

# Mechanical Face Seals





Mechanical face seals consist of two geometrically identical metal seals and two elastomeric components, which are mounted into two separate housings. The elastomeric parts, as a secondary seal, take over the function of the clamping force of the spring, the static seal between the sliding ring and the work holder as well as the torque transmission. One of the two sealing rings rotates with the shaft, while the counter sealing ring remains stationary. The plan lapped contact surfaces of both metal sealing rings are pressed against and axially slide on each other.

An essential functional feature of the mechanical face seal is a robust construction form, combined with very long lifecycles. The selection of the most suitable materials for the sliding ring and elastomer part ensure high wear resistance. Mechanical face seals guarantee a fully adequate corrosion protection, as well as optimum lubricant and temperature resistance. The materials used to make elastomeric O-rings assure minimal power loss over the life of the drive seal. Thus, this seal is technically superior to other types of construction.

## Functionality in Adverse and Dirty Environments

As a result of permanent operations in adverse and dirty environments the sealed units and vehicles are exposed to extreme and constant strain. In all “Outdoor” implementations, such as coal-mining, open-cast mining, construction industry, agricultural- and forestry applications, chemistry, waste disposal and removal industries, water treatment, wind craft energy, offshore drilling etc. the following abrasive and corrosive media have to be taken into account, which standardized oil seals or rotary shaft seals cannot cope with:

- Sand, loam, mud, earth, stone, lime sandstone, granite, basalt
- Concrete, lime, potash, rubble, grit, slag, glass, asphalt, bitumen
- Chemicals, liquids, salts, lye, acids
- Sewage water, rainwater, harbor water, dirty water, sea water
- Secondary raw materials, liquid manure, metal scrap, metal recycling & disposal materials

Additionally, in combination to extreme weather conditions such as -55 °C/-131 °F to +200 °C/+392 °F and corrosive surroundings, e.g. maritime climate, the mechanical face seal solutions prove exceedingly reliable and functional in a wide range of applications.

## Product and Functionality Advantages

Mechanical face seals prove themselves in application due to three outstanding advantages:

- Prevention of entry of abrasive dirt, contamination and media into the sealing space
- Avoidance of leakage (oil or grease escape) from the sealing space
- Extremely high wear resistance according to application



## Application-related

- Mechanical Face Seals must withstand to a circumferential speed of up to 5 m/s.
- The sealing faces must be 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 contact 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 demands extreme wear resistance of the sealing system. A high quality component like bearing, wet brake discs, gears, spindles, axles need to be perfectly protected against contamination of destructive media.



## Lubrication-related

- 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 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 application 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.

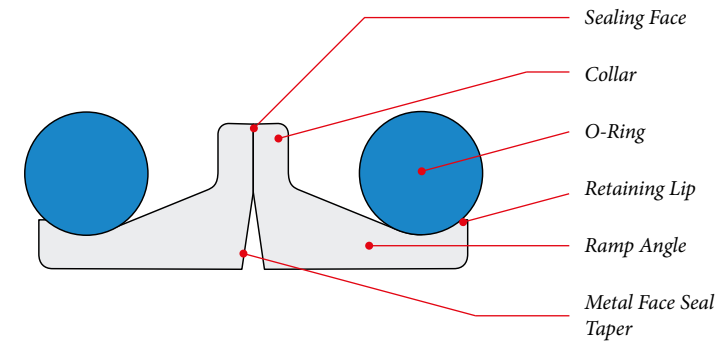
The maintenance care needs to be taken while filling grease is that, if the gun pressure is increased chances of dislodging the elastomeric torric rings.



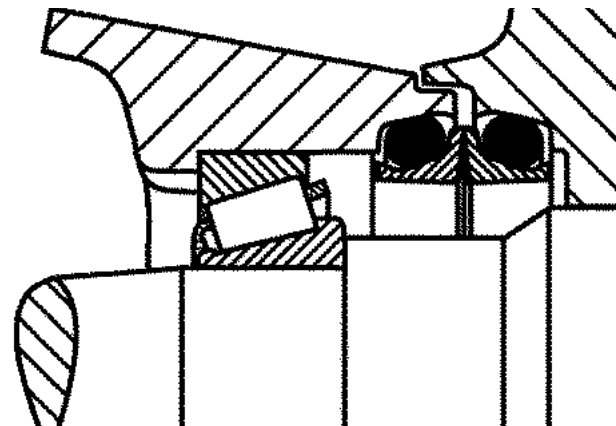
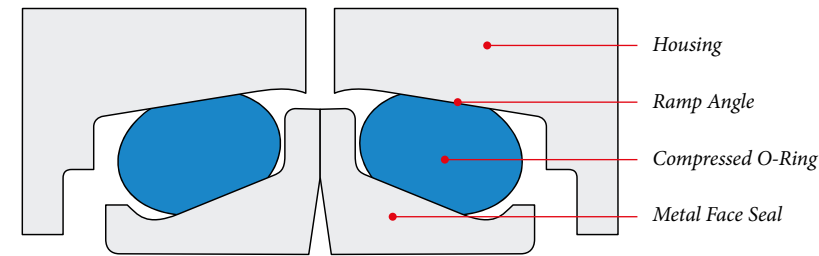
## Face Seals with O-Ring Elastomer

The Mechanical Face Seal DO-Type consists of two identical metal face seals and two rubber O-rings placed on the ramp profile of the metal rings. SAPPARTS seals comes in four material versions – Alloy forged steel, Alloy cast iron, High Chroma Alloy Cast Iron and Carbide coated super duplex steel. The O-ring materials however are of variety of types based on the application requirements. In cast iron alloys, SAPPARTS 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 SAPPARTS standards it is around 25 % volumetric compression, which is critical for proper operation of the sealingsystem 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 instllation process.



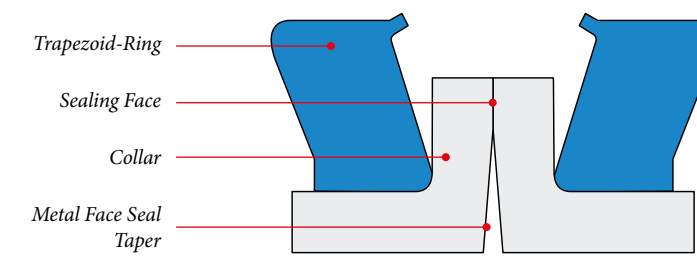
### Assembled condition



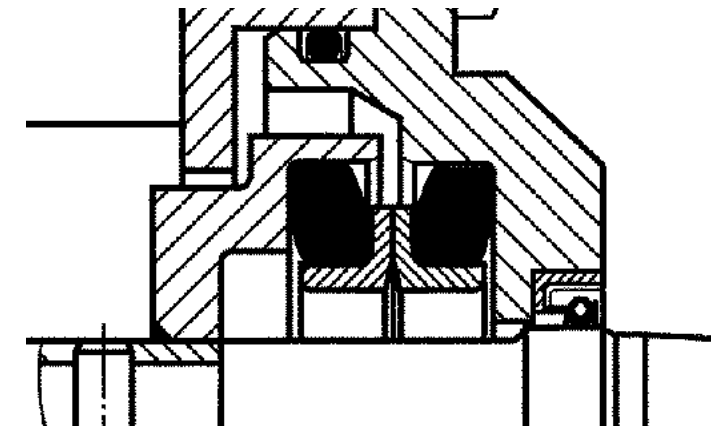
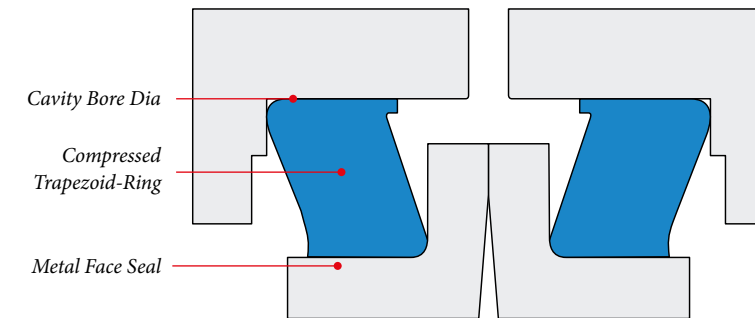
## Face Seals with Square Bore Elastomer

The Mechanical Face Seal 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 no installation tool. As compared to the DO-type 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. SAPPARTS 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 to the other seal. This provides considerable advantage of manufacturing process of the sealing system mating components.



### Assembled condition



Metal Seal Rings

Cast in Ni-Hard

As a result of very high requirements for the wear resistance of mechanical face seals we make use of a special cast with a natural hardness of 58 to 64 HRC, which consists of a material called Ni-Hard.

The extremely high wear resistance is reached by a carbide-martensite structure of the material and a selection of the alloy elements as well as their concentration. By means of the combination of selected alloy elements and the high carbon content a structural composition is achieved, which proves to be advantageous with respect to wear resistance compared to other materials such as steel. At the same time this material performs with a low corrosion index.

Super Duplex Steel with HVOF WcCrCo2 Coating

Due to extremely high hardness of 92 HRC the high quality material Carbide offers themselves for selected requirements. Wear and corrosion resistance, thermal conductivity and tribological properties enable high functionalities and a long lasting lifetime under extreme operating conditions in applications such as separations, washing, waste water and chemical equipment, agricultural equipment.

Individual Material Recipes

Depending on the media to be sealed off, it is possible to compile individual material recipes for a special high alloy cast in order to substantially increase life span and wear resistance of the mechanical face seal. Individual recipes of high alloy cast for sealing solutions in biogas fermentation plants or harrowing machinery with chemical exposure to slurry show substantial improvements with respect to life cycles, wear resistance and corrosion resistance.

Individual Sealing Solution Design

Since 10 years, core competencies in individual sealing solution design are successfully developed and implemented on behalves of customer requirements. The initiation is always the leakage of the installed sealing solution.

Due to severe conditions within the constructive design of the machinery or very abrasive outdoor exposure, we analyse the working conditions as example to oil adulteration, temperature progression, shaft rotational speed, surface pressure, dirt and mud behavior on the outside exposure.

For customers we have successfully developed sealing solutions such as agricultural track roles and agri-hubs, cutter-roles in mining, waste water pumps, track roles in cementary and bauxite transportation, recycling shafts, heavy duty axles and cuttings heads in construction machinery.

Material Selection:

- Bearing Steel 1.3505 / SAE-52100
- Cast in NiHard
- Cast in High Chroma Alloy (Fc15Cr3Mo)
- Super Duplex Steel with HVOF WcCrCo2 Coating

Elastomers – O-Rings / Square Bore Rings

High thermal resistance and a low compression set are the essential criteria specified for the elastomeric material in demanding applications.

The standard design NBR meets these requirements with the use of nitrile-butadiene-rubber. For higher thermal stresses the O-rings are constructed of HNBR, VMQ or FKM. The oil compatibility of several elastomers has to be examined.

The elastomeric materials listed are offered in various degrees of hardness (ShoreA), so that the O-ring can adequately perform its function of generating a permanent and consistent contact pressure within the sealing system.

NBR-LT - Nitrile-Butadiene-Rubber

Nitrile is recommended for temperatures ranging from -50 °C to 105 °C continuous and is compatible with most mineral based lubricant oils. Nitrile O-rings offer the maximum resistance to abrasion. It is the most common O-ring material choice and is used in most standard axle, final drive and undercarriage applications.

HNBR-LT - Hydrogenated Nitrile-Butadiene-Rubber

HNBR is a nitrile-based material recommended for temperatures ranging from -40 °C to 135 °C continuous. It has very similar abrasion resistance characteristics to standard nitrile, but HNBR has better resistance to compression sets (permanent deformations) when exposed to high temperatures for extended periods of time.

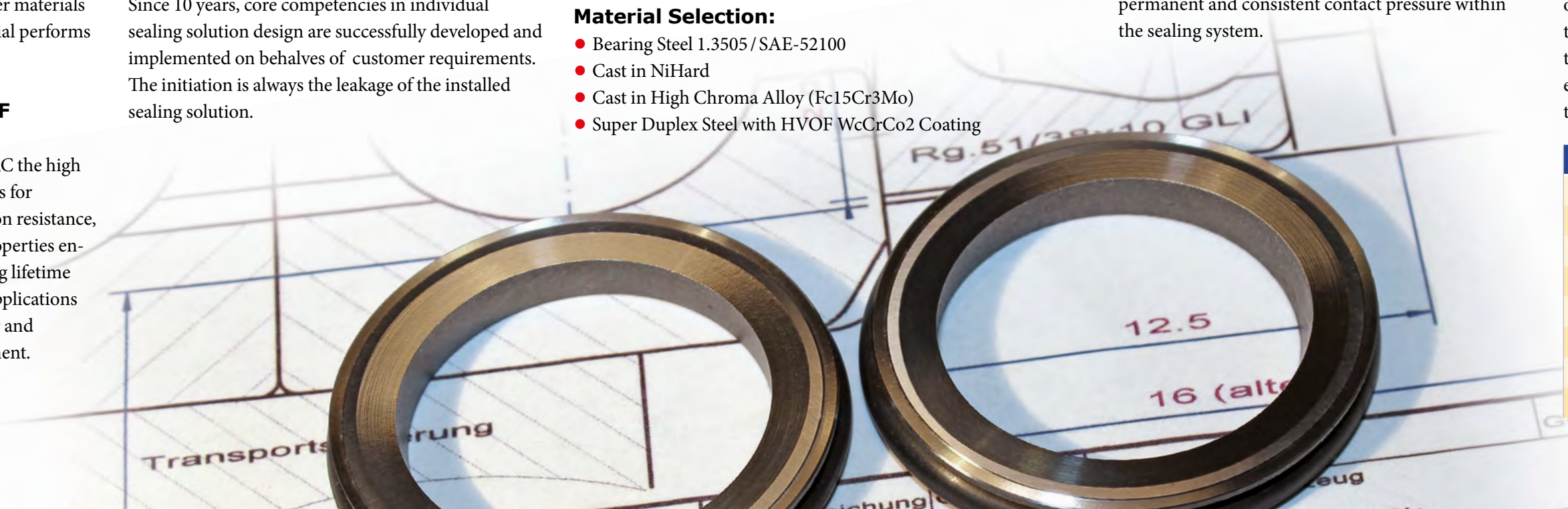
VMQ - Silicone-Rubber

Silicone is recommended for temperatures ranging from -60 °C to 165 °C continuous. It is not compatible with fuels or certain types of gear lubricants. Silicone also has inferior abrasion resistance to nitrile. Typically, silicone uses are: extreme high (wet disc brake systems) or extreme low (arctic environment) temperature applications.

FKM – Fluorocarbon-Rubber

FKM has a recommended temperature range between -10 °C to 190 °C. FKM is typically used in steel mill type applications where extremely high temperatures are a concern and low temperatures are not a problem. FKM has a very weak low temperature capability and will harden at temperatures near freezing.

Material Properties	Test Method Standards	Unit	NBR	NBR-LT	HNBR	HNBR-LT	VMQ	FKM
Working Temperature Range		°C	-35 to 110	-50 to 105	-25 to 135	-40 to 135	-60 to 165	-10 to 190
Short Term Peak Temperature		°C	130	110	150	150	200	220
Colour	Visual	-	Black	Black	Black	Black	Yellow	Black
Hardness	ASTM D2240	ShoreA	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65
Tensile Test (Min.)	ASTM D412	KG/cm²	100	60	140	100	60	125
Elongation (Min.)	ASTM D412	%	200	200	350	250	200	220
Specific Gravity	ASTM D792	gm/cm³	1.16 ± 0.02	1.22 ± 0.02	1.9 ± 0.02	1.9 ± 0.02	1.32 ± 0.02	1.87 ± 0.02
TRIO	ASTM D1329	°C	-43	-54	-20	-35	-55	-10





## Products in construction industry:

Wheel loaders, ditch rollers, tar machines, dump trucks, trucks, concrete mixers, concrete pumps, bulldozers, earth movers, etc.

Components: Undercarriages, axles, gears, driving wheels, drive chains, grubbers, shovels, etc.

## Products in agricultural engineering industry

Tractors, towing vehicles, soil cultivation machineries, harrows, ploughs, fertilizer machines, harvesting machines, hay balers, etc.

Components: Undercarriages, axles, gears, driving wheels, drive chains, grubbers, shovels, hubs etc.



*Applications in construction:  
Shovels, axles, grubbers*

*Cutting head and cutter wheels  
in mining industry*

*Agricultural engineering: Harrow  
and hub for a cultivation slice*

*Undercarriage application*

*Grubber application*

*Sealing of track roller  
in military applications*

## Products in mining industry

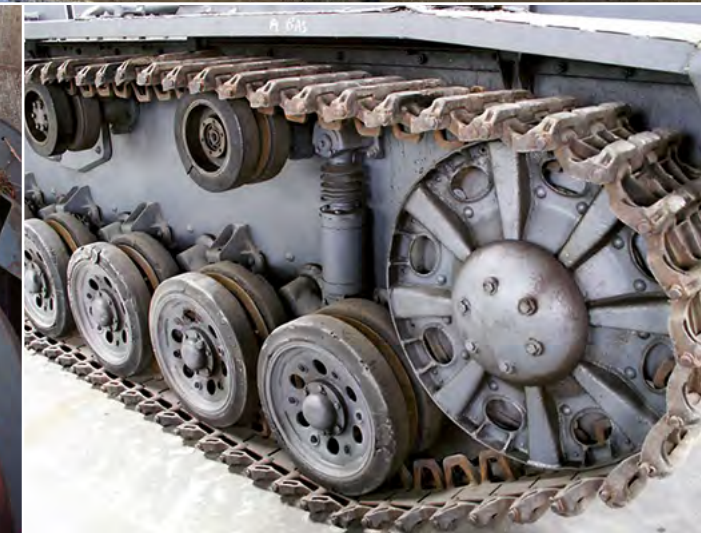
Tunnel boring machines, wheel loaders, ditch rollers, dump trucks, transportation systems, concrete mixers, concrete pumps, bulldozers, earth movers, etc.

Components: Cutting heads, conveyors, undercarriages, axles, gears, driving wheels, drive chains, grubbers, shovels, etc.

## Products in military applications

Tanks, transporters, trucks, towing vehicles, bulldozers, cranes, etc.

Components: Drive chains, track rollers, carrier rollers, undercarriages, axles, gears, driving wheels, forklifts, grubbers, shovels, etc.



## Products in industrial applications

Chemical industry, pumps and hydraulics industry, waste and removal management, truck industry, logistics, cranes and forklifts, shipyards, harbor and embarkment equipment, railway and wagons, etc.

Components: mixers, agitators, bubblers, pumps, waste and concrete shredders, axles, drive chains, gears, etc.





SAPPARTS Portfolio-List  
in Reference to Goetze  
and Trelleborg

Our portfolio- and reference list presents an overall view  
of competitive products and their seal and O-ring dimensions.  
In order to substitute running applications a technical product  
comparison and evaluation must be conducted with regard  
to material and dimensions for the seal ring and the O-ring.  
All other dimensions and types are available on demand.

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SAPPARTS DO Type	Ref. 76.90/97	Ref. TSS	Material	Inner Ø	Outer Ø	Height	O-Ring Ø	Cross section
45F	-	TLDOA 0340	SAE 52100	34	45	14	35.5	5
50F	-	TLDOA 0390	SAE 52100	39	50	14	40	5
51F	H-50	TLDOC 0380	SAE 52100	38	51	20	41	6
51/6.7F	H-50A1	-	SAE 52100	38	51	20	40	6.7
58	H-021	TLDOA 0450	Ni-Hard	45	58	21	48	6.1
58/14F	-	TLDOB 0480	SAE 52100	48	58	14	48	5
59	H-01	TLDOA 0460	Ni-Hard	46	59	20	47.5	6.5
62F	H-019	TLDOC 0480	SAE 52100	48	62.15	25	50	7.5
70	H-32	TLDOA 0555	Ni-Hard	55.5	70	22	58	7.5
70/8	H-32 A1	-	Ni-Hard	55.5	70	22	58	8
73	H-57	-	Ni-Hard	60.2	73	20	60	6.5
73/18	H-042	TLDOA 0610	Ni-Hard	61	73	18	64	5.2
78F	H-020	TLDOA 0640	SAE 52100	64	78	25	66	8.2
80	H-01 A1	-	Ni-Hard	67	80	20	68.5	6.5
80/5	H-53	-	Ni-Hard	63	80.5	26	66	8
82	H-02	TLDOA 0635	Ni-Hard	63.5	82.4	32	66	9.5
84	H-02 A1	TLDOB 0710	Ni-Hard	71	84	20	72.5	6.5
86/5	H-03	TLDOA 0675	Ni-Hard	67.5	86.5	31.8	71	9.5
88/5	H-113	-	Ni-Hard	77.5	88.5	15	78	4.3
89	H-05	TLDOB 0690	Ni-Hard	68	89	24	75	8
91F	H-04 A1	TLDOA 0710	SAE 52100	71.5	91	29	75	9
92	H-04	TLDOA 0730	Ni-Hard	73	92	32	75.7	9.5
92.5	H-45	TLDOA 0795	Ni-Hard	79.5	92.5	20	81	6.5
98	H-39	TLDOA 0810	Ni-Hard	81	98	28	82	8
100	H-003	TLDOB 0800	Ni-Hard	79	100	30	85	9.5
100/80	H-016	-	Ni-Hard	80	100	29	83	9
102	H-07	-	Ni-Hard	83	102	28	87	8.5
104.5	H-05 A3	TLDOB 0900	Ni-Hard	90.5	104.5	26	93	6.3
108	H-05 A2	-	Ni-Hard	88	108	24	93	8
109.5	H-06	TLDOA 0900	Ni-Hard	90.5	109.5	32	93.2	9.5
111	H-08 A5	TLDOA 0950	Ni-Hard	95	111	24	99	7.7
117	H-45 A1	-	Ni-Hard	103	117	20	105	6.5



SAPPARTS DO Type	Ref. 76.90/97	Ref. TSS	Material	Inner Ø	Outer Ø	Height	O-Ring Ø	Cross section
119	H-08	TLDOA 1000	Ni-Hard	100	119	32	102.8	9.5
120	H-08 A3	TLDOA 0990	Ni-Hard	99	120	28	105	8.5
125	H-08 A2	TLDOF 1040	Ni-Hard	104	125	28	110	8.5
125/24	H-08 A4	TLDOA 1070	Ni-Hard	107	125	24	110	8.5
125/7.7	H-08 A9	-	Ni-Hard	107	125	24	110	7.7
128F	-	TLDOB 1100	SAE 52100	111	128	22	113	9.2
129	H-16 A8	TLDOA 1145	Ni-Hard	114.5	129	21	117	7
132	-	TLDOA 1090	Ni-Hard	109	132	32	115	9.5
138	H-09	TLDOA 1170	Ni-Hard	120	138	32	122.5	8.4
138/9	H-09 A3	TLDOA 1170	Ni-Hard	120	138	32	124.3	9
139	H-09 A1	TLDOA 1200	Ni-Hard	120	139	31.8	123.5	9.5
139.5	H-52	TLDOA 1190	Ni-Hard	118.5	139.5	28	124	8.5
140	H-09 A2	-	Ni-Hard	117	140	29	124	8.7
140.7	H-12 A6	TLDOD 1270	Ni-Hard	127	140.7	25	130	6
141F	-	TLDOC 1270	SAE 52100	127	141	29	130	6
141	H-12	-	Ni-Hard	127	141	29	130	6
141/8.3	H-12 A3	-	Ni-Hard	127	141	29	130	8.3
141/9	H-12 A5	-	Ni-Hard	127	141	29	124.3	9
142	H-022	TLDOA 1200	Ni-Hard	120	142	38	122	11.3
144	H-11	TLDOB 1250	Ni-Hard	125	144	31.8	128.5	9.5
146	H-10	TLDOA 1260	Ni-Hard	127	146	32	130	9.5
146/31	H-10 A1	-	Ni-Hard	127	146	31	130	9.5
151F	-	TLDOB 0130	SAE 52100	130	151	32	136	9
154.5	H-12 A2	-	Ni-Hard	135.5	154.5	28	139	8.3
157F		TLDOB 1430	SAE 52100	142.7	157	25.4	145	6.3
157	H-14	-	Ni-Hard	143	157	27	145	6.3
160F	-	TLDOA 1430	SAE 52100	143	160	27	145.7	8.3
160	H-13	TLDOA 1430	Ni-Hard	143	160	27	145.7	8.3
167F	-	-	SAE 52100	150	167	28	153.8	8.5
167	H-15	-	Ni-Hard	150	167	28	153.8	8.5
168/25.4F	-	TLDOA 1539	SAE 52100	153.9	168.1	25.4	153	6.2
168.2F	-	TLDOA 1540	SAE 52100	154	168	27	158	6



SAPPARTS DO Type	Ref. 76.90/97	Ref. TSS	Material	Inner Ø	Outer Ø	Height	O-Ring Ø	Cross section
168.2	H-16	-	Ni-Hard	154	168	27	158	6
168/155F	H-16 A5	-	SAE 52100	155	168	27	158	6
168/6.5	H-16 A4	TLDOA 1539	Ni-Hard	154	168	27	150	6.5
169F	-	TLDOD 1540	SAE 52100	154	169	22	158.1	7
169	H-16 A3	-	Ni-Hard	154	169	22	158.1	7
169/9.2	H-16 A9	-	Ni-Hard	154	169	22	158.1	7
170	H-16 A1	TLDOE 1540	Ni-Hard	154	170	21	158.1	7
171.5	H-15 A3	-	Ni-Hard	153	171.5	28	157	8.3
172	H-18	TLDOA 1463	Ni-Hard	146	172	38	147	12.7
172/40	H-023	TLDOC 1500	Ni-Hard	150	172	40	151	11.2
173.5	H-17	TLDOC 1540	Ni-Hard	154	173.5	32	155	9.65
180.5	H-17 A3	-	Ni-Hard	165	180.5	27	170	7
181	H-17 A7	TLDOA 1650	Ni-Hard	165	181	27	170	7
185.3	H-140	-	Ni-Hard	171.3	185.3	20	172	6
189	H-55	TLDOA 1640	Ni-Hard	164	189	30	170	9.5
191.5	H-20	TLDOA 1630	Ni-Hard	163	191.5	38	166	12.7
194.4	H-124	-	Ni-Hard	172	194.4	31.8	175	9.5
195	H-47	-	Ni-Hard	176	195	28	182	8.3
197.4F	-	TLDOA 1800	SAE 52100	180	197.4	21.4	184	6.2
199	H-56	TLDOA 1780	Ni-Hard	178	199	32	184	9.5
200	H-21	TLDOA 1770	Ni-Hard	177	200	30	184	9.5
200/00	H-21 A3	-	Ni-Hard	177	200	30	184	9.5
205	HNO 150	-	Ni-Hard	178	205	38	178	12.7
209	H-94	-	Ni-Hard	192	209	30	190	9.5
210	H-22 A2	TLDOA 1910	Ni-Hard	191	210	28	190	8.5
210.5F	-	TLDOA 1823	SAE 52100	182	210.5	38	185	12.5
210.5	H-22		Ni-Hard	182	210.5	38	185	12.5
216.5	H-22 A1	TLDOA 1950	Ni-Hard	195	216.5	31.8	198	9.5
222.8F	H-81	TLDOA 2020	SAE 52100	208.7	222.8	26	208	6.2
227	H-23	TLDOA 2050	Ni-Hard	205	227	30	210	9.5
227/10	H-23 A2	-	Ni-Hard	205	227	30	210	10
228.5	H-25	TLDOA 2000	Ni-Hard	200	228.5	38	205.5	13



# Portfolio List DO-Types



SAPPARTS DO Type	Ref. 76.90/97	Ref. TSS	Material	Inner Ø	Outer Ø	Height	O-Ring Ø	Cross section
237	H-93	-	Ni-Hard	216	237	30	218	9.5
239.5	H-24 A3	TLDOA 2200	Ni-Hard	220	239.5	31.8	224	9.5
241.4	H-109	-	Ni-Hard	220	241.4	25	226	7.7
251.5F		TLDOA 2240	SAE 52100	223	251.5	38	226	12.7
251.5	H-24	-	Ni-Hard	223	251.5	38	226	12.7
260F	H-104	TLDOA 2316	SAE 52100	235	259.7	38	235	12.7
261	H-40	-	Ni-Hard	238	261	31.8	245	9.58
262.8	H-41	TLDOA 2400	Ni-Hard	240	262.8	38	243	13
263/242	H-41 A1	TLDOA 2400	Ni-Hard	242	262.8	38	243	13
270	H-130	-	Ni-Hard	250	270	30	250	9.5
276F		TLDOB 2500	SAE 52100	250	276	44	255	12.7
280.5	H-62	-	Ni-Hard	252	280.5	38	255	12.7
280.5F		TLDOA 2520	SAE 52100	252	280.5	38	255	12.7
288	H-142	-	Ni-Hard	262	288	40	266	12
293	H-26	TLDOA 2650	Ni-Hard	265	293	38	268	12.7
303	H-26 A1	TLDOA 2750	Ni-Hard	275	303	38	278	12.7
311	H-102	-	Ni-Hard	282.9	310.8	38	278	12.7
311F		TLDOA 2829	SAE 52100	282.9	310.8	38	278	12.7
324.6	H-27	-	Ni-Hard	300	324.65	38	305	12.7
325	H-27 A4	TLDOA 3000	Ni-Hard	300	325	38	305	12.7
328	H-42	TLDOB 3000	Ni-Hard	300	328	38	300	12.7
341	H-28	TLDOA 3180	Ni-Hard	318	341	38	315	12.7
346	H-28 A4	TLDOA 3185	Ni-Hard	318	346	38	315	12.7
346/40	H-28 A6	-	Ni-Hard	318	346	40	320	12.7
354	H-161	-	Ni-Hard	326	354	30	334	12.7
369	H-99 A1	-	Ni-Hard	340	368.5	38	338	13.1
375F		TLDOA 3500	SAE 52100	350	375	38	355	12.7
375	H-30	-	NiHard	350	375	38	355	12.7
375/355	H-30 A1	-	Ni-Hard	355	375	38	355	12.7
394.4	H-60	TLDOA 3665	Ni-Hard	366	394.4	38	359.5	12.7
394.4/40	H-60 A2	-	Ni-Hard	366	394.4	40	359.5	12.7

SAPPARTS DO Type	Ref. 76.90/97	Ref. TSS	Material	Inner Ø	Outer Ø	Height	O-Ring Ø	Cross section
398	H-60 A3	TLDOA 3700	Ni-Hard	370	398	38	370	12.7
405	H-143	TLDOA3805	Ni-Hard	382	405	40	377	12
415	H-70	TLDOA 3870	Ni-Hard	388	415	38	385	12.7
416.2	H-70 A1	-	Ni-Hard	388	416.2	38	385	12.7
457	H-61	TLDOA 4290	Ni-Hard	430	457	38	420	12.7
459.2	H-61 A4	-	Ni-Hard	430	459.2	38	420	12.7
480	H-65 A1	-	Ni-Hard	450	480	50	454	16
495F	H-65 A2	-	SAE 52100	465	495	43.6	460	12.7
497.2	H-65 A5	-	Ni-Hard	465	497.2	43.6	460	12.7
500	H-65	TLDOA 4700	Ni-Hard	470	500	50	474	16
533	H-74	TLDOA 5054	Ni-Hard	505	533.4	43.6	493	12.7
535.8	H-74 A2	-	Ni-Hard	505	535.8	43.6	493	12.7
548	H-144	TLDOA5080	Ni-Hard	508	548	60	510	18
560	H-89	TLDOA 5300	Ni-Hard	530	560	50	530	16
566.8	H-146	-	Ni-Hard	538	566.8	43.6	535	12.7
590	H-82	-	Ni-Hard	559	590	50	560	16
608	H-83	TLDOA 5800	Ni-Hard	576	608	43.6	582	12.7
608/581	H-83 A2	-	Ni-Hard	581.5	608	43.6	582	12.7
623	H-76	TLDOA 5910	Ni-Hard	591	623	50	595	16
628	H-90	-	Ni-Hard	596	628	50	595	16
695	H-75	-	Ni-Hard	660	695	53	665	16
700/43.6	H-75 A2	TLDOA 6670	Ni-Hard	667	700	43.6	660	12.7
700	H-75 A3	-	Ni-Hard	667	700	50	660	12.7
750	H-86	TLDOA7100	Ni-Hard	718	750	50	722	16
826	H-80 A1		Ni-Hard	770	826	80	780	20.5
886	H-80	TLDOA 8300	Ni-Hard	834	886	80	840	20.5
941	H-141	-	Ni-Hard	902	941	60	897	16.25
951	H-163	-	Ni-Hard	890	951	80	895	20.5
976	H-155	-	Ni-Hard	920	976	80	930	20.5
1085	H-106 A2	-	Ni-Hard	1030	1085	80	1020	20.5
1105	H-106 A4	-	Ni-Hard	1044	1105	80	1050	20.5



SAPPARTS DF Type	Ref. SKF	Ref. 76.95	Ref. TSS	Material	Inner Ø	Outer Ø	Height	Housing Bore
59FL-NBR60	-	-	TLDFA0420	SAE 52100	42	59	20	65 x24
62FL-NBR60	CR16904	-45	TLDFA0470	SAE 52100	45	65	22	70.1 x24.7
65FL-NBR60	CR18259	-28	TLDFA0505	SAE 52100	50.5	65	19	76.2 x22.6
73FL-NBR60	-	-	TLDFA5400	SAE 52100	54	73	22	80 x23
76L-NBR60	CR21301	-55	TLDFA0585	Ni-Hard	58.5	73	19	82.6 x22.9
80L-NBR60	-	-30	TLDFA0486	Ni-Hard	58.6	80	19.6	85 x28
86L-NBR60	CR25096	-	TLDFA0680	Ni-Hard	68	86.2	20	95.6 x23.3
93L-NBR60	CR27536	-27	TLDFA0738	Ni-Hard	73.5	93	20	102.3 x23.3
101FL-NBR60	CR30551	-32	TLDFA0825	SAE 52100	82.5	100	22	114.3 x25.8
111,5FL-NBR60		-32	TLDFA0875	SAE 52100	87,5	111,5	19	115.8 x25
120L-NBR60	CR35076	-29	TLDFA0990	Ni-Hard	94	120	25	125.8 x27.8
120L-FKM60	CR35076	-29	TLDFA0990	Ni-Hard	94	120	25	125.8 x27.8
126FL-NBR60	CR38740	5-14	TLDFA1050	SAE 52100	105	124	24.4	134.9 x28
138L-NBR60	CR43135	-	TLDFA1140	Ni-Hard	114	133.2	26	147.9 x28
141FL-NBR60	CR43150	-33	-	SAE 52100	115	141	28	152.4 x33.5
144FL-NBR60	CR46975	- 88	TLDFA1240	SAE 52100	124	144	32	162.5 x38.5
155,5FL-NBR60	CR50655	-	-	SAE 52100	132	158	31	171.5 x34
167L-NBR60CAT		-35 A1		Ni-Hard				174.6 x23
168FL-NBR60	CR56170	-40	TLDFA1485	SAE 52100	148.5	168	32.4	184.1 x34.7

SAPPARTS DF Type	Ref. SKF	Ref. 76.95	Ref. TSS	Material	Inner Ø	Outer Ø	Height	Housing Bore
172FL-NBR60	CR56170	-40	TLDFA1485	SAE 52100	148,5	168	32.4	184.1 x34.7
175FL-NBR60	CR58775	-	TLDFA1540	SAE 52100	154	180	36	194.1 x38.4
195FL-NBR60	CR63796	-49	TLDFA1690	SAE 52100	169	195	33	206.2 x32.1
214FL-NBR60	CR74310	-42 A1	TLDFA1940	SAE 52100	193	214.3	31	239 x42
218L-NBR60		-102	TLDFA1980	Ni-Hard	192	218	32	231 x32.2
242FL-NBR60	CR78020	5-47	-	SAE 52100	201	238	36	254 x44.5
249FL-NBR60	CR82540	-47 A1	-	SAE 52100	213,5	238	27,4	255.5 x40
260FL-NBR60	CR86860	-56	TLDFA2280	SAE 52100	225	265	40	277 x49
263FL-NBR60	CR93115	-58	TLDFA2330	SAE 52100	233	259	35	280 x36.5
273FL-NBR60	CR93125	-85	-	SAE 52100	256	282	30	295 x44.5
323FL-NBR60	CR108710	-48	TLDFA2830	SAE 52100	283	305	42	329 x48
352FL-NBR60	CR124020	-68	TLDFA3200	SAE 52100	320	352.5	40	365 x42
392FL-NBR60	CR137570	-54	TLDFA3550	SAE 52100	355	392	39.6	401 x47.6
414L-NBR60	CR807115-806715	-86	-	Ni-Hard	378.25	414	42	424 x47.6
470/482L-NBR60	CR171025	-64	TLDFA4420	Ni-Hard	442	470	41	488 x39
534L-NBR60	CR191022	-80	TLDFA4920	Ni-Hard	492	530	43	546 x41.7
670L-NBR60	CR238020	-75	-	Ni-Hard	617	670	52	683 x54
800L-NBR60	CR807149	-79	-	Ni-Hard	752	800	56	812 x58



# Mechanical Face Seals

## Manufacturer-Designer-OEM Supplier

### Mechanical Face Seals – Floating Seals

SAPPARTS™ is a manufacturer, designer and supplier of technologically enriched and specially designed mechanical face seals/ floating seals and special surface treated products for construction, mining, defense, transmission, and agriculture equipment.

SAPPARTS™ is a rapidly growing company in the field of precision products serving heavy engineering industry, construction and agricultural OEMs, based in INDIA with a mission to produce innovative and world class mechanical floating seals. Today SAPPARTS™ serves major OEM's in Europe, India, US as well as throughout the globe.

Equipped with the state-of-the-art seal manufacturing facility, alloy casting foundry, design and testing center, advanced elastomeric & polymer technologies

and maintaining the highest quality standards, the seals produced by SAPPARTS™ are extremely customized to specific needs of its application. SAPPARTS™ seals deliver the increased life of the equipment at the most drastic environments, safeguarding the vital parts for equipment performance.

### SAPPARTS™ core competencies:

- Development, design, production and delivery of products
- Customer services and technical support in sealing design and application
- Reliable business process, fast communication and sustainable cooperation

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