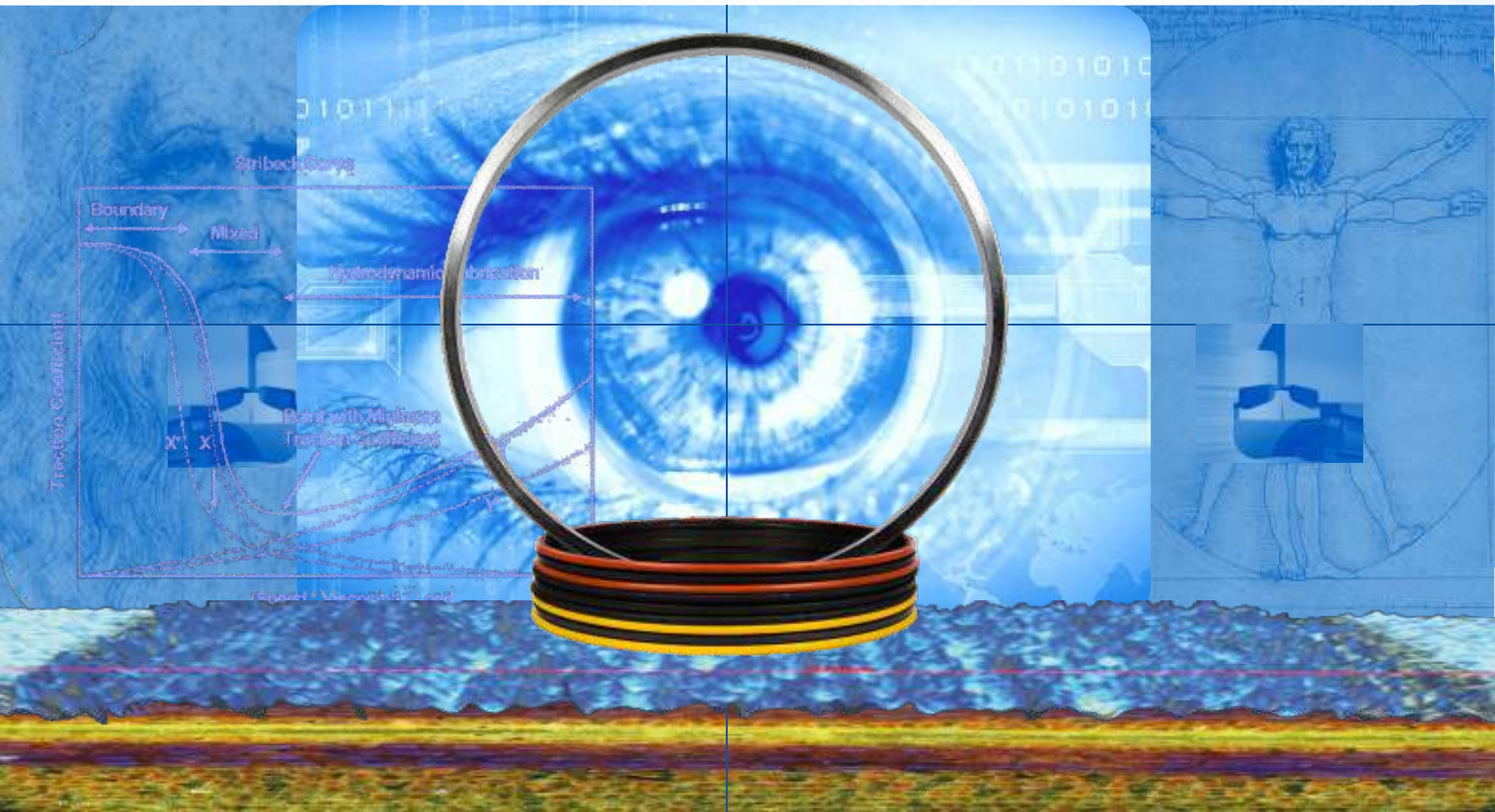


Mechanical Face Seals



**Leadership in Technology with
Passion, Innovation and Teamwork**

Why SAP Parts™ Seals

- Corrosion Resistant.
- Higher operational life.
- Precision Lapped seals.
- No micro-fine scratches.
- Wear Re-counteracting Design.
- Minimum face load variations.
- Self-renewing sealing surfaces.
- Special Seal and O - Ring materials.
- Suitable for Heavy Duty Applications.
- Life Tested & Performance Warranted.

Content

Page

1	Mechanical Face Seals.....	2
2	Application Requirement	3
3	Sealing Function	4
4	Lubrication Requirements	5
5	Seal Design (DO).....	6
6	Seal Design (DF).....	7
7	Special Seal Design.....	8
8	Innovations: Friction Management	9
9	Sealing System Clearance	11
10	Material - Metal Seal Ring.....	13
11	Elastomers.....	14
12	Installation Guideline.....	16
13	Product List.....	19
14	Seal Design Input Data Form.....	29

Mechanical Face Seals



Mechanical face Seals are designed to be employed in most exhaustive working conditions, accepted worldwide to use in extremely harsh environments under enormous stresses, sand, dirt, mud, dust and earth material.

Sealing technology for static or dynamic Applications is mainly concerned with providing sealing solutions for machinery and applications in which conventional seals fail or lack the necessary durability.

For decades together, SAP Parts™ branded Mechanical Face Seals have been used by OEMs and users of Seals with outstanding success in Construction Equipments, Transmission Drives, axles, Rollers and Agro machineries. The special alloy cast iron materials provided by SAP Parts™ are having extraordinary capacity for wear resistance, for a verity of demanding equipments, such as mining machinery, agriculture equipments, undercarriage vehicles, track rollers and many other applications.



Continuous technological research in SAP Parts™ sealing solutions guarantee our esteemed customers a long lasting, highly durable service life and maximum productivity of equipments using SAP Parts™ Seals.

Application Requirements



What to expect from Mechanical Face Seals

- Must withstand to a circumferential speed of up to 10 m/sec .
- The sealing faces must continuously lubricated as to prevent any cold welding due to excessive heat generated in rubbing.
- The sealing faces should be in contact all the time to prevent leakage. Same is about elastomer contactt within the sealing system.

- The static as well as dynamic leakage prevention must be guaranteed.
- The heat generated at sealing faces due to friction must be dissipated with adequate oil flow in the sealing system.
- The pressure spikes in the application must be handled by the sealing system.



Machines operating in abrasive media like dirt, dust, sand, mud and stone demands extreme wear resistance of the sealing system. A high quality component sets like Bearing, wet brake discs, gears, spindles, axles need to be perfectly protected against contamination of destructive media.

Sealing Function



The mechanical face seals are designed in such a way that they open out from the seal faces towards the centre axis, forming a cone-shaped gap which has following benefits:

- Due to capillary action in the gap and centrifugal force, lubricant admits easily in to the seal faces.
- Potential cold welding of the seal faces is avoided since adequate lubrication and cooling is assured.
- As wear goes on, sealing band increases and it can virtually only end when the seal collar gets completely worn out.
- This sealing system retains a continuous oil film on the sealing surfaces.

The alloy cast iron seal rings are preloaded by Torric rings or O - Rings. As a result, the axial load closes the gap between the seal faces, which leads to the sealing function. The relative movement in circumferential direction is only taken place between the seal faces.

Significance of elastomer O - rings in seal assembly

- Axial Load experienced by sealing faces is due to O ring pressure.
- Friction torque is transmitted through O-ring and housing components
- Static sealing between each seal and housing is ensured by O ring



The seal faces of metal rings are hardened and precision lapped, while elastomers are selected based on application conditions, as to be compatible with working environment.

Lubrication Requirements



Oil Lubrication

The use of oil lubrication considerably increases seal life on account of higher heat dissipation properties of the oil. It is however selected considering the field of application, arrangement available in the system for oil circulation and peripheral speed. Normally higher RPM applications prefer oil lubrication.

As a standard, transmission oil of grades SAE 80 and SAE 90 are found to be suitable for typical mechanical face seal operation.

The oil level after filling should be $\frac{2}{3}$ of the available volume of oil housing and above the seal axis. When filled to the correct level normally it is sufficient for the lifetime of the seal. Hence the seal faces require no additional maintenance.

Grease Lubrication

When the applications are with low sliding speeds, to an extent of 1 m/s, grease lubrication is the right consideration as a permanent lubrication to sealing system. Seal face gap is important design view in this selection. The maintenance care needs to be taken while filling grease is that, if the gun pressure is increased chances of dislodging the elastomeric torric rings.



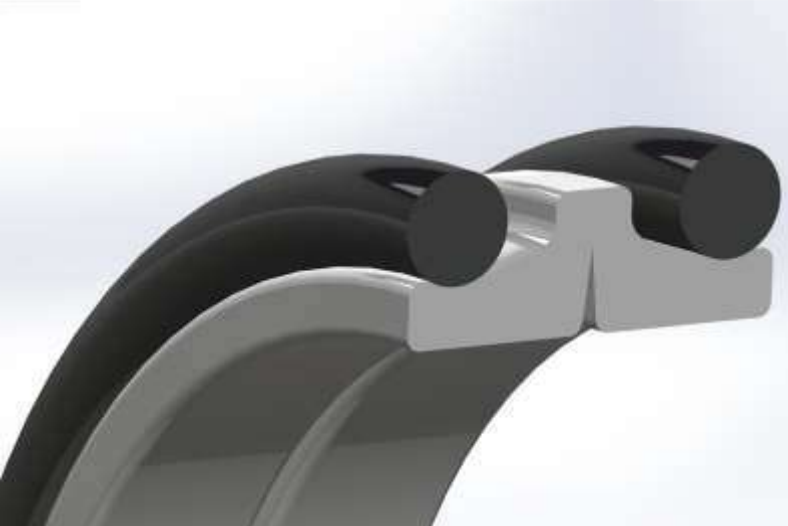
Adequate lubrication of the sealing faces is most necessary for the proper function of mechanical face seal assembly.

Seal Design

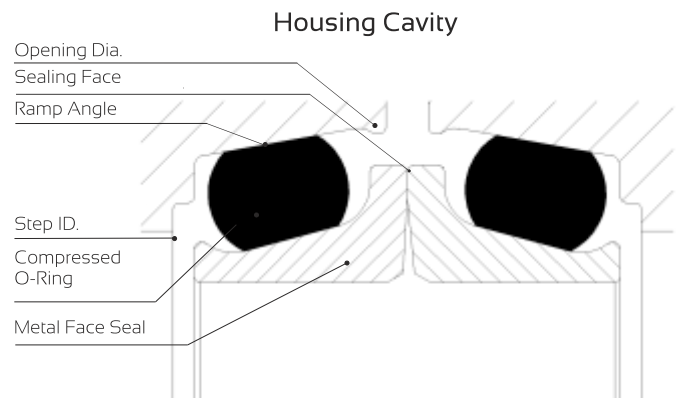
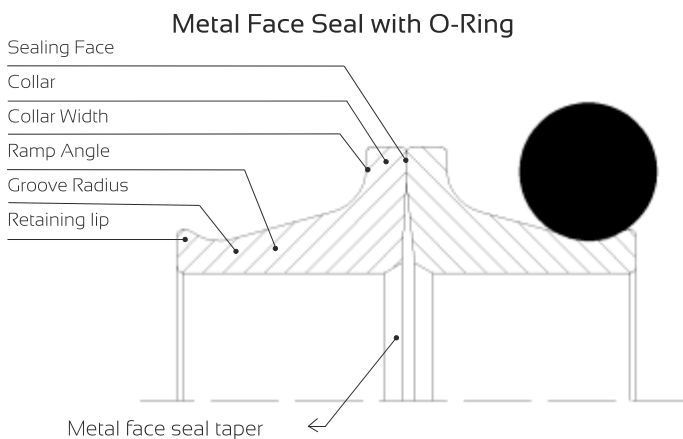
Mechanical Face Seal DO-Type

The DO type mechanical face seal consists of two identical metal face seals and two rubber O - rings placed on the ramp profile of the metal seal. SAP Parts™ Seals comes in two material versions - Alloy cast iron and Alloy Forged Steel grades. The O - ring material s however are of variety of types based on the application requirements.

In cast iron alloys, SAP Parts™ propose two proprietary compositions, selection of which is based on applications requirements.



At Seal assembly the o-rings are compressed between the tapered contact surfaces of the seal ring and housing. The o-rings undergo a calculated compression as per SAP Parts™ standards it is around 25% volumetric compression, which is critical for proper operation of the sealing system also the overall system cleanliness of the o-rings and housing free of oil and dirt is of primary importance. Lubrication of the o-rings with oil or grease is not permitted during the installation process.



Seal Design

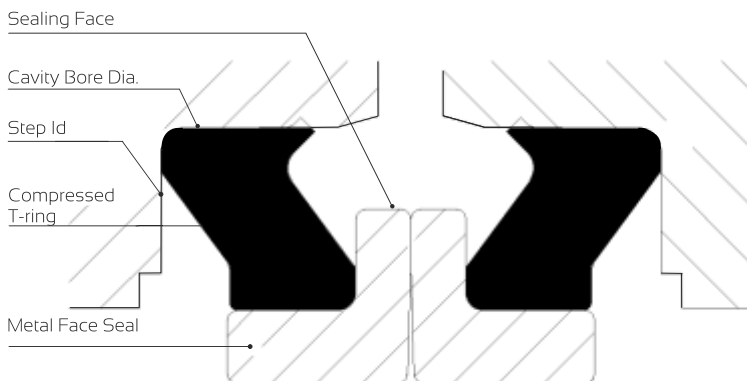
Mechanical Face Seal DF-Type

The mechanical face seal of DF Type consists of two metallic angular seal rings with identical geometrical profiles. The seal rings are assembled with trapezoid rubber rings which are placed in the particular housing bore. The geometry of the housing profile is comparatively easier to produce and the seal installation requires a simple installation tool. As compared to the DO - type Mechanical face seals, the resilience of the trapezoid rubber ring is normally stiffer. This limits the permitted axial movement and tolerance.

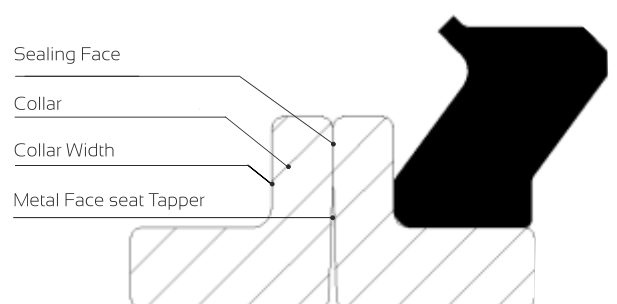


Historically a numerous mechanical face seal designs were developed based on variety of application needs. SAP Parts™ has few unique designs extremely suitable for demanding applications and adverse operating condition. The design of one of the seal in the group is inverted wrt to the other seal. This provides considerable advantage of manufacturing process of the sealing system mating components.

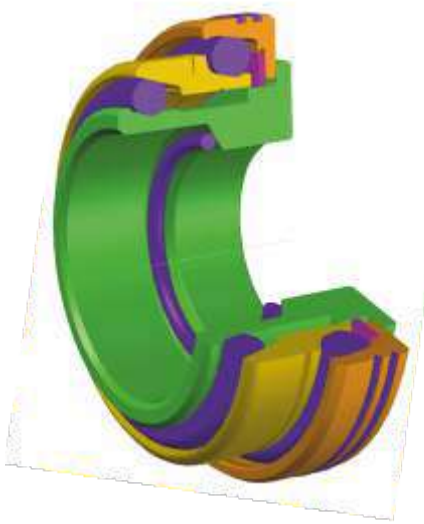
Assembled Condition



Metal Face Seal with T-Ring



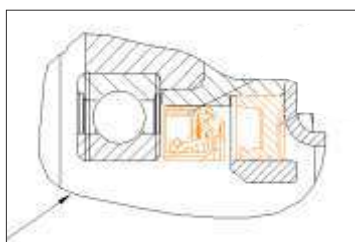
Special Seal Design



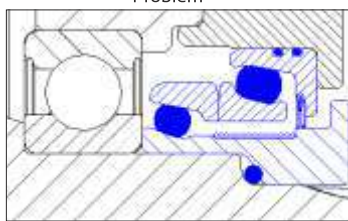
SAP Parts™ not only offers “standard designs – its engineering team is also available to work with your engineers to design ‘non-standard’ metal face seals. Whether developing a new seal size or type to fit your application, or utilizing a new metal seal or O-ring material, SAP Parts™ engineers have the experience necessary to design, procure and test these concepts and follow them to production.



Innovations: Friction Management



Problem



Solution

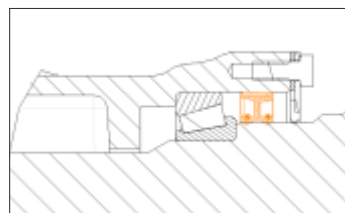


Innovation is the USP of SAP Parts™. It is our Core value and we intend to proactively employ culture of innovative thinking in all our operations.

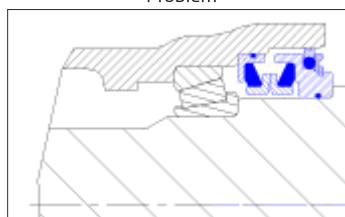
The sealing solution delivered by SAP Parts™ involves a high end research and patented technologies, warranting the highest performance and application sustainability of mechanical face seals at-

- Max 10 M/s Surface speed.
- Most Severe Environmental Situations.

Friction management in sealing solutions is attributed to development of proprietary materials, introduction of innovative process engineering technologies, understanding of tribology of wear elements and specialty thermal barrier coating for making our seals appropriate for most harsh working environments. The outcome is a range of new products for PTO, Axle and Drive motor applications.



Problem



Solution



Innovations: Friction Management



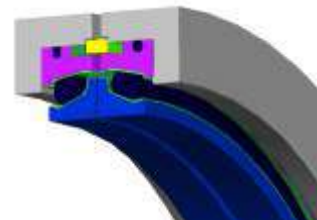
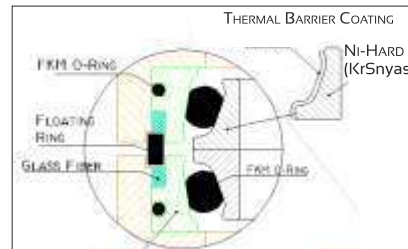
Technological Developments

- Seal Design for Differential Load applications.
- Model for Contact Surface Wear Life Prediction.
- Elastomeric Variable Load Stress Relaxation Modeling.
- Innovative Surface Treatments for Demanding Applications.
- Functional Conformance of Metallurgical Properties of Ni-Hard Cast Alloys & Sealing Surface Asperities in Abrasive Environment.

SAP Parts™ seals come with most advance and innovative anti corrosive surface treatments.

TBC (Thermal Barrier Coating) - unique surface coating technology introduced by SAP Parts™ for the seals undergoing high temperature working conditions $>250^{\circ}\text{C}$. TBC isolates the seal from environmental heat and allows the frictional surfaces dissipate it through the heat sinks provided at the inner side of seal. This is an innovative product development employed in most harsh applications.

Thermal Barrier Coated Seals

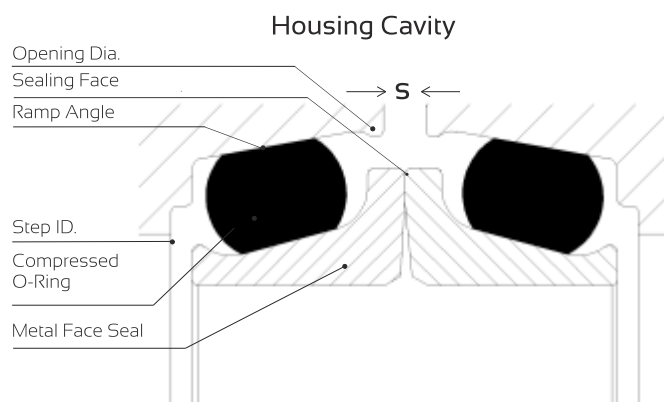


Sealing System Clearance



The axial gap "S" in the housing is vital, and is such that it meets the demands of the construction equipments and off highway vehicle industry. For high sliding speeds it may be necessary to reduce the axial compression, thus reducing the load of the seal faces and the heat generation in the seal face. This is achieved by increasing the axial gap "S". The following gaps are possible, depending on the O-ring cross section.

SAP Parts™ recommend that tests be carried out to find the most appropriate setting. Since the O-Ring is always oversized to the housing, the edges of the housing must be rounded. Surfaces Under pressure, elastomers adapt themselves to irregular surfaces. However, for liquid-tight conditions, certain minimum requirements have to be made on the surface finish of the faces to be sealed. Scores, scratches, pores and concentric or spiral machining scores are not permissible. For the surface of the seal installation chamber we recommend a machining quality of mechanical face seals.

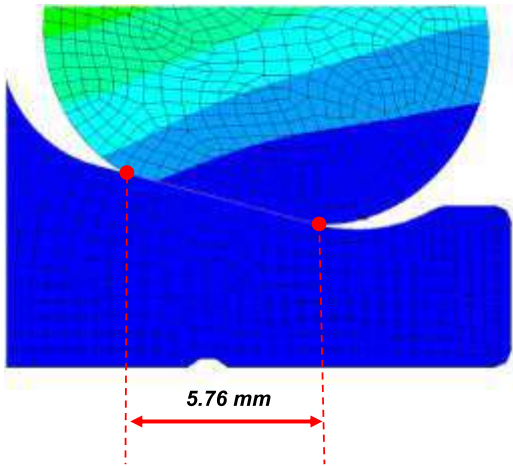


O - Ring Cross Section dl	Gap 'S'
dl < 8.0	4
8 < dl < 12.7	5
dl > 12.7	6
Ra	< 6.5 µm
Rz	< 10.0 µm
Rmax	< 16.0 µm

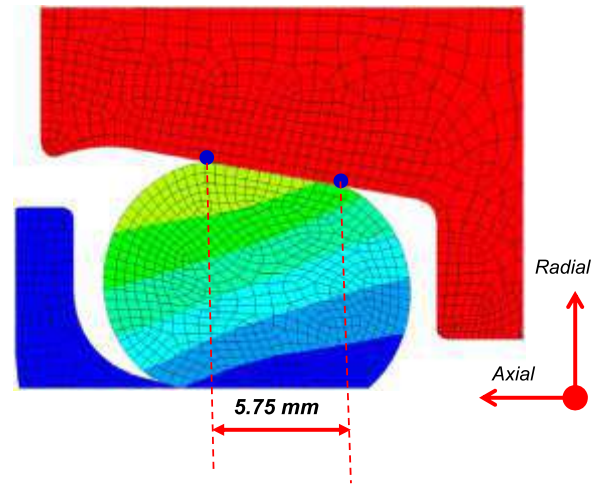


Contact Geometry

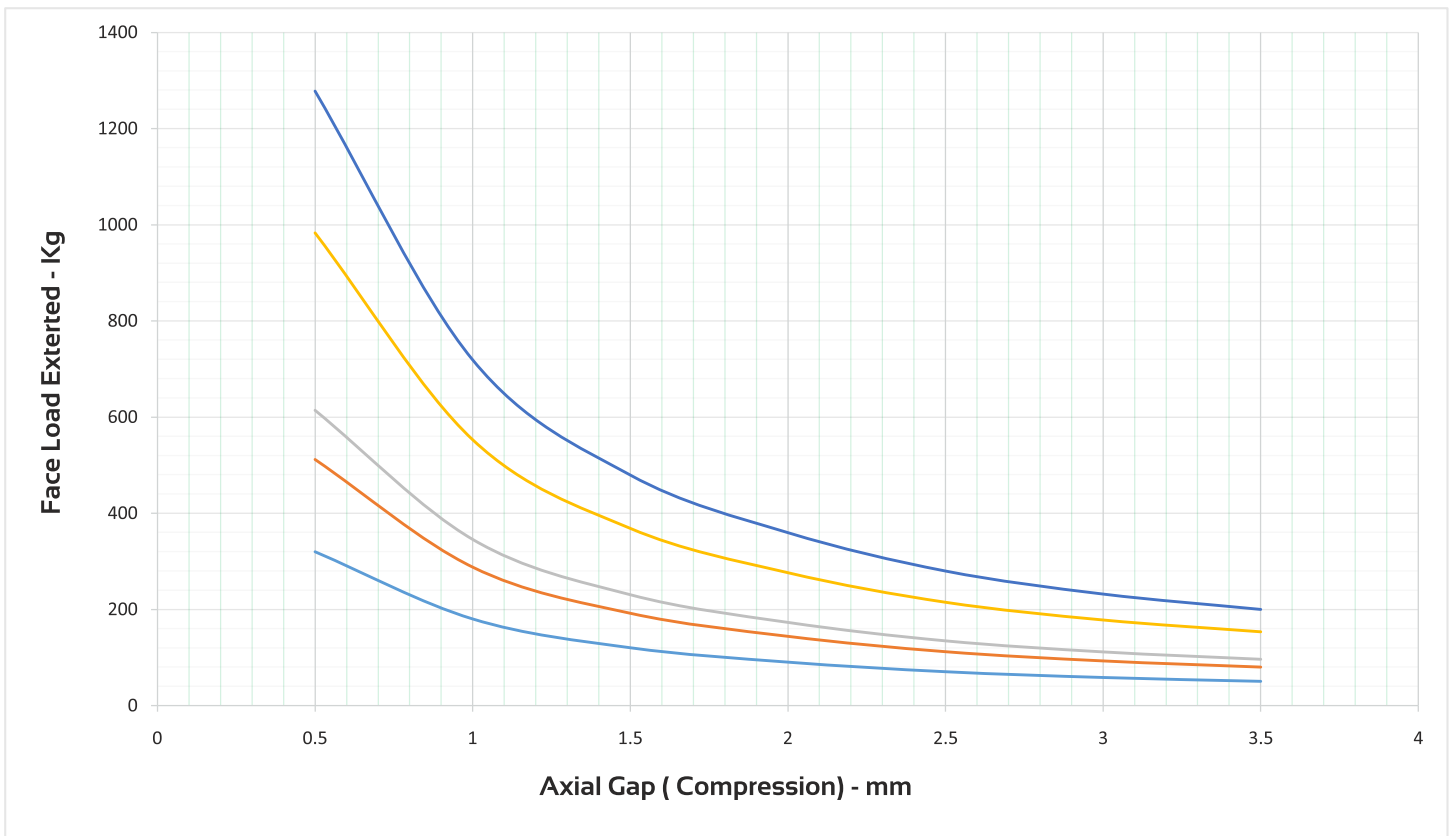
Contact at the bottom of the O-ring



Contact at the top of the O-ring



Elastomer Load V/s Deflection Characteristics



Materials - Metal Seal Ring

Materials: In order to address the potential failure threats to sealing system it is needed that wear and corrosion resistance of metal faces be adequate. SAP parts seals use alloy steel of various grades following to manufacturing processes like forging. Commonly termed as bearing steel of grade SAE 52100 is offered in metal seals of steel version.




Seals specially employed for mining, dredging and paddy field agriculture applications are few of the most demanding environments where Metal face Seal material composition plays a significant role. SAP Parts developed unique and

proprietary Cast Iron materials with high chromium and with high nickel as constituent elements having free graphite in secondary matrix of micro structure ensures the high resistance to abrasion, corrosion and higher heat dissipation.

Based on customer need and application understanding many other cast iron versions are offered. These highly sound castings are produced by processes like lost wax investment casting as well as centrifugal casting for products ranging from outer diameter 50 mm to 1300 mm size.



SAP Part™ offers different coatings which provide a considerable good sealing solutions for harsh environmental conditions, and enhanced corrosion resistance for demanding environments and applications. If any special requirements SAP PARTS™ provides customized solutions on coating for which a contact to the SAP Parts™ Engineering is needed.

Materials	Steel Version	Typical Cast-iron Version	
Chemical Composition	SAE 52100 Grade	जालिकायस JaLiKayas	क्रस्नायस KrSnyas
%		Equivalent to FC15Cr3MO (ASTM -A 532-II Class B cast Iron)	Ni-Hard Cast Iron
C	0.93-1.05	3.2-3.6	3.0-3.6
Si	0.15-0.35	1.1-1.6	0.4-0.7
Ni	0.25 Max	1.0-2.0	3.5-4.3
Cr	1.35-1.60	14-16	1.2-1.7
MO	0.10 Max	2.0-4.0	0.4 Max
CO	-	0.2 Max	-
V	-	0.2 Max	0.3-0.6
W	-	0.2 Max	
Microstructure	Fine Tempered Martensitic	Eutectic carbide in M7C3 in the matrix of martensitic.	Eutectic carbide in M3C in the matrix of lediburite.
Magnification 100 X			
Hardness	59-65 HRC	57-64 Hrc	64-75 Hrc

Elastomers

SAP Parts™ uses several materials for its Torric rings are available to meet a variety of application requirements. The most common materials are nitrile (NBR) and silicone. Viton and highly saturated nitrile (HNBR) are available for more specialized applications. The table listed below gives a brief comparison between available O- ring options



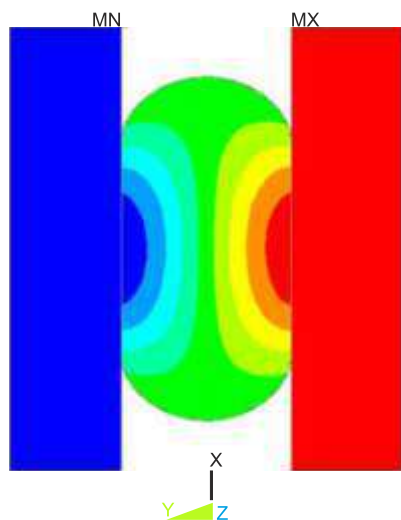
The elastomers of various hardness are proposed in seals design depending upon the application requirements. Below is the common materials and their applicability with respect to service temperature conditions for reference.

Elastomer Properties

Sr.No.	Rubber Material Properties	Test Method Standards	Unit	NBR	NBR-LT	HNBR	HNBR-LT	SILICON	VITON
1	Working Temperature Range			-35 °C / +110°C	-50°C/ +105°C	-25°C/ +135°C	-40 °C/ +135 °C	-60 °C / +165°C	-10 °C / +190 °C
2	Short Term Peak Temp.			130°C	110°C	150°C	150°C	200°C	220°C
3	Colour	Visual		BLACK	BLACK	BLACK	BLACK	YELLOW	BLACK
4	Hardness	ASTM D2240	Shore A	55-65		55-65	55-65	55-65	55-65
5	Tensile Test (Min.)	ASTM D412	Kg/cm ²	100	60	140	100	60	125
6	Elongation (Min.)	ASTM D412	%	200	200	350	250	200	220
7	Specific Gravity	ASTM D792	gm/cm ³	1.164 ± 0.02	1.22 ± 0.02	1.9 ± 0.02	1.9 ± 0.02	1.32 ± 0.02	1.87 ± 0.02
8	TRIO	ASTM D1329	°C	-43	-54	-20	-35	-55	-10

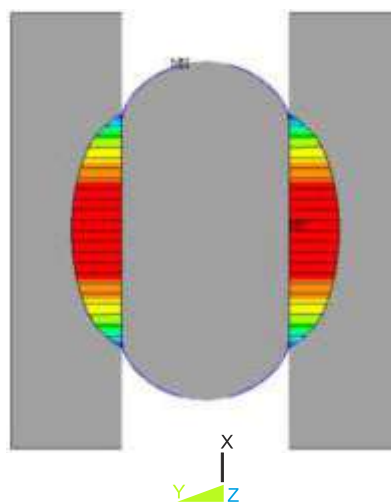
O-Ring Deformation

Non-Linear Finite Elements Analysis



NODAL SOLUTION
 STEP = 5
 SUB = 20
 TIME = 5
 UY
 RSYS = 0
 DMX = 5.08001
 SMN = -.533E-05
 SMX = 5.08001

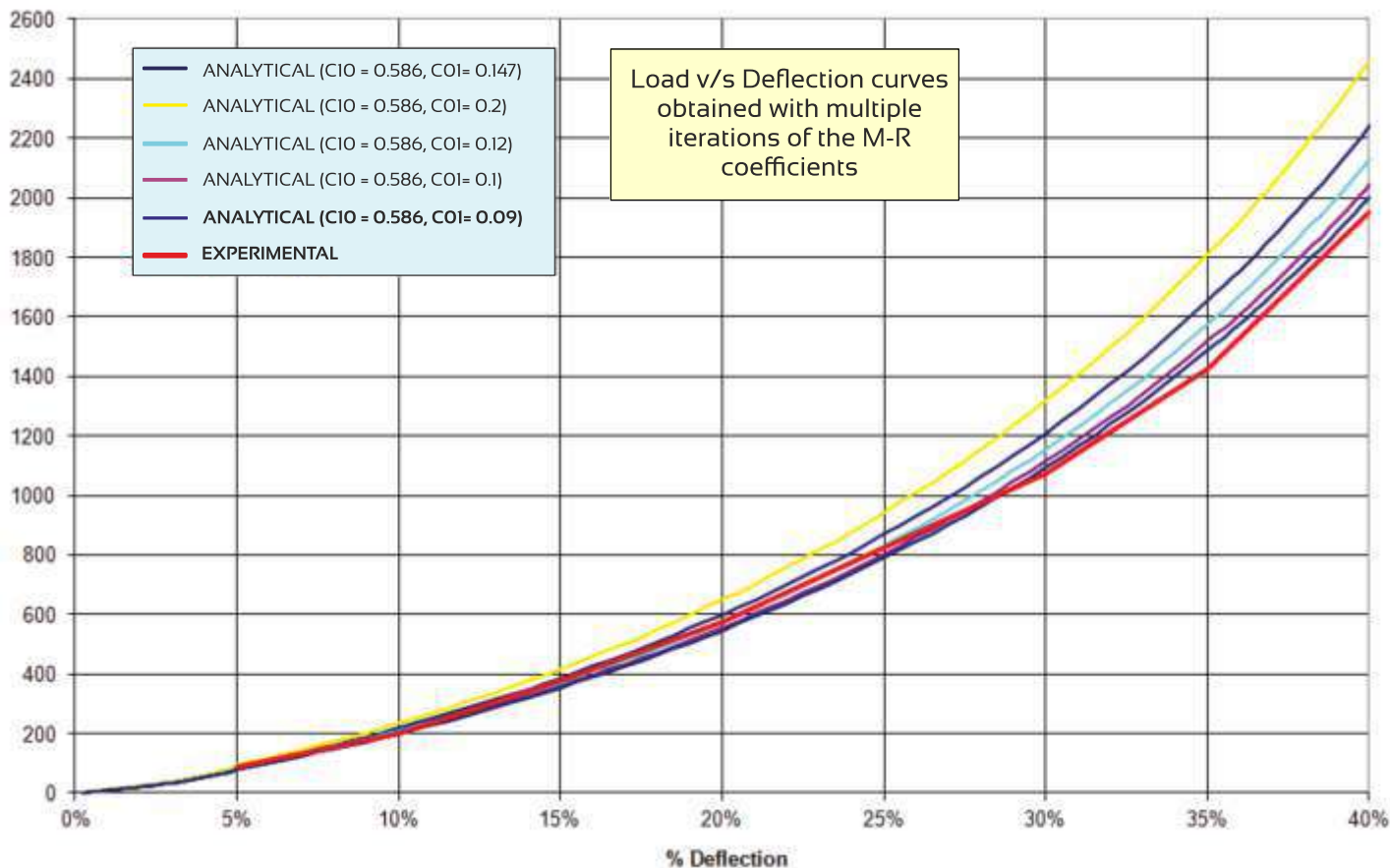
Blue	-.56444
Light Blue	1.12889
Cyan	1.69333
Green	2.25778
Light Green	2.82222
Yellow-Green	3.38667
Yellow	3.95111
Orange	4.51556
Red	5.08001



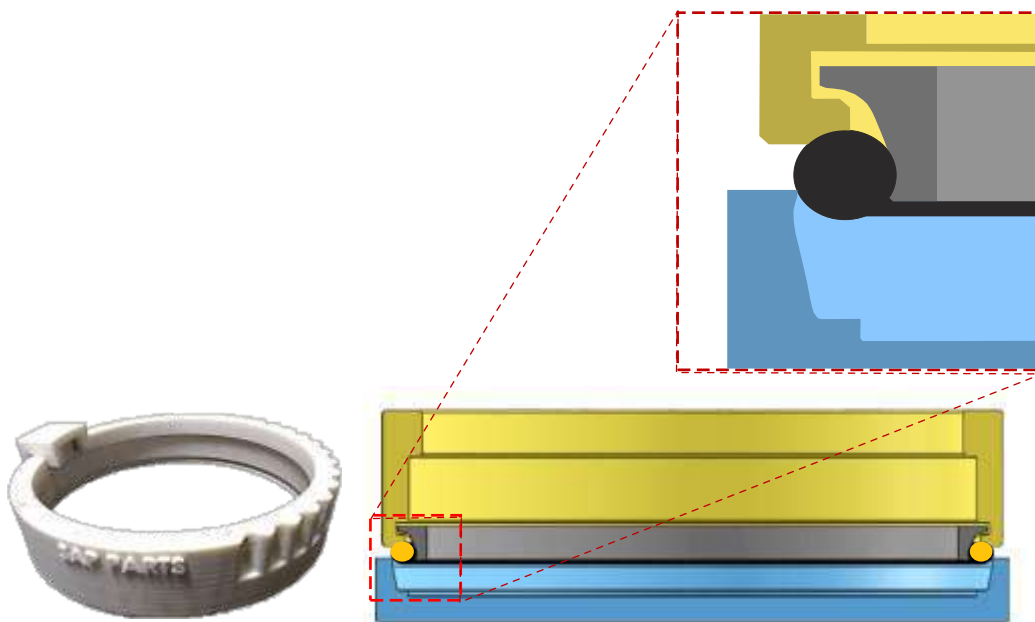
NODAL SOLUTION
 STEP = 5
 SUB = 20
 TIME = 5
 CONTPRES (AVG)
 DMX = 5.08001
 SMX = 1.89639

Blue	0
Light Blue	.21071
Cyan	.421419
Green	.632129
Light Green	.842838
Yellow-Green	1.05355
Yellow	1.26426
Orange	1.47497
Red	1.68568
Dark Red	1.89639

Load v/s Deflection Curve



Installation Guidelines



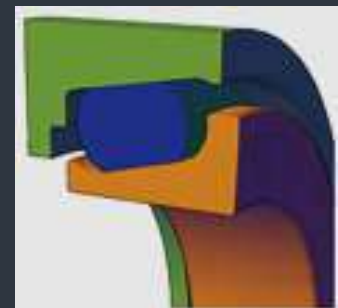
RECOMMENDATIONS

- SAP STANDARD INSTALL TOOL**
 Follow SAP Parts™ supplied Standard Installation tool for the designated Seal part reference.
- SEAL-O-FIXA** unique Seal Lubricant to be employed white Seal Assembly.
- LINT FREE WIPE**
 A must for wiping the metal faces as well as the Seal housing cavity while installation, maintains cleanliness.
- ONLY DESIGNATED LUBRICANTS**
 Recommended for the most reliable performance of Seals & O-Rings.

GENERAL GUIDELINES FOR METAL FACE SEAL INSTALLATION

Mechanical Face seals are fitted in a Groove of retaining housing, to form the sealing at the adjoining faces. Metal faces are precision Lapped. The ramp angle of Seal and Housings are slightly different and form a wedge for the rubber ring to slide into and form a compressed profile giving load on the seals and making it intact.

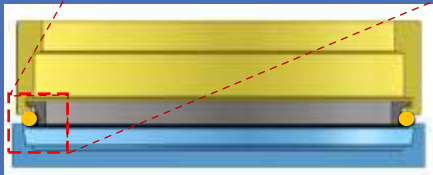
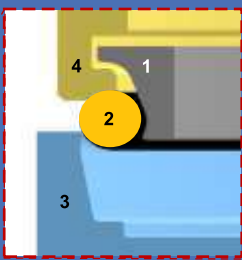
The installation guidelines are aimed to protect the precision lapped and Functional metal sealing faces. The more precautions taken, the more Likely the seals will last in the field.



Installation Guidelines

Terminology:

1. Metal Face Seal
2. Rubber O-Ring
3. Seal Housing
4. Install Tool



Approved Assembly Lubricants:



SAP Parts - Seal-O-Fix

A unique Solution for Seal Installation and Cleaning the Housings.

While applying always follow all the safety practices for handling volatile solvents. Do not use any other oil that leaves oil film or do not evaporate.

SAP Parts™ Seal Installation Tool:

A typical Mechanical Face Seal installation tool looks like as shown in the image below. Made out of advanced 3-D printing technology, it consists of a circular bracket type polyamide ring with clamping arrangement and lock that holds the seal with O-Ring in the special groove made at the face of tool ring and pushes the O-ring in the housing groove.



Special Install Tools:

There are many other versions of designated Seal Installation Tools developed by SAP Parts™ out of special polymers including PTFE, ABS, PU materials using 3 D – Printing and other advance manufacturing technologies, based on the size and seal application requirements. These are the customized tooling solutions provided by SAP Parts™.



Seal Housing Preparation:

The housing components which contact the rubber O-Rings must be free from foreign particles, like dust, lints etc. before installing the seal. This should be done using lint free wipe and a non-petroleum based solvent especially SAP Parts™ Seal-O-Fix Spray. Also following other approved assembly lubricants may be used following to manufacturer specified safety guidelines for respective lubricant.

Other Approved Assembly Lubricants:

- Denaturatedalcohol or Isopropyl Alcohol*/ Houghto-Grind 60 CT/ Quaker® Solvo Clean 68-RAH
- (*) All applicable safety and disposal guidelines for flammable liquids must be followed.

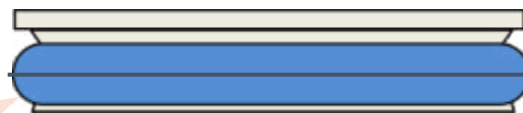
Note: Do not use Stanosol or any other liquid that leaves an oil film and /or does not evaporate quickly.

Metal Face Seal Handling Care: After unpacking from the Box, handle the seals with great care. Do not allow the Polished Metal faces placed inverted on ground or metal surface where they can get damaged during handling. Clear the Oil film on the metal face Seals with a clean wipe. Remove any foreign material from the rubber torics, the Seal ramps and the lips of both seal rings.

Important Check:

Place the rubber O-Rings on the metal seal ring at the bottom of the seal ring ramp and against the, retaining lip.

Check the O-Rings remain straight on the rim and not squeezed or twisted as it may lead to improper installation of the Mechanical seal.



Ensure Parting Line on the O-Ring should be parallel with Seal face.

Steps by Step Seal Installation Guidelines

1. Arrange Right Duo cone Seal, Installation Tool, Seal-O-Fix Spray, Mallet, Lint Free Cloth, etc. as shown below before starting actual seal installation in the housing cavity.
2. Check you are using appropriate tool part number, and design provided by SAP Parts™ for the Seal. Note: – Each seal has different Tool. Check Seal face, O-Ring & housings are clean and free from any mechanical damage, dent etc.
3. Apply Seal-O-Fix on Seal face and clean the Seal using Lint Free Wipe. Ensure the seal face be thoroughly cleaned and no fine particles of dust should remain on it. Employ the spray on the O-Ring circumference, this gives sufficient lubrication for Seal to fit in the cavity of Housing. Do never use Ethanol, Oil or Grease for lubricating the O-Ring.
4. Put the O-Ring on the Seal Ramp and check it is properly placed on the metal ring ramp. Check there is no skewing or twisting of O-Ring, and Hold the O-Ring on the Seal Ramp and engage the Lip of the tool between the gap of O-Ring and seal face inside the circular guide way groove of the Tool.
5. Bring the edges of tool bracket close to each other and hold the seal firmly in the clamp formed. This makes the Seal Guided in the Install Tool.



Installation Guidelines

IMPORTANT INSTRUCTIONS

- Metal Face Seals are precision components made of special cast iron, being very brittle due care must be taken to avoid impacts. Following care to be taken
- Do not open the original packaging as long seal assembly preparations are made ready.
- Be careful to protect the hands as sharp edges may injure the users, hence use gloves.
- Protect rubber rings from dust contamination
- Ensure the seal housing cavity bore is rounded as sharp edges may cut O-Rings.
- Protect the functional edge of installation tool from excessive wear and fall down.
- Put the tool in designated box or holder.
- Clean the tool it with IPA in regular intervals to maintain the life.

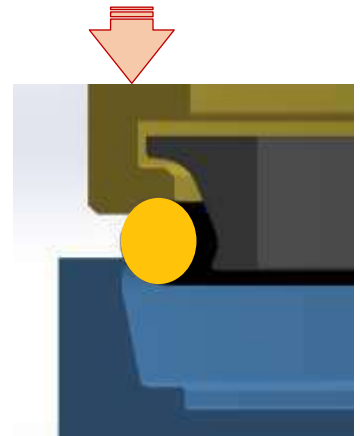


1. For installation of Seal, arrange a cleaned Seal & cleaned ,wiped housing. Put the Seal on the Housing.

2. Hold the O- Ring in the Fixture and form the tool guide assembly as explained above.

3. Hold the Seal and O-Ring Firmly and see O-Ring is not twisted. Locate the seal & tool on groove opening.

4. Press the fixture with even load on the O-ring, and experience the O-Ring insertion jerk, inside the housing. Small Rings can be manually fixed, for big rings apply even and gentle pressure around the rim of guide plate using wooden mallet.



5. Below is the correct Final Seal Assembly. Check the Assembly height "H" as shown below at 4 diagonally opposite positions. The variation should not be more than the specified limit of respective seal assembly.



CAUTION

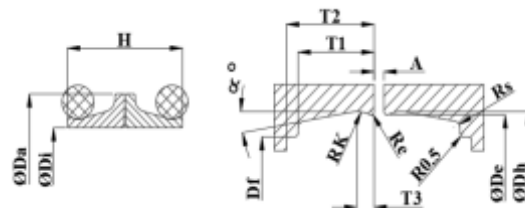
- The Rubber O-Ring can twist if it is not wet all around during installation or if there are burrs and fins on the retaining ramp of housing. Twist, misalignments, and bulges of O-ring will result in seal failure.
- If Seal is not installed correctly, remove it from housing and repeat the process. Never use Rubber O-Rings with Blow holes/ damages.
- Never allow Sealing surface be dirty, it should be cleaned well before Assembly.
- Never try hammering on sealing surface and never use sharp tools to locate O-Rings.

DOS

- Clean the Sealing Surface thoroughly before installation.
- Use SAP Parts™ Seal – O-Fix Spray or approved lubricants.
- Carefully check for Sealing edge is free from dust, dirt, hair etc.
- Always use Only Lint free Wipes/Cloths, Never use tissue Paper or cotton waste.
- While completing the final assembly of the unit, make sure that both seals are in correct housings together. High impact can scratch or break the seal components



List of DO Type Seals

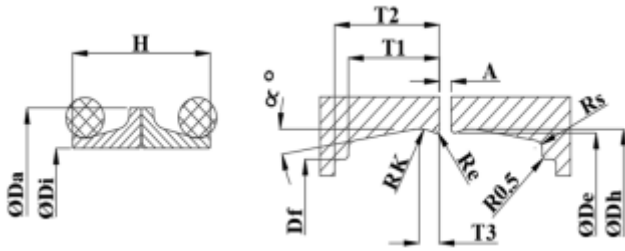


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
1	SAPC100510038020NB60	3	51	38	20	53.7	53	46	9	11	1.8	0.5	2	1	10°
2	SAPC100580045021NB60	3	58	45	21	61.6	60.8	53.4	10	12	1.8	0.3	2.5	1	10°
3	SAPC100590046020NB60	3	59	46	20	62.5	61.8	56	8.5	10.5	1.8	0.5	2	1	10°
4	SAPC106220048025NB60	3	62.15	48	25	68	67.2	58	12	14	2	0.4	3	1	10°
5	SAPC100700555022NB60	3	70	55.5	22	73.8	73.1	65.5	10	11.5	2.4	0.5	5	1	10°
6	SAPC100730602020NB60	3	73	60.2	20	76.5	75.8	69	8.5	10.5	1.8	0.5	2	1	10°
7	SAPC100780064025NB60	3	78	64	25	84.6	83.8	74	12.5	14.5	2	0.4	3	1	12°
8	SAPC100800067020NB60	3	80	67	20	83.4	82.7	76.8	8.5	10.5	1.8	0.5	2	1	10°
9	SAPC108050063026NB60	3	80.5	63	26	84	83.2	72	11.5	13	2.5	0.5	5	1	10°
10	SAPC108240635032NB60	3	82.4	63.5	32	87	86	74.5	14.5	17.5	2.8	0.5	5	1	10°
11	SAPC100840071020NB60	3	84	71	20	87.4	86.7	80.8	8.5	10.5	1.8	0.5	2	1	10°
12	SAPC108650675318NB60	3	86.5	67.5	31.8	91	90	78	14.5	17	2.8	0.5	5	1	10°
13	SAPC100890685024NB60	3	89	68.5	24	92.5	91.5	83	11	13.5	2.8	0.5	5	1	10°
14	SAPC100920073032NB60	3	92	73	32	96.5	95.5	84	14.5	17.5	2.8	0.5	5	1	10°
15	SAPC109250795020NB60	3	92.5	79.5	20	96	95.3	88	8.5	10.5	1.8	0.5	2	1	10°
16	SAPC100980081028NB60	3	98	81	28	102.3	101.3	91	12.5	14.5	2.8	0.5	5	1	10°
17	SAPC101000079030NB60	3	100	79	30	105.2	104.2	92	15	17	2.5	0.7	3	1	10°
18	SAPC101000080029NB60	3	100	80	29	104	103.2	92	14.5	16.5	2	0.4	3	1	10°
19	SAPC101020083028NB60	3	102	83	28	105.5	104.5	94	12.5	15	2.8	0.5	5	1	10°
20	SAPC110450905026NB60	3	104.5	90.5	26	107.4	106.6	100.4	11.8	14.2	2.9	1.2	2.8	1	10°
21	SAPC101080088024NB60	3	108	88	24	111.5	110.5	102	11	13.5	2.8	0.5	5	1	10°
22	SAPC110950905032NB60	3	109.5	90.5	32	114	113	101.5	14.5	17.5	2.8	0.5	5	1	10°
23	SAPC101100091032NB60	3	110	91	32	114	113	101.5	14.5	17.5	2.8	0.5	5	1	10°
24	SAPC101110962024NB60	3	111	96.2	24	115.6	114.8	108	11	12.5	1.8	0.5	2	1	10°
25	SAPC101160097032NB60	3	116	97	32	120.5	119.5	108	14.5	17.5	2.8	0.5	5	1	10°
26	SAPC101170103020NB60	3	117	103	20	119.8	119	112.5	9	11	1.8	0.5	2	1	10°
27	SAPC101190100032NB60	3	119	100	32	123.5	122.5	111	14.5	17.5	2.8	0.5	5	1	10°
28	SAPC101200099028NB60	3	120	99	28	123.5	122.5	112	12.5	14.5	2.8	0.5	5	1	10°
29	SAPC101230107023NB60	3	123	107	23	125.5	125.1	117.5	9.5	11.5	1.8	0.7	3	1	10°
30	SAPC101250104028NB60	3	125	104	28	128.5	127.5	117	12.5	14	2.8	0.5	5	1	10°
31	SAPC101250107024NB60	3	125	107	24	130.4	129.4	119.5	11	13.5	2.8	0.5	5	1	10°
32	SAPC101280110032NB60	3	128	110	32	133	132	121	15	17	2.5	0.7	3	1	12°
33	SAPC101291145021NB60	3	129	114.5	21	134.1	133.1	126	9.2	10	2.3	0.5	3	1	10°
34	SAPC101380120032NB60	3	138	120	32	143	142	132	14.5	17	2.8	0.5	5	1	10°
35	SAPC101390120318NB60	3	139	120	31.8	143.8	142.8	132	14.5	17	2.8	0.5	5	1	10°
36	SAPC113951185028NB60	3	139.5	118.5	28	143	142	131.5	12.5	15	2.8	0.5	5	1	10°
37	SAPC101400117029NB60	3	140	117	29	142.5	141.5	132	13	14	2.8	0.5	5	1	10°
38	SAPC114070127025NB60	3	140.7	127	25	144	143.2	135	12.7	15.2	2.7	1	2.8	1	10°
39	SAPC101410127029NB60	3	141	127	29	144	143	136	12	14.5	2.3	0.5	3	1	10°
40	SAPC101420120038NB60	4	142	120	38	149	148	133	17	19	2.5	0.7	3	1	10°

* This part list is for reference only. Ask for latest updates.

* F-steel version | * C- cast version

List of DO Type Seals

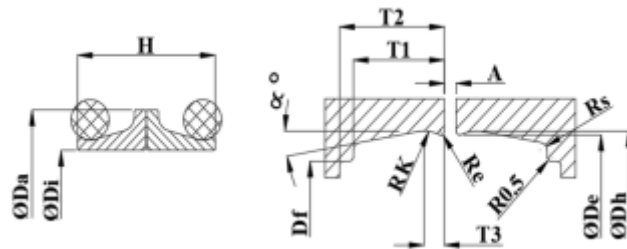


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
41	SAPC101440125318NB60	3	144	125	31.8	148.5	147.5	136	14.5	17	2.8	0.5	5	1	10°
42	SAPC101460127032NB60	3	146	127	32	150.5	149.5	138	14.5	17.5	2.8	0.5	5	1	10°
43	SAPC101460127031NB60	3	146	127	31	150.2	149.4	137	14.5	16.5	2.6	0.5	5	1	10°
44	SAPC115451355028NB60	3	154.5	135.5	28	158.3	157.3	146.5	12.5	14	2.8	0.5	5	1	10°
45	SAPC101570143027NB60	3	157	143	27	160	159	152	12	14.5	2.3	0.5	3	1	10°
46	SAPC101600143027NB60	3	160	143	27	164	163	154	12	14.5	2.8	0.5	5	1	10°
47	SAPC101670150028NB60	3	167	150	28	171	170	160	13	15.5	2.8	0.5	5	1	12°
48	SAPC101680154027NB60	3	168	154	27	171	170	162.5	12	14.5	2.3	0.5	3	1	10°
49	SAPC101690154022NB60	3	169	154	22	174.5	173.5	166	9.5	11	2.3	0.5	3	1	10°
50	SAPC101700154021NB60	3	170	154	21	175.1	174.1	167	9.2	11	2.3	0.5	3	1	10°
51	SAPC117150153028NB60	3	171.5	153	28	176.3	175.3	164.5	12.5	14.5	2.8	0.5	5	1	10°
52	SAPC117171465038NB60	3	171.7	146.5	38	176.8	175.9	158.9	18.4	20.3	3.7	0.5	6.3	1	10°
53	SAPC101720150040NB60	4	172	150	40	179	178	165	18	20	2.5	0.7	3	1	10°
54	SAPC117350154032NB60	3	173.5	154	32	178	177	166	14.5	17	2.8	0.5	5	1	10°
55	SAPC101800154038NB60	3	180	154	38	185	184	167	18	20.5	3.1	0.5	6.5	1	10°
56	SAPC118050165027NB60	3	180.5	165	27	185	184	176.5	12	14.5	2.3	0.5	3	1	10°
57	SAPC101890164030NB60	3	189	164	30	193.5	192.5	179	14.5	17	2.8	0.5	5	1	10°
58	SAPC119150163038NB60	3	191.5	163	38	196.5	195.5	178.5	18	20.5	3.1	0.5	6.5	1	10°
59	SAPC119440172318NB60	3	194.4	172	31.8	198.9	197.9	186	14.5	16.5	2.8	0.5	5	1	10°
60	SAPC101950176028NB60	3	195	176	28	199.8	198.8	188	12.5	14.5	2.8	0.5	5	1	10°
61	SAPC101990178032NB60	3	199	178	32	203.6	202.6	190	14.5	17	2.8	0.5	5	1	10°
62	SAPC102000177030NB60	3	200	177	30	204.5	203.5	191	14.5	17	2.8	0.5	5	1	10°
63	SAPC102050178038NB60	4	205	178	38	210.6	209.6	192	19	21	3	0.8	4	1	10°
64	SAPC102090192030NB60	3	209	192	30	213.5	212.5	200	14.5	17	2.8	0.5	5	1	10°
65	SAPC102100191028NB60	3	210	191	28	214	213	203	12.5	14.5	2.8	0.5	5	1	10°
66	SAPC121050182038NB60	3	210.5	182	38	215.5	214.5	197.5	18	20.5	3.1	0.5	6.5	1	10°
67	SAPC121650195318NB60	3	216.5	195	31.8	221	220	207	14.5	17	2.8	0.5	5	1	10°
68	SAPC122282087026NB60	3	222.8	208.7	26	225.4	224.4	217	11.5	13.5	2.2	0.5	2.5	1	10°
69	SAPC102270205030NB60	3	227	205	30	231.5	230.5	219	14.5	17	2.8	0.5	5	1	10°
70	SAPC122850200038NB60	3	228.5	200	38	233.5	232.5	215.5	18	20.5	3.1	0.5	6.5	1	10°
71	SAPC102370216030NB60	3	237	216	30	241.5	240.5	229	14.5	17	2.8	0.5	5	1	10°
72	SAPC123950220318NB60	3	239.5	220	31.8	244	243	232	14.5	16.5	2.8	0.5	5	1	10°
73	SAPC102410220025NB60	3	241.4	220	25	244.7	244	233.5	11	13.5	2.2	0.5	4	1	10°
74	SAPC125150223038NB60	3	251.5	223	38	256.5	255.5	238.5	18	20.5	3.1	0.5	6.5	1	10°
75	SAPC125970235038NB60	5	259.7	235	38	264.7	263.7	247	18	20.5	3.1	0.5	6.5	1	10°
76	SAPC102610238318NB60	3	261	238	31.8	265.5	264.5	254	14.5	17	2.8	0.5	5	1	10°
77	SAPC126280240038NB60	3	262.8	240	38	273.5	272.5	255.5	18	20.5	3.1	0.5	6.5	1	10°
78	SAPC126280242040NB60	3	262.8	242	40	273.5	272.5	255.5	18	20.5	3.1	0.5	6.5	1	10°
79	SAPC102700250030NB60	3	270	250	30	274.7	273.7	262	14	15.5	2.8	0.5	5	1	10°
80	SAPC128050252038NB60	3	280.5	252	38	285.5	284.5	267.5	18	20.5	3.1	0.5	6.5	1	10°

* F-steel version | * C- cast version

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List of DO Type Seals

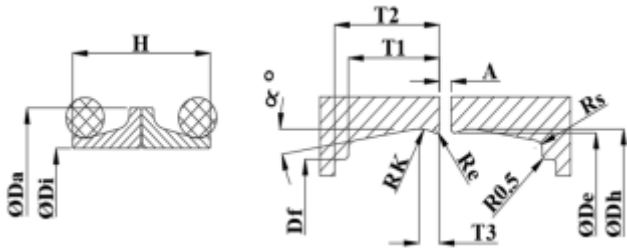


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
81	SAPC102880262040NB60	7	288	262	40	294	293	276	17	20	3.8	1.2	6	3	10°
82	SAPC102930265038NB60	3	293	265	38	298	297	280	18	20.5	3.1	0.5	6.5	1	10°
83	SAPC103030275038NB60	3	303	275	38	308	307	290	18	20.5	3.1	0.5	6.5	1	10°
84	SAPC132470300038NB60	3	324.65	300	38	335.5	334.5	318	17.5	20.5	3.1	0.5	6.5	1	10°
85	SAPC103250300038NB60	3	325	300	38	336.5	335.5	318	17.5	20.5	3.1	0.5	6.5	1	10°
86	SAPC103280300038NB60	4	328	300	38	333	332	315	19.5	22	3.1	0.8	4	1	10°
87	SAPC103410318038NB60	3	341	318	38	351.5	350.5	334	17.5	20.5	3.1	0.5	6.5	1	12°
88	SAPC103460318038NB60	3	346	318	38	351.5	350.5	334	18	20.5	3.1	0.5	6.5	1	10°
89	SAPC103540326030NB60	3	354	326	30	358.7	357.7	346	15	16.5	2.8	0.5	5	1	10°
90	SAPC136850340038NB60	3	368.5	340	38	374.8	373.2	358	19	21.5	3	0.5	4	1	10°
91	SAPC103750350038NB60	3	375	350	38	385.5	384.5	368	17.5	20.5	3.1	0.5	6.5	1	10°
92	SAPC103750355038NB60	3	375	355	38	385.5	384.5	368	17.5	20.5	3.1	0.5	6.5	1	10°
93	SAPC139440366038NB60	3	394.4	366	38	399.5	398.6	381	17.5	20.5	3	0.5	6.5	1	10°
94	SAPC139440366040NB60	6	394.4	366	40	399.5	398.6	381	17.5	20.5	3	0.5	6.5	1	10°
95	SAPC103980370038NB60	3	398	370	38	403.5	402.6	385	17.5	20.5	3	0.5	6.5	1	10°
96	SAPC104050382040NB60	6	405	382	40	412	411	395	17	22	3.8	1.1	6	3	10°
97	SAPC104150388038NB60	3	415	388	38	420.3	419.4	402	17.5	20.5	3	0.5	6.5	1	10°
98	SAPC141620388038NB60	3	416.2	388	38	421.6	420.7	402	17.5	20.5	3	0.5	6.5	1	10°
99	SAPC104570430038NB60	3	457	430	38	462.3	461.3	444	17.5	20.5	3	0.5	6.5	1	10°
100	SAPC145920430038NB60	3	459.2	430	38	464.5	463.5	444	17.5	20.5	3	0.5	6.5	1	10°
101	SAPC104800450050NB60	3	480	450	50	492.2	490.2	470	23.5	25.5	4	0.5	6	1	10°
102	SAPC104950465436NB60	3	495	465	43.6	500.7	498.5	482.9	21.2	22.9	4.7	0.7	7	1	10°
103	SAPC149720465436NB60	3	497.2	465	43.6	503.1	500.9	482.9	21.2	23	4.7	0.7	7	1	10°
104	SAPC105000470050NB60	3	500	470	50	512.2	510.2	490	23.5	25.5	4	0.5	6	1	10°
105	SAPC153340505436NB60	6	533.4	505	43.6	538.4	537.4	521	19.7	21.7	4	1.3	6.5	1	10°
106	SAPC153580505436NB60	3	535.8	505	43.6	541.8	539.7	521	19.7	21.7	4.2	0.5	6.5	1	10°
107	SAPC105480508060NB60	15	548	508	60	553	551.5	528	22	26	5	1.1	9	3	10°
108	SAPC105600530050NB60	3	560	530	50	572.2	570.2	545	23.5	25.5	4	0.5	6	1	10°
109	SAPC156680538436NB60	6	566.8	538	43.6	572.2	571.2	554	19.7	21.7	4	1.3	6.5	1	10°
110	SAPC105900559050NB60	3	590	559	50	602.2	600.2	575	23.5	25.5	4	0.5	6	1	10°
111	SAPC106080576436NB60	6	608	576	43.6	613	612	596	19.7	21.7	4	1.3	6.5	1	10°
112	SAPC106085815436NB60	6	608	581.5	43.6	613	612	596	19.7	21.7	4	1.3	6.5	1	10°
113	SAPC106230591050NB60	5.25	623	591	50	635.2	633.2	613	23.5	25.5	4	0.5	6	1	10°
114	SAPC106280596050NB60	5.25	628	596	50	640.2	638.2	618	23.5	25.5	4	0.5	6	1	10°
115	SAPC106950660053NB60	13	695	660	53	705.3	703.3	680	20	22.5	4	0.5	6	1	10°
116	SAPC107000667436NB60	9	700	667	43.6	705.6	704.3	687	21.3	24	3.7	0.7	6.3	1	10°
117	SAPC107000667050NB60	12	700	667	50	705.6	704.7	687.7	21.3	26.2	3.7	1.2	6.3	1	10°
118	SAPC107500718050NB60	3	750	718	50	762.2	760.2	740	23.5	25.5	4	0.5	6	1	10°
119	SAPC108010740080NB60	17	801	740	80	816.9	815.9	784	34.5	39.5	4.4	1.1	10	1	10°
120	SAPC108260770080NB60	17	826	770	80	831.9	830.9	800	34.5	39.5	4.4	1.1	10	1	10°

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* F-steel version | * C- cast version

List of DO Type Seals

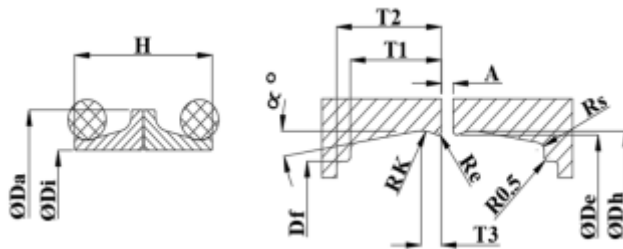


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
121	SAPC108360780080NB60	17	836	780	80	841.9	840.9	810	34.5	39.5	4.4	1.1	10	1	10°
122	SAPC108650817466NB60	12	865	817	46.6	870.6	869.7	852.7	21.3	26.2	3.8	1.2	6.3	1	10°
123	SAPC186550825048NB60	11	865.5	825	48	870.6	869.7	852.7	18.4	23.3	3.7	1.2	6.3	1	10°
124	SAPC108860834080NB60	17	886	834	80	891.9	890.9	860	34.5	39.5	4.5	1.1	10	1	10°
125	SAPC109410902060NB60	16	941	902	60	946.3	945.2	922.4	23.8	25.2	4.65	1.4	8	1	10°
126	SAPC109510890080NB60	17	951	890	80	956.9	955.9	924	30	34	4.4	1.1	10	5	10°
127	SAPC109760920080NB60	17	976	920	80	981.9	980.9	950	34.5	39.5	4.4	1.1	10	1	12°
128	SAPC110851030080NB60	17	1085	1030	80	1090.9	1089.9	1058	34.5	39.5	4.4	1.1	10	1	10°
129	SAPC111051044080NB60	17	1105	1044	80	1110.9	1109.9	1078	34.5	39.5	4.4	1.1	10	1	10°
130	SAPC112361175080NB60	26	1236	1175	80	1241.9	1240.4	1209	32.5	37.5	4.4	0.5	10	1	10°
131	SAPC114251372080NB60	26	1425	1372	80	1430.9	1429.9	1398	32.5	37.5	4.4	1.1	10	1	10°
132	SAPF100450034014NB60	1.5	45	34	14	47	46.5	42	6.5	8	1	0.5	1	1	10°
133	SAPF100500039014NB60	1.5	50	39	14	52	51.5	46	6.5	8	1	0.5	1	1	10°
134	SAPF100510038204NB60	3	51	38	20.4	53.7	53	46	9	11	1.8	0.5	2	1	10°
135	SAPF100520040020NB60	3	52	40	20	55	54.2	46	9	11	1	0.5	1	1	10°
136	SAPF100580043024NB60	3	58	43	24	61.6	60.8	53.4	10	12	1.8	0.5	2.5	1	10°
137	SAPF100580045216NB60	3	58	45	21.6	61.6	61	54	10.5	12.5	1.8	0.5	2.5	1	10°
138	SAPF100580048144NB60	1.5	58	48	14.4	59.9	59.4	55	6.3	8	1.5	0.5	1.7	1	10°
139	SAPF100590046020NB60	3	59	46	20	61.6	61.2	53	9	11	2	0.5	2.5	1	10°
140	SAPF100620048026NB60	3	62	48	26	68	67.2	58	12	14	2	0.5	3	1	10°
141	SAPF100700555022NB60	3	70	55.5	22	73.8	73.1	65.5	10	11.5	2.4	0.5	5	1	10°
142	SAPF100700056026NB60	3	70	56	26	76	75.2	66	12	14	2	0.5	2.5	1	10°
143	SAPF100730061176NB60	3	73	61	17.6	75.8	75.5	66.8	6.5	7.5	1	0.5	1.4	1	10°
144	SAPF100740060206NB60	3	74	60	20.6	78.4	77.4	70	9	11	1.9	0.5	2.5	1	10°
145	SAPF100750058027NB60	3	75	58	27	79.2	78.6	66	12	14	2	0.5	2.5	1	10°
146	SAPF107750057356NB60	-	77.5	57	35.6	81.4	80.7	68.5	15.2	20.9	3.5	0.5	4.8	1	10°
147	SAPF100780064025NB60	3	78	64	25	84.6	83.8	74	12.5	14.5	2	0.5	3	1	10°
148	SAPF108250635318NB60	3	82.5	63.5	31.8	86.5	85.7	73.5	15.2	16.8	3.5	0.5	4.8	1	10°
149	SAPF100840069024NB60	3	84	69	24	89.6	88.6	78.5	11	13	1.9	0.5	3	1	10°
150	SAPF100840071020NB60	3	84	71	20	87.4	86.7	80.8	8.5	10	1.8	0.5	2	1	10°
151	SAPF108650675318NB60	3	86.5	67.5	31.8	91	90	78	14.5	17	2.8	0.5	5	1	10°
152	SAPF108650074225NB60	3	86.5	74	22.5	91.4	90.7	80	9.5	11.5	2	0.5	3	1	10°
153	SAPF108760775136NB60	-	87.6	77.5	13.6	90.7	90.2	89.5	7.5	8	1.4	0.5	1.5	1	10°
154	SAPF108850735204NB60	3	88.5	73.5	20.4	90.2	89.4	82	12.7	14.3	2.2	0.5	2.8	1	10°
155	SAPF100890069024NB60	3	89	69	24	92.5	91.5	83	11	13.5	2.8	0.5	5	1	10°
156	SAPF100900070029NB60	3	90	70	29	95.5	94.7	84	13.5	15.5	2	0.5	3	1	10°
157	SAPF109190731318NB60	3	91.9	73.1	31.8	96	95.2	83	15.2	16.8	3.5	0.5	4.8	1	10°
158	SAPF100920725356NB60	-	92	72.5	35.6	96	95.2	83	15.2	20.9	3.5	0.5	4.8	1	10°
159	SAPF100920073318NB60	3	92	73	31.8	96.2	95.4	84	15	17	2.8	0.5	4	1	10°
160	SAPF109250795020NB60	3	92.5	79.5	20	96	95.3	88	8.5	10.5	1.8	0.5	2	1	10°

* F-steel version | * C- cast version

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List of DO Type Seals

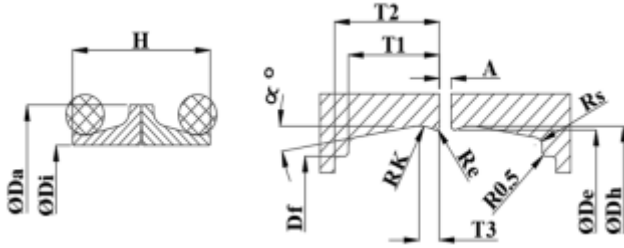


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
161	SAPF100940075029NB60	3	94	75	29	101.4	100.6	89	14.5	16.5	2	0.5	3	1	10°
162	SAPF100980081028NB60	3	98	81	28	102.3	101.3	91	12.5	14.5	2.8	0.5	5	1	10°
163	SAPF101000080030NB60	3	100	80	30	104.1	103.3	93	15	18	2.3	0.5	2.5	1	10°
164	SAPF101020825356NB60	-	102	82.5	35.6	107.3	106.5	94.3	15.2	20.9	3.5	0.5	4.8	1	10°
165	SAPF101050090026NB60	3	105	90	26	107.3	106.7	100.4	11.5	14	2.9	0.5	2.8	1	10°
166	SAPF110650094023NB60	3	106.5	94	23	111.6	110.8	102	9.5	11.5	2	0.5	3	1	10°
167	SAPF110680965136NB60	3	106.8	96.5	13.6	109.7	109.2	108.5	7.5	8	1.4	0.5	1.5	1	12°
168	SAPF101090090032NB60	3	109	90	32	112.5	111.7	104	14.5	17	3.2	0.5	3	1	10°
169	SAPF110940904318NB60	3	109.4	90.4	31.8	113.4	112.7	100.4	15.2	16.8	3.5	0.5	4.8	1	10°
170	SAPF110950904356NB60	-	109.5	90.4	35.6	113.4	112.7	100.4	15.2	20.9	3.5	0.5	4.8	1	10°
171	SAPF110950092022NB60	3	109.5	92	22	113.8	113	105	9.5	11.5	2	0.5	3	1	10°
172	SAPF101110095024NB60	3	111	95	24	115.6	114.8	108	11	12.5	1.8	0.5	2	1	10°
173	SAPF101140095032NB60	3	114	95	32	120	119.2	107	15	17	2.5	0.5	3	1	10°
174	SAPF101170104022NB60	3	117	104	22	121	120.2	107	9.5	11.5	2	0.5	3	1	10°
175	SAPF101190100318NB60	3	119	100	31.8	123	122.2	110	15.2	16.8	3.5	0.5	4.8	1	10°
176	SAPF101220103032NB60	3	122	103	32	127.2	126.2	115	15.5	17.5	2.5	0.5	3	1	10°
177	SAPF112250104225NB60	3	122.5	104	22.5	125.5	125.1	117.5	9.5	11.5	2	0.5	3	1	10°
178	SAPF101250104028NB60	3	125	104	28	128.5	127.5	117	12.5	14	2.8	0.5	5	1	10°
179	SAPF101250107024NB60	3	125	107	24	130.4	129.4	119.5	11	13.5	2.8	0.5	5	1	10°
180	SAPF101280110032NB60	3	128	110	32	133	132	121	14.5	17	2.5	0.5	3	1	10°
181	SAPF101280111022NB60	3	128	111	22	132.5	132	123	10.6	12.3	2.8	0.5	3	1	10°
182	SAPF101291145235NB60	3	129	114.5	23.5	134.1	133.1	126	10.4	11.9	2.8	0.5	5	1	10°
183	SAPF101320109032NB60	3	132	109	32	136.5	135.5	124	15.5	17.5	2.5	0.5	3	1	10°
184	SAPF101330111032NB60	5	133	111	32	137	136.5	124.5	14.5	18	2.8	0.5	5	1	10°
185	SAPF101370115031NB60	3	137	115	31	141.8	140.8	130	14.5	16.5	2.5	0.5	3	1	10°
186	SAPF101380117318NB60	3	138	117	31.8	142.5	141.5	132	14.5	17	2.8	0.5	5	1	10°
187	SAPF101390120318NB60	3	139	120	31.8	143	142	129.3	14.3	17.4	3	0.5	5.4	1	10°
188	SAPF101391265268NB60	3	139	126.5	26.8	143.8	143.1	136.9	11.8	14.2	2.9	0.5	2.8	1	10°
189	SAPF101400117028NB60	3	140	117	28	142.5	141.5	132	12.5	14	2.8	0.5	5	1	10°
190	SAPF101400119028NB60	3	140	119	28	142.5	141.5	132	12.5	14	2.8	0.5	5	1	10°
191	SAPF101410120318NB60	3	141	120	31.8	144	143	138	14.5	17.5	2.8	0.5	5	1	10°
192	SAPF101410124022NB60	3	141	124	22	146.4	145.3	136	10.6	12.3	2.8	0.5	3	1	10°
193	SAPF101410127029NB60	3	141	127	29	144	143	136	12	14.5	2.8	0.5	5	1	10°
194	SAPF114120127254NB60	3	141.2	127	25.4	143.8	143.1	136.9	11.8	14.2	2.9	0.5	2.8	1	10°
195	SAPF101420120038NB60	4	142	120	38	149	148	133	17	19	2.5	0.5	3	1	10°
196	SAPF114410125318NB60	3	144.1	125	31.8	148.5	147.5	136	14.3	17.4	3	0.5	5	1	10°
197	SAPF101460126318NB60	3	146	126	31.8	150	149.2	137	15.2	16.8	3.5	0.5	4.8	1	10°
198	SAPF101460127318NB60	4	146	127	31.8	150.5	149.5	138	14.5	17.5	2.8	0.5	5	1	10°
199	SAPF115050130032NB60	3	150.5	130	32	155.6	154.6	144	14.5	16.5	2.5	0.5	5	1	10°
200	SAPF101520130385NB60	-	152	130	38.5	159	158	144	18.5	20.5	2.5	0.5	3	1	10°

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* F-steel version | * C- cast version

List of DO Type Seals

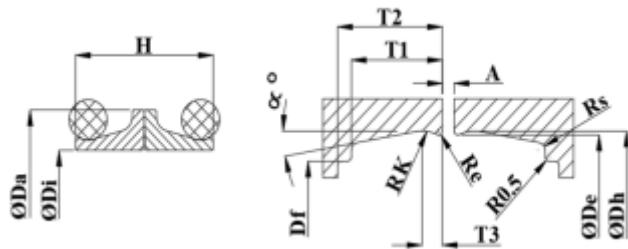


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
161	SAPF100940075029NB60	3	94	75	29	101.4	100.6	89	14.5	16.5	2	0.5	3	1	10°
162	SAPF100980081028NB60	3	98	81	28	102.3	101.3	91	12.5	14.5	2.8	0.5	5	1	10°
163	SAPF101000080030NB60	3	100	80	30	104.1	103.3	93	15	18	2.3	0.5	2.5	1	10°
164	SAPF101020825356NB60	-	102	82.5	35.6	107.3	106.5	94.3	15.2	20.9	3.5	0.5	4.8	1	10°
165	SAPF101050090026NB60	3	105	90	26	107.3	106.7	100.4	11.5	14	2.9	0.5	2.8	1	10°
166	SAPF110650094023NB60	3	106.5	94	23	111.6	110.8	102	9.5	11.5	2	0.5	3	1	10°
167	SAPF110680965136NB60	3	106.8	96.5	13.6	109.7	109.2	108.5	7.5	8	1.4	0.5	1.5	1	12°
168	SAPF101090090032NB60	3	109	90	32	112.5	111.7	104	14.5	17	3.2	0.5	3	1	10°
169	SAPF110940904318NB60	3	109.4	90.4	31.8	113.4	112.7	100.4	15.2	16.8	3.5	0.5	4.8	1	10°
170	SAPF110950904356NB60	-	109.5	90.4	35.6	113.4	112.7	100.4	15.2	20.9	3.5	0.5	4.8	1	10°
171	SAPF110950092022NB60	3	109.5	92	22	113.8	113	105	9.5	11.5	2	0.5	3	1	10°
172	SAPF101110095024NB60	3	111	95	24	115.6	114.8	108	11	12.5	1.8	0.5	2	1	10°
173	SAPF101140095032NB60	3	114	95	32	120	119.2	107	15	17	2.5	0.5	3	1	10°
174	SAPF101170104022NB60	3	117	104	22	121	120.2	107	9.5	11.5	2	0.5	3	1	10°
175	SAPF101190100318NB60	3	119	100	31.8	123	122.2	110	15.2	16.8	3.5	0.5	4.8	1	10°
176	SAPF101220103032NB60	3	122	103	32	127.2	126.2	115	15.5	17.5	2.5	0.5	3	1	10°
177	SAPF112250104225NB60	3	122.5	104	22.5	125.5	125.1	117.5	9.5	11.5	2	0.5	3	1	10°
178	SAPF101250104028NB60	3	125	104	28	128.5	127.5	117	12.5	14	2.8	0.5	5	1	10°
179	SAPF101250107024NB60	3	125	107	24	130.4	129.4	119.5	11	13.5	2.8	0.5	5	1	10°
180	SAPF101280110032NB60	3	128	110	32	133	132	121	14.5	17	2.5	0.5	3	1	10°
181	SAPF101280111022NB60	3	128	111	22	132.5	132	123	10.6	12.3	2.8	0.5	3	1	10°
182	SAPF101291145235NB60	3	129	114.5	23.5	134.1	133.1	126	10.4	11.9	2.8	0.5	5	1	10°
183	SAPF101320109032NB60	3	132	109	32	136.5	135.5	124	15.5	17.5	2.5	0.5	3	1	10°
184	SAPF101330111032NB60	5	133	111	32	137	136.5	124.5	14.5	18	2.8	0.5	5	1	10°
185	SAPF101370115031NB60	3	137	115	31	141.8	140.8	130	14.5	16.5	2.5	0.5	3	1	10°
186	SAPF101380117318NB60	3	138	117	31.8	142.5	141.5	132	14.5	17	2.8	0.5	5	1	10°
187	SAPF101390120318NB60	3	139	120	31.8	143	142	129.3	14.3	17.4	3	0.5	5.4	1	10°
188	SAPF101391265268NB60	3	139	126.5	26.8	143.8	143.1	136.9	11.8	14.2	2.9	0.5	2.8	1	10°
189	SAPF101400117028NB60	3	140	117	28	142.5	141.5	132	12.5	14	2.8	0.5	5	1	10°
190	SAPF101400119028NB60	3	140	119	28	142.5	141.5	132	12.5	14	2.8	0.5	5	1	10°
191	SAPF101410120318NB60	3	141	120	31.8	144	143	138	14.5	17.5	2.8	0.5	5	1	10°
192	SAPF101410124022NB60	3	141	124	22	146.4	145.3	136	10.6	12.3	2.8	0.5	3	1	10°
193	SAPF101410127029NB60	3	141	127	29	144	143	136	12	14.5	2.8	0.5	5	1	10°
194	SAPF114120127254NB60	3	141.2	127	25.4	143.8	143.1	136.9	11.8	14.2	2.9	0.5	2.8	1	10°
195	SAPF101420120038NB60	4	142	120	38	149	148	133	17	19	2.5	0.5	3	1	10°
196	SAPF114410125318NB60	3	144.1	125	31.8	148.5	147.5	136	14.3	17.4	3	0.5	5	1	10°
197	SAPF101460126318NB60	3	146	126	31.8	150	149.2	137	15.2	16.8	3.5	0.5	4.8	1	10°
198	SAPF101460127318NB60	4	146	127	31.8	150.5	149.5	138	14.5	17.5	2.8	0.5	5	1	10°
199	SAPF115050130032NB60	3	150.5	130	32	155.6	154.6	144	14.5	16.5	2.5	0.5	5	1	10°
200	SAPF101520130385NB60	-	152	130	38.5	159	158	144	18.5	20.5	2.5	0.5	3	1	10°

* F-steel version | * C- cast version

* This part list is for reference only. Ask for latest updates.

List of DO Type Seals

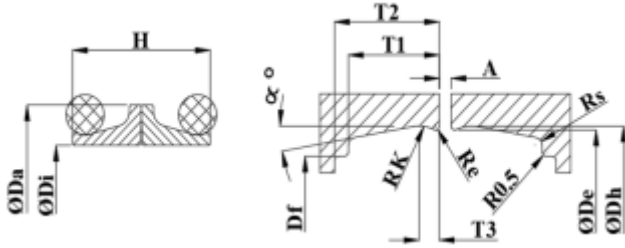


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
201	SAPF115691427254NB60	3	156.9	142.7	25.4	159.7	158.9	152.1	11.8	14.2	2.9	0.5	2.8	1	10°
202	SAPF101570144026NB60	3	157	144	26	160	159	154.5	12	14.5	2.8	0.5	5	1	10°
203	SAPF101600143027NB60	4	160	143	27	164	163	154	12	14.5	2.8	0.5	5	1	10°
204	SAPF101670147028NB60	3	167	147	28	171	170	160	13	15.5	2.8	0.5	5	1	10°
205	SAPF101680146038NB60	4	168	146	38	176.8	175.9	159	18	20.5	3	0.5	6.5	1	10°
206	SAPF101680154027NB60	3	168	154	27	171	170	162.5	12	14.5	2.3	0.5	3	1	10°
207	SAPF116811539254NB60	3	168.1	153.9	25.4	171	170.2	164	11.8	14.2	2.9	0.5	2.8	1	12°
208	SAPF101690154022NB60	3	169	154	22	174.5	173.5	166	9.2	11	2.3	0.5	3	1	10°
209	SAPF101700148031NB60	4	170	148	31	175.6	174.6	164	15	17	2.5	0.5	3	1	10°
210	SAPF101700154021NB60	3	170	154	21	175.1	174.1	167	9.2	10	2.3	0.5	3	1	10°
211	SAPF117150152032NB60	-	171.5	152	32	175.4	174.7	162.5	15.2	16.8	3.5	0.5	4.8	1	10°
212	SAPF117150153028NB60	3	171.5	153	28	176.3	175.3	164.5	12.5	14.5	2.8	0.5	5	1	10°
213	SAPF117171463038NB60	-	171.7	146.3	38	176.8	175.9	158.9	18.4	20.3	3.7	0.5	6.3	1	10°
214	SAPF101720150040NB60	4	172	150	40	179	178	165	18	20	2.5	0.5	2	1	10°
215	SAPF117350154032NB60	3	173.5	154	32	178	177	166	14.5	17	2.8	0.5	6.5	1	10°
216	SAPF101750146038NB60	6	175	146	38	180.5	179.5	162	17.7	20.5	3	0.5	6.3	1	10°
217	SAPF101810165027NB60	3	181	165	27	185	184	176.5	12	14.5	2.7	0.5	4	1	10°
218	SAPF101890164030NB60	3	189	164	30	193.5	192.5	179	14.5	17	2.8	0.5	5	1	10°
219	SAPF101901725254NB60	3	190	172.5	25.4	192.7	191.8	188	12.7	14.3	2.3	0.5	2.8	1	10°
220	SAPF101900174254NB60	3	190	174	25.4	192.7	191.8	188	12.7	14.3	2.3	0.5	2.8	1	10°
221	SAPF119121633038NB60	6	191.2	163.3	38	196.8	195.8	178.9	18.4	20.3	3.7	0.5	6.3	1	10°
222	SAPF119131633046NB60	6	191.3	163.3	46	196.8	195.9	178.9	18.4	24.1	3.7	0.5	6.3	1	10°
223	SAPF119740180214NB60	3	197.4	180	21.4	202.2	201.9	196	9.4	10.6	1.2	0.5	3	1	10°
224	SAPF101990178032NB60	3	199	178	32	203.6	202.6	190	14.5	17	2.8	0.5	5	1	10°
225	SAPF102000177031NB60	3	200	177	31	204.5	203.4	191	14.5	17	3.1	0.5	5	1	10°
226	SAPF102000178038NB60	4	200	178	38	210.6	209.6	192	19	21	3	0.5	4	1	10°
227	SAPF102020183028NB60	3	202	183	28	206	205	195	12.5	14.5	2.8	0.5	5	1	10°
228	SAPF102030186254NB60	3	203	186	25.4	205.7	204.9	190.5	14.5	16	2.3	0.5	2.8	1	10°
229	SAPF102100191028NB60	3	210	191	28	214	213	203	12.5	14.5	2.8	0.5	5	1	10°
230	SAPF121031823038NB60	6	210.3	182.3	38	215.4	214.4	197.5	18.4	20.3	3.7	0.5	6.3	1	10°
231	SAPF121031824046NB60	6	210.3	182.4	46	215.4	214.4	197.5	18.4	24.1	3.7	0.5	6.3	1	10°
232	SAPF102150192033NB60	4	215	192	33	220.8	219.8	207	16.5	18.5	3	0.5	4	1	10°
233	SAPF121650195032NB60	3	216.5	195	32	221	220	207	14.5	17	2.8	0.5	5	1	10°
234	SAPF122230202265NB60	3	222.3	202	26.5	224.9	224.1	217.9	11.8	14.2	2.9	0.5	2.8	1	10°
235	SAPF102270205030NB60	3	227	205	30	231.5	230.5	219	14.5	17	2.8	0.5	5	1	10°
236	SAPF122850200038NB60	6	228.5	200	38	233.5	232.5	215.5	18	20.5	3.1	0.5	6.3	1	10°
237	SAPF102340209042NB60	4	234	209	42	242.6	241.6	224	19.5	22.5	3	0.5	4	1	10°
238	SAPF123950220032NB60	3	239.5	220	32	244	243	232	14.5	16.5	2.8	0.5	5	1	10°
239	SAPF125142235038NB60	6	251.4	223.5	38	256.5	255.7	238.7	18.4	20.3	3.7	0.5	6.3	1	10°
240	SAPF125152235046NB60	6	251.5	223.5	46	256.6	255.7	238.7	18.4	24.1	3.7	0.5	6.3	1	10°

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* F-steel version | * C- cast version

List of DO Type Seals

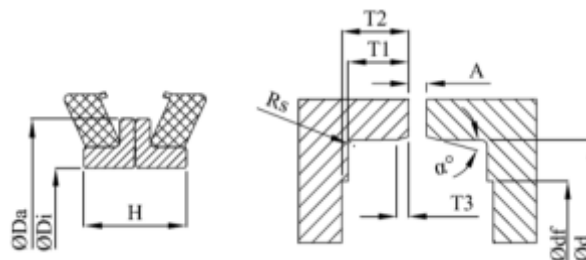


SR.No.	SAP PART No.	A	ØDa	ØDi	H	ØDh*	ØDe*	ØDf	T1	T2 min	T3	Re	Rk	Rs	α°
241	SAPF102520225038NB60	4	252	225	38	258	257	241	19	21	3	0.5	4	1	10°
242	SAPF125962316038NB60	6	259.6	231.6	38	264.7	263.8	247	18.4	20.5	3.7	0.5	6.3	1	10°
243	SAPF102610238032NB60	3	261	238	32	265.5	264.5	254	14.5	17	2.8	0.5	5	1	10°
244	SAPF126280240038NB60	3	262.8	240	38	273.5	272.5	255.5	18	20.5	3.1	0.5	6.5	1	10°
245	SAPF126450245032NB60	3	264.5	245	32	268.9	267.9	255	14.5	17	2.8	0.5	5	1	10°
246	SAPF102680239040NB60	4	268	239	40	274.2	273.2	257	20.5	22.5	3	0.5	4	1	10°
247	SAPF102760250044NB60	4	276	250	44	284.6	283.6	266	20.5	24	3	0.5	4	1	12°
248	SAPF102800252038NB60	3	280	252	38	285.5	284.5	265	18	20	3.1	0.5	6.5	1	10°
249	SAPF129280265046NB60	6	292.8	265	46	297.8	297	280	18.4	24.1	3.7	0.5	6.3	1	10°
250	SAPF102930265038NB60	4	293	265	38	298	297	280	18	20.5	3.1	0.5	6.3	1	10°
251	SAPF103030275038NB60	3	303	275	38	308	307	290	18	20.5	3.1	0.5	6.5	1	10°
252	SAPF131082829038NB60	6	310.8	282.9	38	316.3	315.4	298.4	18.4	20.3	3.7	0.5	6.3	1	10°
253	SAPF103250300038NB60	3	325	300	38	335.5	334.5	318	17.5	20.5	3.1	0.5	6.5	1	10°
254	SAPF103280300040NB60	4	328	300	40	333	332	315	18.5	21	3	0.5	4	1	10°
255	SAPF103280301038NB60	6	328	301	38	333	332.1	315.1	18.4	20.3	3.7	0.5	6.3	1	10°
256	SAPF103410318038NB60	3	341	318	38	351.5	350.5	334	18	20.5	3.1	0.5	6.5	1	10°
257	SAPF134643185038NB60	6	346.4	318.5	38	351.6	350.7	333.7	18.4	20.3	3.7	0.5	6.3	1	10°
258	SAPF134650319046NB60	6	346.5	319	46	351.6	350.7	333.7	18.4	24.1	3.7	0.5	6.3	1	10°
259	SAPF103680340040NB60	3	368	340	40	374.8	373.8	358	19	21.5	3	0.5	4	1	10°
260	SAPF103693395040NB60	4	369	339.5	40	374.8	373.8	358	19	21.5	3	0.5	4	1	10°
261	SAPF103750350038NB60	3	375	350	38	385	384.5	368	17.5	20.5	3.1	0.5	6.5	1	10°
262	SAPF139443665038NB60	6	394.4	366.5	38	399.5	398.6	381.7	18.4	20.3	3.7	0.5	6.3	1	10°
263	SAPF139453665048NB60	6	394.5	366.5	48	399.5	398.6	381.7	18.4	24.1	3.7	0.5	6.3	1	10°
264	SAPF139453672038NB60	6	394.5	367.2	38	399.5	398.6	381.7	18.4	20.3	3.7	0.5	6.3	1	10°
265	SAPF103980370038NB60	3	398	370	38	403.5	402.6	385	17.5	20.5	3	0.5	6.5	1	10°
266	SAPF104053805040NB60	4	405	380.5	40	412.2	410.5	395	17	22	3	0.5	4	1	10°
267	SAPF104150387038NB60	3	415	387	38	420.3	419.3	402	17.5	20.5	3.1	0.5	6.5	1	10°
268	SAPF104544285037NB60	4	454	428.5	37	462.3	461.3	444.6	18.5	21	3	0.5	4	1	10°
269	SAPF145724292038NB60	6	457.2	429.2	38	462.3	461.4	444.4	18.4	20.3	3.7	0.5	6.3	1	10°
270	SAPF105000470050NB60	3	500	470	50	512.2	510.2	490	23.5	25.5	13	0.5	6	1	10°
271	SAPF153345054044NB60	6	533.4	505.4	44	538.5	537.6	520.6	21.3	26.2	3.7	0.5	6.3	1	10°
272	SAPF105600530050NB60	3	560	530	50	572.2	570.2	545	23.5	25.5	4	0.5	6	1	10°
273	SAPF106080580436NB60	6	608	580	43.6	613	611	596	19.7	21.7	4	0.5	6.5	1	10°
274	SAPF106230591050NB60	5	623	591	50	635.2	632.1	613	23.5	25.5	4	0.5	6	1	10°
275	SAPF107000667044NB60	6	700	667	44	705.6	704.6	687.6	18.4	23.4	3.7	0.5	6.3	1	10°
276	SAPF107500710050NB60	3	750	710	50	762.2	760.2	740	23.5	25.5	4	0.5	6	1	10°
277	SAPF108860830080NB60	17	886	830	80	891.6	890.6	860	34.5	39.5	4.4	0.5	10	1	10°

* F-steel version | * C- cast version

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List of DF Type Seals

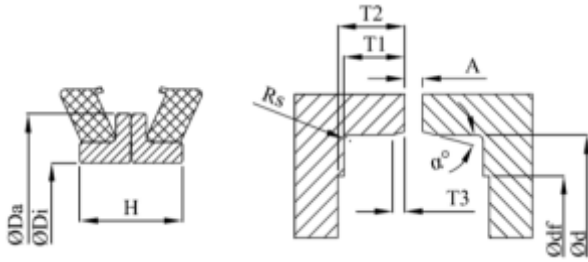


SR.No.	SAP PARTS NO.	A	Ø Da	Ø Di[mm]	H	Ø d	Ø df	T1	T2	T3	Rs	α°
1	SAPC1L62500485256NB60	22.7	62.5	48.5	25.6	76.3	62.9	10.6	14	1.6	1	30°
2	SAPC1L00650045022NB60	24.7	65	45	22	70.1	58	11.5	12.1	1.5	1	30°
3	SAPC1L00760056021NB60	22.9	76	56	21	82.6	70.1	10.6	11.7	1	1	30°
4	SAPC1L00800060024NB60	28	80	60	24	85	70	10.5	10.5	1	1	30°
5	SAPC1L00900076017NB60	18	90	76	17	95	83	8	9.5	1	1	30°
6	SAPC1L00930735020NB60	23.3	93	73.5	20	102.4	88.4	10.8	11.2	1	1	30°
7	SAPC1L01040088019NB60	20	104	88	19	113	98	8	9.5	1	1	20°
8	SAPC1L01200094025NB60	27.8	120	94	25	125.8	109.1	13	13.6	1.5	1	30°
9	SAPC1L01410115028NB60	33.5	141	115	28	152.4	131.4	15.9	15.9	1.5	1	30°
10	SAPC1L01580132031NB60	34	158	132	31	171.5	151.8	15.4	15.9	1.5	1.5	30°
11	SAPC1L01611425024NB60	27.7	161	142.5	24	173	139.7	11.1	11.3	1.5	1	30°
12	SAPC1L01720148029NB60	34.7	172	148	29	184.5	164.7	16.5	16.5	1.5	1.5	30°
13	SAPC1L02180192032NB60	32.2	218	192	32	231	206	15.2	17.1	1	1.5	30°
14	SAPC1L02380201036NB60	44.5	238	201	36	254	235.5	21.2	21.2	1	1.5	30°
15	SAPC1L02382135274NB60	32	238	213.5	27.4	254	240	13.7	13.7	1.5	1	30°
16	SAPC1L02640239034NB60	36.5	264	239	34	279.4	261.9	17.5	18.2	1.6	1	45°
17	SAPC1L02650225040NB60	48.9	265	225	40	277.1	247.8	23.7	23.7	1.5	1.5	30°
18	SAPC1L02652357030NB60	33.8	265	235.7	30	273.1	230	15.6	15.7	1.5	1	30°
19	SAPC1L02820256030NB60	32.8	282	256	30	292.1	276.2	15.6	16.2	1.5	1	30°
20	SAPC1L03190283034NB60	39.1	319	283	34	329.4	307.3	18.5	18.5	1.5	1	45°
21	SAPC1L03530319036NB60	42.1	353	319	36	365.1	343.7	20	20	1.6	1.5	30°
22	SAPF1L00590042020NB60	24	59	42	20	65	53	10	10.5	2	1	15°
23	SAPF1L00620047020NB60	25	62	47	20	70	58	10	11	2	1	15°
24	SAPF1L00650505019NB60	24.5	65	50.5	19	76.2	63	10	11	2	1	15°
25	SAPF1L00730054022NB60	27	73	54	22	80	67	11.5	12	1.5	1	15°
26	SAPF1L00730585019NB60	#REF!	73	58.5	19	82.5	65	10	10	2	1	15°
27	SAPF1L00800586196NB60	22	80	58.6	19.6	84	71	9	9.5	1.5	1	15°
28	SAPF1L00810635019NB60	22	81	63.5	19	87.8	71	9	9.5	1	1	15°
29	SAPF1L08620067020NB60	25	86.2	67	20	95.4	82	10	11	2	1	15°
30	SAPF1L08620068020NB60	25.5	86.2	68	20	95.6	82	10	11	2	1	15°
31	SAPF1L00870067025NB60	30	87	67	25	95	81	12.5	13	1.5	1	15°
32	SAPF1L09170067020NB60	25	91.7	67	20	95.4	82	10	11	2	1	15°
33	SAPF1L09280738020NB60	25	92.8	73.8	20	102.2	88	10	11	2	1	15°
34	SAPF1L00970077025NB60	31	97	77	25	105	87	12.5	13.5	1.5	1	15°

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* F-steel version | * C- cast version

List of DF Type Seals



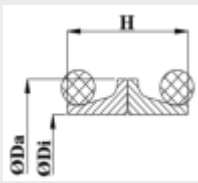
SR.No.	SAP PARTS NO.	A	Ø Da	Ø Di[mm]	H	Ø d	Ø df	T1	T2	T3	Rs	α°
35	SAPF1L00990074020NB60	25	99	74	20	102.2	88	10	11	2	1	15°
36	SAPF1L01000825022NB60	27.5	100	82.5	22	114.3	97	11	12	2	1	15°
37	SAPF1L10150817020NB60	25	101.5	81.7	20	110.2	96	10	11	2	1	15°
38	SAPF1L01090875175NB60	22	109	87.5	17.5	113	100	8.5	9.5	1.5	1	15°
39	SAPF1L11150875019NB60	25	111.5	87.5	19	115.8	102	10	11	1.5	1	15°
40	SAPF1L11250094024NB60	29	112.5	94	24	125.8	109	12.5	13	2.5	1	15°
41	SAPF1L01130092024NB60	29	113	92	24	125.8	109	12.5	13	2.5	1	15°
42	SAPF1L01200099175NB60	22	120	99	17.5	124	110	8.5	9.5	1.5	1	15°
43	SAPF1L01230099019NB60	25	123	99	19	127.3	113	10	11	3	1	15°
44	SAPF1L01240105244NB60	32	124	105	24.4	134.9	125	13.3	14.5	1.5	1	15°
45	SAPF1L01260104024NB60	30	126	104	24	135	114	12	13	2	1	15°
46	SAPF1L13320114026NB60	30	133.2	114	26	147.9	130	12	13	1.5	1	15°
47	SAPF1L01380114026NB60	30	138	114	26	148	126	12	13	2	1	15°
48	SAPF1L01440124032NB60	44	144	124	32	162.5	141.5	18.5	20.5	1.5	1	15°
49	SAPF1L01560133028NB60	34.5	156	133	28	171.5	151	13	14	2	1	15°
50	SAPF1L01681485324NB60	40	168	148.5	32.4	184.1	164	16.5	17.5	1.5	1	15°
51	SAPF1L01750150030NB60	36	175	150	30	190	170	15	15.5	2	1	15°
52	SAPF1L01800154036NB60	44.5	180	154	36	194	174	18.4	20	1.4	1	15°
53	SAPF1L01800158018NB60	26	180	158	18	190	174	8	10	1	1	15°
54	SAPF1L01950169033NB60	41.8	195	169	33	206.2	191.5	15.1	18.4	1.1	1	15°
55	SAPF1L02071777029NB60	35	207	177.7	29	218.9	197	16.6	17.5	1.6	1	15°
56	SAPF1L21430193031NB60	43.8	214.3	193	31	238.9	215	19.4	20.4	1.4	1	15°
57	SAPF1L21450194031NB60	42	214.5	194	31	238.8	214	20.1	21	1.1	1	15°
58	SAPF1L02240198035NB60	41	224	198	35	245	223	17	17.5	2	1	15°
59	SAPF1L02590233035NB60	42	259	233	35	280	250	17	18	2	1	15°
60	SAPF1L26050228041NB60	#REF!	260.5	228	41	277.1	247.5	23.5	24.5	1.5	1	15°
61	SAPF1L27352415036NB60	42	273.5	241.5	36	279.4	260.6	17.5	20	1	1	15°
62	SAPF1L03030275036NB60	42	303	275	36	309.4	290	17.5	20	1	1	15°
63	SAPF1L03050283042NB60	47.2	305	283	42	329.4	307	18.5	22.1	1.5	1	15°
64	SAPF1L35250320040NB60	45	352.5	320	40	365.1	343	20	21.5	1.5	1	15°
65	SAPF1L03920355396NB60	49.8	392	355	39.6	401.7	380	23	24	1.5	1	15°
66	SAPF1L04700442041NB60	46.5	470	442	41	488.7	467	18.4	22	1.4	1	15°
67	SAPF1L05300492043NB60	50.8	530	492	43	546.1	532	19.9	24.4	1.5	1	15°

Seal Design Input Data Form

Contact Information

Company Name :
 Date:
 Contact Person's Name:
 Email ID:
 Phone No.1:
 Phone No.2:

A Housing Flange Gap
Dh Retaining Lip Diameter
De Installation Diameter
Df Diameter of Shoulder
α Ramp Angle
TI Housing Depth



H Seal Group Width
Do Outer Diameter of Seal
DI Inner Diameter of Seal

Housing Position

Material / grade
 Hardness
 Surface Finish
 Dynamic Run Out
 Offset

Motion - Direction of Rotation

Clockwise Counter- Clockwise Both
 Normal RPM Max RPM

Assembly

Removal Frequency Rare Often
 Space Restrictions Yes No
 IF Yes - Extenet of Restriction

Operating Temperature

Oil Sump
 Environment Max Min

Contamination

Partical Type
 % Exposed
 % Submerged

Application Load

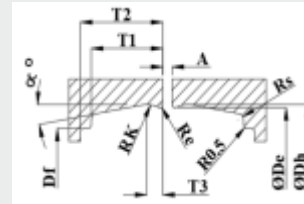
Type Axial Radial
 Extent in Kg/Cm2

Fluid / Lubrication

Grade Oil Grease
 Viscosity
 Sump Level

Application Description

Seal Housing Groove Parameters



T2 Depth of Shoulder
T3 Transitional Radius Distance
RK Transitional Radius
Re Opening/Entrance Radius
Rs Shoulder Radius I

Horizontal Vertical



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