ComTech AB

Teknisk Information

(In English)

Material selection

1) Sealing lip material

NITRILE (NBR OR BUNA-N)

Nitrile is the most important and most commonly used sealing elastomer. Nitrile is a copolymer of butadiene and acrylonitrile. The popularity of Nitrile is the result of its excellent resistance to petroleum products, hydrocarbon-solvents, mineral and vegetable oils, and gasoline. Additional advantages include good workability, good performance in dry running and low smell applications, and low cost. Nitrile are recommended för continuous operation at temperatures from -65 F to 225 F (-54 C to 107 C) and intermittently 250 F (121 C).

Not recommended for applications requiring resistance to ozone, direct sunlight and weather.

POLYACRYLATE (ACM)

Polyacrylate rubber is comprised of polymerised acrylic acid esters (ethyl acrylates) and posses excellent resistance to E.P. additives, mineral oils, grease, and ozone.

Polyacrylate elastomers have a temperature range of -40 F to 300 F (-40 C to 150 C).

Not recommended for dry running and weather resistant applications.

SILICONE

Silicone rubber has outstanding resistance to temerature extremes. Its high lubricancy minimizes friction and wear in applications. Silicone is recommended for its resistance to ozone and animal & vegetable oils and has an operating range fo -80 F to 400 F (-62 C to 204 C) and intermittently to 500 F (260 C).

Not recommended for applications that require resistance to hydrocarbon fluids or stream over 50 psi.

NEOPRENE (CHLOROPRENE OR CR)

Neoprene rubber has moderate resistance to petroleum oils and good resistance to weather, ozone and oxygen. Going with an operating temperature range of -40 F to 250 F (-40 C to 121 C) Neoprene is recommended for applications requiring resistance to high aniline petroleum oils, silicate seter lubricants, and refrigerants (Freons, Ammonia)

FLUOROCARBON (*VITON OR **FLUOREL)

Fluorocarbon is the most significant elastomer developed in recent history due to its wide chemical computability and temperature range. Fluoroelastomers resist most lubricants and chemicals that abrasion, wear, ozone, hydrocarbons and chemical solvents. Its temperature range in from -40 F to 204 F (-40 C to 204 C) and intermittantly up to 600 F (316 C).

When a high temperature range in required fluorocarbon is a better choice than Nitrile or Polyacrylate, although its cost is higher.

Other special compounds and materials are available upon request.

GENERAL ELASTIMER PROPERTIES COMPARISON

Elastomers Temperature Propertise	Nitrile -65 F -250 F -54 C -121 C	Polyacrylate -30 F -300 F -40 C -150 C	Silicone -80 F -400 F -62 C -204 C	Neoprene -40 F -250 F -40 C-121 C	Fluorocarbon -40 F -400 F -40 C -204 C
Oil Resistance	E	E	G	G	G
Heat Resistance	G	E	E	G	E
Cold Resistance	G	F	E	F	F
Wear Resistance	E	E	G	G	E
Ozone Resistance	P	E	E	E	E
Water Resistance	E	E	G	F	E
Acid Resistance	F	P	F	G	E
Alkali Resistance	G	P	P	F	F

E: Excellent G: Good F: Fair P: Poor

2) Metal Case

The second major component of a Shaft Oil Seal is the Metal Case. M-son Components AB supplies SAE 1008-SAE 1010 metal cases for all general applications. In addition, we provide special materials such as SAE 30302-SAE 20304 Stainless Steel for conditions that require high Corrosion resistance.

3) Garter Spring

Spring material is another very important element in Oil Seals. Garter Springs provide additional sealing strength for rotating and other dynamic applications.

General application Seals are loaded with SAE 1070-SAE 1080 Garter Springs. Special corrosion resistance Seals will be loaded with Stainless Steel springs per 30302-SAE 30304.

Kullsgårdsvägen 6
312 34 Laholm
Telefon: 0430 - 711 00
Telefax: 0430 – 109 97
Mail: info@comtechab.se
www.comtechab.se

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Recommendation of Shaft and Housing Bore

1) Shaft Finish

Because of the direct contact of the sealing lip and shaft, the shaft finish is very important and greatly influences wear and sealing performance. The following shaft finishes are recommended.

2) Shaft Hardness

The hardness of the shaft is another important factor. To prevent excessive wear, deformations, scratches, nicks, etc..., the contact area of the chaft should be Rockwell C45 minimum.

3) Shaft Diameter Tolerance

The recommended shaft diameter tolerances are as follows:

INCH DIAMETER	TOLERANCE
Up to 4.000"	0.003
4.000" to 6.000"	0.004
6.000" to 10 000"	0.005

METRIC DIAMETER	TOLERANCE
Up to 100MM	0.08
100.10 to 150MM	0.10
150.10 to 250MM	0.13

4) Bore Finish

A proper Bore surface finish is essential. An excessively rough bore finish may allow paths for fluid and cause O.D. leakage problems. The recommended Bore Surface Roughness are as follows:

	METAL O.D.	RUBBER O.D.
MAXIMUM	100 micro inches AA	150 micro inches AA
ROUGHNESS	2,5 micro meter RA	3,75 micro meter RA

5) Bore Hardness

Standard Rockwell Bore Hardness is recommended. However, the proper bore hardness should be high enougt to maintain interference with the seals O.D.

6) Bore Tolerance and O.D. Tolerance

INCHES

Bore Diameter	Bore Tolerance	Nominal PressFit		O.D Tolerance Seals with Metal O.D.
		Metal Case	Rubber Case	
Up to 1.000	± .001	.004	.006	± .002
1.001 to 2.000	± .001	.004	.007	± .002
2.001 to 3.000	± .001	.004	.008	± .002
3.001 to 4.000	± .0015	.005	.010	± .002
4.001 to 6.000	± .0015	.005	.010	+ .003 - .002
6.001 to 8.000	± .002	.006	.010	+ .003 - .002
8.001 to 10.000	.002	.008	.010	+ .004 - .002

MILLIMETERS

Diameter	(ISO/BS) Bore Tolerance	O.D. Diametral Tolerance	
		Metal Case	Rubber Covered
Over 6 to 10	+0.022 -0.000	+0.20 +0.08	+0.30 +0.15
Over 10 to 18	+0.027 -0.000	+0.20 +0.08	+0.30 +0.15
Over 18 to 30	+0.033 +0.000	+0.20 +0.08	+0.30 +0.15
Over 30 to 50	+0.039 -0.000	+0.20 +0.08	+0.30 +0.15
Over 50 to 80	+0.046 -0.000	+0.23 +0.09	+0.35 +0.20
Over 80 to 120	+0.054 -0.000	+0.25 +0.10	+0.35 +0.20
Over 120 to 180	+0.063 -0.000	+0.28 +0.12	+0.45 +0.25
Over 180 to 250	+0.072 -0.000	+0.35 +0.15	+0.45 +0.25

* Viton is a registered trademark fo E.I Du Pont.
** Fluorel is a registered trademark of 3M.

Kullsgårdsvägen 6
312 34 Laholm
Telefon: 0430 - 711 00
Telefax: 0430 – 109 97
Mail: info@comtechab.se
www.comtechab.se