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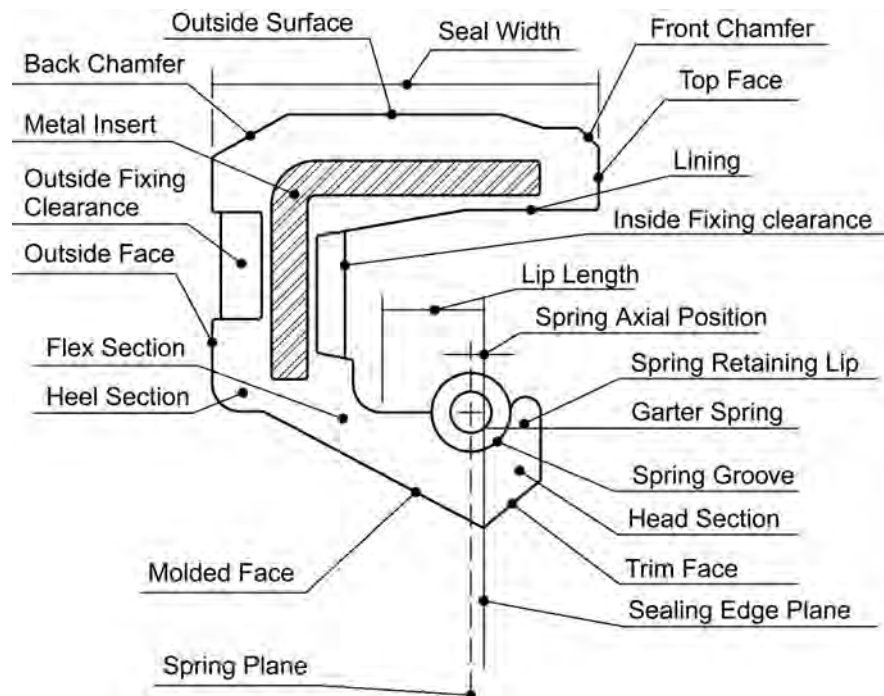
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***7-10 business day delivery into Harwal on most items.**

Please call for quotation.

Rotary shaft seals are applied for sealing rotating shafts. Essentially, they consist of a rubber sealing lip, a stiffening metal core, and a garter spring. Depending on the application, there are three standard types: A, B, and C. Below is our A style.



Pressure

Our standard seal designs are generally used for sealing lower pressure applications. The chart below shows the maximum psi allowed for our standard seal types.

Seal Type	A, ADL, AO, B, C, DC	A-P, ADL-P	MS, MD (Teflon®)
Max allowable pressure	7psi	140psi	MS 60psi / MD 150psi

Shaft to Bore Misalignment

This is the degree of misalignment from the center of the shaft to the bore center. Misalignment concentrates wear on one side of the sealing lip. This becomes more severe as surface speeds increase. The chart below shows maximum misalignment.

Total Misalignment Allowed	.010 .005 (AO type only)	.010	.005
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Shaft Run-Out

This is the misalignment of the sealing lip to the shaft with the center of shaft rotation, or movement of the center of the rotation through bearing looseness or shaft whip. This type of wear is more evenly distributed throughout the circumference of the sealing lip. Run-Out should be kept to a minimum. A combination of shaft run-out and bore misalignment create very difficult sealing conditions.

Total RPM Allowed	0-800 800 - 2200 2200 - 4200	.025 (AO .005) .020 (AO .005) .015 (AO .005)	.025 .020 .015	.005 .005 .005
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Hardware Specifications

Shaft Specifications

Our seals perform the best on medium carbon steel or stainless steel shafts. Heat treatment or nitriding is especially recommended.

Shaft Hardness

In the area where the sealing lip contacts the shaft, we recommend that the minimum hardness is 45 HRC. Where lubrication is doubtful, abrasive matter is present, or the shaft speed is greater than 14m/s, 55 HRC is preferred.

Shaft Roughness

We recommend the shaft to be machined to a surface roughness of Ra = 10-20 (Ra = .2-.8um). In the area of the contact surface, rifling marks are not permitted.

Shaft Eccentricity

Two types of shaft eccentricity affect seal performance. They are dynamic run out (double dynamic eccentricity) and offset (shaft to bore misalignment or static eccentricity).

Shaft Tolerance

Shaft tolerances are shown on tables 1&2.

Housing Specifications

Steel and cast iron provide a good surface for both rubber and metal O.D. seals. For soft alloy, such as aluminum housing, seals with a rubber O.D. are a better choice.

Housing Roughness

The housing inside diameter roughness is 10 micro inch Ra or 2.5 micrometers Ra for metal O.D. seals, and 150 micro inch or 3.75 micrometers for rubber covered O.D. seals.

Housing Tolerance

Housing tolerances are shown on tables 3&4.

Table 1. Shaft Tolerance in INCH

Nominal Shaft Diameter	Tolerance
up to 4.000	+/- 0.003
over 4.000 to 6.000	+/- 0.004
over 6.000 to 10.000	+/- 0.005
over 10.000	+/- 0.006

Table 2. Shaft Tolerance in METRIC

Shaft Diameter		Tolerance in mm		
over	to	+	/	-
0	3	0.0	/	-.060
3	6	0.0	/	-.075
6	10	0.0	/	-.090
10	18	0.0	/	-.110
18	30	0.0	/	-.130
30	50	0.0	/	-.160
50	80	0.0	/	-.190
80	120	0.0	/	-.220
120	180	0.0	/	-.250
180	250	0.0	/	-.290
250	315	0.0	/	-.320
315	400	0.0	/	-.360
400	500	0.0	/	-.400

Table 3. Housing Tolerance in INCH

Bore Diameter	Bore Tolerance
up to 3.000	+/- 0.001
3.001 to 6.000	+/- 0.0015
6.001 to 10.000	+/- 0.002
10.001 to 20.000	+0.002 / -0.004
20.001 to 40.000	+0.002 / -0.006
40.001 to 60.000	+0.002 / -0.010

Table 4. Housing Tolerance in METRIC

Bore Diameter	Bore Tolerance
over 6 to 10	+0.022 / -0.000
over 10 to 18	+0.027 / -0.000
over 18 to 30	+0.033 / -0.000
over 30 to 50	+0.039 / -0.000
over 50 to 80	+0.046 / -0.000
over 80 to 120	+0.054 / -0.000
over 120 to 180	+0.063 / -0.000
over 180 to 250	+0.072 / -0.000
over 250 to 315	+0.081 / -0.000
over 315 to 400	+0.089 / -0.000

Width Tolerance of Seals

Unit	Width Range	Tolerance
Inch	ANY	+/-0.015
Metric	up to 10mm	+/-0.20
	over 10mm	+/-0.30

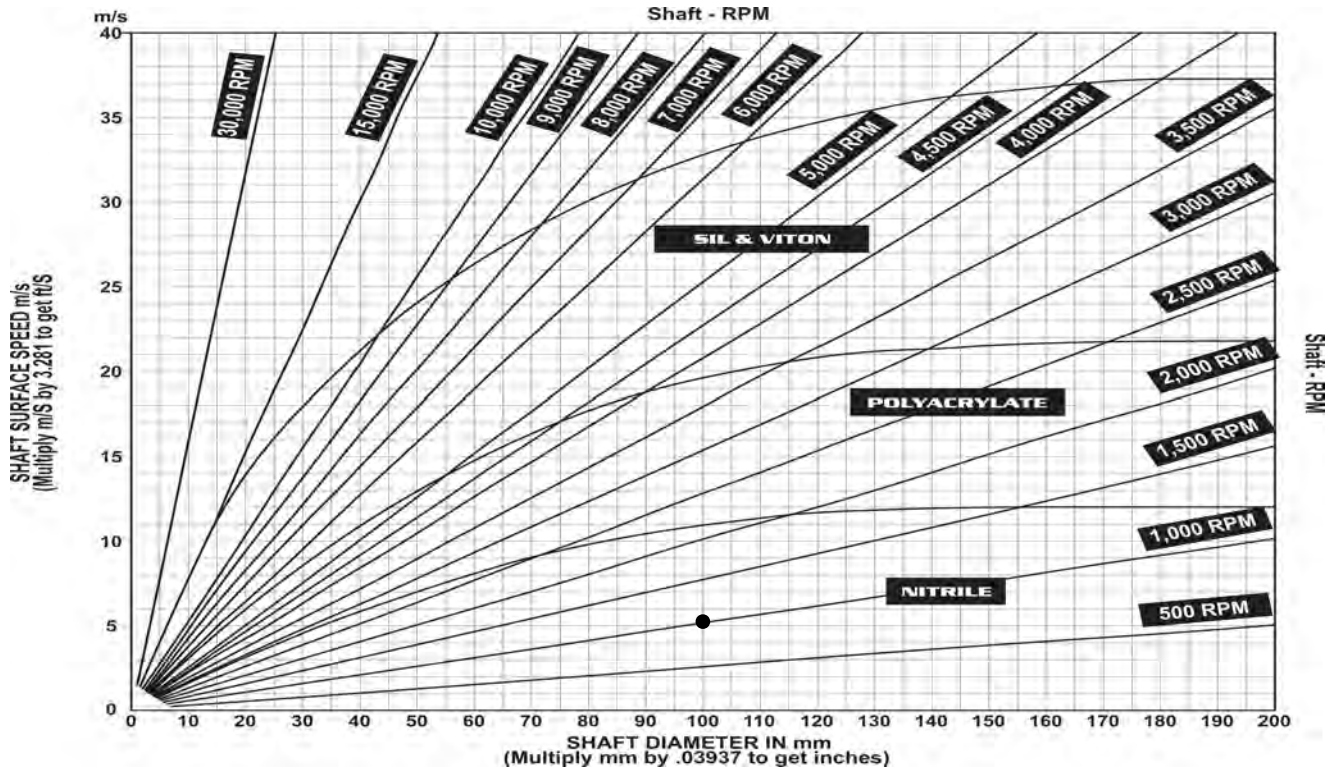
Seal Outside Diameter Tolerances - INCH

Bore Diameter	Press-fit allowance		Tolerance	
	Metal case	Rubber covered case	Metal case	Rubber covered case
up to 1.000	+ 0.004	+ 0.006	+/- 0.002	+/- 0.003
1.001 to 2.000	+ 0.004	+ 0.007	+/- 0.002	+/- 0.003
2.001 to 3.000	+ 0.004	+ 0.008	+/- 0.002	+/- 0.003
3.001 to 4.000	+ 0.005	+ 0.010	+/- 0.002	+/- 0.004
4.001 to 6.000	+ 0.005	+ 0.010	+ 0.003 / - 0.002	+/- 0.004
6.001 to 8.000	+ 0.006	+ 0.010	+ 0.003 / - 0.002	+/- 0.004
8.001 to 10.000	+ 0.008	+ 0.010	+ 0.004 / - 0.002	+/- 0.004
10.001 to 20.000	+ 0.008	+ 0.010	+ 0.006 / - 0.002	+/- 0.004
20.001 to 40.000	+ 0.008	+ 0.010	+ 0.008 / - 0.002	+/- 0.004
40.001 to 60.000	+ 0.008	+ 0.010	+ 0.010 / - 0.002	+/- 0.004

Seal Outside Diameter Tolerances - METRIC

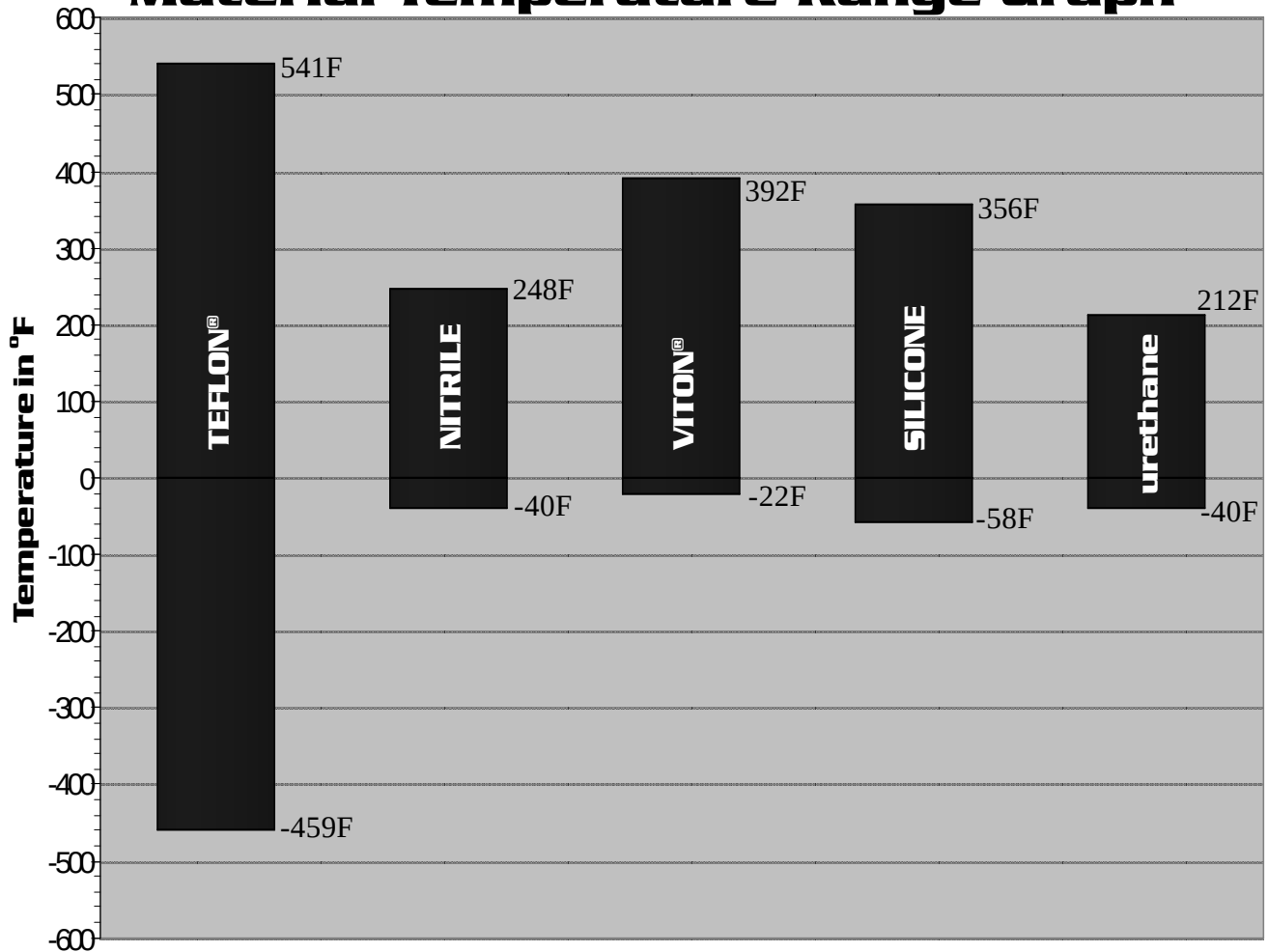
Bore Diameter	Press-fit allowance		Permissible Eccentricity
	Metal Case	Rubber Covered Case	
up to 50	+ 0.20 / + 0.10	+ 0.30 / + 0.15	0.25
over 50 to 80	+ 0.23 / + 0.13	+ 0.35 / + 0.20	0.35
over 80 to 120	+ 0.25 / + 0.15	+ 0.35 / + 0.20	0.50
over 120 to 180	+ 0.28 / + 0.18	+ 0.45 / + 0.25	0.65
over 180 to 300	+ 0.30 / + 0.20	+ 0.45 / + 0.25	0.80
over 300 to 500	+ 0.35 / + 0.23	+ 0.55 / + 0.30	1.00

Shaft Speed Graph



● Example: A 100mm shaft rotating at 1000rpm would require a Nitrile lip.

Material Temperature Range Graph

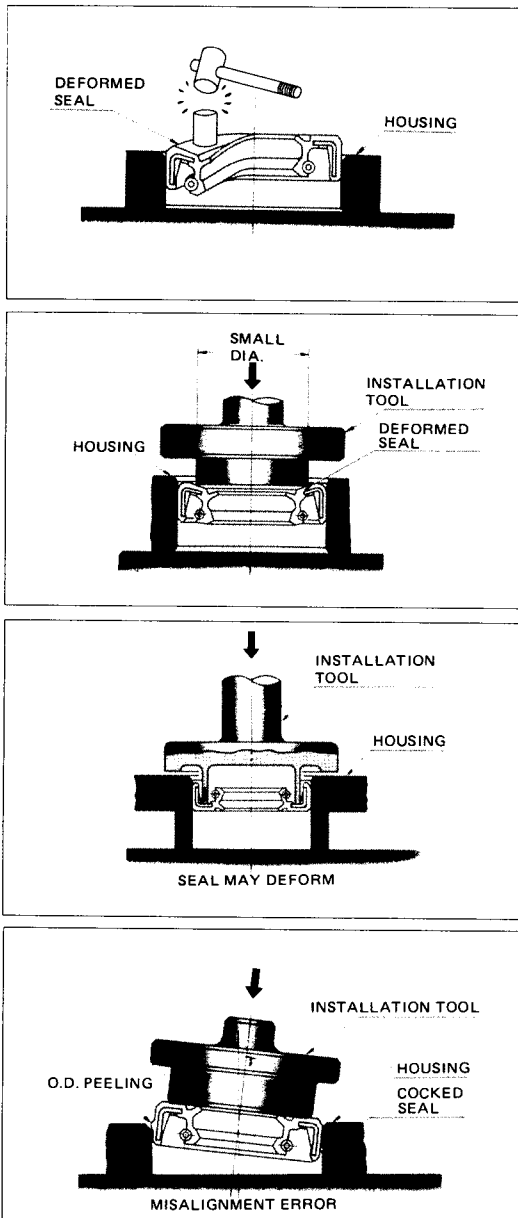


Installation Methods

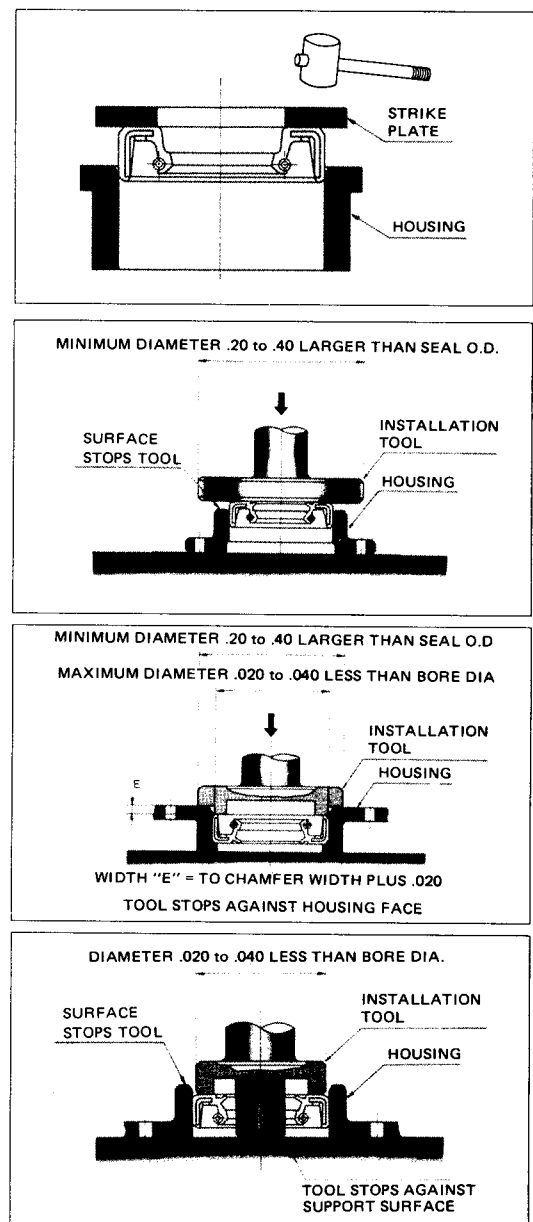
The subject of installation represents an area commonly overlooked when selecting an oil seal for an application. Studies have shown this area to be one of the major causes of premature seal failure. To assist the installation, the oil seal should be prelubricated with grease or oil to reduce sliding friction of contact surfaces. This will also help protect the seal lips during initial run-in. This section expands on recommended procedures for installation.

HOUSING INSTALLATION

Figure 5 IMPROPER METHODS



ACCEPTABLE METHODS



An installation tool should always be used when installing an oil seal. The use of a tool can make installation easier and lower the possibility of seal cocking. A hydraulic or pneumatic press is advised to supply necessary force to install the seal. Figure 5 describes examples of both recommended and improper installation methods. In each preferred method, installation load is absorbed by either housing or bottom plate to prevent seal damage and to locate the seal properly within the bore.

Materials & Specifications

The most important component of an oil seal is the elastomer material. You must consider all environmental conditions and functions of the seal such as:

Chemical Resistance	Low Compression Set
Resistance to high and low temperatures	Elasticity
Resistance to ozone and weathering	Cost
Resistance to water	

Harwal offers many compounds to satisfy almost any sealing application. The chart below shows the limitations and resistance qualities of our most common elastomers. Also included are the advantages and disadvantages of each elastomer.

Material	Advantages	Disadvantages	Ranges	Substitutes
Nitrile (NBR)	Highly cost efficient. Good low temp. capabilities. Excellent wear resistance. Little to no swell in hydrocarbon fluids.	Poor high heat resistance. Poor ozone resistance. Poor resistance to lubricants containing sulfur or EP additives, hydrocarbons or oxygenate blends (gasoline/methanol).	-40°F to +248°F -40°C to +120°C	FPM Polyacrylate PTFE
Viton® (FPM)	Excellent properties for sealing under high temperatures. Excellent fluid compatibilities. Very long usage life.	Poor resistance to basic fluids with a pH >7. Expensive compared to other materials.	-22°F to +392°F -30°C to +200°C	PTFE
Leather	Good dry running capabilities	Higher cost than Nitrile. Poor heat resistance.	-50°F to +200°F -46°C to +93°C	Nitrile FPM Polyacrylate PTFE
Polyacrylate (ACM)	Good resistance to EP lubricants. Low swell when sealing hydrocarbon fluids. Better heat resistance than Nitrile.	Higher cost than Nitrile. Poor low temp. capabilities. Should not be used when sealing aqueous media.	-20°F to +300°F -29°C to +149°C	FPM PTFE
Silicone	Good resistance to dry heat. Excellent sealing capabilities in low temp. applications.	Higher cost than Nitrile. High swell properties. Poor dry running capabilities. Poor resistance to some EP additives.	-80°F to +350°F -62°C to +176°C	FPM PTFE
Urethane	Good lubricant and ozone resistance. Good abrasion resistance. More durable than Silicone.	Substantial softening when used in applications above 250°F. Poor resistance to hot water or steam.	Please contact your Harwal representative with your specific application.	Urethane cannot be substituted.
Teflon® (PTFE)	Superior dry running capabilities. Extremely low coefficient of friction. Excellent chemical resistance. Resistant to hydrocarbon/oxygenate blends.	Poor resistance to abrasion in dirty environments. Can be easily damaged during installation. High thermal expansion.	-100°F to +450°F -73°C to +232°C	PTFE cannot be substituted.

Material Characteristics

	Nitrile (NBR)	Polyacrylate	Silicone	Viton® (FPM)
Temperature Range	+248F / -40F +120C / -40C	+302F / -22F +150C / -30C	+356F / -58F +180C / -50C	+392F / -22F +200C / -30C
Abrasion Resistance	B	C	D	B
Compression Set	B	C	B	B
Cracking Resistance	C	C	A	B
Cut Growth Resistance	B	B	D	D
Flex Cracking Resistance	C	C	B	B
Impact Strength	B	D	C	C
Low Temperature Resistance	B	D	A	B
Oxidation Resistance	B	A	A	A
Sunlight Resistance	C	A	A	A
Tear Resistance	B	D	D	C
Weathering Resistance	B	A	A	A

Legend: A=Excellent B=Good C=Fair D=Poor

Media Compatibility Table

The recommendations shown in this table are based on data supplied by our polymer manufacturers and comparison made with similar materials. The table below is meant only as a guideline and users of the actual product must conduct their own functional tests to determine the suitability of any compound for their particular application.

Media							
	Nitrile (NBR)	EPDM	Neoprene	Teflon® (PTFE)	Silicone	Viton® (FPM)	Nylon
Acetaldehyde	D	A	C	A	A	D	A
Acetamide	A	A	B	A	B	B	A
Acetate Solvent	C	A	D	A	C	D	A
Acetic Acid	C	A	C	A	C	B	D
Acetic Acid 20%	B	A	A	A	B	B	D
Acetic Acid 80%	C	A	C	A	B	B	D
Acetic Acid, Glacial	C	B	D	A	B	D	B
Acetic Anhydride	D	B	A	A	C	D	A
Acetone	D	A	C	A	D	D	A
Acetyl Bromide	*	*	*	A	*	*	D
Acetyl Chloride (dry)	D	D	D	A	C	A	B
Acetylene	B	A	B	A	B	A	A
Acrylonitrile	D	D	C	A	D	D	A
Adipic Acid	C	A	C	A	*	A	*
Alcohols: Amyl	B	A	A	A	D	A	A
Alcohols: Benzyl	D	B	C	A	*	A	B
Alcohols: Butyl	C	A	A	A	B	A	D
Alcohols: Diacetone	D	A	D	A	D	D	A
Alcohols: Ethyl	C	A	A	A	B	A	A
Alcohols: Hexyl	A	C	A	A	B	C	A
Alcohols: Isobutyl	B	A	A	A	A	A	A
Alcohols: Isopropyl	B	A	B	A	A	A	D
Alcohols: Methyl	A	A	A	A	A	C	B
Alcohols: Octyl	B	A	B	*	B	B	A
Alcohols: Propyl	A	A	A	A	A	A	D
Aluminum Chloride	A	A	A	A	B	A	B
Aluminum Chloride 20%	A	A	A	A	B	A	D
Aluminum Fluoride	A	A	A	A	B	A	A
Aluminum Hydroxide	A	A	A	A	*	A	A
Aluminum Nitrate	A	A	A	A	B	A	A
Aluminum Potassium Sulfate 10%	A	A	A	A	A	A	D
Aluminum Potassium Sulfate 100%	A	A	A	A	A	A	D
Aluminum Sulfate	A	A	A	A	A	A	A
Alums	A	A	B	A	A	A	A
Amines	D	B	B	A	B	D	D
Ammonia 10%	A	A	A	A	*	D	A
Ammonia Nitrate	C	A	C	A	*	D	D
Ammonia, anhydrous	B	A	A	A	C	D	A
Ammonia, liquid	C	A	A	A	*	D	B
Ammonium Acetate	B	A	A	A	*	A	A
Ammonium Bifluoride	B	A	D	A	*	A	*
Ammonium Carbonate	B	A	A	A	C	A	A
Ammonium Caseinate	*	*	A	*	*	*	*
Ammonium Chloride	B	A	B	A	C	A	B
Ammonium Hydroxide	D	A	A	A	A	B	A
Ammonium Nitrate	A	A	B	A	C	A	A
Ammonium Oxalate	D	A	A	*	*	*	*
Ammonium Persulfate	A	B	A	A	D	A	D
Ammonium Phosphate, Dibasic	A	A	A	A	A	A	C
Ammonium Phosphate, Monobasic	A	A	A	A	A	A	B
Ammonium Phosphate, Tribasic	A	A	A	A	A	A	B
Ammonium Sulfate	A	A	A	A	A	A	A
Ammonium Sulfite	A	A	A	A	*	D	A
Ammonium Thiosulfate	A	A	A	*	*	*	*
Amyl Acetate	D	A	D	A	D	D	B
Amyl Alcohol	B	A	A	A	D	A	A
Amyl Chloride	D	D	D	A	D	B	C
Aniline	D	B	D	A	B	A	A
Aniline Hydrochloride	D	B	D	A	D	A	D
Antifreeze	A	A	C	*	C	A	D
Antimony Trichloride	B	B	*	A	*	A	D
Aqua Regia (80% HCl, 20% HNO3)	D	C	D	A	D	B	D
Arochlor 1248	C	B	D	A	B	A	A

* - Insufficient Data

D - Severe Effect

C - Fair

B - Good

A - Excellent

LEGEND:

Media	Media Compatibility Chart							
	Nitrile (NBR)	EPDM	Neoprene	Teflon® (PTFE)	Silicone	Viton® (FPM)	Nylon	
Aromatic Hydrocarbons	D	D	D	*	D	A	*	
Arsenic Acid	A	A	A	A	A	A	C	
Arsenic Salts	*	*	*	*	*	A	A	
Asphalt	B	D	D	A	D	A	A	
Barium Carbonate	A	A	*	A	*	A	A	
Barium Chloride	A	A	A	A	A	A	A	
Barium Cyanide	C	A	C	A	*	A	A	
Barium Hydroxide	A	A	A	A	A	A	A	
Barium Nitrate	A	A	A	A	B	A	A	
Barium Sulfate	A	A	A	A	A	A	A	
Barium Sulfide	A	A	A	A	A	A	A	
Beer	A	A	A	A	A	A	A	
Beet Sugar Liquids	A	A	A	A	A	A	A	
Benzaldehyde	D	A	D	A	D	D	A	
Benzene	D	D	D	A	D	A	A	
Benzene Sulfonic Acid	D	D	A	A	D	A	D	
Benzoic Acid	D	D	B	A	B	A	D	
Benzol	D	D	D	A	D	A	D	
Benzonitrile	*	*	*	A	A	*	*	
Benzyl Chloride	D	D	D	*	D	A	A	
Bleaching Liquors	D	A	D	A	B	A	C	
Borax (Sodium Borate)	B	A	A	A	B	A	A	
Boric Acid	A	A	D	A	A	A	B	
Brewery Slop	A	*	A	*	*	A	*	
Bromine	D	D	D	A	D	A	D	
Butadiene	D	C	B	A	D	B	C	
Butane	A	D	A	A	D	A	A	
Butanol (Butyl Alcohol)	A	A	A	A	B	A	B	
Butter	A	A	B	A	B	A	*	
Buttermilk	A	A	D	A	A	A	B	
Butyl Amine	*	*	D	A	B	D	A	
Butyl Ether	B	D	D	A	D	D	A	
Butyl Phthalate	D	B	D	A	A	C	A	
Butylacetate	D	B	D	A	D	D	A	
Butylene	A	D	D	A	D	A	B	
Butyric Acid	D	B	D	A	D	B	C	
Calcium Bisulfate	A	A	A	*	C	*	*	
Calcium Bisulfide	A	C	A	A	C	A	A	
Calcium Bisulfite	A	D	A	A	A	A	A	
Calcium Carbonate	A	A	A	A	A	A	A	
Calcium Chlorate	A	A	*	A	*	A	*	
Calcium Chloride	A	A	A	A	A	A	A	
Calcium Hydroxide	A	A	A	A	A	A	A	
Calcium Hypochlorite	C	B	D	A	B	A	D	
Calcium Nitrate	A	A	A	A	B	A	A	
Calcium Oxide	A	A	A	A	A	B	B	
Calcium Sulfate	A	A	B	A	*	A	D	
Calgon	A	A	A	*	A	A	A	
Cane Juice	A	A	A	A	A	A	A	
Carbolic Acid (Phenol)	D	B	D	A	D	A	D	
Carbon Bisulfide	C	D	D	*	*	A	A	
Carbon Dioxide (dry)	A	B	B	A	B	B	A	
Carbon Dioxide (wet)	A	B	B	A	B	B	A	
Carbon Disulfide	D	D	D	A	*	A	B	
Carbon Monoxide	A	A	B	A	A	A	A	
Carbon Tetrachloride	D	D	D	A	D	A	D	
Carbon Tetrachloride (dry)	C	B	D	A	D	A	*	
Carbon Tetrachloride (wet)	D	D	D	A	D	*	*	
Carbonated Water	A	*	A	*	*	A	A	
Carbonic Acid	D	B	D	A	A	A	A	
Catsup	A	A	A	*	*	A	A	
Chloric Acid	*	*	*	A	*	*	D	
Chlorinated Glue	B	B	D	*	*	A	*	
Chlorine (dry)	B	A	C	A	D	A	D	
Chlorine Water	D	C	D	A	D	A	C	
Chlorine, Anhydrous Liquid	D	B	D	A	D	A	D	
Chloroacetic Acid	D	B	D	A	D	D	D	
Chlorobenzene (Mono)	D	D	D	B	D	A	D	

LEGEND:

A - Excellent

B - Good

C - Fair

D - Severe Effect

* - Insufficient Data

Media								
	Nitrile (NBR)	EPDM	Neoprene	Teflon® (PTFE)	Silicone	Viton® (FPM)	Nylon	
Chlorobromomethane	D	B	D	A	D	A	C	* - Insufficient Data
Chloroform	D	D	D	A	D	A	A	
Chlorosulfonic Acid	D	D	D	A	D	D	D	* - Insufficient Data
Chocolate Syrup	A	A	A	A	*	A	A	
Chromic Acid 10%	D	C	D	A	C	B	D	* - Insufficient Data
Chromic Acid 30%	D	B	D	A	C	A	D	
Chromic Acid 5%	D	A	D	A	C	A	D	* - Insufficient Data
Chromic Acid 50%	D	B	D	A	C	A	D	
Chromium Salts	*	*	*	*	*	*	B	* - Insufficient Data
Cider	A	A	A	*	B	A	A	
Citric Acid	A	A	A	A	A	A	A	* - Insufficient Data
Citric Oils	A	B	D	*	*	A	*	
Clorox® (Bleach)	D	B	B	A	*	A	A	* - Insufficient Data
Coffee	A	A	A	*	A	A	A	
Copper Chloride	A	A	A	A	A	A	D	* - Insufficient Data
Copper Cyanide	A	A	A	A	A	A	D	
Copper Fluoborate	B	*	A	*	*	A	*	* - Insufficient Data
Copper Nitrate	A	*	A	A	*	A	D	
Copper Sulfate >5%	A	A	A	A	A	A	D	* - Insufficient Data
Copper Sulfate 5%	A	A	A	A	A	A	D	
Cream	A	*	D	A	*	A	A	* - Insufficient Data
Cresols	D	D	D	*	D	A	D	
Cresylic Acid	D	D	D	A	D	A	D	* - Insufficient Data
Cupric Acid	B	A	A	A	A	A	D	
Cyanic Acid	C	*	C	A	A	A	*	* - Insufficient Data
Cyclohexane	B	D	D	A	D	A	A	
Cyclohexanone	D	B	D	A	D	D	A	* - Insufficient Data
Detergents	A	A	B	A	A	A	A	
Diacetone Alcohol	D	A	D	A	D	D	A	* - Insufficient Data
Dichlorobenzene	D	D	D	A	D	C	D	
Dichloroethane	D	*	D	A	*	C	A	* - Insufficient Data
Diesel Fuel	A	D	B	A	D	A	A	
Diethyl Ether	D	D	D	A	D	D	A	* - Insufficient Data
Diethylamine	C	B	A	D	B	A	A	
Diethylene Glycol	A	A	A	A	B	A	A	* - Insufficient Data
Dimethyl Aniline	D	B	D	A	D	D	A	
Dimethyl Formamide	D	B	D	A	C	C	A	* - Insufficient Data
Diphenyl	D	D	B	A	D	A	*	
Diphenyl Oxide	A	D	D	A	C	A	*	* - Insufficient Data
Dyes	*	*	C	*	*	A	A	
Epsom Salts (Magnesium Sulfate)	A	A	A	A	A	A	A	* - Insufficient Data
Ethane	A	D	B	A	D	A	D	
Ethanol	C	A	A	A	B	A	A	* - Insufficient Data
Ethanolamine	B	B	B	A	B	D	A	
Ether	D	C	D	A	D	C	A	* - Insufficient Data
Ethyl Acetate	D	B	D	A	B	D	A	
Ethyl Benzoate	D	*	D	A	D	A	*	* - Insufficient Data
Ethyl Chloride	A	A	C	A	D	A	A	
Ethyl Ether	D	D	D	A	D	D	A	* - Insufficient Data
Ethyl Sulfate	A	*	*	A	*	A	*	
Ethylene Bromide	D	C	C	A	D	A	*	* - Insufficient Data
Ethylene Chloride	D	D	D	A	D	B	A	
Ethylene Chlorohydrin	D	B	A	A	C	A	D	* - Insufficient Data
Ethylene Diamine	A	A	B	A	A	B	D	
Ethylene Dichloride	D	C	D	A	D	A	A	* - Insufficient Data
Ethylene Glycol	A	A	A	A	A	A	A	
Ethylene Oxide	D	C	D	A	D	D	A	* - Insufficient Data
Fatty Acids	B	D	C	A	C	A	A	
Ferric Chloride	A	A	B	A	B	A	A	* - Insufficient Data
Ferric Nitrate	A	A	A	A	C	A	A	
Ferric Sulfate	A	A	A	A	B	A	A	* - Insufficient Data
Ferrous Chloride	A	*	A	A	*	A	D	
Ferrous Sulfate	A	A	*	A	*	B	D	* - Insufficient Data
Fluoboric Acid	A	A	A	A	*	B	D	
Fluorine	D	A	*	D	D	C	D	* - Insufficient Data
Fluosilicic Acid	A	A	A	A	*	B	D	
Formaldehyde 100%	C	A	C	A	B	D	D	* - Insufficient Data
Formaldehyde 40%	B	A	B	A	*	A	A	

Media								
	Nitrile (NBR)	EPDM	Neoprene	Teflon® (PTFE)	Silicone	Viton® (FPM)	Nylon	
Formic Acid	C	A	A	A	B	C	D	LEGEND:
Freon 113	A	D	C	A	D	B	*	
Freon 12	A	B	A	A	D	B	A	A - Excellent
Freon 22	D	A	A	A	D	D	B	
Freon TF	A	D	A	A	D	B	D	B - Good
Freonr 11	B	D	D	A	D	B	D	
Fruit Juice	A	*	A	A	*	A	A	C - Fair
Fuel Oils	A	D	B	B	D	A	A	
Furan Resin	D	C	D	A	D	D	*	D - Severe Effect
Furfural	D	D	D	A	D	D	B	
Gallic Acid	B	B	B	B	D	A	A	* - Insufficient Data
Gasoline (high-aromatic)	A	D	A	B	D	A	A	
Gasoline, leaded, ref.	A	D	B	A	D	A	A	A - Excellent
Gasoline, unleaded	A	D	B	A	D	A	A	
Gelatin	A	A	A	A	A	A	A	B - Good
Glucose	A	A	A	A	A	A	A	
Glue, P.V.A.	A	A	A	A	A	B	A	C - Fair
Glycerin	A	A	A	A	A	A	A	
Glycolic Acid	A	A	A	A	A	A	*	D - Severe Effect
Gold Monocyanide	A	*	A	D	*	A	*	
Grape Juice	A	A	D	A	A	A	A	A - Excellent
Grease	A	D	D	A	D	A	*	
Heptane	A	D	B	A	D	A	A	B - Good
Hexane	A	D	B	A	D	A	B	
Honey	A	A	*	A	A	A	A	C - Fair
Hydraulic Oil (Petro)	A	D	A	A	B	A	A	
Hydraulic Oil (Synthetic)	D	A	A	A	B	A	A	D - Severe Effect
Hydrazine	B	A	B	A	B	A	*	
Hydrobromic Acid 100%	D	A	D	A	D	A	D	A - Excellent
Hydrobromic Acid 20%	D	A	D	*	D	A	D	
Hydrochloric Acid 100%	D	D	D	A	D	A	D	B - Good
Hydrochloric Acid 20%	*	A	C	A	D	A	D	
Hydrochloric Acid 37%	B	C	B	A	B	A	D	C - Fair
Hydrochloric Acid, Dry Gas	*	*	*	A	*	*	A	
Hydrocyanic Acid	B	B	B	A	C	A	B	D - Severe Effect
Hydrocyanic Acid (Gas 10%)	B	A	A	A	D	A	*	
Hydrofluoric Acid 100%	D	D	D	A	D	B	D	A - Excellent
Hydrofluoric Acid 20%	D	D	B	A	D	A	C	
Hydrofluoric Acid 50%	D	D	D	A	D	B	D	B - Good
Hydrofluoric Acid 75%	D	C	D	A	D	B	D	
Hydrofluosilicic Acid 100%	B	A	B	A	D	A	D	C - Fair
Hydrofluosilicic Acid 20%	A	A	B	A	D	A	D	
Hydrogen Gas	A	A	A	A	C	A	A	D - Severe Effect
Hydrogen Peroxide 10%	D	A	D	A	A	A	C	
Hydrogen Peroxide 100%	D	D	D	A	B	A	D	A - Excellent
Hydrogen Peroxide 30%	D	B	D	A	B	A	D	
Hydrogen Peroxide 50%	D	B	D	A	B	A	D	B - Good
Hydrogen Sulfide (aqua)	D	B	A	A	C	D	C	
Hydrogen Sulfide (dry)	D	B	A	A	C	D	C	C - Fair
Hydroquinone	D	D	A	A	*	B	D	
Hydroxyacetic Acid 70%	A	A	A	A	*	A	*	D - Severe Effect
Ink	A	*	A	A	*	A	C	
Iodine	B	B	D	A	*	A	A	A - Excellent
Iodine (in alcohol)	*	A	*	*	*	*	C	
Iodoform	D	A	A	C	*	*	*	B - Good
Isooctane	A	D	B	A	D	A	A	
Isopropyl Acetate	D	B	D	A	D	D	B	C - Fair
Isopropyl Ether	B	D	D	A	D	D	A	
Isotane	A	*	D	*	*	A	D	D - Severe Effect
Jet Fuel (JP3, JP4, JP5)	A	D	D	A	D	A	C	
Kerosene	A	D	A	A	D	A	A	A - Excellent
Ketones	D	A	D	A	*	D	A	
Lacquer Thinners	D	D	D	A	D	D	A	B - Good
Lacquers	D	D	D	A	D	D	A	
Lactic Acid	A	A	A	A	A	A	B	C - Fair
Lard	A	D	D	A	B	A	A	
Latex	A	A	*	A	A	A	A	D - Severe Effect
Lead Acetate	B	A	A	A	A	D	A	

Media								
	Nitrile (NBR)	EPDM	Neoprene	Teflon® (PTFE)	Silicone	Viton® (FPM)	Nylon	
Lead Nitrate	A	A	A	A	B	A	*	* - Insufficient Data
Lead Sulfamate	B	A	A	B	B	A	B	
Ligroin	A	D	B	A	D	A	D	* - Insufficient Data
Lime	A	D	A	A	*	A	A	
Linoleic Acid	B	D	*	A	B	B	*	* - Insufficient Data
Lithium Chloride	A	A	A	A	A	A	*	
Lithium Hydroxide	C	*	*	A	*	*	*	* - Insufficient Data
Lubricants	A	D	D	A	D	A	A	
Lye: Ca(OH)2 Calcium Hydroxide	A	A	A	A	A	B	A	* - Insufficient Data
Lye: KOH Potassium Hydroxide	B	A	B	A	C	B	C	
Lye: NaOH Sodium Hydroxide	A	B	B	A	A	B	A	* - Insufficient Data
Magnesium Bisulfate	B	*	B	A	*	*	A	
Magnesium Carbonate	A	A	A	A	*	A	*	* - Insufficient Data
Magnesium Chloride	A	A	A	A	A	A	A	
Magnesium Hydroxide	A	A	A	A	A	A	B	* - Insufficient Data
Magnesium Nitrate	A	A	A	A	*	A	A	
Magnesium Oxide	A	*	A	A	*	C	*	* - Insufficient Data
Magnesium Sulfate (Epsom Salts)	A	A	A	A	A	A	A	
Maleic Acid	D	D	D	A	*	A	A	* - Insufficient Data
Maleic Anhydride	D	D	D	A	*	A	*	
Malic Acid	A	D	D	A	B	A	A	* - Insufficient Data
Manganese Sulfate	A	A	A	A	A	A	A	
Mash	A	A	A	*	*	A	A	* - Insufficient Data
Mayonnaise	C	*	A	A	*	A	A	
Melamine	C	A	D	A	C	A	A	* - Insufficient Data
Mercuric Chloride (dilute)	A	A	A	A	*	A	D	
Mercuric Cyanide	A	A	A	B	A	A	A	* - Insufficient Data
Mercurous Nitrate	B	A	B	A	*	A	*	
Mercury	A	A	A	A	*	A	A	* - Insufficient Data
Methane	A	D	B	A	D	A	A	
Methanol (Methyl Alcohol)	A	A	A	A	A	C	B	* - Insufficient Data
Methyl Acetate	D	B	B	A	D	D	A	
Methyl Acetone	D	A	D	A	*	D	A	* - Insufficient Data
Methyl Acrylate	D	B	B	*	D	D	*	
Methyl Alcohol 10%	A	A	A	A	A	C	B	* - Insufficient Data
Methyl Bromide	B	D	D	A	*	A	B	
Methyl Butyl Ketone	D	A	D	*	D	D	D	* - Insufficient Data
Methyl Cellosolve	A	B	B	A	D	D	C	
Methyl Chloride	D	D	D	A	D	A	B	* - Insufficient Data
Methyl Dichloride	D	D	*	*	*	A	C	
Methyl Ethyl Ketone	D	A	D	A	D	D	A	* - Insufficient Data
Methyl Ethyl Ketone Peroxide	D	D	D	*	B	D	*	
Methyl Isobutyl Ketone	D	B	D	A	D	D	B	* - Insufficient Data
Methyl Isopropyl Ketone	D	C	D	A	C	D	A	
Methyl Methacrylate	D	D	D	*	C	D	*	* - Insufficient Data
Methylamine	B	A	*	A	*	D	*	
Methylene Chloride	D	C	*	A	*	B	C	* - Insufficient Data
Milk	A	A	A	A	A	A	A	
Mineral Spirits	A	D	C	A	D	A	A	* - Insufficient Data
Molasses	A	A	A	A	*	A	A	
Monochloroacetic acid	D	C	A	A	*	C	D	* - Insufficient Data
Monoethanolamine	B	B	D	A	B	D	A	
Morpholine	D	D	D	A	*	*	A	* - Insufficient Data
Motor oil	A	D	B	A	*	*	A	
Mustard	B	A	A	A	*	D	A	* - Insufficient Data
Naphtha	A	D	D	B	D	A	A	
Naphthalene	D	D	D	A	D	A	A	* - Insufficient Data
Natural Gas	A	D	A	A	A	A	*	
Nickel Chloride	A	A	B	A	A	A	C	* - Insufficient Data
Nickel Nitrate	A	A	A	A	*	A	A	
Nickel Sulfate	A	A	A	A	A	A	A	* - Insufficient Data
Nitrating Acid (<15% HNO3)	*	*	A	A	*	*	*	
Nitrating Acid (>15% H2SO4)	D	A	A	A	*	*	*	* - Insufficient Data
Nitrating Acid (S1% Acid)	*	*	A	A	*	*	*	
Nitrating Acid (S15% H2SO4)	*	*	A	A	*	*	*	* - Insufficient Data
Nitric Acid (20%)	D	A	D	A	D	A	D	
Nitric Acid (50%)	D	D	D	A	D	A	D	* - Insufficient Data
Nitric Acid (5-10%)	D	A	B	A	C	A	D	

LEGEND: A - Excellent B - Good C - Fair D - Severe Effect * - Insufficient Data

Media	Nitrile (NBR)		EPDM	Neoprene	Teflon® (PTFE)		Silicone	Viton® (FPM)		Nylon
Nitric Acid (Concentrated)	D	D	D	A	D	A	D	D		
Nitrobenzene	D	B	D	A	D	B	B	B		
Nitrogen Fertilizer	*	*	*	A	*	*	*	*		
Nitromethane	D	B	D	A	D	D	D	B		
Nitrous Acid	*	A	D	A	*	B	B	*		
Nitrous Oxide	*	A	A	A	*	B	C	C		
Oils:Aniline	D	B	D	A	D	C	A	*		
Oils:Anise	*	*	D	*	*	*	*	*		
Oils:Bay	*	*	D	*	*	A	*	*		
Oils:Bone	A	*	D	A	*	A	*	*		
Oils:Castor	B	B	A	A	A	A	A	A		
Oils:Cinnamon	*	*	C	A	*	A	A	*		
Oils:Citric	D	B	D	A	*	A	A	*		
Oils:Clove	A	*	C	A	*	A	*	*		
Oils:Coconut	A	D	C	A	A	A	A	*		
Oils:Cod Liver	A	A	B	A	B	A	A	*		
Oils:Coron	D	C	A	A	A	B	A	A		
Oils:Cottonseed	A	D	C	A	A	A	A	B		
Oils:Creosote	D	D	C	A	D	A	A	D		
Oils:Diesel Fuel (20, 30, 40, 50)	A	D	B	A	D	A	A	A		
Oils:Fuel (1, 2, 3, 5A, 5B, 6)	B	D	D	A	C	B	A	A		
Oils:Ginger	A	A	A	A	*	A	A	*		
Oils:Hydraulic Oil (Petro)	A	D	A	A	B	A	A	A		
Oils:Hydraulic Oil (Synthetic)	D	A	A	A	B	A	A	A		
Oils:Lemon	*	D	D	A	*	A	A	*		
Oils:Linseed	A	D	D	A	A	A	A	A		
Oils:Mineral	A	D	B	A	C	A	A	A		
Oils:Olive	D	D	B	A	D	A	A	A		
Oils:Orange	A	*	C	*	D	A	*	*		
Oils:Palm	A	A	D	A	*	A	*	*		
Oils:Peanut	A	D	B	A	A	A	*	*		
Oils:Peppermint	D	*	D	A	*	A	*	*		
Oils:Pine	D	D	D	A	D	A	A	A		
Oils:Rapeseed	D	A	B	A	D	A	*	A		
Oils:Rosin	A	*	*	A	*	A	*	*		
Oils:Sesame Seed	A	*	D	A	*	A	*	*		
Oils:Silicone	A	A	D	A	C	A	A	A		
Oils:Soybean	A	C	C	A	A	A	A	*		
Oils:Sperm (whale)	A	*	D	A	*	A	*	*		
Oils:Tanning	A	*	D	*	*	A	*	*		
Oils:Transformer	A	D	B	A	B	A	A	A		
Oils:Turbine	B	A	D	A	D	A	A	A		
Oleic Acid	B	B	C	A	D	B	A	A		
Oleum 100%	D	D	D	A	D	A	A	D		
Oleum 25%	D	D	D	A	D	A	A	D		
Oxalic Acid (cold)	D	A	D	A	B	A	A	B		
Ozone	D	A	C	A	A	A	A	D		
Palmitic Acid	A	B	D	A	D	A	A	A		
Paraffin	B	D	B	A	*	B	A	A		
Pentane	A	D	B	A	D	A	A	A		
Perchloric Acid	D	B	A	A	D	A	A	D		
Perchloroethylene	C	D	D	A	D	A	C	D		
Petrolatum	A	A	A	C	D	A	A	D		
Petroleum	A	D	B	A	D	A	A	A		
Phenol (10%)	D	B	D	A	D	A	A	D		
Phenol (Carbolic Acid)	D	B	D	A	D	A	A	D		
Phosphoric Acid (>40%)	D	B	B	A	D	A	A	B		
Phosphoric Acid (crude)	D	B	D	A	D	A	A	B		
Phosphoric Acid (molten)	*	*	A	*	*	*	*	*		
Phosphoric Acid (S40%)	D	B	B	A	C	A	A	B		
Phosphoric Acid Anhydride	D	*	A	*	*	*	*	*		
Phosphorus	*	*	*	A	*	*	*	*		
Phosphorus Trichloride	D	A	D	A	*	A	*	*		
Photographic Developer	A	B	A	A	B	A	*	*		
Photographic Solutions	B	A	B	A	A	B	A	A		
Phthalic Acid	D	A	A	A	B	A	A	B		
Phthalic Anhydride	D	A	A	A	*	A	*	*		
Picric Acid	C	B	A	A	D	A	C	C		

* - Insufficient Data

D - Severe Effect

C - Fair

B - Good

A - Excellent

LEGEND:

Media							
	Nitrile (NBR)	EPDM	Neoprene	Teflon® (PTFE)	Silicone	Viton® (FPM)	Nylon
Potash (Potassium Carbonate)	A	A	A	*	*	A	A
Potassium Bicarbonate	A	A	A	A	A	A	A
Potassium Bromide	A	A	A	A	A	A	A
Potassium Chlorate	A	A	A	A	B	A	C
Potassium Chloride	A	A	A	A	A	A	A
Potassium Chromate	A	A	A	A	*	A	B
Potassium Cyanide Solutions	A	A	B	A	A	A	A
Potassium Dichromate	A	A	A	A	A	A	B
Potassium Ferricyanide	D	A	A	A	*	A	B
Potassium Ferrocyanide	D	A	A	A	*	A	B
Potassium Hydroxide (Caustic Potash)	B	A	B	A	C	B	C
Potassium Hypochlorite	A	A	B	A	*	*	B
Potassium Iodide	A	A	A	A	*	A	A
Potassium Nitrate	A	A	A	A	A	A	B
Potassium Oxalate	*	*	*	A	*	*	*
Potassium Permanganate	C	A	A	A	*	A	D
Potassium Sulfate	A	A	A	A	A	A	A
Potassium Sulfide	A	A	A	A	A	A	A
Propane (liquefied)	A	D	C	A	D	A	A
Propylene	D	D	D	A	D	A	*
Propylene Glycol	A	A	C	A	A	A	A
Pyridine	D	B	D	A	D	D	C
Pyrogalllic Acid	*	B	A	A	*	A	*
Resorcinal	*	B	D	A	*	A	D
Rosins	A	*	A	A	A	A	A
Rum	A	A	A	*	A	A	A
Rust Inhibitors	A	*	C	*	*	A	*
Salad Dressings	A	*	*	*	*	A	A
Salicylic Acid	B	A	*	A	*	A	A
Salt Brine (NaCl saturated)	A	A	A	A	A	A	A
Sea Water	A	A	B	A	A	A	A
Shellac (Bleached)	A	A	B	A	*	A	A
Shellac (Orange)	A	A	D	A	*	A	A
Silicone	A	A	A	A	C	A	A
Silver Bromide	*	*	*	A	*	*	*
Silver Nitrate	B	A	A	A	A	A	A
Soap Solutions	A	A	B	A	A	A	A
Soda Ash (see Sodium Carbonate)	A	A	A	A	A	A	B
Sodium Acetate	B	A	B	A	D	D	B
Sodium Aluminate	A	A	A	A	*	A	A
Sodium Benzoate	B	A	A	A	*	A	B
Sodium Bicarbonate	A	A	A	A	A	A	A
Sodium Bisulfate	B	A	A	A	A	A	A
Sodium Bisulfite	A	A	A	A	A	A	C
Sodium Borate (Borax)	A	A	A	A	A	A	A
Sodium Bromide	*	A	A	A	*	A	B
Sodium Carbonate	A	A	A	A	A	A	B
Sodium Chlorate	B	A	A	A	C	A	D
Sodium Chloride	A	A	A	A	A	A	A
Sodium Chromate	A	*	A	A	*	A	C
Sodium Cyanide	A	A	A	A	A	A	A
Sodium Ferrocyanide	A	A	A	A	*	A	*
Sodium Fluoride	A	A	A	A	*	A	B
Sodium Hydrosulfite	C	B	B	A	C	A	A
Sodium Hydroxide (20%)	A	B	B	A	A	C	A
Sodium Hydroxide (50%)	A	B	B	A	A	D	A
Sodium Hydroxide (80%)	D	B	B	A	A	D	C
Sodium Hypochlorite (<20%)	B	B	C	A	B	A	D
Sodium Hypochlorite (100%)	D	B	C	A	B	A	D
Sodium Hyposulfate	*	*	C	A	*	*	*
Sodium Metaphosphate	A	A	B	A	A	A	A
Sodium Metasilicate	A	A	A	A	*	A	*
Sodium Nitrate	A	A	B	A	D	A	A
Sodium Perborate	B	A	B	A	B	A	B
Sodium Peroxide	B	A	B	A	D	A	A
Sodium Polyphosphate	A	A	B	A	D	A	A
Sodium Silicate	A	A	A	A	A	A	A
Sodium Sulfate	A	A	A	A	A	A	A

LEGEND: A - Excellent B - Good C - Fair D - Severe Effect * - Insufficient Data

Media								
	Nitrile (NBR)	EPDM	Neoprene	Teflon® (PTFE)	Silicone	Viton® (FPM)	Nylon	
Sodium Sulfide	A	A	A	A	A	A	A	LEGEND: A - Excellent B - Good C - Fair D - Severe Effect * - Insufficient Data
Sodium Sulfite	A	A	A	A	A	A	D	
Sodium Tetraborate	A	A	B	A	A	A	A	
Sodium Thiosulfate (hypo)	B	A	A	A	A	A	B	
Sorghum	A	*	A	*	*	A	A	
Soy Sauce	A	*	A	*	*	A	A	
Stannic Chloride	A	A	C	A	B	A	B	
Stannic Fluoborate	A	*	A	*	*	A	*	
Stannous Chloride	A	C	A	A	B	A	C	
Starch	A	A	A	A	*	A	A	
Stearic Acid	B	B	B	A	B	A	A	
Stoddard Solvent	A	D	C	A	D	A	A	
Styrene	D	D	D	A	D	B	A	
Sugar (Liquids)	A	A	A	A	A	A	A	
Sulfate (Liquors)	A	A	B	A	B	A	B	
Sulfur Chloride	D	D	D	A	C	A	A	
Sulfur Dioxide	D	A	B	A	B	A	C	
Sulfur Dioxide (dry)	D	A	D	A	B	A	B	
Sulfur Hexafluoride	B	B	A	*	B	*	B	
Sulfur Trioxide	D	C	D	A	B	A	D	
Sulfur Trioxide (dry)	D	C	D	A	B	A	A	
Sulfuric Acid (<10%)	A	A	B	A	C	A	C	
Sulfuric Acid (10-75%)	B	B	B	A	D	A	D	
Sulfuric Acid (75-100%)	C	B	D	A	D	A	D	
Sulfuric Acid (cold concentrated)	D	C	D	A	D	B	D	
Sulfuric Acid (hot concentrated)	D	D	D	A	D	A	D	
Sulfurous Acid	B	B	C	A	D	A	D	
Sulfuryl Chloride	*	*	*	A	*	*	*	
Tallow	A	A	B	A	*	A	A	
Tannic Acid	A	A	A	A	B	A	C	
Tanning Liquors	B	B	A	A	B	A	A	
Tartaric Acid	A	B	A	A	A	A	B	
Tetrachloroethane	D	D	D	A	D	A	C	
Tetrachloroethylene	D	D	D	A	D	A	A	
Tetrahydrofuran	D	D	D	A	D	D	A	
Tin Salts	A	B	*	A	B	A	*	
Toluene (Toluol)	D	D	D	A	D	C	A	
Tomato Juice	A	A	A	A	*	A	A	
Trichloroacetic Acid	*	B	D	A	D	C	C	
Trichloroethane	D	D	D	A	D	A	C	
Trichloroethylene	D	D	D	A	D	A	C	
Trichloropropane	D	*	A	A	*	A	*	
Tricresylphosphate	D	A	C	A	C	A	A	
Triethylamine	C	A	A	A	*	D	A	
Trisodium Phosphate	A	A	A	A	A	A	A	
Turpentine	*	D	D	A	D	A	B	
Urea	B	A	B	A	B	A	A	
Uric Acid	*	*	A	A	*	*	A	
Urine	A	A	D	A	*	A	B	
Varnish	B	D	D	A	D	A	A	
Vegetable Juice	A	A	*	A	B	A	A	
Vinegar	B	A	B	A	A	A	A	
Vinyl Acetate	D	B	D	A	D	A	*	
Vinyl Chloride	D	C	D	A	*	A	A	
Water, Acid, Mine	A	A	C	A	B	A	A	
Water, Deionized	A	A	A	A	*	A	A	
Water, Distilled	A	A	A	A	C	A	A	
Water, Fresh	A	A	A	A	B	A	A	
Water, Salt	A	A	A	A	B	A	A	
Weed Killers	A	*	C	*	A	A	A	
Whey	A	*	*	A	*	A	*	
Whiskey & Wines	A	A	C	A	A	A	A	
White Liquor (Pulp Mill)	A	*	A	A	A	A	A	
White Water (Paper Mill)	*	*	A	*	*	A	A	
Xylene	D	D	D	A	D	B	A	
Zinc Chloride	A	A	A	A	B	A	A	
Zinc Hydrosulfite	A	A	A	A	*	*	A	
Zinc Sulfate	A	A	A	A	A	A	A	

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE / SOLUTION
Lip Surface hardened	Lip hardening can be caused by excessive operating temperatures, inadequate lubrication, or if the media being sealed is incompatible with the lip material.
Sealing lip brittle or cracked	Operating temperature of sealed media or lubricant may exceed the recommended limits for the type of sealing member material. Make sure the seal is the correct size for the application. If the seal is too tight on the shaft, this may cause overheating. Check that the seal was installed with and maintained adequate lubrication for the type of seal you are using.
Sealing lip shows excessive wear (entire circumference)	Shaft finish may be too rough at point of lip contact. Seal may not have been properly or adequately lubricated prior to installation. Make sure the seal is the correct size. If the seal is too tight on the shaft, this may cause overheating and rapid wear. Shaft run-out or shaft whip may exceed the recommended limits. Make sure that the seal seats close to the bearing and check for excessive looseness in the bearing or splines.
Sealing lip shows excessive wear (one side)	Check misalignment of shaft to bore. Shaft misalignment causes rapid wear at one point on the sealing lip.
Sealing lip contact on shaft is too light	Make sure the seal is the correct size for the application. Check for excessive wear at point of lip contact. The shaft may be too soft, be sure to check the minimum shaft hardness specifications for your application. Check to make sure you used the proper installation tool. Your installation tool must not have an O.D. of more than 1/32" greater than the shaft or the sealing lip may be overstretched
Sealing lip is nicked or scratched	This can be caused by careless storage, handling, or the use of improper assembly / installation tools. This can also be caused by failing to properly clean and prepare shaft prior to installation and/or failing to protect the sealing member when installing over splines or keyways etc.
Seal case is distorted	The seal O.D. may be too large for the housing bore. The housing bore may be excessively out-of-round. If you find that the bore diameter and the out-of-round limits are correct, look for evidence of careless handling or the use of improper installation tools.
Garter spring is damaged	This may be caused by careless handling or use of improper installation tools or methods. Excessive spreading of the primary sealing lip during the installation process can damage the spring.
Inner components of the seal assembly are loose	This can be caused by the use of improper installation tools. Check the out-of-round limits of the housing bore and make sure the O.D. of the seal is not too large for the bore. Either of these conditions can cause the seal to become distorted. Seal distortion may not be apparent, but may be enough to loosen the inner components of the seal and cause it to leak.
Seal cocked in housing	This can be because of the use of improper installation tools or methods. Check to make sure the seal O.D. is not too large for the bore. Also be sure to check for burrs, scale, or chips that may prevent the seal from seating properly.
Excessive shaft wear	Check to be sure the seal is the proper size for the shaft. Too tight of a fit will cause excessive wear on both the lip and the contact point on the shaft. Check to be sure the seal was properly and adequately lubricated prior to installation. Check to be sure that the seal stays lubricated while in use. Check for the presence of abrasive dirt or other debris. Make sure shaft was cleaned properly prior to the installation of the seal. In applications where the seal has the possibility of getting dirt or other large debris on or near the sealing lip, a seal with a dust lip should be used.
Shaft is scratched or gouged	Carefully inspect and clean the shaft prior to installation. If the shaft cannot be refinished, a shaft repair sleeve may be needed.
Leakage around the O.D. of the seal	The seal may be cocked in the housing. Check the O.D. surface of the seal for evidence of damage from installation, careless handling or improper storage prior to use. Check interior of housing for excessive roughness, foreign matter, scratches or burrs. Check housing to be sure it is not out-of-round. If the eccentricity is only slight, .001" or so, special cement on the O.D. can be used to offset this problem.
Other	Your Harwal representative will be happy to assist you with any questions or concerns you may have with our sealing products.

Shaft Seal Interchange Table

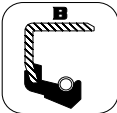
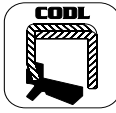
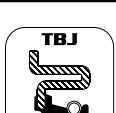
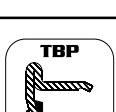
HARWAL TYPES	A	AO	ADL	B	BO	BDL	C
Chicago Rawhide (SKF)	HMS4	HM4	HMSA7	CRW1	HM14	CRWA1	CRWH1
Dichtomatic	A		AS	B		BS	CRWH1
Freudenberg	BA	BAOF	BASL	B1	B1OF	B1SL	B2
Gaco	A		FA	ABI			
Garlock	92	91	94	76	71	78	50
Goetze	827N		827S	822N		822S	824N
ISP	A	VC	AS	BE	VB	BES	CE
Kaco	DG	DGS	DF	DC	DFS	DFK	DFSK
NAK	SC		TC	SB		TB	SA
National	35	34	32	48	44	47	45
NOK	SC	VC	TC	SB	VB	TB	SA2
Paulstra	IE		IEL	EE		EEL	EEP
Pioneer Weston	R21		R23	R4/WR		R6	R1/WRL
Simmerwerke	A		ASL	B		BSL	C
Stefa	CB		CC	BB		BC	DB
Timken	35	34	32	48		47	45
Transcom (TCM)	SC	VC	TC	SB	VB	TB	SA2
Wyko Seals	A1N#		ASN#	B1N#		BSN#	C1N#

HARWAL TYPES	CDL	DC	HLSRS	HP-1	HES	VA	VS
Chicago Rawhide (SKF)	CRWHA1					VR1	VR2
Dichtomatic		ADUO		WCP21		VA	VS
Freudenberg	B2SL	DB					
Gaco			SMK				
Garlock			64	PS			
Goetze	824S						
ISP	CES						
Kaco							
NAK		DB					
National	41	7S			8L	VR1	VR2
NOK	TA2	BADUO					
Paulstra							
Pioneer Weston							
Simmerwerke	SCL						
Stefa	DC						
Timken	41				8L	VRS1	VRS2
Transcom (TCM)	TA	DC		PA1		VA	VS
Wyko Seals		A/BDN#					

HARWAL TYPES	VL	VE	RB	9RB	U4 1	U4 3	U4 5
Chicago Rawhide (SKF)	VR3	VR4	MVR1	MVR2	UN	SI	
Dichtomatic	VL	VE	VRM		MA25	MA23	MA24
Freudenberg							
Gaco							
Garlock							
Goetze							
ISP							
Kaco							
NAK							
National	VR3	VR4					
NOK							
Paulstra							
Pioneer Weston							
Simmerwerke							
Stefa							
Timken	VRS3	VRS4					
Transcom (TCM)			AFS	AFX	UNP	UOP	UIP
Wyko Seals							

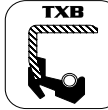
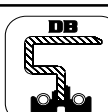
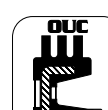
Harwal design capabilities:

Virtually ANY design is available, including custom designs. Shown here are the most widely used designs and configurations. See page 22 for helix designs.

Rubber covered O.D. improves sealing ability at the housing, and is kind to softer materials. The “A” and “ADL” styles will hold up in low-pressure applications. The “AO” and “AODL” are for non-pressure applications only.				
Precision ground O.D. with a lead-in chamfer to help ease the installation. Does not have the sealability around the O.D. like the rubber covered and is also not as kind to softer housing materials. Stainless steel is available on special request.				
Precision ground O.D. with the addition of an inner case that provides increased structural rigidity and durability. This style is more often used in large bore diameters or heavy duty applications. Stainless steel is available on special request.				
Rubber covered O.D. improves sealing ability at the housing, and is kind to softer materials. This seal type offers an additional rubber lining that fully protects the inner case from rusting or corroding which could contaminate the sealed media.				
Precision ground O.D. with a lead-in chamfer to help ease the installation. This seal type offers an additional rubber lining that fully protects the inner case from rusting or corroding which could contaminate the sealed media. Stainless steel is available on special request.				
Ribbed O.D. for use in applications where the housing material is subject to high thermal expansion. This seal type is also used when press fitting into a housing where installation is usually difficult.				
Precision ground O.D. with added structural rigidity particularly when there is a large radial seal width. This seal type also allows for installation from both sides. Stainless steel is available on special request.				
Rubber covered O.D. with a flange will allow easy installation or replacement . These features also give additional rigidity and restrict the installation depth into the housing.				
Precision ground O.D. with a flange will allow easy installation or replacement . These features also give additional rigidity and restrict the installation depth into the housing. Stainless steel is available on special request.				
Precision ground and reinforced O.D. includes a minimum clearance flange that allows for an easy installation or replacement. The flange also restricts the installation depth into the housing. Stainless steel is available on special request.				
Precision ground O.D. includes a minimum clearance flange that allows for an easy installation or replacement. The flange also restricts the installation depth into the housing. Stainless steel is available on special request.				

Harwal design capabilities:

Virtually ANY design is available, even custom designs, shown here are the most widely used designs and configurations. See page 22 for helix designs.

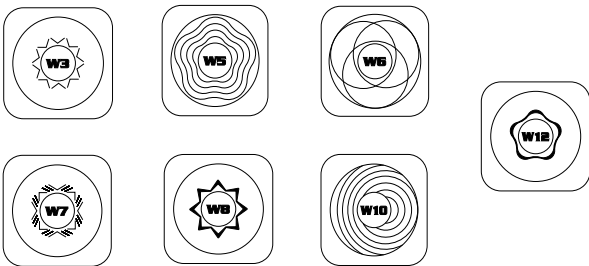
Precision ground or rubber covered O.D. available. This lip design includes a cavity to allow pre-lubrication of the seal. This will help during the initial dry running. The inward-facing double lip is perfect for applications where space is limited and a secondary lip is required. Stainless steel is available on special request.				
This design features a 50/50 metal / rubber O.D. to provide the metal-to-metal press fit and the sealing capabilities of a rubber O.D. into one simple design. This seal design will counter rough or worn housings. Stainless steel is available on special request.				
Precision ground or rubber O.D. with a triple flat lip design is for use in heavy dirt applications. These will commonly be found in agricultural equipment. Stainless steel is available on special request.				
The metal case of this design is extended into the lip flex section to strengthen the lip and allow for low to medium pressures depending on shaft speed and runout. Stainless steel is available on special request.				
The metal case of this design is extended into the lip flex section to strengthen the lip and allow for low to medium pressures depending on shaft speed and runout. An additional dust lip has been added to protect the sealing lip from large particles. Stainless steel is available on special request.				
Dual opposing spring loaded sealing members. Designed for sealing and separating two different media. Stainless steel is available on special request.				
External Seals (Sealing against housing) Designed to press fit onto the shaft instead of the housing, the external lip type performs and has the same design characteristics as standard radial lip seals. Stainless steel is available on special request.				
				
				
				
				

Harwal design capabilities:
Virtually ANY design is available, even custom designs, shown here are the most widely used designs and configurations.

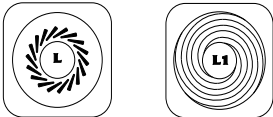
Designed for applications where there is a reciprocating shaft. This seal type will act as a dust wiper or scraper. Primarily used in hydraulic or pneumatic applications. Stainless steel is available on special request.	W1 W2 W3 W4
Designed for static applications to act as a plug or barrier. The VK type is for applications that do not have pressure above 7psi. The VK-HP type is designed to be able to handle pressure up to 50psi. Stainless steel is available on special request.	VK VKHP
Designed for reciprocating or static applications to retain fluid or act as a dust wiper/scraper. Made out of solid 90 shore polyurethane. These types are flexible, have good abrasion resistance, and are considerably durable.	U41 U43 U45
VA and VS styles are designed to be fixed on the shaft sealing axially against a perpendicular counter face. RB and 9RB styles perform in the same way as the VA and VS styles but have the added feature of a metal face for protection. Stainless steel is available on special request.	VA VS RB 9RB

Harwal helix capabilities:
 Adding a helix design to an oil seal can improve the performance of the primary sealing lip. The helix causes a pumping action to push any medium back towards the fluid side. Specific designs are available for bi-directional, left, and right hand shaft rotations.

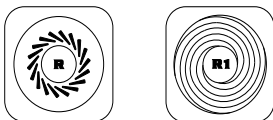
Bi-directional:
 For use in applications where the shaft rotates left and/or right.  and/or 



Left only:
 For use in applications where the shaft rotates to the left. 



Right only:
 For use in applications where the shaft rotates to the right. 



Metric Shaft Seals

Complete Size Listing

6,528 different sizes and styles.

Nitrile price breaks at:

50, 100, 250, 500 and 1,000 pcs.*

Viton® price breaks at:

10, 25, 50, 100, 250, 500, 1,000 pcs.*

*Custom price breaks available, please call us with your needs.

Harwal can beat any competitors price.

Reference Numbers for Metric Sizes

Harwal seals are designated by the actual hardware dimensions.

The capital letters refer to type. The most common seal types can be found at the top of the listing on each page. See pages 20-22 for additional seal types.

35	47	10	A	NBR
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35 = 35mm Shaft Diameter (I.D.)

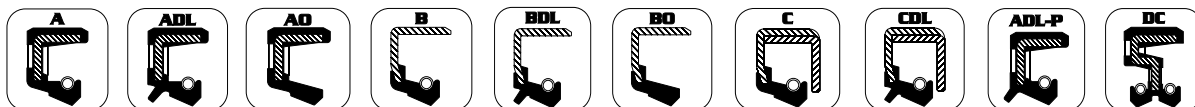
47 = 47mm Bore Diameter (O.D.)

10 = 10mm Width

A = Seal Type

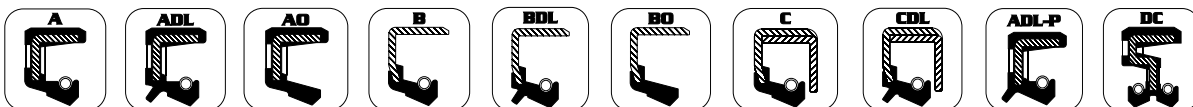
NBR = Lip Material

Can't find the size or style you are looking for?
Harwal can make almost ANY seal in 2 weeks!

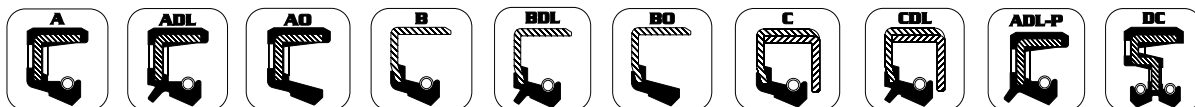


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
02	09	03	AO	NBR	06	16	05	A	NBR
03	10	06	AO	NBR	06	16	05	A	FPM
3.5	09	03	AO	NBR	06	16	05	ADL	NBR
04	08	02	AO	NBR	06	16	06	A	NBR
04	08	02	BO	NBR	06	16	06	A	FPM
04	08	02	BO	FPM	06	16	07	A	NBR
04	09	3.2	AO	NBR	06	16	07	A	FPM
04	10	04	AO	NBR	06	16	07	ADL	NBR
04	11	02	AO	NBR	06	17	06	A	NBR
04	11	06	A	NBR	06	17	07	A	NBR
04	11	06	A	FPM	06	18	05	A	NBR
04	12	06	A	NBR	06	18	06	A	NBR
04	12	06	A	FPM	06	18	07	A	NBR
04	16	07	ADL	NBR	06	18	07	ADL	NBR
4.5	17	07	ADL	NBR	06	19	04	A	NBR
4.8	22	07	A	NBR	06	19	06	A	NBR
05	09	02	AO	NBR	06	19	06	A	FPM
05	09	02	BO	NBR	06	19	06	ADL	NBR
05	09	03	AO	NBR	06	19	07	A	NBR
05	10	02	AO	NBR	06	19	07	A	FPM
05	11	02	AO	NBR	06	19	07	ADL	NBR
05	11	03	AO	NBR	06	20	5.5	AO	NBR
05	14	05	BODL	NBR	06	20	06	A	FPM
05	14.5	07	ADL	NBR	06	21	07	ADL	NBR
05	15	06	A	NBR	06	22	06	ADL	NBR
05	15	07	A	NBR	06	22	07	A	NBR
05	16	06	A	NBR	06	22	07	A	FPM
05	16	07	A	NBR	06	22	07	ADL	NBR
05	16	07	A	FPM	06	22	07	ADL	FPM
05	16	07	ADL	NBR	06	22	08	A	NBR
05	17	07	ADL	NBR	06	22	08	ADL	NBR
05	18	07	A	NBR	06	25	06	ADL	NBR
05	18	07	ADL	NBR	6.5	12	04	AO	NBR
05	18	08	ADL	NBR	6.5	14.5	07	ADL	NBR
05	19	05	ADL	NBR	07	11	02	AO	NBR
05	22	07	ADL	NBR	07	11	02	BO	NBR
05	25	07	ADL	NBR	07	11	02	BO	FPM
05	30	06	AODL	NBR	07	12	02	BO	NBR
06	09	3.2	AO	NBR	07	13	03	AO	NBR
06	10	02	AO	NBR	07	14	02	BO	NBR
06	10	02	BO	NBR	07	14	02	BO	FPM
06	10	02	BO	FPM	07	14	04	ADL	NBR
06	11	03	AO	NBR	07	14	05	A	NBR
06	11	05	AO	NBR	07	15	05	A	NBR
06	12	02	AO	NBR	07	16	04	ADL	NBR
06	12	04	A	NBR	07	16	07	A	NBR
06	12	4.5	ADL	NBR	07	16	07	A	FPM
06	12	5.5	A	NBR	07	16	07	ADL	NBR
06	13	4.5	BO	NBR	07	18	05	ADL	NBR
06	14	06	A	NBR	07	18	07	A	NBR
06	14	06	A	FPM	07	18	08	ADL	NBR
06	15	04	A	NBR	07	19	06	A	NBR
06	15	04	A	FPM	07	19	07	ADL	NBR
06	15	04	AO	NBR	07	20	06	A	NBR
06	15	06	A	NBR	07	22	06	ADL	NBR

NBR=Nitrile FPM=Viton®

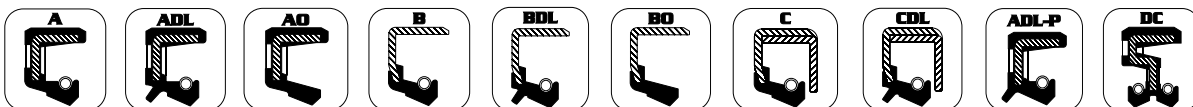


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
07	22	07	A	NBR	08	22	07	A	FPM
07	22	07	ADL	NBR	08	22	07	ADL	FPM
07	22	07	ADL	FPM	08	22	07	ADL-P	NBR
07	22	08	A	NBR	08	22	08	A	NBR
07	26	5.5	ADL	NBR	08	22	10	A	NBR
07	29	07	ADL	NBR	08	23	07	ADL	NBR
08	12	03	AO	NBR	08	24	07	A	NBR
08	12	03	AO	FPM	08	24	07	A	FPM
08	13	3.5	AO	NBR	08	24	07	ADL	NBR
08	14	04	A	NBR	08	25	07	ADL	NBR
08	14	04	A	FPM	08	25	08	ADL	NBR
08	14	04	ADL	NBR	08	26	07	ADL	NBR
08	14	04	AO	NBR	08	30	06	ADL	NBR
08	14	04	B	FPM	08	30	07	A	NBR
08	14	06	B	NBR	08	30	07	A	FPM
08	15	03	A	FPM	09	13	03	AO	NBR
08	15	03	AO	NBR	09	15	03	AO	NBR
08	15	05	A	NBR	09	15	05	AODL	NBR
08	15	07	A	NBR	09	16	03	AO	NBR
08	16	03	AO	NBR	09	16	04	A	NBR
08	16	04	A	NBR	09	16	05	A	NBR
08	16	06	A	NBR	09	17	4.5	B	NBR
08	16	06	ADL	NBR	09	18	03	AO	NBR
08	16	06	ADL	FPM	09	18	06	A	NBR
08	16	07	A	NBR	09	18	07	A	NBR
08	16	07	A	FPM	09	19	04	A	NBR
08	16	07	ADL	NBR	09	19	05	ADL	NBR
08	16	07	ADL	FPM	09	19	05	ADL	NBR
08	16	07	ADL	FPM	09	20	06	ADL-P	NBR
08	17	05	ADL	NBR	09	20	07	ADL	NBR
08	17	07	ADL	NBR	09	20	09	ADL	NBR
08	18	04	A	NBR	09	21	9.5	ADL	NBR
08	18	05	A	NBR	09	22	07	A	NBR
08	18	05	A	FPM	09	22	07	A	FPM
08	18	05	ADL	NBR	09	22	07	ADL	NBR
08	18	05	ADL	FPM	09	22	07	ADL	FPM
08	18	06	A	NBR	09	24	07	A	NBR
08	18	07	A	NBR	09	24	07	A	FPM
08	18	07	ADL	NBR	09	24	07	ADL	NBR
08	18	08	ADL	NBR	09	26	07	A	NBR
08	19	6.5	A	NBR	09	26	07	A	FPM
08	19	07	A	FPM	09	28	08	A	NBR
08	19	07	ADL	NBR	09	29	07	ADL	NBR
08	20	05	ADL	NBR	09	30	07	A	NBR
08	20	07	A	NBR	10	14	03	AO	NBR
08	20	08	A	NBR	10	14	03	AO	FPM
08	20	08	A	FPM	10	14	03	BO	NBR
08	20	08	ADL	NBR	10	14	03	BO-P	NBR
08	21	06	ADL	NBR	10	15	03	BO	NBR
08	22	04	ADL	NBR	10	16	04	A	NBR
08	22	05	A	NBR	10	16	04	A	FPM
08	22	06	ADL	NBR	10	16	04	AO	NBR
08	22	06	ADL-P	NBR	10	16	05	A	NBR
08	22	06	ADL-P	FPM	10	16	06	B	NBR
08	22	07	A	NBR	10	16	07	ADL	NBR

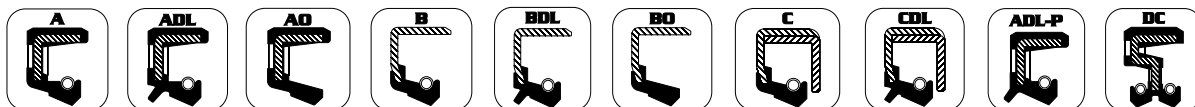


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
10	16.5	04	A	NBR	10	22	07	ADL	NBR
10	17	03	AO	NBR	10	22	07	ADL	FPM
10	17	03	AO	FPM	10	22	08	A	NBR
10	17	04	AO	NBR	10	22	08	A	FPM
10	17	05	B	NBR	10	22	08	ADL	NBR
					10	22	08	B	NBR
10	17	05	BO	NBR	10	23	07	ADL	NBR
10	17	06	A	NBR	10	23	08	ADL	NBR
10	17	07	ADL	NBR	10	23	09	ADL	NBR
10	18	04	A	NBR	10	23.5	08	ADL	NBR
10	18	04	ADL	NBR					
					10	24	06	ADL	NBR
10	18	05	A	NBR	10	24	07	A	NBR
10	18	05	ADL	NBR	10	24	07	A	FPM
10	18	06	A	NBR	10	24	07	ADL	NBR
10	18	06	ADL	NBR	10	24	07	ADL	FPM
10	18	06	ADL	FPM					
					10	25	05	ADL	NBR
10	18	07	A	FPM	10	25	06	A	NBR
10	18	07	ADL	NBR	10	25	06	ADL	NBR
10	18	08	ADL	NBR	10	25	06	ADL	NBR
10	18	09	A	NBR	10	25	07	A	NBR
10	19	03	AO	NBR	10	25	07	ADL	NBR
					10	25	07	ADL	FPM
10	19	04	A	NBR	10	25	07	ADL-P	NBR
10	19	04	ADL	NBR	10	25	10	ADL	NBR
10	19	06	AODL	NBR	10	26	03	BO	NBR
10	19	07	A	NBR	10	26	07	A	NBR
10	19	07	A	FPM					
					10	26	07	A	FPM
10	19	07	ADL	NBR	10	26	07	ADL	NBR
10	19	07	ADL	FPM	10	26	07	ADL	FPM
10	19	08	A	NBR	10	26	08	ADL	NBR
10	20	04	A	NBR	10	28	07	A	NBR
10	20	04	ADL	NBR					
					10	28	07	A	FPM
10	20	04	AO	NBR	10	28	07	ADL	NBR
10	20	4.5	A	NBR	10	28	08	A	FPM
10	20	05	A	NBR	10	30	06	ADL	NBR
10	20	05	ADL	NBR	10	30	07	A	NBR
10	20	06	A	NBR					
					10	30	07	ADL	NBR
10	20	06	A	FPM	10	30	07	ADL	FPM
10	20	06	ADL	NBR	10	30	08	A	NBR
10	20	06	ADL-P	NBR	10	30	10	A	NBR
10	20	06	ADL-P	FPM	10	30	12	ADL	NBR
10	20	07	A	NBR					
					10	40	07	ADL	NBR
10	20	07	ADL	NBR	10.5	15	03	AO	NBR
10	20	07	ADL	FPM	10.8	20	09	AO	NBR
10	21	04	AO	NBR	11	16	03	AO	NBR
10	21	05	A	NBR	11	17	04	A	NBR
10	21	05	ADL	NBR					
					11	17	04	A	FPM
10	21	07	ADL	NBR	11	17	04	ADL	NBR
10	22	03	AO	NBR	11	17	04	ADL	FPM
10	22	04	ADL	NBR	11	18	04	ADL	NBR
10	22	05	ADL	NBR	11	19	05	ADL	NBR
10	22	06	A	NBR					
					11	19	06	ADL	NBR
10	22	06	A	FPM	11	19	07	A	NBR
10	22	06	ADL	NBR	11	20	04	ADL	NBR
10	22	06	ADL-P	NBR	11	20	4.5	B	NBR
10	22	07	A	NBR	11	22	04	AO	NBR
10	22	07	A	FPM					

NBR=Nitrile FPM=Viton®

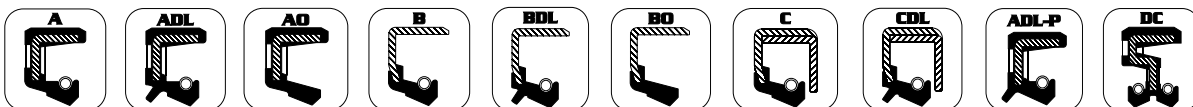


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
11	22	04	ADL	NBR	12	22	4.5	A	NBR
11	22	07	A	NBR	12	22	05	A	NBR
11	22	07	A	FPM	12	22	05	ADL	NBR
11	22	07	ADL	NBR	12	22	5.5	ADL-P	NBR
11	22	07	ADL-P	NBR	12	22	06	A	NBR
11	22	08	A	NBR	12	22	06	ADL	NBR
11	23	07	ADL	NBR	12	22	06	ADL-P	NBR
11	24	07	ADL	NBR	12	22	6.5	A	NBR
11	25	07	ADL	NBR	12	22	07	A	NBR
11	26	07	A	NBR	12	22	07	A	FPM
11	26	07	A	FPM	12	22	07	ADL	NBR
11	26	07	ADL	NBR	12	22	07	ADL	FPM
11	26	07	ADL	FPM	12	22	07	ADL-P	NBR
11	28	07	ADL	NBR	12	22	07	B	NBR
11	29	07	CDL	NBR	12	22	07	DC	NBR
11	30	07	A	NBR	12	22	08	A	NBR
11	30	07	ADL	NBR	12	22	09	ADL	NBR
11	30	08	A	NBR	12	22.5	07	ADL	NBR
11	30	10	A	NBR	12	23	08	ADL	NBR
11.6	19	06	A	NBR	12	24	04	AO	NBR
12	16	03	AO	NBR	12	24	4.5	A	NBR
12	16	03	AO	FPM	12	24	06	A	NBR
12	18	03	AO	NBR	12	24	06	ADL	NBR
12	18	03	AO	FPM	12	24	06	ADL-P	NBR
12	18	03	BO	NBR	12	24	06	ADL-P	FPM
12	18	03	BO	FPM	12	24	6.5	A	NBR
12	18	4.5	A	NBR	12	24	6.5	A	FPM
12	18	4.5	A	FPM	12	24	07	A	NBR
12	18	05	A	NBR	12	24	07	A	FPM
12	18	5.5	AO	NBR	12	24	07	ADL	NBR
12	18	06	B	NBR	12	24	07	ADL	FPM
12	18.5	03	AO	NBR	12	24	07	ADL-P	NBR
12	19	03	AO	NBR	12	24	07	ADL-P	FPM
12	19	03	AO	FPM	12	24	08	A	NBR
12	19	4.5	A	NBR	12	24	10	A	NBR
12	19	05	A	NBR	12	25	4.5	A	NBR
12	19	05	A	FPM	12	25	4.5	ADL	NBR
12	19	05	ADL	NBR	12	25	05	A	NBR
12	19	05	ADL	FPM	12	25	05	A	FPM
12	19	07	ADL	NBR	12	25	05	ADL	NBR
12	19.5	4.5	A	NBR	12	25	06	ADL	NBR
12	20	04	A	NBR	12	25	07	A	NBR
12	20	04	ADL	NBR	12	25	07	A	FPM
12	20	05	A	NBR	12	25	07	ADL	NBR
12	20	05	ADL	NBR	12	25	07	ADL	FPM
12	20	05	ADL	FPM	12	25	07	ADL-P	NBR
12	20	07	A	NBR	12	25	08	A	NBR
12	20	07	ADL	NBR	12	25	08	A	FPM
12	21	04	A	NBR	12	25	08	ADL	NBR
12	21	04	ADL	NBR	12	25	10	ADL	NBR
12	21	05	A	NBR	12	25.5	07	ADL	NBR
12	21	05	ADL	NBR	12	26	06	A	NBR
12	21	07	ADL	NBR	12	26	07	A	NBR
12	22	04	A	NBR	12	26	07	A	FPM
12	22	04	A	FPM	12	26	07	ADL	NBR

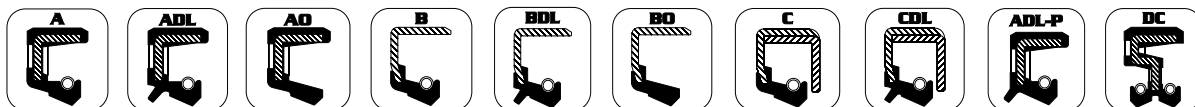


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
12	26	08	A	NBR	12.7	26	06	A	NBR
12	26	08	ADL	NBR	13	19	03	AO	NBR
12	26	10	ADL	NBR	13	19	04	AO	NBR
12	27	07	ADL	NBR	13	20	05	AO	NBR
12	28	05	A	NBR	13	22	04	ADL	NBR
12	28	07	A	NBR	13	22	05	A	NBR
12	28	07	A	FPM	13	22	05	ADL	NBR
12	28	07	ADL	NBR	13	22	05	B	NBR
12	28	07	ADL	FPM	13	22	06	A	NBR
12	28	07	ADL-P	NBR	13	22	07	ADL	NBR
12	28	08	A	NBR	13	23	6.5	B	NBR
12	28	08	ADL	NBR	13	24	07	A	NBR
12	29	07	ADL	NBR	13	24	07	ADL	NBR
12	30	05	A	NBR	13	25	04	A	NBR
12	30	06	A	NBR	13	25	05	A	NBR
12	30	06	AO	NBR	13	25	07	A	NBR
12	30	07	A	NBR	13	25	07	ADL	NBR
12	30	07	A	FPM	13	25	08	ADL	NBR
12	30	07	ADL	NBR	13	26	05	A	NBR
12	30	07	ADL	FPM	13	26	07	A	NBR
12	30	08	ADL	NBR	13	26	07	A	FPM
12	30	09	ADL	NBR	13	26	07	ADL	NBR
12	30	10	A	NBR	13	26	07	ADL	FPM
12	30	10	A	FPM	13	26	09	A	NBR
12	32	4.5	BDL	NBR	13	26	09	ADL	FPM
12	32	05	A	NBR	13	28	07	A	NBR
12	32	05	ADL	NBR	13	28	07	ADL	NBR
12	32	07	A	NBR	13	28	08	ADL	NBR
12	32	07	A	FPM	13	30	05	A	NBR
12	32	07	ADL	NBR	13	30	07	A	NBR
12	32	07	ADL	FPM	13	30	07	A	FPM
12	32	07	ADL-P	NBR	13	30	08	A	NBR
12	32	10	A	NBR	13	30	10	A	NBR
12	34	07	ADL	NBR	13	30	10	ADL	NBR
12	35	4.3	A	NBR	13	32	06	A	NBR
12	35	06	ADL	NBR	13	32	07	A	NBR
12	35	07	A	FPM	13	33	07	BDL	NBR
12	35	07	ADL	NBR	13	35	07	ADL	NBR
12	35	10	A	NBR	13	35	10	A	NBR
12	36	07	ADL	NBR	13.7	24	05	A	NBR
12	37	07	A	NBR	14	18	03	AO	NBR
12	37	07	ADL	NBR	14	18	03	AODL	FPM
12	37	10	A	NBR	14	20	03	AO	NBR
12	38	07	ADL	NBR	14	20	05	AO	NBR
12	42	08	ADL	NBR	14	20	07	ADL	NBR
12	45	07	A	NBR	14	20	12	AO	NBR
12	50	05	ADL	NBR	14	21	03	AO	NBR
12.5	19	05	A	NBR	14	21	04	A	NBR
12.5	20	05	A	NBR	14	22	03	AO	NBR
12.5	20	06	A	NBR	14	22	04	A	FPM
12.5	22	05	A	NBR	14	22	04	ADL	NBR
12.5	22	06	A	NBR	14	22	04	AO	NBR
12.5	22.5	05	A	NBR	14	22	05	A	NBR
12.5	23.5	07	ADL	NBR	14	22	06	AO	NBR
12.5	25	08	ADL	NBR	14	22	07	A	NBR

NBR=Nitrile FPM=Viton®

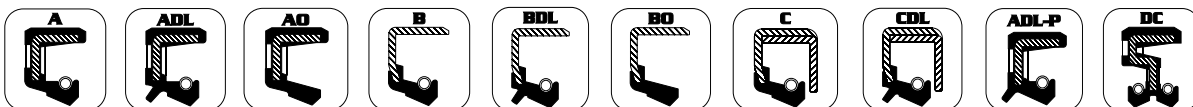


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
14	22	07	ADL	NBR	14	35	10	ADL	NBR
14	23	06	A	NBR	14	38	07	ADL	NBR
14	23.5	06	A	NBR	14	40	07	ADL	NBR
14	24	04	AO	NBR	14.5	24	04	A	NBR
14	24	05	A	NBR	14.5	32	07	ADL	NBR
14	24	05	ADL	NBR	14.6	27	07	ADL	NBR
14	24	05	ADL	FPM	14.7	30	07	ADL	NBR
14	24	06	ADL	NBR	14.8	30	05	ADL	NBR
14	24	07	A	NBR	15	20	05	BO	NBR
14	24	07	A	FPM	15	20	05	BODL	NBR
14	24	07	ADL	NBR	15	21	02	BO	NBR
14	24	07	ADL	FPM	15	21	03	AO	NBR
14	24	07	ADL-P	NBR	15	21	03	AO	FPM
14	24	08	ADL	NBR	15	21	03	AODL	FPM
14	25	05	A	NBR	15	21	03	BO	NBR
14	25	05	ADL	NBR	15	21	04	A	NBR
14	25	07	A	NBR	15	21	04	ADL	NBR
14	25	07	ADL	NBR	15	21	04	AO	NBR
14	25	08	A	NBR	15	21	05	ADL	NBR
14	25.5	07	ADL	NBR	15	22	03	AO	FPM
14	26	07	A	NBR	15	22	04	A	FPM
14	26	07	ADL	NBR	15	22	04	AODL	NBR
14	26	07	ADL	FPM	15	22	05	ADL	NBR
14	26	08	ADL	NBR	15	22	07	A	NBR
14	27	07	A	FPM	15	23	03	AO	NBR
14	27	07	ADL	NBR	15	23	03	AO	FPM
14	28	06	A	NBR	15	23	04	ADL	NBR
14	28	06	ADL	NBR	15	23	05	ADL	NBR
14	28	07	A	NBR	15	23	07	ADL	NBR
14	28	07	A	FPM	15	24	4.5	AO	NBR
14	28	07	ADL	NBR	15	24	05	A	NBR
14	28	07	ADL	FPM	15	24	05	A	FPM
14	28	07	ADL-P	NBR	15	24	05	ADL	NBR
14	28	08	ADL	NBR	15	24	06	ADL	NBR
14	28	10	A	FPM	15	24	07	A	NBR
14	28	10	ADL	NBR	15	24	07	A	FPM
14	29	07	ADL	NBR	15	24	07	ADL	NBR
14	30	03	AO	NBR	15	24	07	ADL	FPM
14	30	07	A	NBR	15	24	07	ADL-P	NBR
14	30	07	A	FPM	15	24	07	DC	NBR
14	30	07	ADL	NBR	15	24	08	A	NBR
14	30	07	ADL	FPM	15	25	03	AO	NBR
14	30	08	A	NBR	15	25	04	ADL	NBR
14	30	08	ADL	NBR	15	25	05	A	NBR
14	30	09	ADL	NBR	15	25	05	A	FPM
14	30	10	A	NBR	15	25	05	ADL	NBR
14	32	05	A	NBR	15	25	05	ADL	FPM
14	32	06	ADL	NBR	15	25	05	BO	FPM
14	32	07	ADL	NBR	15	25	06	A	NBR
14	32	10	A	NBR	15	25	06	ADL	NBR
14	34	07	A	NBR	15	25	06	ADL-P	NBR
14	35	07	A	NBR	15	25	06	ADL-P	FPM
14	35	07	A	FPM	15	25	07	A	NBR
14	35	07	ADL	NBR	15	25	07	ADL	NBR
14	35	08	A	NBR	15	25	07	ADL	FPM

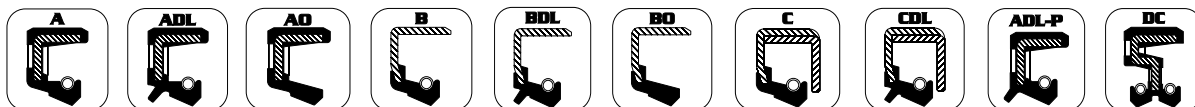


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
15	25	07	ADL-P	NBR	15	32	07	ADL	NBR
15	25	08	ADL	NBR	15	32	07	ADL	FPM
15	25	10	A	FPM	15	32	07	ADL-P	NBR
15	25.5	4.5	A	NBR	15	32	07	B	NBR
15	25.5	4.5	A	FPM	15	32	08	ADL	NBR
15	25.5	07	ADL	NBR	15	32	09	ADL	NBR
15	26	4.5	A	NBR	15	32	10	A	NBR
15	26	06	A	NBR	15	33	07	A	NBR
15	26	06	ADL	NBR	15	33	10	ADL	NBR
15	26	07	A	NBR	15	34	07	ADL	NBR
15	26	07	A	FPM	15	35	05	A	NBR
15	26	07	ADL	NBR	15	35	05	A	FPM
15	26	07	ADL	FPM	15	35	06	ADL	NBR
15	26	07	B	NBR	15	35	06	ADL-P	NBR
15	26	08	ADL	NBR	15	35	07	A	NBR
15	26	09	ADL	NBR	15	35	07	A	FPM
15	27	05	AO	NBR	15	35	07	ADL	NBR
15	27	07	A	NBR	15	35	07	ADL	FPM
15	27	07	A	FPM	15	35	07	BDL	NBR
15	27	07	ADL	NBR	15	35	08	A	NBR
15	28	03	BO	NBR	15	35	08	ADL	NBR
15	28	04	A	NBR	15	35	09	ADL	NBR
15	28	05	A	FPM	15	35	10	A	NBR
15	28	06	A	NBR	15	35	10	ADL	NBR
15	28	07	A	NBR	15	35	10	ADL	FPM
15	28	07	A	FPM	15	35.2	5.5	ADL	NBR
15	28	07	ADL	NBR	15	36	07	ADL	NBR
15	28	07	ADL	FPM	15	37	07	A	NBR
15	28	08	A	NBR	15	37	07	A	FPM
15	28	08	ADL	NBR	15	37	07	ADL	NBR
15	28	10	ADL	NBR	15	37	10	A	NBR
15	28.58	07	ADL	NBR	15	38	10	ADL	NBR
15	29	07	ADL	NBR	15	40	07	ADL	NBR
15	30	04	AO	NBR	15	40	08	ADL	NBR
15	30	4.5	A	NBR	15	40	10	A	NBR
15	30	05	A	NBR	15	40	10	A	FPM
15	30	05	ADL	NBR	15	40	10	ADL	NBR
15	30	5.5	A	NBR	15	42	07	A	NBR
15	30	06	A	FPM	15	42	07	A	FPM
15	30	07	A	NBR	15	42	07	ADL	NBR
15	30	07	A	FPM	15	42	08	ADL	NBR
15	30	07	ADL	NBR	15	42	10	A	NBR
15	30	07	ADL	FPM	15	42	10	A	FPM
15	30	07	ADL-P	NBR	15	42	10	ADL	NBR
15	30	07	DC	NBR	15	46	06	A	NBR
15	30	08	ADL	NBR	15	47	10	ADL	NBR
15	30	10	A	NBR	15	48	08	ADL	NBR
15	30	10	A	FPM	15	50	07	A	NBR
15	30	10	ADL	NBR	15.5	28	07	ADL	NBR
15	30	12	ADL	NBR	15.6	25.5	07	ADL	NBR
15	31	07	ADL	NBR	15.8	24	05	BDL	NBR
15	32	05	A	NBR	15.88	24	04	AO	NBR
15	32	5.5	A	NBR	16	20	2.5	BO	NBR
15	32	07	A	NBR	16	20	07	AO	NBR
15	32	07	A	FPM	16	21	03	BO	NBR

NBR=Nitrile FPM=Viton®

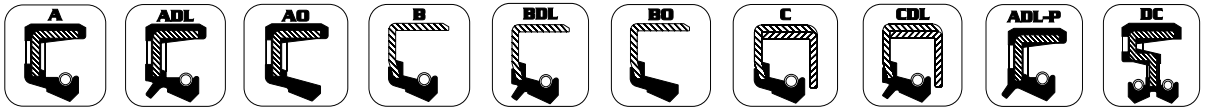


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
16	21	4.5	BDL	NBR	16	30	07	A	FPM
16	22	03	AO	NBR	16	30	07	ADL	NBR
16	22	03	AO	FPM	16	30	07	ADL	FPM
16	22	04	A	NBR	16	30	08	A	NBR
16	22	04	A	FPM	16	30	08	ADL	NBR
16	22	04	ADL	NBR	16	30	10	A	NBR
16	22	04	AO	NBR	16	30	10	A	FPM
16	22	07	A	NBR	16	31	07	ADL	NBR
16	22	07	ADL	NBR	16	32	07	A	NBR
16	22.2	04	A	NBR	16	32	07	A	FPM
16	23	04	ADL	NBR	16	32	07	ADL	NBR
16	24	03	AO	NBR	16	32	07	ADL	FPM
16	24	03	AO	FPM	16	32	07	B	NBR
16	24	04	A	FPM	16	32	08	A	FPM
16	24	04	AO	NBR	16	32	10	A	NBR
16	24	04	AO	FPM	16	32	10	A	FPM
16	24	05	A	NBR	16	33	11	A	NBR
16	24	05	A	FPM	16	34	10	ADL	NBR
16	24	06	B	NBR	16	35	07	A	NBR
16	24	6.5	ADL	NBR	16	35	07	A	FPM
16	24	07	A	NBR	16	35	07	ADL	NBR
16	24	07	A	FPM	16	35	07	ADL	FPM
16	24	07	ADL	NBR	16	35	08	A	NBR
16	25	03	AO	NBR	16	35	09	ADL	NBR
16	25	03	AO	FPM	16	35	09	ADL-P	NBR
16	25	04	ADL	NBR	16	35	10	A	NBR
16	25	06	ADL	NBR	16	35	10	A	FPM
16	25	07	A	NBR	16	36	07	ADL	NBR
16	25	07	ADL	NBR	16	37	07	ADL	NBR
16	25	07	BDL	NBR	16	38	07	A	NBR
16	25.5	07	A	NBR	16	40	05	A	NBR
16	26	05	A	NBR	16	40	07	ADL	NBR
16	26	06	A	NBR	16	40	10	A	NBR
16	26	06	ADL	NBR	16	40	10	ADL	NBR
16	26	07	A	NBR	16	40	10	ADL-P	FPM
16	26	07	A	FPM	16	42	06	A	NBR
16	26	07	ADL	NBR	16	42	07	ADL	NBR
16	26	07	ADL-P	NBR	16	42	10	ADL	NBR
16	26	08	ADL	NBR	16	47	08	ADL	NBR
16	27	07	ADL	NBR	16	48	07	ADL	NBR
16	28	04	AO	NBR	16.5	28	08	ADL	NBR
16	28	05	A	NBR	17	23	03	AO	NBR
16	28	07	A	NBR	17	23	03	AO	FPM
16	28	07	A	FPM	17	23	03	AODL	NBR
16	28	07	ADL	NBR	17	23	04	AODL	NBR
16	28	07	ADL	FPM	17	24	2.5	AODL	NBR
16	28	07	ADL-P	NBR	17	24	03	AODL	NBR
16	28	08	ADL	NBR	17	24	04	ADL	NBR
16	28.58	07	ADL	NBR	17	24	04	AO	NBR
16	29	07	ADL	NBR	17	24	05	ADL	NBR
16	30	4.5	A	NBR	17	24	07	A	NBR
16	30	4.5	ADL	FPM	17	25	03	AO	NBR
16	30	4.5	ADL-P	NBR	17	25	03	AO	FPM
16	30	06	B	NBR	17	25	04	A	NBR
16	30	07	A	NBR	17	25	04	A	FPM

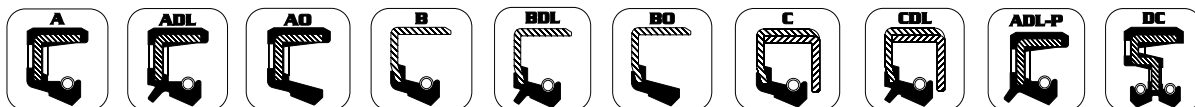


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
17	25	04	ADL	NBR	17	32	05	A	NBR
17	25	06	ADL	NBR	17	32	07	A	NBR
17	25	07	A	NBR	17	32	07	A	FPM
17	25	07	ADL	NBR	17	32	07	ADL	NBR
17	26	02	AO	NBR	17	32	07	ADL	FPM
17	26	03	AO	FPM	17	32	7.5	B	NBR
17	26	06	A	NBR	17	32	08	A	NBR
17	26	06	A	FPM	17	32	08	ADL	NBR
17	26	06	ADL	NBR	17	32	10	A	NBR
17	26	07	A	NBR	17	32	10	A	FPM
17	27	06	A	NBR	17	33	07	B	NBR
17	27	06	ADL	NBR	17	33	07	BDL	NBR
17	27	07	A	NBR	17	33	08	A	NBR
17	27	07	ADL	NBR	17	34	04	ADL	NBR
17	27	07	ADL	FPM	17	34	04	B	NBR
17	27	08	ADL	NBR	17	34	06	ADL	NBR
17	27	10	ADL	NBR	17	34	07	A	NBR
17	28	04	A	NBR	17	35	05	A	NBR
17	28	05	A	NBR	17	35	05	ADL	NBR
17	28	05	A	FPM	17	35	06	A	NBR
17	28	05	ADL-P	NBR	17	35	07	A	NBR
17	28	06	A	NBR	17	35	07	A	FPM
17	28	06	ADL	NBR	17	35	07	ADL	NBR
17	28	06	ADL	FPM	17	35	07	ADL	FPM
17	28	07	A	NBR	17	35	07	ADL-P	NBR
17	28	07	A	FPM	17	35	07	B	FPM
17	28	07	ADL	NBR	17	35	08	A	NBR
17	28	07	ADL	FPM	17	35	08	ADL	NBR
17	28	07	ADL-P	NBR	17	35	08	ADL-P	NBR
17	28	08	A	NBR	17	35	09	ADL	NBR
17	28	08	A	FPM	17	35	10	A	NBR
17	28	08	ADL	NBR	17	35	10	A	FPM
17	28	08	DC	NBR	17	36	07	ADL	NBR
17	28.5	09	ADL	NBR	17	37	05	ADL	NBR
17	28.5	10	ADL	NBR	17	37	07	A	NBR
17	28.65	07	ADL	NBR	17	37	07	ADL	NBR
17	29	05	A	NBR	17	37	10	A	NBR
17	29	05	A	FPM	17	37	10	ADL	NBR
17	29	07	ADL	NBR	17	38	05	ADL	NBR
17	30	03	AO	NBR	17	38	07	A	NBR
17	30	05	A	NBR	17	38	07	ADL	NBR
17	30	05	A	FPM	17	39	9.5	ADL	NBR
17	30	05	ADL	NBR	17	40	4.6	AODL	NBR
17	30	06	A	NBR	17	40	05	ADL	NBR
17	30	06	ADL	NBR	17	40	06	A	NBR
17	30	06	ADL-P	NBR	17	40	06	A	FPM
17	30	07	A	NBR	17	40	07	A	NBR
17	30	07	A	FPM	17	40	07	A	FPM
17	30	07	ADL	NBR	17	40	07	ADL	NBR
17	30	07	ADL	FPM	17	40	07	ADL	FPM
17	30	07	ADL-P	NBR	17	40	07	DC	NBR
17	30	08	A	NBR	17	40	08	A	NBR
17	30	08	ADL	NBR	17	40	08	ADL	NBR
17	31	07	A	NBR	17	40	8.5	A	NBR
17	31	07	ADL	NBR	17	40	10	A	NBR

NBR=Nitrile FPM=Viton®

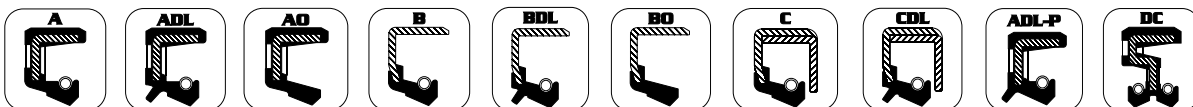


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
17	40	10	A	FPM	18	30	10	A	NBR
17	40	10	ADL	NBR	18	31	07	ADL	NBR
17	42	05	A	NBR	18	32	05	ADL	NBR
17	42	07	A	NBR	18	32	06	ADL	NBR
17	47	07	A	NBR	18	32	06	ADL-P	NBR
17	47	07	A	FPM	18	32	07	A	NBR
17	47	07	ADL	NBR	18	32	07	ADL	NBR
17	47	08	A	NBR	18	32	07	ADL	NBR
17	47	08	ADL	NBR	18	32	07	ADL	FPM
17	47	10	A	NBR	18	32	07	ADL-P	NBR
17	47	10	ADL	NBR	18	32	08	A	NBR
17	47	11	A	NBR	18	32	08	A	FPM
17.5	23	03	AODL	NBR	18	32	08	ADL	NBR
17.5	28	06	A	NBR	18	32	10	A	NBR
18	24	03	AO	NBR	18	34	07	ADL	NBR
18	24	03	AO	FPM	18	35	06	A	NBR
18	24	04	AO	NBR	18	35	06	ADL	NBR
18	24	05	A	NBR	18	35	06	ADL-P	NBR
18	25	03	AO	NBR	18	35	06	ADL-P	FPM
18	25	04	B	NBR	18	35	07	A	NBR
18	25	06	B	NBR	18	35	07	A	FPM
18	25	07	ADL	NBR	18	35	07	ADL	NBR
18	26	04	A	NBR	18	35	07	ADL	FPM
18	26	04	AO	NBR	18	35	08	A	NBR
18	26	04	BO	FPM	18	35	08	A	FPM
18	26	06	A	NBR	18	35	08	ADL	NBR
18	27	04	AO	NBR	18	35	10	A	NBR
18	27	04	AO	FPM	18	35	10	ADL	NBR
18	27	07	ADL	NBR	18	36	08	ADL	NBR
18	28	04	A	NBR	18	37	07	ADL	NBR
18	28	04	A	FPM	18	37	08	A	NBR
18	28	06	A	NBR	18	37	08	ADL	NBR
18	28	06	A	FPM	18	38	05	A	NBR
18	28	06	ADL	NBR	18	38	07	ADL	NBR
18	28	07	A	NBR	18	38	10	ADL	NBR
18	28	07	A	FPM	18	40	06	ADL	NBR
18	28	07	ADL	NBR	18	40	07	A	NBR
18	28	07	ADL	FPM	18	40	07	A	FPM
18	28	08	A	NBR	18	40	07	ADL	NBR
18	28	08	A	FPM	18	40	07	ADL	FPM
18	28	08	ADL	NBR	18	40	10	A	NBR
18	28	10	ADL	NBR	18	40	10	A	FPM
18	29	05	ADL	NBR	18	40	10	ADL	NBR
18	29	07	A	NBR	18	42	07	ADL	NBR
18	29	07	ADL	NBR	18	42	08	A	NBR
18	30	05	A	NBR	18	42	08	A	FPM
18	30	06	ADL	NBR	18	42	10	A	NBR
18	30	06	ADL-P	NBR	18	42	10	ADL	NBR
18	30	06	ADL-P	FPM	18	44	08	A	NBR
18	30	07	A	NBR	18	47	08	ADL	NBR
18	30	07	A	FPM	18	47	10	A	NBR
18	30	07	ADL	NBR	18.9	28	05	A	NBR
18	30	07	ADL	FPM	18.9	30	05	ADL	NBR
18	30	07	ADL-P	NBR	19	26	05	AO	NBR
18	30	08	ADL	NBR	19	27	04	AO	NBR

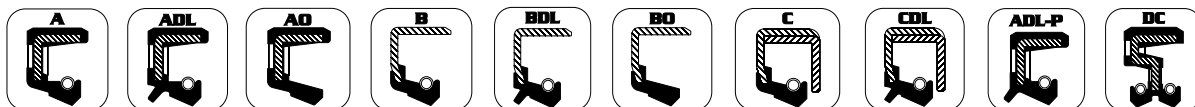


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
19	27	04	AO	FPM	20	24	2.5	AO	NBR
19	27	05	ADL	NBR	20	25	05	ADL	NBR
19	27	06	A	NBR	20	25	07	ADL	NBR
19	28	05	ADL-P	FPM	20	26	02	AO	NBR
19	28	07	ADL	NBR	20	26	04	AO	NBR
19	29	07	ADL	NBR	20	26	04	AO	NBR
19	29	08	ADL	NBR	20	26	04	AODL	NBR
19	30	05	A	NBR	20	26	04	ADL	NBR
19	30	05	ADL	NBR	20	26	05	ADL	NBR
19	30	06	A	NBR	20	26	10	AO	NBR
19	30	07	ADL	NBR	20	27	04	AODL	NBR
19	30	07	ADL	FPM	20	27	05	ADL	NBR
19	30	08	A	NBR	20	27	06	B	NBR
19	30	10	A	NBR	20	28	03	BO	NBR
19	30.5	07	AODL	NBR	20	28	04	AO	NBR
19	31	05	ADL	NBR	20	28	04	AO	NBR
19	31	08	ADL	NBR	20	28	04	BO	NBR
19	32	05	ADL	NBR	20	28	4.5	AO	NBR
19	32	06	ADL-P	FPM	20	28	05	BO	NBR
19	32	07	A	NBR	20	28	06	A	NBR
19	32	07	A	FPM	20	28	06	A	FPM
19	32	07	ADL	NBR	20	28	06	ADL	NBR
19	32	07	ADL	FPM	20	28	07	A	NBR
19	32	07	ADL-P	NBR	20	28	07	A	FPM
19	32	08	ADL	NBR	20	28	07	ADL	NBR
19	32	10	A	NBR	20	29	9.5	BDL	NBR
19	33.3	08	ADL	NBR	20	30	04	AODL	NBR
19	34	07	ADL	NBR	20	30	4.5	A	NBR
19	35	06	ADL-P	FPM	20	30	4.5	ADL	NBR
19	35	07	A	NBR	20	30	05	A	NBR
19	35	07	ADL	NBR	20	30	05	A	FPM
19	35	08	A	NBR	20	30	05	ADL	NBR
19	35	08	ADL	NBR	20	30	05	ADL-P	NBR
19	35	10	A	NBR	20	30	06	ADL	NBR
19	35	10	ADL	NBR	20	30	07	A	NBR
19	36	07	A	NBR	20	30	07	A	FPM
19	36	08	A	NBR	20	30	07	ADL	NBR
19	36	08	ADL	NBR	20	30	07	ADL	FPM
19	37	07	ADL	NBR	20	30	07	ADL-P	NBR
19	37	08	ADL	NBR	20	30	07	B	NBR
19	37	10	A	NBR	20	30	07	B	NBR
19	38	07	ADL	NBR	20	30	07	DC	NBR
19	38	7.5	ADL-P	NBR	20	30	08	A	NBR
19	38	10	A	NBR	20	30	08	ADL	FPM
19	38	10	ADL	NBR	20	30	09	B	NBR
19	40	08	ADL	NBR	20	31	07	A	NBR
19	40	10	A	NBR	20	31	07	ADL	NBR
19	42	07	A	NBR	20	31	07	ADL	FPM
19	46	17	ADL	NBR	20	32	04	AO	NBR
19	47	07	ADL	NBR	20	32	05	A	NBR
19	47	07	ADL	NBR	20	32	05	ADL	NBR
19	47	07	BDL	NBR	20	32	06	A	NBR
19	47	10	ADL	NBR	20	32	06	A	FPM
19	52	06	A	NBR	20	32	06	ADL	NBR
19	53	7.5	A	NBR	20	32	06	ADL	FPM
19.8	30	05	ADL	NBR	20	32	07	A	NBR

NBR=Nitrile FPM=Viton®

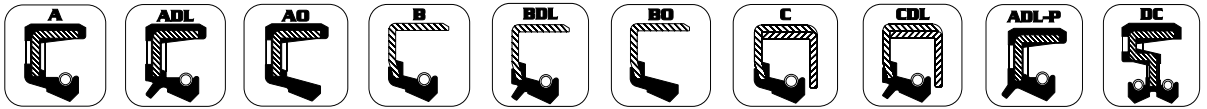


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
20	32	07	A	FPM	20	38	08	A	NBR
20	32	07	ADL	NBR	20	38	08	A	FPM
20	32	07	ADL	FPM	20	38	08	ADL	NBR
20	32	07	ADL-P	NBR	20	38	10	ADL	NBR
20	32	07	B	NBR	20	38	15	DC	NBR
20	32	08	ADL	NBR	20	40	04	ADL	NBR
20	32	08	DC	NBR	20	40	05	ADL	NBR
20	32	12	ADL	NBR	20	40	06	A	NBR
20	33	07	ADL	NBR	20	40	06	A	FPM
20	33	09	A	NBR	20	40	07	A	NBR
20	33	10	A	NBR	20	40	07	A	FPM
20	33	10	A	FPM	20	40	07	ADL	NBR
20	34	06	A	NBR	20	40	07	ADL	FPM
20	34	07	A	NBR	20	40	07	B	NBR
20	34	07	ADL	NBR	20	40	08	ADL	NBR
20	34	08	ADL	NBR	20	40	08	DC	NBR
20	35	04	ADL	NBR	20	40	09	A	NBR
20	35	05	A	NBR	20	40	09	DC	NBR
20	35	06	A	NBR	20	40	10	A	NBR
20	35	06	ADL	NBR	20	40	10	A	FPM
20	35	06	ADL-P	NBR	20	40	10	ADL	NBR
20	35	06	ADL-P	FPM	20	40	10	ADL	FPM
20	35	07	A	NBR	20	40	11	ADL	NBR
20	35	07	A	FPM	20	41	07	ADL	NBR
20	35	07	ADL	NBR	20	41.2	05	ADL	NBR
20	35	07	ADL	FPM	20	42	05	ADL	NBR
20	35	07	ADL-P	NBR	20	42	06	A	FPM
20	35	07	B	NBR	20	42	06	ADL	NBR
20	35	08	A	NBR	20	42	07	A	NBR
20	35	08	A	FPM	20	42	07	A	FPM
20	35	08	ADL	NBR	20	42	07	ADL	NBR
20	35	08	ADL	FPM	20	42	07	ADL	FPM
20	35	08	DC	NBR	20	42	07	ADL-P	NBR
20	35	10	A	NBR	20	42	07	B	NBR
20	35	10	A	FPM	20	42	08	ADL	NBR
20	35	10	ADL	NBR	20	42	10	A	NBR
20	35	10	ADL	FPM	20	42	10	A	FPM
20	35	10	C	NBR	20	42	10	ADL	NBR
20	35	12	ADL	NBR	20	42	10	B	NBR
20	35.8	04	BDL	NBR	20	43	7.5	A	NBR
20	36	07	A	NBR	20	45	07	ADL	NBR
20	36	07	ADL	NBR	20	45	08	ADL	NBR
20	36	08	A	FPM	20	45	10	A	NBR
20	36	08	ADL	FPM	20	45	10	ADL	NBR
20	37	06	B	NBR	20	45	12	A	NBR
20	37	07	ADL	NBR	20	45	12	ADL	NBR
20	37	08	A	NBR	20	46	06	A	NBR
20	37	08	A	FPM	20	46	08	ADL	NBR
20	37	08	ADL	NBR	20	47	05	ADL	NBR
20	37	10	A	NBR	20	47	07	A	NBR
20	37	10	ADL	NBR	20	47	07	A	FPM
20	38	05	A	NBR	20	47	07	ADL	NBR
20	38	05	ADL	NBR	20	47	07	ADL	FPM
20	38	07	A	NBR	20	47	07	B	NBR
20	38	07	ADL	NBR	20	47	08	A	NBR

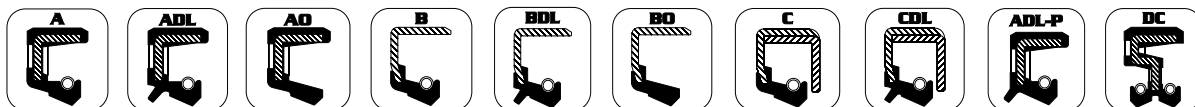


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
20	47	08	ADL	NBR	22	30	06	ADL	NBR
20	47	09	ADL	NBR	22	30	07	A	NBR
20	47	10	A	NBR	22	30	07	A	FPM
20	47	10	A	FPM	22	30	07	ADL	NBR
20	47	10	ADL	NBR	22	30	10	AO	NBR
20	47.5	07	ADL	NBR	22	31	05	A	NBR
20	48	09	A	NBR	22	31	06	ADL	NBR
20	50	05	ADL	NBR	22	32	03	BO	NBR
20	50	08	ADL	NBR	22	32	04	A	NBR
20	50	10	ADL	NBR	22	32	4.5	ADL	NBR
20	52	06	A	NBR	22	32	05	A	NBR
20	52	07	A	NBR	22	32	5.5	A	NBR
20	52	07	A	FPM	22	32	5.5	ADL	NBR
20	52	07	ADL	NBR	22	32	06	ADL	NBR
20	52	08	ADL	NBR	22	32	06	B	NBR
20	52	09	ADL	NBR	22	32	07	A	NBR
20	52	10	A	NBR	22	32	07	A	FPM
20	52	10	A	FPM	22	32	07	ADL	NBR
20	52	10	ADL	NBR	22	32	07	ADL	FPM
20	52	10	ADL	FPM	22	32	07	ADL-P	NBR
20	52	12	A	NBR	22	32	08	ADL	NBR
20	52	12	ADL	NBR	22	32	10	A	NBR
20	62	6.5	A	NBR	22	33	6.5	ADL	NBR
20	62	08	ADL	NBR	22	33	07	A	NBR
20	62	10	ADL	NBR	22	33	07	ADL	NBR
20	72	10	A	NBR	22	34	05	A	NBR
21	28	3.5	BO	NBR	22	34	05	ADL	NBR
21	28	5.5	BO	NBR	22	35	05	ADL	NBR
21	29	04	AO	NBR	22	35	5.5	ADL	NBR
21	30	6.5	A	NBR	22	35	06	A	NBR
21	32	05	A	NBR	22	35	06	ADL	NBR
21	32	07	A	NBR	22	35	06	ADL-P	NBR
21	32	07	ADL	NBR	22	35	07	A	NBR
21	32	08	ADL	NBR	22	35	07	A	FPM
21	33	07	ADL	NBR	22	35	07	ADL	NBR
21	35	06	A	NBR	22	35	07	ADL	FPM
21	35	6.5	A	NBR	22	35	07	B	NBR
21	35	07	A	NBR	22	35	07	DC	NBR
21	35	07	ADL	NBR	22	35	08	A	NBR
21	35	10	A	NBR	22	35	08	A	FPM
21	35	10	C	NBR	22	35	08	ADL	NBR
21	35	13	ADL	NBR	22	35	10	A	NBR
21	36	07	ADL	NBR	22	35	10	ADL	NBR
21	37	07	A	NBR	22	36	07	A	NBR
21	40	05	A	NBR	22	36	07	ADL	NBR
21	40	07	ADL	NBR	22	36	08	ADL	NBR
21	48	08	A	NBR	22	36	10	ADL	NBR
21	52	08	A	NBR	22	37	07	A	NBR
21.5	35	08	ADL	NBR	22	37	07	ADL	NBR
21.9	40	08	ADL	NBR	22	37	8.5	ADL	NBR
22	28	04	AO	NBR	22	38	05	ADL	NBR
22	29	04	ADL	NBR	22	38	07	A	NBR
22	29	04	AO	NBR	22	38	07	A	FPM
22	30	04	AO	NBR	22	38	07	ADL	NBR
22	30	04	AO	FPM	22	38	08	A	NBR

NBR=Nitrile FPM=Viton®

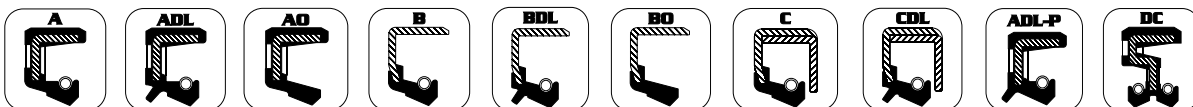


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
22	38	08	ADL	NBR	23	35	06	A	NBR
22	39	06	ADL	NBR	23	35	07	A	NBR
22	40	04	ADL	NBR	23	35	07	ADL	NBR
22	40	05	A	FPM	23	36	06	ADL	NBR
22	40	06	A	NBR	23	36	07	ADL	NBR
22	40	07	A	NBR	23	37	06	ADL	NBR
22	40	07	A	FPM	23	38	07	A	NBR
22	40	07	ADL	NBR	23	38	08	A	NBR
22	40	07	ADL	FPM	23	38	08	A	FPM
22	40	07	BDL	NBR	23	40	06	ADL	NBR
22	40	08	A	NBR	23	40	07	BDL	NBR
22	40	08	ADL	NBR	23	40	08	A	NBR
22	40	8.5	A	NBR	23	40	08	ADL	NBR
22	40	10	A	NBR	23	40	10	A	NBR
22	40	10	A	FPM	23	40	10	ADL	NBR
22	40	10	ADL	NBR	23	42	06	ADL	NBR
22	40	12	ADL	NBR	23	42	07	ADL	NBR
22	40	16	ADL	NBR	23	42	10	A	NBR
22	41	07	ADL	NBR	23	42	11	ADL-P	NBR
22	41.25	06	ADL	NBR	23	43	08	ADL	NBR
22	41.5	07	BDL	NBR	23	45	11	ADL	NBR
22	42	06	ADL	NBR	23	47	07	ADL	NBR
22	42	07	A	NBR	23	47	10	ADL	NBR
22	42	07	ADL	NBR	23	48	10	ADL	NBR
22	42	10	A	NBR	23	52	11	ADL	NBR
22	42	10	ADL	NBR	23	52	12	A	NBR
22	42	11	ADL	NBR	24	30	03	BO	NBR
22	42	11	ADL-P	NBR	24	31	03	AODL	NBR
22	45	07	A	NBR	24	32	04	AO	NBR
22	45	07	A	FPM	24	32	05	B	NBR
22	45	10	ADL	NBR	24	32	07	BDL	NBR
22	46	10	ADL	NBR	24	33	05	ADL-P	NBR
22	47	07	A	NBR	24	34	5.5	A	NBR
22	47	07	A	FPM	24	34	07	ADL	NBR
22	47	07	ADL	NBR	24	35	5.5	A	NBR
22	47	07	ADL	FPM	24	35	5.5	ADL	NBR
22	47	10	A	NBR	24	35	06	A	NBR
22	47	10	B	NBR	24	35	06	A	FPM
22	48	10	A	NBR	24	35	07	A	NBR
22	50	05	ADL	NBR	24	35	07	A	FPM
22	50	10	A	NBR	24	35	07	ADL	NBR
22	50.8	9.52	ADL	NBR	24	35	07	ADL	FPM
22	52	10	A	FPM	24	35	08	ADL	NBR
22	52	10	ADL	NBR	24	36	06	A	NBR
22	55	07	ADL	NBR	24	36	07	A	FPM
22	56	08	ADL	NBR	24	36	07	ADL	NBR
22.5	35	06	ADL	NBR	24	36	07	B	NBR
23	28	03	BO	NBR	24	36.5	08	ADL	NBR
23	29	03	AO	NBR	24	37	07	A	NBR
23	29	3.5	AO	NBR	24	37	07	A	FPM
23	30	04	AODL	NBR	24	37	07	ADL	NBR
23	32	05	AO	NBR	24	37	07	ADL	FPM
23	32	05	BDL	NBR	24	38	07	ADL	NBR
23	32	07	ADL	NBR	24	38	08	ADL	NBR
23	34	08	ADL	NBR	24	38	10	ADL	NBR

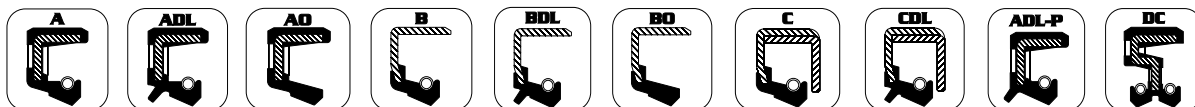


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
24	38.2	07	ADL	NBR	25	33	04	BO	FPM
24	39	08	A	NBR	25	33	06	A	NBR
24	40	06	ADL-P	NBR	25	33	06	A	FPM
24	40	06	ADL-P	FPM	25	33	06	ADL	NBR
24	40	07	A	NBR	25	33	06	ADL-P	NBR
24	40	07	A	FPM	25	33	09	A	NBR
24	40	07	ADL	NBR	25	34	05	BDL	NBR
24	40	07	ADL	FPM	25	34	07	BDL	NBR
24	40	07	ADL-P	NBR	25	35	04	AO	NBR
24	40	08	A	NBR	25	35	04	AO	FPM
24	40	10	A	NBR	25	35	05	A	NBR
24	42	07	A	NBR	25	35	05	ADL	NBR
24	42	08	A	NBR	25	35	06	A	NBR
24	42	08	A	FPM	25	35	06	A	FPM
24	42	08	ADL	NBR	25	35	06	ADL	NBR
24	42	10	A	NBR	25	35	06	ADL	FPM
24	42	10	C	NBR	25	35	06	ADL-P	NBR
24	43	06	ADL	NBR	25	35	06	ADL-P	FPM
24	43	07	ADL	NBR	25	35	07	A	NBR
24	44	07	A	NBR	25	35	07	A	FPM
24	45	06	ADL	NBR	25	35	07	ADL	NBR
24	45	11	ADL	NBR	25	35	07	ADL	FPM
24	46	07	ADL	NBR	25	35	07	B	NBR
24	46	10	ADL	NBR	25	35	07	B	FPM
24	47	07	A	NBR	25	35	07	BDL	FPM
24	47	07	A	FPM	25	35	08	A	NBR
24	47	07	ADL	NBR	25	35	08	ADL	NBR
24	47	07	ADL-P	NBR	25	35	08	DC	NBR
24	47	10	A	NBR	25	35	09	A	NBR
24	47	10	ADL	NBR	25	35	10	A	NBR
24	48	07	ADL	NBR	25	35	10	ADL	NBR
24	49	12	ADL	NBR	25	36	05	ADL	NBR
24	49	18	ADL	NBR	25	36	06	A	NBR
24	50	10	A	NBR	25	36	06	ADL-P	NBR
24	50	12	ADL	NBR	25	36	07	A	NBR
24	52	07	ADL	NBR	25	36	07	A	FPM
24	52	10	ADL	NBR	25	36	07	ADL	NBR
24	55	10	ADL	NBR	25	36	08	ADL	NBR
24	62	07	A	NBR	25	36	10	A	NBR
24.5	40	8.5	A	NBR	25	37	05	A	NBR
25	30	04	BO	NBR	25	37	05	A	FPM
25	31	2.5	BO	NBR	25	37	05	ADL	NBR
25	32	04	AO	NBR	25	37	06	A	NBR
25	32	04	AO	FPM	25	37	06	ADL	NBR
25	32	04	BO	FPM	25	37	06	ADL	FPM
25	32	05	ADL	NBR	25	37	06	ADL-P	NBR
25	32	06	A	NBR	25	37	07	A	NBR
25	32	06	A	FPM	25	37	07	A	FPM
25	32	06	ADL	NBR	25	37	07	ADL	NBR
25	32	06	ADL	FPM	25	37	07	ADL	FPM
25	32	06	BDL	NBR	25	37	08	A	NBR
25	32	07	A	NBR	25	37	08	ADL	NBR
25	32	07	BDL	NBR	25	38	05	B	NBR
25	33	04	A	NBR	25	38	06	ADL	NBR
25	33	04	AO	NBR	25	38	07	A	NBR

NBR=Nitrile FPM=Viton®

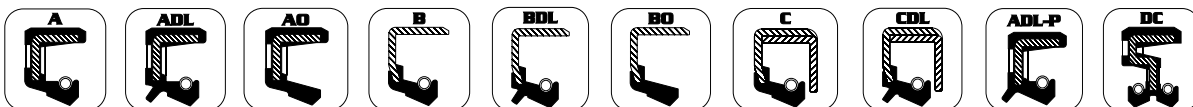


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
25	38	07	A	FPM	25	43	09	A	NBR
25	38	07	ADL	NBR	25	43	09	A	FPM
25	38	07	ADL	FPM	25	43	10	A	NBR
25	38	07	B	NBR	25	43	10	A	FPM
25	38	08	ADL	NBR	25	44	07	A	NBR
25	38	10	ADL	NBR	25	44	07	ADL	NBR
25	39	09	A	NBR	25	44	10	ADL	NBR
25	40	03	A	NBR	25	44.45	10	ADL	NBR
25	40	05	A	NBR	25	44.5	06	A	NBR
25	40	05	A	FPM	25	45	07	A	NBR
25	40	05	ADL	NBR	25	45	07	ADL	NBR
25	40	06	ADL	NBR	25	45	07	ADL	FPM
25	40	06	ADL	FPM	25	45	08	ADL	NBR
25	40	07	A	NBR	25	45	10	A	NBR
25	40	07	A	FPM	25	45	10	A	FPM
25	40	07	ADL	NBR	25	45	10	ADL	NBR
25	40	07	ADL	FPM	25	45	10	ADL	FPM
25	40	07	ADL-P	NBR	25	45	11	ADL	NBR
25	40	07	ADL-P	FPM	25	45	11	ADL-P	NBR
25	40	07	B	NBR	25	46	07	A	NBR
25	40	08	A	NBR	25	46	07	A	FPM
25	40	08	A	FPM	25	46	07	ADL	NBR
25	40	08	ADL	NBR	25	47	06	A	NBR
25	40	08	ADL	FPM	25	47	06	ADL	NBR
25	40	08	DC	NBR	25	47	06	ADL-P	NBR
25	40	09	C	NBR	25	47	06	ADL-P	FPM
25	40	10	A	NBR	25	47	06	B	NBR
25	40	10	A	FPM	25	47	07	A	NBR
25	40	10	ADL	NBR	25	47	07	A	FPM
25	40	10	ADL	FPM	25	47	07	ADL	NBR
25	40	10	B	NBR	25	47	07	ADL	FPM
25	41	06	ADL	NBR	25	47	07	BDL	NBR
25	41	07	ADL	NBR	25	47	08	A	NBR
25	41.5	08	ADL	NBR	25	47	08	A	FPM
25	42	05	ADL	NBR	25	47	08	ADL	NBR
25	42	06	A	NBR	25	47	09	C	NBR
25	42	06	A	FPM	25	47	10	A	NBR
25	42	06	ADL-P	NBR	25	47	10	A	FPM
25	42	07	A	NBR	25	47	10	ADL	NBR
25	42	07	A	FPM	25	47	10	ADL	FPM
25	42	07	ADL	NBR	25	47	10	C	NBR
25	42	07	ADL	FPM	25	48	07	ADL	NBR
25	42	07	B	NBR	25	48	08	A	NBR
25	42	08	A	NBR	25	48	08	ADL	NBR
25	42	08	A	FPM	25	48	10	ADL	NBR
25	42	08	ADL	NBR	25	49	07	ADL	NBR
25	42	08	B	NBR	25	50	07	A	NBR
25	42	8.5	A	NBR	25	50	07	A	FPM
25	42	09	A	NBR	25	50	08	ADL	NBR
25	42	10	A	NBR	25	50	10	A	NBR
25	42	10	A	FPM	25	50	10	ADL	NBR
25	42	10	ADL	NBR	25	50	10	ADL	FPM
25	42	10	ADL	FPM	25	50	12	A	NBR
25	42.9	9.5	BDL	NBR	25	51	11	A	NBR
25	43	06	A	NBR	25	52	05	A	NBR

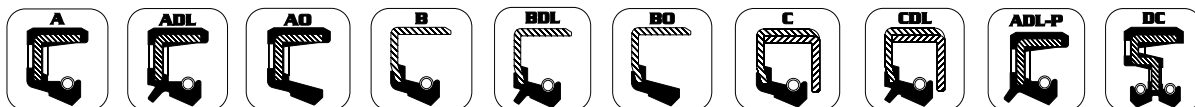


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
25	52	07	A	NBR	26	37	07	A	FPM
25	52	07	A	FPM	26	37	07	ADL	NBR
25	52	07	ADL	NBR	26	37	07	ADL	FPM
25	52	07	ADL	FPM	26	37	08	ADL	NBR
25	52	07	ADL-P	NBR	26	37	10	A	NBR
25	52	07	B	NBR	26	37	10.5	ADL	NBR
25	52	08	A	NBR	26	38	05	A	NBR
25	52	08	A	FPM	26	38	05	ADL	NBR
25	52	08	ADL	NBR	26	38	06	ADL	NBR
25	52	09	C	NBR	26	38	07	A	NBR
25	52	09	DC	NBR	26	38	07	ADL	NBR
25	52	10	A	NBR	26	38	07	ADL	FPM
25	52	10	A	FPM	26	38	08	A	NBR
25	52	10	ADL	NBR	26	38	08	ADL	NBR
25	52	12	A	NBR	26	40	05	ADL	NBR
25	52	12	ADL	NBR	26	40	06	A	NBR
25	52	15	ADL	NBR	26	40	07	A	NBR
25	53	10	ADL	NBR	26	40	07	ADL	NBR
25	54	08	ADL	NBR	26	40	09	A	NBR
25	55	08	ADL	NBR	26	40	09	ADL	NBR
25	55	09	ADL	NBR	26	41	07	ADL	NBR
25	55	10	ADL	NBR	26	42	06	A	NBR
25	58	10	A	NBR	26	42	07	A	NBR
25	58	10	ADL	NBR	26	42	07	ADL	NBR
25	62	06	A	NBR	26	42	07	ADL	FPM
25	62	07	A	NBR	26	42	08	A	NBR
25	62	07	A	FPM	26	42	08	ADL	NBR
25	62	07	ADL	NBR	26	42	10	ADL	NBR
25	62	08	A	NBR	26	42	10	C	NBR
25	62	08	A	FPM	26	43	06	B	NBR
25	62	08	ADL	NBR	26	43	07	ADL	NBR
25	62	10	A	NBR	26	43	08	ADL	NBR
25	62	10	A	FPM	26	45	06	ADL	NBR
25	62	10	ADL	NBR	26	45	07	A	NBR
25	62	12	C	NBR	26	45	07	ADL	NBR
25	65	12	ADL	NBR	26	45	10	B	NBR
25	70	10	ADL	NBR	26	46	07	ADL	NBR
25	72	07	A	FPM	26	47	05	ADL	NBR
25	72	07	ADL	NBR	26	47	07	A	NBR
25	72	10	ADL	NBR	26	47	07	A	FPM
26	30	06	AODL	NBR	26	47	07	ADL	NBR
26	31	03	BO	NBR	26	47	07	ADL	FPM
26	34	04	A	FPM	26	47	09	ADL	NBR
26	34	04	AO	NBR	26	47	10	A	NBR
26	34	09	AO	NBR	26	47	12	ADL	NBR
26	35	06	ADL	NBR	26	48	07	ADL	NBR
26	35	07	A	NBR	26	50	10	A	NBR
26	35	07	A	FPM	26	50	10	ADL	NBR
26	35	07	ADL	NBR	26	52	07	ADL	NBR
26	36	05	ADL	NBR	26	52	08	A	NBR
26	36	07	A	NBR	26	52	08	ADL	NBR
26	36	07	A	FPM	26	52	10	A	NBR
26	36	07	ADL	NBR	26	62	09	ADL	NBR
26	36	10	ADL	NBR	26.5	47	07	A	NBR
26	37	07	A	NBR	27	34	03	BO	NBR

NBR=Nitrile FPM=Viton®

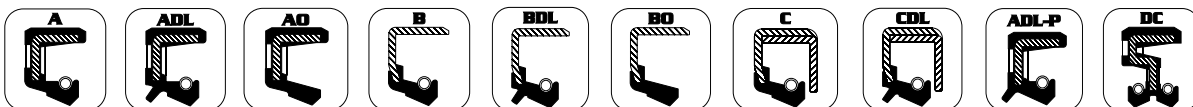


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
27	34	04	ADL	NBR	27	51	10	ADL	NBR
27	34	07	A	NBR	27	52	05	ADL	NBR
27	35	04	A	NBR	27	52	08	A	NBR
27	35	07	A	NBR	27	53	07	A	NBR
27	35	7.5	A	NBR	27	55	07	ADL	NBR
27	36	06	ADL	NBR	27	55	08	ADL	NBR
27	37	07	A	NBR	27	56	10	ADL	NBR
27	37	07	A	FPM	27	62	12	C	NBR
27	37	07	ADL	NBR	27	77	07	ADL	NBR
27	38	05	ADL	NBR	27.8	38	07	A	NBR
27	38	06	ADL	NBR	28	34	04	AO	NBR
27	38	07	A	NBR	28	35	04	AO	NBR
27	38	07	ADL	NBR	28	35	04	AO	FPM
27	39	10.5	ADL	NBR	28	35	05	ADL	NBR
27	39	10.5	BDL	NBR	28	35	05	BDL	NBR
27	40	06	A	NBR	28	35	07	ADL	NBR
27	40	06	ADL	NBR	28	35	08	ADL	NBR
27	40	07	A	NBR	28	36	05	BDL	NBR
27	40	07	A	FPM	28	36	07	ADL	NBR
27	40	07	ADL	NBR	28	37	04	AO	NBR
27	40	08	ADL	NBR	28	37	04	AO	FPM
27	40	10	A	NBR	28	37	05	ADL	NBR
27	41	07	ADL	NBR	28	37	06	ADL	NBR
27	41	10	A	NBR	28	37	07	ADL	NBR
27	41	10	A	FPM	28	38	5.5	A	NBR
27	41	10	ADL	NBR	28	38	06	A	NBR
27	42	07	A	NBR	28	38	07	A	NBR
27	42	07	A	FPM	28	38	07	A	FPM
27	42	07	ADL	FPM	28	38	07	ADL	NBR
27	42	07	ADL-P	NBR	28	38	07	ADL	FPM
27	42	08	ADL	NBR	28	38	10	ADL	NBR
27	42	09	ADL	NBR	28	39	07	ADL	NBR
27	42	10	A	NBR	28	39.5	08	BDL	NBR
27	42	10	ADL	NBR	28	40	05	A	NBR
27	42.85	08	ADL	NBR	28	40	05	ADL	NBR
27	43	08	ADL	NBR	28	40	06	ADL	FPM
27	43	08	ADL	FPM	28	40	06	ADL-P	NBR
27	43	09	A	NBR	28	40	06	ADL-P	FPM
27	44	07	ADL-P	NBR	28	40	07	A	NBR
27	45	07	ADL	NBR	28	40	07	A	FPM
27	45	08	A	NBR	28	40	07	ADL	NBR
27	45	08	ADL	NBR	28	40	07	ADL	FPM
27	45	09	ADL	NBR	28	40	07	ADL-P	NBR
27	47	5.5	ADL	FPM	28	40	08	A	NBR
27	47	06	A	NBR	28	40	08	ADL	NBR
27	47	07	A	NBR	28	40	08	ADL	FPM
27	47	07	ADL	NBR	28	40	08	ADL-P	NBR
27	47	08	A	NBR	28	40	08	DC	NBR
27	47	08	A	FPM	28	40	09	ADL-P	NBR
27	47	10	A	NBR	28	40	10	A	NBR
27	47	10	ADL	NBR	28	40	10	A	FPM
27	47	11	ADL	NBR	28	40	10	B	NBR
27	48	09	ADL	NBR	28	41	07	ADL	NBR
27	49	7.5	A	NBR	28	41	08	ADL	NBR
27	50	10	A	NBR	28	42	05	ADL	NBR

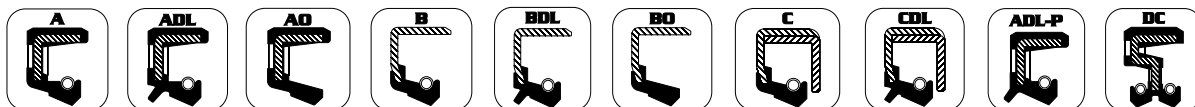


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
28	42	06	ADL	NBR	28	51	06	ADL	NBR
28	42	07	A	NBR	28	51	08	ADL	NBR
28	42	07	A	FPM	28	51	10	ADL	NBR
28	42	07	ADL	NBR	28	52	05	A	NBR
28	42	08	A	NBR	28	52	06	ADL	NBR
28	42	08	A	FPM	28	52	07	A	NBR
28	42	08	ADL	NBR	28	52	07	A	FPM
28	42	10	A	NBR	28	52	07	ADL	NBR
28	42	10	A	FPM	28	52	07	ADL	FPM
28	42	11	ADL	NBR	28	52	10	A	NBR
28	42.5	08	ADL	NBR	28	52	10	ADL	NBR
28	43	07	ADL	NBR	28	52	12	A	NBR
28	43	08	ADL	NBR	28	55	07	ADL	NBR
28	43	10	A	NBR	28	56	08	ADL	NBR
28	43	10	ADL	NBR	28	57	12	A	NBR
28	44	07	ADL	NBR	28	58	08	ADL	NBR
28	44	08	ADL	NBR	28	60	10	ADL	NBR
28	44	10	A	NBR	28	62	07	ADL	NBR
28	44	10	ADL	NBR	28	62	10	A	NBR
28	44	11	ADL	NBR	28	62	12	A	NBR
28	44	15	ADL	NBR	28	74	11	BDL	NBR
28	44.5	07	ADL	NBR	29	35	03	AO	NBR
28	45	06	A	NBR	29	36	08	BO	NBR
28	45	07	A	NBR	29	38	04	AO	NBR
28	45	07	A	FPM	29	38	04	AODL	NBR
28	45	07	ADL	NBR	29	38	07	A	NBR
28	45	08	A	NBR	29	39	05	A	NBR
28	45	08	ADL	NBR	29	40	07	A	NBR
28	45	09	A	FPM	29	40	08	ADL	NBR
28	45	10	ADL	NBR	29	41	06	A	NBR
28	47	05	ADL	NBR	29	42	06	ADL	NBR
28	47	07	A	NBR	29	42	07	A	NBR
28	47	07	A	FPM	29	43	07	A	NBR
28	47	07	ADL	NBR	29	45	07	A	NBR
28	47	07	ADL	FPM	29	45	08	ADL	NBR
28	47	08	A	NBR	29	45	09	A	NBR
28	47	08	ADL	NBR	29	45	9.5	A	NBR
28	47	08	B	NBR	29	46	10	ADL	NBR
28	47	10	A	NBR	29	47	07	ADL	NBR
28	47	10	A	FPM	29	47	10	A	NBR
28	47	10	ADL	NBR	29	50	10	A	NBR
28	47	10	ADL	FPM	29	50	12	A	NBR
28	48	05	A	NBR	29	52	07	ADL	NBR
28	48	08	ADL	NBR	29	52	09	A	NBR
28	48	11	ADL	NBR	29	55	09	A	NBR
28	49	10	ADL	NBR	29	62	10	A	NBR
28	50	06	ADL	NBR	29	62	10	A	FPM
28	50	07	A	FPM	30	34	03	BO	NBR
28	50	07	ADL	NBR	30	35	03	BO	NBR
28	50	08	A	NBR	30	35	04	BO	NBR
28	50	10	A	NBR	30	37	03	BO	NBR
28	50	10	A	FPM	30	37	04	AO	NBR
28	50	10	ADL	NBR	30	37	04	AO	FPM
28	50	12	B	NBR	30	37	06	ADL	NBR
28	50.8	10	ADL	NBR	30	38	04	A	NBR

NBR=Nitrile FPM=Viton®

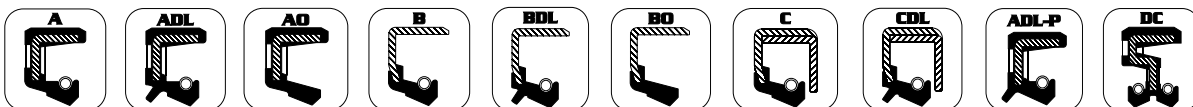


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
30	38	05	ADL	NBR	30	45	5.5	A	NBR
30	38	05	B	NBR	30	45	06	A	NBR
30	38	07	ADL	NBR	30	45	06	A	FPM
30	40	04	ADL	NBR	30	45	06	ADL	NBR
30	40	04	AO	NBR	30	45	07	A	NBR
30	40	05	A	NBR	30	45	07	A	FPM
30	40	05	A	FPM	30	45	07	ADL	NBR
30	40	05	ADL	NBR	30	45	07	ADL	FPM
30	40	05	ADL-P	NBR	30	45	08	A	NBR
30	40	07	A	NBR	30	45	08	A	FPM
30	40	07	A	FPM	30	45	08	ADL	NBR
30	40	07	ADL	NBR	30	45	08	ADL	FPM
30	40	07	ADL	FPM	30	45	08	B	NBR
30	40	07	ADL-P	NBR	30	45	8.5	DC	NBR
30	40	08	A	NBR	30	45	9.5	B	NBR
30	40	09	A	NBR	30	45	10	A	NBR
30	40	10	A	NBR	30	45	10	A	FPM
30	41	07	ADL	NBR	30	45	10	ADL	NBR
30	41	08	ADL	NBR	30	45	11	ADL	NBR
30	41	10	ADL	NBR	30	46	05	A	NBR
30	42	4.5	A	NBR	30	46	07	ADL	NBR
30	42	05	ADL	NBR	30	46	07	ADL	FPM
30	42	5.7	A	NBR	30	46	08	A	NBR
30	42	06	A	NBR	30	46	08	ADL	FPM
30	42	06	A	FPM	30	46	10	A	NBR
30	42	06	ADL	NBR	30	47	05	A	NBR
30	42	06	ADL	FPM	30	47	05	A	FPM
30	42	06	ADL-P	NBR	30	47	06	A	NBR
30	42	06	ADL-P	FPM	30	47	06	ADL	NBR
30	42	07	A	NBR	30	47	07	A	NBR
30	42	07	A	FPM	30	47	07	A	FPM
30	42	07	ADL	NBR	30	47	07	ADL	NBR
30	42	07	ADL	FPM	30	47	07	ADL	FPM
30	42	07	B	NBR	30	47	07	ADL-P	NBR
30	42	07	DC	NBR	30	47	07	B	NBR
30	42	08	A	NBR	30	47	08	A	NBR
30	42	08	ADL	NBR	30	47	08	A	FPM
30	42	08	ADL	FPM	30	47	08	ADL	NBR
30	42	10	A	NBR	30	47	08	ADL	FPM
30	42	10	ADL	NBR	30	47	08	ADL-P	NBR
30	42	12	A	NBR	30	47	08	DC	NBR
30	43	07	ADL	NBR	30	47	09	C	NBR
30	43	08	A	NBR	30	47	10	A	NBR
30	43	08	ADL	NBR	30	47	10	A	FPM
30	43	8.5	ADL	NBR	30	47	10	ADL	NBR
30	43.5	10	ADL	NBR	30	47	10	ADL	FPM
30	44	05	ADL	NBR	30	47	10	ADL-P	NBR
30	44	07	A	NBR	30	47	10	C	NBR
30	44	07	ADL	NBR	30	47	14	DC	NBR
30	44	08	ADL	NBR	30	47.5	08	ADL	NBR
30	44	09	ADL	NBR	30	48	07	ADL	NBR
30	44	10	A	NBR	30	48	08	A	NBR
30	44	10	ADL	NBR	30	48	08	A	FPM
30	44.5	07	ADL	NBR	30	48	08	ADL	NBR
30	45	05	A	NBR	30	48	08	ADL	FPM

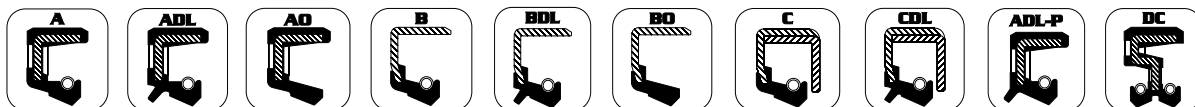


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
30	48	10	A	NBR	30	55	07	ADL	FPM
30	48	10	ADL	NBR	30	55	08	ADL	NBR
30	48	10	B	NBR	30	55	10	A	NBR
30	49	07	ADL	NBR	30	55	10	A	FPM
30	50	05	AO	NBR	30	55	10	ADL	NBR
30	50	06	ADL	NBR	30	55	10	ADL	FPM
30	50	07	A	NBR	30	55	12	A	NBR
30	50	07	A	FPM	30	55	12	ADL	NBR
30	50	07	ADL	NBR	30	56	7.5	ADL	NBR
30	50	07	ADL	FPM	30	56	08	A	NBR
30	50	07	ADL-P	NBR	30	56	10	A	NBR
30	50	08	A	NBR	30	56	10	A	FPM
30	50	08	A	FPM	30	56	10	ADL	NBR
30	50	08	ADL	NBR	30	56	12	A	NBR
30	50	10	A	NBR	30	56	12	ADL	NBR
30	50	10	A	FPM	30	57	08	A	NBR
30	50	10	ADL	NBR	30	58	08	ADL	NBR
30	50	10	ADL	FPM	30	58	10	ADL	NBR
30	50	10	C	NBR	30	60	08	B	NBR
30	50	11	ADL	NBR	30	60	10	A	NBR
30	50	12	A	NBR	30	60	10	ADL	NBR
30	50	12	ADL	NBR	30	60	12	C	NBR
30	50.8	07	ADL	NBR	30	62	06	B	NBR
30	51	07	ADL	NBR	30	62	07	A	NBR
30	51	10	ADL	NBR	30	62	07	A	FPM
30	52	04	AO	NBR	30	62	07	ADL	NBR
30	52	05	A	NBR	30	62	07	ADL	FPM
30	52	05	A	FPM	30	62	07	B	NBR
30	52	06	A	NBR	30	62	07	BDL	NBR
30	52	06	ADL	NBR	30	62	08	A	NBR
30	52	07	A	NBR	30	62	08	ADL	NBR
30	52	07	A	FPM	30	62	09	C	NBR
30	52	07	ADL	NBR	30	62	10	A	NBR
30	52	07	ADL	FPM	30	62	10	A	FPM
30	52	07	ADL-P	NBR	30	62	10	ADL	NBR
30	52	07	B	NBR	30	62	10	ADL	FPM
30	52	08	A	NBR	30	62	11	ADL	NBR
30	52	08	A	FPM	30	62	12	A	NBR
30	52	08	ADL	NBR	30	62	12	ADL	NBR
30	52	08	ADL	FPM	30	65	10	A	NBR
30	52	09	C	NBR	30	68	07	A	NBR
30	52	10	A	NBR	30	68	07	ADL	NBR
30	52	10	A	FPM	30	68	10	A	NBR
30	52	10	ADL	NBR	30	70	10	ADL	NBR
30	52	10	ADL	FPM	30	72	06	A	NBR
30	52	11	ADL	NBR	30	72	07	BDL	NBR
30	52	12	A	NBR	30	72	08	A	NBR
30	52	12	A	FPM	30	72	08	ADL	NBR
30	52	12	ADL	NBR	30	72	08	ADL	FPM
30	52.1	08	A	NBR	30	72	10	A	NBR
30	54	10	A	NBR	30	72	10	A	FPM
30	55	06	A	NBR	30	72	10	ADL	NBR
30	55	07	A	NBR	30	72	10	ADL	FPM
30	55	07	A	FPM	30	72	11	ADL	NBR
30	55	07	ADL	NBR	30	72	12	C	NBR

NBR=Nitrile FPM=Viton®

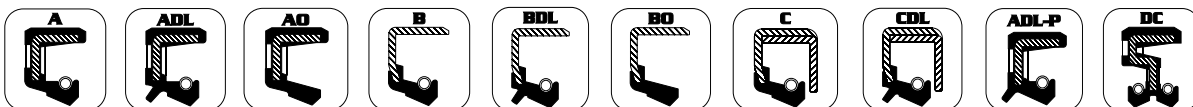


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
30	75	10	ADL	NBR	32	44.5	07	ADL	NBR
30	77	09	ADL	NBR	32	45	04	AO	NBR
30	80	10	ADL	NBR	32	45	06	A	NBR
30.5	47	08	ADL	NBR	32	45	06	ADL	NBR
31	40	07	ADL	NBR	32	45	07	A	NBR
31	41	12.5	ADL	NBR	32	45	07	A	FPM
31	42	08	A	NBR	32	45	07	ADL	NBR
31	43	08	ADL	NBR	32	45	07	ADL	FPM
31	44	07	ADL	NBR	32	45	07	ADL-P	NBR
31	45	08	ADL	NBR	32	45	08	A	NBR
31	45	09	ADL	NBR	32	45	08	ADL	NBR
31	46	08	ADL	NBR	32	45	08	ADL	FPM
31	47	07	A	NBR	32	45	10	A	NBR
31	47	07	A	FPM	32	45	10	A	FPM
31	47	10	A	NBR	32	45	10	ADL	NBR
31	48	07	ADL	NBR	32	45	12	ADL	NBR
31	48	10	ADL	NBR	32	46	08	ADL	NBR
31	49	07	ADL	NBR	32	46	10	ADL	NBR
31	50	07	ADL	NBR	32	47	06	A	FPM
31	50	08	ADL	NBR	32	47	06	ADL	NBR
31	51	07	ADL	NBR	32	47	06	ADL-P	NBR
31	52	06	A	FPM	32	47	07	A	NBR
31	52	06	ADL	NBR	32	47	07	A	FPM
31	52	07	A	NBR	32	47	07	ADL	NBR
31	52	07	A	FPM	32	47	07	ADL	FPM
31	52	07	ADL	NBR	32	47	07	ADL-P	NBR
31	52	08	A	NBR	32	47	07	B	NBR
31	52	09	A	NBR	32	47	08	A	NBR
31	55	09	A	NBR	32	47	08	ADL	NBR
31.5	47	07	A	NBR	32	47	09	C	NBR
31.5	52	07	A	NBR	32	47	10	A	NBR
31.8	40	08	ADL	NBR	32	47	10	A	FPM
32	38	04	BO	NBR	32	47	10	ADL	NBR
32	40	05	AO	NBR	32	47	10	B	NBR
32	40	07	A	NBR	32	48	05	A	NBR
32	40	07	ADL	FPM	32	48	07	A	NBR
32	40	10	ADL	NBR	32	48	07	ADL	NBR
32	42	04	ADL	FPM	32	48	08	A	NBR
32	42	04	AO	NBR	32	48	08	A	FPM
32	42	04	AO	FPM	32	48	08	ADL	NBR
32	42	05	A	NBR	32	48	08	ADL	FPM
32	42	05	A	FPM	32	48	09	A	NBR
32	42	07	A	NBR	32	48	10	A	NBR
32	42	07	ADL	NBR	32	48	10	ADL	NBR
32	42	07	ADL	FPM	32	48	12	A	NBR
32	42	08	ADL	NBR	32	48	12	ADL	NBR
32	43	06	A	NBR	32	50	07	A	FPM
32	43	07	ADL	NBR	32	50	07	ADL	FPM
32	43	07	ADL	FPM	32	50	07	B	NBR
32	44	07	ADL	NBR	32	50	08	A	NBR
32	44	07	ADL-P	NBR	32	50	08	A	FPM
32	44	08	ADL	NBR	32	50	08	ADL	NBR
32	44	09	B	NBR	32	50	10	A	NBR
32	44	10	ADL	NBR	32	50	10	A	FPM
32	44	12	ADL	NBR	32	50	10	ADL	NBR

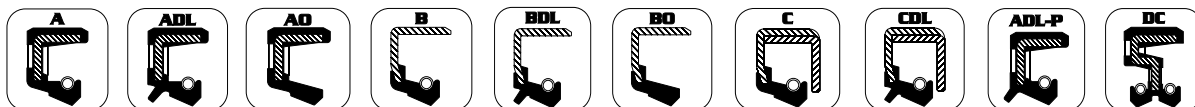


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
32	50	10	ADL	FPM	32	68	08	ADL	NBR
32	50	12	A	NBR	32	70	10	ADL	NBR
32	50	12	A	FPM	32	72	06	A	NBR
32	51	08	A	NBR	32	72	06	ADL	NBR
32	52	05	ADL	NBR	32	72	08	ADL	NBR
32	52	07	A	NBR	32	72	10	ADL	NBR
32	52	07	A	FPM	32	72	12	ADL	NBR
32	52	07	ADL	NBR	32	72	12	C	NBR
32	52	07	ADL	FPM	32	75	10	ADL	NBR
32	52	07	ADL-P	NBR	32	78	10	ADL	NBR
32	52	07	B	NBR	32	82	06	A	NBR
32	52	08	A	NBR	32	86	06	A	NBR
32	52	08	ADL	NBR	33	38	03	BO	NBR
32	52	08	ADL	FPM	33	39	04	AODL	NBR
32	52	09	A	NBR	33	40	03	BO	NBR
32	52	10	A	NBR	33	43	07	A	NBR
32	52	10	A	FPM	33	44	08	ADL	NBR
32	52	10	ADL	NBR	33	45	07	A	NBR
32	52	11	ADL	NBR	33	45	07	A	FPM
32	52	12	A	FPM	33	45	07	ADL	NBR
32	52	12	ADL	NBR	33	45	08	ADL	NBR
32	53	07	ADL	NBR	33	45	10	ADL	NBR
32	54	07	AO	NBR	33	46	07	ADL	NBR
32	54	10	ADL	NBR	33	47	10	ADL	NBR
32	54	11	A	NBR	33	47	11	A	NBR
32	55	07	ADL	NBR	33	48	8.9	ADL	NBR
32	55	08	ADL	NBR	33	48	12	A	NBR
32	55	10	A	NBR	33	49.5	09	ADL	NBR
32	55	10	ADL	NBR	33	50	06	A	NBR
32	55	12	C	NBR	33	50	06	ADL	NBR
32	56	10	A	NBR	33	50	07	A	NBR
32	56	10	A	FPM	33	50	07	ADL	NBR
32	56	10	ADL	NBR	33	50	08	ADL	NBR
32	56	12	A	NBR	33	50	10	A	NBR
32	57	9.5	A	FPM	33	50	10	ADL	NBR
32	57.2	10	ADL	NBR	33	50	12	ADL	NBR
32	58	08	ADL	NBR	33	51	07	BDL	NBR
32	58	10	ADL	NBR	33	52	06	A	NBR
32	58	10	B	NBR	33	52	08	A	NBR
32	58	12	ADL	NBR	33	52	10	A	NBR
32	60	10	C	NBR	33	54	10	A	NBR
32	60	12	C	NBR	33	55	9.5	BDL	NBR
32	62	07	ADL	NBR	33	56	08	ADL	NBR
32	62	08	A	NBR	33	56	10	ADL	NBR
32	62	08	ADL	NBR	33	56	12	ADL	NBR
32	62	08	DC	NBR	33	62	10	ADL	NBR
32	62	10	A	NBR	33	62	12	C	NBR
32	62	10	A	FPM	33	63	09	ADL	NBR
32	62	10	ADL	NBR	33	66	13	A	NBR
32	62	12	A	NBR	33	72	08	ADL	NBR
32	65	6.5	ADL	NBR	33.5	55	9.5	ADL	NBR
32	65	10	C	NBR	34	39	03	AO	NBR
32	65	12	C	NBR	34	40	04	AO	NBR
32	65	13	ADL	NBR	34	41	04	AODL	NBR
32	66	10	A	NBR	34	42	05	AO	NBR

NBR=Nitrile FPM=Viton®

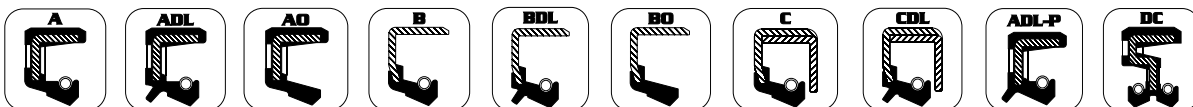


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
34	44	06	A	NBR	34	72	14	ADL	NBR
34	44	07	A	NBR	35	40	04	BO	NBR
34	44	08	ADL	NBR	35	42	04	AO	NBR
34	45	07	A	NBR	35	42	04	AO	FPM
34	45	07	ADL	NBR	35	42	08	ADL	NBR
34	46	08	ADL	NBR	35	43	06	A	NBR
34	46	08	B	NBR	35	44	04	A	NBR
34	46	10	A	NBR	35	44	07	A	FPM
34	47	07	ADL	NBR	35	45	04	AO	NBR
34	47	07	ADL	FPM	35	45	04	AO	FPM
34	47	09	A	NBR	35	45	06	A	NBR
34	48	07	ADL	NBR	35	45	06	A	NBR
34	48	08	ADL	NBR	35	45	06	A	FPM
34	48	08	BDL	FPM	35	45	06	ADL	NBR
34	48	10	ADL	NBR	35	45	07	A	NBR
34	49	08	A	FPM	35	45	07	A	FPM
34	50	07	ADL	NBR	35	45	07	ADL	NBR
34	50	08	A	NBR	35	45	07	ADL	FPM
34	50	09	ADL	NBR	35	45	08	ADL	NBR
34	50	10	A	NBR	35	45	10	A	NBR
34	50	10	A	FPM	35	45	10	ADL	NBR
34	50	10	ADL	NBR	35	45	10	ADL	FPM
34	50	12	ADL	NBR	35	46	08	ADL	NBR
34	51	08	A	NBR	35	46	10	ADL	NBR
34	52	07	B	NBR	35	47	4.5	A	NBR
34	52	7.5	A	NBR	35	47	05	A	NBR
34	52	7.5	A	FPM	35	47	06	A	NBR
34	52	08	A	NBR	35	47	06	A	FPM
34	52	08	ADL	NBR	35	47	06	ADL	NBR
34	52	10	A	NBR	35	47	06	ADL-P	NBR
34	52	11	ADL	NBR	35	47	07	A	NBR
34	54	07	ADL	NBR	35	47	07	A	FPM
34	54	08	ADL	NBR	35	47	07	ADL	NBR
34	54	11	ADL	NBR	35	47	07	ADL	FPM
34	54	12.5	ADL	NBR	35	47	07	ADL-P	NBR
34	55	06	A	NBR	35	47	07	B	NBR
34	55	09	A	NBR	35	47	08	A	NBR
34	55	09	ADL	NBR	35	47	09	ADL	NBR
34	55	10	A	FPM	35	47	10	A	NBR
34	55	11	ADL	NBR	35	47	10	ADL	NBR
34	56	10	ADL	NBR	35	47	10	ADL-P	NBR
34	57	06	A	NBR	35	47	10	DC	NBR
34	58	06	ADL	NBR	35	48	05	BO	NBR
34	58	13	C	NBR	35	48	07	ADL	NBR
34	62	08	ADL	NBR	35	48	07	ADL	FPM
34	62	10	A	NBR	35	48	08	A	NBR
34	62	10	ADL	NBR	35	48	08	ADL	NBR
34	62	10	ADL	FPM	35	48	09	A	NBR
34	62	12	C	NBR	35	48	10	ADL	NBR
34	68	10	ADL	NBR	35	49	06	ADL	NBR
34	70	10	ADL	NBR	35	49	07	ADL	NBR
34	72	10	A	NBR	35	50	05	A	NBR
34	72	10	ADL	NBR	35	50	07	A	NBR
34	72	11	ADL	NBR	35	50	07	A	FPM
34	72	12	C	NBR	35	50	07	ADL	NBR

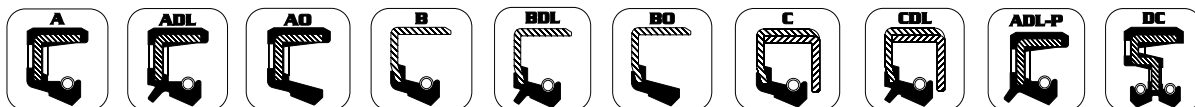


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
35	50	07	ADL	FPM	35	55	10	A	NBR
35	50	07	ADL-P	NBR	35	55	10	A	FPM
35	50	08	A	NBR	35	55	10	ADL	NBR
35	50	08	A	FPM	35	55	10	ADL	FPM
35	50	08	ADL	NBR	35	55	11	ADL	NBR
35	50	08	ADL	FPM	35	55	12	ADL-P	NBR
35	50	09	C	NBR	35	55	12	C	NBR
35	50	10	A	NBR	35	56	08	A	NBR
35	50	10	A	FPM	35	56	08	ADL	NBR
35	50	10	ADL	NBR	35	56	10	A	NBR
35	50	10	ADL	FPM	35	56	10	A	FPM
35	50	11	ADL	NBR	35	56	10	ADL	NBR
35	50	12	ADL	NBR	35	56	12	A	NBR
35	51	08	ADL	NBR	35	56	12	ADL	NBR
35	51	10	ADL	NBR	35	57	13	ADL	NBR
35	51	14	ADL	NBR	35	58	06	ADL	NBR
35	52	06	ADL	NBR	35	58	07	A	NBR
35	52	06	ADL	FPM	35	58	7.5	A	NBR
35	52	06	ADL-P	NBR	35	58	08	ADL	NBR
35	52	07	A	NBR	35	58	10	A	NBR
35	52	07	A	FPM	35	58	10	A	FPM
35	52	07	ADL	NBR	35	58	10	ADL	NBR
35	52	07	ADL	FPM	35	58	11	ADL	NBR
35	52	07	B	NBR	35	58	12	A	NBR
35	52	08	A	NBR	35	58	12	ADL	NBR
35	52	08	A	FPM	35	60	07	ADL	NBR
35	52	08	ADL	NBR	35	60	10	A	NBR
35	52	08	ADL	FPM	35	60	10	A	FPM
35	52	08	B	NBR	35	60	10	ADL	NBR
35	52	09	A	NBR	35	60	10	ADL	FPM
35	52	09	ADL	NBR	35	60	11	ADL	NBR
35	52	10	A	NBR	35	60	12	A	NBR
35	52	10	A	FPM	35	60	12	ADL	NBR
35	52	10	ADL	NBR	35	62	05	B	NBR
35	52	10	ADL	FPM	35	62	06	ADL	NBR
35	52	10	DC	NBR	35	62	07	A	NBR
35	52	12	A	NBR	35	62	07	A	FPM
35	52	12	ADL	NBR	35	62	07	ADL	NBR
35	53	08	A	NBR	35	62	07	ADL	FPM
35	54	06	ADL	NBR	35	62	07	ADL-P	NBR
35	54	07	A	NBR	35	62	07	B	NBR
35	54	08	A	NBR	35	62	08	A	NBR
35	54	08	ADL	NBR	35	62	08	ADL	NBR
35	54	10	A	NBR	35	62	10	A	NBR
35	54	10	A	FPM	35	62	10	A	FPM
35	55	05	B	NBR	35	62	10	ADL	NBR
35	55	07	A	NBR	35	62	10	ADL	FPM
35	55	07	A	FPM	35	62	12	A	NBR
35	55	07	ADL	NBR	35	62	12	ADL	NBR
35	55	07	ADL	FPM	35	62	12	ADL	FPM
35	55	08	A	NBR	35	62	12	B	NBR
35	55	08	A	FPM	35	62	15	BDL	NBR
35	55	08	ADL	NBR	35	63	10	ADL	NBR
35	55	08	ADL	FPM	35	64	13	ADL	NBR
35	55	09	ADL	NBR	35	65	09	A	NBR

NBR=Nitrile FPM=Viton®

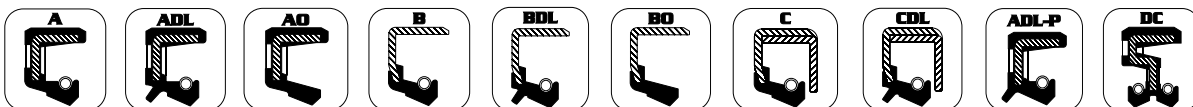


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
35	65	10	A	NBR	36	50	07	A	NBR
35	65	12	A	NBR	36	50	07	A	FPM
35	65	12	ADL	NBR	36	50	07	ADL	NBR
35	67	07	A	NBR	36	50	10	A	NBR
35	68	06	A	NBR	36	50.5	07	ADL	NBR
35	68	10	A	NBR	36	50.8	08	BDL	NBR
35	68	10	A	FPM	36	51	08	ADL	NBR
35	68	12	A	NBR	36	52	6.5	A	NBR
35	70	08	ADL	NBR	36	52	07	A	NBR
35	70	10	ADL	NBR	36	52	07	A	FPM
35	70	10	B	NBR	36	52	07	ADL	NBR
35	70	12	C	NBR	36	52	07	ADL	FPM
35	72	07	A	FPM	36	52	08	ADL	NBR
35	72	07	ADL	NBR	36	52	09	ADL	NBR
35	72	07	ADL	FPM	36	52	10	ADL	NBR
35	72	08	ADL	NBR	36	53	09	ADL	NBR
35	72	10	A	NBR	36	54	6.5	A	NBR
35	72	10	A	FPM	36	54	07	A	NBR
35	72	10	ADL	NBR	36	54	07	ADL	NBR
35	72	10	ADL	FPM	36	54	7.5	A	NBR
35	72	12	A	NBR	36	54	7.5	A	FPM
35	72	12	A	FPM	36	54	08	ADL	NBR
35	72	12	ADL	NBR	36	54	10	ADL	NBR
35	72	12	B	NBR	36	54	11	ADL	NBR
35	74	10	ADL	NBR	36	55	08	ADL	NBR
35	75	12	ADL	NBR	36	56	07	ADL	NBR
35	76	09	ADL	NBR	36	56	10	A	NBR
35	78	08	ADL	NBR	36	56	10	A	FPM
35	80	07	A	NBR	36	57	10	ADL	NBR
35	80	08	A	NBR	36	58	10	A	NBR
35	80	08	ADL	NBR	36	58	10	ADL	NBR
35	80	10	A	NBR	36	58	12	A	NBR
35	80	10	ADL	NBR	36	59	9.5	A	NBR
35	80	12	A	NBR	36	60	07	ADL	NBR
35	80	12	ADL	NBR	36	60	10	ADL	NBR
35	80	12	ADL	FPM	36	62	07	A	NBR
35	80	13	ADL	NBR	36	62	07	A	FPM
35	80	13	C	NBR	36	62	07	ADL	NBR
35	82	06	A	NBR	36	62	07	ADL	FPM
35	90	10	ADL	NBR	36	62	10	A	NBR
35.8	68	10	B	NBR	36	62	10	A	FPM
35.9	52	08	B	NBR	36	63.5	09	ADL	NBR
36	42	3.5	BO	NBR	36	65	10	ADL	NBR
36	45	07	A	NBR	36	68	10	A	NBR
36	46	09	B	NBR	36	68	10	A	FPM
36	47	07	A	NBR	36	68	10	ADL	NBR
36	47	07	ADL	NBR	36	72	08	ADL	NBR
36	47	07	ADL	FPM	36	75	12	A	NBR
36	48	04	AO	NBR	36	83	12	A	NBR
36	48	05	ADL-P	NBR	37	45	07	ADL	NBR
36	48	07	ADL	NBR	37	47	04	ADL	NBR
36	48	10	A	NBR	37	47	04	AO	NBR
36	48	10	A	FPM	37	47	04	AO	FPM
36	49	07	ADL	NBR	37	47	10	ADL	NBR
36	50	05	A	NBR	37	48	06	ADL	NBR

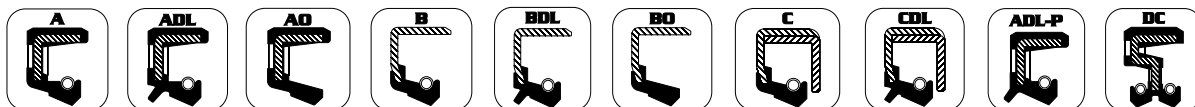


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
37	50	06	BDL	NBR	38	52	08	ADL	NBR
37	50	07	ADL	NBR	38	52	09	ADL	NBR
37	50	08	ADL	NBR	38	52	10	A	NBR
37	50	10	A	NBR	38	52	10	A	FPM
37	51	06	A	NBR	38	52	10	ADL	NBR
37	52	07	A	NBR	38	52	10	B	NBR
37	52	08	A	NBR	38	52	10	C	NBR
37	52	10	A	NBR	38	53	07	ADL	NBR
37	52	10	A	FPM	38	54	6.5	A	NBR
37	52	12	ADL	NBR	38	54	6.5	A	FPM
37	53	07	ADL	NBR	38	54	08	ADL	NBR
37	55	08	ADL	NBR	38	54	10	A	NBR
37	55	10	ADL	NBR	38	54	10	A	FPM
37	57	08	ADL	NBR	38	54	10	ADL	NBR
37	57	10	ADL	NBR	38	55	06	ADL	NBR
37	58	13	A	NBR	38	55	07	A	NBR
37	58	13	ADL	NBR	38	55	07	A	FPM
37	60	08	ADL	NBR	38	55	07	ADL	NBR
37	62	08	A	NBR	38	55	07	ADL	FPM
37	62	08	A	FPM	38	55	08	ADL	NBR
37	62	09	ADL	NBR	38	55	08	B	NBR
37	62	09	C	NBR	38	55	09	ADL	NBR
37	62	10	A	NBR	38	55	10	A	NBR
37	62	11	A	NBR	38	55	10	ADL	NBR
37	62	12	A	NBR	38	55	10	ADL	FPM
37	64	13	ADL	NBR	38	56	07	A	NBR
37	65	12	ADL	NBR	38	56	10	A	NBR
37	66	10	ADL	NBR	38	56	10	A	FPM
37	80	13	C	NBR	38	56	12	A	NBR
38	43	03	B	NBR	38	57	10	ADL	NBR
38	47	07	ADL	NBR	38	58	05	AO	NBR
38	47	10	B	NBR	38	58	07	ADL	NBR
38	48	04	AO	NBR	38	58	10	A	NBR
38	48	04	AO	FPM	38	58	10	A	FPM
38	48	06	ADL	NBR	38	58	10	ADL	NBR
38	48	07	A	NBR	38	58	10	ADL	FPM
38	50	06	ADL-P	NBR	38	58	11	A	NBR
38	50	06	BDL	NBR	38	58	11	ADL	NBR
38	50	07	A	NBR	38	58	12	ADL	NBR
38	50	07	A	FPM	38	58	12	C	NBR
38	50	07	ADL	NBR	38	59	09	ADL	NBR
38	50	07	ADL	FPM	38	60	07	ADL	FPM
38	50	08	ADL	NBR	38	60	08	ADL	NBR
38	50	10	A	NBR	38	60	10	A	NBR
38	50	10	ADL	NBR	38	60	10	A	FPM
38	50	11	ADL	NBR	38	60	10	ADL	NBR
38	51	07	ADL	NBR	38	60	12	A	NBR
38	51	08	ADL	NBR	38	60	12	ADL	NBR
38	52	06	ADL	NBR	38	60.5	10	ADL	NBR
38	52	07	A	NBR	38	62	04	AO	NBR
38	52	07	A	FPM	38	62	07	A	NBR
38	52	07	ADL	NBR	38	62	07	ADL	NBR
38	52	07	ADL	FPM	38	62	07	ADL	FPM
38	52	08	A	NBR	38	62	07	ADL-P	NBR
38	52	08	A	FPM	38	62	08	A	NBR

NBR=Nitrile FPM=Viton®

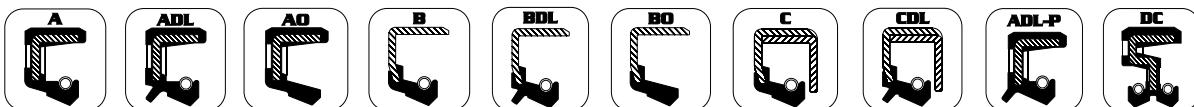


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
38	62	08	ADL	NBR	40	51.5	4.5	A	NBR
38	62	08	ADL	FPM	40	52	05	A	NBR
38	62	10	A	NBR	40	52	05	ADL	NBR
38	62	10	A	FPM	40	52	05	AO	NBR
38	62	10	ADL	NBR	40	52	06	A	NBR
38	62	10	ADL	NBR	40	52	06	A	FPM
38	62	12	A	NBR	40	52	06	ADL	NBR
38	62	12	ADL	NBR	40	52	06	ADL	FPM
38	64	12	A	NBR	40	52	07	A	NBR
38	64	12	ADL	NBR	40	52	07	A	FPM
38	65	08	A	FPM	40	52	07	ADL	NBR
38	65	08	ADL	NBR	40	52	07	ADL	FPM
38	65	10	A	NBR	40	52	07	ADL-P	NBR
38	68	12	BDL	NBR	40	52	07	B	NBR
38	70	08	ADL	NBR	40	52	08	A	NBR
38	70	10	C	NBR	40	52	08	ADL	NBR
38	70	12	A	NBR	40	52	09	A	NBR
38	72	08	ADL	NBR	40	52	09	ADL	NBR
38	72	10	A	NBR	40	52	10	A	NBR
38	72	10	A	FPM	40	52	10	ADL	NBR
38	72	10	ADL	NBR	40	53	08	ADL	NBR
38	72	12	A	NBR	40	54	05	ADL	NBR
38	74	10	A	NBR	40	54	5.5	BDL	NBR
38	74	11	ADL	NBR	40	54	07	ADL	NBR
38	80	10	A	NBR	40	54	07	AO	NBR
38	80	12	A	NBR	40	54	09	ADL	NBR
38.5	58	09	ADL	NBR	40	55	05	AO	NBR
38.5	58	11	ADL	NBR	40	55	06	ADL-P	FPM
39	47	05	AODL	NBR	40	55	6.5	A	NBR
39	51	7.5	A	NBR	40	55	07	A	NBR
39	52	10	ADL	NBR	40	55	07	A	FPM
39	55.9	09	A	NBR	40	55	07	ADL	NBR
39	58	06	ADL	NBR	40	55	07	ADL	FPM
39	59	07	ADL	NBR	40	55	07	ADL-P	NBR
39	65	08	ADL	NBR	40	55	08	A	NBR
39	65	09	A	NBR	40	55	08	A	FPM
39.5	60	10	BDL	NBR	40	55	08	ADL	NBR
40	46	4.5	BO	NBR	40	55	08	ADL	FPM
40	46	08	ADL	NBR	40	55	09	C	NBR
40	47	04	AO	NBR	40	55	10	A	NBR
40	47	04	AO	FPM	40	55	10	A	FPM
40	48	04	BO	NBR	40	55	10	ADL	NBR
40	48	04	BO	FPM	40	55	10	ADL	FPM
40	49	10	B	NBR	40	55	12	C	NBR
40	50	04	AO	NBR	40	56	06	ADL	NBR
40	50	05	ADL	NBR	40	56	06	ADL-P	NBR
40	50	6.5	ADL	NBR	40	56	07	A	NBR
40	50	07	A	NBR	40	56	07	ADL	NBR
40	50	07	A	FPM	40	56	08	A	NBR
40	50	07	ADL	NBR	40	56	08	A	FPM
40	50	08	A	NBR	40	56	08	ADL	NBR
40	50	08	A	FPM	40	56	09	A	NBR
40	50	08	ADL	NBR	40	56	10	A	NBR
40	50	10	ADL	NBR	40	56	10	A	FPM
40	51	5.5	A	NBR	40	56	10	ADL	NBR

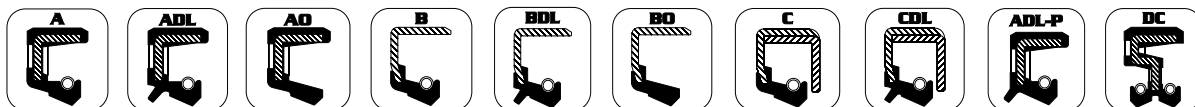


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
40	56	12	A	NBR	40	62	12	A	FPM
40	57	10	ADL	NBR	40	62	12	ADL	NBR
40	58	07	A	NBR	40	62	12	ADL	FPM
40	58	07	ADL	NBR	40	62	14	ADL	NBR
40	58	08	A	NBR	40	63	07	ADL	NBR
40	58	08	A	FPM	40	63	10	A	NBR
40	58	08	ADL	NBR	40	64	12	ADL	NBR
40	58	08	ADL	FPM	40	64	13	ADL	NBR
40	58	08	ADL-P	NBR	40	65	09	A	NBR
40	58	8.5	ADL	NBR	40	65	09	ADL	NBR
40	58	09	A	NBR	40	65	10	A	NBR
40	58	10	A	NBR	40	65	10	A	FPM
40	58	10	A	FPM	40	65	10	ADL	NBR
40	58	10	ADL	NBR	40	65	10	ADL	FPM
40	58	12	A	NBR	40	65	12	A	NBR
40	60	07	A	NBR	40	65	12	A	FPM
40	60	07	ADL	NBR	40	65	12	ADL	NBR
40	60	07	ADL-P	NBR	40	65.4	10	ADL	NBR
40	60	08	A	NBR	40	66	09	ADL	NBR
40	60	08	A	FPM	40	67	08	ADL	NBR
40	60	08	ADL	NBR	40	67	10	ADL	NBR
40	60	08	ADL	FPM	40	68	05	ADL	NBR
40	60	10	A	NBR	40	68	06	A	NBR
40	60	10	A	FPM	40	68	07	A	NBR
40	60	10	ADL	NBR	40	68	07	ADL	NBR
40	60	10	ADL	FPM	40	68	08	A	NBR
40	60	10	ADL-P	NBR	40	68	08	ADL	NBR
40	60	12	A	NBR	40	68	10	A	NBR
40	60	12	ADL	NBR	40	68	10	A	FPM
40	61	10	B	NBR	40	68	10	ADL	NBR
40	62	05	AO	NBR	40	68	12	A	NBR
40	62	06	A	FPM	40	68	12	ADL	NBR
40	62	06	ADL	FPM	40	70	08	A	NBR
40	62	06	ADL-P	NBR	40	70	08	ADL	NBR
40	62	06	ADL-P	FPM	40	70	10	A	NBR
40	62	07	A	NBR	40	70	10	A	FPM
40	62	07	A	FPM	40	70	10	ADL	NBR
40	62	07	ADL	NBR	40	70	12	A	NBR
40	62	07	ADL	FPM	40	70	12	ADL	NBR
40	62	07	B	NBR	40	72	07	A	NBR
40	62	07	BDL	NBR	40	72	07	A	FPM
40	62	08	A	NBR	40	72	07	ADL	NBR
40	62	08	ADL	NBR	40	72	07	ADL	FPM
40	62	08	ADL	FPM	40	72	08	A	NBR
40	62	08	B	NBR	40	72	09	C	NBR
40	62	09	ADL	NBR	40	72	10	A	NBR
40	62	10	A	NBR	40	72	10	A	FPM
40	62	10	A	FPM	40	72	10	ADL	NBR
40	62	10	ADL	NBR	40	72	11	ADL	NBR
40	62	10	ADL	FPM	40	72	12	A	NBR
40	62	10	ADL-P	NBR	40	72	12	ADL	NBR
40	62	10	C	NBR	40	75	08	ADL	NBR
40	62	11	ADL	NBR	40	75	10	ADL	NBR
40	62	11.5	A	NBR	40	75	12	ADL	NBR
40	62	12	A	NBR	40	76	08	ADL	NBR

NBR=Nitrile FPM=Viton®

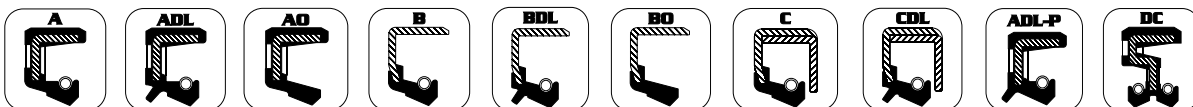


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
40	78	10	A	NBR	42	55	07	ADL	FPM
40	80	07	ADL	NBR	42	55	08	A	NBR
40	80	08	A	NBR	42	55	08	A	FPM
40	80	08	ADL	NBR	42	55	08	ADL	NBR
40	80	10	A	NBR	42	55	08	ADL	FPM
40	80	10	A	FPM	42	55	09	ADL	NBR
40	80	10	ADL	NBR	42	55	10	A	NBR
40	80	10	ADL	FPM	42	55	10	ADL	NBR
40	80	12	ADL	NBR	42	56	07	A	NBR
40	80	12	ADL	FPM	42	56	07	A	FPM
40	80	13	A	NBR	42	56	07	ADL	NBR
40	80	13	ADL	NBR	42	56	08	B	NBR
40	85	10	A	NBR	42	56	10	ADL	NBR
40	85	10	A	FPM	42	57	07	A	NBR
40	85	10	ADL	NBR	42	58	07	ADL	NBR
40	85	12	ADL	NBR	42	58	07	ADL	FPM
40	88	06	A	NBR	42	58	08	ADL	NBR
40	90	08	A	NBR	42	58	09	B	NBR
40	90	10	A	NBR	42	58	10	A	NBR
40	90	10	ADL	NBR	42	58	10	ADL	NBR
40	90	12	ADL	NBR	42	58	11	ADL	NBR
40	90	12	ADL	FPM	42	58	12	A	NBR
40	90	12	B	NBR	42	59.5	10	ADL	NBR
40	90	13	C	NBR	42	60	07	A	NBR
40.5	58	08	ADL	NBR	42	60	07	ADL	NBR
41	47	04	BO	NBR	42	60	07	ADL	FPM
41	51	05	AODL	NBR	42	60	08	A	NBR
41	52	08	A	NBR	42	60	08	A	FPM
41	53	07	BDL	NBR	42	60	08	ADL	NBR
41	53	08	ADL	NBR	42	60	09	ADL	NBR
41	55	06	BDL	NBR	42	60	10	A	NBR
41	55	07	ADL	NBR	42	60	10	A	FPM
41	55.7	09	ADL	NBR	42	60	10	ADL	NBR
41	56	07	A	NBR	42	60	12	A	NBR
41	56	08	A	NBR	42	60	12	A	FPM
41	56	10	A	NBR	42	60	12	ADL	NBR
41	62	08	ADL	NBR	42	62	07	A	NBR
41	64	10	ADL	NBR	42	62	07	A	FPM
41	65	09	BDL	NBR	42	62	07	ADL	NBR
42	50	07	A	NBR	42	62	07	ADL	FPM
42	51	07	ADL	NBR	42	62	07	BDL	NBR
42	52	04	ADL	NBR	42	62	08	A	NBR
42	52	04	AO	NBR	42	62	08	A	FPM
42	52	04	AO	FPM	42	62	08	ADL	NBR
42	52	05	A	NBR	42	62	08	ADL	FPM
42	52	5.5	AO	NBR	42	62	08	ADL-P	NBR
42	52	08	A	FPM	42	62	10	A	NBR
42	52	08	ADL	NBR	42	62	10	A	FPM
42	52	10	ADL	NBR	42	62	10	ADL	NBR
42	53	08	ADL	NBR	42	62	12	A	NBR
42	54	05	AO	NBR	42	63	09	ADL	NBR
42	54	05	ADL	NBR	42	64	07	A	NBR
42	55	06	ADL	NBR	42	64	08	ADL	NBR
42	55	07	A	NBR	42	65	08	A	NBR
42	55	07	ADL	NBR	42	65	08	ADL	NBR

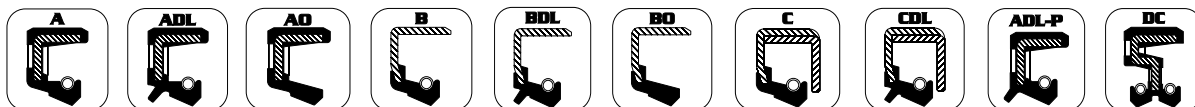


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
42	65	08	ADL	FPM	43	60	10	A	FPM
42	65	09	ADL	NBR	43	60	10	ADL	NBR
42	65	10	A	NBR	43	62	08	ADL	NBR
42	65	10	A	FPM	43	62	10	A	NBR
42	65	10	ADL	NBR	43	62	10	A	FPM
42	65	12	A	NBR	43	62	12	ADL	NBR
42	65	12	ADL	NBR	43	65	13	A	NBR
42	65	12	ADL-P	NBR	43	66	10	A	NBR
42	66	08	A	NBR	43	75	10	A	NBR
42	66	08	ADL	NBR	43	80	10	A	NBR
42	67	10	ADL	NBR	44	52	10	ADL	NBR
42	68	08	ADL	FPM	44	52	10	AO	NBR
42	68	10	ADL	NBR	44	54	4.5	A	NBR
42	68	11	A	NBR	44	54	7.5	ADL	NBR
42	68	11.5	A	NBR	44	54	09	ADL	NBR
42	70	10	A	NBR	44	55	07	A	NBR
42	70	10	ADL	NBR	44	56	08	ADL	NBR
42	70	12	A	NBR	44	57	9.5	A	NBR
42	70	12	ADL	NBR	44	57	9.5	ADL	NBR
42	72	06	ADL	NBR	44	58	07	ADL	NBR
42	72	07	ADL	NBR	44	58	07	B	NBR
42	72	08	A	NBR	44	60	07	ADL	NBR
42	72	08	A	FPM	44	60	09	A	NBR
42	72	08	ADL	NBR	44	60	09	ADL	NBR
42	72	08	ADL	FPM	44	60	10	A	NBR
42	72	09	ADL	NBR	44	60	10	A	FPM
42	72	10	A	NBR	44	60	12	ADL	NBR
42	72	10	A	FPM	44	62	08	ADL	NBR
42	72	10	ADL	NBR	44	62	09	ADL	NBR
42	72	10	ADL	FPM	44	62	10	A	NBR
42	72	12	A	NBR	44	62	10	ADL	NBR
42	72	12	ADL	NBR	44	62	11.5	ADL	NBR
42	72.5	10	ADL	NBR	44	62	12	C	NBR
42	75	10	ADL	NBR	44	63	07	ADL	NBR
42	75	12	ADL	NBR	44	64	09	ADL	NBR
42	76	12	ADL	NBR	44	64	10	ADL	NBR
42	78	10	ADL	NBR	44	65	08	ADL	NBR
42	80	09	ADL	NBR	44	65	08	ADL	FPM
42	80	10	A	NBR	44	65	10	A	NBR
42	80	12	C	NBR	44	65	10	A	FPM
42	80	13	C	NBR	44	65	10	ADL	NBR
42	81	13	A	NBR	44	65	10	ADL	FPM
43	50	08	AODL	NBR	44	65	11	ADL	NBR
43	52	10	B	NBR	44	67	10	ADL	NBR
43	53	04	AO	NBR	44	68	08	A	NBR
43	53	05	A	FPM	44	70	12	C	NBR
43	54	7.5	B	NBR	44	72	09	ADL	NBR
43	54	09	ADL	NBR	44	72	10	A	NBR
43	55	07	A	NBR	44	72	12	C	NBR
43	55	07	ADL	FPM	44	80	06	A	NBR
43	55	09	ADL	NBR	44	92	10	ADL	NBR
43	56	06	ADL	NBR	44	100	12	A	NBR
43	58	07	ADL	NBR	44.5	54	07	ADL	NBR
43	58	08	ADL	NBR	44.5	62	10	A	NBR
43	60	10	A	NBR	45	50	03	BO	NBR

NBR=Nitrile FPM=Viton®

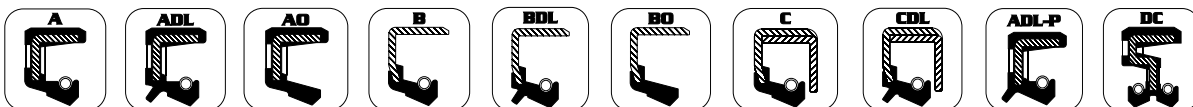


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
45	52	04	AO	NBR	45	62	08	ADL	NBR
45	52	08	A	NBR	45	62	08	ADL	FPM
45	52	08	ADL	NBR	45	62	08	AODL	NBR
45	53	07	B	NBR	45	62	09	A	NBR
45	55	04	AO	NBR	45	62	09	ADL	NBR
45	55	04	AO	FPM	45	62	09	ADL	FPM
45	55	07	A	NBR	45	62	10	A	NBR
45	55	07	A	FPM	45	62	10	A	FPM
45	55	07	ADL	NBR	45	62	10	ADL	NBR
45	55	07	ADL-P	NBR	45	62	11	ADL	NBR
45	55	07	B	NBR	45	62	12	A	NBR
45	55	08	A	NBR	45	62	12	A	FPM
45	55	10	A	NBR	45	62	12	ADL	NBR
45	56	07	ADL	NBR	45	63	07	ADL	NBR
45	57	5.5	ADL	NBR	45	63.5	10	ADL	NBR
45	57	07	A	NBR	45	64	09	ADL	NBR
45	57	7.5	ADL	NBR	45	65	05	A	NBR
45	57	09	A	NBR	45	65	06	A	NBR
45	57	10	ADL	NBR	45	65	07	ADL	NBR
45	58	06	ADL-P	NBR	45	65	07	ADL-P	NBR
45	58	07	A	NBR	45	65	07	ADL-P	FPM
45	58	07	ADL	NBR	45	65	08	A	NBR
45	58	07	ADL	FPM	45	65	08	A	FPM
45	58	07	ADL-P	NBR	45	65	08	ADL	NBR
45	58	08	A	NBR	45	65	08	ADL	FPM
45	58	08	ADL	NBR	45	65	08	ADL-P	NBR
45	58	09	BDL	NBR	45	65	08	B	FPM
45	59	10	A	NBR	45	65	09	ADL	NBR
45	60	06	A	NBR	45	65	10	A	NBR
45	60	07	A	NBR	45	65	10	A	FPM
45	60	07	A	FPM	45	65	10	ADL	NBR
45	60	07	ADL	NBR	45	65	10	ADL	FPM
45	60	07	ADL	FPM	45	65	12	A	NBR
45	60	08	A	NBR	45	65	12	A	FPM
45	60	08	A	FPM	45	65	12	ADL	NBR
45	60	08	ADL	NBR	45	66	06	A	NBR
45	60	08	ADL	FPM	45	66	06	A	FPM
45	60	09	ADL	NBR	45	66	09	A	NBR
45	60	10	A	NBR	45	66	10	A	NBR
45	60	10	A	FPM	45	68	07	ADL	NBR
45	60	10	ADL	NBR	45	68	08	A	NBR
45	60	10	ADL	FPM	45	68	08	ADL	NBR
45	60	12	A	NBR	45	68	09	ADL	NBR
45	61	09	ADL	NBR	45	68	10	A	NBR
45	61	10	ADL	NBR	45	68	10	A	FPM
45	61.5	05	C	NBR	45	68	10	ADL	NBR
45	62	06	A	NBR	45	68	10	ADL	FPM
45	62	07	A	NBR	45	68	12	A	NBR
45	62	07	A	FPM	45	68	12	ADL	NBR
45	62	07	ADL	NBR	45	68	12	ADL-P	NBR
45	62	07	ADL	FPM	45	68	12	C	NBR
45	62	07	ADL-P	NBR	45	69	10	ADL	NBR
45	62	07	B	NBR	45	70	05	ADL	NBR
45	62	08	A	NBR	45	70	10	A	NBR
45	62	08	A	FPM	45	70	10	ADL	NBR

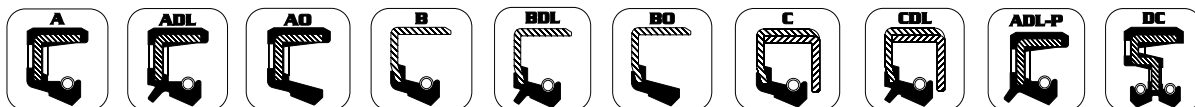


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
45	70	10	C	NBR	45	100	10	ADL	FPM
45	70	12	A	NBR	46	56	07	ADL	NBR
45	70	12	A	FPM	46	58	05	AO	NBR
45	70	12	ADL	NBR	46	59	12	ADL	NBR
45	71	07	BO	NBR	46	60	07	ADL	NBR
45	72	07	A	NBR	46	60	10	ADL	NBR
45	72	08	A	NBR	46	62	08	ADL	NBR
45	72	08	A	FPM	46	62	09	A	NBR
45	72	08	ADL	NBR	46	64	08	A	NBR
45	72	08	ADL	FPM	46	64	09	ADL	NBR
45	72	09	A	NBR	46	65	09	ADL	NBR
45	72	10	A	NBR	46	65	10	A	NBR
45	72	10	A	FPM	46	68	08	ADL	NBR
45	72	10	ADL	NBR	46	70	08	ADL	NBR
45	72	11	ADL	NBR	46	70	08	ADL	FPM
45	72	12	A	NBR	46	72	10	A	NBR
45	72	12	ADL	NBR	46	73	10	ADL	NBR
45	72	12	B	NBR	46	78	10	A	NBR
45	72	15	ADL	NBR	46	78	10	ADL	NBR
45	73	10	ADL	NBR	46.2	80	10	A	NBR
45	75	06	A	NBR	47	56	10	A	NBR
45	75	07	ADL	NBR	47	58	05	ADL	NBR
45	75	07	ADL	FPM	47	58	06	A	NBR
45	75	08	A	NBR	47	58	07	A	NBR
45	75	08	ADL	NBR	47	62	06	A	NBR
45	75	08	ADL	FPM	47	62	06	A	FPM
45	75	10	A	NBR	47	62	07	ADL-P	NBR
45	75	10	A	FPM	47	62	07	ADL-P	FPM
45	75	10	ADL	NBR	47	62	08	A	NBR
45	75	10	ADL	FPM	47	62	09	ADL	NBR
45	75	12	ADL	NBR	47	65	08	A	NBR
45	75	12	C	NBR	47	65	10	A	NBR
45	75	13	ADL	NBR	47	65	10	A	FPM
45	78	10	BDL	NBR	47	65	10	ADL-P	NBR
45	78	13	A	NBR	47	66	06	BDL	NBR
45	80	08	A	NBR	47	67	12	A	NBR
45	80	10	A	NBR	47	68	13	BDL	NBR
45	80	10	A	FPM	47	70	10	ADL	NBR
45	80	10	ADL	NBR	47	72	08	ADL	NBR
45	80	10	ADL	FPM	47	72	09	A	NBR
45	80	10	B	NBR	47	72	09	A	FPM
45	80	13	A	NBR	47	72	10	A	NBR
45	80	13	ADL	NBR	47	72	12	ADL	NBR
45	82	12	ADL	NBR	47	75	10	ADL	FPM
45	85	08	A	FPM	48	52	05	BO	NBR
45	85	08	ADL	NBR	48	54	04	AO	NBR
45	85	10	A	NBR	48	58	04	A	NBR
45	85	10	ADL	NBR	48	58	04	ADL	NBR
45	85	10	ADL	FPM	48	60	07	ADL	NBR
45	85	13	A	NBR	48	60	08	ADL	NBR
45	90	10	A	NBR	48	60	09	BDL	NBR
45	90	10	ADL	NBR	48	60	10	A	FPM
45	90	10	ADL	FPM	48	62	06	AO	NBR
45	100	10	A	NBR	48	62	07	ADL	NBR
45	100	10	ADL	NBR	48	62	08	A	NBR

NBR=Nitrile FPM=Viton®

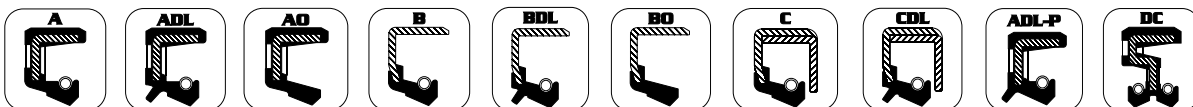


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
48	62	08	A	FPM	48	72	12	ADL	NBR
48	62	08	ADL	NBR	48	72	15	DC	NBR
48	62	08	ADL	FPM	48	72	15	DC	FPM
48	62	08	ADL-P	NBR	48	73	12	ADL	NBR
48	62	09	ADL	NBR	48	74	10	A	NBR
48	62	10	A	NBR	48	74	10	ADL	NBR
48	62	10	A	FPM	48	75	09	ADL	NBR
48	62	10	ADL	NBR	48	75	10	ADL	NBR
48	62	12	A	NBR	48	76	13	ADL	NBR
48	63	11	A	NBR	48	79	09	ADL	NBR
48	63.5	08	ADL	NBR	48	80	08	A	NBR
48	65	07	A	FPM	48	80	10	A	NBR
48	65	07	ADL	NBR	48	80	10	A	FPM
48	65	08	A	NBR	48	80	10	ADL	NBR
48	65	08	ADL	FPM	48	80	13	A	NBR
48	65	09	ADL	NBR	48	82	12	BDL	NBR
48	65	10	A	NBR	48	85	06	A	FPM
48	65	10	A	FPM	48	85	10	A	NBR
48	65	10	ADL	NBR	48	90	10	A	NBR
48	65	10	ADL	FPM	48	90	10	A	FPM
48	65	12	A	NBR	48	90	13	ADL	NBR
48	65	12	B	NBR	48	110	12	ADL	NBR
48	67	09	ADL	NBR	49	55	05	BDL	NBR
48	67	10	ADL	NBR	49	60	07	B	NBR
48	68	08	ADL	NBR	49	60	10	ADL	NBR
48	68	08	ADL	FPM	49	62	06	ADL	NBR
48	68	10	A	NBR	49	65	10	A	NBR
48	68	10	A	FPM	49	68	12	A	NBR
48	68	10	ADL	NBR	49	72	10	A	NBR
48	68	10	ADL	FPM	49	77	18	ADL	NBR
48	68	11	ADL	NBR	49	86	12	ADL	NBR
48	68	12	A	NBR	49	92	10	ADL	NBR
48	68	14	ADL	NBR	50	56	07	BO	NBR
48	69	10	ADL	NBR	50	58	04	AO	NBR
48	70	08	A	NBR	50	58	04	AO	FPM
48	70	09	ADL	NBR	50	58	05	B	NBR
48	70	10	A	NBR	50	59	04	AO	NBR
48	70	10	A	FPM	50	60	04	AO	NBR
48	70	10	ADL	NBR	50	60	07	A	NBR
48	70	10	ADL	FPM	50	60	07	A	FPM
48	70	12	A	NBR	50	60	08	A	NBR
48	70	12	ADL	NBR	50	60	08	ADL	NBR
48	70	12	ADL	FPM	50	60	10	A	NBR
48	72	07	A	NBR	50	62	05	AO	NBR
48	72	07	ADL	NBR	50	62	05	AO	FPM
48	72	07	ADL-P	NBR	50	62	06	A	NBR
48	72	08	A	NBR	50	62	07	A	NBR
48	72	08	A	FPM	50	62	07	A	FPM
48	72	08	ADL	NBR	50	62	07	ADL	NBR
48	72	08	ADL	FPM	50	62	07	ADL	FPM
48	72	09	A	NBR	50	62	08	A	FPM
48	72	10	A	NBR	50	62	08	ADL	NBR
48	72	10	A	FPM	50	62	10	A	NBR
48	72	10	ADL	NBR	50	62	10	ADL	NBR
48	72	12	A	NBR	50	63	03	BODL	NBR

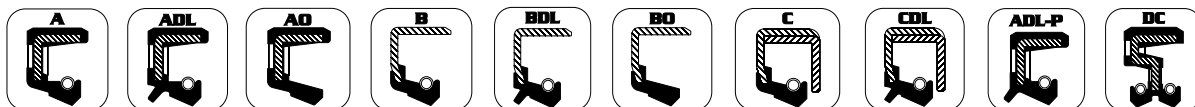


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
50	63	03	BDL	NBR	50	70	12	A	NBR
50	63	06	BO	NBR	50	70	12	A	FPM
50	64	10	A	NBR	50	70	12	ADL	NBR
50	64	10	ADL	NBR	50	70	13.5	ADL	NBR
50	64	12	ADL	NBR	50	72	05	ADL	NBR
50	65	07	A	NBR	50	72	06	ADL	NBR
50	65	07	ADL-P	NBR	50	72	06	AO	NBR
50	65	07	ADL-P	FPM	50	72	07	ADL	NBR
50	65	08	A	NBR	50	72	07	ADL	FPM
50	65	08	A	FPM	50	72	07	ADL-P	NBR
50	65	08	ADL	NBR	50	72	07	ADL-P	FPM
50	65	08	ADL	FPM	50	72	08	A	NBR
50	65	08	ADL-P	NBR	50	72	08	A	FPM
50	65	09	ADL	NBR	50	72	08	ADL	NBR
50	65	10	A	NBR	50	72	08	ADL	FPM
50	65	10	A	FPM	50	72	08	B	NBR
50	65	10	ADL	NBR	50	72	08	B	FPM
50	65	10	ADL	FPM	50	72	09	ADL	NBR
50	65	10	C	NBR	50	72	10	A	NBR
50	65	12	A	NBR	50	72	10	A	FPM
50	66	08	A	NBR	50	72	10	ADL	NBR
50	66	10	A	NBR	50	72	10	ADL	FPM
50	66	12	A	NBR	50	72	12	A	NBR
50	67	09	BDL	NBR	50	72	12	A	FPM
50	67	11	AODL	NBR	50	72	12	ADL	NBR
50	68	04	AO	NBR	50	72	12	ADL	FPM
50	68	06	ADL	NBR	50	73	12	ADL	NBR
50	68	07	ADL	NBR	50	74	12	ADL	NBR
50	68	07	ADL-P	NBR	50	75	08	ADL	NBR
50	68	08	A	NBR	50	75	08	ADL	FPM
50	68	08	A	FPM	50	75	10	A	NBR
50	68	08	ADL	NBR	50	75	10	A	FPM
50	68	08	ADL	FPM	50	75	10	ADL	NBR
50	68	08	ADL-P	NBR	50	75	10	ADL	FPM
50	68	09	ADL	NBR	50	75	12	A	NBR
50	68	10	A	NBR	50	75	12	A	FPM
50	68	10	A	FPM	50	75	12	ADL	NBR
50	68	10	ADL	NBR	50	76	10	A	NBR
50	68	10	ADL	FPM	50	76	12	ADL	NBR
50	68	11	A	NBR	50	78	10	A	NBR
50	68	12	A	NBR	50	78	12	A	NBR
50	68	12	C	NBR	50	80	07	ADL	NBR
50	68	14	B	NBR	50	80	08	A	NBR
50	70	07	CDL	NBR	50	80	08	A	FPM
50	70	08	A	NBR	50	80	08	ADL	NBR
50	70	08	A	FPM	50	80	08	ADL	FPM
50	70	08	ADL	FPM	50	80	10	A	NBR
50	70	09	A	NBR	50	80	10	A	FPM
50	70	09	ADL	NBR	50	80	10	ADL	NBR
50	70	9.5	ADL	NBR	50	80	10	ADL	FPM
50	70	10	A	NBR	50	80	12	A	NBR
50	70	10	A	FPM	50	80	12	ADL	NBR
50	70	10	ADL	NBR	50	80	13	A	NBR
50	70	10	ADL	FPM	50	80	13	ADL	NBR
50	70	10	ADL-P	NBR	50	80	13	ADL	FPM

NBR=Nitrile FPM=Viton®

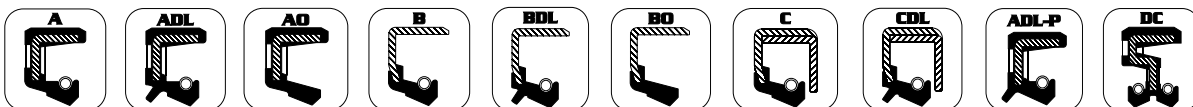


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
50	82	12	ADL	NBR	52	68	13	A	NBR
50	85	08	A	NBR	52	68	13.5	BDL	NBR
50	85	10	A	NBR	52	69	10	A	NBR
50	85	10	ADL	NBR	52	69	10	A	FPM
50	85	10	ADL	FPM	52	70	08	ADL	NBR
50	85	13	A	NBR	52	70	09	ADL	NBR
50	90	08	A	FPM	52	70	10	C	NBR
50	90	08	ADL	NBR	52	71	09	A	NBR
50	90	10	A	NBR	52	72	08	A	NBR
50	90	10	A	FPM	52	72	08	A	FPM
50	90	10	ADL	NBR	52	72	08	ADL	NBR
50	90	10	ADL	FPM	52	72	08	ADL	FPM
50	90	12	C	NBR	52	72	09	ADL	NBR
50	90	13	A	NBR	52	72	10	A	NBR
50	90	13	ADL	NBR	52	72	10	A	FPM
50	95	10	C	NBR	52	72	10	ADL	NBR
50	100	10	ADL	NBR	52	72	12	A	NBR
50	100	10	ADL	FPM	52	72	12	ADL	NBR
50	110	10	ADL	NBR	52	72	12	ADL-P	NBR
50	110	10	ADL	FPM	52	72	12	B	NBR
50	110	10.5	A	NBR	52	73	09	A	NBR
50	110	12	A	NBR	52	75	08	A	NBR
50	110	12	ADL	NBR	52	75	10	A	NBR
50	120	12	ADL	NBR	52	75	10	A	FPM
50	125	10	ADL	NBR	52	75	12	A	NBR
50.5	62	09	ADL	NBR	52	75	12	A	FPM
51	58	04	BO	NBR	52	75	12	ADL	NBR
51	62	07	A	NBR	52	75	15	ADL	NBR
51	62	07	ADL	NBR	52	76	12	A	NBR
51	63	06	BO	NBR	52	76	13	A	NBR
51	65	07	CDL	NBR	52	78	13	A	NBR
51	65	09	BO	NBR	52	80	08	A	NBR
51	70	11	ADL	NBR	52	80	10	A	NBR
51	72	10	A	NBR	52	80	10	A	FPM
52	60	07	ADL	NBR	52	80	10	ADL	NBR
52	62	07	A	NBR	52	80	13	A	NBR
52	62	07	ADL	NBR	52	80	13	A	FPM
52	62	08	A	NBR	52	80	13	C	NBR
52	62	08	A	FPM	52	84	14	A	NBR
52	62	08	ADL	NBR	52	85	08	A	NBR
52	63	06	ADL	NBR	52	85	10	A	NBR
52	63	08	ADL	NBR	52	85	10	ADL	NBR
52	65	08	A	NBR	52	90	13	C	NBR
52	65	09	ADL	NBR	52	100	10	ADL	NBR
52	65	10	ADL	NBR	53	65	10	ADL	NBR
52	66	07	ADL	NBR	53	68	10	A	NBR
52	68	08	A	NBR	53	68	10	A	FPM
52	68	08	A	FPM	53	72	10	ADL	NBR
52	68	08	ADL	NBR	53	72	12	ADL	NBR
52	68	08	ADL	FPM	53	80	10	A	NBR
52	68	09	ADL	NBR	53	80	10	A	FPM
52	68	10	A	NBR	53	90	13	ADL	NBR
52	68	10	ADL	NBR	54	61	04	BO	NBR
52	68	10	ADL	FPM	54	65	13	ADL	NBR
52	68	12	C	NBR	54	66	07	ADL	NBR

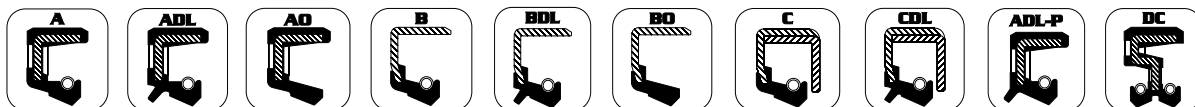


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
54	68	09	ADL	NBR	55	70	10	A	NBR
54	68	10.5	A	NBR	55	70	10	A	FPM
54	70	10	A	NBR	55	70	10	ADL	NBR
54	70	12	A	FPM	55	70	10	ADL	FPM
54	72	05	A	NBR	55	70	12	C	NBR
54	72	08	A	NBR	55	72	07	ADL	FPM
54	72	08	ADL	NBR	55	72	07	ADL-P	NBR
54	72	10	A	NBR	55	72	07	ADL-P	FPM
54	72	10	ADL	NBR	55	72	07	AO	NBR
54	72	10	ADL	FPM	55	72	08	A	NBR
54	72	12	C	NBR	55	72	08	A	FPM
54	72.5	09	A	NBR	55	72	08	ADL	NBR
54	73	06	BO	NBR	55	72	08	ADL	FPM
54	74	08	A	NBR	55	72	08	ADL-P	NBR
54	74	10	ADL	NBR	55	72	08	ADL-P	FPM
54	75	10	ADL	NBR	55	72	08	B	NBR
54	75	12	A	NBR	55	72	09	ADL	NBR
54	76	12	A	NBR	55	72	10	A	NBR
54	78	12	A	NBR	55	72	10	A	FPM
54	80	10	C	NBR	55	72	10	ADL	NBR
54	80	13	ADL	NBR	55	72	10	ADL	FPM
54	81	10	ADL	NBR	55	72	10	BDL	NBR
54	82	11	ADL	NBR	55	72	12	A	NBR
54	85	10	A	FPM	55	72	12	ADL	NBR
54	85	10	ADL	NBR	55	72	13	A	NBR
54	85	10	C	NBR	55	73	10	ADL	NBR
54	85	15	A	NBR	55	75	07	ADL	FPM
54	90	13	A	NBR	55	75	08	A	NBR
54	90	13	A	FPM	55	75	08	ADL	NBR
55	62	04	BO	NBR	55	75	08	ADL	FPM
55	63	05	AO	NBR	55	75	09	ADL	NBR
55	63	05	AO	FPM	55	75	10	A	NBR
55	65	05	BO	NBR	55	75	10	A	FPM
55	65	08	A	NBR	55	75	10	ADL	NBR
55	65	08	ADL	NBR	55	75	10	ADL	FPM
55	67	05	BO	NBR	55	75	12	A	NBR
55	67	06	ADL	NBR	55	75	12	A	FPM
55	68	07	ADL-P	NBR	55	75	12	ADL	NBR
55	68	08	A	NBR	55	76	12	ADL	NBR
55	68	08	A	FPM	55	77	5.5	A	NBR
55	68	08	ADL	NBR	55	78	08	A	NBR
55	68	08	ADL	FPM	55	78	08	A	FPM
55	70	04	BO	NBR	55	78	09	ADL	NBR
55	70	06	ADL	NBR	55	78	10	A	NBR
55	70	07	A	NBR	55	78	10	A	FPM
55	70	07	A	FPM	55	78	10	ADL	NBR
55	70	07	ADL-P	NBR	55	78	10	ADL	FPM
55	70	08	A	NBR	55	78	12	A	NBR
55	70	08	A	FPM	55	78	12	ADL	NBR
55	70	08	ADL	NBR	55	78	12	ADL	FPM
55	70	08	ADL	FPM	55	78	13	C	NBR
55	70	08	ADL-P	NBR	55	80	06	A	NBR
55	70	08	BDL	NBR	55	80	08	A	NBR
55	70	09	A	NBR	55	80	08	A	FPM
55	70	09	ADL	NBR	55	80	08	ADL	NBR

NBR=Nitrile FPM=Viton®

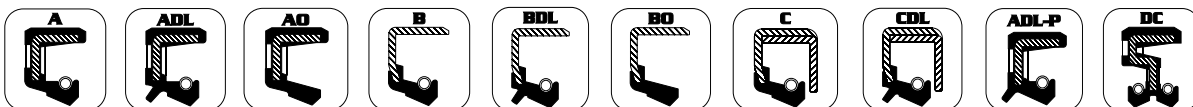


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
55	80	08	ADL	FPM	56	72	10	ADL	NBR
55	80	10	A	NBR	56	75	08	ADL	NBR
55	80	10	A	FPM	56	78	13	C	NBR
55	80	10	ADL	NBR	56	80	08	A	NBR
55	80	10	ADL	FPM	56	80	08	ADL	FPM
55	80	10	CDL	NBR	56	80	10	C	NBR
55	80	10	DC	NBR	56	80	12	A	FPM
55	80	12	A	NBR	56	80	12	ADL	NBR
55	80	12	ADL	NBR	56	82	08	ADL	NBR
55	80	13	A	NBR	56	85	08	A	NBR
55	80	13	ADL	NBR	56	85	08	A	FPM
55	80	13	ADL-P	NBR	56	85	08	ADL	NBR
55	82	09	ADL	NBR	56	85	08	ADL	FPM
55	82	10	ADL	NBR	56	85	13	A	NBR
55	82	12	ADL	NBR	56	88	10	A	NBR
55	85	08	A	NBR	56	90	10	A	NBR
55	85	08	A	FPM	56	90	13	C	NBR
55	85	08	ADL	NBR	56	100	10	ADL	NBR
55	85	08	ADL	FPM	56	100	10	B	NBR
55	85	10	A	NBR	57	67	06	ADL	NBR
55	85	10	A	FPM	57	71	09	ADL	NBR
55	85	10	ADL	NBR	57	73	07	ADL	NBR
55	85	10	ADL	FPM	57	75	7.5	ADL	NBR
55	85	12	ADL	NBR	57	75	10	A	NBR
55	85	13	A	NBR	57	75	12	A	NBR
55	85	13	B	NBR	57	76	10	ADL	NBR
55	88	10	A	NBR	57	77	10	ADL	NBR
55	90	06	BO	NBR	57	79.5	10	ADL	NBR
55	90	08	A	NBR	57	80	12	ADL	NBR
55	90	08	ADL	NBR	57	81	13	ADL	NBR
55	90	10	A	NBR	57	82.5	13	BDL	NBR
55	90	10	A	FPM	57	85	10	A	NBR
55	90	10	ADL	NBR	57	85	13	A	NBR
55	90	10	ADL	FPM	57	85	13	ADL	NBR
55	90	13	A	NBR	57	85	13	ADL	FPM
55	95	09	ADL	NBR	57	85.4	08	A	NBR
55	100	08	A	FPM	57	86	08	ADL	NBR
55	100	10	ADL	NBR	57	86	12	A	NBR
55	100	10	ADL	FPM	57	87	15	A	NBR
55	100	12	A	NBR	57	90	13	A	NBR
55	100	12	ADL	NBR	57	90	13	C	NBR
55	100	13	A	NBR	57	95	10	A	NBR
55	100	13	ADL	NBR	58	65	3.5	BO	NBR
55	100	16	A	NBR	58	66	05	AO	NBR
55	110	12	ADL	NBR	58	68	09	ADL	NBR
56	65	12	B	NBR	58	70	06	A	NBR
56	69	10	ADL	NBR	58	72	08	A	NBR
56	70	08	A	NBR	58	72	08	A	FPM
56	70	08	A	FPM	58	72	08	ADL	NBR
56	70	09	ADL	NBR	58	72	08	ADL	FPM
56	72	07	ADL	NBR	58	72	09	A	NBR
56	72	08	A	NBR	58	72	09	ADL	NBR
56	72	08	ADL	FPM	58	74	10	ADL	NBR
56	72	08	ADL-P	NBR	58	75	07	ADL	NBR
56	72	10	A	FPM	58	75	08	A	FPM

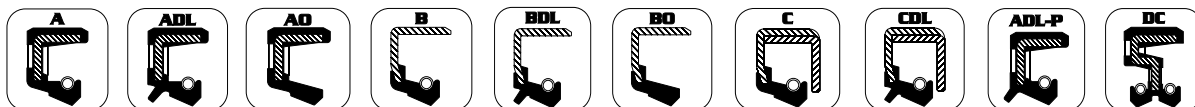


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
58	75	08	ADL	NBR	60	72	08	A	FPM
58	75	08	B	NBR	60	72	08	ADL	NBR
58	75	09	A	NBR	60	72	08	B	NBR
58	75	09	ADL	NBR	60	72	09	ADL	NBR
58	75	12	A	NBR	60	72	10	ADL	NBR
58	75	12	C	NBR	60	74	10	A	NBR
58	75	13	ADL	NBR	60	74	10	ADL	NBR
58	76	09	A	NBR	60	75	04	AO	NBR
58	76	10	ADL	NBR	60	75	07	A	NBR
58	78	09	ADL	NBR	60	75	08	A	NBR
58	78	13	A	NBR	60	75	08	A	FPM
58	78	13	A	FPM	60	75	08	ADL	NBR
58	80	05	A	NBR	60	75	08	ADL	FPM
58	80	08	A	NBR	60	75	08	ADL-P	NBR
58	80	08	A	FPM	60	75	08	B	NBR
58	80	08	ADL	NBR	60	75	09	A	NBR
58	80	08	ADL	FPM	60	75	09	ADL	NBR
58	80	08	ADL-P	NBR	60	75	10	A	NBR
58	80	09	ADL	NBR	60	75	10	A	FPM
58	80	09	ADL	FPM	60	75	10	ADL	NBR
58	80	10	A	NBR	60	75	12	A	NBR
58	80	10	A	FPM	60	75	12	ADL	NBR
58	80	10	ADL	NBR	60	76	11	ADL	NBR
58	80	10	ADL	FPM	60	77	10	ADL	NBR
58	80	12	A	NBR	60	77	12	ADL	NBR
58	80	12	ADL	NBR	60	78	09	A	NBR
58	80	13	A	NBR	60	78	10	A	NBR
58	80	13	ADL	NBR	60	78	10	A	FPM
58	80	13	CDL	NBR	60	78	13	A	NBR
58	84	10	ADL	NBR	60	79.4	08	A	FPM
58	85	10	A	NBR	60	80	07	A	NBR
58	85	10	A	FPM	60	80	07	ADL	NBR
58	85	10	ADL	NBR	60	80	07	ADL-P	NBR
58	85	12	A	NBR	60	80	07	ADL-P	FPM
58	85	13	ADL	NBR	60	80	08	A	NBR
58	86	12	A	NBR	60	80	08	A	FPM
58	90	09	ADL	NBR	60	80	08	ADL	NBR
58	90	10	A	NBR	60	80	08	ADL	FPM
58	90	10	A	FPM	60	80	08	B	NBR
58	90	10	ADL	NBR	60	80	09	ADL	NBR
58	90	11	A	NBR	60	80	10	A	NBR
58	90	13	A	NBR	60	80	10	A	FPM
58	110	10	ADL	NBR	60	80	10	ADL	NBR
59	72	12.3	ADL	NBR	60	80	10	ADL	FPM
59	75	10	ADL	NBR	60	80	10	B	NBR
59	80	10	A	NBR	60	80	10	DC	NBR
59	85	08	A	NBR	60	80	12	A	NBR
60	67	04	AO	NBR	60	80	12	A	FPM
60	70	07	A	NBR	60	80	12	ADL	NBR
60	70	07	B	NBR	60	80	12	ADL	FPM
60	70	10	AO	NBR	60	80	13	A	NBR
60	72	04	BO	NBR	60	80	13	ADL	NBR
60	72	07	ADL-P	NBR	60	82	07	ADL	NBR
60	72	07	B	NBR	60	82	07	AODL	NBR
60	72	08	A	NBR	60	82	09	ADL	NBR

NBR=Nitrile FPM=Viton®

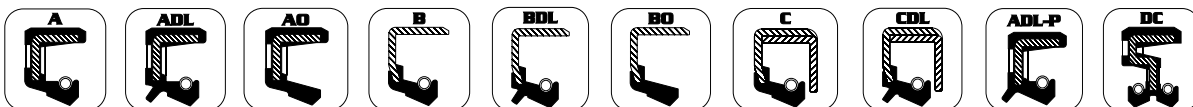


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
60	82	10	A	NBR	60	112	12	ADL	NBR
60	82	12	A	NBR	60	120	12	A	NBR
60	82	12	ADL	NBR	60	130	12	A	FPM
60	82	12	ADL	FPM	60	130	15	A	NBR
60	85	06	ADL	NBR	60	140	13	ADL	NBR
60	85	08	A	NBR	61	75	08	A	FPM
60	85	08	A	FPM	61	85	13	C	NBR
60	85	08	ADL	NBR	61	89	12.5	ADL	NBR
60	85	08	ADL	FPM	62	70	10	AO	NBR
60	85	08	ADL-P	NBR	62	72	09	ADL	NBR
60	85	10	A	NBR	62	72	10	ADL	NBR
60	85	10	A	FPM	62	75	7.5	ADL-P	NBR
60	85	10	ADL	NBR	62	75	10	ADL	NBR
60	85	10	ADL	FPM	62	75	10	B	NBR
60	85	12	A	NBR	62	76	10	ADL	NBR
60	85	12	ADL	NBR	62	80	08	ADL	NBR
60	85	13	A	NBR	62	80	09	ADL	NBR
60	85	13	A	FPM	62	80	10	A	NBR
60	90	07	ADL-P	NBR	62	80	10	A	FPM
60	90	08	A	NBR	62	80	10	ADL	NBR
60	90	08	A	FPM	62	80	10	B	NBR
60	90	08	ADL	NBR	62	80	12	A	NBR
60	90	08	ADL	FPM	62	80	12	ADL	NBR
60	90	10	A	NBR	62	82	07	ADL	NBR
60	90	10	A	FPM	62	82	10	A	NBR
60	90	10	ADL	NBR	62	82	10	ADL	NBR
60	90	10	ADL	FPM	62	85	07	ADL-P	NBR
60	90	11	ADL	NBR	62	85	07	ADL-P	FPM
60	90	12	ADL	NBR	62	85	08	A	NBR
60	90	12	C	NBR	62	85	08	ADL	FPM
60	90	13	A	NBR	62	85	10	A	NBR
60	90	13	A	FPM	62	85	10	A	FPM
60	90	13	ADL	NBR	62	85	10	ADL	NBR
60	92	10	ADL	NBR	62	85	10	ADL	FPM
60	93	13	A	NBR	62	85	12	A	NBR
60	95	08	A	NBR	62	85	12	A	FPM
60	95	10	A	NBR	62	85	12	ADL	NBR
60	95	10	A	FPM	62	85	12	C	NBR
60	95	10	ADL	NBR	62	85	13	A	NBR
60	95	10	ADL	FPM	62	88	12	ADL	NBR
60	95	13	ADL	NBR	62	89	13	CDL	NBR
60	98.5	13	ADL	NBR	62	90	10	A	NBR
60	100	10	A	NBR	62	90	10	ADL	NBR
60	100	10	A	FPM	62	90	10	ADL	FPM
60	100	10	ADL	NBR	62	90	11	A	NBR
60	100	12	ADL	NBR	62	90	12	ADL	NBR
60	100	12	C	NBR	62	90	12	C	NBR
60	100	13	A	NBR	62	90	13	A	NBR
60	100	13	ADL	NBR	62	90	13	ADL	NBR
60	103	12	ADL	NBR	62	95	10	A	NBR
60	110	10	ADL	NBR	62	95	13	B	NBR
60	110	12	A	NBR	62	100	10	A	NBR
60	110	13	A	NBR	62	100	10	ADL	NBR
60	110	13	A	FPM	62	100	12	A	NBR
60	110	13	ADL	NBR	62	100	12	ADL	NBR

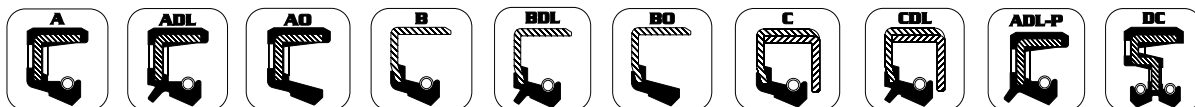


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
62	100	13	C	NBR	65	81	07	ADL	NBR
62	110	13	A	NBR	65	82	10	A	NBR
62	120	12	ADL	NBR	65	82	12	A	NBR
63	75	08	ADL	NBR	65	84	10	ADL	NBR
63	78	10	A	NBR	65	85	08	A	NBR
63	80	09	ADL	NBR	65	85	08	A	FPM
63	80	12	ADL	NBR	65	85	08	ADL	NBR
63	85	10	A	NBR	65	85	08	ADL-P	NBR
63	85	10	A	FPM	65	85	10	A	NBR
63	85	10	ADL	NBR	65	85	10	A	FPM
63	85	10	ADL	FPM	65	85	10	ADL	NBR
63	85	12	C	NBR	65	85	10	ADL	FPM
63	85	13	A	NBR	65	85	10	ADL-P	NBR
63	88	10	A	NBR	65	85	12	A	NBR
63	90	07	ADL	NBR	65	85	12	A	FPM
63	90	08	ADL	NBR	65	85	12	ADL	NBR
63	90	10	A	NBR	65	85	12	ADL	FPM
63	90	10	A	FPM	65	85	13	A	NBR
63	90	10	ADL	FPM	65	85	13	ADL	NBR
63	100	10	ADL	NBR	65	85	13	ADL	FPM
63	100	13	A	NBR	65	86	10	ADL	NBR
63.4	85.4	08	ADL	NBR	65	88	06	AO	NBR
63.5	90	10	A	NBR	65	88	08	ADL	NBR
64	80	08	A	NBR	65	88	10	ADL	NBR
64	80	08	A	FPM	65	88	12	ADL	NBR
64	80	08	ADL	NBR	65	88	12	ADL	FPM
64	80	13	ADL	NBR	65	89	13	ADL	NBR
64	85	10	A	NBR	65	90	07	ADL	NBR
64	85	12	ADL	NBR	65	90	07	ADL	FPM
64	85	13	ADL	NBR	65	90	07	ADL-P	NBR
64	85	16	ADL	NBR	65	90	08	ADL	NBR
64	86	08	ADL	NBR	65	90	10	A	NBR
64	88	15	ADL	NBR	65	90	10	A	FPM
64	90	10	C	NBR	65	90	10	ADL	NBR
64	90	13	ADL	NBR	65	90	10	ADL	FPM
64	90	13	ADL	FPM	65	90	10	ADL-P	NBR
64	90	13	CDL	NBR	65	90	12	A	NBR
64	95	10	ADL	NBR	65	90	12	ADL	NBR
64	100	13	C	NBR	65	90	12	ADL	FPM
65	75	05	AO	NBR	65	90	13	A	NBR
65	75	05	AO	FPM	65	90	13	A	FPM
65	75	08	ADL	NBR	65	90	13	ADL	NBR
65	77	12	BDL	NBR	65	90	13	B	NBR
65	80	08	A	NBR	65	92	12	A	NBR
65	80	08	A	FPM	65	92	12	ADL	NBR
65	80	08	ADL	NBR	65	95	10	A	NBR
65	80	08	ADL	FPM	65	95	10	A	FPM
65	80	10	A	NBR	65	95	10	ADL	NBR
65	80	10	ADL	NBR	65	95	10	ADL	FPM
65	80	10	ADL	FPM	65	95	13	A	NBR
65	80	10	B	NBR	65	95	13	ADL	NBR
65	80	12	A	NBR	65	95	13	C	NBR
65	80	12	A	FPM	65	95	16	A	NBR
65	80	12	ADL	NBR	65	100	08	A	FPM
65	80	13	A	NBR	65	100	10	A	NBR

NBR=Nitrile FPM=Viton®

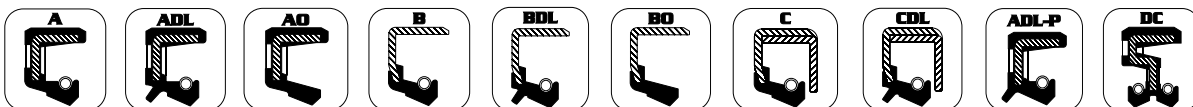


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
65	100	10	A	FPM	68	95	12	A	NBR
65	100	10	ADL	NBR	68	95	13	A	NBR
65	100	10	ADL	FPM	68	100	07	ADL	NBR
65	100	12	A	NBR	68	100	08	ADL	NBR
65	100	12	ADL	NBR	68	100	10	A	NBR
65	100	13	A	NBR	68	100	10	ADL	NBR
65	100	13	ADL	NBR	68	100	10	ADL	FPM
65	105	12	ADL	NBR	68	100	12	C	NBR
65	110	10	A	NBR	68	100	13	A	NBR
65	110	10	ADL	NBR	68	100	13	ADL	NBR
65	110	12	ADL	NBR	68	110	13	C	NBR
65	115	12	ADL	NBR	69	85	10	B	NBR
65	115	15	A	NBR	69	85	12	BDL	NBR
65	120	08	B	NBR	69	90	10	A	NBR
65	120	10	A	NBR	70	78	05	AO	NBR
65	120	12	A	NBR	70	78	05	AO	FPM
65	120	12	A	FPM	70	80	08	ADL	NBR
65	120	12	ADL	NBR	70	80	10	ADL	NBR
65	120	13	ADL	NBR	70	81.5	6.5	A	NBR
65	125	12	A	NBR	70	82.5	10	ADL	NBR
65	125	12	A	FPM	70	85	04	AO	NBR
66	90	13	C	NBR	70	85	06	B	NBR
66	100	11	A	NBR	70	85	07	A	NBR
67	82	7.5	ADL	NBR	70	85	07	A	FPM
67	85	10	C	NBR	70	85	08	A	NBR
67	90	10	C	NBR	70	85	08	A	FPM
68	80	07	A	FPM	70	85	08	ADL	NBR
68	80	10	ADL	NBR	70	85	08	ADL	FPM
68	82	07	ADL	NBR	70	85	08	BDL	NBR
68	82	10	ADL	NBR	70	85	10	A	NBR
68	83	10	ADL	NBR	70	85	10	ADL	NBR
68	84	09	ADL	NBR	70	87	10	ADL	NBR
68	85	08	A	NBR	70	88	08	ADL	NBR
68	85	10	A	NBR	70	88	09	A	FPM
68	85	10	B	NBR	70	88	12	ADL	NBR
68	85	13	ADL	NBR	70	90	07	ADL	NBR
68	86	07	ADL	NBR	70	90	07	ADL-P	NBR
68	88	09	ADL	NBR	70	90	07	ADL-P	FPM
68	88	10	ADL	NBR	70	90	08	ADL	NBR
68	90	08	ADL	NBR	70	90	10	A	NBR
68	90	08	ADL	FPM	70	90	10	A	FPM
68	90	10	A	NBR	70	90	10	ADL	NBR
68	90	10	A	FPM	70	90	10	ADL	FPM
68	90	10	ADL	NBR	70	90	10	ADL-P	NBR
68	90	10	ADL	FPM	70	90	10	B	NBR
68	90	10	ADL-P	NBR	70	90	10	C	NBR
68	90	12	A	NBR	70	90	11	DC	NBR
68	90	12	ADL	NBR	70	90	12	A	NBR
68	90	13	A	NBR	70	90	12	A	FPM
68	90	13	ADL	NBR	70	90	12	ADL	NBR
68	92	12	BDL	NBR	70	90	12	ADL	FPM
68	94	08	ADL	NBR	70	90	12	C	NBR
68	95	07	AO	NBR	70	90	12	CDL	NBR
68	95	10	A	NBR	70	90	13	A	NBR
68	95	10	ADL	FPM	70	90	13	A	FPM



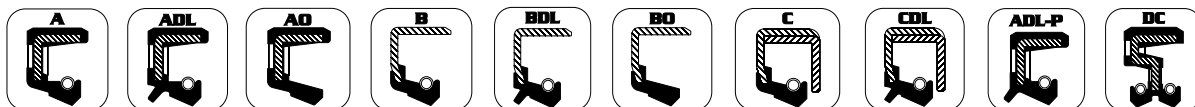
Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
70	90	13	ADL	NBR	70	120	13	A	FPM
70	92	8.5	ADL	NBR	70	120	13	ADL	NBR
70	92	12	A	NBR	70	125	12	ADL	NBR
70	92	12	ADL	NBR	70	130	13	ADL	NBR
70	94	12	ADL	NBR	70	135	12	A	NBR
70	95	10	A	NBR	71	80	06	B	NBR
70	95	10	ADL	NBR	71	88	08	ADL	NBR
70	95	10	ADL	FPM	72	84	07	BDL	NBR
70	95	12	ADL	NBR	72	85	08	A	NBR
70	95	12	ADL	FPM	72	85	08	A	FPM
70	95	13	A	NBR	72	85	10	A	NBR
70	95	13	A	FPM	72	85.5	05	AO	NBR
70	95	13	ADL	NBR	72	86	07	ADL	NBR
70	98.5	13	ADL	NBR	72	88	08	ADL	NBR
70	100	06	A	NBR	72	90	08	A	NBR
70	100	08	A	NBR	72	90	10	A	NBR
70	100	08	ADL	NBR	72	90	10	A	FPM
70	100	10	A	NBR	72	90	10	ADL	NBR
70	100	10	A	FPM	72	90	10	ADL	FPM
70	100	10	ADL	NBR	72	90	13	C	NBR
70	100	12	A	NBR	72	94	12	ADL	NBR
70	100	12	A	FPM	72	95	10	A	NBR
70	100	12	ADL	NBR	72	95	10	A	FPM
70	100	13	A	NBR	72	95	10	ADL	NBR
70	100	13	ADL	FPM	72	95	10	ADL	FPM
70	100	13	C	NBR	72	95	10	ADL-P	NBR
70	102	12	ADL	NBR	72	95	12	A	NBR
70	102	13	ADL	NBR	72	95	13	A	NBR
70	105	10	ADL	NBR	72	95	13	ADL	NBR
70	105	13	A	NBR	72	95	13	B	NBR
70	105	13	A	FPM	72	96	09	ADL	NBR
70	105	13	ADL	NBR	72	98	09	ADL	NBR
70	110	08	A	NBR	72	100	10	A	NBR
70	110	08	ADL	NBR	72	100	10	ADL	NBR
70	110	08	ADL	FPM	72	100	10	ADL	FPM
70	110	10	A	NBR	72	100	12	ADL	NBR
70	110	10	A	FPM	72	100	13	A	NBR
70	110	10	ADL	NBR	72	100	13	ADL	NBR
70	110	10	B	NBR	72	105	10	ADL	NBR
70	110	12	A	NBR	72	105	13	B	NBR
70	110	12	ADL	NBR	72	110	12	A	NBR
70	110	13	A	NBR	72	110	12	ADL	NBR
70	110	13	A	FPM	72	110	12	ADL	NBR
70	110	13	ADL	NBR	72	140	12	ADL	NBR
70	110	13	ADL	FPM	73	95	10	A	NBR
70	112	12	A	NBR	73	96	09	ADL	FPM
70	115	15	A	NBR	73	108	12	ADL	NBR
70	115	15	ADL	NBR	74	88	08	ADL	NBR
70	120	10	ADL	NBR	74	90	10	ADL	NBR
70	120	12	A	NBR	74	90	10	BDL	NBR
70	120	13	A	NBR	74	95	07	ADL	NBR
					74	95	10	C	NBR
					74	96	10	ADL	NBR
					74	98	12	ADL	NBR
					74	100	13	C	NBR

NBR=Nitrile FPM=Viton®



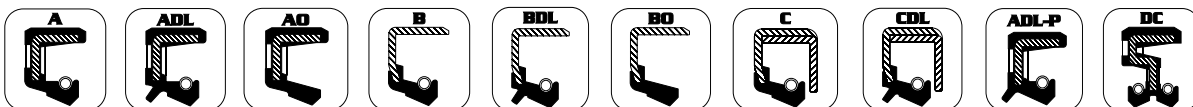
Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
74	105	12	A	NBR	75	108	13	ADL	NBR
74	105	12	A	FPM	75	110	10	ADL	NBR
74	135	15	A	NBR	75	110	12	A	NBR
75	85	08	A	FPM	75	110	12	A	FPM
75	90	06	AO	NBR	75	110	12	ADL	NBR
75	90	07	ADL	NBR	75	110	12	ADL	FPM
75	90	08	A	NBR	75	110	13	A	NBR
75	90	08	A	FPM	75	110	13	A	FPM
75	90	08	ADL	NBR	75	110	13	ADL	NBR
75	90	10	A	NBR	75	112	12	A	NBR
75	90	10	A	FPM	75	115	10	A	NBR
75	90	10	ADL	NBR	75	115	10	ADL	NBR
75	90	10	ADL	FPM	75	115	10	ADL	FPM
75	90	10	ADL-P	NBR	75	115	12	A	NBR
75	90	12	C	NBR	75	115	12	ADL	NBR
75	92	07	A	NBR	75	115	13	C	NBR
75	93	10	ADL	NBR	75	120	12	A	NBR
75	94	10	ADL	NBR	75	120	12	A	FPM
75	95	05	ADL	NBR	75	120	12	ADL	NBR
75	95	05	B	NBR	75	120	12	ADL	FPM
75	95	08	ADL	NBR	75	121	13	ADL	NBR
75	95	09	ADL	NBR	75	125	12	ADL	NBR
75	95	10	A	NBR	75	130	13	A	NBR
75	95	10	A	FPM	75	130	13	A	FPM
75	95	10	ADL	NBR	76	93	10	ADL	NBR
75	95	10	ADL	FPM	76	98	12	ADL	NBR
75	95	10	B	NBR	76	100	16	ADL	NBR
75	95	12	A	NBR	76	105	13	A	NBR
75	95	12	A	FPM	76	105	13	ADL	NBR
75	95	12	ADL	NBR	76	114	14	ADL	NBR
75	95	12	ADL	FPM	76	120	12	A	NBR
75	95	12	DC	NBR	77	95	10	C	NBR
75	95	13	A	NBR	77	100	10	A	NBR
75	95	13	ADL	NBR	77	100	11.5	ADL	NBR
75	95	15	B	NBR	77	100	13	C	NBR
75	100	07	A	NBR	78	90	08	A	NBR
75	100	08	ADL-P	NBR	78	92	06	A	NBR
75	100	10	A	NBR	78	95	11	A	NBR
75	100	10	A	FPM	78	95	11	A	FPM
75	100	10	ADL	NBR	78	95	13	C	NBR
75	100	10	ADL	FPM	78	100	10	A	NBR
75	100	10	ADL-P	NBR	78	100	10	A	FPM
75	100	12	A	NBR	78	100	10	ADL	NBR
75	100	12	A	FPM	78	100	10	ADL	FPM
75	100	12	ADL	NBR	78	100	12	C	NBR
75	100	12	ADL	FPM	78	100	13	A	NBR
75	100	13	A	NBR	78	100	13	ADL	NBR
75	100	13	ADL	NBR	78	105	13	A	NBR
75	100	13	ADL	FPM	78	105	13	A	FPM
75	101	12	A	NBR	78	105	13	ADL	NBR
75	102	12	ADL	NBR	78	105	15	A	NBR
75	105	10	ADL	NBR	78	110	12	A	NBR
75	105	12	A	NBR	78	110	12	A	FPM
75	105	13	ADL	NBR	78	110	13	A	NBR
75	105	15	ADL	NBR	78	115	10	ADL	NBR

NBR=Nitrile FPM=Viton®



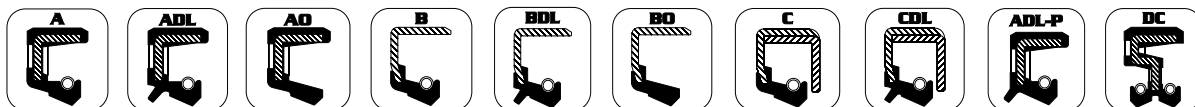
Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
79	102	12.5	ADL	NBR	80	112	12.5	A	NBR
79	120	13	ADL	NBR	80	113	12	A	NBR
80	90	05	AO	NBR	80	115	10	A	NBR
80	90	05	AO	FPM	80	115	10	ADL	NBR
80	95	04	AO	NBR	80	115	10	ADL	FPM
80	95	05	AO	NBR	80	115	12	A	NBR
80	95	08	A	NBR	80	115	12	ADL	NBR
80	95	08	A	FPM	80	120	10	ADL	NBR
80	95	08	ADL	NBR	80	120	12	ADL	NBR
80	95	10	ADL	NBR	80	120	12	C	NBR
80	96	09	ADL	NBR	80	120	13	A	NBR
80	98	10	ADL	NBR	80	120	13	A	FPM
80	100	07	ADL	NBR	80	120	13	ADL	NBR
80	100	07	ADL-P	NBR	80	125	10	ADL	NBR
80	100	07	ADL-P	FPM	80	125	12	A	NBR
80	100	08	ADL	NBR	80	125	12	A	FPM
80	100	10	A	NBR	80	125	12	ADL	NBR
80	100	10	A	FPM	80	125	12	ADL	FPM
80	100	10	ADL	NBR	80	125	13	A	NBR
80	100	10	ADL	FPM	80	125	13	ADL	NBR
80	100	10	B	NBR	80	128	10	ADL	NBR
80	100	10	DC	NBR	80	130	13	A	NBR
80	100	12	A	NBR	80	130	13	ADL	NBR
80	100	12	ADL	NBR	80	140	13	A	NBR
80	100	13	A	NBR	80	140	13	ADL	NBR
80	100	13	A	FPM	80	145	13	A	NBR
80	100	13	ADL	NBR	80	150.5	13	A	NBR
80	100	13	ADL	FPM	80	180	13	ADL	NBR
80	100	13	CDL	NBR	82	100	08	A	NBR
80	100	14	A	NBR	82	104	05	BDL	FPM
80	100	18	ADL	NBR	82	105	10	A	FPM
80	102	11	ADL	NBR	82	105	10	ADL	NBR
80	105	10	A	NBR	82	105	12	A	NBR
80	105	10	A	FPM	82	105	12	A	FPM
80	105	10	ADL	NBR	82	105	12	ADL	NBR
80	105	12	A	NBR	82	105	12	ADL-P	FPM
80	105	12	A	FPM	82	105	13	ADL	NBR
80	105	12	ADL	NBR	82	105	13	ADL	FPM
80	105	13	A	NBR	82	105	14	A	NBR
80	105	13	ADL	NBR	82	110	12	A	NBR
80	105	13	ADL-P	NBR	82	110	12	A	FPM
80	105	13	C	NBR	82	110	13	C	NBR
80	105	14	ADL	NBR	82	160	13	ADL	NBR
80	105	15	B	NBR	83	100	09	ADL	NBR
80	108	13	ADL	NBR	83	110	12	C	NBR
80	110	10	A	NBR	83	110	13	C	NBR
80	110	10	A	FPM	83.5	110	12	ADL	NBR
80	110	10	ADL	NBR	84	100	13	A	NBR
80	110	10	ADL	FPM	84	100	13	ADL	FPM
80	110	12	A	NBR	84	105	12	ADL	NBR
80	110	12	A	FPM	84	105	13	C	NBR
80	110	12	ADL	NBR	84	110	12	C	NBR
80	110	12	ADL	FPM	84	110	16	ADL	NBR
80	110	13	A	NBR	85	95	05	B	NBR
80	110	13	ADL	NBR	85	100	09	A	NBR

NBR=Nitrile FPM=Viton®



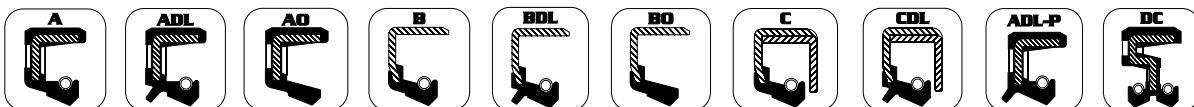
Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
85	100	09	ADL	NBR	85	125	12	ADL	NBR
85	100	09	B	NBR	85	125	13	C	NBR
85	100	10	ADL	NBR	85	125	14	ADL	NBR
85	100	12	A	NBR	85	126	13	A	NBR
85	100	12	A	FPM	85	130	10	A	NBR
85	100	12	ADL	NBR	85	130	10	ADL	NBR
85	100	13	ADL	NBR	85	130	12	A	NBR
85	100	13	C	NBR	85	130	12	ADL	NBR
85	102	13	ADL	NBR	85	130	12	ADL	FPM
85	103	08	ADL	NBR	85	130	13	ADL	FPM
85	105	7.5	ADL-P	NBR	85	130	13	C	NBR
85	105	08	ADL	NBR	85	140	12	A	NBR
85	105	10	A	NBR	85	140	12	ADL	NBR
85	105	10	A	FPM	85	150	12	A	NBR
85	105	10	ADL	NBR	85	150	12	ADL	NBR
85	105	12	A	NBR	85	150	13	A	NBR
85	105	12	ADL	NBR	85	155	12	A	NBR
85	105	12	ADL	FPM	86	100	07	A	FPM
85	105	12	ADL-P	NBR	86	100	10	A	FPM
85	105	13	A	NBR	86	104	11	ADL	NBR
85	105	13	ADL	NBR	86	110	13	A	NBR
85	110	08	ADL-P	NBR	87	100	12	ADL	NBR
85	110	10	A	NBR	87	110	13	A	NBR
85	110	10	A	FPM	88	100	13	A	NBR
85	110	10	ADL	NBR	88	105	12	A	NBR
85	110	11	ADL	NBR	88	106	10	ADL	NBR
85	110	12	A	NBR	88	110	10	A	NBR
85	110	12	A	FPM	88	110	12	A	NBR
85	110	12	ADL	NBR	88	110	13	A	NBR
85	110	12	ADL	FPM	88	110	13	A	FPM
85	110	12	C	NBR	88	110	13	C	NBR
85	110	13	A	NBR	88	120	12	A	NBR
85	110	13	A	FPM	88	120	13	ADL	NBR
85	110	13	ADL	NBR	88	120	13	C	NBR
85	110	13	ADL	FPM	88	121.5	12	A	NBR
85	110	14	ADL	NBR	88	126	12	A	NBR
85	110	15	C	NBR	88	126	12	A	FPM
85	111	10	ADL	NBR	88	128	12	A	NBR
85	115	10	A	NBR	88	140	13	A	NBR
85	115	13	A	NBR	89	120	13	C	NBR
85	115	13	A	FPM	90	104	11	ADL	NBR
85	115	13	ADL	NBR	90	105	04	AO	NBR
85	115	13	C	NBR	90	105	06	A	NBR
85	115	15	A	NBR	90	105	09	ADL	NBR
85	120	7.5	ADL-P	NBR	90	105	10	A	NBR
85	120	10	ADL	NBR	90	105	10	ADL	NBR
85	120	12	A	NBR	90	109	10	ADL	NBR
85	120	12	ADL	NBR	90	110	5.5	A	NBR
85	120	12	ADL	FPM	90	110	5.5	ADL	NBR
85	120	12	B	NBR	90	110	07	ADL	NBR
85	120	13	A	NBR	90	110	7.5	ADL-P	NBR
85	120	13	ADL	NBR	90	110	7.5	ADL-P	FPM
85	120	15	C	NBR	90	110	08	A	NBR
85	125	12	A	NBR	90	110	08	ADL	NBR
85	125	12	A	FPM	90	110	08	C	NBR

NBR=Nitrile FPM=Viton®

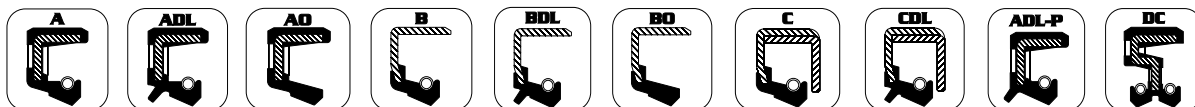


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
90	110	09	ADL	NBR	90	130	13	A	FPM
90	110	10	A	NBR	90	130	13	ADL	NBR
90	110	10	A	FPM	90	130	13	ADL	FPM
90	110	10	ADL	NBR	90	135	13	ADL	NBR
90	110	10	ADL	FPM	90	140	13	A	NBR
90	110	10	C	NBR	90	140	13	ADL	NBR
90	110	12	A	NBR	90	140	13	C	NBR
90	110	12	A	FPM	90	150	13	ADL	NBR
90	110	12	ADL	NBR	90	160	12	A	NBR
90	110	12	ADL	FPM	90	160	13	ADL	NBR
90	110	12	ADL-P	NBR	90	167	14	A	NBR
90	110	13	A	NBR	91	136	12	A	FPM
90	110	13	ADL	NBR	92	108	10	ADL	NBR
90	110	13	ADL	FPM	92	110	10	ADL	NBR
90	110	13	CDL	NBR	92	120	13	A	NBR
90	110	15	ADL	NBR	92	120	13	A	FPM
90	112	12	ADL	NBR	93	110	12	ADL	NBR
90	114	12	ADL	NBR	93	114	12	ADL	NBR
90	115	08	A	NBR	95	105	09	ADL	NBR
90	115	09	A	NBR	95	110	09	B	NBR
90	115	09	A	FPM	95	110	10	A	NBR
90	115	09	ADL	NBR	95	110	10	A	FPM
90	115	09	C	NBR	95	110	10	ADL	NBR
90	115	10	A	NBR	95	110	10	BDL	NBR
90	115	10	ADL	NBR	95	110	11	ADL	NBR
90	115	12	A	FPM	95	110	12	A	NBR
90	115	12	ADL	NBR	95	110	12	A	FPM
90	115	12	ADL	FPM	95	110	13	A	NBR
90	115	13	A	NBR	95	112	12	ADL	NBR
90	115	13	A	FPM	95	114	12	ADL	NBR
90	115	13	ADL	NBR	95	115	08	A	NBR
90	115	13	ADL	FPM	95	115	10	C	NBR
90	115	13	BDL	NBR	95	115	11	A	NBR
90	118	12	ADL	NBR	95	115	12	A	NBR
90	120	08	ADL	NBR	95	115	12	ADL	NBR
90	120	10	A	NBR	95	115	12	ADL	FPM
90	120	12	A	NBR	95	115	13	A	NBR
90	120	12	A	FPM	95	115	13	ADL	NBR
90	120	12	ADL	NBR	95	115	13	ADL	FPM
90	120	12	ADL	FPM	95	115	13	C	NBR
90	120	12	DC	NBR	95	120	08	A	NBR
90	120	13	A	NBR	95	120	08	AO	NBR
90	120	13	A	FPM	95	120	10	ADL	NBR
90	120	13	ADL	NBR	95	120	12	A	NBR
90	120	13	CDL	NBR	95	120	12	A	FPM
90	120	15	A	NBR	95	120	12	ADL	NBR
90	120	15	ADL	NBR	95	120	12	ADL	FPM
90	125	13	A	NBR	95	120	12	ADL-P	NBR
90	125	13	ADL	NBR	95	120	12	B	NBR
90	125	14	A	NBR	95	120	12	BDL	FPM
90	125	14	A	FPM	95	120	12	DC	NBR
90	127	13	BDL	NBR	95	120	13	A	NBR
90	130	12	A	NBR	95	120	13	ADL	NBR
90	130	12	ADL	NBR	95	120	13	ADL	FPM
90	130	13	A	NBR	95	120	15	C	NBR

NBR=Nitrile FPM=Viton®

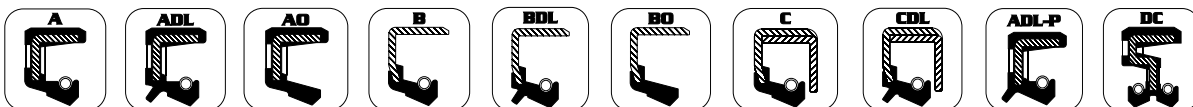


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
95	125	12	A	NBR	100	120	7.5	ADL-P	NBR
95	125	12	A	FPM	100	120	08	B	NBR
95	125	12	ADL	NBR	100	120	10	A	NBR
95	125	12	ADL	FPM	100	120	10	ADL	NBR
95	125	13	A	NBR	100	120	10	ADL	FPM
95	125	13	ADL	NBR	100	120	10	ADL-P	NBR
95	125	13	ADL	FPM	100	120	11	ADL	NBR
95	125	15	C	NBR	100	120	12	A	NBR
95	127	13	BDL	NBR	100	120	12	A	FPM
95	130	12	A	NBR	100	120	12	ADL	NBR
95	130	12	ADL	NBR	100	120	12	ADL	FPM
95	130	12	ADL	FPM	100	120	12	ADL-P	NBR
95	130	12	CDL	NBR	100	120	13	A	NBR
95	130	13	A	NBR	100	120	13	ADL	NBR
95	130	13	A	FPM	100	120	13	ADL	FPM
95	130	13	ADL	NBR	100	120	15	ADL	NBR
95	130	13	B	NBR	100	120	15	C	NBR
95	130	13	C	NBR	100	120	17	ADL	NBR
95	130	15	A	NBR	100	125	04	ADL	NBR
95	132	12	A	NBR	100	125	10	A	NBR
95	135	13	A	NBR	100	125	10	ADL	NBR
95	136	13	A	NBR	100	125	12	A	NBR
95	145	10	ADL	NBR	100	125	12	A	FPM
95	145	13	A	NBR	100	125	12	ADL	NBR
95	145	13	ADL	NBR	100	125	12	ADL	FPM
95	150	15	A	NBR	100	125	13	A	NBR
95	150	15	A	FPM	100	125	13	A	FPM
95	160	15	A	NBR	100	125	13	ADL	NBR
95	160	15	A	FPM	100	125	13	ADL	FPM
95	170	13	A	FPM	100	125	13	C	NBR
96	112	10	A	NBR	100	125	13	CDL	FPM
96	117	10	A	FPM	100	125	14	ADL	NBR
96	136	12	A	NBR	100	125	15	A	NBR
96	140	13	A	NBR	100	127	13	A	NBR
97	127	13	A	NBR	100	130	08	C	NBR
97	167	13	A	NBR	100	130	10	A	NBR
98	118	10	ADL	NBR	100	130	10	ADL	NBR
98	120	13	A	NBR	100	130	12	A	NBR
98	120	13	ADL	NBR	100	130	12	A	FPM
98	125	13	A	NBR	100	130	12	ADL	NBR
98	128	10	A	NBR	100	130	12	ADL	FPM
98	128	10	A	FPM	100	130	13	A	NBR
98	128	10	C	NBR	100	130	13	ADL	NBR
98	130	13	B	NBR	100	130	13	BDL	NBR
100	110	07	B	NBR	100	130	13	C	NBR
100	110	07	BO	NBR	100	130	13	DC	NBR
100	114	10	B	NBR	100	130	14	A	NBR
100	114	12	BDL	NBR	100	130	14	ADL	NBR
100	115	04	AO	NBR	100	130	15	ADL	NBR
100	115	09	A	NBR	100	130	15	C	NBR
100	115	09	ADL	FPM	100	134	10	B	NBR
100	115	09	B	NBR	100	135	10	ADL	NBR
100	115	12	ADL	NBR	100	135	12	ADL	NBR
100	116	08	B	NBR	100	135	13	A	NBR
100	118	12	B	NBR	100	135	13	ADL	NBR

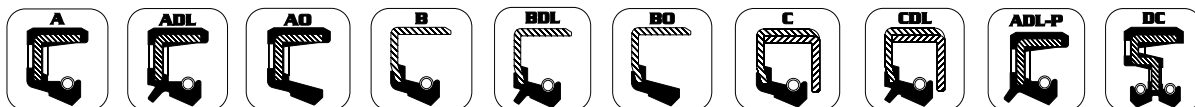


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
100	135	13	ADL	FPM	105	130	12	ADL	FPM
100	140	12	A	NBR	105	130	12	DC	NBR
100	140	12	ADL	NBR	105	130	13	A	NBR
100	140	13	A	NBR	105	130	13	A	FPM
100	140	13	A	FPM	105	130	13	ADL	NBR
100	140	13	ADL	NBR	105	130	13	ADL	FPM
100	140	13	C	NBR	105	130	13	B	NBR
100	140	15	BDL	NBR	105	130	15	A	NBR
100	145	14	ADL	NBR	105	130	15	A	FPM
100	150	12	ADL	NBR	105	130	15	ADL	NBR
100	150	12	ADL	FPM	105	135	12	A	FPM
100	150	12	B	NBR	105	135	13	A	NBR
100	150	13	A	NBR	105	135	13	A	FPM
100	150	13	ADL	NBR	105	135	14	A	NBR
100	150	15	A	NBR	105	135	14	ADL	NBR
100	160	12	A	NBR	105	135	14	ADL	FPM
100	160	15	C	NBR	105	135	15	ADL	NBR
100	162	12	ADL	NBR	105	136	13	ADL	NBR
100	170	15	ADL	NBR	105	140	12	A	NBR
100	180	12	ADL	NBR	105	140	12	A	FPM
100	180	12	ADL	FPM	105	140	12	ADL	NBR
100	180	13	A	NBR	105	140	12	ADL	FPM
100	185	13	A	NBR	105	140	12	ADL-P	NBR
101	114	10	ADL	NBR	105	140	13	A	NBR
102	115	10	ADL	NBR	105	140	13	ADL	NBR
102	116	14	BDL	NBR	105	140	15	BDL	NBR
102	120	12	A	NBR	105	140	16	A	NBR
102	123	7.5	B	NBR	105	145	12	ADL	NBR
102	125	13	C	NBR	105	145	12	ADL	FPM
102	130	13	C	NBR	105	145	13	B	NBR
102	135	13	A	NBR	105	145	15	B	NBR
103	125	13	C	NBR	105	145	16	A	NBR
103	135	12	ADL	NBR	105	150	15	A	NBR
104	120	13	A	FPM	105	160	12	ADL	NBR
104	125	10	A	NBR	106	126	12	ADL	NBR
104	125	10	A	FPM	108	130	13	C	NBR
104	130	10	A	NBR	108	135	15	ADL	NBR
105	120	07	B	NBR	108	140	13	C	NBR
105	120	15	C	NBR	109	130	15	CDL	NBR
105	125	06	ADL	NBR	109	140	13	BDL	NBR
105	125	10	A	NBR	110	124	08	ADL	NBR
105	125	12	ADL	FPM	110	125	08	B	NBR
105	125	13	A	NBR	110	125	08	BDL	NBR
105	125	13	A	FPM	110	125	12	A	NBR
105	125	13	ADL	NBR	110	125	13	A	NBR
105	125	13	ADL	FPM	110	128	09	C	NBR
105	125	13	BO	FPM	110	130	08	A	NBR
105	125	13	C	NBR	110	130	08	A	FPM
105	125	13	C	FPM	110	130	10	A	NBR
105	127	13	BDL	NBR	110	130	12	A	NBR
105	130	7.5	ADL-P	NBR	110	130	12	A	FPM
105	130	10	ADL	NBR	110	130	12	ADL	NBR
105	130	12	A	NBR	110	130	12	ADL	FPM
105	130	12	A	FPM	110	130	12	ADL-P	NBR
105	130	12	ADL	NBR	110	130	13	A	NBR

NBR=Nitrile FPM=Viton®

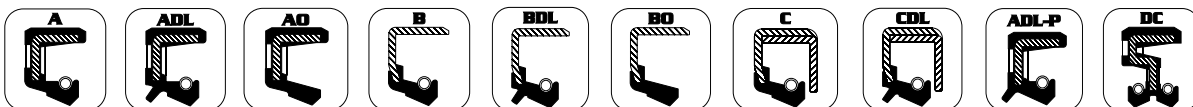


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
110	130	13	A	FPM	110	180.5	12	ADL	NBR
110	130	13	ADL	NBR	110	200	13	ADL	NBR
110	130	13	B	NBR	111	130	10	BDL	NBR
110	130	13	C	NBR	112	125	12	ADL	NBR
110	130	14.5	A	NBR	112	130	08	B	NBR
110	130	15	C	NBR	112	130	12	B	NBR
110	132	12	B	NBR	112	140	13	A	NBR
110	135	10	ADL	NBR	112	142	12	ADL	NBR
110	135	12	A	NBR	112	142	14	ADL	NBR
110	135	12	A	FPM	113	140	13	C	NBR
110	135	12	ADL	NBR	114	126	06	ADL	FPM
110	135	12	ADL	FPM	114	135	13	ADL	NBR
110	135	13	A	NBR	114	140	10	A	NBR
110	135	13	ADL	NBR	114	140	13	A	NBR
110	140	10	A	NBR	114	140	13	C	NBR
110	140	10	ADL	FPM	114	145	14	A	NBR
110	140	12	A	NBR	114	159	14	CDL	NBR
110	140	12	A	FPM	114	160	12	A	NBR
110	140	12	ADL	NBR	115	130	12	A	NBR
110	140	12	ADL	FPM	115	130	12	A	FPM
110	140	13	A	NBR	115	130	13	CDL	FPM
110	140	13	A	FPM	115	135	09	C	NBR
110	140	13	ADL	NBR	115	135	13	B	NBR
110	140	14	A	FPM	115	135	14	ADL	NBR
110	140	14	ADL	NBR	115	140	10	A	NBR
110	140	14	ADL	FPM	115	140	10	A	FPM
110	140	15	C	NBR	115	140	12	A	NBR
110	142	14	ADL	NBR	115	140	12	A	FPM
110	143	12	CDL	FPM	115	140	12	ADL	NBR
110	145	13	A	NBR	115	140	12	ADL	FPM
110	145	13	ADL	NBR	115	140	13	A	NBR
110	145	13	C	FPM	115	140	13	ADL	NBR
110	145	14	ADL	NBR	115	140	14	ADL	NBR
110	145	15	A	NBR	115	140	15	B	NBR
110	145	15	ADL	NBR	115	140	15	C	NBR
110	145	15	ADL	FPM	115	140	16	ADL	NBR
110	146	14	CDL	NBR	115	140	16	BDL	NBR
110	150	08	ADL-P	NBR	115	142	14	ADL	NBR
110	150	12	ADL	NBR	115	143	17	ADL	NBR
110	150	13	A	NBR	115	145	12	A	NBR
110	150	13	A	FPM	115	145	13	A	NBR
110	150	13	ADL	FPM	115	145	13	A	FPM
110	150	15	A	NBR	115	145	14	A	NBR
110	150	15	C	NBR	115	145	14	ADL	NBR
110	152	15	C	NBR	115	145	14	ADL	FPM
110	155	15	A	NBR	115	145	14	ADL-P	NBR
110	155	15	A	FPM	115	145	15	ADL	NBR
110	160	08	A	NBR	115	146.5	13	ADL	NBR
110	160	12	ADL	NBR	115	150	12	A	NBR
110	160	13	ADL	NBR	115	150	12	A	FPM
110	160	14	ADL	NBR	115	150	12	ADL	NBR
110	160	15	A	NBR	115	150	12	ADL	FPM
110	160	16	ADL	NBR	115	150	13	A	NBR
110	170	12	ADL	NBR	115	150	13	ADL	NBR

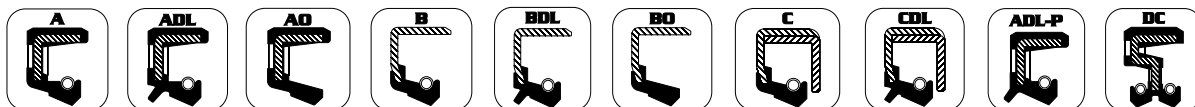


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
115	150	13	C	NBR	120	150	14	ADL	NBR
115	150	15	ADL	NBR	120	150	15	A	NBR
115	155	12	ADL	NBR	120	150	15	ADL	NBR
115	160	15	A	NBR	120	150	15	ADL	FPM
115	165	15	ADL	NBR	120	150	15	C	NBR
115	180	15	ADL	NBR	120	150	16	A	FPM
116	132	12	ADL	NBR	120	150	16	ADL	NBR
117	143	13	ADL	NBR	120	152	16	C	NBR
118	136	13	BDL	NBR	120	153	15	ADL	NBR
118	140	13	A	NBR	120	155	15	ADL	NBR
118	150	12	A	FPM	120	155	16	CDL	NBR
118	150	12	CDL	NBR	120	160	08	B	NBR
119	140	12	BDL	NBR	120	160	12	A	NBR
119	153	15	ADL	NBR	120	160	12	A	FPM
120	130	13	ADL	NBR	120	160	12	ADL	NBR
120	135	08	B	NBR	120	160	12	ADL	FPM
120	135	12	A	FPM	120	160	13	A	NBR
120	140	7.5	A	FPM	120	160	13	A	FPM
120	140	7.5	ADL	NBR	120	160	13	ADL	NBR
120	140	7.5	ADL-P	NBR	120	160	13	C	NBR
120	140	10	A	NBR	120	160	14	A	NBR
120	140	10	A	FPM	120	160	15	A	NBR
120	140	10	ADL-P	NBR	120	160	15	A	FPM
120	140	12	A	NBR	120	160	15	ADL	NBR
120	140	12	ADL	NBR	120	160	15	C	NBR
120	140	12	ADL	FPM	120	162	13	ADL	NBR
120	140	13	A	NBR	120	165	14	ADL	NBR
120	140	13	A	FPM	120	170	14	ADL	NBR
120	140	13	ADL	NBR	120	170	15	C	NBR
120	140	13	ADL	FPM	120	180	15	ADL	NBR
120	140	13	ADL-P	NBR	120	180	15	ADL	FPM
120	140	13	B	NBR	120	195	13	A	NBR
120	140	13	BDL	NBR	120	215	12	ADL	NBR
120	140	13	C	NBR	122	150	13	C	NBR
120	140	13	DC	NBR	122	150	15	A	NBR
120	140	14	A	NBR	124	150	15	C	NBR
120	140	15	ADL	NBR	125	140	07	ADL	NBR
120	145	12	A	NBR	125	140	10	A	NBR
120	145	12	ADL	NBR	125	140	10	A	FPM
120	145	15	ADL	NBR	125	140	12	ADL	NBR
120	145	15	BDL	NBR	125	143	13	ADL	NBR
120	146	13	ADL	NBR	125	145	7.5	A	NBR
120	146	15	ADL	FPM	125	145	12	ADL	NBR
120	150	09	A	NBR	125	145	13	A	FPM
120	150	10	A	NBR	125	145	13	BDL	NBR
120	150	12	A	NBR	125	145	14	ADL	NBR
120	150	12	A	FPM	125	150	10	A	FPM
120	150	12	ADL	NBR	125	150	12	A	NBR
120	150	12	ADL	FPM	125	150	12	A	FPM
120	150	12	ADL-P	NBR	125	150	12	ADL	NBR
120	150	13	A	NBR	125	150	12	ADL	FPM
120	150	13	A	FPM	125	150	13	A	NBR
120	150	13	ADL	NBR	125	150	13	A	FPM
120	150	13	C	NBR	125	150	13	ADL	NBR
120	150	14	A	NBR	125	150	13	ADL	FPM

NBR=Nitrile FPM=Viton®

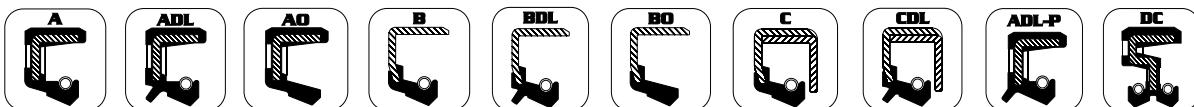


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
125	150	13	BDL	NBR	130	153	12	ADL	NBR
125	150	13	C	NBR	130	154	16	ADL	NBR
125	150	13	C	FPM	130	155	10	ADL	NBR
125	150	13	CDL	NBR	130	155	10	C	NBR
125	150	14	A	NBR	130	155	12	C	NBR
125	150	14	ADL	NBR	130	155	14	ADL	NBR
125	150	15	A	NBR	130	159	14	CDL	NBR
125	150	15	ADL	NBR	130	160	12	A	NBR
125	150	15	C	NBR	130	160	12	A	FPM
125	150	15	C	FPM	130	160	12	ADL	NBR
125	152	13	ADL	NBR	130	160	12	ADL	FPM
125	155	12	A	NBR	130	160	12	ADL-P	NBR
125	155	12	A	FPM	130	160	13	A	NBR
125	155	12	ADL	NBR	130	160	13	A	FPM
125	155	13	ADL	NBR	130	160	13	ADL	NBR
125	155	14	ADL	NBR	130	160	13	C	NBR
125	159	14	CDL	NBR	130	160	14	A	NBR
125	160	12	A	NBR	130	160	14	A	FPM
125	160	12	A	FPM	130	160	14	ADL	NBR
125	160	12	ADL	NBR	130	160	14	ADL	FPM
125	160	12	ADL	FPM	130	160	15	A	NBR
125	160	13	A	NBR	130	160	15	A	FPM
125	160	15	A	NBR	130	160	15	ADL	NBR
125	160	15	A	FPM	130	160	15	ADL	FPM
125	160	15	ADL	NBR	130	160	16	B	NBR
125	160	15	C	NBR	130	162	09	ADL	NBR
125	162	13	ADL	NBR	130	163	18	ADL	NBR
125	165	13	ADL	NBR	130	165	13	A	NBR
125	165	15	ADL	NBR	130	165	13	A	FPM
125	170	12	ADL	NBR	130	165	13	ADL	NBR
125	170	13	C	NBR	130	165	15	A	NBR
125	170	15	C	NBR	130	170	12	A	NBR
126	164	16	ADL	FPM	130	170	12	A	FPM
127	148	13.5	ADL	NBR	130	170	12	ADL	NBR
127	150	13	A	NBR	130	170	12	ADL	FPM
127	170	14	A	FPM	130	170	13	A	NBR
127	180	12	ADL	NBR	130	170	13	A	FPM
128	146	13.5	A	NBR	130	170	13	ADL	NBR
128	146	13.5	C	NBR	130	170	14	A	NBR
128	148	13	ADL	NBR	130	170	14	ADL	NBR
128	150	13	A	NBR	130	170	15	A	NBR
128	150	13	A	FPM	130	170	15	A	FPM
128	150	15	B	NBR	130	170	15	ADL	NBR
128	160	15	C	NBR	130	170	15	ADL	FPM
130	150	7.5	ADL-P	NBR	130	180	15	C	NBR
130	150	10	A	NBR	130	182	16	A	NBR
130	150	10	A	FPM	130	190	12	ADL	NBR
130	150	10	ADL	NBR	130	200	12	ADL	NBR
130	150	10	ADL	FPM	130	230	14	ADL	NBR
130	150	12	ADL	NBR	132	160	12	ADL	NBR
130	150	12	ADL	FPM	132	160	13	C	NBR
130	150	13	A	FPM	132	160	15	ADL	NBR
130	150	14	BDL	NBR	134	152	11	BDL	NBR
130	150	15	ADL	NBR	135	150	15	ADL	NBR
130	150	15	ADL	FPM	135	155	12	A	NBR

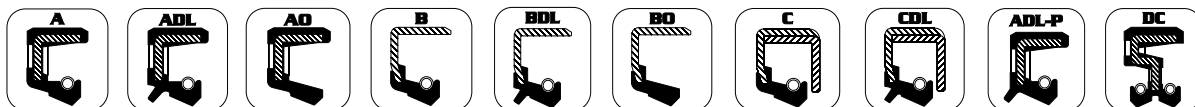


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
135	159	13	ADL	NBR	140	160	14	ADL	NBR
135	160	10	A	FPM	140	160	15	A	NBR
135	160	12	A	NBR	140	165	10	A	NBR
135	160	12	A	FPM	140	165	12	A	NBR
135	160	12	ADL	NBR	140	165	12	A	FPM
135	160	12	ADL	FPM	140	165	12	ADL	NBR
135	160	13	A	NBR	140	165	12	ADL	FPM
135	160	13	A	FPM	140	165	12	C	NBR
135	160	13	ADL	NBR	140	165	14	BDL	NBR
135	160	13	B	NBR	140	165	15	ADL	NBR
135	160	14	A	FPM	140	165	15	C	NBR
135	160	14	ADL	NBR	140	170	12	A	NBR
135	160	15	A	NBR	140	170	12	A	FPM
135	160	15	ADL	NBR	140	170	12	ADL	NBR
135	162	13	BDL	NBR	140	170	12	ADL	FPM
135	165	12	A	NBR	140	170	13	A	NBR
135	165	12	A	FPM	140	170	13	A	FPM
135	165	12	ADL	NBR	140	170	13	ADL	NBR
135	165	13	ADL	NBR	140	170	13	ADL	FPM
135	165	13	C	NBR	140	170	13	C	NBR
135	165	14	ADL	NBR	140	170	14	A	NBR
135	165	15	ADL	NBR	140	170	14	A	FPM
135	170	12	A	NBR	140	170	14	ADL	NBR
135	170	12	A	FPM	140	170	14	ADL	FPM
135	170	12	ADL	NBR	140	170	15	A	NBR
135	170	12	ADL	FPM	140	170	15	A	FPM
135	170	13	C	NBR	140	170	15	ADL	NBR
135	170	15	A	NBR	140	170	15	ADL	FPM
135	170	15	A	FPM	140	170	15	ADL-P	NBR
135	170	15	ADL	NBR	140	175	13	ADL	NBR
135	170	15	ADL	NBR	140	175	15	ADL	NBR
135	170	15	C	NBR	140	180	12	A	NBR
135	175	12	ADL	NBR	140	180	12	A	FPM
135	175	16	BDL	FPM	140	180	12	ADL	NBR
135	180	15	A	NBR	140	180	12	ADL	FPM
135	190	14	A	NBR	140	180	13	A	NBR
135	190	15	A	NBR	140	180	13	A	FPM
135	192	16	A	NBR	140	180	14	A	NBR
135	200	12	ADL	NBR	140	180	14	ADL	NBR
138	152	12	BDL	NBR	140	180	15	A	NBR
138	160	15	A	NBR	140	180	15	A	FPM
138	162	13	ADL	NBR	140	180	15	ADL	NBR
139	170	13	ADL	NBR	140	190	10	ADL	NBR
140	155	10	A	NBR	140	190	15	A	FPM
140	157	08	ADL	FPM	140	210	15	ADL	NBR
140	160	10	A	NBR	140	215	12	A	NBR
140	160	10	A	FPM	142	165	10	A	NBR
140	160	10	ADL	NBR	142	166	10	ADL	NBR
140	160	10	ADL-P	NBR	142	168	16	ADL	NBR
140	160	12	A	NBR	143	175	16	A	NBR
140	160	12	ADL	NBR	144	160	10	ADL	NBR
140	160	12	ADL	FPM	144	160	12	A	NBR
140	160	13	A	NBR	144	160	12	A	FPM
140	160	13	A	FPM	144	160	12	A	NBR
140	160	13	ADL	NBR	144	160	12	A	NBR
140	160	13	C	NBR	144	160	12	A	NBR

NBR=Nitrile FPM=Viton®

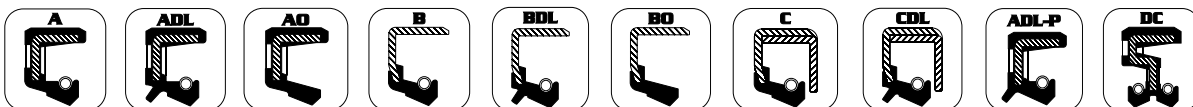


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
144	172	15	ADL	NBR	150	180	8.5	ADL-P	NBR
145	160	10	A	NBR	150	180	10	ADL	NBR
145	165	13	A	NBR	150	180	12	A	NBR
145	165	13	A	FPM	150	180	12	A	FPM
145	165	13	ADL	NBR	150	180	12	ADL	NBR
145	165	13	C	NBR	150	180	12	ADL	FPM
145	165	15	A	NBR	150	180	13	A	NBR
145	167	13	ADL	NBR	150	180	13	A	FPM
145	168	13	ADL	NBR	150	180	13	ADL	NBR
145	170	12	ADL	NBR	150	180	13	ADL	FPM
145	170	12	ADL	FPM	150	180	14	A	NBR
145	170	13	ADL	NBR	150	180	14	A	FPM
145	170	13	C	NBR	150	180	14	ADL	NBR
145	170	15	A	NBR	150	180	14	ADL	FPM
145	170	15	A	FPM	150	180	14	BDL	NBR
145	170	15	ADL	NBR	150	180	15	A	NBR
145	170	15	B	NBR	150	180	15	A	FPM
145	175	13	ADL	NBR	150	180	15	ADL	NBR
145	175	13	B	NBR	150	180	15	ADL	FPM
145	175	13	C	NBR	150	180	15	C	NBR
145	175	14	BDL	NBR	150	180	15	C	FPM
145	175	15	A	NBR	150	180	15	CDL	NBR
145	175	15	A	FPM	150	190	13	BDL	NBR
145	175	15	ADL	NBR	150	190	15	ADL	NBR
145	175	15	ADL	FPM	150	190	15	ADL	FPM
145	180	12	A	NBR	150	190	15	C	NBR
145	180	12	A	FPM	150	190	16	A	NBR
145	180	12	ADL	NBR	150	190	16	ADL	FPM
145	180	13	A	NBR	150	200	15	C	NBR
145	180	13	A	FPM	150	210	15	ADL	NBR
145	180	14	A	NBR	150	225	12	ADL	NBR
145	180	14	A	FPM	150	225	15	ADL	NBR
145	180	15	C	NBR	152	178	13	ADL	NBR
145	185	15	A	NBR	152	190	15	ADL	NBR
146	163	07	A	NBR	154	175	14	ADL	NBR
146	170	15	C	NBR	154	176	10	ADL	NBR
148	170	14.5	A	NBR	154	180	15	ADL	NBR
148	170	15	C	NBR	155	172	14	BDL	NBR
148	180	15	C	NBR	155	174	12	A	NBR
150	162	09	A	NBR	155	174	12	ADL	NBR
150	168	12	A	NBR	155	175	12	A	NBR
150	168	13	A	NBR	155	175	13	A	FPM
150	170	12	A	NBR	155	175	13	BDL	NBR
150	170	12	A	FPM	155	180	12	ADL	NBR
150	170	12	ADL	NBR	155	180	13	A	FPM
150	170	13	A	NBR	155	180	15	A	NBR
150	170	15	A	NBR	155	180	15	A	FPM
150	170	15	A	FPM	155	180	15	ADL	NBR
150	170	15	ADL	NBR	155	180	15	C	NBR
150	170	15	ADL	FPM	155	185	14	ADL	NBR
150	170	15	C	NBR	155	185	15	ADL	FPM
150	172	10	ADL	NBR	155	190	15	A	NBR
150	172	12	ADL	NBR	155	190	15	ADL	NBR
150	175	10	ADL	NBR	155	200	15	A	NBR
150	178	13	ADL	NBR	156	196	20	A	NBR

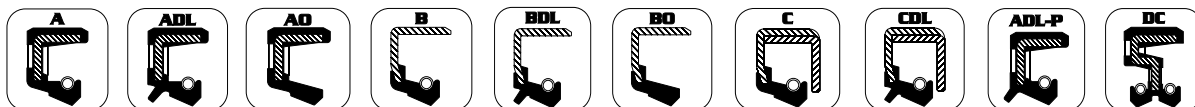


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
158	180	15	A	NBR	165	197	13	ADL	NBR
160	175	07	ADL	NBR	165	200	09	A	NBR
160	180	10	ADL	NBR	165	200	15	A	FPM
160	180	10	BDL	NBR	165	200	15	ADL	NBR
160	180	12	A	NBR	165	200	15	ADL	FPM
160	180	12	A	FPM	165	200	15	C	NBR
160	180	12	ADL	NBR	168	190	15	C	NBR
160	180	12	ADL	FPM	168	200	13	ADL	FPM
160	180	15	A	NBR	168	200	15	C	NBR
160	180	15	A	FPM	170	190	8.5	ADL	NBR
160	180	15	ADL	NBR	170	190	10	ADL	NBR
160	180	15	C	NBR	170	190	13	A	NBR
160	182	18	ADL	NBR	170	190	13	ADL	NBR
160	185	10	A	NBR	170	190	13	ADL	FPM
160	185	10	A	FPM	170	190	14	ADL	NBR
160	185	10	ADL	NBR	170	190	15	A	NBR
160	185	10	C	NBR	170	190	15	A	FPM
160	185	13	BDL	NBR	170	190	15	C	NBR
160	185	14	A	NBR	170	195	18	BDL	NBR
160	185	15	ADL	NBR	170	200	12	A	NBR
160	190	13	A	NBR	170	200	12	A	FPM
160	190	13	A	FPM	170	200	12	ADL	NBR
160	190	14	A	NBR	170	200	13	A	FPM
160	190	15	A	NBR	170	200	13	C	NBR
160	190	15	A	FPM	170	200	14	A	NBR
160	190	15	ADL	NBR	170	200	14	ADL	NBR
160	190	15	ADL	FPM	170	200	15	A	NBR
160	190	15	B	NBR	170	200	15	A	FPM
160	190	16	ADL	NBR	170	200	15	ADL	NBR
160	190	16	ADL	FPM	170	200	15	ADL	FPM
160	200	12	A	NBR	170	200	15	C	NBR
160	200	12	A	FPM	170	200	15	C	FPM
160	200	12	ADL	NBR	170	200	16	B	NBR
160	200	14	A	NBR	170	203	11.5	BDL	NBR
160	200	14	ADL	NBR	170	205	15	ADL	NBR
160	200	15	A	NBR	170	205	18	A	FPM
160	200	15	A	FPM	170	210	14	A	NBR
160	200	15	ADL	NBR	170	210	15	ADL	NBR
160	210	15	C	NBR	170	215	16	C	NBR
160	220	15	ADL	NBR	170	220	15	A	NBR
160	240	15	ADL	NBR	170	220	16	ADL	FPM
160	290	18	ADL	NBR	170	225	15	C	NBR
161	215	15	A	NBR	170	230	15	ADL	FPM
162	182	14	ADL	NBR	172	200	15	A	NBR
162	187	12	ADL	NBR	172	200	15	C	NBR
162	190	12	A	NBR	175	190	13	ADL	NBR
164	185	12	C	NBR	175	200	10	A	NBR
165	180	10	ADL	NBR	175	200	10	A	FPM
165	187	09	A	NBR	175	200	15	A	NBR
165	190	10	A	FPM	175	200	15	A	FPM
165	190	13	A	NBR	175	200	15	ADL	NBR
165	190	13	A	FPM	175	203.5	19	BDL	NBR
165	190	13	ADL	NBR	175	205	15	A	NBR
165	190	15	ADL	NBR	175	205	15	ADL	NBR
165	195	15	ADL	NBR	175	205	15	C	FPM

NBR=Nitrile FPM=Viton®

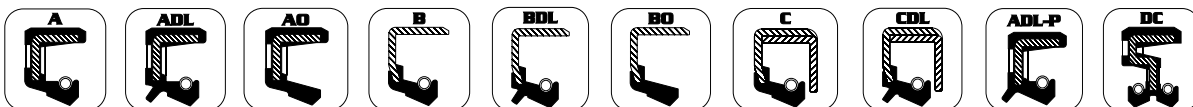


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
175	210	14	A	NBR	185	215	16	A	NBR
175	210	14	A	FPM	185	230	16	C	NBR
175	210	15	C	NBR	186	216	12	C	NBR
175	215	16	C	NBR	188	215	16	ADL	NBR
175	220	17	A	NBR	188	215	16	B	NBR
175	230	20	ADL	NBR	188	215	16	C	NBR
177	250	16	A	NBR	190	210	10	ADL	NBR
178	194	08	AO	NBR	190	215	15	A	NBR
178	200	15	C	NBR	190	215	15	ADL	NBR
178	208	15	A	NBR	190	215	15	C	NBR
178	215	16	C	NBR	190	215	16	ADL	NBR
180	200	13	A	NBR	190	215	16	ADL	FPM
180	200	13	A	FPM	190	215	16	C	NBR
180	200	15	A	NBR	190	215	16	C	FPM
180	200	15	A	FPM	190	220	10	ADL	NBR
180	200	15	ADL	NBR	190	220	12	A	NBR
180	200	15	C	NBR	190	220	12	A	FPM
180	200	16	ADL	NBR	190	220	12	C	NBR
180	200	16	ADL	FPM	190	220	15	A	NBR
180	205	15	ADL	NBR	190	220	15	A	FPM
180	210	8.5	ADL-P	NBR	190	220	15	ADL	NBR
180	210	10	A	NBR	190	220	15	ADL	FPM
180	210	10	ADL	NBR	190	220	15	C	FPM
180	210	14	ADL	NBR	190	220	16	A	NBR
180	210	15	A	NBR	190	220	16	C	NBR
180	210	15	A	FPM	190	225	12	A	NBR
180	210	15	ADL	NBR	190	225	15	A	NBR
180	210	15	ADL	FPM	190	225	16	A	NBR
180	210	16	A	FPM	190	225	16	ADL	NBR
180	210	16	ADL	NBR	190	225	16	ADL	FPM
180	215	15	A	NBR	190	225	16	C	FPM
180	215	15	A	FPM	190	230	15	A	NBR
180	215	15	ADL	NBR	190	230	15	C	NBR
180	215	16	A	NBR	190	230	16	ADL	NBR
180	215	16	A	FPM	190	230	16	ADL	FPM
180	215	16	ADL	NBR	190	230	16	C	NBR
180	216	19	CDL	NBR	190	240	15	ADL	NBR
180	220	13	ADL	NBR	192	210	10	A	NBR
180	220	15	A	NBR	195	215	15	A	NBR
180	220	15	A	FPM	195	220	16	C	NBR
180	220	15	ADL	NBR	195	230	15	BO	FPM
180	220	16	A	NBR	195	230	16	A	NBR
180	220	16	ADL	NBR	195	230	16	ADL	NBR
180	225	15	B	NBR	195	230	20	ADL	NBR
180	260	15	ADL	NBR	195	235	15	ADL	NBR
182	215	15	ADL	NBR	198	230	12	A	NBR
185	210	10	A	FPM	200	221	09	ADL	NBR
185	210	13	A	NBR	200	225	15	A	NBR
185	210	13	A	FPM	200	225	15	A	FPM
185	210	13	ADL	NBR	200	225	15	ADL	NBR
185	210	13	ADL	FPM	200	225	15	ADL	FPM
185	215	15	A	NBR	200	230	13	A	NBR
185	215	15	ADL	NBR	200	230	13	A	FPM
185	215	15	BO	FPM	200	230	13	ADL	NBR
185	215	15	C	NBR	200	230	13	ADL-P	NBR

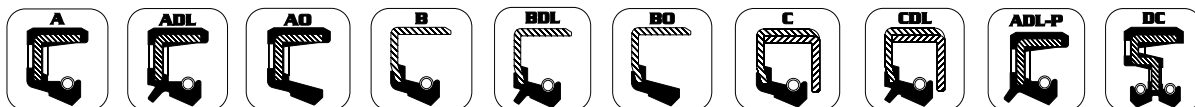


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
200	230	15	A	NBR	215	255	18	A	NBR
200	230	15	A	FPM	216	260	16	C	NBR
200	230	15	ADL	NBR	218	250	16	C	NBR
200	230	15	ADL	FPM	220	245	08	A	NBR
200	230	15	C	NBR	220	250	11	B	NBR
					220	250	12	A	FPM
200	230	16	A	NBR	220	250	14	A	NBR
200	230	16	ADL	NBR	220	250	15	A	NBR
200	235	15	ADL	FPM	220	250	15	A	FPM
200	235	16	A	NBR	220	250	15	ADL	NBR
200	235	18	A	NBR					
200	235	18	A	FPM	220	250	15	ADL	FPM
200	240	15	A	NBR	220	250	15	C	NBR
200	240	15	A	FPM	220	250	16	A	NBR
200	240	15	ADL	NBR	220	250	16	ADL	NBR
200	240	16	A	NBR	220	250	16	ADL	FPM
					220	255	16	A	NBR
200	240	16	CDL	NBR	220	255	18	A	NBR
200	240	18	ADL	NBR	220	258	13	B	NBR
200	240	20	ADL	NBR	220	260	14	ADL	NBR
200	250	15	A	NBR	220	260	15	A	NBR
200	250	15	A	FPM					
					220	260	15	ADL	NBR
200	250	15	ADL	NBR	220	260	16	A	NBR
200	310	18	ADL	NBR	220	260	16	A	FPM
205	225	18	ADL	NBR	220	260	16	ADL	NBR
205	230	15	A	NBR	220	260	22	B	NBR
205	230	15	ADL	NBR					
					220	270	15	C	NBR
205	230	15	BDL	NBR	220	275	23	ADL	NBR
205	230	16	A	NBR	225	250	16	ADL	NBR
205	230	16	A	FPM	225	250	16	C	NBR
205	230	16	C	NBR	225	270	16	ADL	NBR
205	235	18	ADL	NBR					
					230	250	15	A	NBR
205	250	16	A	NBR	230	255	10	ADL	NBR
207	230	14	ADL	NBR	230	255	10	B	NBR
210	240	15	A	NBR	230	255	15	A	NBR
210	240	15	A	FPM	230	255	15	ADL	NBR
210	240	15	ADL	NBR					
210	240	15	ADL	FPM	230	255	18	ADL	NBR
210	240	15	C	NBR	230	260	15	A	NBR
210	245	18	ADL	NBR	230	260	15	A	FPM
210	250	13	C	NBR	230	260	15	ADL	NBR
210	250	15	A	NBR	230	260	15	C	NBR
210	250	15	A	FPM	230	260	20	BDL	NBR
210	250	15	ADL	NBR	230	260	20	BDL	FPM
210	250	16	A	NBR	230	270	15	A	NBR
210	250	16	C	NBR	230	270	15	ADL	NBR
210	260	16	BDL	NBR	230	270	15	C	NBR
210	260	16	C	NBR	230	270	16	C	NBR
210	265	25	A	NBR	230	280	15	A	NBR
210	290	20	A	NBR	230	280	15	A	FPM
212	245	16	A	NBR	230	285	23	ADL	NBR
215	240	12	A	NBR	230	310	16	A	NBR
215	240	12	A	FPM	235	265	15	A	NBR
215	245	16	C	NBR	235	270	15	C	FPM
215	248	15	ADL	NBR	235	270	16	C	NBR
215	250	15	C	NBR	240	270	15	A	NBR
215	250	16	A	NBR	240	270	15	A	FPM

NBR=Nitrile FPM=Viton®

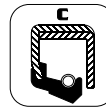
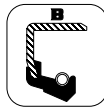


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
240	270	15	ADL	NBR	267	293	10	A	NBR
240	270	15	ADL	FPM	270	300	15	A	NBR
240	270	15	B	NBR	270	300	15	A	FPM
240	270	15	CDL	NBR	270	300	15	ADL	NBR
240	275	16	A	NBR	270	300	15	B	NBR
240	275	16	ADL	FPM	270	310	15	A	NBR
240	280	15	A	NBR	270	310	16	A	NBR
240	280	15	A	FPM	270	310	16	A	FPM
240	280	15	ADL	NBR	270	310	16	ADL	NBR
240	280	16	A	NBR	270	310	16	C	NBR
240	280	16	C	NBR	270	310	16	CDL	NBR
240	290	16	C	NBR	270	310	20	A	NBR
240	335	15	A	NBR	270	310	20	ADL	NBR
245	270	16	C	NBR	270	320	20	ADL	NBR
245	273	15	ADL	NBR	270	330	25	BDL	NBR
250	270	12	A	NBR	272	304	16	B	NBR
250	275	19	ADL	NBR	272	310	16	C	NBR
250	280	15	A	NBR	275	294	12	A	NBR
250	280	15	A	FPM	275	305	12	A	NBR
250	280	15	ADL	NBR	275	310	16	C	NBR
250	280	15	ADL	FPM	275	320	15	ADL	NBR
250	280	15	C	NBR	280	310	15	A	NBR
250	280	15	CDL	NBR	280	310	15	A	FPM
250	280	16	ADL	NBR	280	310	15	ADL	NBR
250	280	16	C	NBR	280	310	16	A	NBR
250	285	18	ADL	NBR	280	310	16	C	NBR
250	290	15	A	NBR	280	320	15	A	NBR
250	290	16	C	NBR	280	320	16	C	NBR
250	290	16	C	FPM	280	320	20	A	NBR
250	310	25	A	NBR	280	320	20	A	FPM
255	290	16	C	NBR	280	320	20	ADL	NBR
258	290	16	C	NBR	280	320	20	C	NBR
260	280	16	C	NBR	285	310	16	C	NBR
260	290	15	A	NBR	285	310	16	C	FPM
260	290	16	A	NBR	285	320	20	ADL	NBR
260	290	16	ADL	NBR	285	325	16	A	NBR
260	290	16	C	NBR	290	320	18	ADL	NBR
260	290	16	C	FPM	290	330	15	C	NBR
260	300	15	A	NBR	290	330	16	C	NBR
260	300	16	A	FPM	290	330	18	C	NBR
260	300	16	C	NBR	290	330	16/18	BDL	NBR
260	300	20	A	NBR	290	350	18	ADL	NBR
260	300	20	A	FPM	295	335	18	C	NBR
260	300	20	ADL	NBR	300	320	20	A	NBR
260	300	25	C	NBR	300	332	16	C	NBR
260	310	15	CDL	NBR	300	335	18	C	NBR
260	310	16	C	NBR	300	340	16	A	NBR
260	320	25	C	NBR	300	340	16	ADL	NBR
260	320	25	CDL	NBR	300	340	16	C	NBR
265	290	15	C	NBR	300	340	18	A	NBR
265	290	16	A	NBR	300	340	18	A	FPM
265	290	16	A	FPM	300	340	18	ADL	NBR
265	290	16	C	NBR	300	340	20	A	NBR
265	300	16	C	NBR	300	340	20	A	FPM
265	310	16	C	NBR	300	340	20	ADL	NBR



Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
300	340	20	ADL	FPM	365	395	15	ADL	NBR
300	340	20	C	NBR	365	405	18	A	FPM
300	350	15	CDL	NBR	365	405	18	C	NBR
300	360	25	CDL	FPM	370	410	15	A	NBR
300	410	18	ADL	NBR	370	410	15	A	FPM
305	330	13	A	NBR	370	410	20	C	NBR
310	340	15	ADL	NBR	370	415	15	ADL	NBR
310	350	18	A	FPM	370	430	26	BDL	FPM
310	350	18	C	NBR	380	400	10	A	NBR
310	350	18	C	FPM	380	410	12	BDL	NBR
310	370	25	C	NBR	380	420	20	A	NBR
310	370	28	BDL	FPM	380	420	20	A	FPM
315	350	18	A	NBR	380	420	20	ADL	NBR
315	355	18	C	NBR	380	420	20	ADL	FPM
315	365	16	C	NBR	380	420	20	C	NBR
315	365	20	C	NBR	380	424	20.5	A	NBR
320	350	18	C	NBR	380	430	19	CDL	NBR
320	360	18	A	NBR	390	425	18	CDL	NBR
320	360	18	C	NBR	390	430	16	C	NBR
320	360	20	A	NBR	390	430	18	C	FPM
320	360	20	A	FPM	390	430	20	A	NBR
320	360	20	ADL	NBR	394	420	16	A	NBR
320	360	20	C	NBR	400	440	18	C	NBR
320	380	25	C	NBR	400	440	20	A	NBR
325	365	16	A	FPM	400	440	20	A	FPM
325	365	16	C	NBR	400	440	20	ADL	NBR
330	370	18	A	NBR	400	440	20	C	NBR
330	370	18	A	FPM	400	450	15	C	NBR
330	370	18	C	NBR	400	450	20	A	NBR
330	370	20	C	NBR	400	450	20	C	NBR
330	390	25	A	NBR	400	460	25	B	NBR
335	375	18	A	NBR	400	485	20	ADL	NBR
335	375	18	A	FPM	410	450	20	C	NBR
340	372	16	A	FPM	410	460	15	C	NBR
340	372	16	C	NBR	420	460	15	C	NBR
340	380	18	A	NBR	420	460	20	A	NBR
340	380	18	A	FPM	420	460	20	A	FPM
340	380	18	C	NBR	420	460	20	C	NBR
340	380	20	A	NBR	420	470	15	A	NBR
340	380	20	A	FPM	420	470	20	A	NBR
340	380	20	ADL	NBR	420	470	20	ADL	FPM
340	380	20	C	NBR	420	470	20	C	NBR
340	388	12	ADL	NBR	430	470	20	BDL	NBR
340	400	25	C	NBR	430	480	25	BDL	FPM
350	380	16	ADL	NBR	435	465	18	B	NBR
350	380	16	C	NBR	440	470	20	A	NBR
350	390	18	A	NBR	440	470	20	C	NBR
350	390	18	A	FPM	440	480	20	A	NBR
350	390	18	C	NBR	440	480	20	A	FPM
360	392	20	C	NBR	440	480	20	ADL	NBR
360	400	16	A	NBR	440	480	20	C	NBR
360	400	18	C	NBR	440	490	25	C	NBR
360	400	20	ADL	NBR	445	480	16	CDL	NBR
360	400	20	ADL	FPM	450	490	20	A	NBR
360	400	20	C	NBR	450	500	22	A	NBR

NBR=Nitrile FPM=Viton®



Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
450	510	25	B	NBR	500	540	20	C	NBR
455	495	20	C	NBR	500	550	20	C	NBR
460	500	20	A	FPM	500	550	22	C	NBR
460	500	20	C	NBR	520	545	18.5	ADL	NBR
460	510	22	A	FPM	520	560	20	A	NBR
465	495	18	C	FPM	530	580	22	ADL	NBR
467	510	20	A	NBR	530	580	22	CDL	NBR
470	510	20	C	NBR	530	580	25	A	NBR
470	520	22	A	NBR	540	565	20	ADL	NBR
470	530	25	BDL	NBR	540	590	25	B	NBR
475	530	18	C	NBR	550	600	25	A	NBR
480	520	20	A	NBR	560	610	20	A	NBR
480	520	20	ADL	NBR	560	610	20	A	FPM
480	520	20	C	NBR	580	630	22.6	A	NBR
480	530	25	A	NBR	580	630	25	A	NBR
480	530	25	ADL	NBR	600	640	20	C	NBR
480	540	25	A	NBR	600	640	20	C	FPM
500	540	20	A	NBR	600	650	25	A	NBR
500	540	20	A	FPM	710	760	20	C	NBR

Inch Shaft Seals

Complete Size Listing

1,415 different sizes and styles.

Nitrile price breaks at:

50, 100, 250, 500 and 1,000 pcs.*

Viton® price breaks at:

10, 25, 50, 100, 250, 500, 1,000 pcs.*

*Custom price breaks available, please call us with your needs.

Harwal can beat any competitors price.

Reference Numbers for Inch Sizes

Harwal seals are designated by the actual hardware dimensions.

The capital letters refer to type. The most common seal types can be found at the top of the listing on each page. See pages 20-22 for additional seal types.

1.000	2.000	.500	A	NBR
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1.000 = 1.000 Inch Shaft Diameter (I.D.)

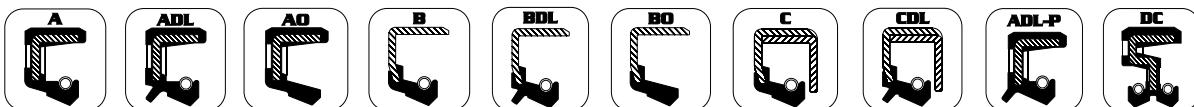
2.000 = 2.000 Inch Bore Diameter (O.D.)

.500 = 0.500 Inch Width

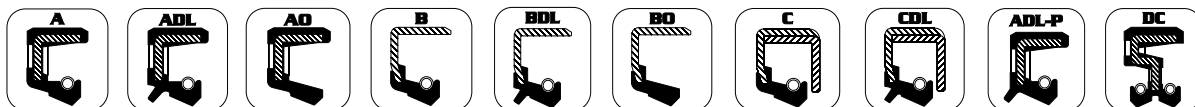
A = Seal Type

NBR = Lip Material

Can't find the size or style you are looking for?
Harwal can make almost ANY seal in 2 weeks!

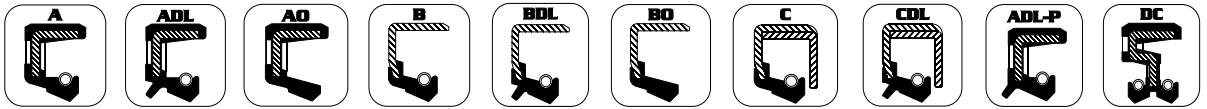


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
.125	.313	.125	AO	NBR	.438	1.125	.375	A	NBR
.187	.631	.250	A	NBR	.500	.678	.125	BO	NBR
.187	.750	.250	A	NBR	.500	.688	.093	AO	NBR
.187	.750	.250	A	FPM	.500	.688	.125	BO	NBR
.250	.500	.125	BODL	NBR	.500	.749	.165	ADL	FPM
.250	.500	.188	ADL	FPM	.500	.750	.125	AO	NBR
.250	.750	.250	A	NBR	.500	.750	.125	AODL	NBR
.250	.750	.250	A	FPM	.500	.820	.156	BO	NBR
.250	.750	.250	ADL	NBR	.500	.843	.250	BO	NBR
.250	1.000	.187	ADL	NBR	.500	.875	.125	A	NBR
.312	.500	.102	AO	NBR	.500	.875	.125	BO	NBR
.313	.563	.125	AO	NBR	.500	.875	.188	A	NBR
.313	.563	.250	A	NBR	.500	.875	.245	ADL	NBR
.313	.625	.156	A	NBR	.500	.875	.250	A	NBR
.313	.625	.156	BO	FPM	.500	.875	.250	ADL	NBR
.313	.688	.109	AO	NBR	.500	.875	.250	ADL	FPM
.313	.688	.313	A	NBR	.500	.875	.250	BDL	FPM
.313	.750	.250	A	NBR	.500	.875	.312	ADL	NBR
.313	.750	.250	A	FPM	.500	.937	.250	ADL	NBR
.313	.750	.250	ADL	NBR	.500	1.000	.188	A	NBR
.313	.750	.313	B	NBR	.500	1.000	.188	A	FPM
.313	.875	.250	ADL	NBR	.500	1.000	.250	BDL	NBR
.354	.703	.156	A	NBR	.500	1.000	.250	A	NBR
.375	.563	.094	AO	NBR	.500	1.000	.250	ADL	NBR
.375	.563	.094	AO	FPM	.500	1.000	.250	ADL	FPM
.375	.563	.125	AO	NBR	.500	1.000	.313	ADL	NBR
.375	.625	.125	BO	NBR	.500	1.000	.375	A	NBR
.375	.625	.188	AO	NBR	.500	1.062	.250	ADL	NBR
.375	.678	.150	AO	NBR	.500	1.125	.250	A	NBR
.375	.750	.250	A	NBR	.500	1.125	.250	ADL	NBR
.375	.750	.250	ADL	FPM	.500	1.125	.313	A	NBR
.375	.750	.250	B	NBR	.500	1.125	.375	A	NBR
.375	.875	.250	ADL	NBR	.500	1.250	.250	A	NBR
.375	.875	.250	A-P	FPM	.500	1.250	.375	A	FPM
.375	.875	.250	ADL-P	NBR	.531	.750	.125	BO	FPM
.375	.875	.250	BODL	NBR	.562	1.250	.250	ADL	NBR
.375	.875	.313	A	NBR	.563	.750	.115	AO	NBR
.375	.875	.313	ADL	NBR	.563	.813	.158	BO	NBR
.375	.938	.188	BO	NBR	.563	.875	.188	B	NBR
.375	.999	.250	B	NBR	.563	1.000	.250	A	NBR
.375	1.000	.250	ADL	NBR	.563	1.000	.250	ADL	NBR
.375	1.062	.250	ADL	NBR	.563	1.000	.250	BO	FPM
.375	1.125	.250	ADL	NBR	.563	1.125	.250	ADL	NBR
.390	.788	.200	BDL	NBR	.563	1.125	.375	A	NBR
.437	.691	.125	BO	NBR	.563	1.250	.250	A	NBR
.437	.812	.312	A	NBR	.594	1.125	.438	ADL	NBR
.437	.875	.250	ADL	FPM	.625	.813	.094	BO	NBR
.437	1.000	.250	A	NBR	.625	.875	.188	ADL	NBR
.437	1.000	.375	A	NBR	.625	.875	.188	BDL	NBR
.438	.875	.156	B	NBR	.625	.938	.188	A	NBR
.438	.875	.250	A	NBR	.625	.999	.250	BDL	NBR
.438	.875	.250	ADL	NBR	.625	1.000	.125	AO	NBR
.438	1.000	.250	A	NBR	.625	1.000	.188	A	NBR
.438	1.000	.250	ADL	FPM	.625	1.000	.188	A	FPM
.438	1.000	.313	CDL	NBR	.625	1.000	.188	ADL	NBR

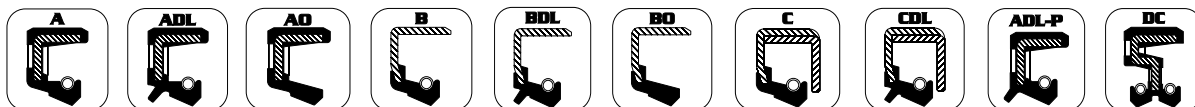


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
.625	1.000	.250	ADL	FPM	.750	1.188	.250	B	NBR
.625	1.000	.250	B	NBR	.750	1.250	.188	A	NBR
.625	1.125	.156	A	NBR	.750	1.250	.188	B	NBR
.625	1.125	.250	A	NBR	.750	1.250	.250	A	NBR
.625	1.125	.250	A	FPM	.750	1.250	.250	A	FPM
.625	1.125	.250	ADL	FPM	.750	1.250	.250	ADL	NBR
.625	1.125	.250	BDL	NBR	.750	1.250	.250	ADL	FPM
.625	1.125	.313	A	NBR	.750	1.250	.250	ADL-P	NBR
.625	1.125	.375	A	NBR	.750	1.250	.312	A	NBR
.625	1.125	.375	BDL	NBR	.750	1.250	.312	A	FPM
.625	1.125	.500	BO	FPM	.750	1.250	.312	B	NBR
.625	1.250	.250	A	NBR	.750	1.250	.375	A	NBR
.625	1.250	.250	ADL	NBR	.750	1.312	.250	A	NBR
.625	1.250	.250	BO	FPM	.750	1.312	.250	BDL	NBR
.625	1.250	.250	BDL	FPM	.750	1.375	.250	A	NBR
.625	1.250	.250	BDL	NBR	.750	1.375	.250	ADL	NBR
.625	1.250	.313	A	NBR	.750	1.375	.313	A	NBR
.625	1.250	.375	A	NBR	.750	1.375	.375	A	NBR
.625	1.313	.250	A	NBR	.750	1.375	.375	ADL	NBR
.625	1.375	.250	A	NBR	.750	1.375	.406	BDL	NBR
.625	1.375	.250	ADL	NBR	.750	1.375	.406	CDL	NBR
.625	1.375	.250	BDL	FPM	.750	1.500	.250	A	NBR
.625	1.375	.313	A	NBR	.750	1.500	.313	A	NBR
.625	1.500	.250	ADL	NBR	.750	1.500	.313	ADL	NBR
.625	1.500	.375	A	NBR	.750	1.500	.375	A	NBR
.625	1.563	.375	A	NBR	.750	1.625	.250	ADL	NBR
.650	1.124	.312	BDL	NBR	.750	1.625	.250	ADL	FPM
.656	1.124	.313	ADL	FPM	.750	1.625	.313	A	NBR
.656	1.124	.313	B	NBR	.750	1.625	.313	AO	NBR
.656	1.250	.250	B	NBR	.750	1.625	.375	A	NBR
.656	1.250	.250	BO	FPM	.750	1.750	.312	A	NBR
.656	1.375	.250	B	NBR	.750	1.750	.312	BDL	NBR
.656	1.500	.250	A	NBR	.750	1.750	.313	ADL	NBR
.669	.984	.118	AO	NBR	.750	1.875	.250	A	NBR
.687	1.125	.250	ADL	FPM	.750	1.875	.250	ADL-P	NBR
.688	.875	.125	BO	NBR	.781	1.250	.250	A	NBR
.688	1.125	.250	ADL	NBR	.781	1.375	.313	B	NBR
.688	1.188	.188	B	NBR	.781	1.625	.188	BO	NBR
.688	1.250	.250	A	NBR	.787	1.125	.196	AO	NBR
.688	1.250	.250	BO	FPM	.812	1.375	.250	ADL	NBR
.688	1.375	.312	ADL	NBR	.813	1.188	.250	A	NBR
.718	1.250	.250	B	FPM	.813	1.250	.250	ADL	NBR
.750	1.000	.125	AO	NBR	.813	1.375	.250	A	NBR
.750	1.000	.125	BO	NBR	.813	1.375	.313	ADL	NBR
.750	1.000	.164	AO	NBR	.813	1.375	.375	A	NBR
.750	1.000	.250	ADL	NBR	.813	1.500	.250	A	NBR
.750	1.063	.109	AO	NBR	.813	1.625	.250	B	NBR
.750	1.063	.188	BO	NBR	.866	1.378	.354	A	NBR
.750	1.124	.188	B	NBR	.875	1.125	.125	AO	NBR
.750	1.125	.156	A	NBR	.875	1.125	.125	BO	NBR
.750	1.125	.156	AO	NBR	.875	1.250	.188	A	NBR
.750	1.125	.250	A	NBR	.875	1.250	.188	B	NBR
.750	1.125	.250	ADL	NBR	.875	1.250	.250	A	NBR
.750	1.125	.313	ADL	NBR	.875	1.250	.250	ADL	NBR
.750	1.187	.156	BO	NBR	.875	1.308	.250	BO	NBR

NBR=Nitrile FPM=Viton®

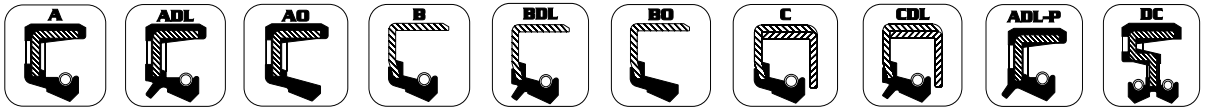


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
.875	1.375	.187	A	NBR	1.000	1.500	.313	A	NBR
.875	1.375	.250	A	NBR	1.000	1.500	.313	BDL	NBR
.875	1.375	.250	ADL	NBR	1.000	1.500	.375	A	NBR
.875	1.375	.250	BDL	NBR	1.000	1.500	.375	ADL	NBR
.875	1.375	.250	BDL	FPM	1.000	1.500	.375	ADL	FPM
.875	1.375	.313	A	NBR	1.000	1.503	.250	BDL	NBR
.875	1.375	.375	A	NBR	1.000	1.561	.250	B	NBR
.875	1.375	.375	ADL	NBR	1.000	1.563	.312	A	NBR
.875	1.375	.375	ADL	FPM	1.000	1.568	.312	A	NBR
.875	1.384	.312	B	FPM	1.000	1.575	.313	ADL	NBR
.875	1.384	.375	A	FPM	1.000	1.624	.250	BDL	FPM
.875	1.499	.250	BDL	NBR	1.000	1.624	.312	ADL-P	NBR
.875	1.500	.250	A	NBR	1.000	1.625	.250	A	NBR
.875	1.500	.313	A	NBR	1.000	1.625	.250	A	FPM
.875	1.500	.375	A	NBR	1.000	1.625	.250	BDL	NBR
.875	1.500	.375	ADL	NBR	1.000	1.625	.313	A	NBR
.875	1.624	.250	BDL	NBR	1.000	1.625	.313	A	FPM
.875	1.625	.375	A	NBR	1.000	1.625	.375	A	NBR
.875	1.625	.375	ADL	NBR	1.000	1.625	.375	ADL	NBR
.875	1.625	.375	ADL	FPM	1.000	1.625	.375	ADL	FPM
.875	1.750	.250	A	NBR	1.000	1.750	.250	A	NBR
.875	1.750	.375	A	NBR	1.000	1.750	.250	ADL	FPM
.875	1.875	.250	BDL	NBR	1.000	1.750	.250	BDL	NBR
.875	1.875	.375	A	NBR	1.000	1.750	.276	BDL	NBR
.875	1.875	.375	ADL	NBR	1.000	1.750	.375	A	NBR
.875	2.000	.250	B	NBR	1.000	1.750	.375	A	FPM
.875	2.000	.375	A	NBR	1.000	1.750	.375	ADL	NBR
.937	1.500	.375	ADL	NBR	1.000	1.875	.250	A	NBR
.938	1.375	.250	BDL	NBR	1.000	1.875	.250	BDL	NBR
.938	1.438	.250	A	NBR	1.000	1.875	.375	A	NBR
.938	1.500	.375	A	NBR	1.000	1.875	.375	ADL	NBR
.938	1.625	.250	B	NBR	1.000	2.000	.250	A	NBR
.938	1.625	.375	B	NBR	1.000	2.000	.250	ADL	NBR
.938	1.750	.313	ADL	NBR	1.000	2.000	.250	BDL	NBR
.938	1.750	.375	A	NBR	1.000	2.000	.375	A	NBR
.966	1.752	.250	A	NBR	1.000	2.000	.375	ADL	NBR
.969	1.406	.250	BDL	NBR	1.000	2.000	.500	A	NBR
.969	1.500	.313	C	NBR	1.000	2.000	.500	ADL	NBR
.969	1.688	.313	ADL	NBR	1.000	2.062	.375	A	NBR
.969	1.752	.250	A	NBR	1.000	2.063	.250	B	NBR
.984	1.375	.235	AO	NBR	1.000	2.125	.375	ADL	NBR
1.000	1.250	.125	AO	NBR	1.000	2.250	.375	A	NBR
1.000	1.250	.125	BO	FPM	1.000	2.250	.375	ADL	NBR
1.000	1.250	.156	AO	NBR	1.000	2.441	.375	BDL	NBR
1.000	1.250	.250	BDL	NBR	1.050	2.000	.406	CDL	NBR
1.000	1.375	.187	A	NBR	1.062	1.312	.129	AO	NBR
1.000	1.375	.250	A	NBR	1.062	1.625	.375	ADL	NBR
1.000	1.375	.250	ADL	NBR	1.062	1.750	.375	ADL	NBR
1.000	1.438	.250	A	NBR	1.062	1.875	.375	ADL	NBR
1.000	1.438	.250	ADL	NBR	1.063	1.500	.250	A	NBR
1.000	1.499	.250	BDL	NBR	1.063	1.500	.250	B	NBR
1.000	1.499	.312	CDL	NBR	1.063	1.563	.250	A	NBR
1.000	1.500	.250	ADL	NBR	1.063	1.563	.250	B	NBR
1.000	1.500	.250	ADL	FPM	1.063	1.625	.313	A	NBR
1.000	1.500	.250	ADL-P	NBR	1.063	1.750	.375	A	NBR

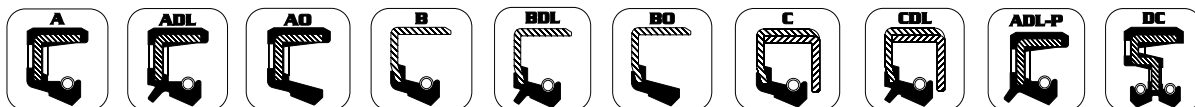


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
1.063	2.000	.250	BDL	NBR	1.125	2.250	.375	A	NBR
1.063	2.250	.375	A	NBR	1.125	2.437	.437	ADL	NBR
1.125	1.375	.125	AO	NBR	1.125	2.438	.375	ADL	NBR
1.125	1.375	.125	BO	NBR	1.125	2.881	.250	A	NBR
1.125	1.438	.156	A	NBR	1.156	1.498	.187	ADL	NBR
1.125	1.438	.203	AO	NBR	1.156	1.498	.187	ADL	FPM
1.125	1.499	.188	BO	NBR	1.156	1.686	.250	BDL	NBR
1.125	1.500	.250	A	NBR	1.156	1.686	.312	ADL	NBR
1.125	1.500	.250	ADL	NBR	1.156	1.688	.313	ADL	NBR
1.125	1.500	.500	A	NBR	1.156	1.875	.250	ADL	NBR
1.125	1.563	.250	A	NBR	1.181	1.625	.275	AO	NBR
1.125	1.563	.375	A	NBR	1.187	1.875	.375	C	NBR
1.125	1.624	.256	BDL	NBR	1.187	2.000	.250	ADL-P	NBR
1.125	1.625	.250	A	NBR	1.187	2.000	.312	ADL	NBR
1.125	1.625	.250	ADL	FPM	1.187	2.000	.375	ADL	FPM
1.125	1.625	.250	BDL	NBR	1.187	2.000	.437	BDL	NBR
1.125	1.625	.250	BDL-P	NBR	1.188	1.625	.250	A	NBR
1.125	1.625	.250	BDL-P	FPM	1.188	1.688	.375	A	NBR
1.125	1.625	.256	BDL	NBR	1.188	1.719	.500	BDL	NBR
1.125	1.625	.313	A	NBR	1.188	1.750	.187	A	NBR
1.125	1.625	.313	ADL	NBR	1.188	1.750	.250	A	NBR
1.125	1.625	.375	A	FPM	1.188	1.750	.250	BO	FPM
1.125	1.626	.375	A	NBR	1.188	1.828	.375	B	NBR
1.125	1.631	.250	A	NBR	1.188	1.875	.375	A	NBR
1.125	1.687	.250	ADL	NBR	1.188	2.000	.250	A	NBR
1.125	1.750	.210	A	NBR	1.188	2.000	.313	A	NBR
1.125	1.750	.250	ADL	FPM	1.188	2.000	.375	A	NBR
1.125	1.750	.313	ADL	NBR	1.188	2.250	.500	A	NBR
1.125	1.750	.313	A	NBR	1.215	2.000	.313	ADL	NBR
1.125	1.750	.375	A	NBR	1.219	1.979	.406	BO	NBR
1.125	1.750	.375	ADL	NBR	1.235	2.250	.500	ADL	NBR
1.125	1.750	.437	A	NBR	1.245	2.000	.250	A	FPM
1.125	1.781	.250	ADL	NBR	1.245	2.000	.250	AO	FPM
1.125	1.785	.406	A	NBR	1.250	1.382	.157	BO	NBR
1.125	1.828	.250	A	NBR	1.250	1.500	.125	BO	NBR
1.125	1.828	.250	ADL	NBR	1.250	1.500	.125	BO	FPM
1.125	1.828	.313	A	NBR	1.250	1.500	.156	BO	NBR
1.125	1.832	.313	ADL	NBR	1.250	1.500	.250	B	NBR
1.125	1.875	.250	A	NBR	1.250	1.625	.186	BDL	NBR
1.125	1.875	.250	BDL	FPM	1.250	1.625	.187	BO	FPM
1.125	1.875	.375	A	NBR	1.250	1.625	.188	B	NBR
1.125	1.875	.375	ADL	NBR	1.250	1.625	.188	BO	NBR
1.125	1.875	.375	ADL	FPM	1.250	1.625	.250	A	NBR
1.125	2.000	.250	ADL	NBR	1.250	1.625	.250	ADL	NBR
1.125	2.000	.375	A	NBR	1.250	1.687	.250	ADL	NBR
1.125	2.000	.375	ADL	NBR	1.250	1.687	.375	A	NBR
1.125	2.000	.437	A	FPM	1.250	1.688	.188	BDL	NBR
1.125	2.000	.500	A	NBR	1.250	1.750	.250	A	NBR
1.125	2.047	.313	ADL	NBR	1.250	1.750	.250	ADL	NBR
1.125	2.062	.375	A	NBR	1.250	1.750	.250	ADL	FPM
1.125	2.062	.375	ADL	NBR	1.250	1.750	.250	ADL-P	NBR
1.125	2.125	.313	B	NBR	1.250	1.750	.250	BDL	FPM
1.125	2.125	.375	A	NBR	1.250	1.750	.313	BDL	NBR
1.125	2.125	.375	ADL	NBR	1.250	1.752	.375	B	NBR
1.125	2.250	.250	B	NBR	1.250	1.874	.250	BDL	NBR

NBR=Nitrile FPM=Viton®

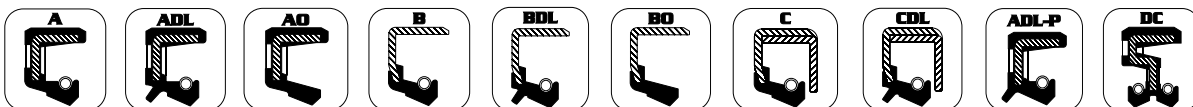


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
1.250	1.875	.250	A	NBR	1.313	2.285	.500	B	NBR
1.250	1.875	.250	A	FPM	1.365	2.261	.313	B	NBR
1.250	1.875	.313	A	NBR	1.375	1.750	.187	AO	NBR
1.250	1.875	.375	A	NBR	1.375	1.750	.197	BO	NBR
1.250	1.875	.375	ADL	NBR	1.375	1.750	.250	ADL	NBR
					1.375	1.831	.276	ADL	NBR
1.250	1.875	.438	ADL	NBR	1.375	1.835	.250	B	NBR
1.250	1.930	.253	BDL	NBR	1.375	1.875	.250	A	NBR
1.250	1.938	.438	A	NBR	1.375	1.875	.250	ADL	NBR
1.250	1.938	.438	ADL	NBR	1.375	1.875	.312	BDL	FPM
1.250	1.979	.250	BDL	NBR	1.375	1.875	.313	ADL	NBR
					1.375	1.875	.375	ADL	NBR
1.250	1.983	.250	B	NBR	1.375	1.938	.250	BO	FPM
1.250	1.984	.250	BDL	NBR	1.375	1.938	.250	BDL	NBR
1.250	2.000	.250	A	NBR	1.375	2.000	.313	A	NBR
1.250	2.000	.250	ADL	NBR	1.375	2.000	.313	ADL	NBR
1.250	2.000	.250	BDL	FPM	1.375	2.000	.313	BDL	NBR
1.250	2.000	.313	ADL	NBR	1.375	2.000	.313	BDL	FPM
1.250	2.000	.375	A	NBR	1.375	2.000	.375	A	NBR
1.250	2.000	.375	ADL	NBR	1.375	2.000	.375	ADL	NBR
1.250	2.000	.375	ADL	FPM	1.375	2.000	.438	ADL	NBR
1.250	2.000	.437	C	NBR	1.375	2.000	.500	A	NBR
					1.375	2.062	.375	A	NBR
1.250	2.000	.500	A	NBR	1.375	2.063	.250	A	NBR
1.250	2.000	.500	ADL	NBR	1.375	2.063	.500	A	NBR
1.250	2.063	.250	BDL	NBR	1.375	2.125	.313	A	NBR
1.250	2.063	.375	B	NBR	1.375	2.125	.313	ADL	FPM
1.250	2.063	.500	C	NBR	1.375	2.125	.313	BDL	NBR
					1.375	2.125	.313	BDL	FPM
1.250	2.125	.250	ADL	NBR	1.375	2.125	.375	A	NBR
1.250	2.125	.250	ADL	FPM	1.375	2.125	.375	ADL	NBR
1.250	2.125	.313	A	NBR	1.375	2.125	.312	BDL	NBR
1.250	2.125	.313	ADL	NBR	1.375	2.250	.313	B	NBR
1.250	2.125	.375	A	NBR	1.375	2.250	.375	A	NBR
					1.375	2.250	.375	ADL	NBR
1.250	2.188	.438	A	NBR	1.375	2.250	.500	A	NBR
1.250	2.250	.313	A	NBR	1.375	2.282	.250	BO	NBR
1.250	2.250	.375	A	NBR	1.375	2.313	.438	ADL	NBR
1.250	2.250	.375	ADL	NBR	1.375	2.374	.312	B	NBR
1.250	2.250	.500	A	NBR	1.375	2.374	.312	BDL-P	NBR
					1.375	2.375	.375	A	NBR
1.250	2.375	.312	BDL	NBR	1.375	2.375	.375	ADL	NBR
1.250	2.375	.375	A	NBR	1.375	2.375	.500	A	NBR
1.250	2.375	.375	ADL	NBR	1.375	2.437	.250	B	NBR
1.250	2.438	.250	B	NBR	1.375	2.437	.375	ADL	NBR
1.250	2.441	.250	B	NBR	1.375	2.500	.375	A	NBR
					1.375	2.500	.375	ADL	NBR
1.250	2.500	.375	A	NBR	1.375	2.500	.500	A	NBR
1.250	2.563	.500	C	NBR	1.375	2.500	.500	ADL	NBR
1.250	2.750	.313	B	NBR	1.375	2.625	.375	A	NBR
1.250	2.750	.375	A	NBR	1.375	2.750	.500	A	NBR
1.250	2.750	.375	ADL	NBR	1.375	3.000	.375	ADL	NBR
					1.413	1.964	.237	B	NBR
1.250	2.835	.375	ADL	NBR	1.437	2.070	.312	ADL	NBR
1.258	1.625	.250	ADL	NBR	1.437	2.250	.312	BDL	NBR
1.311	1.686	.252	ADL	NBR					
1.312	2.250	.313	B	NBR					
1.312	2.250	.375	ADL	NBR					
1.312	2.375	.375	B	NBR					
1.313	1.875	.313	A	NBR					
1.313	1.938	.188	A	NBR					
1.313	2.000	.375	B	NBR					
1.313	2.125	.375	BDL	NBR					

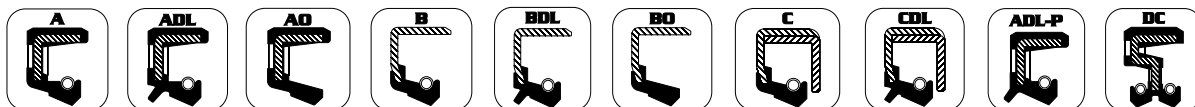


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
1.437	2.250	.375	ADL	NBR	1.500	2.375	.500	A	NBR
1.437	2.500	.500	A	NBR	1.500	2.437	.375	ADL	NBR
1.438	2.000	.313	ADL	NBR	1.500	2.438	.375	A	NBR
1.438	2.000	.313	ADL	FPM	1.500	2.441	.313	BDL	NBR
1.438	2.063	.313	ADL	NBR	1.500	2.500	.250	A	NBR
1.438	2.125	.250	A	NBR	1.500	2.500	.313	A	NBR
1.438	2.125	.313	ADL	NBR	1.500	2.500	.313	ADL	NBR
1.438	2.125	.375	A	NBR	1.500	2.500	.313	BDL	NBR
1.438	2.125	.375	ADL	NBR	1.500	2.500	.375	A	NBR
1.438	2.250	.313	ADL	FPM	1.500	2.500	.500	A	NBR
1.438	2.250	.375	A	NBR	1.500	2.500	.500	ADL	NBR
1.438	2.250	.375	ADL	NBR	1.500	2.502	.313	B	FPM
1.438	2.374	.313	BDL	NBR	1.500	2.561	.312	BDL	NBR
1.438	2.375	.375	ADL	NBR	1.500	2.625	.375	ADL	NBR
1.438	2.500	.500	A	NBR	1.500	2.625	.500	A	NBR
1.438	2.750	.313	B	NBR	1.500	2.750	.375	ADL	NBR
1.500	1.810	.118	ADL	NBR	1.500	2.750	.500	A	NBR
1.500	1.874	.188	BO	FPM	1.500	2.875	.250	AO	NBR
1.500	1.875	.190	A	NBR	1.500	2.875	.313	B	NBR
1.500	1.875	.250	AODL	NBR	1.500	3.000	.375	ADL	NBR
1.500	1.875	.375	A	NBR	1.500	3.125	.375	ADL	NBR
1.500	1.980	.500	A	NBR	1.500	3.548	.500	C	NBR
1.500	1.983	.250	BDL	NBR	1.562	2.125	.500	ADL	NBR
1.500	2.000	.250	A	NBR	1.562	2.312	.375	ADL	NBR
1.500	2.000	.250	A	FPM	1.562	2.312	.375	ADL	FPM
1.500	2.000	.250	ADL	NBR	1.562	2.375	.375	ADL	NBR
1.500	2.000	.313	ADL	FPM	1.562	2.441	.375	CDL	NBR
1.500	2.000	.313	B	NBR	1.562	2.500	.375	ADL	NBR
1.500	2.000	.313	B	FPM	1.562	2.625	.375	ADL	NBR
1.500	2.000	.500	A	NBR	1.563	2.063	.250	BO	FPM
1.500	2.000	.500	ADL	NBR	1.563	2.125	.438	CDL	NBR
1.500	2.062	.250	ADL	NBR	1.563	2.250	.375	A	NBR
1.500	2.062	.313	A	NBR	1.563	2.375	.375	A	NBR
1.500	2.063	.250	A	NBR	1.563	2.441	.500	BDL	NBR
1.500	2.063	.375	A	NBR	1.563	2.461	.500	A	NBR
1.500	2.125	.312	ADL	NBR	1.563	2.500	.313	A	NBR
1.500	2.125	.313	A	NBR	1.563	2.500	.375	A	NBR
1.500	2.125	.375	A	NBR	1.563	2.500	.500	ADL	NBR
1.500	2.166	.281	B	NBR	1.563	2.502	.313	ADL	FPM
1.500	2.188	.313	A	NBR	1.563	2.502	.313	B	FPM
1.500	2.188	.375	A	NBR	1.563	2.625	.313	B	NBR
1.500	2.250	.250	A	NBR	1.563	2.625	.453	BDL	NBR
1.500	2.250	.313	A	NBR	1.563	2.688	.375	A	NBR
1.500	2.250	.313	ADL	FPM	1.578	2.219	.313	AO	NBR
1.500	2.250	.313	ADL-P	NBR	1.593	2.500	.250	B	NBR
1.500	2.250	.375	A	NBR	1.625	2.000	.250	ADL	NBR
1.500	2.250	.375	ADL	NBR	1.625	2.000	.500	A	NBR
1.500	2.250	.438	BDL	NBR	1.625	2.063	.275	B	NBR
1.500	2.250	.500	A	NBR	1.625	2.125	.250	A	NBR
1.500	2.250	.500	C	NBR	1.625	2.125	.250	ADL	FPM
1.500	2.314	.500	BDL	NBR	1.625	2.188	.375	A	NBR
1.500	2.328	.500	BDL	NBR	1.625	2.250	.313	ADL	NBR
1.500	2.375	.313	BDL	NBR	1.625	2.250	.375	ADL	NBR
1.500	2.375	.375	ADL	NBR	1.625	2.374	.312	BDL	NBR
1.500	2.375	.438	A	NBR	1.625	2.374	.312	CDL	NBR

NBR=Nitrile FPM=Viton®

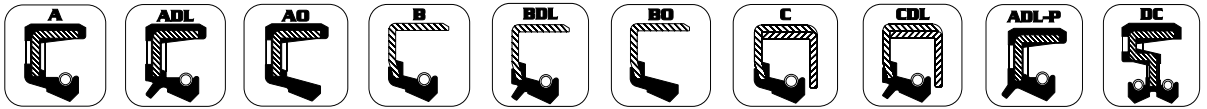


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
1.625	2.375	.313	A	NBR	1.750	2.375	.375	ADL	NBR
1.625	2.375	.375	A	NBR	1.750	2.375	.500	A	NBR
1.625	2.375	.375	ADL	NBR	1.750	2.383	.375	ADL	NBR
1.625	2.375	.375	ADL	FPM	1.750	2.437	.375	ADL	NBR
1.625	2.375	.500	A	NBR	1.750	2.438	.313	A	FPM
1.625	2.437	.375	ADL	NBR	1.750	2.438	.313	ADL	NBR
1.625	2.438	.375	B	NBR	1.750	2.438	.313	ADL	FPM
1.625	2.438	.500	A	NBR	1.750	2.438	.375	B	NBR
1.625	2.500	.250	ADL	NBR	1.750	2.441	.313	ADL	NBR
1.625	2.500	.313	A	NBR	1.750	2.441	.375	A	FPM
1.625	2.500	.313	ADL	NBR	1.750	2.500	.250	ADL	NBR
1.625	2.500	.375	ADL	NBR	1.750	2.500	.313	A	NBR
1.625	2.500	.500	A	NBR	1.750	2.500	.313	B	NBR
1.625	2.500	.500	ADL	NBR	1.750	2.500	.313	BDL	NBR
1.625	2.562	.438	ADL	NBR	1.750	2.500	.313	BDL	FPM
1.625	2.563	.375	A	NBR	1.750	2.500	.313	BDL-P	NBR
1.625	2.625	.313	BO	FPM	1.750	2.500	.375	A	FPM
1.625	2.625	.375	A	NBR	1.750	2.500	.375	ADL	NBR
1.625	2.625	.375	ADL	NBR	1.750	2.500	.375	ADL	FPM
1.625	2.625	.500	A	NBR	1.750	2.500	.500	A	NBR
1.625	2.750	.375	A	NBR	1.750	2.500	.500	A	FPM
1.625	2.750	.375	ADL	NBR	1.750	2.563	.109	BO	NBR
1.625	2.750	.500	A	NBR	1.750	2.563	.313	A	NBR
1.625	2.875	.313	A	NBR	1.750	2.625	.375	A	NBR
1.625	2.875	.375	A	FPM	1.750	2.625	.375	ADL	NBR
1.625	2.875	.375	ADL	NBR	1.750	2.625	.500	A	NBR
1.625	2.875	.500	A	NBR	1.750	2.687	.500	ADL	NBR
1.625	3.000	.375	ADL	NBR	1.750	2.688	.438	A	NBR
1.656	2.625	.388	ADL	NBR	1.750	2.688	.500	A	NBR
1.687	2.328	.312	BDL	NBR	1.750	2.718	.375	ADL	NBR
1.687	2.500	.375	ADL	NBR	1.750	2.719	.500	A	NBR
1.687	2.623	.437	BDL	NBR	1.750	2.750	.312	BDL	NBR
1.687	3.000	.375	ADL	NBR	1.750	2.750	.375	A	NBR
1.688	2.125	.188	A	NBR	1.750	2.750	.375	ADL	NBR
1.688	2.250	.313	A	NBR	1.750	2.750	.500	A	NBR
1.688	2.500	.375	A	NBR	1.750	2.750	.500	ADL	NBR
1.688	2.500	.500	A	NBR	1.750	2.762	.375	BDL	NBR
1.688	2.625	.375	ADL	NBR	1.750	2.814	.313	BDL	NBR
1.688	2.688	.500	A	NBR	1.750	2.875	.313	B	NBR
1.719	2.565	.500	BDL	NBR	1.750	2.875	.375	A	NBR
1.750	2.125	.187	BO	NBR	1.750	2.875	.375	ADL	NBR
1.750	2.125	.188	A	NBR	1.750	2.875	.500	A	NBR
1.750	2.125	.188	ADL	NBR	1.750	3.000	.375	ADL	NBR
1.750	2.250	.188	BO	FPM	1.750	3.188	.500	A	NBR
1.750	2.250	.250	A	NBR	1.750	3.375	.375	ADL	NBR
1.750	2.250	.250	BO	NBR	1.750	3.500	.375	ADL	NBR
1.750	2.250	.313	A	NBR	1.750	3.938	.313	BDL	NBR
1.750	2.250	.313	B	NBR	1.762	2.412	.375	BDL	NBR
1.750	2.250	.375	A	NBR	1.812	3.187	.375	ADL	NBR
1.750	2.250	.375	ADL	NBR	1.813	2.437	.313	C	NBR
1.750	2.250	.375	DC	NBR	1.813	2.500	.250	A	NBR
1.750	2.312	.250	ADL	NBR	1.813	2.500	.375	A	NBR
1.750	2.313	.250	A	NBR	1.813	2.500	.500	ADL	NBR
1.750	2.375	.313	A	NBR	1.813	2.625	.375	A	NBR
1.750	2.375	.375	A	NBR	1.813	2.750	.375	ADL	NBR

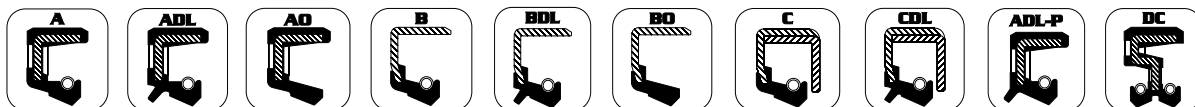


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
1.813	2.750	.500	A	NBR	2.000	2.750	.250	ADL	NBR
1.813	3.000	.375	A	NBR	2.000	2.750	.312	ADL	NBR
1.820	2.438	.250	A	FPM	2.000	2.750	.313	BDL	FPM
1.865	2.328	.300	AO	NBR	2.000	2.750	.375	A	FPM
1.865	2.331	.300	BO	NBR	2.000	2.750	.375	ADL	NBR
					2.000	2.750	.438	A	NBR
1.875	2.375	.250	A	NBR	2.000	2.750	.500	A	NBR
1.875	2.437	.312	ADL	NBR	2.000	2.750	.500	ADL	NBR
1.875	2.441	.375	A	FPM	2.000	2.875	.313	B	NBR
1.875	2.500	.250	A	NBR	2.000	2.875	.375	ADL	NBR
1.875	2.500	.313	A	NBR					
1.875	2.500	.375	A	NBR	2.000	2.875	.500	A	NBR
1.875	2.500	.500	A	NBR	2.000	2.922	.313	A	NBR
1.875	2.563	.250	A	NBR	2.000	3.000	.250	A	NBR
1.875	2.623	.374	AODL	NBR	2.000	3.000	.375	A	NBR
1.875	2.625	.375	A	NBR	2.000	3.000	.375	ADL	NBR
					2.000	3.000	.500	ADL	NBR
1.875	2.625	.375	ADL	NBR	2.000	3.000	.500	ADL	FPM
1.875	2.625	.500	A	NBR	2.000	3.062	.375	ADL	NBR
1.875	2.688	.375	ADL	NBR	2.000	3.125	.312	BDL	FPM
1.875	2.688	.375	B	NBR	2.000	3.125	.375	A	NBR
1.875	2.750	.375	A	NBR					
1.875	2.750	.375	ADL	NBR	2.000	3.188	.375	C	NBR
1.875	2.750	.375	ADL	FPM	2.000	3.250	.375	A	NBR
1.875	2.750	.500	A	NBR	2.000	3.350	.468	CDL	NBR
1.875	2.750	.500	A	FPM	2.000	3.375	.500	A	NBR
1.875	2.750	.500	ADL	NBR	2.000	3.375	.500	ADL	NBR
1.875	2.875	.313	C	NBR	2.000	3.391	.500	BDL	NBR
1.875	2.875	.375	A	NBR	2.000	3.500	.500	A	NBR
1.875	2.875	.500	A	NBR	2.000	3.625	.500	ADL	NBR
1.875	3.000	.375	A	NBR	2.000	3.750	.500	BDL	NBR
1.875	3.000	.375	ADL	NBR	2.062	3.000	.375	ADL	NBR
					2.063	2.625	.313	A	NBR
1.875	3.000	.500	A	NBR	2.063	2.875	.375	A	NBR
1.875	3.000	.500	ADL	NBR	2.063	2.875	.375	ADL	NBR
1.875	3.000	.500	ADL	FPM	2.063	2.875	.375	A	NBR
1.875	3.125	.375	BDL	NBR	2.063	3.000	.375	A	NBR
1.875	3.160	.375	ADL	FPM	2.063	3.063	.313	A	NBR
1.875	3.187	.500	A	NBR	2.063	3.188	.375	A	NBR
1.937	2.750	.312	BDL	NBR	2.063	3.375	.250	ADL	NBR
1.937	2.750	.375	ADL	NBR	2.094	3.063	.500	C	NBR
1.938	2.500	.375	A	NBR	2.125	2.625	.188	A	NBR
1.938	2.500	.375	ADL	NBR	2.125	2.688	.313	A	NBR
					2.125	2.750	.313	A	NBR
1.938	2.500	.375	BDL	NBR	2.125	2.750	.375	A	NBR
1.938	2.625	.375	ADL	NBR	2.125	2.750	.500	C	NBR
1.938	2.750	.375	A	NBR	2.125	2.833	.438	A	NBR
1.938	2.875	.375	ADL	NBR	2.125	2.875	.250	BO	NBR
1.938	3.000	.375	ADL	NBR					
1.938	3.000	.500	A	NBR	2.125	2.875	.375	A	NBR
1.938	3.188	.438	C	NBR	2.125	2.875	.375	ADL	FPM
2.000	2.375	.188	B	NBR	2.125	2.875	.500	A	NBR
2.000	2.375	.188	BO	NBR	2.125	2.875	.500	C	NBR
2.000	2.500	.250	A	NBR	2.125	3.000	.375	ADL	NBR
					2.125	3.000	.375	BDL	NBR
2.000	2.500	.250	ADL	NBR	2.125	3.000	.500	A	NBR
2.000	2.625	.375	A	NBR	2.125	3.000	.500	ADL	NBR
2.000	2.625	.375	ADL	NBR	2.125	3.063	.475	AO	NBR
2.000	2.688	.375	A	NBR	2.125	3.125	.375	ADL	NBR
2.000	2.688	.500	A	NBR					

NBR=Nitrile FPM=Viton®

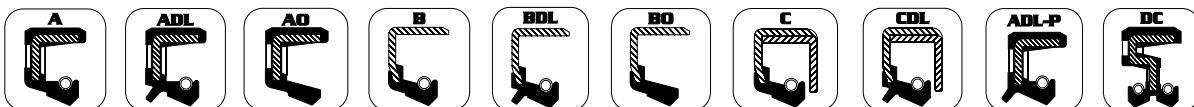


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
2.125	3.125	.375	CDL	NBR	2.313	3.250	.438	C	NBR
2.125	3.188	.438	C	NBR	2.313	3.359	.313	A	NBR
2.125	3.250	.375	ADL	NBR	2.313	3.375	.375	A	NBR
2.125	3.250	.500	A	NBR	2.375	2.875	.313	A	NBR
2.125	3.375	.500	A	NBR	2.375	2.875	.375	ADL	NBR
2.125	3.500	.500	A	NBR	2.375	3.000	.375	A	NBR
2.125	3.500	.500	ADL	NBR	2.375	3.000	.375	ADL	NBR
2.125	3.661	.250	BO	NBR	2.375	3.125	.375	ADL	NBR
2.141	3.547	.375	ADL	NBR	2.375	3.125	.375	ADL	FPM
2.180	3.250	.250	C	NBR	2.375	3.125	.500	BDL	NBR
2.188	2.875	.375	A	FPM	2.375	3.250	.375	ADL	NBR
2.188	2.875	.375	ADL	NBR	2.375	3.250	.500	A	NBR
2.188	2.875	.500	ADL	NBR	2.375	3.375	.375	ADL	NBR
2.188	2.997	.438	BDL	NBR	2.375	3.375	.500	ADL	NBR
2.188	3.000	.375	ADL	NBR	2.375	3.500	.375	A	NBR
2.188	3.063	.375	BDL	NBR	2.375	3.500	.438	A	NBR
2.188	3.250	.375	ADL	NBR	2.375	3.500	.500	A	NBR
2.188	3.375	.500	ADL	NBR	2.375	3.500	.500	ADL	NBR
2.250	2.625	.188	AO	NBR	2.375	3.543	.375	CDL	NBR
2.250	2.750	.375	ADL	NBR	2.375	3.625	.500	A	NBR
2.250	2.875	.375	A	NBR	2.375	3.750	.438	ADL	NBR
2.250	2.997	.438	CDL	NBR	2.375	3.750	.500	ADL	NBR
2.250	3.000	.375	ADL	NBR	2.375	5.543	.375	CDL	NBR
2.250	3.000	.375	ADL	FPM	2.437	3.250	.375	ADL	NBR
2.250	3.000	.375	AODL	NBR	2.437	3.500	.375	CDL	NBR
2.250	3.000	.433	ADL	FPM	2.437	4.250	.375	CO	NBR
2.250	3.000	.500	A	NBR	2.437	4.250	.375	C	NBR
2.250	3.000	.500	ADL	NBR	2.438	3.125	.375	A	FPM
2.250	3.125	.375	A	NBR	2.438	3.250	.375	A	NBR
2.250	3.125	.375	A	FPM	2.438	3.375	.500	A	NBR
2.250	3.188	.500	A	NBR	2.438	3.500	.438	C	FPM
2.250	3.250	.375	ADL	NBR	2.500	3.000	.250	ADL	NBR
2.250	3.250	.500	A	NBR	2.500	3.000	.375	A	NBR
2.250	3.250	.500	ADL	NBR	2.500	3.000	.375	ADL	NBR
2.250	3.335	.435	A	NBR	2.500	3.187	.375	ADL	NBR
2.250	3.344	.313	B	NBR	2.500	3.188	.375	A	NBR
2.250	3.371	.438	CDL	NBR	2.500	3.188	.438	C	NBR
2.250	3.375	.250	ADL	NBR	2.500	3.250	.375	A	NBR
2.250	3.375	.375	A	NBR	2.500	3.250	.438	CDL	FPM
2.250	3.375	.375	ADL	NBR	2.500	3.251	.375	ADL	FPM
2.250	3.375	.500	A	NBR	2.500	3.251	.500	A	NBR
2.250	3.375	.500	ADL	FPM	2.500	3.375	.313	ADL	NBR
2.250	3.500	.375	CDL	NBR	2.500	3.375	.500	A	NBR
2.250	3.500	.438	ADL	NBR	2.500	3.375	.500	ADL	NBR
2.250	3.500	.438	C	NBR	2.500	3.375	.500	BDL	FPM
2.250	3.500	.500	ADL	NBR	2.500	3.500	.375	A	NBR
2.250	3.625	.500	A	NBR	2.500	3.500	.375	ADL	NBR
2.250	3.625	.500	ADL	NBR	2.500	3.500	.375	ADL	FPM
2.250	3.875	.438	ADL	NBR	2.500	3.500	.375	BO	FPM
2.250	4.000	.469	A	FPM	2.500	3.500	.375	BDL	NBR
2.250	5.118	.375	A	NBR	2.500	3.500	.438	A	FPM
2.313	3.000	.250	BO	NBR	2.500	3.500	.500	A	NBR
2.313	3.000	.500	CDL	FPM	2.500	3.500	.500	ADL	NBR
2.313	3.125	.375	A	NBR	2.500	3.547	.500	ADL	NBR
2.313	3.188	.375	ADL	NBR	2.500	3.625	.375	ADL	FPM

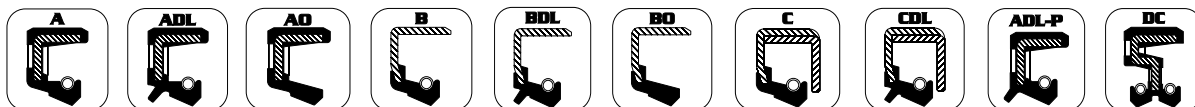


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
2.500	3.625	.500	A	NBR	2.750	4.250	.500	ADL	NBR
2.500	3.750	.500	A	NBR	2.750	4.500	.500	ADL	NBR
2.500	3.751	.438	C	NBR	2.813	3.625	.375	A	NBR
2.500	3.875	.500	A	NBR	2.813	3.625	.375	ADL	NBR
2.500	3.875	.500	ADL	NBR	2.813	3.875	.500	ADL	NBR
2.500	4.000	.500	ADL	NBR	2.828	3.388	.276	ADL	NBR
2.500	4.250	.500	A	NBR	2.875	3.375	.188	ADL	NBR
2.559	3.938	.375	ADL	NBR	2.875	3.625	.375	A	NBR
2.562	3.500	.375	CDL	NBR	2.875	3.625	.375	ADL	NBR
2.562	3.623	.375	CDL	NBR	2.875	3.750	.375	BDL	NBR
2.563	3.375	.375	A	NBR	2.875	3.750	.500	ADL	NBR
2.563	3.500	.438	C	NBR	2.875	3.751	.500	A	NBR
2.563	3.505	.433	ADL	FPM	2.875	3.875	.500	ADL	NBR
2.562	3.625	.375	CDL	NBR	2.875	3.876	.438	C	NBR
2.563	3.625	.703	CDL	NBR	2.875	4.000	.375	C	NBR
2.625	3.250	.375	ADL	NBR	2.875	4.003	.500	ADL	NBR
2.625	3.350	.468	B	NBR	2.875	4.500	.500	ADL	NBR
2.625	3.371	.375	CDL	NBR	2.937	3.750	.375	ADL	NBR
2.625	3.375	.313	A	NBR	2.937	4.003	.375	CDL	NBR
2.625	3.375	.375	A	NBR	2.938	3.750	.375	A	NBR
2.625	3.375	.375	ADL	NBR	2.938	4.000	.625	CDL	NBR
2.625	3.500	.500	A	NBR	2.938	4.125	.375	CDL	NBR
2.625	3.500	.500	ADL	NBR	2.938	4.500	.438	C	NBR
2.625	3.625	.375	ADL	NBR	3.000	3.375	.109	BO	NBR
2.625	3.625	.500	A	NBR	3.000	3.500	.250	A	NBR
2.625	3.625	.500	ADL	NBR	3.000	3.750	.375	A	NBR
2.625	3.625	.500	C	FPM	3.000	3.750	.375	ADL	NBR
2.625	3.750	.500	A	NBR	3.000	3.750	.500	A	NBR
2.625	3.750	.500	ADL	NBR	3.000	3.750	.500	ADL	NBR
2.625	3.875	.438	C	NBR	3.000	3.751	.438	CDL	NBR
2.625	3.875	.500	ADL	NBR	3.000	3.875	.375	A	NBR
2.625	4.000	.500	A	NBR	3.000	3.875	.375	ADL	NBR
2.625	4.000	.500	ADL	NBR	3.000	3.876	.313	B	FPM
2.625	4.438	.438	C	NBR	3.000	4.000	.375	ADL	NBR
2.687	3.750	.500	ADL	NBR	3.000	4.000	.438	ADL	FPM
2.688	3.500	.500	ADL	NBR	3.000	4.000	.438	C	NBR
2.688	3.750	.500	A	NBR	3.000	4.000	.468	CDL	FPM
2.688	3.875	.438	ADL	FPM	3.000	4.000	.500	A	NBR
2.688	4.000	.500	A	NBR	3.000	4.000	.500	ADL	NBR
2.750	3.189	.132	CDL	FPM	3.000	4.125	.438	C	NBR
2.750	3.390	.313	A	NBR	3.000	4.125	.500	ADL	NBR
2.750	3.500	.375	A	NBR	3.000	4.250	.500	A	NBR
2.750	3.500	.375	ADL	NBR	3.000	4.250	.500	ADL	NBR
2.750	3.500	.375	ADL	FPM	3.000	4.375	.375	ADL	NBR
2.750	3.500	.500	ADL	NBR	3.000	4.500	.438	C	NBR
2.750	3.625	.500	A	NBR	3.000	4.500	.438	CDL	NBR
2.750	3.750	.375	ADL	NBR	3.000	4.500	.469	CDL	NBR
2.750	3.750	.500	ADL	NBR	3.000	4.500	.500	A	NBR
2.750	3.750	.500	ADL	FPM	3.000	4.500	.500	ADL	NBR
2.750	3.875	.469	B	NBR	3.000	4.500	.625	A	NBR
2.750	3.875	.500	A	NBR	3.062	4.125	.500	ADL	NBR
2.750	3.875	.500	ADL	NBR	3.063	4.250	.625	CDL	NBR
2.750	3.875	.500	ADL	FPM	3.063	4.500	.500	A	FPM
2.750	4.000	.500	A	NBR	3.125	3.875	.500	ADL	NBR
2.750	4.000	.500	ADL	NBR	3.125	4.000	.375	A	FPM

NBR=Nitrile FPM=Viton®

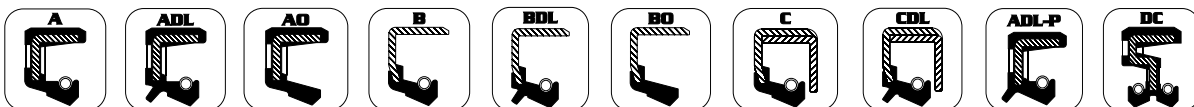


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
3.125	4.000	.500	A	NBR	3.500	4.000	.250	B	NBR
3.125	4.000	.500	ADL	NBR	3.500	4.125	.312	A	NBR
3.125	4.125	.500	A	NBR	3.500	4.125	.375	A	NBR
3.125	4.249	.438	CDL	FPM	3.500	4.249	.500	A	NBR
3.125	4.250	.500	A	NBR	3.500	4.250	.500	ADL	NBR
3.125	4.375	.500	CDL	NBR	3.500	4.376	.375	BDL	NBR
3.125	4.500	.625	A	NBR	3.500	4.376	.500	ADL	NBR
3.125	4.750	.500	A	NBR	3.500	4.500	.375	A	NBR
3.125	5.000	.438	C	NBR	3.500	4.500	.375	ADL	NBR
3.187	4.500	.500	ADL	NBR	3.500	4.500	.438	C	NBR
3.188	4.250	.500	ADL	NBR	3.500	4.500	.500	ADL	NBR
3.188	4.250	.625	ADL	NBR	3.500	4.500	.500	ADL	FPM
3.188	4.375	.500	A	NBR	3.500	4.500	.625	A	NBR
3.188	4.625	.500	ADL	FPM	3.500	4.625	.625	BDL	NBR
3.250	4.000	.469	A	FPM	3.500	4.750	.375	BDL	FPM
3.250	4.000	.500	A	NBR	3.500	4.751	.500	A	NBR
3.250	4.000	.500	ADL	NBR	3.500	4.751	.500	ADL	NBR
3.250	4.125	.562	CDL	NBR	3.500	4.751	.562	ADL	NBR
3.250	4.250	.313	A	NBR	3.500	4.751	.625	B	NBR
3.250	4.250	.375	CDL	NBR	3.500	4.875	.500	ADL	NBR
3.250	4.250	.438	A	FPM	3.500	5.000	.500	A	NBR
3.250	4.250	.438	ADL	FPM	3.500	5.000	.500	ADL	NBR
3.250	4.250	.500	A	NBR	3.500	5.375	.500	A	NBR
3.250	4.250	.500	ADL	NBR	3.563	4.500	.438	C	NBR
3.250	4.250	.750	BDL	NBR	3.625	4.375	.375	ADL	NBR
3.250	4.500	.438	CDL	NBR	3.625	4.501	.500	A	NBR
3.250	4.501	.500	A	NBR	3.625	4.626	.438	C	NBR
3.250	4.501	.500	ADL	NBR	3.625	4.626	.500	A	NBR
3.250	4.625	.500	ADL	NBR	3.625	4.750	.500	A	NBR
3.250	4.625	.500	CDL	NBR	3.625	5.250	.500	ADL	NBR
3.250	4.750	.500	A	NBR	3.687	5.625	.500	ADL	NBR
3.250	4.750	.500	A	FPM	3.688	5.125	.500	ADL	NBR
3.250	5.250	.500	C	NBR	3.750	4.500	.437	ADL	FPM
3.312	4.499	.468	CDL	NBR	3.750	4.500	.468	CDL	NBR
3.313	4.375	.500	A	NBR	3.750	4.501	.500	A	NBR
3.313	4.500	.468	BDL	NBR	3.750	4.686	.438	ADL	FPM
3.357	4.500	.500	A	NBR	3.750	4.750	.375	BDL	NBR
3.375	4.000	.500	A	NBR	3.750	4.751	.500	A	NBR
3.375	4.250	.500	ADL	NBR	3.750	5.000	.375	BDL	NBR
3.375	4.375	.438	ADL	NBR	3.750	5.000	.500	A	NBR
3.375	4.375	.500	A	NBR	3.750	5.250	.500	A	NBR
3.375	4.376	.375	B	FPM	3.750	5.375	.438	A	NBR
3.375	4.500	.500	A	NBR	3.750	5.625	.500	ADL	NBR
3.375	4.500	.500	ADL	NBR	3.750	6.000	.500	A	NBR
3.375	4.625	.375	ADL	NBR	3.750	6.000	.500	C	NBR
3.375	4.626	.500	ADL	NBR	3.812	4.876	.500	A	NBR
3.375	4.686	.438	ADL	FPM	3.813	4.875	.500	ADL	NBR
3.375	4.750	.500	ADL	NBR	3.875	4.750	.500	ADL	NBR
3.375	4.875	.500	C	NBR	3.875	4.875	.500	A	NBR
3.375	5.000	.500	A	NBR	3.875	4.875	.500	ADL	NBR
3.375	5.000	.500	ADL	NBR	3.875	4.881	.500	C	NBR
3.437	4.500	.500	A	FPM	3.875	5.000	.375	BDL	NBR
3.437	4.500	.500	ADL	FPM	3.875	5.000	.500	A	NBR
3.438	4.501	.500	A	NBR	3.875	5.125	.500	ADL	NBR
3.438	4.875	.437	C	NBR	3.875	5.250	.438	A	NBR

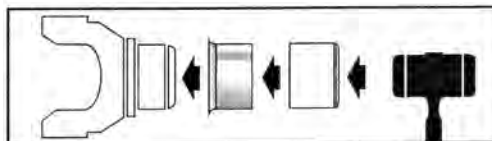


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
3.875	5.250	.438	CDL	NBR	4.500	5.501	.438	C	FPM
3.875	5.251	.500	A	NBR	4.500	5.501	.500	A	NBR
3.875	5.375	.500	ADL	NBR	4.500	5.626	.500	A	NBR
3.875	5.688	.500	ADL	NBR	4.500	5.750	.500	ADL	NBR
3.937	5.501	.500	CDL	NBR	4.500	5.751	.500	A	NBR
3.938	5.000	.500	ADL	NBR	4.500	6.000	.500	ADL	NBR
3.938	5.500	.438	C	NBR	4.500	6.126	.562	ADL	NBR
4.000	4.750	.500	A	NBR	4.500	6.250	.563	BDL	NBR
4.000	4.750	.500	ADL	NBR	4.563	5.312	.250	BO	NBR
4.000	5.000	.313	A	NBR	4.625	5.625	.500	ADL	NBR
4.000	5.000	.375	A	NBR	4.625	5.625	.500	CDL	NBR
4.000	5.000	.375	BDL	FPM	4.625	5.626	.500	A	NBR
4.000	5.000	.500	A	NBR	4.625	5.751	.562	A	NBR
4.000	5.000	.500	ADL	NBR	4.625	6.000	.500	ADL	NBR
4.000	5.126	.500	ADL	NBR	4.625	6.000	.500	CDL	NBR
4.000	5.250	.438	ADL	FPM	4.625	6.000	.563	ADL	NBR
4.000	5.251	.500	A	NBR	4.750	5.500	.375	A	NBR
4.000	5.251	.625	A	NBR	4.750	5.750	.500	A	NBR
4.000	5.375	.500	ADL	NBR	4.750	5.750	.500	ADL	NBR
4.000	5.501	.500	A	NBR	4.750	6.000	.500	A	NBR
4.000	5.750	.500	ADL	NBR	4.750	6.000	.625	ADL	NBR
4.000	6.000	.562	ADL	NBR	4.750	6.001	.562	A	NBR
4.125	5.000	.438	A	FPM	4.750	6.250	.563	BDL	NBR
4.125	5.000	.438	ADL	FPM	4.875	5.750	.437	ADL	NBR
4.125	5.000	.500	A	NBR	4.875	6.000	.500	C	FPM
4.125	5.126	.500	A	NBR	4.875	6.250	.500	ADL	NBR
4.188	5.250	.500	A	NBR	4.937	5.999	.500	CDL	NBR
4.188	5.750	.437	ADL	NBR	4.937	6.000	.500	ADL	NBR
4.250	5.000	.500	A	NBR	4.938	6.000	.500	A	NBR
4.250	5.000	.500	ADL	NBR	5.000	5.750	.438	A	NBR
4.250	5.250	.438	ADL	NBR	5.000	5.750	.500	A	NBR
4.250	5.250	.438	ADL	FPM	5.000	6.000	.500	A	FPM
4.250	5.250	.500	ADL	FPM	5.000	6.000	.500	ADL	NBR
4.250	5.251	.500	A	NBR	5.000	6.000	.500	ADL	FPM
4.250	5.376	.500	A	NBR	5.000	6.000	.500	CDL	FPM
4.250	5.500	.500	ADL	NBR	5.000	6.001	.500	A	NBR
4.250	5.501	.500	A	NBR	5.000	6.001	.562	A	NBR
4.250	5.626	.500	A	NBR	5.000	6.250	.500	CDL	NBR
4.250	5.751	.438	A	NBR	5.000	6.250	.625	B	NBR
4.250	6.000	.500	ADL	NBR	5.000	6.499	.500	CDL	NBR
4.250	6.001	.562	A	NBR	5.000	6.500	.500	A	NBR
4.312	5.751	.500	CDL	NBR	5.000	6.500	.500	CDL	FPM
4.375	5.250	.500	ADL	NBR	5.062	6.125	.500	ADL	NBR
4.375	5.376	.500	A	NBR	5.062	7.874	.500	BDL	NBR
4.375	5.501	.500	A	NBR	5.125	6.125	.500	ADL	NBR
4.375	5.750	.500	ADL	NBR	5.125	6.126	.500	A	NBR
4.375	6.000	.500	ADL	NBR	5.125	6.375	.500	C	NBR
4.375	6.250	.562	ADL	NBR	5.188	6.250	.500	A	NBR
4.437	5.500	.500	A	NBR	5.250	6.125	.563	B	NBR
4.500	5.125	.313	BO	NBR	5.250	6.250	.500	A	NBR
4.500	5.251	.438	A	NBR	5.250	6.250	.500	ADL	NBR
4.500	5.251	.500	ADL	NBR	5.250	6.250	.500	ADL	FPM
4.500	5.376	.438	A	NBR	5.250	6.500	.562	A	NBR
4.500	5.500	.375	A	NBR	5.250	6.500	.562	ADL	NBR
4.500	5.500	.500	ADL	NBR	5.375	6.375	.500	A	NBR

NBR=Nitrile FPM=Viton®

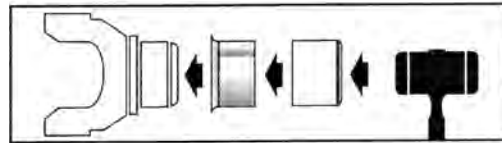


Shaft	Bore	Width	Type	Mat.	Shaft	Bore	Width	Type	Mat.
5.438	6.500	.500	A	NBR	7.000	8.500	.500	A	NBR
5.500	6.250	.500	A	NBR	7.000	8.500	.500	ADL	NBR
5.500	6.500	.500	A	NBR	7.000	9.375	.500	ADL	NBR
5.500	6.500	.500	BO	FPM	7.250	8.750	.562	ADL	NBR
5.500	6.625	.500	ADL	NBR	7.375	8.375	.500	ADL	NBR
					7.500	8.500	.625	ADL	NBR
5.500	6.750	.500	A	NBR	7.500	8.500	.625	C	NBR
5.625	6.624	.500	CDL	NBR	7.500	9.000	.562	A	NBR
5.625	6.625	.500	A	NBR	7.500	9.000	.750	C	NBR
5.625	6.750	.562	A	NBR	7.500	9.750	.625	ADL	NBR
5.625	7.000	.500	C	NBR					
5.625	7.125	.500	CDL	FPM	7.625	9.125	.562	A	NBR
5.750	6.625	.625	CDL	NBR	7.750	8.750	.500	B	NBR
5.750	6.750	.500	ADL	NBR	7.750	9.250	.563	ADL	NBR
5.750	7.000	.500	A	NBR	7.875	9.375	.625	ADL	NBR
5.750	7.000	.500	A	FPM	8.000	9.000	.625	C	NBR
					8.000	9.250	.750	ADL	NBR
5.750	7.000	.500	ADL	NBR	8.000	9.500	.562	A	NBR
5.750	7.000	.625	ADL	NBR	8.000	9.500	.750	ADL	NBR
5.750	7.000	.625	C	NBR	8.000	9.500	.750	ADL	NBR
5.813	6.875	.500	A	NBR	8.000	10.000	.625	CDL	NBR
5.875	6.750	.625	A	NBR	8.250	9.750	.562	A	NBR
					8.500	10.000	.562	A	NBR
5.938	7.000	.500	A	NBR	8.500	10.500	.625	ADL	NBR
6.000	7.000	.500	A	NBR	8.500	10.500	.625	ADL	NBR
6.000	7.500	.500	ADL	NBR	8.750	9.500	.375	ADL	NBR
6.000	7.500	.500	CDL	FPM	9.000	10.000	.750	C	NBR
6.000	7.500	.750	A	NBR	9.000	10.500	.562	A	NBR
					9.250	11.250	.750	A	NBR
6.125	7.125	.500	A	NBR	9.250	11.250	.750	CDL	NBR
6.125	7.125	.500	ADL	NBR	9.500	11.500	1.000	ADL	NBR
6.125	7.125	.550	A	FPM	9.625	11.625	.625	CDL	NBR
6.187	7.250	.500	A	NBR	9.750	11.250	.563	A	NBR
6.250	7.000	.375	ADL	NBR					
					9.750	11.250	.653	A	NBR
6.250	7.188	.625	ADL	NBR	10.000	11.000	.350	BO	NBR
6.250	7.250	.500	A	NBR	10.000	11.000	.500	C	FPM
6.250	7.250	.500	A	FPM	10.000	11.500	.562	A	NBR
6.250	7.250	.500	ADL	NBR	10.500	12.500	.750	ADL	FPM
6.250	7.500	.500	C	NBR					
					11.000	12.250	.625	CDL	NBR
6.250	7.750	.500	A	NBR	12.000	14.000	.750	CDL	NBR
6.250	7.750	.625	C	NBR	12.500	13.750	.750	C	NBR
6.375	7.375	.500	A	NBR	14.000	15.500	.625	B	NBR
6.375	7.500	.500	A	NBR	14.500	16.000	.688	C	NBR
6.375	7.750	.500	BDL	NBR					
					6.500	7.500	.500	ADL	NBR
6.500	7.500	.500	ADL	NBR	6.500	7.500	.500	BDL	FPM
6.500	7.500	.563	A	FPM	6.500	7.500	.563	A	FPM
6.500	7.500	.563	C	NBR	6.500	7.500	.563	C	NBR
6.500	7.750	.500	A	NBR					
					6.500	7.750	.500	ADL	NBR
6.500	7.750	.500	ADL	NBR	6.500	8.000	.625	CDL	NBR
6.625	7.625	.500	A	NBR	6.625	7.625	.500	A	NBR
6.625	7.625	.500	ADL	NBR	6.625	7.625	.500	ADL	NBR
6.687	7.750	.500	A	NBR					
					6.750	7.750	.500	A	NBR
6.750	7.750	.500	A	NBR	6.750	7.750	.500	ADL	NBR
6.750	7.750	.500	ADL	NBR	6.875	7.875	.625	C	NBR
6.875	7.875	.625	C	NBR	6.875	8.375	.500	ADL	NBR
6.875	8.375	.500	ADL	NBR	7.000	8.000	.500	A	NBR
7.000	8.000	.500	A	NBR					



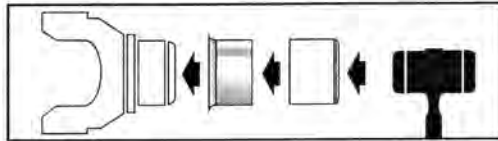
Shaft Repair Sleeves - Metric Listing

Harwal Part Number	Minimum Shaft Diameter	Maximum Shaft Diameter	Width	Length	Installation Tool Depth
99078	19.94	20.04	8.00	11.00	50.80
99100	25.27	25.45	7.92	11.10	51.61
99101	25.27	25.45	7.92	11.10	51.61
99112	28.52	28.63	7.92	11.13	17.48
99116	28.52	28.63	9.53	12.70	17.48
99125	31.62	31.83	7.92	11.10	22.23
99128	31.85	32.08	7.92	11.10	22.23
99134	33.86	34.01	12.70	15.88	20.65
99138	34.75	34.90	12.70	15.88	25.40
99139	34.85	35.00	12.70	16.00	25.40
99143	36.37	36.53	14.30	17.48	25.81
99144	36.45	36.60	9.53	12.70	25.81
99149	38.00	38.18	14.27	17.48	25.81
99150	38.02	38.18	9.53	12.70	25.81
99152	38.58	38.76	11.13	14.30	25.81
99155	39.34	39.50	11.13	14.30	25.81
99156	39.60	39.75	14.30	17.48	25.81
99157	39.93	40.08	13.00	16.00	25.98
99162	41.20	41.35	14.27	17.48	20.62
99168	42.77	42.93	14.30	17.48	22.23
99169	41.83	41.99	14.30	17.50	21.01
99170	44.07	44.25	9.53	12.70	26.21
99172	44.32	44.53	9.53	12.70	26.21
99173	44.32	44.53	22.23	25.40	26.21
99174	44.32	44.53	14.27	17.48	26.21
99175	44.32	44.53	19.05	22.23	26.21
99176	44.68	44.88	14.27	17.48	26.21
99177	44.88	45.09	13.97	16.99	26.21
99181	45.90	46.10	14.27	17.48	31.75
99187	47.47	47.70	14.27	17.48	31.75
99189	47.93	48.08	13.97	16.97	24.99
99192	48.49	48.64	9.53	12.70	25.40
99193	49.07	49.28	14.27	17.48	31.75
99196	49.91	50.06	13.97	16.97	24.99
99199	50.70	50.88	14.27	17.48	52.32
99200	50.70	50.88	22.23	25.40	52.32
99205	52.25	52.40	20.65	23.83	34.93
99210	53.90	54.05	12.70	19.05	32.51
99212	53.90	54.10	19.81	23.80	34.93
99218	55.50	55.68	19.84	23.83	33.32
99220	55.83	56.01	12.70	15.88	33.32
99225	57.10	57.28	19.81	23.80	34.93
99227	57.12	57.28	7.70	11.13	33.32
99235	59.92	60.07	19.99	22.99	34.93
99237	60.25	60.40	19.81	23.80	34.93
99238	60.25	60.40	15.09	19.05	34.93
99240	60.30	60.45	13.36	17.35	34.93
99242	61.85	62.00	12.70	15.88	36.20
99243	61.82	61.98	19.84	23.83	35.38
99244	61.80	62.00	12.70	15.88	36.20
99248	63.42	63.65	12.70	16.66	35.38
99249	63.17	63.65	19.81	23.80	35.38
99250	63.42	63.65	19.81	23.80	34.93



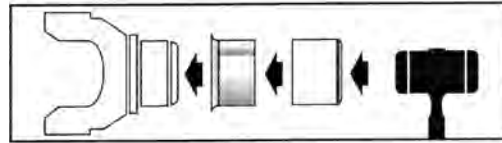
Shaft Repair Sleeves - Metric Listing

Harwal Part Number	Minimum Shaft Diameter	Maximum Shaft Diameter	Width	Length	Installation Tool Depth
99251	63.73	63.91	19.81	23.01	34.93
99253	63.42	63.65	14.10	16.51	22.61
99254	64.87	65.07	19.99	22.99	34.93
99256	65.00	65.18	19.84	23.83	34.93
99262	66.62	66.83	19.81	23.80	38.10
99264	66.55	66.73	19.81	23.01	38.10
99272	69.85	70.00	10.31	14.30	31.75
99274	69.67	69.88	19.81	23.80	34.93
99275	69.80	70.00	19.81	23.80	34.93
99276	69.85	70.08	19.99	24.00	34.93
99282	72.06	72.24	12.70	16.66	31.75
99287	72.92	73.13	19.81	23.80	34.93
99293	74.55	74.75	19.81	23.83	38.10
99294	74.90	75.08	22.00	26.01	33.32
99299	75.87	76.10	20.62	25.40	31.75
99300	76.15	76.35	20.62	25.40	32.54
99303	76.15	76.35	15.88	20.62	27.00
99307	79.32	79.55	13.97	18.01	51.59
99311	79.22	79.40	17.48	20.65	50.80
99312	79.22	79.40	20.62	25.40	50.80
99313	79.78	80.01	19.05	22.50	34.93
99315	79.88	80.09	21.01	24.00	34.93
99317	79.88	80.09	11.00	15.01	34.93
99322	82.45	82.63	20.62	25.40	34.93
99324	82.50	82.70	15.11	18.29	38.10
99325	82.50	82.70	20.62	25.40	38.10
99332	84.76	85.01	16.99	21.01	35.00
99333	84.76	85.01	21.01	22.71	35.00
99337	85.62	85.83	20.62	25.40	38.10
99346	88.77	88.98	15.88	20.62	34.24
99347	88.85	89.05	7.92	12.70	34.24
99349	88.87	89.08	15.88	20.62	34.24
99350	88.85	89.05	20.62	25.40	34.21
99360	91.90	92.05	20.62	25.40	44.45
99362	92.00	92.18	20.62	25.40	44.45
99363	92.00	92.18	12.70	15.88	44.45
99364	94.97	95.15	11.91	15.09	44.45
99367	95.20	95.40	8.74	12.70	44.45
99369	94.89	95.07	21.01	24.00	44.45
99372	95.20	95.40	17.48	22.23	47.63
99374	94.97	95.15	8.74	12.70	44.45
99376	95.12	95.30	14.30	17.48	44.45
99395	101.47	101.75	15.24	18.42	53.98
99399	101.47	101.75	20.62	25.40	53.98
99400	101.47	101.75	16.51	19.69	53.98
99401	101.47	101.75	12.70	15.88	53.98
99450	114.20	114.40	20.65	25.40	31.75
99452	114.88	115.09	20.65	23.83	31.75
99492	124.89	125.10	26.01	32.00	36.53
99498	126.95	127.15	17.48	22.23	36.53
99499	126.95	127.15	20.65	25.40	36.53
99599	152.27	152.50	25.40	31.75	44.45
99700	177.65	177.93	25.40	31.75	42.88



Shaft Repair Sleeves - Inch Listing

Harwal Part Number	Minimum Shaft Diameter	Maximum Shaft Diameter	Width	Length	Installation Tool Depth
99078	0.785	0.789	0.315	0.433	2.000
99100	0.995	1.002	0.312	0.437	2.032
99101	0.995	1.002	0.312	0.437	2.032
99112	1.123	1.127	0.312	0.438	0.688
99116	1.123	1.127	0.375	0.500	0.688
99125	1.245	1.253	0.312	0.437	0.875
99128	1.254	1.263	0.312	0.437	0.875
99134	1.333	1.339	0.500	0.625	0.813
99138	1.368	1.374	0.500	0.625	1.000
99139	1.372	1.378	0.500	0.063	1.000
99143	1.432	1.438	0.563	0.688	1.016
99144	1.435	1.441	0.375	0.500	1.016
99149	1.496	1.503	0.562	0.688	1.016
99150	1.497	1.503	0.375	0.500	1.016
99152	1.519	1.526	0.438	0.563	1.016
99155	1.549	1.555	0.438	0.563	1.016
99156	1.559	1.565	0.563	0.688	1.016
99157	1.572	1.578	0.512	0.630	1.023
99162	1.622	1.628	0.562	0.688	0.812
99168	1.684	1.690	0.563	0.688	0.875
99169	1.647	1.653	0.563	0.689	0.827
99170	1.735	1.742	0.375	0.500	1.032
99172	1.745	1.753	0.375	0.500	1.032
99173	1.745	1.753	0.875	1.000	1.032
99174	1.745	1.753	0.562	0.688	1.032
99175	1.745	1.753	0.750	0.875	1.032
99176	1.759	1.767	0.562	0.688	1.032
99177	1.767	1.775	0.550	0.669	1.032
99181	1.807	1.815	0.562	0.688	1.250
99187	1.869	1.878	0.562	0.688	1.250
99189	1.887	1.893	0.550	0.668	0.984
99192	1.909	1.915	0.375	0.500	1.000
99193	1.932	1.940	0.562	0.688	1.250
99196	1.965	1.971	0.550	0.668	0.984
99199	1.996	2.003	0.562	0.688	2.060
99200	1.996	2.003	0.875	1.000	2.060
99205	2.057	2.063	0.813	0.938	1.375
99210	2.122	2.128	0.500	0.750	1.280
99212	2.122	2.130	0.780	0.937	1.375
99218	2.185	2.192	0.781	0.938	1.312
99220	2.198	2.205	0.500	0.625	1.312
99225	2.248	2.255	0.780	0.937	1.375
99227	2.249	2.255	0.303	0.438	1.312
99235	2.359	2.365	0.787	0.905	1.375
99237	2.372	2.378	0.780	0.937	1.375
99238	2.372	2.378	0.594	0.750	1.375
99240	2.374	2.380	0.526	0.683	1.375
99242	2.435	2.441	0.500	0.625	1.425
99243	2.434	2.440	0.781	0.938	1.393
99244	2.433	2.441	0.500	0.625	1.425
99248	2.497	2.506	0.500	0.656	1.393
99249	2.487	2.506	0.780	0.937	1.393
99250	2.497	2.506	0.780	0.937	1.375

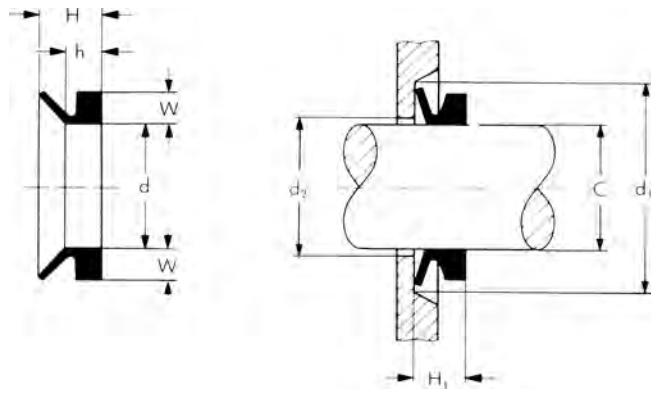


Shaft Repair Sleeves - Inch Listing

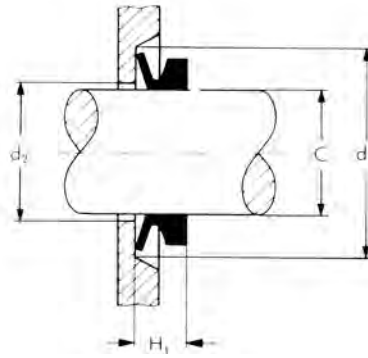
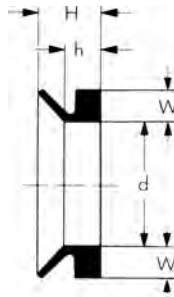
Harwal Part Number	Minimum Shaft Diameter	Maximum Shaft Diameter	Width	Length	Installation Tool Depth
99251	2.509	2.516	0.780	0.906	1.375
99253	2.497	2.506	0.555	0.650	0.890
99254	2.554	2.562	0.787	0.905	1.375
99256	2.559	2.566	0.781	0.938	1.375
99262	2.623	2.631	0.780	0.937	1.500
99264	2.620	2.627	0.780	0.906	1.500
99272	2.750	2.756	0.406	0.563	1.250
99274	2.743	2.751	0.780	0.937	1.375
99275	2.748	2.756	0.780	0.937	1.375
99276	2.750	2.759	0.787	0.945	1.375
99282	2.837	2.844	0.500	0.656	1.250
99287	2.871	2.879	0.780	0.937	1.375
99293	2.935	2.943	0.780	0.938	1.500
99294	2.949	2.956	0.866	1.024	1.312
99299	2.987	2.996	0.812	1.000	1.250
99300	2.998	3.006	0.812	1.000	1.281
99303	2.998	3.006	0.625	0.812	1.063
99307	3.123	3.132	0.550	0.709	2.031
99311	3.119	3.126	0.688	0.813	2.000
99312	3.119	3.126	0.812	1.000	2.000
99313	3.141	3.150	0.750	0.886	1.375
99315	3.145	3.153	0.827	0.945	1.375
99317	3.145	3.153	0.433	0.591	1.375
99322	3.246	3.253	0.812	1.000	1.375
99324	3.248	3.256	0.595	0.720	1.500
99325	3.248	3.256	0.812	1.000	1.500
99332	3.337	3.347	0.669	0.827	1.378
99333	3.337	3.347	0.827	0.894	1.378
99337	3.371	3.379	0.812	1.000	1.500
99346	3.495	3.503	0.625	0.812	1.348
99347	3.498	3.506	0.312	0.500	1.348
99349	3.499	3.507	0.625	0.812	1.348
99350	3.498	3.506	0.812	1.000	1.347
99360	3.618	3.624	0.812	1.000	1.750
99362	3.622	3.629	0.812	1.000	1.750
99363	3.622	3.629	0.500	0.625	1.750
99364	3.739	3.746	0.469	0.594	1.750
99367	3.748	3.756	0.344	0.500	1.750
99369	3.736	3.743	0.827	0.945	1.750
99372	3.748	3.756	0.688	0.875	1.875
99374	3.739	3.746	0.344	0.500	1.750
99376	3.745	3.752	0.563	0.688	1.750
99395	3.995	4.006	0.600	0.725	2.125
99399	3.995	4.006	0.812	1.000	2.125
99400	3.995	4.006	0.650	0.775	2.125
99401	3.995	4.006	0.500	0.625	2.125
99450	4.496	4.504	0.813	1.000	1.250
99452	4.523	4.531	0.813	0.938	1.250
99492	4.917	4.925	1.024	1.260	1.438
99498	4.998	5.006	0.688	0.875	1.438
99499	4.998	5.006	0.813	1.000	1.438
99599	5.995	6.004	1.000	1.250	1.750
99700	6.994	7.005	1.000	1.250	1.688

V-Rings

VA Series



Harwal Part Number	Shaft Diameter C	Seal Dimensions				Mounting Dimensions		
		d	D	h	H	d ₂	d ₁	H ₁
VA 3	2.7 - 3.5	2.5	5.5	2.1	3	C + 1	C + 4	2.5 ± 0.3
VA 4	3.5 - 4.5	3.2	7.2	2.4	3.7	C + 1	C + 6	3 ± 0.4
VA 5	4.5 - 5.5	4	8	2.4	3.7	C + 1	C + 6	3 ± 0.4
VA 6	5.5 - 6.5	5	9	2.4	3.7	C + 1	C + 6	3 ± 0.4
VA 7	6.5 - 8	6	10	2.4	3.7	C + 1	C + 6	3 ± 0.4
VA 8	8 - 9.5	7	11	2.4	3.7	C + 1	C + 6	3 ± 0.4
VA 10	9.5 - 11.5	9	15	3.4	5.5	C + 2	C + 9	4.5 ± 0.6
VA 12	11.5 - 13.5	10.5	16.5	3.4	5.5	C + 2	C + 9	4.5 ± 0.6
VA 14	13.5 - 15.5	12.5	18.5	3.4	5.5	C + 2	C + 9	4.5 ± 0.6
VA 16	15.5 - 17.5	14	20	3.4	5.5	C + 2	C + 9	4.5 ± 0.6
VA 18	17.5 - 19	16	22	3.4	5.5	C + 2	C + 9	4.5 ± 0.6
VA 20	19 - 21	18	26	4.7	7.5	C + 2	C + 12	6 ± 0.8
VA 22	21 - 24	20	28	4.7	7.5	C + 2	C + 12	6 ± 0.8
VA 25	24 - 27	22	30	4.7	7.5	C + 2	C + 12	6 ± 0.8
VA 28	27 - 29	25	33	4.7	7.5	C + 3	C + 12	6 ± 0.8
VA 30	29 - 31	27	35	4.7	7.5	C + 3	C + 12	6 ± 0.8
VA 32	31 - 33	29	37	4.7	7.5	C + 3	C + 12	6 ± 0.8
VA 35	33 - 36	31	39	4.7	7.5	C + 3	C + 12	6 ± 0.8
VA 38	36 - 38	34	42	4.7	7.5	C + 3	C + 12	6 ± 0.8
VA 40	38 - 43	36	46	5.5	9	C + 3	C + 15	7 ± 1
VA 45	43 - 48	40	50	5.5	9	C + 3	C + 15	7 ± 1
VA 50	48 - 53	45	55	5.5	9	C + 3	C + 15	7 ± 1
VA 55	53 - 58	49	59	5.5	9	C + 3	C + 15	7 ± 1
VA 60	58 - 63	54	64	5.5	9	C + 3	C + 15	7 ± 1
VA 65	63 - 68	58	68	5.5	9	C + 3	C + 15	7 ± 1
VA 70	68 - 73	63	75	6.8	11	C + 4	C + 18	9 ± 1.2
VA 75	73 - 78	67	79	6.8	11	C + 4	C + 18	9 ± 1.2
VA 80	78 - 83	72	84	6.8	11	C + 4	C + 18	9 ± 1.2
VA 85	83 - 88	76	88	6.8	11	C + 4	C + 18	9 ± 1.2
VA 90	88 - 93	81	93	6.8	11	C + 4	C + 18	9 ± 1.2
VA 95	93 - 98	85	97	6.8	11	C + 4	C + 18	9 ± 1.2
VA 100	98 - 105	90	102	6.8	11	C + 4	C + 18	9 ± 1.2
VA 110	105 - 115	99	113	7.9	12.8	C + 4	C + 21	10.5 ± 1.5
VA 120	115 - 125	108	122	7.9	12.8	C + 4	C + 21	10.5 ± 1.5
VA 130	125 - 135	117	131	7.9	12.8	C + 4	C + 21	10.5 ± 1.5
VA 140	135 - 145	126	140	7.9	12.8	C + 4	C + 21	10.5 ± 1.5
VA 150	145 - 155	135	149	7.9	12.8	C + 4	C + 21	10.5 ± 1.5
VA 160	155 - 165	144	160	9	14.5	C + 5	C + 24	12 ± 1.8
VA 170	165 - 175	153	169	9	14.5	C + 5	C + 24	12 ± 1.8
VA 180	175 - 185	162	178	9	14.5	C + 5	C + 24	12 ± 1.8
VA 190	185 - 195	171	187	9	14.5	C + 5	C + 24	12 ± 1.8
VA 199	195 - 210	180	196	9	14.5	C + 5	C + 24	12 ± 1.8



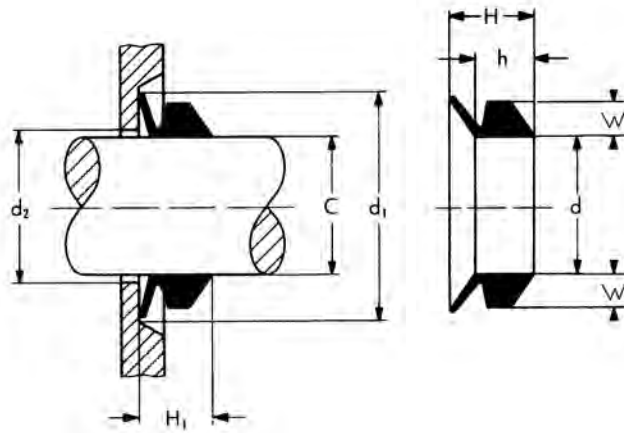
V-Rings

VA Series

Harwal Part Number	Shaft Diameter C	Seal Dimensions				Mounting Dimensions		
		d	D	h	H	d ₂	d ₁	H ₁
VA 200	190 - 210	180	210	14.3	25	C + 10	C + 45	20 ± 4
VA 220	210 - 235	198	228	14.3	25	C + 10	C + 45	20 ± 4
VA 250	235 - 265	225	255	14.3	25	C + 10	C + 45	20 ± 4
VA 275	265 - 290	247	277	14.3	25	C + 10	C + 45	20 ± 4
VA 300	290 - 310	270	300	14.3	25	C + 10	C + 45	20 ± 4
VA 325	310 - 335	292	322	14.3	25	C + 10	C + 45	20 ± 4
VA 350	335 - 365	315	345	14.3	25	C + 10	C + 45	20 ± 4
VA 375	365 - 390	337	367	14.3	25	C + 10	C + 45	20 ± 4
VA 400	390 - 430	360	390	14.3	25	C + 10	C + 45	20 ± 4
VA 450	430 - 480	405	435	14.3	25	C + 10	C + 45	20 ± 4
VA 500	480 - 530	450	480	14.3	25	C + 10	C + 45	20 ± 4
VA 550	530 - 580	495	525	14.3	25	C + 10	C + 45	20 ± 4
VA 600	580 - 630	540	570	14.3	25	C + 10	C + 45	20 ± 4
VA 650	630 - 665	600	630	14.3	25	C + 10	C + 45	20 ± 4
VA 700	665 - 705	630	660	14.3	25	C + 10	C + 45	20 ± 4
VA 725	705 - 745	670	700	14.3	25	C + 10	C + 45	20 ± 4
VA 750	745 - 785	705	735	14.3	25	C + 10	C + 45	20 ± 4
VA 800	785 - 830	745	775	14.3	25	C + 10	C + 45	20 ± 4
VA 850	830 - 875	785	815	14.3	25	C + 10	C + 45	20 ± 4
VA 900	875 - 920	825	855	14.3	25	C + 10	C + 45	20 ± 4
VA 950	920 - 965	865	895	14.3	25	C + 10	C + 45	20 ± 4
VA 1000	965 - 1015	910	940	14.3	25	C + 10	C + 45	20 ± 4
VA 1050	1015 - 1065	955	985	14.3	25	C + 10	C + 45	20 ± 4
VA 1100	1065 - 1115	1000	1030	14.3	25	C + 10	C + 45	20 ± 4
VA 1150	1115 - 1165	1045	1075	14.3	25	C + 10	C + 45	20 ± 4
VA 1200	1165 - 1215	1090	1120	14.3	25	C + 10	C + 45	20 ± 4
VA 1250	1215 - 1270	1135	1165	14.3	25	C + 10	C + 45	20 ± 4
VA 1300	1270 - 1320	1180	1210	14.3	25	C + 10	C + 45	20 ± 4
VA 1350	1320 - 1370	1225	1255	14.3	25	C + 10	C + 45	20 ± 4
VA 1400	1370 - 1420	1270	1300	14.3	25	C + 10	C + 45	20 ± 4
VA 1450	1420 - 1470	1315	1345	14.3	25	C + 10	C + 45	20 ± 4
VA 1500	1470 - 1520	1360	1390	14.3	25	C + 10	C + 45	20 ± 4
VA 1550	1520 - 1570	1405	1435	14.3	25	C + 10	C + 45	20 ± 4
VA 1600	1570 - 1620	1450	1480	14.3	25	C + 10	C + 45	20 ± 4
VA 1650	1620 - 1670	1495	1525	14.3	25	C + 10	C + 45	20 ± 4
VA 1700	1670 - 1720	1540	1570	14.3	25	C + 10	C + 45	20 ± 4
VA 1750	1720 - 1770	1585	1615	14.3	25	C + 10	C + 45	20 ± 4
VA 1800	1770 - 1820	1630	1660	14.3	25	C + 10	C + 45	20 ± 4
VA 1850	1820 - 1870	1675	1705	14.3	25	C + 10	C + 45	20 ± 4
VA 1900	1870 - 1920	1720	1750	14.3	25	C + 10	C + 45	20 ± 4
VA 1950	1920 - 1970	1765	1795	14.3	25	C + 10	C + 45	20 ± 4
VA 2000	1970 - 2020	1810	1840	14.3	25	C + 10	C + 45	20 ± 4

V-Rings

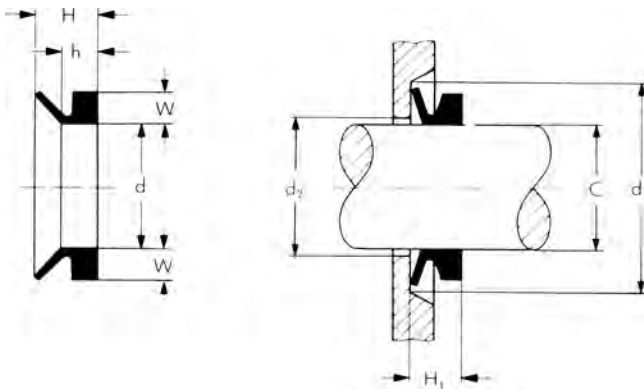
VS Series



Harwal Part Number	Ø Shaft Diameter C	Seal Dimensions				Mounting Dimensions		
		d	D	h	H	d ₂	d ₁	H ₁
VS 5	4.5 - 5.5	4	8	3.9	5.2	C + 1	C + 6	4.5 ± 0.4
VS 6	5.5 - 6.5	5	9	3.9	5.2	C + 1	C + 6	4.5 ± 0.4
VS 7	6.5 - 8	6	10	3.9	5.2	C + 1	C + 6	4.5 ± 0.4
VS 8	8 - 9.5	7	11	3.9	5.2	C + 1	C + 6	4.5 ± 0.4
VS 10	9.5 - 11.5	9	15	3.9	5.2	C + 1	C + 6	6.7 ± 0.6
VS 12	11.5 - 13.5	10.5	16.5	5.6	7.7	C + 2	C + 9	6.7 ± 0.6
VS 14	13.5 - 15.5	12.5	18.5	5.6	7.7	C + 2	C + 9	6.7 ± 0.6
VS 16	15.5 - 17.5	14	20	5.6	7.7	C + 2	C + 9	6.7 ± 0.6
VS 18	17.5 - 19	16	22	5.6	7.7	C + 2	C + 9	6.7 ± 0.6
VS 20	19 - 21	18	26	7.9	10.5	C + 2	C + 12	9 ± 0.8
VS 22	21 - 24	20	28	7.9	10.5	C + 2	C + 12	9 ± 0.8
VS 25	24 - 27	22	30	7.9	10.5	C + 2	C + 12	9 ± 0.8
VS 28	27 - 29	25	33	7.9	10.5	C + 3	C + 12	9 ± 0.8
VS 30	29 - 31	27	35	7.9	10.5	C + 3	C + 12	9 ± 0.8
VS 32	31 - 33	29	37	7.9	10.5	C + 3	C + 12	9 ± 0.8
VS 35	33 - 36	31	39	7.9	10.5	C + 3	C + 12	9 ± 0.8
VS 38	36 - 38	34	42	7.9	10.5	C + 3	C + 12	9 ± 0.8
VS 40	38 - 43	36	46	9.5	13	C + 3	C + 15	11 ± 1
VS 45	43 - 48	40	50	9.5	13	C + 3	C + 15	11 ± 1
VS 50	48 - 53	45	55	9.5	13	C + 3	C + 15	11 ± 1
VS 55	53 - 58	49	59	9.5	13	C + 3	C + 15	11 ± 1
VS 60	58 - 63	54	64	9.5	13	C + 3	C + 15	11 ± 1
VS 65	63 - 68	58	68	9.5	13	C + 3	C + 15	11 ± 1
VS 70	68 - 73	63	75	11.3	15.5	C + 4	C + 18	13.5 ± 1.2
VS 75	73 - 78	67	79	11.3	15.5	C + 4	C + 18	13.5 ± 1.2
VS 80	78 - 83	72	84	11.3	15.5	C + 4	C + 18	13.5 ± 1.2
VS 85	83 - 88	76	88	11.3	15.5	C + 4	C + 18	13.5 ± 1.2
VS 90	88 - 93	81	93	11.3	15.5	C + 4	C + 18	13.5 ± 1.2
VS 95	93 - 98	85	97	11.3	15.5	C + 4	C + 18	13.5 ± 1.2
VS 100	98 - 105	90	102	11.3	15.5	C + 4	C + 18	13.5 ± 1.2
VS 110	105 - 115	99	113	13.1	18	C + 4	C + 21	15.5 ± 1.5
VS 120	115 - 125	108	122	13.1	18	C + 4	C + 21	15.5 ± 1.5
VS 130	125 - 135	117	131	13.1	18	C + 4	C + 21	15.5 ± 1.5
VS 140	135 - 145	126	140	13.1	18	C + 4	C + 21	15.5 ± 1.5
VS 150	145 - 155	135	149	13.1	18	C + 4	C + 21	15.5 ± 1.5
VS 160	155 - 165	144	160	15	20.5	C + 5	C + 24	18 ± 1.8
VS 170	165 - 175	153	169	15	20.5	C + 5	C + 24	18 ± 1.8
VS 180	175 - 185	162	178	15	20.5	C + 5	C + 24	18 ± 1.8
VS 190	185 - 195	171	187	15	20.5	C + 5	C + 24	18 ± 1.8
VS 199	195 - 210	180	196	15	20.5	C + 5	C + 24	18 ± 1.8

V-Rings

VL Series



V-Ring Dimensions

$H = 10.5$

$h = 6.0$

$W = 6.0$

Assembling Dimensions

$H_1 = B \pm 1.5$

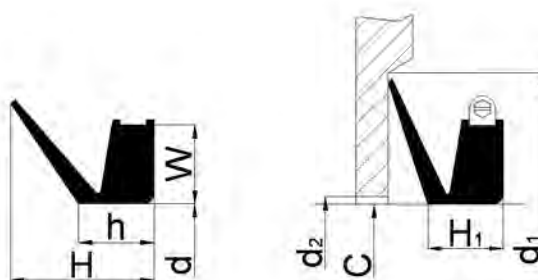
$d_2 \max C + 5$

$d_1 \min = C + 20$

Part#	Shaft Size (C)	V-Ring I.D. (d)	Part#	Shaft Size (C)	V-Ring I.D. (d)
VL 110	105 - 115	99	VL 450	440 - 475	405
VL 120	115 - 125	108	VL 500	480 - 530	450
VL 130	125 - 135	117	VL 525	510 - 540	472
VL 140	135 - 145	126	VL 550	530 - 580	495
VL 150	145 - 155	135	VL 575	565 - 585	517
VL 160	155 - 165	144	VL 600	580 - 630	540
VL 170	165 - 175	153	VL 650	630 - 675	600
VL 180	175 - 185	162	VL 700	675 - 710	630
VL 190	185 - 195	171	VL 725	710 - 740	670
VL 200	195 - 210	182	VL 750	740 - 775	705
VL 220	210 - 233	198	VL 800	775 - 825	745
VL 250	233 - 260	225	VL 850	825 - 875	785
VL 275	260 - 285	247	VL 900	875 - 925	825
VL 300	285 - 310	270	VL 950	925 - 975	865
VL 325	310 - 335	292	VL 1000	975 - 1025	910
VL 350	325 - 365	315	VL 1050	1025 - 1075	955
VL 375	365 - 385	337	VL 1100	1075 - 1125	1000
VL 400	385 - 410	360	VL 1150	1125 - 1175	1045
VL 425	410 - 440	382	VL 1200	1175 - 1225	1090

V-Rings

VE Series



Ring Dimensions

H = 65

h = 32

W = 30

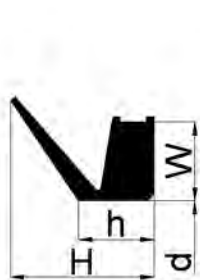
Assembling Dimensions

$H_1 \pm 12$

$d_2 \text{ max} = C+24$

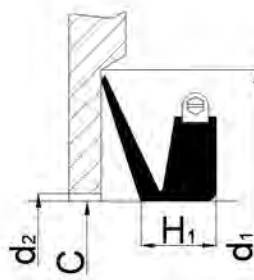
$d_1 \text{ min} = C+115$

Part Number	Shaft Range	d	Part Number	Shaft Range	d
VE 300	300 - 305	294	VE 470	470 - 475	458
VE 305	305 - 310	299	VE 475	475 - 480	463
VE 310	310 - 315	304	VE 480	480 - 485	468
VE 315	315 - 320	309	VE 485	485 - 490	473
VE 320	320 - 325	314	VE 490	490 - 495	478
VE 325	325 - 330	319	VE 495	495 - 500	483
VE 330	330 - 335	323	VE 500	500 - 505	488
VE 335	335 - 340	328	VE 505	505 - 510	493
VE 340	340 - 345	333	VE 510	510 - 515	497
VE 345	345 - 350	338	VE 515	515 - 520	502
VE 350	350 - 355	343	VE 520	520 - 525	507
VE 355	355 - 360	347	VE 525	525 - 530	512
VE 360	360 - 365	352	VE 530	530 - 535	517
VE 365	365 - 370	357	VE 535	535 - 540	521
VE 370	370 - 375	362	VE 540	540 - 545	526
VE 375	375 - 380	367	VE 545	545 - 550	531
VE 380	380 - 385	371	VE 550	550 - 555	536
VE 385	385 - 390	376	VE 555	555 - 560	541
VE 390	390 - 395	381	VE 560	560 - 565	546
VE 395	395 - 400	386	VE 565	565 - 570	550
VE 400	400 - 405	391	VE 570	570 - 575	555
VE 405	405 - 410	396	VE 575	575 - 580	560
VE 410	410 - 415	401	VE 580	580 - 585	565
VE 415	415 - 420	405	VE 585	585 - 590	570
VE 420	420 - 425	410	VE 590	590 - 600	575
VE 425	425 - 430	415	VE 600	600 - 610	582
VE 430	430 - 435	420	VE 610	610 - 620	592
VE 435	435 - 440	425	VE 620	620 - 630	602
VE 440	440 - 445	429	VE 630	630 - 640	612
VE 445	445 - 450	434	VE 640	640 - 650	621
VE 450	450 - 455	439	VE 650	650 - 660	631
VE 455	455 - 460	444	VE 660	660 - 670	640
VE 460	460 - 465	448	VE 670	670 - 680	650
VE 465	465 - 470	453	VE 680	680 - 690	660



Ring Dimensions

H = 65
h = 32
W = 30



Assembling Dimensions

$H_1 \pm 12$
 $d_2 \text{ max} = C+24$
 $d_1 \text{ min} = C+115$

V-Rings

VE Series

Part Number	Shaft Range	d	Part Number	Shaft Range	d
VE 690	690 - 700	670	VE 1060	1045 - 1065	1008
VE 700	700 - 710	680	VE 1080	1065 - 1085	1027
VE 710	710 - 720	689	VE 1100	1085 - 1105	1045
VE 720	720 - 730	699	VE 1120	1105 - 1125	1065
VE 730	730 - 740	709	VE 1140	1125 - 1145	1084
VE 740	740 - 750	718	VE 1160	1145 - 1165	1103
VE 750	750 - 758	728	VE 1180	1165 - 1185	1121
VE 760	758 - 766	735	VE 1200	1185 - 1205	1139
VE 770	766 - 774	743	VE 1220	1205 - 1225	1157
VE 780	774 - 783	751	VE 1240	1225 - 1245	1176
VE 790	783 - 792	759	VE 1260	1245 - 1270	1195
VE 800	792 - 801	768	VE 1280	1270 - 1295	1218
VE 810	801 - 810	777	VE 1300	1295 - 1315	1240
VE 820	810 - 821	786	VE 1325	1315 - 1340	1259
VE 830	821 - 831	796	VE 1350	1340 - 1365	1281
VE 840	831 - 841	805	VE 1375	1365 - 1390	1305
VE 850	841 - 851	814	VE 1400	1390 - 1415	1328
VE 860	851 - 861	824	VE 1425	1415 - 1440	1350
VE 870	861 - 871	833	VE 1450	1440 - 1465	1374
VE 880	871 - 882	743	VE 1475	1465 - 1490	1397
VE 890	882 - 892	853	VE 1500	1490 - 1515	1419
VE 900	892 - 912	871	VE 1525	1515 - 1540	1443
VE 920	912 - 922	880	VE 1550	1540 - 1570	1467
VE 930	922 - 933	890	VE 1575	1570 - 1600	1495
VE 940	933 - 944	900	VE 1600	1600 - 1640	1524
VE 950	944 - 955	911	VE 1650	1640 - 1680	1559
VE 960	955 - 966	921	VE 1700	1680 - 1720	1596
VE 970	966 - 977	932	VE 1750	1720 - 1765	1632
VE 980	977 - 988	942	VE 1800	1765 - 1810	1671
VE 990	988 - 999	953	VE 1850	1810 - 1855	1714
VE 1000	999 - 1010	963	VE 1900	1855 - 1905	1753
VE 1020	1010 - 1025	973	VE 1950	1905 - 1955	1794
VE 1040	1025 - 1045	990	VE 2000	1955 - 2010	1844

Hydraulic U-Cups

Polyurethane Piston / Rod Seals

90 Shore UB903

Application: Hydraulic Reciprocating Actions under Extreme Pressures

Functions: All three types are single function piston seals and are used as a piston / rod seal.



U41

Symmetrical sealing elements which are self energizing and activated by unit pressure.



U43

Asymmetrical sealing elements with a slightly shorter outer sealing element. The energy is forced outward to strengthen its sealing function at low to extreme pressures.



U45

Asymmetrical sealing elements with a slightly shorter inner sealing element. The energy is forced inward to strengthen its sealing function at low to extreme pressures.

Material: 90sh Polyurethane (Blue)

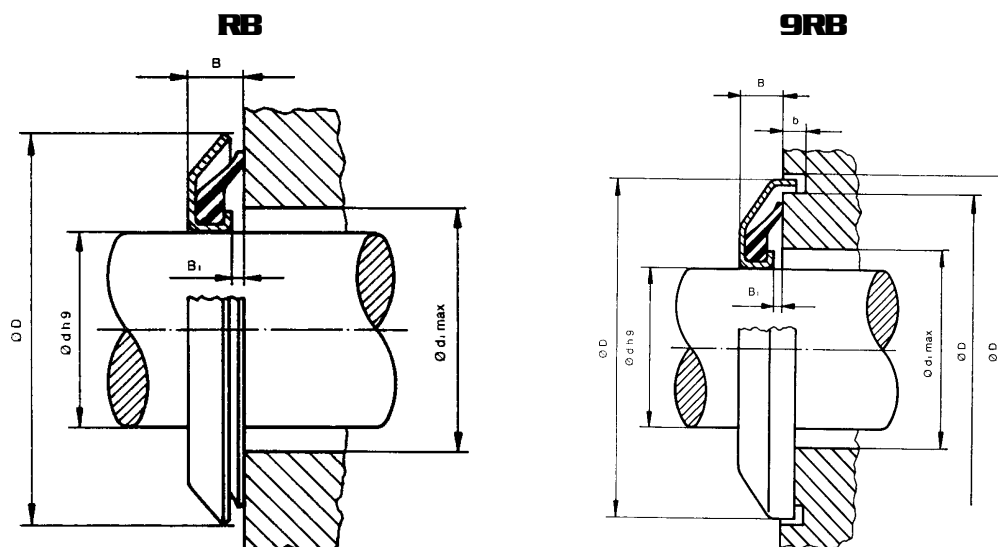
Type	U41	U43	U45
Max. Pressure	4,300 PSI (300 Bar)	5,800 PSI (400 Bar)	5,800 PSI (400 Bar)
Temperature	-40F / +212F -40C / +100C	-40F / +212F -40C / +100C	-40F / +212F -40C / +100C
Max. Speed	1.64 f/s .5 m/s	1.64 f/s .5 m/s	1.64 f/s .5 m/s

I.D.	O.D.	Width	U41	U43	U45	I.D.	O.D.	Width	U41	U43	U45	I.D.	O.D.	Width	U41	U43	U45
04	10	04	X			13	19	04			X	22	32	08	X		
4.5	11	05	X			14	20	08	X			22	32	10	X		
05	10	05	X			14	22	05	X			22	35	10	X		
05	11	07	X			14	22	06	X			22.4	30	05	X		
05	12	06	X			14	24	7.3			X	24	32	05	X		
06	10	4.2	X			14	24	08	X			24	32	07	X		
06	10	4.5		X		14	30	05	X			24	40	08	X		
06	12	4.5	X			15	23	5.7			X	24	40	09		X	
06	12	06	X			15	25	08	X			25	30	04	X		
06	13	05			X	15	27	06	X			25	33	04	X		
06	14	5.5			X	15	28	10	X			25	33	05	X		
06	14	06	X			15	30	08	X			25	33	5.7			X
06	15	04	X			15	30	10		X		25	33	6.5			X
06	15	06	X			16	22	04	X			25	33	7.2	X		
06	15	08	X			16	22	05	X			25	33	7.2			X
6.3	16	08	X			16	22	05			X	25	33	08	X		
07	15	07	X			16	24	05	X			25	35	05	X		
08	14	04	X			16	24	5.7	X			25	35	06	X		
08	14	5.7		X		16	24	5.7			X	25	35	07	X		
08	14	06	X			16	24	6.2			X	25	35	7.2			X
08	15	5.7	X			16	24	09	X			25	35	08	X		
08	15	06	X			16	26	05	X			25	38	08	X		
08	15	08	X			16	26	07	X			25	38	10	X		
08	16	4.5			X	16	26	7.5			X	25	38	10			X
08	16	5.7			X	16	26	08	X			25	40	10	X		
08	16	06	X			16	26	08			X	25	45	10	X		
08	16	08	X			16	28	08			X	26	38	08	X		
08	18	08	X			16	32	08	X			27	35	05	X		
08	18	09	X			17	25	10	X			27	36	06	X		
09	19	06	X			18	25	05	X			28	35.5	05	X		
9.5	14	2.5			X	18	25	06	X			28	36	05	X		
10	16	04	X			18	26	05	X			28	36	08	X		
10	16	4.5			X	18	26	5.7			X	28	38	08	X		
10	16	4.8	X			18	26	6.5	X			28	38	10	X		
10	18	05	X			18	26	08	X			28	40	08	X		
10	18	5.5	X			18	28	7.3	X			28	40	10	X		
10	18	5.7			X	18	28	08	X			28	43	10	X		
10	18	06	X			18	34	08	X			30	37	06	X		
10	20	4.5			X	18	35	08	X			30	38	05	X		
10	20	06	X			19	25	06	X			30	38	5.7			X
10	20	7.2			X	20	26	05			X	30	38	06	X		
10	20	08	X			20	28	05	X			30	38	07	X		
10	20	10	X			20	28	5.7			X	30	38	08	X		
10	21	4.5			X	20	28	08	X			30	39	6.5		X	
10	22	05	X			20	30	06	X			30	40	05	X		
10	22	08	X			20	30	07			X	30	40	5.5	X		
11.2	21.5	08	X			20	30	7.2			X	30	40	06	X		
12	18	04	X			20	30	08	X			30	40	07	X		
12	18	06	X			20	32	08	X			30	40	07		X	
12	20	5.5		X		20	35	10	X			30	40	07			X
12	20	06	X			20	40	10	X			30	40	08	X		
12	20	08	X			22	28	04	X			30	40	08			X
12	22	05	X			22	28	08	X			30	40	10	X		
12	22	07	X			22	30	04	X			30	42	10	X		
12	22	08		X		22	30	05	X			30	45	10	X		
12	22	08			X	22	30	5.7			X	30	45	10.2	X		
12	24	09	X			22	30	06	X			30	50	10	X		
12	25	08	X			22	30	06			X	30	50	12	X		
12.5	21	4.6			X	22	30	07	X			31.5	41.5	05	X		

I.D. O.D. Width			U41	U43	U45	I.D. O.D. Width			U41	U43	U45	I.D. O.D. Width			U41	U43	U45
32	40	04	X			40	56	10	X			53	63	12		X	
32	40	05	X			40	60	10	X			54	70	12	X		
32	40	5.7		X		40	60	12	X			55	60	10	X		
32	40	06	X			40	60	18	X			55	63	5.7		X	
32	40	07	X			40	65	12	X			55	63	08			X
32	40	08	X			42	50	08	X			55	65	05	X		
32	40	08			X	42	50	08		X		55	65	06	X		
32	42	06	X			42	52	10	X			55	65	7.2			X
32	42	07			X	45	53	5.6			X	55	65	10			X
32	42	7.3			X	45	53	08	X			55	65	12	X		
32	42	10	X			45	53	10	X			55	67	10			X
32	45	10			X	45	53	10			X	55	70	10			X
33	40	08		X		45	53	11.5			X	55	70	12	X		
33	43	10	X			45	55	06	X			55	70	12		X	
34	45	09	X			45	55	6.5	X			55	75	10	X		
35	43	5.7			X	45	55	07	X			55	75	12	X		
35	43	06	X			45	55	7.2			X	55	75	12		X	
35	43	07	X			45	55	10	X			56	66	6.5	X		
35	45	06	X			45	55	10			X	56	66	6.7	X		
35	45	7.2			X	45	56	07	X			56	66	10			X
35	45	10	X			45	56	07		X		56	71	10	X		
35	48	10	X			45	57.7	9.5	X			56	71	10			X
35	50	10	X			45	57.7	9.5			X	56	71	11.5			X
35	55	10	X			45	60	10	X			57	70	10			X
35	55	12	X			45	60	10		X		60	68	08	X		
35.5	45	06	X			45	60	10			X	60	68	11.5			X
36	44	04	X			45	63	10	X			60	68	13.5			X
36	44	5.7	X			45	63	12	X			60	70	05	X		
36	44	08	X			45	63	12		X		60	70	06	X		
36	46	07	X			45	65	10	X			60	70	7.2			X
36	46	7.3			X	45	65	12	X			60	70	08	X		
36	46	10	X			46	58	12	X			60	70	08		X	
36	51	10			X	48	58	10	X			60	70	10			X
36	51	11.5			X	48	63	09		X		60	70	12	X		
36	56	12			X	48	63	10	X			60	70	12		X	
38	45	06	X			50	60	05	X			60	73	10			X
38	45	08	X			50	60	06	X			60	75	10			X
38	48	06	X			50	60	10	X			60	75	11.5			X
38	48	10	X			50	60	10		X		60	75	12	X		
38	50	09	X			50	60	10			X	60	75	12			X
38	50	10	X			50	60	12	X			60	75	15.5			X
38	55	10	X			50	62	09	X			60	80	10	X		
39	47	06	X			50	63	06	X			60	80	12	X		
40	48	5.7			X	50	63	08	X			60	80	13		X	
40	48	5.8	X			50	63	10	X			60	80	14.5		X	
40	48	08	X			50	65	10	X			60	80	18	X		
40	48	08			X	50	65	10		X		60	85	12	X		
40	50	05	X			50	65	10			X	60	90	15	X		
40	50	05	X			50	65	11.5			X	61	71	06		X	
40	50	06	X			50	70	10	X			63	73	05	X		
40	50	6.5	X			50	70	12	X			63	73	12			X
40	50	07	X			50	70	12			X	63	75	8.7			X
40	50	07		X		50	70	18	X			63	75	12	X		
40	50	7.2			X	50	75	12	X			63	78	10	X		
40	50	10	X			51	66	14	X			63	78	11.5			X
40	50	10		X		51	76	14	X			63	80	12	X		
40	50	10			X	52	62	12	X			63	83	15	X		
40	55	10	X	X		53	63	06	X			65	73	13			X
40	55	10			X	53	63	07		X		65	75	10			X

I.D. O.D. Width			U41	U43	U45	I.D. O.D. Width			U41	U43	U45	I.D. O.D. Width			U41	U43	U45
65	75	11.5		X		85	100	12			X	120	140	15	X		
65	75	12	X			85	105	12	X			120	140	16	X		
65	75	12			X	85	105	18	X			120	150	15	X		
65	77.7	9.5			X	87	95	13			X	120	150	18		X	
65	80	10	X			90	98	12			X	125	140	09	X		
65	80	10			X	90	100	05	X			125	140	11	X		
65	80	11.4		X		90	100	07	X			125	140	15	X		
65	80	11	X			90	100	08	X			125	140	15		X	
65	85	10	X			90	100	10			X	125	145	15	X		
65	90	12	X			90	100	11.5			X	125	145	16	X		
66	77	12	X			90	100	12	X			125	150	12	X		
67	77	06	X			90	102	09			X	125	150	15			X
67	77	10	X			90	105	12	X			125	155	15	X		
70	80	05	X			90	105	12			X	130	150	12			X
70	80	06	X			90	110	10	X			130	150	15	X		
70	80	6.7		X		90	110	12	X			130	150	15		X	
70	80	07		X		90	110	12		X		130	150	15			X
70	80	08	X			90	110	12			X	130	150	16	X		
70	80	12	X			90	110	15	X			130	160	18		X	
70	85	10	X			90	110	15		X		135	150	15	X		
70	85	11.5			X	90	110	17			X	135	155	15	X		
70	88	13.5			X	90	115	15	X			140	150	05	X		
70	90	10	X			95	105	12	X			140	160	12	X		
70	90	10			X	95	110	09	X			140	160	15		X	
70	90	12	X			95	110	12	X			140	160	15			X
70	90	12		X		95	110	12			X	140	165	15	X		
70	90	12			X	95	112	12	X			143	151	13.5			X
70	90	15			X	95	115	12	X			145	165	15	X		
70	95	12	X			95	115	15		X		146	160	09	X		
71	80	06	X			95	115	14.5		X		150	170	14.5			X
75	85	06	X			97	105	13.5			X	150	170	15	X		
75	85	08		X		100	110	14			X	150	170	15			X
75	85	10	X			100	115	12	X			160	180	15			X
75	85	12	X			100	120	10	X			160	185	15	X		
75	90	09	X			100	120	12		X		160	185	16	X		
75	90	10	X			100	120	12			X	160	185	18.2			X
75	90	11.4		X		100	120	14.5			X	160	190	15	X		
75	90	12	X			100	120	15	X			160	190	18			X
75	95	10	X			100	125	12	X			160	190	19	X		
75	95	12	X			100	125	15	X			165	190	15	X		
76	91	14			X	100	125	15		X		170	190	15	X		
78	86	13.5			X	100	125	15			X	171	179	13.5			X
80	90	05	X			105	120	08	X			180	200	15		X	
80	90	06	X			105	120	9.9			X	180	200	15			X
80	90	10.5			X	105	120	15	X			180	205	16	X		
80	93	10			X	105	125	10	X			180	205	19			X
80	95	11.5			X	105	125	15	X			185	200	7.5	X		
80	95	12	X			110	125	12	X			190	220	18		X	
80	95	12			X	110	125	15	X			200	220	15	X		
80	100	10	X			110	135	15			X	200	220	15			X
80	100	10		X		110	140	15	X			210	230	15			X
80	100	12	X			115	135	15	X			220	250	18	X		
80	100	12			X	115	145	18	X								
80	100	13.5		X		115	145	18		X							
80	100	15		X		120	130	05	X								
85	95	8.5	X			120	135	15			X						
85	95	12	X			120	140	10	X								
85	100	11.4		X		120	140	12	X								
85	100	11.5			X	120	140	12		X							

Gamma Seals RB & 9RB



Gamma Seals (also known as flingers or deflector rings) consist of two parts; a sealing member and a metal case. The case supports, holds, and protects the sealing member.

The sealing member is not bonded to the case, rather it is stretched and held by its elasticity.

Gamma seals are primarily intended to seal against foreign matter, liquid splatter, and grease.

Case: Stamped from cold rolled steel (zinc plated)

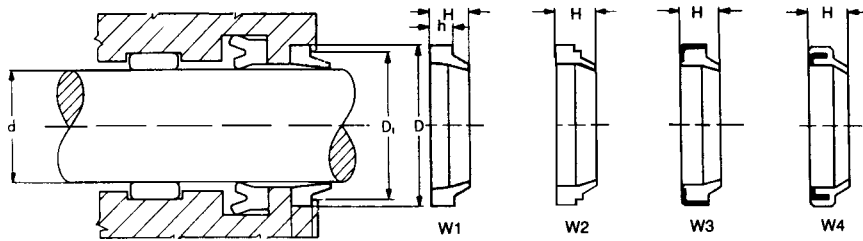
Sealing Member: Nitrile rubber (70 shore) offers a good resistance to mineral oils, salt solutions, and alkalis

Operating temperatures: -40F to +212F

RB & 9RB Dimension List

Type	I.D.	O.D.	Width	Type	I.D.	O.D.	Width	Type	I.D.	O.D.	Width
RB	10	24	3.5	9RB 35	53	4.5	9RB 65	87	5.5		
RB	11	26	3.5	RB	38	55	4.5	RB	68	88	5.5
RB	12	26	3.5	RB	40	57	4.5	RB	70	90	5.5
RB	14	30	4.0	9RB 40	58	4.5	9RB 70	92	5.5		
RB	15	30	4.0	9RB 40	58	5.5	RB	72	92	5.5	
9RB 15	32	4.0		RB	41	57	4.5	RB	75	95	5.5
RB	16	32	4.0	RB	42	59	4.5	9RB 75	97	5.5	
RB	17	32	4.0	RB	45	62	4.5	RB	78	98	5.5
9RB 17	34	4.0		9RB 45	63	4.5		RB	80	100	5.5
RB	18	33	4.0	RB	48	65	4.5	9RB 80	102	5.5	
RB	20	35	4.0	RB	50	70	5.5	RB	85	105	5.5
RB	22	40	3.5	9RB 50	72	5.5		RB	85	107	5.5
RB	24	40	4.0	RB	52	72	4.5	9RB 85	107	5.5	
RB	25	40	4.0	RB	55	75	5.5	RB	90	110	5.5
RB	25	42	4.0	RB	55	77	5.5	9RB 90	112	5.5	
9RB 25	42	4.0		9RB 55	77	5.5		RB	95	115	5.5
RB	26	40	4.0	RB	58	78	5.5	9RB 95	117	5.5	
RB	28	43	4.0	RB	60	80	5.5	RB	100	120	5.5
RB	30	47	4.5	9RB 60	82	5.5		9RB 100	122	5.5	
9RB 30	48	4.5		RB	62	82	5.5	RB	105	125	5.5
RB	32	49	4.5	RB	65	85	5.5	9RB 105	143	5.5	
RB	35	52	4.5	RB	65	87	5.5	RB	135	159	6.5

Wiper Seals



ID.	O.D.	h/H	W1	W2	W3	W4
06	13	3/4.5				X
08	14	3.5/5				X
10	16	3.5/5				X
10	18	4/7		X		
10	20	5/8			X	X
12	18	3.5/5				X
12	20	4/6			X	
12	20	4/7		X		
12	22	5/8			X	X
14	20	3.5/5				X
14	22	4/7		X		
15	21	3.5/5				X
15	25	5/7				X
15	25	5/8				X
16	22	3.5/5			X	X
16	24	4/7		X		
16	26	5/8			X	X
18	26	4/7		X		
18	28	5/7				X
18	28	7/10			X	X
20	28	4/7		X		
20	28	5/7	X			
20	30	5/7				X
20	30	5/8			X	
20	30	7/10			X	X
22	30	4/7		X		
22	30	5/8			X	
22	32	5/7				X
24	35	5/8				X
25	33	4/7		X		
25	33	5/7	X			X
25	35	5/7				X
25	35	7/10			X	X
26	35	7/10				X
28	36	4/7		X		
28	36	5/7	X			
28	38	5/7				X
28	38	7/10			X	
28	40	7/10				X
30	38	4/7		X		
30	38	5/7	X			
30	40	5/7			X	X
30	40	5/8			X	
30	40	7/10			X	X
32	40	4/7		X		

ID.	O.D.	h/H	W1	W2	W3	W4
32	40	5/7	X			
32	42	5/7				X
32	45	7/10			X	
35	43	4/7		X		
35	43	5/7	X			
35	45	7/10			X	X
36	44	4/7		X		
36	44	5/7	X			
36	45	7/10			X	
36	46	5/7				X
38	46	4/7		X		
38	48	7/10				X
40	48	4/7		X		
40	48	5/7	X			
40	50	5/8			X	X
40	50	7/10			X	
40	52	5/8			X	
40	52	7/10				X
42	50	4/7		X		
42	50	5/7	X			
42	52	5/7				X
42	52	7/10			X	X
45	53	4/7		X		
45	55	5/7	X			X
45	55	7/10			X	X
45	60	7/10			X	X
48	56	4/7		X		
48	60	7/10				X
50	58	4/7		X		
50	60	5/7	X		X	
50	60	5/8			X	
50	60	7/10			X	X
50	65	5/8			X	
52	62	7/10			X	X
55	63	4/7		X		
55	65	5/7	X			X
55	65	7/10			X	X
56	64	4/7		X		
56	66	5/7	X			
60	68	4/7		X		
60	70	5/7	X		X	X
60	70	7/10			X	X
63	71	4/7		X		
63	73	5/7	X			X
63	75	7/10			X	

ID.	O.D.	h/H	W1	W2	W3	W4
65	73	4/7		X		
65	75	5/7	X		X	
65	75	7/10			X	X
70	78	4/7		X		
70	80	5/7	X		X	X
70	80	7/10			X	X
75	83	7/10				X
75	85	7/10			X	X
75	87	7/12	X			
80	88	4/7		X		
80	88	7/10				X
80	90	7/10			X	X
80	92	7/12	X			
83	93	4/7		X		
85	95	7/10			X	X
85	97	7/12	X			
90	98	4/7		X		
90	100	7/10			X	X
90	102	7/12	X			
95	103	4/7		X		
95	105	7/10			X	X
100	108	4/7		X		
100	110	7/10			X	X
100	112	7/12	X			
105	115	7/10				X
110	120	7/10			X	
110	122	5.5/10		X		
110	122	7/12	X			
115	125	7/10			X	
115	127	7/12	X			
120	130	7/10			X	
120	132	5.5/10		X		
125	140	9/12			X	
125	140	10/16	X			
130	142	5.5/10		X		
140	152	5.5/10		X		
140	155	10/16	X			
145	160	9/12			X	
150	165	10/16	X			
160	175	10/16	X			
180	195	10/14			X	
180	200	10/18	X			
200	220	10/18	X			
220	240	12/16				X

“VK” END CAPS

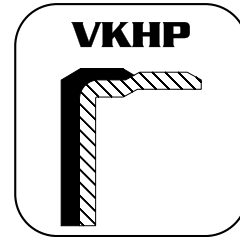
End caps are used in order to seal bearings, e.g., in gearboxes, where the shaft does not pass through the housing wall. This product offers great advantages for design and production. The end caps are designed to fit directly in housing bores for rotary shaft lip seals which means that a shaft can easily be left or right hand oriented.

Harwal end caps are made of cold rolled steel and Nitrile (NBR) rubber (70 IRHD).

“VKHP” END CAPS

Offered exclusively at Harwal

High Pressure End Caps -- **For pressure up to 50 PSI** -- NBR & Viton® Materials

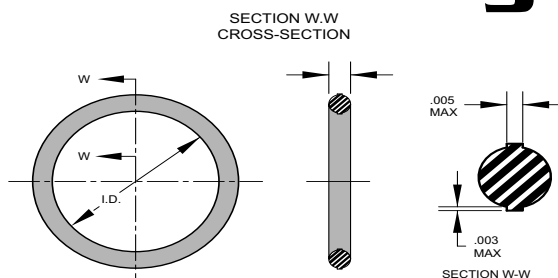


VK & VKHP size listing **Bold = VKHP**

O.D.	Width	O.D.	Width	O.D.	Width	O.D.	Width	O.D.	Width
13	x 4.5	32	x 05	47	x 07	70	x 08	100	x 12
15	x 05	32	x 07	47	x 07	70	x 10	105	x 10
16	x 04	32	x 08	47	x 08	70	x 12	110	x 10
18	x 03	32	x 9.5	47	x 10	72	x 09	110	x 12
19	x 5.5	35	x 3.5	50	x 07	72	x 09	110	x 12
19	x 07	35	x 4.5	50	x 10	72	x 10	120	x 12
20	x 04	35	x 07	52	x 6.5	72	x 12	120	x 12
21	x 04	35	x 08	52	x 07	75	x 07	125	x 12
22	x 05	35	x 08	52	x 07	75	x 10	125	x 12
22	x 05	36	x 4.5	52	x 08	75	x 12	130	x 12
22	x 06	37	x 05	52	x 10	80	x 07	140	x 10
22	x 07	37	x 07	52	x 10	80	x 08	140	x 15
24	x 05	37	x 07	55	x 07	80	x 10	140	x 15
24	x 07	37	x 10	55	x 09	80	x 12	150	x 13
24	x 07	38	x 07	55	x 10	80	x 12	150	x 15
25	x 05	39	x 04	55	x 10	85	x 10	150	x 15
25	x 07	40	x 4.5	60	x 07	85	x 12	160	x 15
26	x 04	40	x 07	60	x 07	85	x 12	160	x 15
26	x 6.5	40	x 07	60	x 08	90	x 08	170	x 15
26	x 07	40	x 10	60	x 10	90	x 10	180	x 12
28	x 04	42	x 06	62	x 07	90	x 12	190	x 10
28	x 07	42	x 07	62	x 08	90	x 12	190	x 12
28	x 07	42	x 07	62	x 08	92	x 10	215	x 15
30	x 3.5	42	x 9.5	62	x 10	95	x 10	220	x 15
30	x 05	42	x 9.5	62	x 12	95	x 12	230	x 14
30	x 06	45	x 07	65	x 08	95	x 12	240	x 15
30	x 08	47	x 04	65	x 10	100	x 10	250	x 15
30	x 08	47	x 6.5	68	x 08	100	x 12	260	x 15

Available in Nitrile (NBR) or Viton®(FPM). Please call for pricing.

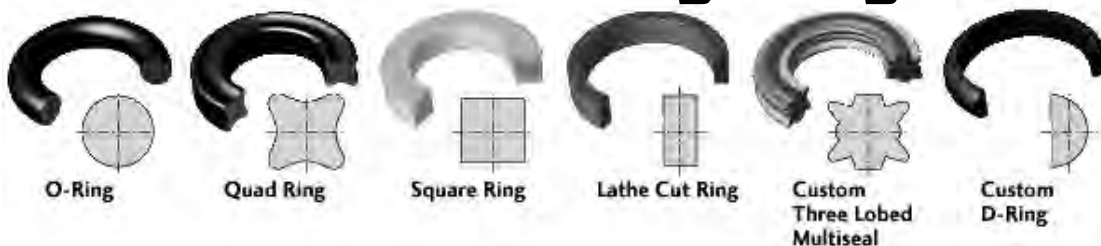
Standard & Metric O-Ring Kits



Part#	I.D.	O.D.	Width	Qty/kit
3x2	3	7	2	18
4x2	4	8	2	18
5x2	5	9	2	18
6x2	6	10	2	18
7x2	7	11	2	17
8x2	8	12	2	17
10x2	10	14	2	17
10x2.5	10	15	2.5	14
11x2.5	11	16	2.5	14
12x2.5	12	17	2.5	14
14x2.5	14	19	2.5	14
16x2.5	16	21	2.5	14
17x2.5	17	22	2.5	14
19x2.5	19	24	2.5	14
19x3	19	25	3	12
20x3	20	26	3	12
22x3	22	28	3	12
24x3	24	30	3	12
25x3	25	31	3	12
27x3	27	33	3	12
28x3	28	34	3	12
30x3	30	36	3	12
32x3	32	38	3	12
33x3	33	39	3	12
35x3	35	41	3	12
36x3	36	42	3	12
38x3	38	44	3	12
38x4	38	46	4	9
42x4	42	50	4	9
45x4	45	53	4	9

AS-568#	I.D.	O.D.	Width	Qty/kit
-006	1/8	1/4	1/16	20
-007	5/32	9/32	1/16	20
-008	3/16	5/16	1/16	20
-009	7/32	11/32	1/16	20
-010	1/4	3/8	1/16	20
-011	5/16	7/16	1/16	20
-012	3/8	1/2	1/16	20
-110	3/8	9/16	3/32	13
-111	7/16	5/8	3/32	13
-112	1/2	11/16	3/32	13
-113	9/16	3/4	3/32	13
-114	5/8	13/16	3/32	13
-115	11/16	7/8	3/32	13
-116	3/4	15/16	3/32	13
-210	3/4	1	1/8	10
-211	13/16	1-1/16	1/8	10
-212	7/8	1-1/8	1/8	10
-213	15/16	1-3/16	1/8	10
-214	1	1-1/4	1/8	10
-215	1-1/16	1-5/16	1/8	10
-216	1-1/8	1-3/8	1/8	10
-217	1-3/16	1-7/16	1/8	10
-218	1-1/4	1-1/2	1/8	10
-219	1-5/16	1-9/16	1/8	10
-220	1-3/8	1-5/8	1/8	10
-221	1-7/16	1-11/16	1/8	10
-222	1-1/2	1-3/4	1/8	10
-325	1-1/2	1-7/8	3/16	7
-326	1-5/8	2	3/16	7
-327	1-3/4	2-1/8	3/16	7

Other available O-Ring Designs



302 Stainless Steel Springs

Stainless Steel Springs can be sold separately or pre-installed in seals ordered from Harwal.

Non-magnetic 316 & Monel Stainless is also available on special order.

316 Stainless is a stock item for us.

Harwal springs have male & female ends. WE STOCK 1000's

Also available in large spools (any size - any length)

Please call for pricing.

Springs can be joined together and/or cut to make ANY length.

Pre-Cut sizes will come joined and will fit in a seal with the corresponding I.D.

Un-Cut lengths may come joined or open. Either can be requested.

Dimensions for un-cut lengths are listed as follows:

length x overall thickness x thread thickness

Pre-Cut Sizes: (I.D. of seal)	Un-Cut Lengths:	Non-magnetic 316 Stainless:
6mm 7mm 8mm 9mm 10mm	41.5 x 1.2 x .2 56 x 1.7 x .4 58.5 x 1.2 x .2 83.5 x 1.2 x .2 87.5 x 1.2 x .2	Pre-Cut: 35mm
11mm 12mm 15mm 16mm 17mm	100 x 1.2 x .2 100 x 2 x .35 133 x 2 x .3 150 x 1.5 x .25 163 x 1.5 x .25	Un-Cut Lengths: 270 x 3 x .5 500 x 3 x .5
20mm 22mm 25mm 30mm 35mm	164.5 x 1.8 x .3 193 x 2.3 x .4 270 x 2 x .5 270 x 2.3 x .5 300 x 2.8 x .5	
40mm 45mm 50mm 55mm 60mm	365 x 2.5 x .4 365 x 2.5 x .5 500 x 3 x .5 600 x 3 x .5 650 x 3 x .5	
65mm 70mm 75mm 80mm 85mm	800 x 3 x .5	
90mm 95mm 100mm 105mm 110mm		

'SAFEGARD' SEAL.

PATENTED 'SAFEGARD' SEAL

■ The 'Safeguard' patented and unique design improves on seals currently available, provides maximum bearing protection and superior sealing performance.

■ 'Safeguard' is a suitable replacement for the open backed and fully metal enclosed (metal clad) seal.

■ Cost effective replacement for heavy duty, larger diameter seals, including finger spring designs.

■ Can also be supplied with lugs.

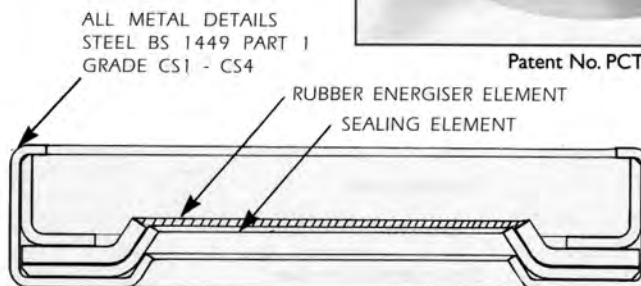
■ Inner diameter dependent on size of seal and run- out on shaft but generally designed for shaft size +2.5mm +/- 0.5mm.

■ Shape of sealing lip depending on interference required.

■ Pressure design available.



Patent No. PCT/GB96/00453



METAL MATERIALS

Mild steel - BS1449 EN2 CR4 Stainless steel - BS1449 Part 2 1983 Grade 316 Brass - BS2870 1987

SEALING LIP

Nitrile, Viton, PTFE.

Standard section (Difference between O/D and I/D) 25mm to 60mm 1in to 2³/₈ in

Temperature range

-60°C to + 250°C
-76°F to +482°F

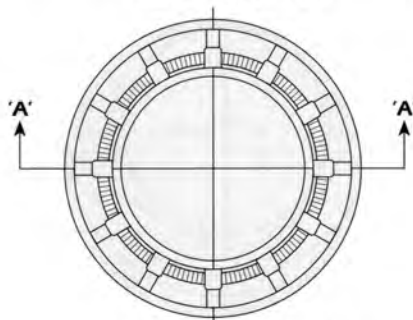
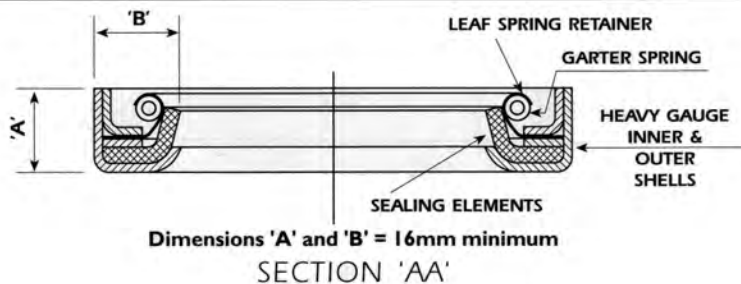
Speeds

Maximum shaft speed
45m/s 147ft/s

Sizes

Outer Diameter
152mm to 1737mm 6in to 68in
Dependent on material
Width
12.7mm to 35mm 1/2in to 1³/₈ in

LEAF SPRING RETAINER SEALS.



METAL MATERIALS

Outer/inner shell and base washer = Mild steel as standard.

Garter Spring = Galvanised steel as standard.

Leaf spring retainer = Stainless steel (AISI 301 S21) as standard

Also available in non ferrous metals.

LEAF SPRING RETAINER SEALS

NITRILE

SILICONE

VITON

PTFE

■ Replacement for Garlock 64 style and Gaco S.M.K. style.

■ Heavy duty applications e.g. rolling mills, paper mills, etc.

■ Excellent for shaft misalignment. Maximum 2/3mm dependent on shaft speed.

For further information please contact our technical department.

VITON is the Registered Trade Mark of E.I. DuPont De Nemours Inc, Delaware, USA

Temperature range

-60°C to +250°C
-76°F to +482°F.

Speeds

Sealing surface speeds
up to 15m/s 49ft/s

Sizes

from
150mm O/dia to 1727mm O/dia
5.9in to 68in

METAL CASED VITON[®] RUBBER SEAL.

VITON[®] RUBBER SEAL

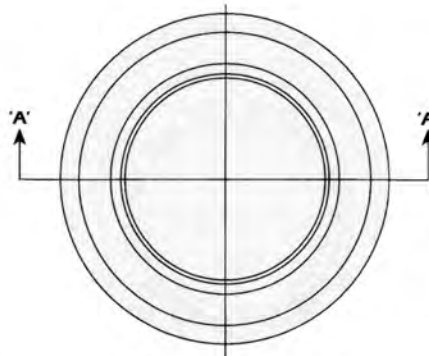
- Capable of being retrofitted for all other manufacturers types.
- Excellent for wide temperature range.
- Resistant to most of the special lubricants and chemicals that destroy nitrile polyacrylates or silicones.
- Superior performance and wear in heat and harsh environments.
- Used in similar applications to nitrile but having additional temperature and chemical resistance.

For multi-lip designs please consult our technical department.

VITON is the Registered Trade Mark of E.I. DuPont de Nemours Inc, Delaware, USA



SECTION 'AA'



METAL MATERIALS

Outer/inner shell and base washer = Mild steel as standard.

Garter Spring = Galvanised steel as standard.

Also available in non ferrous metals.

Temperature range

-40°C to +250°C
-130°F to +480°F.

Speeds

Maximum shaft speed
15m/s 49ft/s.

Sizes

from
50mm O/dia to 1727mm
O/dia 2in to 68in

HIGH PRESSURE P.T.F.E. SEALS.

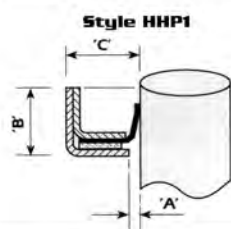


HIGH PRESSURE P.T.F.E. SEALS

- Features pressure seal up to 25 Bar (367psi).
- Our equivalent to Garlock P.S. and Elring styles.
- Applications include Pumps, Agitators, Blowers, Rotating Compressors, Mixers etc.
- Excellent for extreme temperatures, high pressures, high speeds and corrosive liquids & gases.
- P.T.F.E. sealing lip with any number of other combinations.

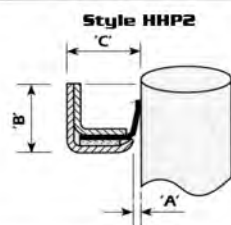
Seals are also available in multi-lip designs. For further information please consult our technical department.

VITON is the Registered Trade Mark of E.I. DuPont De Nemours Inc, Delaware, USA



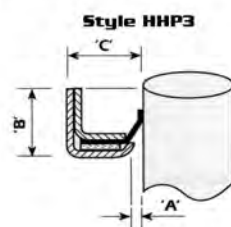
SPECIAL SEAL DESIGN

Size range from 30mm O/dia. to 530 O/dia.
Pressure up to 5 bar. Vacuum 0.1 torr.
Dimension 'A' = 0.5mm 'B' = 6mm 'C' = 7mm
Metal parts = Stainless steel (BS 1449 Pt2 1983/ANSI 1316)
Sealing element = Black or White PTFE
Captive Elastomer = VITON (up to 250°C)



SPECIAL SEAL DESIGN

Size range from 30mm O/dia. to 530 O/dia.
Pressure up to 10 bar. Vacuum 0.1 torr.
Dimension 'A' = 0.25mm 'B' = 6mm 'C' = 7mm
Metal parts = Stainless steel (BS 1449 Pt2 1983/ANSI 1316)
Sealing element = Black or White PTFE
Captive Elastomer = VITON (up to 250°C)



STANDARD SEAL DESIGN

Size range from 46mm O/dia. to 530 O/dia.
Pressure up to 25 bar. Vacuum 0.1 torr.
Dimension 'A' = 1.5mm 'B' = 6mm 'C' = 8mm
Metal parts = Stainless steel (BS 1449 Pt2 1983/ANSI 1316)
Sealing element = Black or White PTFE
Captive Elastomer = VITON (up to 250°C)
P.T.F.E. Element is supported by metal outer case

Temperature range

-90°C to +250°C
-130°F to +482°F.

Speeds

Sealing surface speeds
up to 45m/s 147.6ft/s

Sizes

from
30mm O/dia to 530mm
O/dia 1.2in to 20.9 in

METAL CASED P.T.F.E. SEAL.

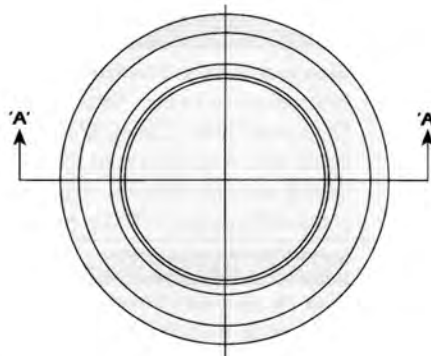
STANDARD P.T.F.E. SEAL

- Capable of being retrofitted for all other manufacturers types.
- Excellent for wide temperature range.
- Ability to run in dry conditions.
- Very low coefficient of friction.
- Outstanding resistance to modern day chemicals.

For multi-lip designs please consult our technical department.



SECTION 'AA'



METAL MATERIALS

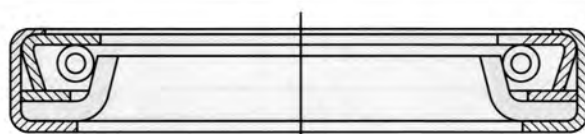
Outer/inner shell and base washer = Mild steel as standard.

Garter Spring = Galvanised steel as standard.

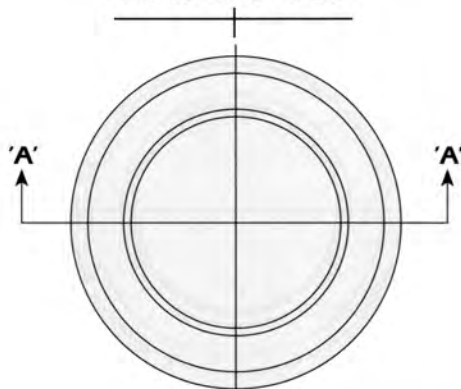
Also available in non ferrous metals.

Temperature range	Speeds	Sizes
-90°C to +300°C -130°F to +572°F.	Maximum shaft speed 45m/s 147.6ft/s.	from 50mm O/dia to 1220mm O/dia 2in to 48in

METAL CASED LEATHER OIL SEAL.



SECTION 'AA'



METAL MATERIALS

Outer/inner shell and base washer = Mild steel as standard.
Garter Spring = Galvanised steel as standard.
Also available in non ferrous metals.

LEATHER OIL SEAL

- Capable of being retrofitted for all other manufacturers types.
- This seal should normally be used for oils and grease.
- Particular applications for retrofit. For worn and poor shaft conditions.
- Can be used for intermittent dry running.

For multi-lip designs
please consult our
technical department.

Temperature range

-30°C to +90°C
-22°F to +194°F

Speeds

Speeds up to
10m/s 33 ft/s

Sizes

36mm O/dia to 1220mm O/dia
1.4in to 48in

METAL CASED NITRILE RUBBER SEAL.

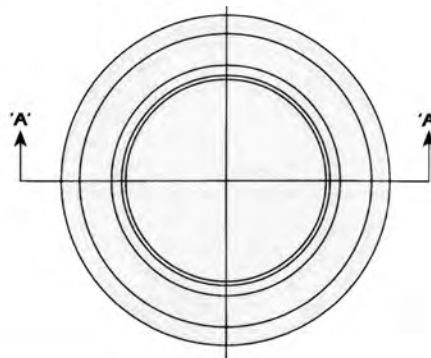
NITRILE RUBBER SEAL

- Capable of being retrofitted for all other manufacturers types.
- Excellent for most mineral oils and greases.
- Design can be manufactured from 3 Bar to 12 Bar, 44 psi to 176 psi.
- Can perform in dry running conditions only intermittently.

For multi-lip designs please consult our technical department.



SECTION 'AA'



METAL MATERIALS

Outer/inner shell and base washer = Mild steel as standard.

Garter Spring = Galvanised steel as standard.

Also available in non ferrous metals.

Temperature range

-54°C to +120°C
-65°F to +248°F

Speeds

Maximum shaft speed
15m/s 49ft/s.

Sizes

from
50mm O/dia to 1727mm O/dia
2in to 68in

METAL CASED SILICONE RUBBER SEAL.

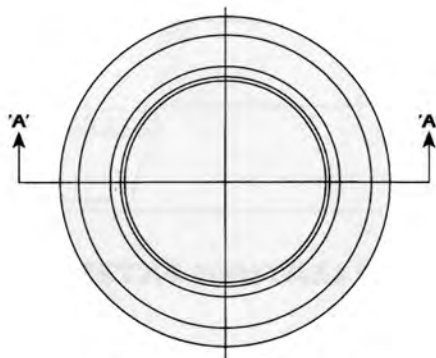


SILICONE RUBBER SEAL

- Capable of being retrofitted for all other manufacturers types.
- Excellent for wide temperature range.
- Absorbs lubricant, minimising friction and wear.
- This material should **not** be used in dry running conditions.



SECTION 'AA'



METAL MATERIALS

Outer/inner shell and base washer = Mild steel as standard.
Garter Spring = Galvanised steel as standard.
Also available in non ferrous metals.

For multi-lip designs please consult our technical department.

Temperature range	Speeds	Sizes
-70°C to +200°C -94°F to +392°F	Speeds up to 15m/s 49 ft/s	50mm O/dia to 1727mm O/dia 2in to 68in

EXTERNAL SEALS.

EXTERNAL SEALS

LEATHER*

SILICONE

VITON

NITRILE-RUBBER

P.T.F.E.**

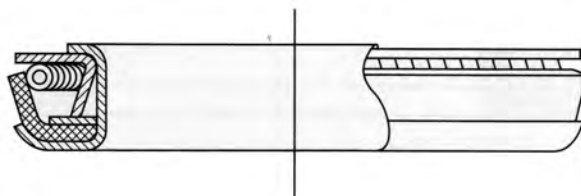
■ Used in applications where shaft is stationary and housing rotates.

■ Capable of being retrofitted for all other manufacturers types

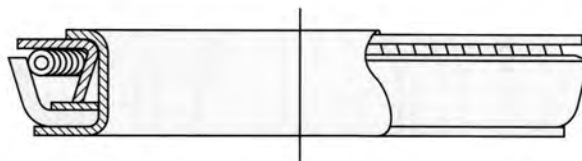
■ Application criteria - see to right.

* Manufactured up to 1020mm (40 in)

** Manufactured up to 1220mm (48ins)



STANDARD EXTERNAL SEALS



STANDARD LEATHER EXTERNAL SEALS

METAL MATERIALS

Outer/inner shell and base washer = Mild steel as standard.

Garter Spring = Galvanised steel as standard.

Also available in non ferrous metals.

Temperature range

-90°C to +300°C
-130°F to +572°F

Speeds

Speeds up to 45 m/s / 48 ft/s
depending on media used.

Sizes

50mm O/dia to 1727mm O/dia
2in to 68in

Other available designs

The most popular design in our range of seals. A spring loaded element enclosed in a steel casing presents a robust seal.

Standard - Leather

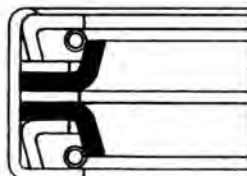


Standard - Rubber

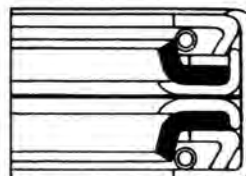


Two sealing members with opposed lips. One to exclude foreign matter the other to retain lubricant.

HD1

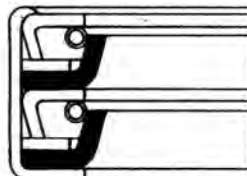


HD1R

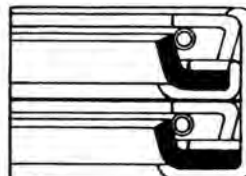


Again dual elements designed for applications of a more critical nature.

HD2



HD2R



When duplicate sealing members are required, but the width does not allow D1 to be used, then D3 is an excellent alternative. The washer prevents dirt etc, damaging the main element.

HD3



HD3R



A further variation of dual sealing. Here the spring loaded element is preceded by a washer.

HD4

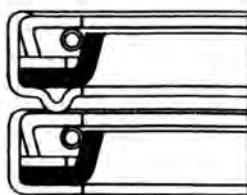


HD4R

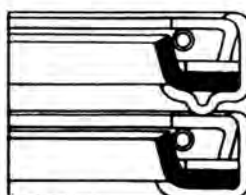


From time to time arduous conditions require a special dual seal which will allow grease to be administered to the centre cavity after the seal is installed, thereby cleaning the wiping lips of extraneous matter. Such is the make up of our D5.

HD5

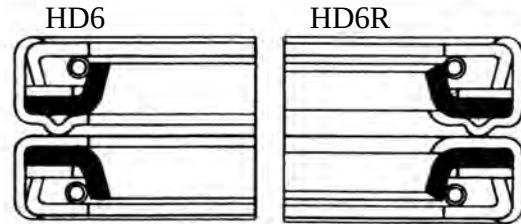


HD5R

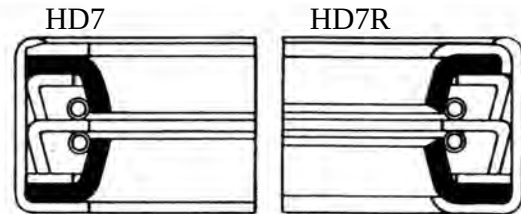


Other available designs

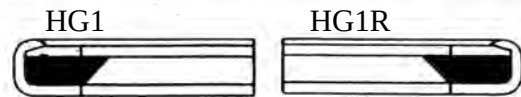
Two seals fitted back to back, one with indentations, which again allows the easy passage of lubricant administered through a grease nipple.



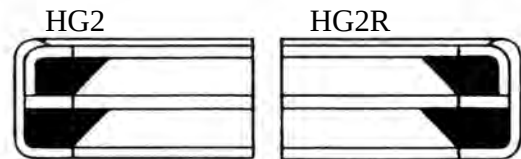
A dual seal with both lips facing each other, allowing a liberal quantity of grease to be prepacked before assembly. Particularly suitable when automatic grease feed is not possible.



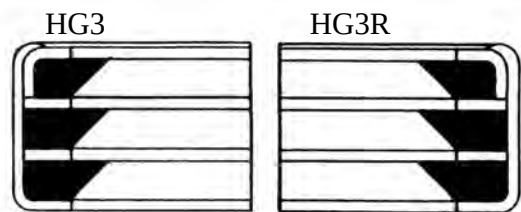
Where both axial and radial dimensions are restricted we offer a springless seal.



Limited space requiring dual sealing poses a problem which is overcome by our G2 type.



A triple lipped springless seal is ideal for grease and thick oils.



Type X (not illustrated) - The sealing element is mounted externally where the requirement is to seal the housing as opposed to sealing the shaft which is stationary, the housing revolving around the seal; refer to page 10.

Combinations of material are possible as are special designs to customer requirements. We invite your enquiries on any sealing problem you may have which will receive our immediate attention.

VERTEC Teflon® Seals

Material Features

- Virtually unlimited chemical compatibility
- Minimal break-away and running friction
- Self lubricating, dry running
- Kind to soft dynamic surfaces
- Minimal temperature increase from friction



Standard Delivery 4-6 Weeks!

VERTEC Rotary Shaft Seals

Features:

- 5 standard part geometry's
- Fluorocarbon O-ring static seal on O.D.
- Standard cross section range .200 - .750
- Size range from .125" – 4.000" shafts

Function:

- Shaft speeds up to 6000 fpm
- Rotary motion only
- Pressures from vacuum to 200 PSI
- Pressure/velocity
Combination 250,000 (PSI FT/MIN)
- Temperatures range from –100 to 500F*

*Upper temperature ranges may require a non-standard seal.

VERTEC Spring Energized Seals

Features:

4 standard cross sections
Shaft size range .125" – 16"
4 standard part geometry's
Stainless cantilever beam
Finger springs

Function:

Rotary motion up to 300 fpm
Reciprocating motion
Static applications
Temperature ranges from
cryogenic to 600F*
Radial and face seal geometry's
Pressures from vacuum
To 20,000+ PSI



#	SEAL TYPE	SEAL DESCRIPTION	SAMPLE PART
1	MS	SINGLE LIP SEALS ARE DESIGNED FOR ROTARY SPEEDS TO 4000 FEET PER MINUTE, AND PRESSURES TO 60 PSI. PRESSURE - VELOCITY COMBINATION TO 200,000 PV.	
2	MD	DOUBLE LIP SEALS OFFER AN ADDITIONAL LIP FACING THE PRESSURE SIDE. THE SECOND LIP INCREASES THE PRESSURE RATING TO 150 PSI. PRESSURE - VELOCITY COMBINATION TO 200,000 PV.	
3	DL	DUST LIP SEALS OFFER THE SAME FEATURES AS THE TYPE MS. THE ADDITION OF A DUST LIP FACING THE ATMOSPHERE SIDE PREVENTS ALL EXTERNAL CONTAMINATION.	
4	MR	REVERSE LIP SEALS ARE USED WHEN THE NORMAL LIP CONTACT AREA ON THE SHAFT CAN NOT BE USED. SHAFT KEYWAYS, SPLINES, AND SNAP-RING GROOVES CAN ALL BE AVOIDED WITH THIS SEAL TYPE.	
5	MB	THE DOUBLE LIP AND DOUBLE O-RING SEALS ARE SPACED TO ALLOW FOR TWO AIR PURGE OR DRAIN HOLES TO BE PLACED IN THE CENTER OF THE SEAL. CONTAMINANT BUILD UP AROUND THE PRIMARY SEALING LIP CAN BE PURGED TO INCREASE THE SEAL LIFE.	
6	PS	SPRING ENERGIZED SEAL EXCELS IN RECIPROCATING MOTION. SPECIFICALLY DESIGNED TO FIT MOST STANDARD O-RING GROOVES. THESE SEAL USE A STAINLESS STEEL CANTILEVER BEAM SPRING TO ENERGIZE THE PTFE JACKET. ADDITIONALLY, TYPE PS SEALS CAN BE USED FOR SLOW ROTAR	
7	PE	HIGHER PRESSURE SPRING ENERGIZED SEALS OFFER THE SAME FEATURES AS THE TYPE PS. THE INCREASED WIDTH ALLOWS THE SEAL TO HANDLE INCREASED PRESSURE WITHOUT FEAR OF SEAL FAILURE DUE TO EXTRUSION	
8	SS	OFFERS A SHARP SCRAPING EDGE THAT REMOVES EXCESS OIL OR DEBRIS FROM THE ROD OR BORE SURFACE. USED PRIMARILY IN RECIPROCATING APPLICATIONS. THE SCRAPING EDGE CAN BE MANUFACTURED TO MATE WITH THE EXISTING DYNAMIC SURFACE.	
9	FS	A CLAMPING FLANGE PREVENTS THE SEAL FROM ROTATING WITH THE DYNAMIC SURFACE. SPECIAL HARDWARE CONFIGURATION MAY BE REQUIRED. CONSULT THE FACTORY FOR RECOMMENDATIONS.	



CODE	MATERIAL DESCRIPTION	RECOMMENDED CONTACT SURFACE HARDNESS MIN.	COLOR
01	GRAPHITE FILLED PTFE. OFFERS LOW WEAR, LOW COEFFICIENT OF FRICTION, A SUPERIOR MATERIAL FOR DYNAMIC APPLICATIONS. KIND TO SOFT HARDWARE MATERIALS	ROCKWELL B 76	BLACK
02	MINERAL FILLED PTFE. FDA APPROVED MATERIALS ARE COMBINED TO ACHIEVE: IMPROVED WEAR, LONGER LIFE, AND FDA CLEARANCE. THIS SEAL MATERIAL IS USED IN BOTH STATIC AND DYNAMIC APPLICATION.	ROCKWELL B 76	OFF WHITE
13	VIRGIN PTFE. USED IN STATIC AND VERY SLOW DYNAMIC APPLICATIONS. VERY GOOD CRYOGENIC CAPABILITIES AND IS FDA APPROVED	ROCKWELL B 76	WHITE
18	FIBERGLASS AND MOLYBDENUM DISULFIDE FILLED PTFE. USED IN STATIC AND DYNAMIC PRESSURIZED APPLICATIONS FOR SUPERIOR SEAL LIFE	ROCKWELL C 41	GRAY BLACK
07	PROPRIETARY FDA APPROVED FILLED PTFE. APPROVED FOR DAIRY CONTACT. OFFERS SUPERIOR WEAR CHARACTERISTICS THAT EXCEED OTHER MATERIALS USED IN DYNAMIC FOOD AND DRUG PROCESSING EQUIPMENT APPLICATIONS.	ROCKWELL B 76	BLACK
15	FIBERGLASS FILLED PTFE. HAS ADDED STRENGTH FOR APPLICATIONS WITH HIGH TEMPERATURE AND PRESSURE COMBINATIONS, ALSO USED IN HIGH PRESSURE APPLICATIONS FOR ITS EXTRUSION RESISTANCE	ROCKWELL C 41	OFF WHITE
25	FIBERGLASS FILLED PTFE. VERY SIMILAR TO 06 MATERIAL WITH HIGHER FIBERGLASS CONTENT FOR ADDED STRENGTH AND EXTRUSION RESISTANCE AT ELEVATED TEMPERATURES AND PRESSURES	ROCKWELL C 41	OFF WHITE
17	CARBON FILLED PTFE USED PRIMARILY AS A BACK-UP RING MATERIAL WORKING IN COMBINATION WITH ANOTHER SEAL. MATERIAL OFFERS HIGH TEMPERATURE AND EXTRUSION RESISTANCE.	ROCKWELL C 41	BLACK
09	CARBON GRAPHITE FILLED PTFE. USED IN SEALING ABRASIVE MEDIA SUCH AS DUST, SAND, OR WATER. EXCELLENT FOR HARSH ATMOSPHERIC CONDITIONS. CAN BE USED ON SOFTER MATING MATERIALS	ROCKWELL B 76	BLACK
10	POLYIMIDE FILLED PTFE. OFFERS LOW WEAR AND SUPERIOR LOW FRICTION PROPERTIES. KIND TO SOFTER MATING SURFACES. EXCELLENT FOR DYNAMIC NON-LUBRICATED APPLICATIONS	ROCKWELL B 76	GOLD
11	AEROMATIC FIBER FILLED PTFE. OFFERS LOW WEAR, AND LOW FRICTION PROPERTIES. USED IN NON ABRASIVE HIGH TEMPERATURE APPLICATIONS, EXCELLENT LOW SPEED AND STATIC MATERIAL	ROCKWELL B 76	TAN BROWN
27	PROPRIETARY FILLED PTFE. OFFERS LOW WEAR AND FRICTION PROPERTIES. USED IN GENERAL APPLICATIONS WHERE LONG SEAL LIFE IS REQUIRED. NOT RECOMMEND FOR ABRASIVE APPLICATIONS.	ROCKWELL B 76	GRAY PURPLE
05	PROPRIETARY FILLED PTFE. OFFERS LOW WEAR AND EXCEPTIONAL THERMAL STABILITY. USED IN LARGER DIAMETERS WHERE BORE RETENTION IS CRITICAL. SHOULD BE CONSIDERED FOR RECIPROCATING AND SLOW ROTARY MOVEMENT.	ROCKWELL C 50	GRAY BLACK

Made-To-Order Parts

7-10 business day delivery on most parts.

Expediting is available in as little as 2 business days!

Rotary Shaft Seals



HS01



HS02



HS06



HS07



HS08



HS09



HS03



HS05



HS04



HS11



HS10



HS13



HS14

Rod Wiper Seals



HW01



HW02



HW09



HW06



HW07



HW08



HW11

Rod Seals



HRS01



HRS06



HRS17



HRS08



HRS14



HRS03



HRS07



HRS25



HRS21



HRS22



HRS39



HRS51



HRS02



HRS04



HRS10



HRS11



HRS12



HRS29



HRS30



HRS31



HRS43



HRS16



HRS00



HRS09



HRS92



HRS93



HRS20



HRS19

Available Materials	Material Code	Material Color
General Purpose Polyurethane	GP-PUR	Clear, Cream, Black, Green
Hot Water Resistant Polyurethane	H-PUR	Blue, Red
Nitrile Buna Rubber	NBR	Black
Hydrogenated Nitrile	H-NBR	Green, Black
Fluorocarbon	Viton®, FKM	Brown, Black
Ethylene Propylene	EPDM	Black
Silicone	SIL	Orange, Light Blue
Fluoro-Silicone	F-SIL	Blue, White
Perfluoroelastomer	Aflas®	Black
Ultra High Molecular Weight Polyethylene	UHMW	White

Available Materials	Material Code	Material Color
Polyacetal	Pom	White, Black, Orange
Polyetheretherketone	Virgin Peek	Tan
Thermoplastic Elastomer	Hytrel	Black, Natural
Polyamid	Nylon	Black, Natural, Orange, Blue
PTFE Filled Polyamid	Turcite X	Turquoise
Polytetrafluoroethylene	Virgin PTFE	White
Polytetrafluoroethylene	TFB40%	Bronze
Polytetrafluoroethylene	TFN Nickel Filled PTFE	Gray
Polytetrafluoroethylene	TFC Carbon Graphite	Black
Composites	Phenolic Polyester, Linen	White, Blue

Made-To-Order Parts

7-10 business day delivery on most parts.

Expediting is available in as little as 2 business days!

Guide Bands



HG01



HG03



HG04



HG05



HG06



HG07



HG08

Back-Up Rings



HB01



HB09



HB10



HB11



HB12



HB13

Piston Seals



HP06



HP01



HP19



HP07



HP18



HP21



HP03



HP39



HP02



HP04



HP41



HP11



HP10



HP12



HP20



HP54



HP34



HP17



HP09



HP35



HP16



HP08



HP81



HP82

Available Materials	Material Code	Material Color
General Purpose Polyurethane	GP-PUR	Clear, Cream, Black, Green
Hot Water Resistant Polyurethane	H-PUR	Blue, Red
Nitrile Buna Rubber	NBR	Black
Hydrogenated Nitrile	H-NBR	Green, Black
Fluorocarbon	Viton®, FKM	Brown, Black
Ethylene Propylene	EPDM	Black
Silicone	SIL	Orange, Light Blue
Fluoro-Silicone	F-SIL	Blue, White
Perfluoroelastomer	Aflas®	Black
Ultra High Molecular Weight Polyethylene	UHMW	White

Available Materials	Material Code	Material Color
Polyacetal	Pom	White, Black, Orange
Polyetheretherkeytone	Virgin Peek	Tan
Thermoplastic Elastomer	Hytrel	Black, Natural
Polyamid	Nylon	Black, Natural, Orange, Blue
PTFE Filled Polyamid	Turcite X	Turquoise
Polytetrafluoroethylene	Virgin PTFE	White
Polytetrafluoroethylene	TFB40%	Bronze
Polytetrafluoroethylene	TFN Nickel Filled PTFE	Gray
Polytetrafluoroethylene	TFC Carbon Graphite	Black
Composites	Phenolic Polyester, Linen	White, Blue



APPLICATION DATA SHEET

DATE: _____

CONTACT: _____

CUSTOMER: _____

TITLE: _____

ADDRESS: _____

PHONE: _____

FAX: _____

SHAFT DIAMETER: _____

VELOCITY: _____ (RPM, FT/MIN, CYCLES/MIN)

BORE DIAMETER: _____

RUNOUT (TIR): _____

BORE DEPTH: _____

STROKE LENGTH: _____

LEAD-IN CHAMFER SIZE: BORE _____ SHAFT _____

INSTALLATION (IF RECIPROCATING)
_____ IN CYLINDER _____ ON PISTON

EQUIPMENT TYPE: _____

BORE TO SHAFT MISALIGNMENT: _____

NUMBER OF SEALS PER UNIT: _____

SHAFT POSITION: _____ VERTICAL _____ HORIZONTAL

FREQUENCY OF OPERATION (HRS/DAY): _____

DIRECTION OF SHAFT ROTATION:

NUMBER OF UNITS PER YEAR: _____

_____  _____  _____ BOTH

EXPECTED SEAL LIFE: _____

SHAFT MATERIAL: _____

TEMPERATURE: _____ MIN. _____ MAX.

SHAFT SURFACE FINISH: _____

PRESSURE: _____ PSI OPERATING _____ PSI MAX.
_____ PSI SPIKE

SHAFT HARDNESS: _____

MEDIA: _____ SEALED IN
_____ SEALED OUT

BORE MATERIAL: _____

BORE SURFACE FINISH: _____

MEDIA LEVEL:
_____ FULL HEAD _____ HALF SHAFT _____ SPLASH

SHAFT FEATURES:

TYPE OF MOVEMENT:

_____ STATIC _____ ROTARY
_____ RECIPROCATING _____ OSCILLATING

_____ KEYWAY _____ SPLINE
_____ SNAP-RING GROOVE _____ O-RING GROOVE

DIRECTION OF INSTALLATION:

_____ TOWARD MEDIA _____ TOWARD ATMOSPHERE

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Notes

Notes

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