BRITISH STANDARD

BS EN
12756:2001

Mechanical seals — Principal dimensions, designation and material codes

The European Standard EN 12756:2000 has the status of a British Standard

ICS 21.140

National foreword

This British Standard is the official English language version of EN 12756:2000.

The UK participation in its preparation was entrusted by Technical Committee MCE/6, Pumps and pump testing, to Subcommittee MCE/6/2, Dimensions and technical specifications, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 11 and a back cover.

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Garnitures mécaniques d'étanchéité - Dimensions principales, désignation et codes matériaux

Gleitringdichtungen - Hauptmaße, Bezeichnung und Werkstoffschlüssel

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 197 "Pumps", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2001, and conflicting national standards shall be withdrawn at the latest by June 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard defines the principal dimensions for the internal installation of single and multiple mechanical seals with (rotating) spring units into the pump sealing cavity according to ISO 3069 as minimum cavity dimensions as typical for centrifugal pumps in accordance with EN 22858 and EN 733. It also gives the seal designations and material codes to be used.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 733, *End-suction centrifugal pumps, rating 10 bar with bearing bracket — Nominal duty point, main dimensions, designation system*

EN 22858, *End suction centrifugal pumps (rating 16 bar) — Designation, nominal duty point and dimensions (ISO 2858:1975)*

ISO 1382, *Rubber — Vocabulary Trilingual edition*

ISO 1629, *Rubbers and latices — Classification, symbols*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 3069, *End suction centrifugal pumps — Dimensions of cavities for mechanical seals and for softpacking*

ISO 5199, *Technical specifications for centrifugal pumps — Class II*

ISO 9905, *Technical specifications for centrifugal pumps — Class I*

ISO 9908, *Technical specifications for centrifugal pumps — Class III*

3 Dimensions

The mechanical seals (abbreviation: GLRD[1)]) and cavities need not correspond to the illustrations, however, the dimensions given shall be complied with. The figures show O-rings as the flexible elements but other shapes of seals may also be used.

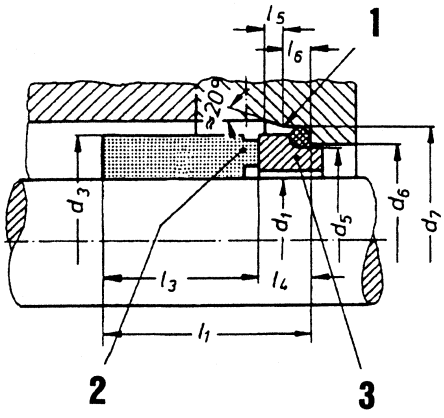
General tolerances: ISO 2768–m

3.1 Example for a single mechanical seal[2)] with rotating spring unit, version N and K[3)]

NOTE Alternative arrangements using the same dimensions can be possible.

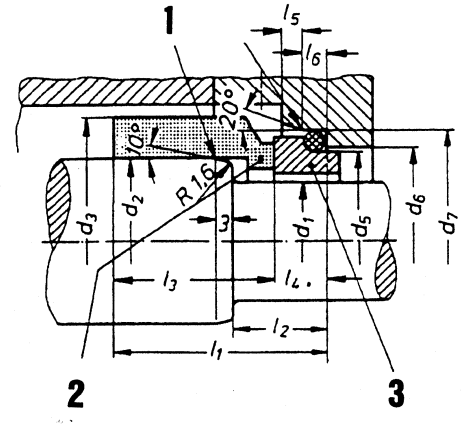
Type U
without shaft step

Dimensions in millimeters



Type B
with shaft step

Dimensions in millimeters



Key

1 rounded
2 spring loaded lead face
3 seat

Figure 1 — Examples for single mechanical seals

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1) based on the German terminology

2) for abbreviations concerning arrangements of shaft seals refer to ISO 5199

3) N = Normal, K = Short

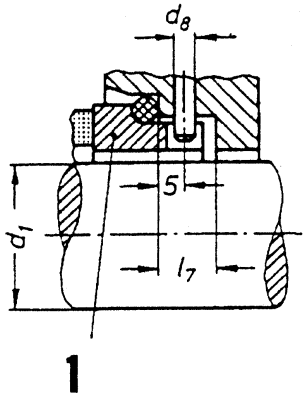
3.2 Retention of the seat

3.2.1 Against rotation

The design is at the descretion of the manufacturer or as agreed.

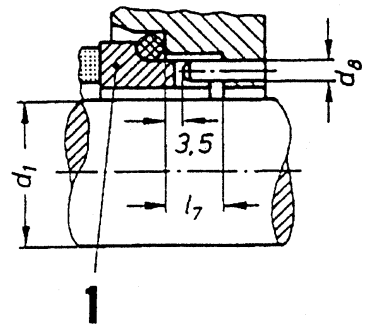
using a radial pin

Dimensions in millimeters



using an axial pin

Dimensions in millimeters



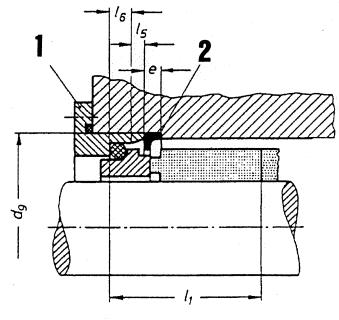
Key
1 seat

Figure 2 — Retention of the seat against rotation

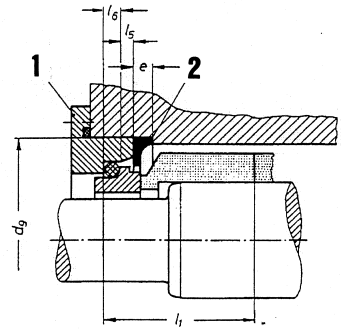
These options are valid for both types U and B.

3.2.2 Against axial movement using a securing ring and stationary seat housing (only valid for mechanical seals on the product side with multiple arrangements)

Example of Type U



Example of Type B



Key
1 Seat housing
2 Securing ring

Figure 3 — Retention of the seat against axial movement

The dimension e and d_9 refer to the seat housing. The manufacturer of the mechanical seal has to deliver the securing ring on demand.

3.3 Dimensions for versions N and K

Table 1 — Dimensions for versions N and K

Dimensions in millimeters

d_1 Nominal diameter Type U h6	d_1 Nominal diameter Type B h6	d_2 Type B h6	d_3 [1] Maximum dimensions Type U	d_3 [1] Maximum dimensions Type B	d_5 h8	d_6 H11	d_7 H8	d_8	d_9 Type U H8	d_9 Type B H8	e	l_1 [2] Version N Type U ±0,5	l_1 [2] Version N Type B ±0,5	l_1 [2] Version K Type U ±0,5	l_1 [2] Version K Type B ±0,5	l_2 ±0,5	l_3 l_4	l_5	l_6	l_7 +0,5 0
10		14	20	24		17	21		26	30										
12		16	22	26		19	23		28	32			50	32,5	40					
14		18	24	32		21	25		30	38		40				18		1,5	4	8,5
16		20	26	34		23	27		32	40			55	35	42,5					
18		22	32	36		27	33		38	42										
20		24	34	38		29	35		40	43		45		37,5	45					
22		26	36	40		31	37		42	46			60							
24		28	38	42		33	39	3	43	48	4									
25		30	39	44		34	40		46	50				40	47,5					
28		33	42	47		37	43		48	53		50				20			5	
30		35	44	49		39	45		50	60								2		
32		38	46	54		42	48		53	62			65	42,5	50					
33		38	47	54		42	48		53	62										
35		40	49	56		44	50		60	65		55								
38		43	54	59	[3]	49	56		62	67							[3]			
40		45	56	61		51	58		65	70			75							9
43		48	59	64		54	61		67	72				45	52,5	23				
45		50	61	66		56	63		70	75										
48		53	64	69		59	66		72	77		60								
50		55	66	71		62	70		75	86									6	
53		58	69	78		65	73		77	88			85	47,5	57,5					
55		60	71	80		67	75		86	91										
58		63	78	83		70	78		88	93		70				25				
60		65	80	85		72	80		91	96					62,5					
63		68	83	88		75	83	4	93	98	6			52,5				2,5		
65		70	85	90		77	85		96	103			95							
68		-	88	-		81	90		98	-					-					
70		75	90	99		83	92		103	108		80								
75		80	99	104		88	97		108	120					70					
80		85	104	109		95	105		120	125				60		28			7	
85		90	109	114		100	110		125	130			105							
90		95	114	119		105	115		130	135		90						3		
95		100	119	124		110	120		135	140				65	75					
100		105	124	129		115	125		140	145										

1) In order to provide a safe clearance between the mechanical seal and the seal housing, the dimensions d_3 are recommended as the maximum dimensions.

2) The manufacturer of the mechanical seal may supply a shorter seal than that which corresponds to dimension l_1. In this case, the difference in lenghts should be compensated by use of a spacer, which should be supplied by the seal manufacturer. For materials see Position 5 of material key (see clause 5).

3) Those dimensions are not defined. They may vary, depending on the manufacturer of the mechanical seal and should therefore be obtained from the relevant suppliers literature.

3.4 Surface condition

Surface conditions shall comply to the values given in Table 2.

Table 2 — Surface condition

Secondary seal material	$\overset{x}{\vee}$ =	$\overset{z}{\vee}$ =
Elastomers[1)]	Ra 2,5	Ra 0,8
Non-elastomers or optional use of elastomers and non-elastomers	Ra 1,6	Ra 0,20
1) For explanation of elastomers refer to ISO 1382; symbols for rubbers and latices, refer to ISO 1629.		

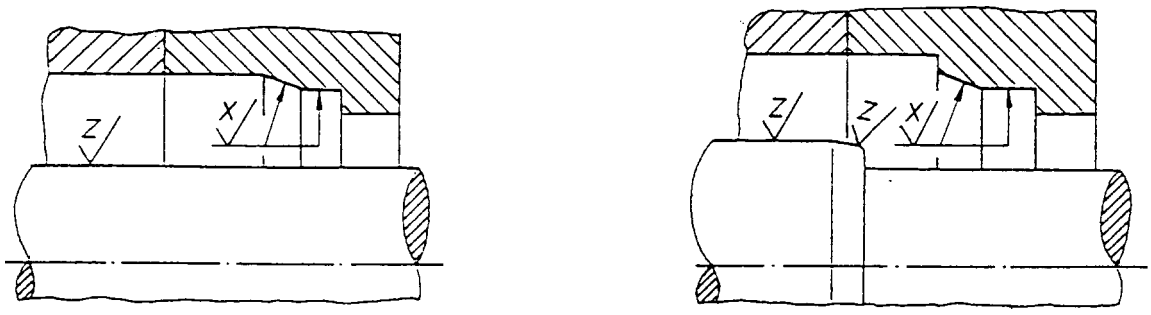


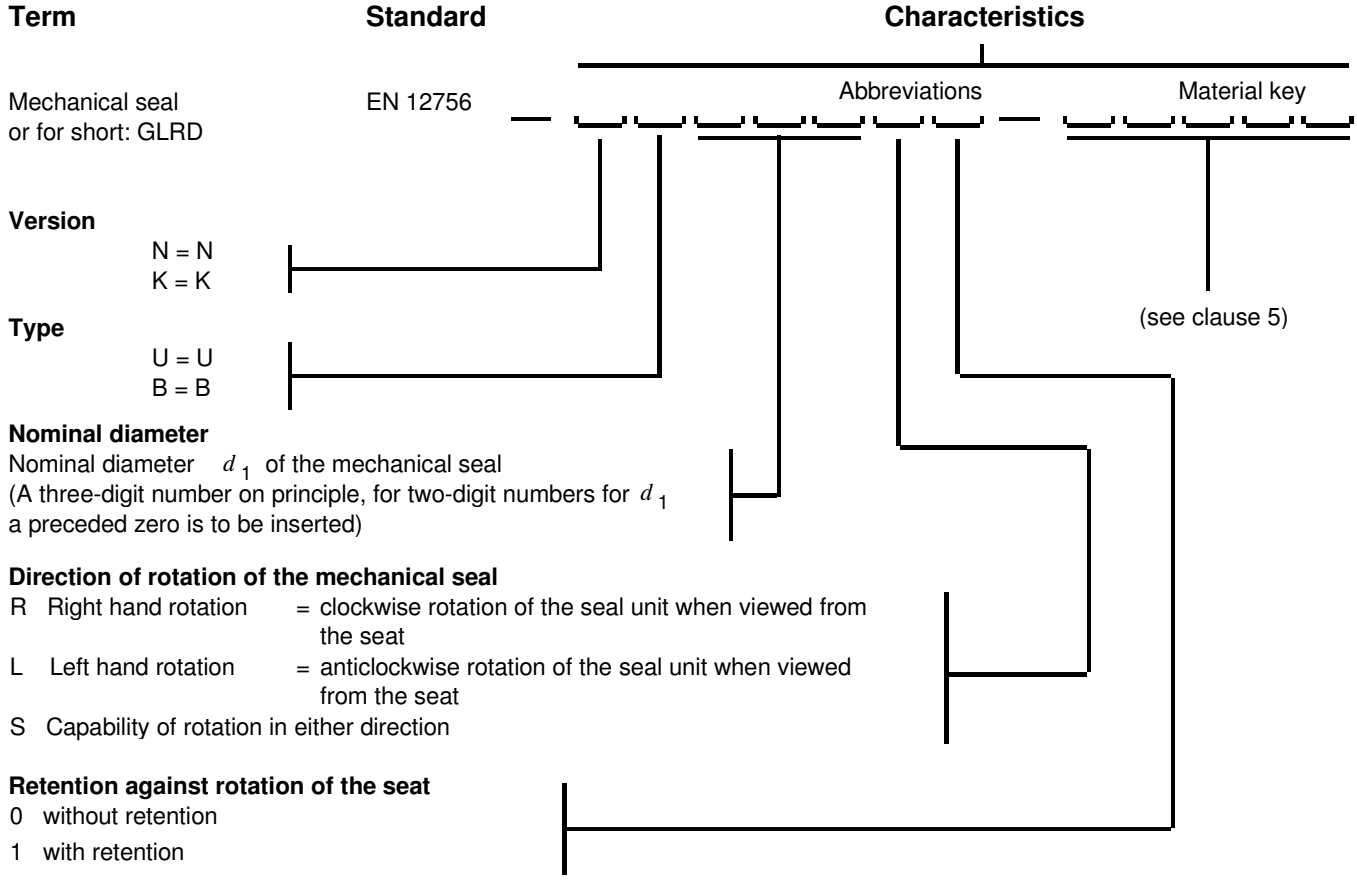
Figure 4 — Surface location

4 Standard designation

This section sets out a coding system for use in designating single and multiple seals by seal type, by nominal dimension, by orientation, and by the classes of materials used. The system is intended to be typical of those in current use and will help in the transfer of information between suppliers and users. It is not intended to fully and unambiguously identify facets of a seal assembly. It is intended to help to identify and group seals for recording purposes and for subsequent analysis.

NOTE It is not a requirement of this European Standard that seals are marked with a designation derived from this system.

4.1 Schematic representation of a designation for single mechanical seals



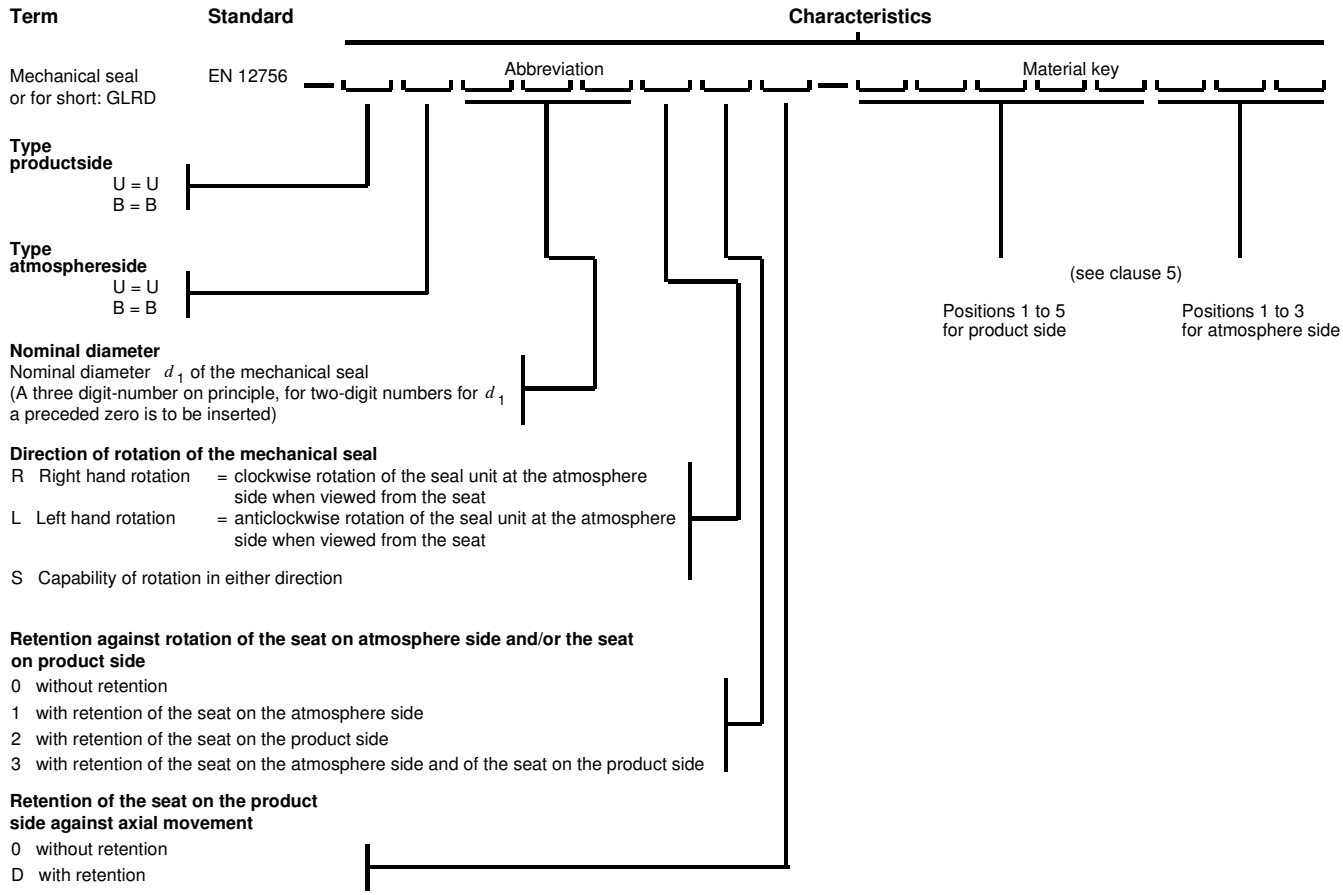
4.2 Example of designation for a single mechanical seal

Designation of a single mechanical seal of normal design (N) in form U with nominal diameter d_1 = 43 mm (043), right hand rotation (R), with securing of the atmospheric side seat against rotation (1), material of the seal face Chromium cast steel S, material of the seat Carbon, resin-impregnated B, material of flexible elements Fluorocarbon rubber V, material of the spring CrNiMo steel G and material of other components CrNiMo steel G:

Mechanical seal EN 12756—NU043R1—SBVGG

or for short: GLRD EN 12756—NU043R1—SBVGG

4.3 Schematic representation of designation for multiple mechanical seals (D1 Back-to-back arrangement)[4)]



4.4 Example of designation for a multiple mechanical seal (D1)

Designation of a multiple mechanical seal (D1) type UU (UU) with nominal diameter d_1 = 43 mm (043), capability of rotation in either direction (S), with retention against rotation of the seat on atmosphere side (1), with retention against axial movement of the seat on the product side (D) and with the material key in accordance with clause 5 (VBVGGSBV):

Mechanical seal EN 12756—UU043S1D—VBVGGSBV

or for short: GLRD EN 12756—UU043S1D—VBVGGSBV

NOTE Multiple mechanical seals (D1 Back-to-back arrangement) consist of single mechanical seals, version K. For multiple mechanical seals (D1) with shorter length the total length is not standardized.

4) see ISO 9905 and ISO 9908

5 Material key

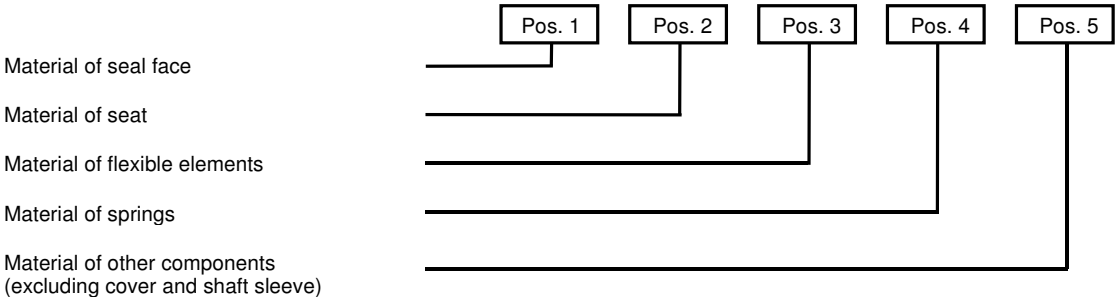


Table 3 — Explanation of symbols for material versions

Position 1/Position 2	Position 3	Position 4/Position 5
Material[1] for rubbing surfaces Seal face[2]/seat	Material for flexible elements[3]	Materials[1] for other components, such as springs, metal bellows[5] (excluding covers and shaft sleeves)
Manufactured carbons A Carbon, metal-impregnated B Carbon, resin-impregnated C Other carbons Metals D Carbon steel E Cr steel F CrNi steel G CrNiMo steel H Metals with carbide coatings K Hard-coating, metallic M High-nickel alloy N Bronze P Grey cast iron R Alloyed grey cast iron S Cr cast steel T Other metals Carbide (Tungsten carbides U, silicon carbides Q, other carbides J) U1 Tungsten carbides, Co-bonded U2 Tungsten carbides, Ni-bonded U3 Tungsten carbides, CrNiMo-bonded Q1 SiC Q2 SiC-Si Q3 SiC-C-Si, composite Q4 C-SiC, surface-siliconised J Other carbides Metal oxides V Aluminium oxide W Chromium oxide X Other metal oxides Plastics (PTFE, reinforced Y, other plastics Z) Y1 PTFE, glass-fibre reinforced Y2 PTFE, carbon reinforced Z Other plastics	Elastomers, not sheathed[4] B Butyl rubber (IIR) E Ethylene propylene rubber (EPPM) K Perfluoro rubber N Chloroprene rubber (CR) P Nitrile rubber (NBR) S Silicon rubber (MVQ) V Fluoro rubber (FPM) X Other elastomers Elastomers, sheathed M Elastomers/PTFE sheathed Non-elastomers G Graphite T PTFE Y Other non-elastomers Various materials U various materials for flexible elements	D Carbon steel E Cr steel F CrNi steel G CrNiMo steel M High-nickel alloy N Copper-tin alloy (Bronze) T Other materials

1) For more detailed data refer to mechanical seals manufacturer´s literature
2) Seal face = spring loaded axially sliding ring of the mechanical seal
3) Flexible elements are seals which seal the rotating components on the shaft/shaft sleeve and the stationary components in the seal housing/end cover, including a bellows when applicable
4) Refer to table 2, footnote[1]
5) For bellows seals any component missing should be designated with a dash "-"

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