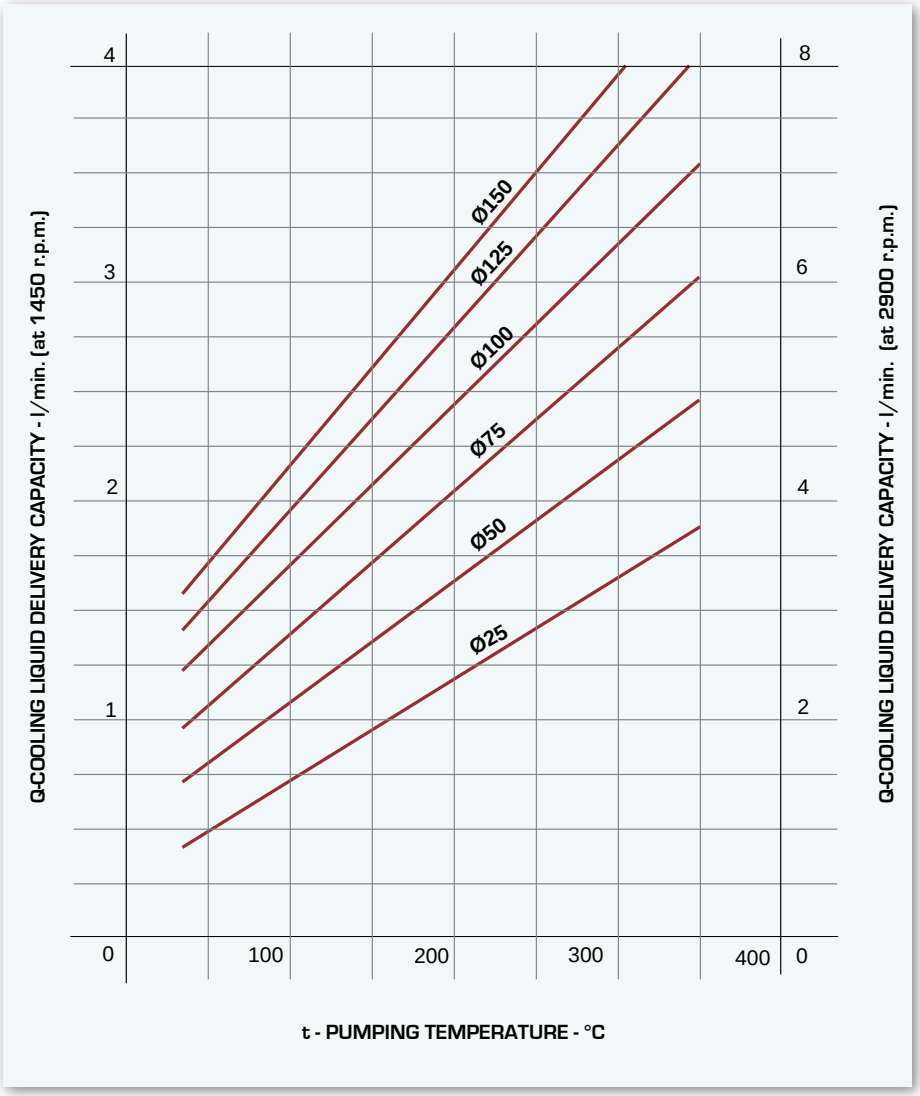
N.B.: In-flowing water temperature must be lower or equal to that of the external environment.

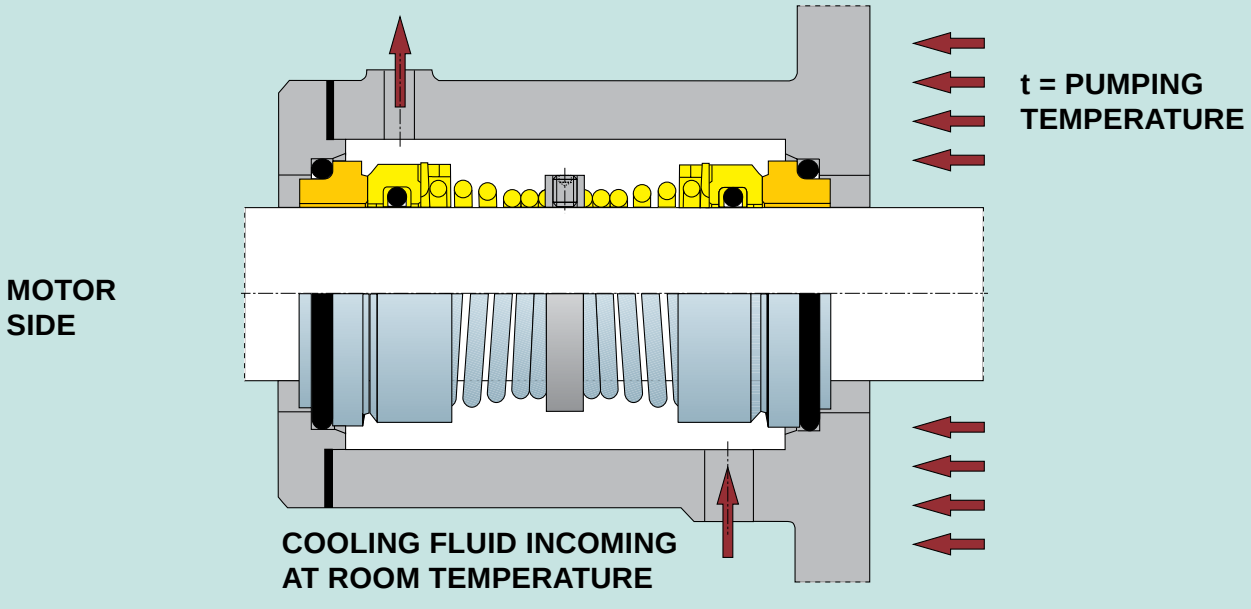
DELIVERY CAPACITY (Q-T)

TEMPERATURE DIAGRAM

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.

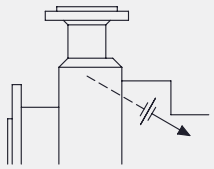
N.B.: The present test chart serves only as a guideline





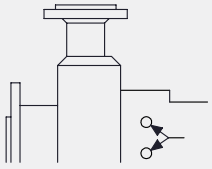
MOST USED CIRCULATION SYSTEMS ACCORDING TO API 682/ISO 21049

PLAN 01



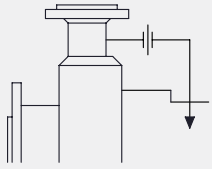
Internal circulation from the pump case to the seal

PLAN 02



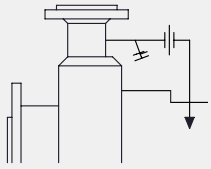
Dead end seal chamber with no circulation. Stuffing box cooling and a neck bush are necessary, unless otherwise specified.

PLAN 11



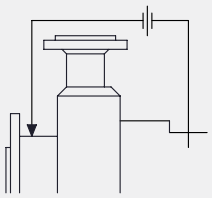
Circulation from the pump discharge, through an orifice to the seal.

PLAN 12



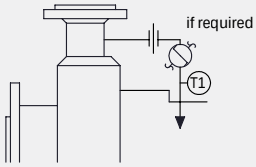
Circulation from the pump discharge, through a strainer and an orifice to the seal

PLAN 13



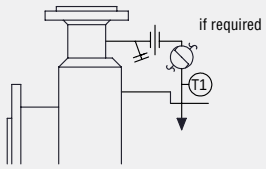
Circulation from the seal chamber, through an orifice and back to pump suction.

PLAN 21



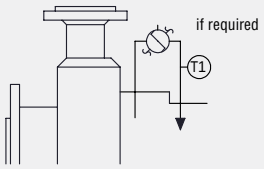
Circulation from the pump discharge, troungh an orifice and a cooler to the seal.

PLAN 22



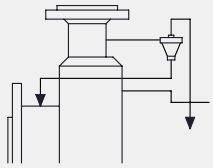
Circulation from the pump discharge, through a strainer, an orifice and a cooler to the seal

PLAN 23



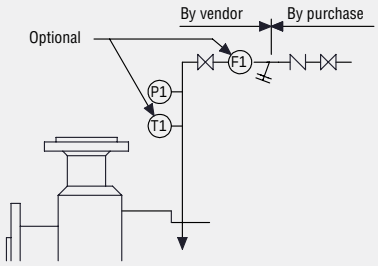
Circulation by means of a pumping ring from the seal, through a cooler and back to the seal.

PLAN 31



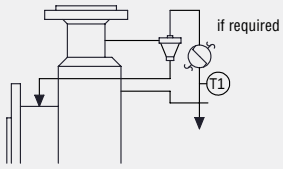
Circulation from the pump discharge through a cyclone separator.

PLAN 32



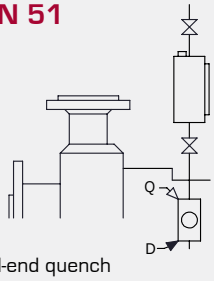
Injection of clean fluid into the seal chamber from an external source.

PLAN 41



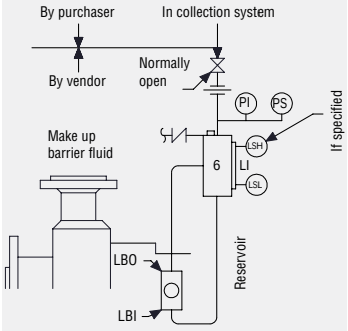
Circulation from the pump case throungh a cyclone separator, and clean fluid through a cooler to the seal.

PLAN 51



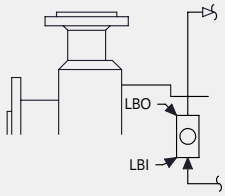
Dead-end quench (usually methanol)

PLAN 53A



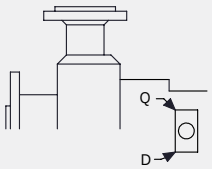
Circulation with thermosiphon system, pressurized. Forced circulation by pumping ring or circulation pump.

PLAN 54



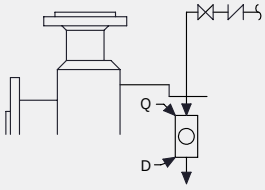
Circulation of clean fluid from an external system.

PLAN 61



Tapped connections for the customer's use.

PLAN 62



External fluid quench (steam, gas, water, ect.)

API PLAN LEGEND

- COOLER
- PRESSURE GAUGE WITH BLOCK VALVE
- DIAL THERMOMETER
- PRESSURE SWITCH WITH BLOCK VALVE
- CYCLONE SEPARATOR
- FLOW INDICATOR
- Y-TYPE STRAINER
- FLOW REGULATING VALVE
- BLOCK VALVE
- CHECK VALVE
- ORIFICE

GUIDE TO MECHANICAL SEALS SELECTION

The issue of this selection it's a long job started on 1964 and subject to continuous updates based on our experience.

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Absorption Oil		100	90	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Acetic Acid	CH_3 CO OH	40	70	2	X1 E1 X1 V1 E1	GBEGG		1				1.05			Liq. Mix. H_2O, Alcohol, Ether, Glycerine; SCALDING
Acetic Aldehyde	CH_3 CHO	100	90	4	X1 X1 C1 X1 V1 C1	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	X1 X1 C1 X1 V1 C1	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	X1 E1 X1 V1 E1	GBEGG		1				0.79	- 94.3	56	Liq. Mix. H_20, Alcohol, Ether, Chlorophorm; VOLATILE, INFLAMMABLE
Acetyl chloride	CH_3 CO Cl	100	40	4	X1 X1 C1 X1 V1 C1	GBTGG						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	X1 E1 X1 E1 R1 V1 E1	U3BEGG	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	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1					135		Powder or crystals sol. Alcohol, Ether, Chlorophorm, H_2O
Acid Fats (Except Acetic Ac.)		100	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	2		2	1					Do not solidify if refined
Acid Fats (Except Acetic Ac.)		100	160	5	X1 Y1 X1 Y1 K4 K1 Y1	Q1Q1VGG	2		2	1					Solidify according to temperature
Acid Molasse Must		100	140	5	X1 E1 X1 E1 K4 K1 E1	Q1Q1EGG		1							
Acid Oil		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1			1					
Acid Solvents		100	90	4	X1 X1 C1 X1 V1 C1	GBTGG									
Acrylic Acid	$CH_3 H_4 O_2$	Conc.	>20	4 Dual	X1 X1 C1 D5 K1 C1	Q1Q1TGG						1.06	13	141	Polymerises at T>30° and with O. Corrosive ; Crystalises at T<12°, sol. H_2O, Alcohol, Acetone
Acrylic Resins		100	140	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Washing with solvent
Air - Compressed Air		100	60	2 Dual	X1 P1 G1 V1 P1	EBPGG	1	1	1	1	1				
Air - Compressed Air and Oil		100	80	5	X1 P1 X1 P1 R1 V1 P1	U3BPGG	1		1	1	1				
Air Gas		100	50	2 Dual	X1 P1 G1 V1 P1	EBPGG	1			1	1				Mixture of Gas N + CO + CO_2; COMBUSTIBLE (Gas-producer Gas, Siemens Gas)
Albumen		100	20	5 Dual	X1 E1 X1 E1 K4 K1 E1	Q1Q1EGG	1	1		1		1.04			
Alcohol and Lubricating Oils			90	2	X1 P1 G1 V1 P1	EBPGG	1								
Alcohol and Sulfonated Fats		10	120	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Alcohol Polyhydric (Poliol)	$CH_2\ OH(CHOH)_n\ CH_2\ OH$	100	40	2	X1 E1 X1 V1 E1	GBEGG		1							n = from 2 to 5 - Liq. containing Glycerine, reacting with Aldehydes and Ketones
Alcohol, Denaturated Alcohol	$C_2\ H_5\ OH$	100	70	2	X1 E1 X1 V1 E1	GBEGG	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	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		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	X1 P1 X1 V1 P1	GBPGG	1	1	1			0.81	-118	78.3	Liq. sol. H_2O, Ether, Chlorophorm; INFLAMMABLE, VOLATILE
Alcohol, Furfunal Alcohol	$C_4\ H_3O$ - $CH_2\ OH$	100	110	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				1.13		170	Liq. sol. Alcohol, Ether, Chloroph., Benzene; POISONOUS
Alcohol, Isobutyl Alcohol	$(CH_3)_2\ CH\ CH_2\ OH$	100	80	2	X1 E1 G1 V1 E1	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	X1 E1 X1 V1 E1	GBEGG	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	X1 E1 X1 V1 E1	GBEGG	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	X1 E1 G1 V1 E1	EBEGG	2	1	2	1		0.82	-16	194	Liq. mix. Alcohol, Chlorophorm, Mineral Oil
Alcohols		100	-70	RF	X1 J1 V2 A1	TBYGG									
Alcohols		100	70	2	X1 E1 X1 V1 E1	GBEGG		1							
Aldehydes				4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									
Alginates		100	90	2 Dual	X1 P1 X3 X3 P1	U1U1PGG	1	1		1					
Alizarine in Methyl Alcohol		0.1	50	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1								
Alkali		10	100	5	X1 E1 X1 E1 K4 K1 E1	Q1Q1EGG		1							They form salts with acids
Alkaline Hypochlorite		70	80	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					
Alkane (Paraffin)	$C_n\ H_{2n+2}$		130	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1	1	0,9	60		
Alkyl Benzene		100	90	2	X1 Y1 G1 V1 Y1	EBVGG				1					
Alkyl Resins		100	140	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					Washing with solvent
Alkylate (light)		100	70	2	X1 Y1 G1 V1 Y1	EBVGG				1					
Alkylphenol		100	80	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Viscous, oily liquid (300 cP)
Allile Chloride	$CH_2\ CH\ CH_2\ Cl$	100	80	4	L1 L1 C1 L1 V2 C1	MBTMM						0.93	-134.5	45	Liq. mix. alcohol, Chlorophorm; INFLAMMABLE, POISONOUS
Alum (Al Ammonium)		10	20	5	X1 P1 X1 P1 K1 K1 P1	Q1Q1PGG	1	1	1	1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Alum (Al Sulphate)	$Al_2(SO_4)_3$	30	140	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1	1		2.71		770	H_2O sol. crystals
Aluminium Chloride	$Al Cl_3$	25	18	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM	1	1	1	1		2.44	190		H_2O sol. Crystals. It frees HCl
Aluminium Fluoride	$Al F_3$	20	20	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM	1	1	1	1		2.88			Hardly H_2O sol. crystals
Aluminium Hydroxyde	$Al(OH)_3$	10	90	5	X1 E1 X1 E1 R1 V2 E1	U3BEGG		1				2.42			Powder Sol. Min. Acids, Caustic Soda
Aluminium Nitrate	$Al(NO_3)_3$ - $9H_2O$	10	20	5	X1 Y1 X1 Y1 K1 V2 Y1	Q1BVGG	1	1	1	1			73		Crystals sol. Alcohol, Acetone, H_2O
Aluminium Sulphate (Alum)	$Al_2(SO_4)_3$	30	140	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1	1		2.71		770	H_2O Sol. crystals
Aluminium Sulphide	$Al_2 S_3$	10	20	5	L1 E1 L1 E1 Z1 V2 E1	VBEMM		1				2.02	1100		It decomposes in H_2O
Amine		Conc.	90	4	X1 X1 C1 X1 V2 C1	GBTGG		2	2						
Amino Acids		10	20	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2							
Amino Benzene (Aniline)	$C_6 H_5 NH_2$	Conc.	90	4	X1 X1 C1 X1 V2 C1	GBTGG		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	X1 X1 C1 X1 V2 C1	GBTGG						0.73	-49	77.1	VOLATILE, INFLAMMABLE liq.
Amino Ethanol (MEA)	$NH_2 CH_2 CH_2 OH$	Conc.	70	4	X1 X1 C1 X1 V2 C1	GBTGG	2	2	2			1.01	10.5	170.5	Liq. lightly viscous, mix. H_2O, sol. Alcohol, Chlorophorm, Carb. Tetrachl.
Ammonia	NH_3	100	-30	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG		1	1			liq. 0.77	-77.7	-33.5	Gas. It liquefies at 8,5 bar (20°C)
Ammonia and Oil		3	70	2	X1 N1 G1 V2 N1	EBNGG	1		1						
Ammonia and Water	$NH_4 OH$	30	70	2	X1 E1 G1 V1 E1	EBEGG	1	1	1						Gas solution in H_2O
Ammonia Gas	NH_3	100	>-33	5 Dual	X1 E1 X1 E1 K1 V2 E1	Q1BEGG	1	1	1			0.59 Air 1	-77.7	-33.5	Gas
Ammonia Solution			20	2	X1 E1 X1 V1 E1	GBEGG	1	1	1						
Ammonia-Copper Solution + HNO_3		Sat.	60	45	X1 X1 C1 X1 C1 Z1V1C1	VBTGG									
Ammonium Acetate	$NH_4(C_2 H_3 O_2)$	30	20	2	X1 E1 X1 V1 E1	GBEGG	1	1				1.07	114		H_2O, Alcohol-sol. crystals
Ammonium Azotate		Conc.	20	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG		1							
Ammonium Bifluoride	$NH_4 HF_2$	10	70	5	L1 E1 L1 E1 K1 K1 E1	Q1Q1EMM		1				1.2			H_2O; Alcohol- Sol. crystals; POISONOUS
Ammonium Bisulphide	$NH_4 HS$	10	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1						
Ammonium Bromide	$NH_4 Br$	5	20	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					2.43			H_2O; Alcohol, Sol. crystals
Ammonium Carbonate	$(NH_4)HCO_3(NH_4)CO_2 NH_2$	10	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1	1						H_2O Sol. crystals
Ammonium Chlorate	NH_4ClO_3	10	30	5	L1 E1 L1 E1 Z1 V2 E1	VBEMM		1							Oxidizer - Explosive
Ammonium Chloride	$NH_4 Cl$	10	30	5	L1 E1 L1 E1 Z1 V2 E1	Q1BEMM	1	1	1			1.54			H_2O, Glycerol, Sol. crystals

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Ammonium Citrate	$(NH_4)_2 HC_6 H_5 O_7$	10	40	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG		1							H_2O sol.Grains
Ammonium Fluoride	$NH_4 F$	Sat.	20	5	X1 E1 X1 E1 Z1 V2 E1	VBEGG		1				1.31			H_2O - Sol. Crystals; POISONOUS
Ammonium Hydroxyde	$NH_4 OH$	30	70	2	X1 E1 G1 V1 E1	EBEGG	1	1	1						Up to 30% Ammonia Solution
Ammonium Nitrate	$NH_4 NO_3$	Sat.	80	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG	1	1	1			1.72	169	210	H_2O; Sol. crystals, Alcohol, Alkali; EXPLOSIVE
Ammonium Oxalate	$(NH_4)_2 C_2 O_4 - H_2O$	5	20	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	1			1.5			H_2O; Sol. crystals; POISONOUS
Ammonium Perchlorate (AP)	$NH_4 Cl O_4$	10	20	4	X1 X1 C1 X1 V2 C1	GBTGG						1.95			H_2O; Sol. crystals; EXPLOSIVE
Ammonium Persulphate	$(NH_4)_2 S_2 O_8$	10	20	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1	1			1.98			H_2O; Sol. crystals
Ammonium Phosphate, mono, Bi, Tri		10	50	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG	1	1	1			1.8			H_2O, Sol. crystals
Ammonium Sulphate	$(NH_4)_2 SO_4$	100	80	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1			1.77	513		H_2O; Sol. crystals
Ammonium Sulphate	$(NH_4)_2 SO_3 - H_2O$	Sat.	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	1						H_2O; Sol. crystals
Ammonium Sulphate + H_2SO_4 (5%)		100	20	5	L1 E1 L1 E1 K1 K1 E1	Q1Q1EMM		1							
Ammonium Sulphide	$(NH_4)_2 S$	Sat.	80	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG	1	1	1			1.41		150	It sublimates. H_2O; Alkali; Alcohol, Sol. crystals; TOXIC
Ammonium Sulphocyanate	$NH_4 SCN$	10	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.3	149.6		H_2O; Sol. crystals, Acetone, Alcohol, Ammonia
Ammonuim Bicarbonate	$NH_4 HCO_3$	10	70	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG		1	1			1.58			H_2O-Sol. crystals
Amyl Acetate	$CH_3 COOC_5 H_{11}$	Conc.	110	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				0.86		148	INFLAMMABLE OIL
Amyl Alcohol (Pentanol)	$CH_3 (CH_2)_4 OH$	100	70	2	X1 E1 G1 V1 E1	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	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				0.98		260	Alcohol sol. liq.
Amyl Butirrate	$C_5 H_{11} OOCC_3 H_7$	Conc.	110	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				0.86		150-180	Alcohol; Ether, Sol. liq.
Amyl Chloride	$C_5 H_{11} Cl$	Conc.	90	5	X1 Y1 X1 Y1 K1 V2 Y1	Q1BVGG				1		0.89		99.7	Alcohol; Ether, Sol. liq.
Amyl Formiate	$HCOOC_3 H_{11}$	Conc.	110	5	X1 E1 X1 E1 Z1 V2 E1	VBEGG		1				0.88		123.5	Liq. mix. Hydrocarbons, Oils, Ketones, Alcohol; INFLAMMABLE
Amyl Nitrate	$(CH_3)_2 CH CH_2 CH_2 NO_2$	Conc.	90	5	X1 E1 X1 E1 Z1 V2 E1	VBEGG		1				0.87		96	Alcohol sol. liq.; INFLAMMABLE
Amyl Phthalate		Conc.	80	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG		1							
Amyl Propionate	$CH_3 CH_2 COOC_5 H_{11}$	Conc.	90	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG		1				0.87			Liq. mix. with many organic solvents
Angamol Oil		Conc.	90	2	X1 P1 G1 V1 P1	EBPGG	1				1				

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Aniline (Aniline Oil)	$C_6H_5NH_2$	Conc.	20	4	X1 X1 C1 X1 V2 C1	GBTGG		2				1.02	-6.2	184.4	Oily liq. sol. Alcohol, Benzene, Ether; POISONOUS
Aniline - Hydrochloride	$C_6H_5NH_2$ HCl	20	20	4	L1 L1 C1 L1 V2 C1	MBTMM		2		2		1.22	198	245	Crystals sol. Ether, Alcohol, Benzene, H_2O; POISONOUS
Anisole	$C_6H_5OCH_3$	Conc.	110	4	X1 X1 C1 X1 V1 C1	GBTGG						1	-37,8	155	Liq. sol. Alcohol, Ether
Anthracene	$C_6H_4(CH)_2C_6H_4$	Conc.	>220	RF	X1 X3 X3 A1	U1U1YGG						1.24	217	355	Crystals sol. Hot Toluol
Anthracene Oil		Conc.	140	5	X1 Y1 X1 Y1 K1 V2 Y1	Q1CVGG				1	1			270-360	
Anthranilic Acid	$C_6H_4(NH_2)(CO_2H)$	Sat.	80	5	X1 Y1 X1 Y1 K1 V2 Y1	Q1BVGG				1			144		Crystals Sol. Hot H_2O, Alcohol, Ether; IT SUBLIMATES
Anti incrustator		10	120	5	X1 E1 X1 E1 K1 V2 E1	Q1BEGG		1							Filming
Antibiotics		30	90	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Apiezon-H Oil		Conc.	250	7F	X1 Y1 J1 V2 A1 H1 X1	XCVGG				1	1				
Apirol		Conc.	130	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1				
Aplezon Oil		Conc.	90	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Aqua regia	(1 HNO_3 + 4 HCl)	100	20	45	L1 L1 C1 L1 C1 K1 K1 C1	Q1Q1TMM									Volatile Liquid
Aragonite (Calcium Carbonate)	$CaCO_3$	Sat.	20	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1	1	1		2.9			Crystals or powder sol. in acids
Argon Gas	Ar	100	20	2 Dual	X1 Y1 G1 V1 Y1	EBVGG	1			1	1	1.38 Air 1	-189	-185.8	INERT Gas
Aromatic Fuel		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1		2	1	1				
Aromatic Hydrocarbons		100	30	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Aromatic Petrol		100	50	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				Liq. VOLATILE, INFLAMMABLE
Aromatic Products		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Aromatic Solvents		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Arsenic Trichloride	$AsCl_3$	Conc.	70	7	X1 Y1 Z1 V2 Y1 H1 X1	VBVGG				1		2.1	-18	130	Oily liq. sol. HCl concentrate, org. liquids
Arsenic Trisulphide Ascorbic Acid (Vitamin C)	As_2S_3 $C_6H_8O_6$	Sat. Sat	70 90	5 5	L1 E1 L1 E1 K1 K1 E1 X1 E1 X1 E1 Z1 V1 E1	Q1Q1EMM VBEGG		1 1				3.43 1.65	300 192		Crystals. POISONOUS H_2O - Sol. crystals
Ash Wood Gas		100	60	2 Dual	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Ash-tree Oil		100	70	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Asphalt (Asphalt oil)			<180	2	X1 Y1 X3 X3 Y1	U1U1VGG				1					
Asphalt			<280	RF	X1 X3 X3 A1	U1U1YGG									
Bacon-Fat (Animal Fat)		100	80	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	2	2	1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Baking Soda (Sodium Bicarbonate)	$NaHCO_3$	Sat.	60	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		2.15			H_2O sol. Crystals
Barium Chlorate	$Ba(ClO_3)_2 - H_2O$	20	20	5	L1 E1 L1 E1 K1 V1 E1	Q1BEMM		1				3.18	414		H_2O sol. crystals; INFLAMMABLE, EXPLOSIVE, POISONOUS
Barium Chloride	$BaCl_2 - 2H_2O$	Sat.	50	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM	1	1	1	1		3.1	960		H_2O sol. crystals; POISONOUS
Barium Hydrate	$Ba(OH)_2$	Sat.	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	1					H_2O, Ether, Alcohol sol. crystals, POISONOUS
Barium Nitrate	$Ba(NO_3)_2$	Sat.	60	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1		3.2	575		H_2O sol. crystals; POISONOUS
Barium Salts		Sat.	60	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM	1	1	1	1					POISONOUS
Barium Sulphate	$BaSO_4$	Sat.	40	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1				4.5			H_2SO_4 concentrate sol. powder
Barium Sulphide	Ba S	Sat.	90	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	1		4.25			H_2O sol. powder; POISONOUS
Beauty Cream		100	60	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	1	1		1					
Beer		100	90	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1		1		1.03			
Beer Must		100	90	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1							
Beer Yeast		Sat.	60		X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1							
Beet - Sugar Juice		100	70	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	1	2	1					
Beet Sugar		100	90	5 Dual	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	1	1	2	1		1.58			Saccharose sol. Crystals
Benzene Alkyl		100	90	2	X1 Y1 G1 V1 Y1	EBVGG				1					
Benzene Chloride (DOW E)		100	>180	RF	X1 X3 X3 A1	U1U1YGG				1			177		
Benzene Dimethyl (orto meta para Xilene)	$C_6H_4(CH_3)_2$	100	120	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		0.86		138.2	Alcohol, Ether sol. liq.; INFLAMMABLE, TOXIC
Benzene Divinyl (orto meta para)	$C_6H_4(CH\,CH_2)_2$	100	140	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG				2		0.92	-67	199	Liq. sol. Methanol, Ether; IT POLYMERIZES
Benzene Dodecyl	$C_{12}H_{25}C_6H_5$	100	90	2	X1 Y1 G1 V1 Y1	EBVGG				1					
Benzene Isopropyl (Cumene)	$C_6H_5C(CH_3)_2$	100	80	2	X1 Y1 X1 V1 Y1	GBVGG				1		0,86	-96	152,7	Liq. Sol Alchool, Ether, Benzene, Carbon Tetrachloride
Benzene Methyl (Toluol)	$CH_3C_6H_5$	100	90	5	X1 Y1 X1 Y1 R1 V1 Y1	U3BVGG				1		0.86	-94.5	110.7	Liq. sol. Alcohol, Ether, Benzene, INFLAMMABLE
Benzene Monochlorine	C_6H_5Cl	100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.1	-45	131.6	Liq. mix. org. solvents; VOLATILE, INFLAMMABLE, NO PTFE
Benzene Ortodichlorine	$C_6H_4Cl_2$	100	80	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.3	-20	180	Liq. VOLATILE, IRRITATING
Benzene Phenyl		100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Benzenecarboxylic Acid	C_6H_5COOH	Sat.	90	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		1.26	121	249	Crystals sol. Alcohol, Ether, Benzene, Chloroph., Carbon Tetrachl.
Benzil Chloride	$C_6H_5CH_2Cl$	100	40	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM				1		1.1	-43	179	Liq. sol. H_2O, Ether; SCALDING
Benzil Chloride (Stabilized)	$C_6H_5CH_2Cl$	100	80	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.1	-43	179	Liq. sol. H_2O, Ether; SCALDING
Benzoic Acid	C_6H_5COOH	Sat.	70	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		1.26	121	249	Crystals sol. Alcohol, Ether, Benzene, Chlorophorm, Carbon tetrachl.
Benzoic Aldehyde	C_6H_3CHO	100	90	2	X1 E1 X1 V1 E1	GBEGG		1				1.04	-56	178	Oil mix. Alcohol, Ether; VOLATILE
Benzol (Benzene)	C_6H_6	100	>60	4	X1 X1 C1 X1 V1 C1	GBTGG						0.88	5.5	80	Liq. mix. Alcohol, Acetone, Ether, Acetic Acid, INFLAMMABLE
Benzol (Benzene)	C_6H_6	100	<60	2	X1 Y1 G1 V1 Y1	EBVGG				1		0.88	5.5	80	Liq. mix. Alcohol, Acetone, Ether, Acetic Acid, INFLAMMABLE
Benzol and Gas Mixture			<60	5	X1 Y1 X1 Y1 R1 V1 Y1	U3BVGG				1					INFLAMMABLE liquid
Benzol Crude	C_6H_6	100	<30	2	X1 Y1 G1 V1 Y1	EBVGG				1					Liq. mix. Alcohol, Acetone, Ether, Acetic Acid; INFLAMMABLE
Benzol Ethyl (Ethylbenzene)	$C_6H_5C_2H_3$	100	110	2	X1 Y1 G1 V1 Y1	EBVGG				1		0.86	-95	136	Liq. sol. Alcohol, Benzene, Ether, Carbon Tetrachloride
Bitumen		100	>130	RF	X1 X3 X3 A1	U1U1YGG				1	1				SOLIDIFY
Black Liquor		100	85	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG		2							Abrasive solution (Cellulose Paper Industry)
Blast Furnace Gas		100	120	2 Dual	X1 Y1 G1 V1 Y1	GBVGG				1	1				
Bleaching	(NaOCl+Na_2CO_3+Cl active)	100	60	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					
Blood Plasm		100	20	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1							
Blue Vitriol (Copper Phosphate)	$CuSO_4 - 5H_2O$	Sat.	80	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1		1		2.28			Crystals soluble in H_2O, Methanol; POISONOUS
Bonder (PK1 Zink Phosph., Potassium Phosph. PH=1)		10	80	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Borax solution (Sodium Tetrabor)	$Na_2B_4O_7$-$10H_2O$	Sat.	60	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1		1,73			H_2O sol. crystals
Boric Acid	H_3BO_3	Sat.	80	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1		1.43			H_2O; Alcohol - Sol. powder
Boric Anhydride	B_2O_3	Sat.	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		1.8			Powder sol. hot H_2O, Alcohol
Brine (Calcium Chloride)	$CaCl_2$	Sat.	-40	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1	1		2.15			H_2O, Alcohol sol. Crystals
Brine (Sodium Chloride)	NaCl	Sat.	-40	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1	1		2.16			H_2O, Glycerol sol. Crystals

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Brines		Sat.	-40	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1							
Bromide		Sat.	35	4	L1 L1 C1 L1 V1 C1	MBTMM									Gas or crystals, POISONOUS
Bromine (Anhydrous Bromine)	Br	100	40	5 Dual	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1		3.11	-7.3	58.8	Liq. sol. H_2O, Alcohol; POISONOUS
Bromine Methane (Gas or liq.)	CH_3 Br	100	20	2 Dual	X1 Y1 G1 V1 Y1	EBVGG	2			1		1.73	-94	3.46	Liq. VOLATILE, POISONOUS, SCALDING
Bromine Water Solution	Br+H_2O	Sat.	20	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					
Broth food		100	90	5	X1E1X1E1Z1V1E1	VBEGG	1	1		1					
Butadiene	H_2 C CHHC CH_2	100	20	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		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_4 H_{10}	100	20	2	X1 P1 G1 V1 P1	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	X1 P1 G1 V1 P1	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_3	100	60	2	X1 E1 G1 V1 E1	EBEGG		1				0.82	-86.4	79.6	Liq. sol. H_2O, Alcohol, Ether, mix. Oils; INFLAMMABLE
Butter (Animal fat)		100	60	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2	1					
Butter Whey		100	60	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Butyl Acetate	CH_3 $COOCH_2$ CH_2 CH_2 CH_3	100	80	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				0.88	-75	126.3	Liq. sol. Alcohol, Ether, Hydrocarbons; INFLAMMABLE
Butyl Acrylate	CH_2 $CHCOOC_4$ H_9	100	70	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG						0.9	-64	145	Liq. it polymerizes with heat
Butyl Alcohol	CH_3 $(CH_2)_2$ CH_2 OH	100	70	2	X1 P1 G1 V1 P1	EBPGG	1	2	1	1		0.81	-89	117.7	Liq. sol. H_2O; Mix. Ether, Alcohol
Butyl Ammine (Ammino Butane)	C_4 H_9 NH_2	100	90	4	X1 X1 C1 X1 V1 C1	GBTGG						0.73	-49	77.1	Liq. VOLATILE, INFLAMMABLE
Butyl Benzoate	C_6 H_5 $COOC_4$ H_9	100	90	2	X1 E1 G1 V1 E1	EBEGG		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	X1 E1 G1 V1 E1	EBEGG		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	X1 E1 X1 E1 Z1 V1 E1	VBEGG		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	X1 X3 X3 A1	U1U1YGG					1	0.95	-68	238.6	Liq. sol. Oils, H_2O
Butyl Formiate	$HCOOC_4$ H_9	100	90	2	X1 E1 G1 V1 E1	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	X1 E1 G1 V1 E1	EBEGG		1				0.98	-43	188	Liq. sol. Oils, solvents
Butyl Maleate		Sat.	40	4	X1 X1 C1 X1 V1 C1	GBTGG									
Butyl Oxytol	$HOCH_2$ OC_4 H_9	100	70	2	X1 E1 G1 V1 E1	EBEGG		1				0.90		171	Liq. mix. H_2O, Hydrocarbons

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Butyl Phosphate		Sat.	70	2	X1 E1 G1 V1 E1	EBEGG		1							
Butyl Phthalate		100	70	2	X1 E1 G1 V1 E1	EBEGG		1							
Butyl Propionate	$C_2 H_5 CO_2 C_4 H_9$	100	70	2	X1 E1 G1 V1 E1	EBEGG		1				0.87	-89	146	Liq. sol. Alcohol, Ether, Hydrocarbons
Butylcellosolve	$CH_2 OH CH_2 OC_4 H_9$	100	20	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				0.9		171	Liq. sol. mineral Oils, H_2O
Butylene (Butene 1)	$CH_2 CH CH_2 CH_3$	100	20	2	X1 Y1 G1 V1 Y1	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	X1 X1 C1 X1 V1 C1	GBTGG		2		2		0.95	-5, -8	163.5	Liq. Mix. Alcohol, Ether
Cadmium Nitrate	$Cd(NO_3)_2$ - $4H_2O$	Sat.	80	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1					2.45	59.5	132	H_2O, Alcohol sol. Crystals
Calcite (Calcium carbonate)	$Ca CO_3$	Sat.	20	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1		2.9			Powder or crystals Acid sol.
Calcium Bisulphite	$Ca(HSO_3)_2$	10	20	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1		1	1		1.06			
Calcium Carbonate	$Ca CO_3$	Sat.	20	5	X1 E1 X1 1E K1 R1 E1	Q1U3EGG	1	1	1	1		2.9			Powder or crystals sol. in acids
Calcium Chloride	$Ca Cl_2$	Sat.	140	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	1		2.15			H_2O, Alcohol sol. crystals
Calcium Fluoride	CaF_2	10	70	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		3.18			Powder non sol. in H_2O
Calcium Hydrate (Hydroxide)	$Ca(OH)_2$	Sat.	80	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	2	1		2.23			Powder sol. in Glycerine, less in H_2O
Calcium Hypochlorite	$Ca(OCl)_2$	Sat.	60	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG		1		1		2.35			H_2O, sol. crystals
Calcium Nitrate	$Ca(NO_3)_2$ - $4H_2O$	Sat.	50	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1	1	1		1.82			Solid subst. sol. H_2O, Alcohol, Acetone
Calcium Phosphate (Meta, mono, bi, tri)		Sat.	50	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1	2	1					
Calcium Sulphate	$Ca SO_4 + 2H_2O$	Sat.	80	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1				2.9			Sol. powder
Calcium Sulphide (Lime)	Ca S	Sat.	80	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1		2.8			Powder sol. in Acids, Less in H_2O
Calcium Sulphite	$Ca SO_3$ - $2H_2O$	Sat.	80	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1					Sulphurous Acid sol. powder, less in H_2O
Camphor	$C_{10} H_{16} O$	10	90	4	X1 X1 C1 X3 X3 C1	U1U1TGG						0.99	179		Crystals sol. in Alcohol, Ether, Chlorophorm
Candy Sugar		100	90	5 Dual	X1 Y1 X3 X3 Y1	U1U1TGG	1	1	2	1					
Cane - Sugar Juice		100	70	5	X1Y1X1Y1K1V1Y1	Q1BEGG	1	1	1	1					Saccarose sol. Cristals.
Cane Sugar		100	90	5 Dual	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	1	1	1					Saccharose sol. Crystals
Caprolactam	$CH_2(CH_2)_4NHCO$	100	>60	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				1,1	69		Cristals sol. in H_2O, chlorate solvents, petroleum derivates
Carbamide (Urea)	$CO(NH_2)_2$	100	140	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG		1				1.33	132.7		H_2O, sol. crystals, Alcohol, Benzene

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Carbinol (Methilic Alcohol)	CH_3 OH	100	70	2	X1 E1 X1 V1 E1	GBEGG	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	X1 E1 X1 V1 E1	GBEGG	2	1	2	1		0.78	-86	82.4	Liq. sol. H_2O, Alcohol, Ether; INFLAMMABLE
Carbitol (Various)		100	70	4	X1 X1 C1 X1 V1 C1	GBTGG	2	2	2	2		1			Liquids
Carbolic Acid (Benzophenol)	$C_6 H_5$ OH	Sat.	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG		2		1		1.07	43	182	Crystals sol. H_2O, Alcohol, Ether, Chlorophorm; POISONOUS, Scalding
Carbon Bioxyde Gas	CO_2	100	70	5 Dual	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	2	2	1		1.53 Air 1			Sol. H_2O, Alcohol, Acetone
Carbon Bioxyde liq.	CO_2	100	-25	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	2	2	1		1.1 (-37°)	-56.6 *		* 5.2 bar; Sol. H_2O, Alcohol, Acetone
Carbon Bisulphide	CS_2	100	30	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.26	-111	46.2	Liq. sol. Alcohol, Ether, Benzene; POISONOUS, INFLAMMABLE
Carbon Bisulphide and Sulphur		100	30	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Carbon Oxyde (Gas)	CO	100	30	2 Dual	X1 Y1 G1 V1 Y1	EBVGG	1	1	2	1		0.96 Air 1	-207	-190	Sol. H_2O, Alcohol; POISONOUS, INFLAMMABLE
Carbon Tetrachloride	C Cl_4	100	20	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM	2			1		1.58	-23	76	Liq. mix. Alcohol, Benzene, Ether, Naphtha, Chlorophorm; POISONOUS
Carbonic Acid Carbonic Anhydride (Gas)	$H_2 CO_3$ CO_2	Sat. 100	30 70	5 5 Dual	X1 E1 X1 E1 Z1 V1 E1 X1Y1X1Y1K1V1Y1	VBEGG Q1BVGG	2 1	1 2	1 2	1 1		1.53 Air 1			Gas sol. H_2O, Alcohol, Acetone
Carbowax (Polyethylene Glycol)		100	140	5	X1 E1 X1 E1 K1 V3 E1	Q1AEGG		1							
Carboxylic Acid		20	70	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					
Caseine (Pigments)		Sat.	30	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1				1.25			
Castor Oil (Ricinus Oil)		100	60	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	2	1	1		0.96	-10		Sol. in Alcohol, Ether, Benzene, Chlorophom.; it may polymerize
Caustic Potash (Pot. Hydroxyde)	K OH	>20	80	5	L1 E1 L1 E1 K1 K1 E1	Q1Q1EMM	2	1	2			2	360		H_2O, Alcohol, Glycerine sol. Crystals; CAUSTIC
Caustic Potash (Pot. Hydroxyde)	K OH	<20	30	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	2	1	2						H_2O, Alcohol, Glycerine sol., Crystals; CAUSTIC
Caustic Soda	Na OH	10	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2	2		2.13			H_2O, Alcohol, Glycerol sol Crystals; CAUSTIC
Caustic Soda	NaOH	30	70	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	2	1	2	2		2,13			H_2O, Alcohol, Glycerol sol Crystals; CAUSTIC
Caustic Soda	NaOH	Sat.	90	5	L1 E1 L1 E1 K1 K1 E1	Q1Q1EMM		1				2,13			H_2O, Alcohol, Glycerol sol Crystals; CAUSTIC

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Caustic Solution		3	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2	2					
Cellosolve		100	20	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2							
Cellulose Acetate		100	80	4	X1 X1 C1 X1 V1 C1	GBTGG									
Cellulose Lacquer		100	20	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									
Cellulose Mixtures		100	20	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									
Cellulose Nitrate (Nitrocellulose)	$C_6 H_7 O_2(ONO_2)_3$	100	20	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Paste sol. in Ether, Acetone, Alcohol; INFLAMMABLE - EXPLOSIVE
Cellulose Solvent		100	40	4	X1 X1 C1 X1 V1 C1	GBTGG									
China Wood Oil (Tung)		100	90	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1				
Chloracetic Acid	CH_2 Cl COOH	Sat.	20	45	L1 L1 C1 L1 C1 K1 K1 C1	Q1Q1TMM		2				1.37	63	190	H_2O; Alcohol, Ether, Sol. Crystals; CAUSTIC
Chloral (Trichloracetaldehyde)	C Cl_3 CHO	100	90	4	X1 X1 C1 X1 V1 C1	GBTGG						1.5	-57	97.7	Oily liq. sol. Alcohol, Ether, Chloroph.; DANGEROUS VAPOURS
Chlorate Solvents		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Chlorbenzene (Benzene Monochlor.)	$C_6 H_5$ Cl	100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.1	- 45	131.6	Liq. mix. org. solvents; VOLATILE, INFLAMMABLE (no PTFE)
Chlorethylene (Vinylchloride)	CH_2 CH Cl	100	30	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				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	X1 Y1 G1 V1 Y1	EBVGG				1		1.3	-40	213	H_2O sol. liq.
Chlorinated Solvents		100	80	4	X1 X1 C1 X1 V1 C1	GBTGG				2					
Chlorine (Anhydrous Gas)	Cl	100	20	5 Dual	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1		2.49 Air 1		-40	POISONOUS
Chlorine (Active Chlorine Liq. >6 - 8 bar)	Cl	100	20	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1		liq. 1.46	-101	-34.5	Gas or liq. sol. H_2O, Alkali; POISONOUS
Chlorine Bioxyde	Cl O_2	100	<10	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				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	X1 Y1 X1 V1 Y1	GBVGG				1					Crystals sol. org. solvents
Chlorine Hexane		100	70	2	X1 P1 G1 V1 P1	EBPGG	1			1					
Chlorine Leather Tanning		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Chlorit	Na Cl O_2	Sat.	90	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1			200		H_2O sol. Crystals
Chloromethane (Methylchloride)	CH_3 Cl	100	20	2 Dual	X1 Y1 G1 V1 Y1	EBVGG				1		liq. 0.92	-97.6	-23.7	Liq. gas sol. Benzene, Alcohols, H_2O, Chloroph., Acetic Acid; POISONOUS

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Chlorophorm (Methantrichlor.)	$CH\ Cl_3$	100	40	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				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	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG		2		1		0.95		59.4	Liq. sol. Alcohol, less in H_2O
Chlorosulphonic Acid	$Cl\ SO_2\ OH$	100	40	45	L1 L1 C1 L1 C1 K1 K1 C1	Q1Q1TMM						1.77	-80	158	Liq. POISONOUS, SCALDING in $H_2O = H_2SO_4 + HCL$
Chlorothene (Trichlorethane 1.1.1.)	$CH_3\ C\ Cl_3$	100	70	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.3		75	Liq. sol. Alcohol, Ether
Chlotethane (Ethyl Chloride)	$C_2\ H_5\ Cl$	100	20	2	X1 P1 G1 V1 P1	EBPGG	1	1	1	1		liq. 0.92	-140	12.5	Liq. mix. common solvents; VOLATILE, INFLAMMABLE
Chocolate		100	90	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1							IT SOLIDIFIES
Chromates (Solutions)		Sat.	60	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM		2		1					
Chrome Alum	$Cr\ K(SO_4)_2 - 12H_2O$	Sat.	80	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1	1	1		1.8	89		Crystals sol. H_2O
Chrome Hydrate	$Cr(OH)_3$	Sat.	60	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1								Crystals sol. in Acids and very alkaline solutions
Chrome Hydrate + Stalked Lime		Sat.	60	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1								
Chrome Oxyde	$Cr_2\ O_3$	30	100	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		2		1		5.04			Non soluble Powder
Chrome Solution		Sat.	70	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		2		1					
Chrome Sulphate (a,b,c)	$Cr_2\ (SO_4)_2$	Sat.	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		1.7 - 3			H_2O, Alcohol sol. crystals
Chromic Acid	$H_2\ Cr\ O_4$	Sat.	70	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		2		1		2.8	196		Crystals sol. H_2O, Alcohol, Min. Acids; It exists only as solution; SCALDING
Chromic Anhydride	$Cr\ O_3$	Sat.	70	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		2		1		2.8	196		Crystals sol. H_2O, Alcohol, Min. Acids; SCALDING
Citrates		Sat.	110	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1					
Citric Acid	$C_6\ H_8\ O_7$	5	25	2	X1 E1 X1 V1 E1	GBEGG	1	1	1	1		1.54	153		H_2O; Alcohol - Sol. crystals
Coalgas		100	30	2 Dual	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Coca Cola		100	20	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1		1					
Coca Cola (Syrup)		100	20	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1		1					
Cocoa Butter		100	80	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1		1					
Coconut Oil		100	80	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	1		1		0.92	24		
Cod-liver Oil		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	2	1					
Coffee (cream)		100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1		1					
Coffee (cream, sugar)		100	90	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1		1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Collodion (Nitrocellulose + Ether + Alcohol)		100	30	4	X1 X1 C1 X1 V1 C1	GBTGG									Liq. mix. H_2O; INFLAMMABLE
Colofony (Resin - Pineresin)		100	30	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	1			1		1.08	100 - 150		Flakes sol. Alcohol, Benzene, Oils, Ether, Acetic Acid
Copper Chloride	$Cu\ Cl_2 - 2H_2O$	Sat.	20	7	X1 Y1 R1 R1 Y1 H1 X1	U3U3VGG	1	1	2	1		2.54			Crystals sol. H_2O, Alcohol; POISONOUS
Copper Cyanide	$Cu(CN)_2$	Sat.	60	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	1	1	1	1					Powder sol. Acids, Alkali; POISONOUS
Copper Nitrate	$Cu(NO_3)_2 - 3H_2O$	Sat.	80	5	X1 P1 X1 P1 K1 K1 P1	Q1Q1PGG	1					2.32	114.5		Crystals sol. H_2O, Alcohol; POISONOUS, STRONG OXYDATING
Copper Oxyde	CuO	10	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					6.32			Acids soluble Crystals; TOXIC
Copper Salts		10	30	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1					Crystals - TOXIC
Copper Sulphate	$Cu\ SO_4 - 5H_2O$	50	80	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1		2.28			H_2O, Methanol sol. Crystals; POISONOUS
Copper Sulphate + 10% H_2SO_4		50	20	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Cottonseeds Oil		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1			1					
Creoline		100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1					
Creosole (Meta, Orto, Para)	$CH_3\ C_6\ H_4\ OH$	Conc.	90	5	X1 Y1 X1 Y1 R1 V1 Y1	U3BVGG				1		1.04	30 - 35	203	Liq. or crystals sol. Alcohol, Ether, Chloroph.; POISONOUS, SCALDING
Creosote		100	140	2	X1 Y1 X3 X3 Y1	U1U1VGG	1		2	1	1	1.08		203	Oily liq. mix. Alcohol, Ether
Creosote + light Oil		100	140	2	X1 Y1 X3 X3 Y1	U1U1VGG	1		2	1	1				
Creosote Oil (Tar Oil)		100	140	2	X1 Y1 X3 X3 Y1	U1U1VGG	1		2	1	1	1.08	5.5	220	Oily liquid mix. Alcohol, Ether; CAUSTIC
Cresylic Acid	$CH_3\ C_6\ H_4\ OH$	Conc.	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				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	X1 Y1 X1 V1 Y1	GBVGG				1		0.85		102	Liq. mix. Alcohol, Ether, Toluol, Benzene, Naphta, INFLAMMABLE
Crotonic Aldehyde + Butanol		100	80	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Crude Oil		100	180	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	2			1	1				
Crude Oil Corrosive		100	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Crude Olefins		100	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1	1				
Cumene (Isopropylbenzene)	$C_6H_5C(CH_3)_2$	100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1		0.86	-96	152.7	Liq. sol Alchohol, Eter, Benzene, Carb. Tetracl.

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Cumene Hydroperoxyde	$C_6H_5C(CH_3)_2OOH$	100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1					Liq. sol. Alcohol, Acetone, Hydrocarbons, Esters
Cyanides		Sat.	40	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1							POISONOUS
Cyclohexane	C_6H_{12}	100	80	2	X1 P1 G1 V1 P1	EBPGG	1			1		0.78	6.3	80.7	Liq. mix. Buthylic Alcohol, Toluol, Xylol; INFLAMMABLE
Cyclohexanon	$C_6H_{10}O$	100	90	4	X1X1C1X1V2C1	GBTGG		2				0,95	-47	156,7	Liq. mix. Solvents
Cyclopentadiene	C_5H_6	100	80	2	X1 P1 G1 V1 P1	EBPGG	1					0.8		42.5	Liq. sol. Alcohol, Ether, Benzene
Cymene (Ortho, Meta, Para)	$CH_3C_6H_4CH(CH_3)_2$	100	80	2	X1 Y1 X1 V1 Y1	GBVGG				1		0,85-0,87	-73	176,5	Liq. sol. Alcohol, Ether, Chlorophorm
DDT (Dichlorodi-pheniltrichloroethane)	$(ClC_6H_4)_2CHCCl_3$	100	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG							109		Crist. sol. Kerosene, Benzene, Ether, Acetone, Carb. Tetrachl.
DEA solution	$(HOCH_2CH_2)_2NH$	Sat..	110	4	X1 X1 C1 X3 X3 C1	U1U1TGG	2	2	2						Liq. or crystals sol. H_2O, Alcohol
Decylene	$H_2C - CH(CH_2)_7CH_3$	100	120	2	X1 Y1 G1 V1 Y1	EBVGG				1		0.73	-66.3	172	Liq. sol. Alcohol
Detergents		100	90	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							
Deuterium (Heavy Water)	D_2O	100	140	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1		1					
Diacetonealcohol (Diacetone)	$CH_3COCH_2C(CH_2)_2OH$	100	130	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1				0.94	-42.8	169	Liq. mix. Alcohol, H_2O, Esters; INFLAMMABLE
Dialysis Liquid		100	40	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1		1					
Diathermic Oil		100	350	RF	X1 X3 X3 A1	U1U1YGG									
Diathermic Oil		100	180	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Dibrometetrafluorethane		100	30	4	X1 X1 C1 X1 V1 C1	GBTGG				2					FIRE- FIGHTING
Dichlorethane (Ethylene Chloride)	$ClCH_2CH_2Cl$	100	60	4	X1 X1 C1 X1 V1 C1	GBTGG				2		1.25	-35	83.5	Oily liquid, mix. common solvents; INFLAMMABLE
Dichlormethane (Methylene Chloride)	CH_2Cl_2	100	40	4	X1 X1 C1 X1 V1 C1	GBTGG				2		1.3	-97	48.1	Liq. sol. Alcohol, Ether; VOLATILE, POISONOUS
Dichlorpropane (Propylenechloride)	$CH_3CHClCH_2Cl$	100	30	4	X1 X1 C1 X1 V1 C1	GBTGG						1.15		96.3	Liquid sol. H_2O, Alcohol, Ether. - INFLAMMABLE
Diesel - Fuel (Diesel Oil)		100	110	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Diesel Naphtha		100	110	5	X1Y1X1Y1K1V1Y1	Q1BVGG				1	1				
Diethanolammine (DEA)	$(HOCH_2CH_2)_2NH$	Sat.	110	4	X1 X1 C1 X3 X3 C1	U1U1TGG	2	2	2			1.09	28	217	Liq. or crystals sol. H_2O, Alcohol
Diethylammine	$(C_2H_5)_2NH$	100	90	4	X1 X1 C1 X1 V1 C1	GBTGG	2	2	2			0.7	-49.8	55.5	Liq. mix. H_2O, Alcohol, org. Solvents; INFLAMMABLE

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Diethylcarbonate	$(C_2H_5)_2CO_3$	100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				0.97	-43	126	Liq. mix. Ketones, Alcohol, Esters, arom. Hydrocarbons; INFLAMMABLE
Diethylene Glycol	$CH_2OH\,CH_2OCH_2\,CH_2OH$	100	140	5	X1 E1 X1 E1 K1 V3 E1	Q1AEGG		1	2	1		1.11	-8	245	Liq. mix. H_2O, Ether, Acetone
Diethylmaleate	$C_2H_5OOCCH : CHCOOC_2H_5$	100	80	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.06	-11.5	225	Liq. sol. Alcohol, Organic Solvents, Hydrocarbons, less in H_2O
Dimethyl Sulphur Oxyde (DMSO)	$(CH_3)_2SO$	100	30	4	X1 X1 C1 X1 V1 C1	GBTGG						1.1	18.5	189	Liq. mix. H_2O
Dimethylammine (DMA)	$(CH_3)_2NH$	100	20	4	X1 X1 C1 X1 V1 C1	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	X1 X1 C1 X3 X3 C1	U1U1TGG		2				0.95	-61	152.8	Liq. mix. H_2O, org. Solvents
Dimethylphormamide + Acrylnitr. + methylenchloride		100	80	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									
Dimethylterephtalate (DMT)	$C_6H_4(COOCH_3)_2$	100	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1			140		Crystals sol. Alcohol, Ether
Dinitrochlorbenzene	$C_6H_3(NO_2)_2Cl$	100	>60	2	X1 Y1 G1 V1 Y1	EBVGG				1		1.69	27-53	315	Alcohol sol. crystals
Dinitrochlorbenzene + Stirol		100	110	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Dioctylamine	$[C_4H_9CH(C_2H_5)CH_2]_2NH$	100	90	2	X1 P1 G1 V1 P1	EBPGG	1					0.8		281	Hydrocarbons sol. liq.
Dioctylphtalate (DOP)	$C_6H_4[COOCH_2CH(C_2H_5)C_4H_3]_2$	100	110	4	X1 X1 C1 X1 V1 C1	GBTGG		2	2	2		0.98		231	Min. oil sol. liquid
Dioxine (TCDD)		100	30	4	X1 X1 C1 X1 V1 C1	GBTGG						1			
Diphenil + Diph. Oxyde (DOW. A)		100	350	RF	X1 X3 X3 A1	U1U1YGG				1	1				
Diphenyl	$C_6H_5C_6H_5$	Sat.	80	4	X1 X1 C1 X1 V1 C1	GBTGG						1	70	225	Alcohol, Ether sol. crystals
Diphenyl Chloro	$ClC_6H_4SO_2C_6H_5$	Sat.	80	2	X1 Y1 X1 V1 Y1	GBVGG				1					Org. Solvents sol. Crystals
Diphyl DT		100	180	2	X1 Y1 X3 V1 Y1	U1BVGG				1	1				
Divinyl (Butadiene)	$H_2C:CH\,HC:CH_2$	100	20	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		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-Lead)	Na_2PbO_2	Sat.	80	2	X1 P1 X1 V1 P1	GBPGG	1								
Dodecyl Mercaptan (DDM)	$C_{12}H_{25}SH$	100	70	2	X1 E1 G1 V1 E1	EBEGG		1				0.85	-7.5	143	Liq. sol. Methanol, Ether, Benzene, Acetone, Petrol, Ethylacetate
Dodecylbenzene	$C_{12}H_{25}C_6H_5$	100	90	2	X1 Y1 G1 V1 Y1	EBVGG				1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Domestic Fuel Oil		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1			1	1				
Dowanol		100	80	4	X1 X1 C1 X1 V1 C1	GBTGG									
Dowtherm 209		100	90	2	X1 P1 G1 V1 P1	EBPGG	1		2		1			99	
Dowtherm A and E		100	250	RF	X1 X3 X3 A1	U1U1YGG				1	1			(*)	(*) A = 258°C; E = 177°C
Dowtherm various		100	150	4	X1 X1 C1 X3 V1 C1	U1BTGG					1				
Dyeing baths		100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1		2					
Dyeing baths		100	140	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1		2					
EDTA (Ethylenediamine Tetraacetic Acid)	$(HOOCCH_2)_2\ N_2C_2H_4\ (CH_2\ COOH)_2$	Conc.	90	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							Hardly sol. crystals in H_2O
Egg Yolk		100	20	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1		1					
English Salt (Bitter Salt)		Sat.	90	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	1	1	1					Compound Magnesium Sulphate
Epichlorhydrin	$CH_2\ OCH\ CH_2\ Cl$	Sat.	90	4	L1 L1 C1 L1 V1 C1	MBTMM		2				1.17	-58.1	115.2	Liq. mix. org. Solvents; VOLATILE, NARCOTIC
Epichlorhydrin	$CH_2\ OCH\ CH_2\ Cl$	30	50	4	X1 X1 C1 X1 V1 C1	GBTGG		2							Liq. mix. org. Solvents; VOLATILE, NARCOTIC
Epoxy Resins		100	140	4Dual	X1X1C1X3X3C1	U1U1TGG				2					Washing with solvents
Essential Oil		100	80	2	X1 E1 X1 V1 E1	GBEGG		1							
Esters Plastifying		100	130	4	X1 X1 C1 X3 X3 C1	U1U1TGG		1							
Esters Plasticizers		100	130	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2							
Esteres - Phthalate Esters		100	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1							
Ethane (Dimethyl)	$C_2\ H_6$	100	90	2 Dual	X1 P1 G1 V1 P1	EBPGG	1		2	1	1	Liq. 0.44	-183	-88.6	INFLAMMABLE Gas
Ethane Dibrome	$Br\ CH_2\ CH_2\ Br$	100	70	4 Dual	X1 X1 C1 X1 V1 C1	GBTGG						2.18	9.1	131	Solvents sol. liq.
Ethane Dichl. (Ethylene Chloride)	$Cl\ CH_2 : CH_2\ Cl$	100	70	4	X1 X1 C1 X1 V1 C1	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	X1 Y1 G1 V1 Y1	EBVGG	1	1	1	1	1		-94	3.55	Liq. Gas
Ethane Tetra-chlordiphenyl (TDE)	$(Cl\ C_6\ H_4)_2\ CHCHCl_2$	100	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG							110		Org. solvents sol. crystals similar to DDT
Ethane Tetrachlore	$CH\ Cl_2\ CH\ Cl_2$	100	90	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				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	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.3		75	Liq. sol. Alcohol, Ether
Ethane Trichlore Trifluor (F 113)	$C\ Cl_2\ F\ CClF_2$	100	40	2	X1 P1 G1 V1 P1	EBPGG	1		1	2		1.42	-36,4	47.6	Liq. VOLATILE, INERT

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Ethanol (Ethil Alcohol)	C_2H_5OH	Conc.	70	2	X1 P1 X1 V1 P1	GBPGG	1	1	1			0.81	-118	78.3	Liq. VOLATILE, INFLAMMABLE, sol. Ether, H_2O, Chlorophorm
Ethanolammines (M E A)	$NH_2CH_2CH_2OH$	Conc.	90	4	X1 X1 C1 X1 V1 C1	GBTGG	2	2	2			1.01	10.5	170.5	Slightly viscous liq. mix. H_2O, sol. Alcohol, Chloroph., Carb. Tetrachl.
Ether Acetic (Ethyl Acetate)	$CH_3COOC_2H_5$	Conc.	70	4	X1 X1 C1 X1 V1 C1	GBTGG		2				0.89	-83.6	77	Liq. sol. Alcohol, Ether, Chloroph. INFLAMMABLE
Ether Isopropylic	$(CH_3)_2CHOCH(CH_3)_2$	100	20	4	X1 X1 C1 X1 V1 C1	GBTGG	2					0.72	-88	67.5	VOLATILE, INFLAMMABLE liq.
Ether Petroleum (Ligroine)		100	80	2	X1 P1 G1 V1 P1	EBPGG	1		2	1				20 - 135	Solvent; VOLATILE, INFLAMABLE, TOXIC
Ether Sulphur (Ethylic)	$(C_2H_5)O$	100	20	4	X1 X1 C1 X1 V1 C1	GBTGG						0.7	-116	34.5	Liq. sol. Naphtha, Alcohols, Oils, Benzene, Chlorophorm; INFLAMMABLE, VOLATILE, EXPLOSIVE
Ethyl Acetate (Ether Acetic)	$CH_3COOC_2H_5$	Conc.	70	4	X1 X1 C1 X1 V1 C1	GBTGG		2				0.89	-83.6	77	Liq. sol. Alcohol, Ether, Chlorophorm; INFLAMMABLE
Ethyl Acrylate	$CH_2:CHCOOC_2H_5$	100	90	4	X1 X1 C1 X1 V1 C1	GBTGG		2				0.92	-72	99.4	Liq.; IRRITATING, INFLAMMABLE, IT POLYMERIZES
Ethyl Benzoate (Niobe Oil)	$C_6H_5CO_2C_2H_5$	100	90	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.04	-32.7	213	Liq. sol. Alcohol, Ether
Ethyl Butirrate	$C_3H_7CO_2C_2H_3$	Conc.	110	2	X1 E1 X1 V1 E1	GBEGG		1				0.87	-93.3	120.6	Liq. sol. Alcohol, Ether; VOLATILE, INFLAMMABLE
Ethyl Carbinol (Diethyl Carbinol)	$CH_3CH_2CHOHCH_2CH_3$	Conc.	100	2	X1 Y1 X1 V1 Y1	GBVGG	1	1	1	1	1	0.82	-75	115.6	Liq. sol. Alcohol, Ether
Ethyl Carbonate (Diethyl Carbonate)	$(C_2H_5)_2CO_3$	100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				0.97	-43	126	Liq. mix. Alcohols, Ketones, Esters, Aromatic Hydrocarbons
Ethyl Chloride (Chlorethane)	C_2H_3Cl	100	20	2	X1 P1 G1 V1 P1	EBPGG	1	1	1	1		Liq. 0.92	-140	12.5	Mix. common solvents; VOLATILE, INFLAMMABLE
Ethyl Chlorophormiate (Chlorecarb.)	$ClCOOC_2H_3$	100	20	5 Dual	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.13		95	Liq. sol. Alcohol, Benzene, Ether, Chlorophorm; POISONOUS, INFLAMMABLE
Ethyl Ethylene (Butene 1)	$CH_2CHCH_2CH_3$	100	20	2	X1 Y1 G1 V1 Y1	EBVGG	2			1		Liq. 0.59	-185	-6.3	Liq. Gas sol. Org. Solvents; INFLAMMABLE, VOLATILE
Ethyl Hexanol (Octyl. Alcohol)	$CH_3(CH_2)_6CH_2OH$	100	70	2	X1 E1 X1 V1 E1	GBEGG	2	1	2	1		0.82	-16	194	Liq. mix. Alcohol, Chlorophorm; Min. Oil
Ethyl Phormiate	$HCOOC_2H_5$	100	40	5	X1 Y1 X1 Y1 R1 V1 Y1	U3BVGG		2	2	1		0.92	-80.5	54.3	Liq. mix. Benzene, Ether, H_2O, Alcohol; INFLAMMABLE
Ethyl Phthalate (DEP)	$C_6H_4(CO_2C_2H_5)_2$	100	90	2	X1 E1 X1 V1 E1	GBEGG		1				1.12	-40.5	298	Liq. mix. Alcohol, Ketones, Esters, Aromatic Hydrocarbons
Ethyl Propionate	$C_2H_5COOC_2H_5$	100	90	2	X1 E1 X1 V1 E1	GBEGG		1				0.89	-73	99	Liq. sol. Alcohol, Ether; INFLAMMABLE

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Ethyl Silicate	$(C_2H_5)_4 Si O_4$	Conc.	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	1		0.93	-77	168.1	Liq. sol. Alcohol; INFLAMMABLE
Ethyl Sulphate	$(C_2H_5)_2 SO_4$	Conc.	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1				1.18	-24.4	208	Liq. sol. Alcohol, Ether
Ethylene (Ethene)	$H_2C : CH_2$	Conc.	20	2 Dual	X1 P1 G1 V1 P1	EBPGG	1				1	Liq. 0.6	-169	-102.5	INFLAMMABLE, EXPLOSIVE Gas
Ethylene Chlore (Vinyl Chloride)	$CH_2 : CH Cl$	100	30	5	X1 Y1 X1 Y1 R1 V1 Y1	U3BVGG				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	X1 X1 C1 X1 V1 C1	GBTGG				2		1.25	-35	83.5	Oily liq. mix. common Solvents; INFLAMMABLE
Ethylene Dimethyl	$(CH_3)_2 CCH_2$	Conc.	20	2	X1 Y1 G1 V1 Y1	EBVGG	2			1		0.6	-139	-6.9	Gas sol. Org. Solvents; VOLATILE, INFLAMMABLE
Ethylene Glycol	$CH_2 OH CH_2 OH$	Conc.	120	5	X1 E1 X1 E1 K1 V3 E1	Q1AEGG	1	1	1	1	1	1.1	-13.5	197	Liq. sol. in H_2O, Ether, Alcohol - Pure without inhibitors
Ethylene Oxyde (ETO)	$CH_2 CH_2 O$	Conc.	20	4	X1 X1 C1 X1 V1 C1	GBTGG						Liq. 0.87	-111.3	10.7	Gas sol. H_2O, common solvents, INFLAMMABLE
Ethylenebichloride (Dichlore)	$Cl HC : CH C_2$	100	20	2	X1 Y1 G1 V1 Y1	EBVGG				1		1.25		47 - 60	Liq. sol. Organic Solvents; TOXIC
Ethylenediamine	$NH_2 CH_2 CH_2 NH_2$	Conc.	40	2	X1 E1 X1 V1 E1	GBEGG	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	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							Hardly sol. crystals in H_2O
Ethyleneperchl. (Tetrachl.)	$Cl_2C : C Cl_2$	Conc.	70	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		1.6	-22.4	121	Liq. mix. Alcohol, Ether, Oils; TOXIC
Extinguishing Oil		100	80	2	X1 P1 G1 V1 P1	EBPGG	1				1				
Fats		100	80	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1			1					
Fats - Animal Fats		100	160	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	2	2	1					
Fats - Mineral Fats		100	80	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1				
Fats - Silicone Fats		100	80	2	X1 E1 G1 V1 E1	EBEGG	1	1	1	1	1				
Fats - Vegetal Fats		100	80	2	X1 P1 G1 V1 P1	EBPGG	1	1	2	1					
Ferric Phosphate	$Fe PO_4 + 4H_2O$	Sat.	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							H_2O non sol. powder; sol. in mineral acids
Ferric Chloride	$Fe Cl_3$	Sat.	20	7	X1 Y1 Z1 C4 Y1 H1 X1	VY1VGG	1	1	2	1		2.89	300		Solid sol. H_2O, Alcohol, Glycerol, Methanol, Ether
Ferric Chloride and Aniline		Sat.	20	7	X1 E1 Z1 C4 E1 H1 X1	VY1EGG		1							
Ferric Sulphate	$Fe(SO_4)_3 - 9H_2O$	Sat.	100	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				2.09			H_2O sol. powder
Ferric Sulphate + Lime		Sat.	100	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							Powder sol. H_2O

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Ferrous Sulphate	$Fe SO_4 - 7H_2O$	Sat.	110	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.89	64		Crystals sol. H_2O
Ferrous Sulphur	Fe S	10	60	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				4.75	1195		Grains sol. Acids
Ferrous Sulphur + HCl		Sat.	30	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					
Fertilizers		Sat.	60	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Fixing Bath (Photogr.)		100	40	7	X1 E1 Z1 C4 E1 H1 X1	VY1EGG		1							
Fluid Silicon		100	90	4	X1 X1 C1 X1 V1 C1	GBTGG									
Fluoborate Acid Solution		10	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	2							
Fluoboric Acid	$H B F_4$	20	30	5 Dual	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1		1.84		130	Liq. mix. H_2O, Alcohol
Fluobrene		100	70	4	X1 X1 C1 X1 V1 C1	GBTGG				2					FIRE - FIGHTING
Fluosilicic Acid	$H_2 Si F_6$	5	50	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM	2	1	2	1					Liq. sol. H_2O, POISONOUS
Foam (Estinguishing Agent)		100	70	2 Dual	X1 P1 X3 X3 P1	U1U1PGG	1								
Food Oxtile Broth		100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1		1					
Food Medium Fermentators		20	40	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1		1					
Formaldehyde (Formol)	HCHO	Sat.	30	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				1.08 Air 1	-118	-19	Liq. Gas sol. H_2O, Ether, Alcohol; POISONOUS, IT POLYMERIZES
Formalin	HCHO at 37%	100	30	4	X1 X1 C1 X1 V1 C1	GBTGG		2				1.07		98	Contains Methylic Alcohol to avoid polymerisation
Formamide	$HCONH_2$	100	120	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1				1.14	2.5	200	Oily liq. sol. H_2O, Alcohol
Formic Acid	HCOOH	10	50	5	L1 E1 L1 E1 K1 V1 E1	Q1BEMM		1				1.22	8.3	100.8	Liq. sol. H_2O, Alcohol, Ether; CAUSTIC, EXPLOSIVE VAPOURS
Formic Acid	HCOOH	1	20	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							Liq. sol. H_2O, Alcohol, Ether
Formic Aldehyde (Liq. gas)	HCOH	Sat.	30	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				1.08 Air 1	-118	-19	Gas sol. H_2O, Ether, Alcohol; POISONOUS, IT POLYMERIZES
Fossil Meal		10	80	2	X1 E1 X3 X3 E1	U1U1EGG	1	1		1					Diatom Silica
Freon 11 (Trichloro-fluormethane)	$C Cl_3 F$	100	60	4	X1 X1 C1 X3 V1 C1	U1BTGG	2			2	1	1.5	-111	23.7	Extinguishing liq.; VOLATILE
Freon 12 (Dichloro-difluormethane)	$C Cl_2 F_2$	100	40	2	X1 N1 G1 V1 N1	EBNGG	1	2	1	1	1	Liq. 1.4	-158	-29.8	Liq. Gas sol. org. solvents. Less in H_2O
Freon 13 (Chloro-trifluormethane)	$C Cl F_3$	100	40	2	X1 N1 X3 V1 N1	U1BNGG	1	1	1	1	1		-181	-81	Liq. Gas
Freon 14 (Tetra-fluormethane)	$C F_4$	100	40	2	X1 N1 X3 V1 N1	U1BNGG	1	1	1	1	1	Liq. 1.96	-184	-128	Liq. Gas

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Freon 21 (Dichlorofluormethane)	$CH Cl_2 F$	100	40	4	X1 X1 C1 X3 V1 C1	U1BTGG			2			Liq.1.42	-135	8.9	Liquid Gas sol. Alcohol, Ether
Freon 22 (Chloro-difluoromethane)	$CH Cl F_2$	100	40	2	X1 N1 G1 V1 N1	EBNGG		1	1		1		-160	-40.8	Liq. Gas
Freon 112	$C Cl_2 FCCl_2 F$	100	40	2	X1 Y1 G1 V1 Y1	EBVGG	2		2	1					
Freon 113 (Trichloro-trifluoroethane)	$C Cl_2 FCClF_2$	100	40	2	X1 P1 G1 V1 P1	EBPGG	1		1	2		Liq. 1.42	-36.4	47.6	VOLATILE INERT liquid
Freon 114 (Dichloro-tetrafluoroethane)	$C Cl F_2 C Cl F_2$	100	40	2	X1 Y1 G1 V1 Y1	EBVGG	1	1	1	1			-94	3.55	Liq. Gas
Freon 115 (Chloro-pentafluoroethane)	$C Cl F_2 CF_3$	100	40	2	X1 Y1 G1 V1 Y1	EBVGG	1	1	1	1			-106	-38.7	Liq. Gas sol. Alcohol, Ether
Freon 502		100	40	2	X1 N1 G1 V1 N1	EBNGG				1					
Freon and refrigerating oil		100	-70	RF	X1 J1 V2 A1	KBYGG					1				
Freon and refrigerating oil		100	-20	2	X1 N1 G1 V1 N1	EBNGG			1	2	1				
Freon C318 (Octa-fluorocyclobutane)	$C_4 F_8$	100	40	2	X1 N1 G1 V1 N1	EBNGG	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	X1 P1 G1 V1 P1	EBPGG	1		1	2		Liq. 1.42	-36.4	47.6	VOLATILE INERT liquid
Freon TMS		100	40	4	X1 X1 C1 X3 V1 C1	U1BTGG						1.48		39.7	Mixture of F113 + Methylalcohol
Fruit Juice		100	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1		1					
Fruit Juice + Sulph. Anhydride		100	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1							
Fuel Oil		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1			1	1				
Fuel Oil and Gas		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1			1	1				
Fuel Aromatic		100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1	1				
Fuel-Gas		100	30	2 Dual	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Fuel Jet Aircraft (JP)		100	50	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Fumaric Acid	$C_4 H_4 O_4$	Sat.	60	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1		2	1		1.63	287		Cryst. sol. H_2O, Alcohol
Fuming Sulfuric Acid (Oleum)	$H_2 SO_4 . SO_3$	100	40	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					Oily liq. - mix. H_2O with exother-mic reaction - SCALDING
Fungicide		Sat.	30	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Furfural Aldehyde (Furole)	$C_4 H_3 OCOH$	100	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				1.16	-36.5	161.7	Liq. sol. Alcohol, Ether, Benzene, at 8,3% in H_2O
Gallic Acid	$C_7 H_6 O_5$-H_2O	Sat.	70	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	2	2	2	1		1.69	222		Cryst. sol. Alcohol, Glycerol
Galvanic Solutions		Sat.	40	5	X1 Y1 X1 Y1 Z1 C4 Y1	VY1VGG				1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Gas Oil		100	110	2	X1 Y1 G1 V3 Y1	EAVGG				1	1				
Gasolene		100	30	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1	0.65		40	
Glacial Acetic Acid	CH_3 CO OH	99.8	>17	4	X1 X1 C1 X1 V1 C1	GBTGG		2				1.05	16.6	118	Acetic Acid 99,8%; SCALDING
Glauber Salt (Sodium Solfate decahydrate)	Na_2 SO_4 - $10H_20$	Sat.	70	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		2	2	1		1.46	33		H_2O, Glycerine sol. Crystals
Glucose (20% H_20)	C_6 H_{12} O_6 - H_2O	20	90	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1					Liq. sol. H_2O, Glycerine
Glue		100	30	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									
Glutamic Acid	C_5 H_9 NO_4	20	80	5	L1 E1 L1 E1 Z1 V1 E1	VBEMM		1				1.5	225		Cryst. sol. H_2O
Glutamic Acid + HCl traces		20	80	7	X1 E1 Z1 V2 E1 H1 X1	VBEGG		1							
Glutaric Acid	C_5 H_8 O_4	Sat.	70	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1						97	302	Cryst. sol. H_2O, Alcohol, Ether
Glycerine (Glycerol)	C_3 $H_5(OH)_3$	100	140	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	1	1	1	1	1.26	18	290	H_2O and Alcohol sol. liq.
Glycerol-Phthalmic Resins		100	120	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1							Washing with solvent
Glycols		100	140	5	X1 E1 X1 E1 K1 V3 E1	Q1AEGG	1	1	1	1	1				Pure, without inhibitors
Grappa Brandy		100	40	2	X1 E1 X1 V1 E1	GBEGG	1	1	1	1					
Green Fuel - Gasoline Super (with MTBE)		100	50	5	X1Y5X1Y5K1V3Y5	Q1AVGG									Y5 = Special FPM - (MTBE<3%)
Green Vitriol (Iron Sulphate)	Fe SO_4 - $7H_2O$	Sat.	60	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.89	64		Crystals soluble in H_2O
Heating water	H_2O	100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	2	1	1				With Polisphosphates, filming Amines
Heavy Oil		100	80	5	X1 P1 X1 P1 K1 K1 P1	Q1Q1PGG	1			1	1				
Helium Gas	He	100	20	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	1	1	0.138 Air 1	-272	-269	Inert Gas
Heptane	$CH_3(CH_2)_5$ CH_3	100	70	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1	0.68	-90.5	98.4	Liq. sol. Alcohol, Ether, Chloro-phorm; VOLATILE, INFLAMMABLE
Heptene	C_7 H_{14}	100	70	2	X1 P1 G1 V1 P1	EBPGG	1				1	0.69	-119.2	93.3	Liq. sol. Alcohol, Acetone, Petroleum, Ether, Hydroc.
Herbicides Liquids		Sat.	20	4	L1 L1 C1 L1 V1 C1	MBTMM									
Hexachloracetone		100	40	45	L1 L1 C1 L1 C1 K1 C4 C1	Q1Y1TMM									
Hexane	$CH_3(CH_2)_4$ CH_3	100	30	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1	0.65	-95	68.7	Liq. sol. Alcohol, Ether, Acetone; VOLATILE, INFLAMMABLE
Hexone (Methyl Isobutyl Chetone - MEC)	$(CH_3)_2$ CH CH_2 CO CH_3	100	40	4	X1 X1 C1 X3 X3 C1	U1U1TGG						0.8	-80.4	115.8	Liq. mix organic solvents INFLAMMABLE
Hydraulic Brakes Oil (Vegetable)		100	80	2	X1 E1 G1 V1 E1	EBEGG		1		2	1				

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Hydraulic Oil (Petroleum Base)		100	80	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1				
Hydraulic Oil (Veg.)		100	80	2	X1 E1 G1 V1 E1	EBEGG		1	2		1				
Hydrazine	$H_2 N NH_2$	100	70	2	X1 E1 X1 V1 E1	GBEGG	2	1	2			1.00	2.0	113.5	Liquid mixable with H_2O, Alcohol; TOXIC VAPOURS
Hydrobromic Acid	H Br	48	40	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM		1		1		2.7 Air 1	-86	-66.4	Water solution - HBr 48% in H_2O
Hydrobromic Acid with Brome		48	40	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					
Hydrocarbons (Aliphatic)		100	90	2	X1 P1 G1 V1 P1	EBPGG	1		2		1				
Hydrocarbons (Aromatic)		100	30	2	X1 Y1 G1 V3 Y1	EAVGG				1	1				
Hydrochloric Acid	H Cl	Sat.	37	7	X1 Y1 Z1 V2 Y1 H1 X1	VBVGG				1		1.1 Air 1	-114	-85	Gas sol. H_2O, Alcohol, Ether; POISONOUS, CAUSTIC
Hydrochloric Acid (Muriatic)	H Cl	38	37	7	X1 Y1 Z1 V2 Y1 H1 X1	VBVGG				1		1.1 Air 1	-114	-85	38% Gas in H_2O - Solution; POISONOUS, CAUSTIC
Hydrocyanic Acid (Prussic)	H CN	99	<25	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	2	1	2	1		0.69	-13	26	Liq. sol. H_2O, Alcohol, Ether; EXPLOSIVE, POISONOUS VAPOURS
Hydrocyanite		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1								
Hydrofluoric Acid	HF	20	20	7 Dual	X1 F1 K1 V2 F1 H1 X1	Q1BXGG				1		0.99	-83	19.5	Liq. or gas sol. H_2O, POISONOUS, SCALDING
Hydrogen	H	100	20	5 Dual	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1	1		0.07 Air 1	-259	-252	Hardly sol. Gas in H_2O; INFLAMMABLE - EXPLOSIVE
Hydrogen Chloride	H Cl	Sat.	37	7	X1 Y1 Z1 V2 Y1 H1 X1	VBVGG				1		1.2 Air 1	-114	-85	Gas sol. H_2O, Alcohol, Ether; POISONOUS, CAUSTIC
Hydrogen Cyanide (Hydrocyanic acid)	H CN	99	<25	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	2	1	2	1		Liq. 0.69	-13	26	Liquid sol. in H_2O, Alcohol, Ether; EXPLOSIVE, POISONOUS VAPOURS
Hydrogen fluoride (Hydrofluoric acid)	HF	20	20	7 Dual	X1 F1 K1 V2 F1 H1 X1	Q1BXGG				1		Liq. 0.99	-83	19.5	Liq. or Gas sol. in H_2O; POISONOUS, SCALDING
Hydrogen Peroxide	$H_2 O_2$	90	30	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1		1,45	-2	150	Liq. sol. H_2O, Alcohol; SCALDING
Hydrogen Sulphurate (Sulphide)	$H_2 S$	100	20	5 Dual	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1	2			1.2 Air 1	-84	-60	Gas sol. in H_2O, Alcohol; POISONOUS, INFLAMABLE, EXPLOSIVE
Hydroquinone	$C_6H_4(OH)_2$	Sat.	80	4	X1 X1 C1 X3 X3 C1	U1U1TGG				2		1.33	170	285	Cristals sol. in H_2O, Alcohol, Ether
Hydrosulphuric Acid	$H_2 S$	100	20	5 Dual	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1	2			1.2 Air 1	-84	-60	Gas solub. H_2O, Alcohol; EXPLOSIVE, INFLAMMABLE, POISONOUS

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Ice Cream		100	20	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1		1					
Illuminating Gas		100	20	2 Dual	X1 Y1 G1 V1 Y1	EBVGG				1	1	0.45 Air 1			Mixture of Gas H + CO +N + Methane
Inert Gas		100	40	2 Dual	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Ink for ballpoint pen		100	30	4	X1 X1 C1 X3 V1 C1	U1BTGG									
Ink, Alcohol Ink		100	30	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1							
Ink, Waterink		100	30	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					
Insecticide		100	70	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Iodine - Dry Iodine	I	10	80	5 Dual	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	2	2		1		4.98	113.5	184	Flakes sol. in Glycerol, Alcohol, Ether, C. Disulphide; POISONOUS
Iodine - Tincture of Iodine		100	30	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					I + Na Jodure solution in Alcohol
Iodophorm	CHI_3	10	90	4 Dual	X1 X1 C1 X1 V1 C1	GBTGG						4.1	115		Powder sol. in Alcohol, Chlorophorm, Glycerol; NO in H_2O
Isobutane (Liquid Gas)	$(CH_3)_2$ CH CH_3	100	30	2	X1 P1 G1 V1 P1	EBPGG	1			1	1	Liq. 0.55	-159.6	-11.7	Liq. Gas sol. Ether; INFLAMMABLE
Isobutilmethylketone		100	70	4	X1 X1 C1 X3 X3 C1	U1U1TGG									
Isobutirric Aldehyde	$(CH_3)_2$ CH CHO	100	60	4	X1 X1 C1 X1 V1 C1	GBTGG		2				0.79	-66	64	Liq. sol. Alcohol; Ether
Isobutylene (Dimethylethylene)	$(CH_3)_2$ C CH_2	Conc.	20	2	X1 Y1 G1 V1 Y1	EBVGG	2			1		0.6	-139	-6.9	Liq. sol. in Organic solvents; VOLATILE, INFLAMMABLE
Isocyanates - Organic Isocyanates		100	70	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					BECOMES SOLID IN AIR
Isopentane	$(CH_3)_2$ $CHCH_2$ CH_3	100	30	2	X1 P1 G1 V1 P1	EBPGG	1				1	0.61	-160	27.8	Liq. sol. Hydrocarbons, Oils, Ether; VOLATILE, INFLAMMABLE
Isophorone	C_9 H_{14} O	100	40	2	X1 E1 X1 V1 E1	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	X1 E1 X1 V1 E1	GBEGG	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	X1 X1 C1 X1 V1 C1	GBTGG						0.86	-73.4	89.4	Liquid mix. org. solvents; INFLAMMABLE
Isopropylamine	$(CH_3)_2$ CH NH_2	100	30	4	X1 X1 C1 X1 V1 C1	GBTGG						0.7	-111	39	VOLATILE Mix. H_2O, Alcohol, Ether
Isopropylbenzene (Cumene)	C_6 H_5 $C(CH_3)_2$	100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1		0.86	-96	152.7	Liq. sol. Alcohol, Ether, Benzene, Carbon Tetrachloride
Isopropylnitrate	$(CH_3)_2$ CH NO_3	100	90	4	X1 X1 C1 X1 V1 C1	GBTGG								102	INFLAMMABLE liquid
J.P. 1-4-5-6		100	50	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1	0.81		186-300	

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Jelly		100	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1	1	1					
Jet Fuel		100	50	2	X1 Y1 G1 V1 Y1	EBVGG			2	1	1	0.81		186-300	
Kerosene		100	50	2	X1 Y1 G1 V1 Y1	EBVGG			2	1	1	0.81		150-300	
Ketchup		100	90	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1		1					
Ketones		100	70	2	X1 E1 X1 V1 E1	GBEGG		1							
Kraftgas (Producer gas)		100	50	2 Dual	X1 P1 G1 V1 P1	EBPGG	1		2	1	1				Mixture 3/4 Airgas + 1/4 Water Gas
Lactams		100	130	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2	2						
Lactic Acid	$C_3 H_6 O_3$	100	80	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.2	18	122	Liq. mix. H_2O, Alcohol, Glycerine
Lacker Solvents		100	90	4	X1 X1 C1 X1 V1 C1	GBTGG									
Lanolin		100	80	5	X1 Y1 X1 Y1 R1 V1 Y1	U3BVGG				1					
Latex		100	20	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									
Lauric Acid	$C_{12} H_{24} O_2$	Sat.	50	45	X1 X1 C1 X1 C1 Z1 V1 C1	VBTGG						1.41	44	225	Powder. sol. Alcohol, Ether, no H_2O
Lead Nitrate	$Pb (NO_3)_2$	Sat.	80	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	1	1	1		4.53			Crystals sol. in H_2O, Alcohol; POISONOUS
Lead Tetraethil	$Pb(C_2 H_5)_4$	100	80	2	X1 Y1 G1 V1 Y1	EBVGG	2		2	1		1.65	-136	200	Oily liquid; POISONOUS
Leaving agents		100	40	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1							
Lecithin		100	120	4	X1 X1 C1 X3 V1 C1	U1BTGG									
Light Oil		100	80	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Light Petrol		100	50	2	X1 Y1 G1 V1 Y1	EBVGG	1			1	1				Liq. VOLATILE, INFLAMMABLE
Ligroine (Petroleum Ether)		100	80	2	X1 P1 G1 V1 P1	EBPGG	1		2	1				20 -135	Solvent liquid VOLATILE, INFLAMMABLE, TOXIC
Lime (Dirty)		Sat.	80	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	2	1					
Lime (Slaked)	$Ca(OH)_2$	Sat.	80	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	2	1		2.23			Powder sol. in Glycerine, less in H_2O
Lime and Water	$Ca(OH)_2$	10	80	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	2	1		2.23			
Lime Milk		Sat.	80	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	2	1					
Linseed Oil		100	80	2	X1 P1 X1 V1 P1	GBPGG	1		2	1		0.94			
Liq. Sulphur (Melted)		100	>112	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		1	2	1					
Liqueurs		100	60	2	X1 P1 X1 V1 P1	GBPGG	1	1	1	1					
Liquid Carbon Dioxyde	CO_2	100	-25	5	X1 E1 X1 E1 R1 V1 E1	U3BEGG	1	1	2	2		1.1 (-37°C)	-56.6*		*5,2 bar - Sol. H_2O, Alcohol, Acetone

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Liquid Gas (GPL) (Dimethylmethane)	$C_3 H_8$	100	30	2	X1 Y1 G1 V1 Y1	EBVGG	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	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2	1					
Lithium Bromide	Li Br	Sat.	40	5	L1 P1 L1 P1 K1 V1 P1	Q1BPMM	1					3.4	547		H_2O, Ether sol. Crystals
Lithium Chloride	Li Cl	40	30	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM				1		2.06	614		H_2O, Ether sol. Crystals
Lockeed Liquid		100	80	2	X1 E1 G1 V1 E1	EBEGG		1			1				
Lubricants, Animal Lubricants		100	80	2	X1 P1 G1 V1 P1	EBPGG	1	2	2	1					
Lubricants, Mineral Lubricants		100	80	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1				
Lubricants, Vegetal Lubricants		100	80	2	X1 P1 G1 V1 P1	EBPGG	1	1	2	1	1				
Lubricating Oil		100	80	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Lubricating Oil and Alcohol		100	80	2	X1 P1 G1 V1 P1	EBPGG	1				1				
Lye (not caustic)		Sat.	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	2					
Lye P3		5	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	2					
Lysophorm		100	40	4	X1 X1 C1 X1 V1 C1	GBTGG		2							
Magnesium and Lime		50	60	5 Dual	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	2	1					
Magnesium Chloride	$Mg Cl_2 . 6H_2O$	Sat.	40	5	L1 P1 L1 P1 Z1 V1 P1	VBPMM	1	1	1	1		1.56	116		H_2O, Alcohol sol. Crystals
Magnesium Chloride	$Mg Cl_2 . 6H_2O$	5	20	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		1.56	116		H_2O, Alcohol sol. Crystals
Magnesium Hydroxyde	$Mg(OH)_2$	Sat.	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2	1		2.3	350		Powder sol. Ammonium Salts solutions, diluted Acids
Magesium Nitrate	$Mg(NO_3)_2.6H_2O$	10	20	5	X1P1X1P1Z1V1P1	VBPGG	1					1,6	89		Crystals sol. H_2O, Alchol; Strongly Oxidating
Magnesium Sulphate	$Mg SO_4 . 7H_2O$	Sat.	20	5	X1 P1 X1 P1 R1 V1 P1	U3BPGG	1	1	1	1		1.67			Crystals sol. H_2O, Glycerol
Maize Wheat + H_2O		30	40	2	X1 P1 X3 X3 P1	U1U1PGG	1	1	1	1					
Malathion		100	30	5 Dual	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	2			1		1.2	2.85	156	Liq. TOXIC VAPOURS, IRRITATING
Maleic Acid	$C_4 H_4 O_4$	Sat.	70	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		1.59	150		H_2O, Alcohol, Sol. crystals
Maleic Anhydride	$C_4H_2O_3$	Sat.	120	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		0.93	53	200	White powder sol. Acetone, Hydrocarbons, Ether, Chlorophorm
Malic Acid	$C_4 H_6 O_5$	Conc.	90	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	1		2	1		1.6	128	150	H_2O, Alcohol, Sol. crystals
Malonic Acid	$CH_2(COOH)_2$	Sat.	40	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					1.63	134		H_2O, Alcohol, Ether, Sol. crystals

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Malt		100	60	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1							
Manganese Chloride	$Mn Cl_2 . 4H_2O$	50	30	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		1.9		87.5	H_2O sol. Crystals
Manganese Phosphate	$Mn_3(PO_4)_2 . 7H_2O$	Sat.	60	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					Powder sol. mineral Acids
Manganese Sulphate	$Mn SO_4 4H_2O$	Sat.	20	5	X1 Y1 X1 Y1 R1 V1 Y1	U3BVGG				1		2.1	30		Crystals sol. in H_2O
Mayonnaise		100	20	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	1		1					
Medium Oil		100	80	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Melamine Resins		100	120	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Washing with solvent
Melted Cheese		100	140	L2	X1 Y1 K1 R1 Y1 H1 X1	Q1U3VGG		1		1					
Melted Paraffin		100	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		0.88	47- 65		Sol. Benzene, hot Alcohol, Chlorophorm, Ligroine
Mercaptan		100	80	2	X1 Y1 X1 V1 Y1	GBVGG				1					
Mercurous Nitrate, Hydrated	$Hg(NO_3) . 2H_2O$	Sat.	30	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1		4.78	70		Hardly sol. in H_2O Crystals; POISONOUS
Mercury Bichlorate	$Hg_2 (ClO_3)_2$	Sat.	80	5 Dual	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1		6.4	250		Crystals sol. H_2O, Alcohol, Acetic acid; EXPLOSIVE IN AIR
Mercury Chloride	$Hg Cl_2$	10	60	5	L1 Y1 L1 Y1 Z1 V1 Y1	VBVGG	1	1	1	1		5.4		303	Crystals sol. H_2O, Alcohol, Glycerine, Ether; POISONOUS
Mercury Metal	Hg	100	60	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1	1	1		13.6	-38.8	356	H_2SO_4, HNO_3 sol.; POISONOUS
Mercury Nitrate	$Hg(NO_2)_2 . H_2O$	5	20	5	X1 Y1 X1 Y1 Z1 C4 Y1	VY1VGG				1					POISONOUS
Mesityl Oxide	$C_6 H_{10} O$	100	110	4	X1 X1 C1 X1 V1 C1	GBTGG		2				0.85		130	Oily liq. mix Alcohol, Ether
Metanoic Acid (Formic Ac.)	H COOH	10	50	5	L1 E1 L1 E1 K1 V1 E1	Q1BEMM		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	X1 X1 C1 X3 V1 C1	U1BTGG			2			Liq: 1.42	-135	8.9	Liq. Gas sol. Alcohol, Ether
Methane Gas	CH_4	100	20	2 Dual	X1 P1 G1 V1 P1	EBPGG	1	2		1	1	0.65 Air 1	-184	- 164	INFLAMMABLE Gas
Methane (F_{22}) Monochloredifluor	$CH Cl F_2$	100	40	2	X1 N1 G1 V1 N1	EBNGG		1	1		1		-160	-40.8	Liq. Gas
Methane Monochloretrifluor	$C Cl F_3$	100	40	2	X1 N1 X3 V1 N1	U1BNGG	1	1	1	1	1		-181	-81	Liq. Gas
Methanedichlore (Methylenechloride)	$CH_2 Cl_2$	100	30	4	X1 X1 C1 X1 V1 C1	GBTGG				2		1.3	-97	40.1	Liq. sol. Alcohol, Ether; VOLATILE, POISONOUS
Methanetetrachl. (Carbontetrachloride)	$C Cl_4$	100	20	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM	2			1		1.58	-23	76	Liq. mix Alcohol, Ether, Benzene, Naphtha, Chlorophorm; POISONOUS
Methanetrichlore (Chlorophorm)	$CH Cl_3$	100	40	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.48	-63.5	61.2	Solvent liq. mix Alcohol, Ether, Benzene, Naphtha ; VOLATILE

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Methanetrichlore (mono) Fluor	$C Cl_3 F$	100	60	4	X1 X1 C1 X3 V1 C1	U1BTGG	2			2		1.5	-111	23.7	Extinguishing liq.; VOLATILE
Methanetrimethyl (Isobutane)	$(CH_3)_2 CH CH_3$	100	30	2	X1 P1 G1 V1 P1	EBPGG	1			1	1	Liq. 0.55	-159.6	-11.7	Gas or Liquid, sol. Ether; INFLAMMABLE
Methanol (Methyl Alcohol) (Carbinol)	$CH_3 OH$	100	70	2	X1 E1 X1 V1 E1	GBEGG	1	1	1			0.79	-98	64.5	Liquid sol. H_2O, Ether, Alcohol; POISONOUS, VOLATILE, INFLAMMABLE
Methilacetic Acid (Propionic Acid)	$CH_3CH_2CO_2H$	100	30	45	X1 X1 C1 X1 C1 Z1 C4 C1	VY1TGG						0.99	-21	141	Liq. sol. H_2O, Alcohol, Ether, Clorophorm
Methyl Acetate	$CH_3 CO_2 CH_3$	100	50	4	X1 X1 C1 X1 V1 C1	GBTGG		2	2			0.92	-98	54	Liq. mix. Hydrocarbons; VOLATILE, INFLAMMABLE
Methyl Acrylate	CH_2 - $CHCOOCH_3$	100	70	4	X1 X1 C1 X1 V1 C1	GBTGG		2	2			0.95	-76.5	80.5	Liq. VOLATILE, INFLAMMABLE, IT POLYMERIZES
Methyl Benzene (Toluene)	$CH_3 C_6 H_5$	100	40	2	X1 Y1 G1 V1 Y1	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	X1 Y1 X1 V1 Y1	GBVGG				1		1.08	-12.3	198.6	Oily liquid sol. Alcohol, Ether
Methyl Bromide	$CH_3 Br$	100	20	2 Dual	X1 Y1 X1 V1 Y1	GBVGG	2			1		Liq. 1.7	-94	3.46	Liquid Gas mix. org. solvents; VOLATILE, POISONOUS
Methyl Butyrate	$CH_3 CH_2 CH_2 COOCH_3$	100	40	2	X1 Y1 G1 V1 Y1	EBVGG				1		0.89		102	Liquid solvent for Ethylcellulose; INFLAMMABLE
Methyl Chlorophorm (Chlorothene)	$CH_3 C Cl_3$	100	70	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.3		75	Liquid sol. Alcohol, Ether
Methyl Ethyl Ketone	$CH_3 CO C_2 H_5$	100	60	2	X1 E1 G1 V1 E1	EBEGG		1				0.82	-86.4	79.6	Liquid sol. H_2O, Alcohol, Ether, Oilmix; INFLAMMABLE
Methyl Isobuthyl Ketone	$(CH_3)_2 CHCH_2 COCH_3$	100	20	4	X1 X1 C1 X3 X3 C1	U1U1TGG						0.8	-80.4	115.8	Liquid mix. org. solvents; INFLAMMABLE
Methyl Metacrylate	CH_2-$C(CH_3)COOCH_3$	100	70	4	X1 X1 C1 X3 C4 C1	U1Y1TGG						0.9	-48.2	101	Liquid mix. org. solvents; INFLAMMABLE VOLATILE
Methyl Phormiate	$HCOOCH_3$	100	20	4	X1 X1 C1 X1 V1 C1	GBTGG		2	2			0.95	-99.8	31.8	Liq. sol. H_2O, Alcohol, Ether; VOLATILE INFLAMMABLE
Methyl Phthalate		100	30	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1							
Methyl Propionate	$CH_3 CH_2 COOCH_3$	100	50	2	X1 E1 G1 V1 E1	EBEGG		1				0.9			Liq. sol. org. solvents; INFLAMMABLE
Methylamine	$CH_3 NH_2$	Sat.	20	4	X1 X1 C1 X1 V1 C1	GBTGG						Liq. 0.69	-92.5	-6.8	Liq. Gas sol. H_2O; VOLATILE, INFLAMMABLE
Methylchloride (Chloromethane)	$CH_3 Cl$	100	20	2 Dual	X1 Y1 G1 V1 Y1	EBVGG				1		Liq. 0.92	-97.6	-23.7	Liq. Gas sol. Alcohol, Chlorophorm, H_2O, Benzene, Acetic Acid; INFLAMM. POISON
Methylene Chloride (Chl. Hydrate)	$CH_2 Cl_2$	100	30	4	X1 X1 C1 X1 V1 C1	GBTGG				2		1.3	-97	40.1	Liq. sol. Alcohol, Ether; VOLATILE POISONOUS

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Methylethylcarbinol	$CH_3\ CH_2\ CH\ OH\ CH_3$	100	60	2	X1 P1 G1 V1 P1	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	X1 P1 G1 V1 P1	EBPGG	1					0.8	-108	107	Liq. sol. H_2O, Alcohol, Ether; INFLAMMABLE
Methyl Tert Butyl Ether (MTBE)	$C_5H_{12}O$	100	80	5	X1 W1 X1 W1 K1 V2 W1	Q1CKGG						0,74	-108,6	55,3	Liq. Sol H_2O, INFLAMMABLE EXPLOSIVE- Gasoline additive
Microwax		100	80	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1	1				BECOMES SOLID
Milk		100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	1	1		1.03			
Milk - Condensed Milk		100	80	2	X1 E1 X3 X3 E1	U1U1EGG	1	1	1	1					
Milk - Sterile Milk		100	149	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1		2					
Mineral Oil		100	80	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1	0.94			
Mineral Spirit		100	60	2	X1 P1 G1 V1 P1	EBPGG	1				1				
Molasses		100	80	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1		1					
Monoethanolamine (MEA)	$NH_2\ CH_2\ CH_2\ OH$	Conc.	90	4	X1 X1 C1 X1 V1 C1	GBTGG	2	2	2			1.01	10.5	170.5	Slightly viscous liq.; sol. Alcohol, Chlorophorm,Carbonte trachloride, mix. H_2O
Monomethylamine	$CH_3\ NH_2$	100	30	4 Dual	X1 X1 C1 X1 V1 C1	GBTGG							-92.5	-6.8	Liq. Gas sol. H_2O, Alcohol, Ether; INFLAMMABLE
Mud		100	40	2 Dual	X1 P1 X3 X3 P1	U1U1PGG	1	1		1					
Mud (Thermal Mud)		100	40	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG		1		1					
Muriatic Acid (HCl 39%)	H Cl	100	37	7	X1Y1Z1V1Y1H1X1	VBVGG				1		1.2 Air 1			Gas in 38% -H_2O- Solution; POISONOUS, CAUSTIC
Mustard		100	30	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1							
Naphtha		100	110	2	X1 Y1 G1 V1 Y1	EBVGG	2			1	1	0.76			
Naphtha - Acid Naphtha		100	110	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Naphtha V.P.M.		100	110	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Naphthalin (Naphthalene)	$C_{10}\ H_8$	100	>80	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		1.14	80.2	218	Crystals sol. Benzene, Alcohol, Ether
Naphthaline Oil		100	90	2	X1 Y1 X1 V1 Y1	GBVGG				1					
Naphthilamin	$C_{10}\ H_7\ NH_2$	100	>60	2	X1 P1 G1 V1 P1	EBPGG	1					1.1	50/110	306	Flakes sol. Alcohol, Ether
Natural Gas		100	30	2 Dual	X1 P1 G1 V1 P1	EBPGG	1		1	1	1				
Nickel Acetate	$Ni(OOCCH_3)_2\ 4H_2O$	Sat.	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2			1.74			Crystals sol. H_2O, Alcohol
Nickel Chloride	$Ni\ Cl_2$	Sat.	20	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	1	1	1	1		3.55			Flakes sol. H_2O, Alcohol, Ammonium Hydrate

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Nickel Salts		Sat.	50	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	2	1					
Nickel Sulphate	$NiSO_4 - 6H_2O$	Sat.	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		2.03			Crystals sol. Alcohol
Nickel-Chrom Plating Bath		100	30	5	X1 Y1 X1 Y1 Z1 C4 Y1	VY1VGG		1		1					
Nicotine Sulphate	$(C_{10}\ H_{14}\ N_2)_2\ H_2\ SO_4$	Sat.	50	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					Crystals sol. H_2O, Alcohol, Ether; POISONOUS
Niobe Oil (methyl benzoate)	$C_6H_5\ CO_2\ CH_3$	100	90	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.08	-12,3	198,6	Liq. sol. Alcohol, Ether
Nitre Solvents		100	60	4	X1 X1 C1 X1 V1 C1	GBTGG									
Nitric Acid	HNO_3	98	20	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					Liq. mix. H_2O; POISONOUS, SCALDING
Nitric Acid	HNO_3	65	80	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1		1.5	-41.6	86	Liq. mix. H_2O; POISONOUS, SCALDING
Nitric Acid	HNO_3	20	70	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG		2		1					Liq. mix. H_2O; POISONOUS, SCALDING
Nitric Solutions		100	20	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					POISONOUS, SCALDING.
Nitrile Acetic	$CH_3\ CN$	100	60	4	X1 X1 C1 X1 V1 C1	GBTGG						0.78	-41	82	Liquid sol. H_2O, Alcohol, INFLAMMABLE POISONOUS
Nitrile Acrylic (ACN- Vinylcianyde)	$H_2\ C\ CH\ CN$	100	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG						0,8	-83	77,4	LIQUID ORGANIC SOLVENT
Nitrobaryte (Barium Nitrate)	$Ba(NO_3)_2$	Sat.	60	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1		3.2	575		Crystals sol. H_2O; POISONOUS
Nitrobenzol (Oil of Mirbane) (Nitro-Benzene)	$C_6\ H_5\ NO_2$	100	60	4	X1 X1 C1 X1 V1 C1	GBTGG				2		1.2	5.7	210	Oily liquid sol. Alcohol, Ether, Benzene; POISONOUS
Nitrocellulose (Cell. Nitrate)	$C_6\ H_7\ O_2(O\ NO_2)_3$	100	20	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Paste sol. Acetone, Alcohol, Ether, INFLAMMABLE - EXPLOSIVE
Nitrogen (Gas)	N	100	60	5 Dual	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1	1	0.96 Air 1	-210	-195	H_2O soluble
Nitrogen dioxideoxyde	NO_2	100	40	4	X1 X1 C1 X1 V1 C1	GBTGG						Liq. 1.45	-11.2	21	It solves in H_2O and forms Nitric Acid
Nitromethane	$CH_3\ NO_2$	100	40	45	X1 X1 C1 X1 C1 Z1 C4 C1	VYTGG		2				1.14	-29	101	Liquid sol. H_2O
Nitrosulphuric Acid	$ONOSO_3\ H+H_2\ SO_4$	100	40	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					Liq. 40% HNO_3 + 54% H_2SO_4
Nitrous Gas		100	30	5 Dual	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Nonil Phenol	$C_9H_{19}C_6H_4OH$	100	90	3	X1Y1X1Y1K1V1Y1	Q1BVGG				1		0,95	-10	315	Viscous liq. Sol. Organic solvents
Octanole	$CH_3(CH_2)_6\ CH_2\ OH$	100	70	2	X1 E1 G1 V1 E1	EBEGG	2	1	2	1		0.82	-16	194	Liquid mixable Alcohol, Chlorophorm; Mineral Oil
Octyl Adipate		100	40	2	X1 P1 G1 V1 P1	EBPGG	1								

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Octyl Phenol	$C_8 H_{17} C_6 H_4 OH$	100	80	4	X1 X1 C1 X1 V1 C1	GBTGG						0.89	72	280	Flakes or liquid soluble in Alcohol, Acetone
Octyl Phtalate		40	50	2	X1 E1 X1 V1 E1	GBEGG		1							
Oil and Freon			-70	RF	X1 X3 X3 A1	U1U1YGG					1				
Oil and Freon (Refrigerator)			-20	2	X1 N1 G1 V1 N1	EBNGG			1		1				
Oil and Methylchloride			80	2	X1 Y1 G1 V1 Y1	EBVGG				1					
Oil and Methylen Chloride			60	4	X1X1C1X1V1C1	GBTGG									
Oil - Food Oil (Vegetable and Animal Oil)		100	80	5	X1P1X1P1Z1V1P1	VBPGG	1			1					
Oil - Insulating Oil		100	140	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1				
Oil Sulphunate		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Oil Sulphurate		100	70	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1								
Olefins (Alchene)	$C_n H_{2n}$	100	20	2	X1 Y1 X1 V1 Y1	GBVGG				1	1				Non - satured Hydrocarbons
Olefins Crude (Alchene)	$C_n H_{2n}$	100	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1	1				Non - satured Hydrocarbons
Oleic acid	$C_{18} H_{34} O_2$	100	70	4	X1 X1 C1 X1 V1 C1	GBTGG				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	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		0,91	-4		Oily liquid sol. Chlorophorm, Ether, Carbon Tetrachlor.
Oleum (Fuming Sulfuric Acid)	$H_2 S_2 O_7$	100	40	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					Oily Hydroscopic liq.; mix. H_2O - It gives heat - SCALDING
Olive Oil		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	2	2	1		0.91			
Oligomer	$(+ H_2O + CH_2 + Cl_2)$	100	60	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Polimerizes at low polim. temp. formed by few monomers
Orange Juice		100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1		1					
Oxalic Acid	$C_2 H_2 O_4 - 2H_2O$	40	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2	1		1.65	187		Cryst. sol. H_2O, Alcohol, Ether; POISONOUS, IRRITATING
Oxygen	O_2	100	<20	5 Dual	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	2	1	1	1		1.1 Air 1	-218	Liq. - 183	
Oxygenated Solvents (Ethers)		100	60	4	X1 X1 C1 X1 V1 C1	GBTGG		2							
Oxygenated Solvents (Ketones)		100	60	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							
Oxygenated Solvents (Esters)		100	60	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							
Ozone	O_3	100	30	5 Dual	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1		1		Liq. 1.6	-192	-112	Gas sol. in H_2O; more oxidating than O_2

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Palm Oil		100	110	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1		1		0.95	30		Sol. Alcohol. Ether, Clorophorm., Carbon Disulfide
Palmitic Acid	$CH_3(CH_2)_{14}$ COOH	Sat.	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	2	2	1		0.84	63	352	Cryst. sol. Alcohol, Ether
Paper (Pulp)		100	80	2 Dual	X1 P1 X3 X3 P1	U1U1PGG	1	1		1		0.7 - 1.2			
Paraffin (Alcane)	$C_n H_{2n+2}$	100	80	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1	1				Liquid sol. Benzene, Hot Alcohol, Clorophorm Ligroine
Paraffin Chlorinated		100	80	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U1VGG				1					Liquid sol. Benzene, Hot Alcohol, Clorophorm Ligroine
Paraffin Oil		100	110	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					
Paratoluolsulphon Acid	$C_6 H_4(SO_3 H)(CH_3)$	Sat.	30	5	L1 Y1 L1 Y1 Z1 V1 Y1	VBVMM				1			107	140	Flakes sol. H_2O, Alcohol, Ether
Pastry (Dough)		100	30	2 Dual	X1 P1 X3 X3 P1	U1U1PGG	1	1		1					
Peanut Oil		100	180	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		0.91			Saponificating
Peanut Oil		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1		2	1		0.91			Saponificating
Peanut Oil With Seeds		100	140	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1			1					
Pectin		100	40	2	X1 E1 X3 X3 E1	U1U1EGG	1	1							GELATINIZING EFFECT
Pectine Liquor		100	60	2	X1 P1 X1 V1 P1	GBPGG	1								
Penicillin (Broth) and Sterile Steam		100	110	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U1VGG				1					
Pentaeritrosol	$C(CH_2OH)_4$	Sat.	30	45	X1 X1 C1 X1 C1 K1 V2 C1	Q1CTGG						1.4	262	276	Crystal Powder sol. in H_2O
Pentane	$CH_3(CH_2)_3 CH_3$	100	30	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1	0.63	-129.7	36	Liquid sol. Hydrocarbons, Oils, Ether; INFLAMMABLE
Pentanol (Amylicalcohol)	$CH_3(CH_2)_4$ OH	100	90	2	X1 E1 G1 V1 E1	EBEGG	2	1	2	2		0.8	78.9	137.8	Liquid mixable Alcohol, Ether
Pentanol Acetate		100	20	4	X1 X1 C1 X1 V1 C1	GBTGG		2	2						
Permanganate Potassium	KMn O_4	10	90	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1				2.7			Crystals sol. in H_2O, Methanol, Strongly oxydating
Petrol and Mercaptane		100	50	2	X1 Y1 X1 V1 Y1	GBVGG				1	1				Liq. VOLATILE, INFLAMMABLE
Petrol and Sulphur Hydrogen		100	50	2	X1 P1 X1 V1 P1	GBPGG	1								Liq. VOLATILE, INFLAMMABLE
Petrol with Acetone		100	80	4	X1 X1 C1 X1 V1 C1	GBTGG									Liq. VOLATILE, INFLAMMABLE
Petrol with Methanol (<20%)		100	50	2	X1 Y4 G1 V1 Y4	EBXGG					1				Liq. VOLATILE, INFLAMMABLE
Petrol/Gasoline		100	50	2	X1 Y1 G1 V1 Y1	EBVGG				1	1	0.75		60 - 200	Liq. VOLATILE, INFLAMMABLE
Petroleum Petroleum Oil		100 100	60 80	2 2	X1 P1 G1 V1 P1 X1 P1 G1 V1 P1	EBPGG EBPGG	1 1		2 2	1 1	1 1	0.8			
Petroleum Spirits		100	90	2	X1 Y1 G1 V1 Y1	EBVGG	1			1	1				Liq. Volatile, Inflammable

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Phenic Acid (Phenol)	$C_6 H_5 OH$	Sat.	70	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.1	43	182	Crystals sol. H_2O, Alcohol, Ether, Chlorophorm,Glycerol, POISONOUS, SCALDING
Phenil Propane		100	20	2	X1 Y1 X1 V1 Y1	GBVGG				1					
Phenilacetic Acid	$C_6 H_5 CH_2 COOH$	75	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.08	78	262	Crystals sol. Alcohol, Ether
Phenol - Formaldeyde (Mixture)		Sat.	70	4	X1 X1 C1 X1 V1 C1	GBTGG									
Phenol (Benzolphenol)	$C_6 H_5 OH$	Sat.	70	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG		2		1		1.07	43	182	H_2O sol. crystals, Alcohol, Ether, Chlorophorm; POISONOUS - SCALDING
Phenol Alkilate		100	80	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG				2					Viscous oily liq. (300 cP)
Phenol and Water		10	70	2	X1 Y1 X1 V1 Y1	GBVGG				1					
Phenol Dodecyl	$C_{12} H_{25} C_6 H_4 OH$	100	40	2	X1 Y1 X1 V1 Y1	GBVGG				1		0.94		310	Liq. solvent sol. org. solvents
Phenol Paraterbutyl		Sat.	>85	4	X1 X1 C1 X3 X3 C1	U1U1TGG							85		t < 85°C It precipitates; sol. in Eptane
Phenol Pentachlore	$C_6 Cl_5 OH$	Sat.	80	4	X1 X1 C1 X1 V1 C1	GBTGG						1.97	190	310	Crystals sol. Alcohol, Ether, Acetone, Methanol, Carbitol, Cellosolve
Phenolic Resins		100	140	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					Washing with solvent
Phenyl Chloride (Chlorebenzene)	$C_6 H_5 Cl$	100	70	2	X1 Y1 X1 V1 Y1	GBVGG				1		1.1	-4.5	131.6	Liq. mix. org. solvents; INFLAMMABLE,VOLATILE, NO PTFE
Phenyl Ethilene (Styrol)	$C_6 H_5 CH : CH_2$	100	140	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG				2		0.9	-30.6	145.2	Oily liq. sol. Alcohol, Ether
Phenyl Methane (Toluol)	$CH_3 C_6 H_5$	100	40	2	X1 Y1 G1 V1 Y1	EBVGG				1		0.86	-94.5	110.7	Liq. sol. Alcohol,Ether, Benzene; INFLAMMABLE
Phoron	$(CH_3)_2CCHCO$	100	40	2	X1 E1 X1 V1 E1	GBEGG		1							
Phosphatating media		10	80	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Phosphates		10	80	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Phosphoric Acid	H_3PO_4	Conc.	80	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM		2		1		1.83	42		Crystals sol. H_2O, Alcohol; IRRITATING
Phosphoric Acid	$H_3 PO_4$	10	20	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1		1					Crystals sol. H_2O, Alcohol; IRRITATING
Phosphorous Acid (Ortophosph.)	$H_3 PO_3$	Conc.	80	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1		1		1.65	70	200	Crystals sol. H_2O, Alcohol; IRRITATING
Phosphorous Pentoxide	$P_2 O_5$	Sat.	20	5	L1 Y1 L1 Y1 Z1 C4 Y1	VY1VMM				1		2.38			White powder sol. H_2O; Esothermic reaction. In H_2O it forms Metaphosphoric Acid
Phosphorus - Liquid	P	100	>80	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1		1.74	>44.1		Paste like, sol. Carbon
Phosphorus															Disulphide; SCALDING

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Phosphorus Oxychloride	$PO Cl_3$	100	30	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1		1.67	-10	107	Sol. H_2O; INFLAMMABLE
Phosphorus Sesquisulphide	$P_4 S_3$	Sat.	60	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				2	172	408	Crystals sol. Carb. Disulphide; INFLAMMABLE
Phosphorus Trichloride	$P Cl_3$	100	30	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM		1		1		1.57	-112	76	Liq. sol. Ether, Benzene, Carb. disulphide
Photo-Developing Bath		100	40	7	X1 E1 Z1 C4 E1 H1 X1	VY1EGG		1							
Photographic Developing		100	40	7	X1 E1 Z1 C4 E1 H1 X1	VYEGG		1							
Phtalate Isodecilic		100	60	4	X1 X1 C1 X1 V1 C1	GBTGG									
Phtalic Acid	$C_6 H_4(CO_2 H)_2$	Sat.	80	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1				1.58	191		Cryst. sol. Alcohol, Less in H_2O
Phtalic Anhydride	$C_6 H_4(CO)_2 O$	100	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG						1.5	131.1	285	White powder sol. Alcohol
Physiologic Solutions		Sat.	40	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG									
Pickling Acid		Conc.	80	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Picric Acid	$C_6 H_2(NO_2)_3 OH$	Sat.	40	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	2	2	2	1		1.76	122		Cryst. sol. H_2O, Alcohol, Ether, Benzene, Chloroph; POISONOUS, EXPLOSIVE
Pine Oil		100	80	2	X1 Y1 X3 V1 Y1	U1BVGG	1			1		0.86			
Pine resin (Colofoni)		100	30	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	1			1		1,08	100-150		Flakes sol. Alcohol, Benzene, Oils, Ether, Acetic Acid.
PK1 (Zinc Phosphate Potassium)		10	80	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					Zinc Phosphate + Potassium Phosphate, PH = 1
Plasticizer Oil		100	160	2	X1 Y1 X3 X3 Y1	U1U1VGG				1					
Plating sol. (Chrome)		100	40	5	X1 Y1 X1 Y1 Z1 C4 Y1	VYVGG		2		1					
Plating sol. (Copper Cyanide)	$Cu(CN)_2$	100	40	5	X1 Y1 X1 Y1 Z1 C4 Y1	VYVGG	1	1	1	1					Powder sol. Acid, Alkali, POISONOUS
Plating sol. (Copper)		100	40	5	X1 Y1 X1 Y1 Z1 C4 Y1	VYVGG	1	1	1	1					
Plating sol. (Nichel)		100	40	5	X1 E1 X1 E1 Z1 C4 E1	VYEGG	1	1	1	1					
Plating solution (Cyanide)		100	40	5	X1 E1 X1 E1 Z1 C4 E1	VYEGG		1							POISONOUS
Poliol (Polyhydric Alcohol)	$CH_2 OH(CHOH)_n CH_2 OH$	100	40	2	X1 E1 X1 V1 E1	GBEGG		1							n = from 2 to 5 - Liq. containing Glycerine, reacting with Aldehydes and Ketones
Polivinylchloride (P.V.C.)	$(H_2 CCH Cl)_n$	100	90	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					Powder or Grains
Polyacrylic Resins		100	120	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Washing with solvent
Polystirol Resins		100	120	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG				2					Washing with solvent
Polyuretane Resins		100	120	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1							Washing with solvent

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Polyvinil Acetate (P.V.A.)	$[CH_2\ CH(OOCCH_3)]_x$	100	90	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1	2			1.19			Thermoplastic solid, soluble in Ethers, Benzol, Hydrocarbons, Chlorophorm
Polyvinil Chloride (P.V.C.)	$(H_2\ CCH\ Cl)_n$	100	90	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					Powder or Grains
Polyvinyl Alcohol	$(CH_2\ CH\ OH)_n$	100	60	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									It plastifies with Glycerine and Ethylene Glycol - Sol. H_2O
Potassium Acetate	$KC_2\ H_3\ O_2$	10	20	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	2	1	2			1.57	292		H_2O, Alcohol sol. Crystals
Potassium Alum		15	50	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1					1.75	92		H_2O sol. Crystals
Potassium and Zinc Phosphate		10	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					
Potassium Bicarbonate	$KHCO_3$	Sat.	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					2.17			H_2O sol. Crystals
Potassium Bichromate	$K_2Cr_2O_7$	20	90	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	1	1	1	1		2.67	396		H_2O sol. Crystals , CAUSTIC, POISONOUS
Potassium Bitartrate	$KHC_4H_4O_6$	Sat.	20	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.98			H_2O sol. Crystals
Potassium Bromide	K Br	Sat.	70	4	X1 X1 C1 X3 X3 C1	U1U1TGG						2.74	730		H_2O, Glycerine sol. Crystals
Potassium Carbonate	$K_2\ CO_3$	50	70	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					2.42			H_2O sol. Crystals
Potassium Chlorate	$K\ Cl\ O_3$	Sat.	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				2.33	356		H_2O, Alkali sol. Crystals; POISONOUS
Potassium Chloride	K Cl	Sat.	60	5	L1 Y1 L1 Y1 Z1 V1 Y1	VBVMM	1	1	1	1		1.98			Sol. in H_2O Crystals
Potassium Cyanide	K CN	Sat.	20	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	1	1	1	1		1.52			H_2O, Alcohol,Glycerol sol. Crystals; POISONOUS
Potassium Ferrocyanide	$K_4\ Fe(CN)_6\ 3H_2O$	10	80	7	X1 E1 Z1 V2 E1 H1 X1	VCEGG		1				1.85			H_2O sol. Crystals; POISONOUS
Potassium Ferricyanide	$K_3\ Fe(CN)_6$	Sat.	70	5 Dual	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1				1.85			Sol. in H_2O Crystals; POISONOUS
Potassium Hydroxyde	K OH	>20	80	5	L1 E1 L1 E1 K1 K1 E1	Q1Q1EMM	2	1	2			2.0	360		H_2O, Alcohol, Glycerine sol. Crystals; CAUSTIC
Potassium Hydroxyde	K OH	<20	30	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2						H_2O, Alcohol, Glycerine sol. Crystals; CAUSTIC
Potassium Nitrate	$K\ NO_3$	Sat.	120	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1	1	1		2.1	337		H_2O sol. Crystals
Potassium Permanganate	$K\ Mn\ O_4$	10	90	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1				2.7			H_2O, Methanol sol. Crystals; STRONGLY OXYDATING
Potassium Phosphate (DKP)	$K_2\ H\ PO_4$	10	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					Crystals sol. in H_2O, Alcohol
Potassium Silikate	$Si\ O_2\ K_2O$	Sat.	70	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1								H_2O sol. Powder
Potassium Sulphate	$K_2\ SO_4$	Sat.	70	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1		2.66			H_2O sol. Crystals
Potassium Tartrate	$K_2\ C_4\ H_4\ O_6\ 1/2H_2O$	Sat.	80	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1					1.98			H_2O sol. Crystals

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Potassium (Tetra) Oxalate	$K_2 C_2 O_4 H_2O$	15	20	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		2.08			H_2O sol. Crystals
Potassiumbisulphate	$KH SO_4$	5	20	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		2.24	214		H_2O sol, Crystals; CAUSTIC
Potassiumchloride	K Cl	5	20	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		1.98			Sol. in H_2O Crystals
Producer Gas (Lean Gas)		100	50	2 Dual	X1 P1 G1 V1 P1	EBPGG	1		2	1	1				Mixture 3/4 Air Gas + 1/4 Water Gas
Propane (Dimethylmetane)	$C_3 H_8$	100	30	2	X1 Y1 G1 V1 Y1	EBVGG	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	X1 Y1 G1 V1 Y1	EBVGG	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	X1 P1 G1 V1 P1	EBPGG	1	1	1	1		0.8	-127	97	H_2O, Alcohol, Ether sol. liquid
Propanone (Acetone)	$CH_3 CO CH_3$	100	55	2	X1 E1 X1 V1E1	GBEGG		1				0.79	-94.3	56.2	Liq. Mix H_2O, Alcohol, Ether, Clorophorm. Volatile Inflammable
Propion Aldehyde	$C_2 H_5 CHO$	100	30	2	X1 E1 G1 V1 E1	EBEGG		1				0.8		48.8	H_2O sol. liq., INFLAMMABLE
Propionic Acid (Methylac.)	$CH_3 CH_2 CO_2 H$	100	30	45	X1 X1 C1 X1 C1 Z1 C4 C1	VY1TGG						0.99	-21	141	Liq. sol. H_2O, Alcohol, Ether, Chlorophorm
Propionic Anhydride	$(CH_3CH_2CO)_2 O$	100	40	4	X1 X1 C1 X3 V1 C1	U1BTGG						1.01	-45	169	Liq. sol. Alcohol, Ether, Chlorophorm, Alkali
Propyl Acetate	$CH_3 COO:CH_2 CH_2 CH_3$	100	30	45	X1 X1 C1 X1 C1 Z1 C4 C1	VY1TGG		2				0.88		96-102	Liquid mix. Alcohol, Ketones, Estheres, Oils, Hydrocarbons; INFLAMMABLE
Propyl Alcohol (Propanol)	$CH_3 CH_2 CH_2 OH$	100	80	2	X1 P1 G1 V1 P1	EBPGG	1	1	1	1		0.8	-127	97	Liq. sol. H_2O, Alcohol, Ether
Propyl Benzoate		100	40	2	X1 E1 G1 V1 E1	EBEGG		1							
Propyl Butyrate	$C_3 H_7 OOCC_3 H_7$	100	50	2	X1 E1 X1 V1 E1	GBEGG		1				0.87	-95.2	142.7	
Propyl Phormate	$CH_3 CH_2 CH_2 OOCH$	100	40	2	X1 E1 G1 V1 E1	EBEGG		1				0.9	-92.9	81.3	Liquid mixable Alcohol, Ether; INFLAMMABLE
Propyl Phtalate		100	50	2	X1 E1 X1 V1 E1	GBEGG		1							
Propyl Propionate	$CH_3 CH_2 COOCH_2 CH_2 CH_3$	100	40	2	X1 E1 G1 V1 E1	EBEGG		1					-76	122	Liquid sol. in org. solventes
Propylene	$CH_3 CH:CH_2$	100	30	2 Dual	X1 Y1 G1 V1 Y1	EBVGG				1		Liq. 0.5	-185.2	-47.7	Gas sol. in Alcohol, Ether; INFLAMMABLE
Propylene Dichloride (Dichloropropane)	$CH_3 CH Cl CH_2 Cl$	100	30	4	X1 X1 C1 X1 V1 C1	GBTGG		2				1.15		96.3	Liquid sol. in H_2O, Alcohol, Ether. - INFLAMMABLE
Propylene Glycol	$CH_3 CHOH CH_2OH$	<30	150	5	X1 E1 X1 E1 K1 V3 E1	Q1AEGG		1		1		1.03		187.3	Oily liquid deriving from Propylene Oxyde
Propylene Oxyde	$CH_3 CHCl CH_2 Cl$	100	70	4	X1 X1 C1 X1 V1 C1	GBTGG						1.15	-80	96.3	Soluble in common solvents, not in H_2O
Proteinal		100	40	4	X1 X1 C1 X3 X3 C1	U1U1TGG									Liquid with crystals

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Prussic Acid (Hydrogen Cyanide)	H CN	99	<25	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	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	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Pyridine	$N(CH_4)CH$	100	70	4	X1 X1 C1 X1 V1 C1	GBTGG						0.97	-42	115.5	Liquid sol. in H_2O, Alcohol, Benzene, Ether, Fatty Acids; INFLAMMABLE
Pyrocatechol	$C_6H_4(OH)_2$	Sat.	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG						1.37	104	245	Crystal sol H_2O, Alcohol, Ether, Benzene.
Pyrogallic Acid	$C_6H_3(OH)_3$	Sat.	50	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		1.46	133	309	Cryst. sol. H_2O, Alcohol, Ether; POISONOUS, EXPLOSIVE
Pyroligneous Acid		100	80	4	X1 X1 C1 X1 V1 C1	GBTGG		2				1.03			Liq. containing: Acetil Acid, Methanol, Acetone, Furfural, Alcohol, Mix. H_2O
Pyroluble		100	120	2	X1 Y1 G1 V1 Y1	EBVGG		2		1	1				
Rapeseed Oil		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1			1		0.91	0		
Recycling Oil		100	80	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				
Red-fuming Nitric Acid	HNO_3	86	60	45	L1 L1 C1 L1 C1 K1 K1 C1	Q1Q11TMM									Liq. mix. H_2O; POISONOUS, SCALDING
Reffinate Oil		100	50	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1				
Resins Resorcin (Resorcinol)	$C_6H_4(OH)_2$	100 Sat.	150 120	4 Dual 5	X1 X1 C1 X3 X3 C1 X1 E1 X1 E1 K1 K1 E1	U1U1TGG Q1Q1EGG		1				1.27	110.7	281	Washing with solvent H_2O, Alcohol, Ether, Glycerol, Benzene sol. Crystals
Rock Alum		15	50	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1								
Rockets Propellant		100	90	4	X1 X1 C1 X1 V1 C1	GBTGG									
Rongalite		100	60	4	X1 X1 C1 X3 X3 C1	U1U1TGG									Formaldehyde + Sodium Hydrosolphite. Reducing, decolourant.
Run (Ron)		100	60	2	X1 E1 X1 V1 E1	GBEGG	1	1	1	1					
Salicylic Acid	$C_6H_4(OH)(COOH)$	Sat.	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1		1		1.44	161	211	Powder sol. Acetone, Alcohol, Ether, Benzene
Salt 66 (Caprolactam)	$CH_2(CH_2)_4NHCO$	100	>60	4	X1 X1 C1 X3 X3 C1	U1U1TGG		2				-1.1	69		H_2O; Chlorate solvents, Petroleum derivates, sol. Crystals
Saltpeter (Potassium Nitrate)	KNO_3	Sat.	70	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1		2.1	337		H_2O soluble Crystals
Salt water (Calcium Chloride)		Sat.	80	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	1					
Salt water (Sodium Chloride)		Sat.	80	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	1	1					
Sewer Liquids		100	80	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	1	1	2	1					

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Sewage Sludge		100	80	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	1	1	2	1					
Silane (Monosilicomethane)	SiH_4	100	60	4	X1 X1 C1 X1 V1 C1	GBTGG									Comp. similar to Hydrocarbons. VOLATILE
Silicate Esters		100	80	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					It solves carbon
Silicone Oil		100	80	2	X1 E1 G1 V1 E1	EBEGG	1	1	1	1	1				
Silver Nitrate	$Ag\ NO_3$	5	20	5	X1 E1 X1 E1 Z1 C4 E1	VY1EGG	2	1	1	1		4.3	212		Crystals sol. in hot H_2O, Glycerols, POISONOUS
Skydrol 500-7000		100	80	2	X1 E1 G1 V1 E1	EBEGG		1			1				
Slurry		100	90	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Soaps		Sat.	140	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2	1					
Soda, Ash-Solvay	$Na_2\ CO_3$	Sat.	<70	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1	1					H_2O soluble Powder
Soda and Water	$H_2O + Na_2CO_3$	3	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	1	1					Washing-Cleaning solution
Sodium Acetate	$Na\ C_2\ H_3\ O_2$	Sat.	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2			1.5	58		H_2O, Ether sol. Crystals
Sodium Alkylsulphate		10	70	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					
Sodium Alluminate	$Na\ Al\ O_2$	Sat.	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					H_2O soluble Powder
Sodium Aluminate Calcareous	$Na_2\ Al_2\ O_4$	Sat.	80	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1								H_2O sol. powder. Alkaline solution
Sodium Bicarbonate (Baking Soda)	$NaHCO_3$	Sat.	60	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		2,15			H_2O sol. Crystals
Sodium Bichromate	$Na_2\ Cr_2\ O_7\ 2H_2O$	Sat.	60	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1		2.5	357		H_2O sol. Crystals, SCALDING
Sodium Bisulphate	$Na\ H\ SO_4$	Sat.	20	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		2.1	58.5		H_2O sol. Crystals
Sodium Bisulphite	$Na\ H\ SO_3$	Sat.	20	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		1.48			H_2O sol. Crystals
Sodium Borate (Borax)	$Na_2\ B_4\ O_7.10H_2O$	Sat.	60	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1		1.73			H_2O sol. Crystals.
Sodium Chloride	$Na\ Cl$	20	-40	5	X1 E1 X1 E1 K1 V1 E1	Q1BGG	1	1	1	1		2.1			H_2O and Glycerol sol. Crystals
Sodium Citrate	$C_6\ H_5\ O_7\ Na_3 : 2H_2O$	Sat.	80	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1			150		H_2O sol. Crystals
Sodium Cyanide	$Na\ CN$	Sat.	40	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1						H_2O sol. Crystals; POISONOUS
Sodium Glutamate	$COOH(CH_2)_2$ $CH(NH_2)COONa$	Sat.	90	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							H_2O and Alcohol sol. Crystals
Sodium Hydrosulphite	$Na_2\ S_2\ O_4$	Sat.	70	5	X1 XE1 X1 E1 K1 K1 E1	Q1Q1EGG		1					55		H_2O sol. Crystals
Sodium Hydroxide (Caustic Soda)	$Na\ OH$	10	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2	2		2.13			H_2O, Alcohol, Glycerol sol Crystals ; CAUSTIC
Sodium Hydroxide (Caustic Soda)	$NaOH$	30	70	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	2	1	2	2		2.13			H_2O, Alcohol, Glycerol sol Crystals; CAUSTIC
Sodium Hydroxide (Caustic Soda)	$NaOH$	Sat.	90	5	L1 E1 L1 E1 K1 K1 E1	Q1Q1EMM		1				2.13			H_2O, Alcohol, Glycerol sol Crystals; CAUSTIC
Sodium Metanylate	$NaSO_3\ C_6\ H_4\ NH_2$	Sat.	40	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					

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Sodium Hypochlorite	Na O Cl . $5H_2O$	100	30	7F	X1 Y1 Z1 C4 A1 H1 X1	VY1VGG	2	2		1					Oxidizing, Irritating
Sodium Hypochlorite	Na O Cl . $5H_2O$	20	70	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM	2	2		1					Oxidizing, Irritating
Sodium Hypochlorite (Bleaching)	(NaOCl + Na_2CO_3 + Cl active)	100	60	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM	2	2		1					Oxidizing, Irritating
Sodium Metanilate	Na SO_3 C_6H_4 NH_2	Sat.	40	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Sodium Metaphosphate	$(Na\ PO_3)_n$	Sat.	40	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1		2					
Sodium Methylate	CH_3 ONa	Sat.	75	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							Amorphic powder, soluble in Methilic and Ethilic Alcohol; decomposed by water.
Sodium Nitrate	Na NO_3	Sat.	60	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2			2.26	308	380	H_2O, Glycerol sol. Crystals
Sodium Nitrite	Na NO_2	Sat.	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					2.1	271		H_2O sol. Crystals, INFLAMMABLE
Sodium Perborate	$NaBO_2$ H_2O_2 $3H_2O$	Sat.	60	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	2	1	2	1			63		Hardly sol. Crystals in H_2O and Glycerol
Sodium Perchlorate	$NaClO_4$	Sat.	40	5 Dual	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1		2.02	482		H_2O and Alcohol soluble Crystals, EXPLOSIVE, DANGEROUS
Sodium Peroxide	Na_2 O_2	10	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	2	1	2	1		2.8			H_2O sol. Powder; Heat developing
Sodium Plumbite (Doctor Solution)	Na_2 Pb O_2	Sat.	80	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1							TOXIC, CORROSIVE
Sodium Salicylate	HOC_6H_4 COONa	Sat.	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1							H_2O, Alcohol, Glycerol soluble Crystals
Sodium Silicate (Water Glass)		Sat.	20	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	1	1	1	1					It Solidifies
Sodium Sulphate	Na SO_4	Sat.	70	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1		2.6			H_2O, Glycerol sol. Crystals
Sodium Sulphide	Na_2 S $9H_2O$	Sat.	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		1.42			H_2O soluble Crystals
Sodium Sulphite	Na_2 SO_3 $7H_2O$	Sat.	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		1.59			H_2O soluble Crystals
Sodium Tetraborate (Borax)	Na_2 B_4 O_7 $10H_2O$	Sat.	140	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1		1.75			H_2O soluble Crystals
Sodium Thiosulphate	Na_2 S_2 O_3 $5H_2O$	Sat.	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	1	1		1.73	48		H_2O soluble Crystals
Sodium Toluenesulphonate	CH_3 C_6 H_4 SO_3 Na	100	60	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					Sodiumtoluene Acid + Na - salts soluble H_2O
Sodiumborate (Borax)	Na_2 B_4 O_7 : $10H_2O$	Sat.	60	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1	1	1		1.75			H_2O sol. Crystals
Sodiumphosphate (mono-bi-tri)	$NaHPO_4$. H_2O	Sat.	50	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	2	1					H_2O soluble Crystals
Soluble Oil (Cut Emuls.)		100	120	2	X1 Y1 X3 X3 Y1	U1U1VGG	1		2	1	1				
Solvents in general		100	90	4	X1 X1 C1 X1 V1 C1	GBTGG									
Sorbitol	C_6 H_8 (OH_6)	Sat.	110	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2	1		1.47	97		H_2O Soluble powder

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Soybean Oil		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1		2	1		0.92	22		Saponificating
Starch		Sat.	93	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1							
Steam	H_2O	100	110	5 Dual	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1			1				
Steam		100	180	5 Dual	X1 E1 X1 E1 K1 V3 E1	Q1AEGG		1			1				
Steam		100	145	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1			1				
Stearic Acid	$CH_3(CH_2)_{16}CO_2H$	100	>75	4	X1 X1 C1 X3 X3 C1	U1U1TGG	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	X1 X1 C1 X3 X3 C1	U1U1TGG	2	2	2			0.94	71.6		Crystals soluble in Alcohol, Chlorophorm, Carb. Disulphide
Steel Hardening Oil		100	180	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1			1	1				
Strontium Nitrate	$Sr(NO_3)_2\ 4H_2O$	Sat.	60	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					2.25			H_2O soluble Powder
Styrene or Styrol	$C_6H_5\ CH{:}CH_2$	100	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG				2		0.9	-30.6	145.2	Oily liquid sol. in Alcohol, Ether
Styrol + acrylic nitrile		100	140	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									IT POLYMERIZES
Succinic Acid	$HOOC\ CH_2\ CH_2\ COOH$	Sat.	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.55	185	235	H_2O - sol. crystals
Sugar (Cooked Mass)		100	90	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	1	1	2	1					
Sugar Juice		100	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2	1					
Sugar Juices		100	90	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2	1					
Sugar Solutions		10	80	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	1	2	1					
Sugar Syrup		15	70	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2	1					
Sulfuric Acid	H_2SO_4	96	20	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1		1.84	10.4	>315	Oily liq. - mix. H_2O It gives heat - SCALDING
Sulfuric Acid	H_2SO_4	20	50	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					Oily liq. - mix. H_2O It gives heat - SCALDING
Sulfuric Acid	H_2SO_4	3	<18	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG		2		1					Oily liq. - mix. H_2O It gives heat - SCALDING
Sulfuric Acid	H_2SO_4	3	50	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG		2		1					Oily liq. - mix. H_2O It gives heat - SCALDING
Sulfurous Acid	H_2SO_3	5	20	5	L1 Y1 L1 Y1 Z1 V1 Y1	VBVMM	2	2	2	1		1.03			Water-solution of SO_2
Sulphon Acid		100	90	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					Benzene + SO_3
Sulphon Alcohol		100	70	2	X1 E1 G1 V1 E1	EBEGG		1							
Sulphonitric Solution		100	30	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					
Sulfunate		100	90	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG				1					
Sulfur	S	Sat.	40	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG		1	2	1		1.96 - 2.06	112-119	445	Crystals sol. in Benzene, C. Tetrachloride, C. Disulphite; INFLAMMABLE
Sulfur (Melted)	S	100	>112	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		1	2	1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Sulfur (Wet - Colloidal)	S	100	>120	5 Dual	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG		1	2	1					
Sulfur Chloride	$S_2 Cl_2$	100	20	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		1.69	-80	138	Oily liquid soluble in Alcohol, Ether, Benzene; IRRITANT
Sulfur Dioxyde	SO_3 (alfa, beta, gamma)	100	30	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1	2	1		Liq. 1.43	-76	-10	Liquid or Gas, soluble in H_2O, Alcohol, Ether; at 20°C - 4,2 bar IRRITANT
Sulfur Trioxyde	SO_3	100	40	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM		2		1			17-62	45	Mixed with H_2O it gives H_2SO_4 with exothermic reaction
Sulfurous Anhydride	SO_2	100	30	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1	2			Liq. 1.43	-76	-10	Liq. or gas. At 20°C - 3,2 bar - Sol. Alcohol, Ether, H_2O
Sulfuric Anhydride (S.Trioxide)	SO_3 (alfa, beta, gamma)	100	40	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM		2		1			17 - 62	45	With H_2O it gives H_2SO_4 with esothermic reaction
Syntethic Detergents		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Syrup		100	60	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	1	2	1					
Tallow		100	80	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	2	2	1	1	0.9 - 1			
Tannic Acid (Tannin)	$C_{76} H_{32} O_{46}$	Sat.	110	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	2	1			210		Powder sol. H_2O, Alcohol, Acetone
Tannic Liquor		100	60	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	2	1					
Tannic Solution		100	110	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	2	1					
Tar		100	>130	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	2			1		1.2			
Tar (Fossil carbon tar)		100	>130	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	2			1					
Tar and Ammonia		100	>130	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG	2								
Tar Oil		100	150	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1	1				
Tartaric Acid	$C_4 H_6 O_6$	50	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	2	2	1		1.76	170		Cryst. sol. H_2O, Alcohol, Ether
Terephtalic Acid	$C_6 H_4(COOH)_2$	Sat.	70	45 Dual	X1 X1 C1 X1 C1 K1 V1 C1	Q1BTGG						1.51			Cryst. sol. in Alkali; Washing with demineralized water
Terpene Dicyclic		100	80	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Terpene Monocyclic		100	80	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Terpene Olephinic		100	60	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				
Terphenyl		100	180	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1	1				
Testing petrol		100	50	2	X1 P1 G1 V1 P1	EBPGG	1			1	1				Liq. VOLATILE, INFLAMMABLE
Tetracicline (Antibiotic)		30	90	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					Powder, Crystals soluble in H_2O and diluted HCl
Tetraclorodifenylethane (TDE)		Sat.	160	4	X1 X1 C1 X3 X3 C1	U1U1TGG							110		Crystals sol. in organic solvents similar to DDT
Tetrahydrofuran	$CH_2 CH_2 CH_2 CH_2 O$	100	40	4	X1 X1 C1 X1 V1 C1	GBTGG		2				0.88	-65	66	Liquid soluble in H_2O, Organic solvents

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Tetrahydronaphtalene (Tetralin)	$C_{10}H_{12}$	100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		0.98	-25	206	Liquid mix. Solvents, It POLYMERIZES
Textile stiffener		Sat.	90	2	X1 Y1 X3 X3 Y1	U1U1VGG				1					
Thionile Chloride	$SOCl_2$	20	40	4	L1 L1 C1 L1 V2 C1	MCTMM				2		1.63	-105	79	
Tinchloride	$SnCl_4$	100	70	7	X1 Y1 Z1 V2 Y1 H1 X1	VCVGG	1	1		1		2.27	-33	114	Liquid soluble in H_2O, Alcohol, Carb. Disulphide; CAUSTIC
Titanium Bioxyd + Water	$TiO_2 + H_2O$	10	40	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1		1		3.8			Powder soluble in hot H_2SO_4, Alkali
Titanium Tetrachloride	$TiCl_4$	100	20	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	2			1		1.76	-30	136	Liquid soluble in HCl diluted with H_2O with temp. development
Toluene Diisocyanate	$CH_3C_6H_3(NCO)_2$	100	90	4	X1 X1 C1 X1 V1 C1	GBTGG		2				1.22	21.5	251	Liquid soluble ether, acetone, organic solv.
Toluene Solution		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1					
Toluensulphonic Acid (Ortho)	$C_6H_4(SO_3H)(CH_3)$	Sat.	40	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM				1			67.5	129	Cryst. sol. H_2O, Alcohol, Ether
Toluensulphonic Acid (Para)	$C_6H_4(SO_3H)(CH_3)$	Sat:	40	5	L1 Y1 L1 Y1 K1 V1 Y1	Q1BVMM							107	140	Cryst. sol. H_2O, Alcohol, Ether
Toluidine (Ortho - Para)	C_7H_9N	100	220	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG						1.1			Liquid soluble Alcohol, Ether. COMBUSTIBLE.
Toluol (Toluene)	$CH_3C_6H_5$	100	40	2	X1 Y1 G1 V1 Y1	EBVGG				1		0.86	-94.5	110.7	Liquid sol. Alcohol, Benzene, Ether, INFLAMMABLE
Toluol (Toluene)	$CH_3C_6H_3$	100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		0.86	-94.5	110.7	Liquid sol. Alcohol, Benzene, Ether, INFLAMMABLE
Tomato Juice - Water solution		100	90	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG	1	1		1					
Tomato Pulp (concentrate)		100	90	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1		1					
Tomato Pulp (not conc.)		100	90	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1		1					
Tomato Pulp (Triconcentrate)		100	90	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1		1					
Tomato Sauce		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	1		1					
Toothpaste		100	30	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1	1		1					
Transformer Oil		100	140	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1				
Trichlorethylene	$CHCl:CCl_2$	100	70	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		1.45	-73	86.7	Liquid mix. with org. solvents; POISONOUS
Trichlorethylene and Fossil Wheat 10%	$CHCl:CCl_2$	100	40	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Trichloroacetaldeide (Chloral)	CCl_3CHO	100	90	4	X1 X1 C1 X1 V1 C1	GBTGG						1.5	-57	97.7	Oily liquid sol. in Alcohol, Ether, Chlorophorm; DANGEROUS VAPOURS

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Tricresyl Borate (Meta, Para)	$(CH_3 C_6 H_4)_3 BO_3$	100	120	4	X1 X1 C1 X1 V1 C1	GBTGG						1.06		390	Liq. solub. Acetone, Chlorophorm, Benzene
Tricresyl Phosphate	$(CH_3 C_6 H_4 O)_3 PO$	100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1		2		1.2	-35	420	Liq. Mix solvents, Not in H_2O
Tridecene	$CH_3(CH_2)_{11} CH_3$	100	80	2	X1 Y1 G1 V1 Y1	EBVGG				1		0.75	-5.4	225	Alcohol sol. liquid
Triethylamine	$(C_2 H_5)_3 N$	100	60	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					0.72	-115	89.7	H_2O, Alcohol, Ether mix. liquid, INFLAMMABLE
Triethylene Glycol (TEG)	$HO(C_2 H_4 O)_3 H$	100	150	5	X1 E1 X1 E1 K1 V3 E1	Q1AEGG	1	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	X1 E1 X1 V1 E1	GBEGG		1					-56.4	216	Liquid soluble in organic solvents, mix. H_2O
Trixylenyl Phosphate	$[(CH_3)_2 C_6 H_3 O]_3 PO$	100	70	2	X1 E1 X1 V1 E1	GBEGG		1				1.15		240	H_2O mix. liquid
Turbo Oil (15-35)		100	90	2	X1 Y1 G1 V1 Y1	EBVGG	1		2	1	1				
Turpentine Oil	$C_{10} H_{16}$	100	70	2	X1 P1 G1 V1 P1	EBPGG	1			1	1	0.9		155	VOLATILE Essential Oil
Unleaded Petrol		100	50	2	X1 Y1 G1 V1 Y1	EBVGG				1	1				Liq. VOLATILE, INFLAMMABLE
Uranyl Nitrate Radioactive	$UO_2(NO_3)_2 6H_2O$	Sat.	20	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1		2.8	60.2	118	Crystals soluble in H_2O, Alcohol, Ether
Urea (Carbamide)	$CO(NH_2)_2$	100	140	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG		2				1.33	132.7		Crystals soluble in H_2O, Alcohol, Benzene
Urea Resins		100	140	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG		2							Washing with solvent
Uric Acid	$C_5 H_4 O_3 N_4$	Sat.	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.89	250		Cryst. sol. in Alkali, Glycerol, Hot H_2SO_4
Urine		100	40	2	X1 E1 X1 V1 E1	GBEGG		1							
Varnish (without Ketone solv.)		100	20	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	2			1					Washing with solvent
Varnish with aromatic solvents		100	20	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					Washing with solvent
Varnish with Nitre solvents		100	20	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Washing with solvent
Varnish with non-aromatic solvents		100	20	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG									Washing with solvent
Vaseline		100	80	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1			1					
Vaseline Oil		100	80	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1			1		0.85	35		
Veg. and Animal Oil (not eatable)		100	180	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG	1			1	1				
Veg. Oil and Sulfur Bioxyde		100	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1							
Veg. Oil Sulfunate		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1			1					
Vegetable Juice		100	70	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1		1					

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Vegetable Oil		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1			1					
Vermouth		100	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1	1	1					
Vinegar		100	90	2	X1 E1 X1 V1 E1	GBEGG	2	1	2	2					
Vinyl Acetate	$CH_3COOCH:CH_2$	100	20	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1	2			0.93	-92.8	73	Liq. Sol in organic solvents. INFLAMMABLE - IT POLYMERIZES
Vinyl Acetate (Poli - PVA)	$[CH_2\ CH(OOCCH_3)]x$	100	90	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1	2			1.19			Thermoplastic solid, soluble Ketones, Esters, Benzene, Chloro Hydrocarb.
Vinyl Benzene (Poli)		100	110	4 Dual	X1 X1 C1 X3 X3 C1	U1U1TGG				2					
Vinyl Chloride (Chloro Ethylene)	$CH_2 : CH\ Cl$	100	30	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		Liq. 0.91	-159.7	-13.9	Liquid Gas soluble in Alcohol, Ether, INFLAMMABLE, liquid at 3 bar
Vinyl Chloride (Poli - PVC)	$(CH_2 : CH\ Cl)_n$	100	90	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					Powder or Granes, Thermo Plastic solid
Vinyl Cyanide (Acrylic Nitrile)	$H_2\ C : CH\ CN$	100	140	4	X1 X1 C1 X3 X3 C1	U1U1TGG						0.8	-83	77.4	Liquid soluble in organic solvents; INFLAMMABLE, TOXIC
Vinyl Ethylene (Butadiene)	$H_2\ C:CHHC:CH_2$	100	20	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		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 Glue		100	30	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					
Vinyl Resins (not Acetate)		100	90	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG				1					Washing with solvent
Vinyldenechloride pure (CVD)	$CH_2\ C\ Cl_2$	100	70	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1			-122	32	VOLATILE liquid, INFLAMMABLE, it may polymerize if not inhibited
Virgin Naphta		100	110	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1	1				
Viscose (Raion)		100	60	4	X1 X1 C1 X3 X3 C1	U1U1TGG						1.52			
Walnut Oil		100	80	5	X1 P1 X1 P1 K1 V1 P1	Q1BPGG	1	1		1		0.93			
Water	H_2O	100	80	2	X1 P1 G1 V1 P1	EBPGG	1	1	2	1	1	1	0	100	
Water - Brackish water		100	40	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1		1					
Water - Bromine		Sat.	20	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM				1					$Br + H_2O$ - solution; CAUSTIC
Water Decationized	H_2O	100	40	5	L1Y1L1Y1Z1V1Y1	VBVMM		1		1					Agressive - Not stable
Water - Dejonized	H_2O	100	130	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	1		1					Agressive - Not stable
Water - Deminaralized	H_2O	100	70	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	2	1	1				
Water - Dirty Water	H_2O	100	20	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1		1					
Water - Distilled	H_2O	100	140	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							
Water - Distilled	H_2O	100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1		1					
Water - drinkable	H_2O	100	140	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG	1	1	2						

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Water - Heavy Water	$2H_2O$ (D_2O)	100	60	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	1	1		1		1.1	3.8	101.5	
Water - Mineral Waters		100	50	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1							
Water - Overheated	H_2O	100	140	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1		1					
Water - Oxydating Mine Water		100	20	2 Dual	X1P1X3X3P1	U1U1PGG	1			1					Washing with demineralized H_2O
Water - Paint		100	20	2 Dual	X1 E1 X3 X3 E1	U1U1EGG		1							Washing with deminaralized H_2O
Water Paint (Cataphorese)	H_2O	100	90	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG	2	1	2	1					
Water - Radioactive water		100	120	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG	1	1		1	1				
Water - Refrigerating towers		100	120	5	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG				1					
Water - Return water		100	60	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1		1		1.03			
Water - Sea Water		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	2	1	1				
Water - Soap water		100	60	5 Dual	X1 Y1 X1 Y1 K1 R1 Y1	Q1U3VGG		1		1					
Water - Thermal Water and mud		100	60	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG		1		1					
Water - Thermal Waters	H_2O	100	30	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1		1	1				
Water (Cold washing)		100	60	2	X1 P1 X3 X3 P1	U1U1PGG	1	1		1					
Water + Abrasives (5%)		100	60	2	X1 P1 X3 X3 P1	U1U1PGG	1	1		1					
Water + Chlorine		Sat.	80	5	L1 Y1 L1 Y1 K1 K1 Y1	Q1Q1VMM	1	1		1					
Water + Detergents		Sat.	80	5	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1		1					
Water + Glycerine		100	140	5	X1 E1 X1 E1 K1V1 E1	Q1BEGG	1	1	1	1					
Water + Mud		100	20	2	X1 P1 X3 X3 P1	U1U1PGG	1	1		1					
Water + sand (5%)		100	60	2	X1 P1 X3 X3 P1	U1U1PGG	1	1		1					
Water + Soda Solvay		Sat.	70	5	X1 E1 X1 E1 K1 K1 E1	Q1Q1EGG	1	1	1	1					
Water + soluble oil		100	80	2	X1 P1 G1 V1 P1	EBPGG	1		2	1	1				
Water Gas		100	30	5 Dual	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1			1	1				Mixture of Gas H + Gas CO; COMBUSTIBLE
Water steam	H_2O	100	180	580 Dual	L3 W1 X9 K1 W1 H1 X1	AQ1KMG					1				
Water steam	H_2O	100	145	5 Dual	X1 E1 X1 E1 K1 V3 E1	Q1AEGG		1			1				
Water steam	H_2O	100	110	5 Dual	X1 E1 X1 E1 K1 V1 E1	Q1BEGG		1			1				
Wax		100	130	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1	1	0.96			

Fluid	Chemical formula	Concentration %	Temperature °C	Seal type	Roten Code	EN Code	P1	E1	N1	Y1	V3	Density kg/dm³	Melting point °C	Boiling point °C	Notes
Wax (Emulsion)		100	90	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1	1				
Wax (Paraffine Wax)		100	90	2	X1 Y1 X3 X3 Y1	U1U1VGG				1	1				
Whale Oil		100	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	2	2	1		0.93			
Whisky		100	40	2	X1 P1 X1 V1 P1	GBPGG	1	1							
White Pine Oil		100	80	2	X1 Y1 X3 V1 Y1	U1BVGG	2			1					
White Spirit		100	40	2	X1 P1 X1 V1 P1	GBPGG	1	1							
White Vitriol (Zinc Sulphate)	$Zn\ SO_4\ 7H_2O$	Sat.	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		1.95	100		Crystals soluble in H_2O, Glycerol
Wine		100	80	2	X1 P1 X1 V1 P1	GBPGG	1	1		1					
Wine + 5% Fossil Meal		100	80	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1		1					
Wine Must		100	90	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1							
Wine Spirit (Ethil Alcohol)	$C_2H_5\ OH$	100	80	2	X1 P1 X1 V1 P1	GBPGG	1	1				0,81	-118	78,3	H_2O, Ether, Chlorophorm soluble liquid, INFLAMMABLE, VOLATILE
Wood Resin		100	120	2 Dual	X1 Y1 X3 X3 Y1	U1U1VGG	1			1					Washing with solvent
Wood Spirit (Methyl-Alcohol)	$CH_3\ OH$	100	60	2	X1 E1 X1 V1 E1	GBEGG	1	1				0.79	-98	64.5	Liq. sol. H_2O, Ether, Alcohol; VOLATILE, INFLAMMABLE, POISONOUS
Xylol or Xylene (Dimethylbenzene)	$C_6\ H_4(CH_3)_2$	100	120	5	X1 Y1 X1 Y1 K1 V1 Y1	Q1BVGG				1		0.86		138.2	Liquid soluble Alcohol, Ether; TOXIC, INFLAMMABLE
Yoghurt		100	70	5	X1 E1 X1 E1 K1 R1 E1	Q1U3EGG	1	1		1					
Zinc Acetate	$Zn(C_2\ H_3\ O_2)_2+2H_2O$	Sat.	80	5	X1 E1 X1 E1 Z1 V1 E1	VBEGG		1				1.73	273		Crystals soluble in H_2O, Alcohol
Zinc Chloride	$Zn\ Cl_2$	Sat.	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		2.91	290		Crystals soluble H_2O, Alcohol, Ether, Glycerol; POISONOUS
Zinc Cyanide	$Zn(CN)_2$	Sat.	20	5	X1 Y1 X1 Y1 K1 K1 Y1	Q1Q1VGG	1			1		1.85	800		Soluble powder mineral Acids diluted, Alkali, POISONOUS
Zinc Nitrate	$Zn(NO_3)_2\ 6H_2O$	Sat.	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1					2.06			Crystals soluble H_2O, Alcohol, INFLAMMABLE
Zinc Phosphate	$Zn_3(PO_4)_2$	10	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					
Zinc Phosphate	$Zn_3(PO4)_2$	Conc.	90	5	L1 Y1 L1 Y1 Z1 V1 Y1	VBVMM				1		3.99			Powder soluble Acids, Ammonium Hydrate
Zinc Phosphate and Potassium Phosphate		10	80	5	X1 Y1 X1 Y1 Z1 V1 Y1	VBVGG				1					
Zinc Salts		Sat.	20	5	X1 P1 X1 P1 K1 R1 P1	Q1U3PGG	1	1	1	1					
Zinc Sulphate (White Vitriol)	$Zn\ SO_4\ 7H_2O$	Sat.	80	5	X1 P1 X1 P1 Z1 V1 P1	VBPGG	1	1	1	1		1.95	100		Crystals soluble in H_2O, Glycerol


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