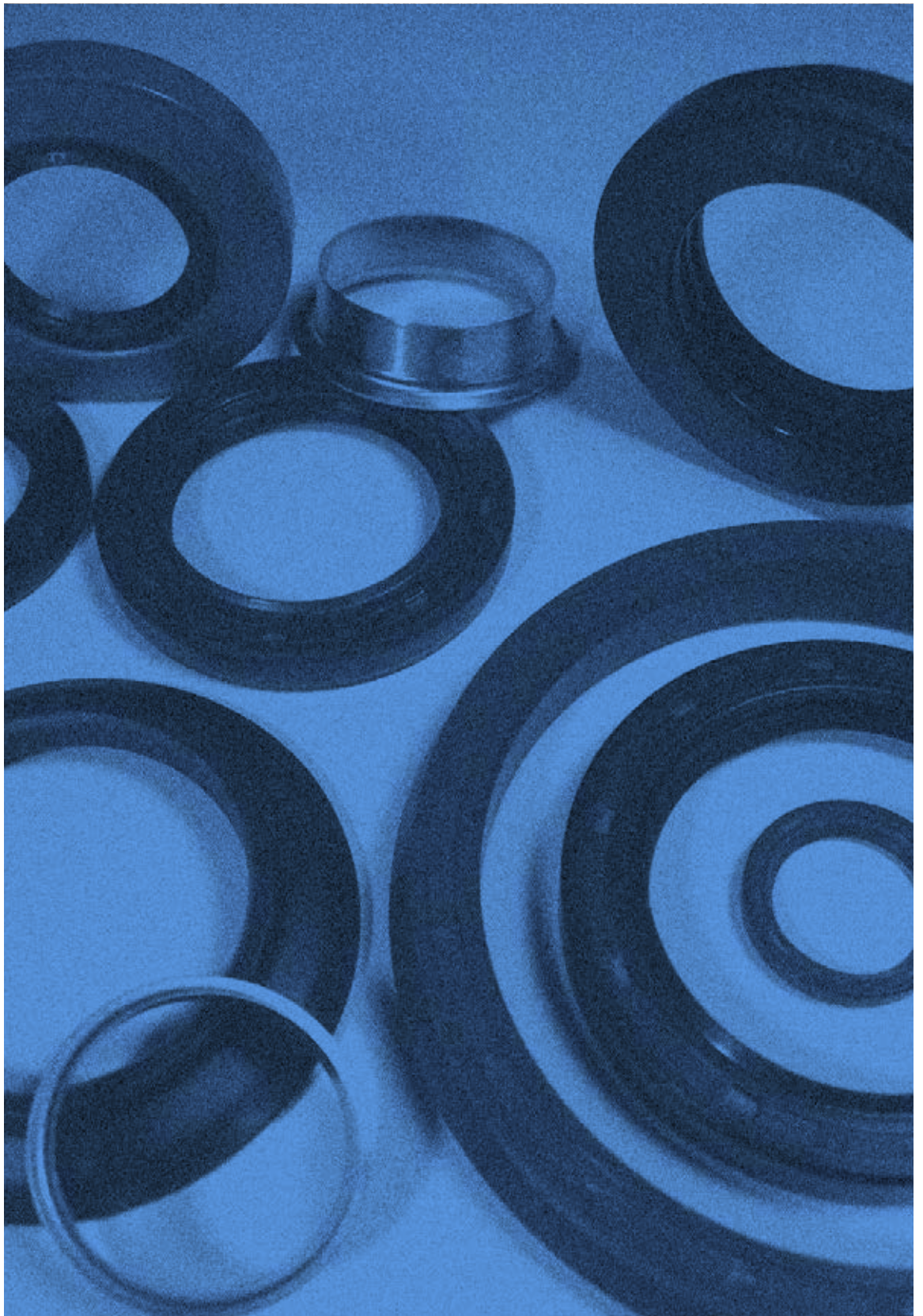


DMR™



www.daemar.com



SHAFT SEALS



For 40 years Daemar® Inc. has remained focused on partnering with our customers to deliver fluid sealing solutions that meet their business challenges. Whether the application is a new design or a maintenance requirement, Daemar's global partnerships offer you one of the most complete sources of supply for Shaft Seals. To ensure that Daemar® consistently meets or exceeds customer requirements, Daemar® is ISO-9001:2008 registered and most suppliers have either TS16949-2000, QS-9000 or ISO-9001:2008 quality registrations.

Daemar® has developed all of the capabilities required to support your lean manufacturing initiatives – providing JIT

delivery, vendor managed inventories and computer systems integration. Supported by the Daemar® regional warehousing network you experience fast, courteous service throughout the world. All of Daemar's locations are fully stocked and staffed with experienced and knowledgeable sales and service professionals. We trust that you will find this catalogue a valuable resource for selecting the appropriate Shaft Seals for your sealing applications. For further selection assistance, pricing and product availability please contact the Daemar® location nearest you.



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ISO-9001:2008 REGISTERED

To consistently meet and exceed our customers' expectations, Daemar®Inc. is ISO-9001: 2008 registered and most of our suppliers are QS-9000 and/or ISO-9000 quality registered.

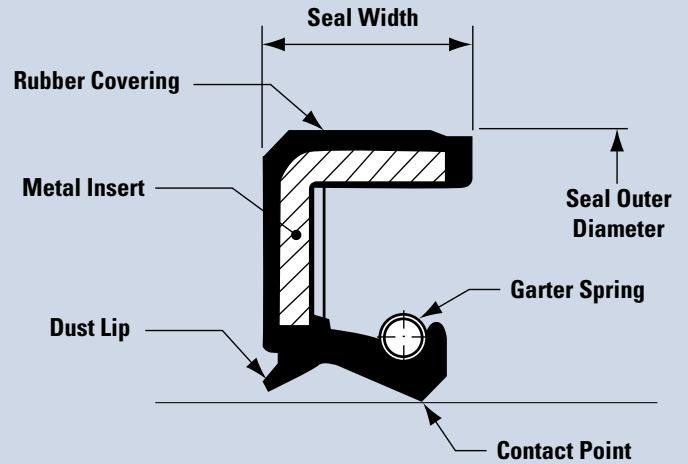


DMR™
ISO 9001:2008
Registered QMS

Introduction

Rotary shaft seals play a key role in extending the operating life of bearing systems and reducing the overall costs of maintaining these systems. The primary function of a rotary shaft seal is to retain bearing system lubricants therefore allowing the bearings to operate in optimal levels of lubrication. The secondary function of a rotary shaft seal is to exclude contaminants from the system, contaminants that can both damage bearings and break down the effectiveness of lubricants. This catalogue provides a listing of Daemar's standard rotary shaft seal styles and sizes. Accommodating shafts ranging from 1/4" to 40". The design guide offers assistance in selecting the appropriate style and material of seal for your particular operating environment. If heat or chemical attack are a concern we offer Viton[®], and polyurethane materials as well as the standard silicones and nitriles. Additionally, design parameters for shaft and bore configurations are provided.

The Construction of DMR™ Shaft Seals



Case Material

Case Material	SAE	Application
Carbon Steel	1008-1010	General Purpose
Stainless Steel	302/304	Corrosive Environments

Spring Materials

Spring Material	SAE	Application
Carbon Spring Steel	1070-1090	General Purpose
Stainless Steel	302/304	Corrosive Environments

SEALING ELEMENT (RUBBER)

An oil seal normally consists of three basic components: Sealing Element, Metal Case, and Spring. The function of an oil seal is to prevent leakage along the shaft. This is mainly achieved by the sealing element. Materials normally used are Nitrile, Acrylic, Silicone, and Fluorinated Rubber.

NITRILE RUBBER (NBR)

NBR is most commonly used material. It has good heat resistance properties, good resistance to oils, salt solutions, hydraulic oils, and gasoline. Operation temperatures are recommended from -40 to 120° C. It also functions well in dry environments, but only for intermittent periods. The disadvantage is poor chemical resistance.

POLYACRYLATE RUBBER (PA)

Acrylic rubber has better heat resistance than Nitrile. It is recommended for high surface speed environments. The operation temperatures are recommended from -20° C to 150° C. It should not be used with water or in temperatures below -20° C.

SILICONE RUBBER (SI)

Silicone compounds operate effectively in a broad temperature range of -50 to 180° C. It is unsurpassed in its resistance to heat and low temperatures. The high lubricant absorbency of silicone

minimizes friction and wear. It is usually used for crank shaft seals. Silicone has poor hydrolysis resistance. It should not be used in oxidized or hypoid oils.

FLUORINATED RUBBER (VI)

Fluorinated rubber is widely known under the DuPont trade name of Viton®. It has the best resistance to chemicals, and superior performance to high temperatures. Though Viton® provides so many good prospects, it has the highest cost.

MATERIAL PERFORMANCE

	NITRILE	PA	SILICONE	VITON
Temp. Range (°C)	-40 to 120	-20 to 150	-50 to 180	-30 to 200
Hardness (Shore)	70/80	70/80	75/85	70/80
Wear Resistance	0	△	X	△
Costs	Most economical	3rd costly	2nd costly	Highest

MATERIAL CHEMICAL RESISTANCE

	NITRILE	PA	SILICONE	VITON
Inorganic acids	△	△	△	△
Organic acids	XX	X	X	△
Alkali	X	0	0	0
Salt	0	0	0	0
Alcohol	XX	0	0	0
Esters	XX	XX	△	XX
Phenol	XX	XX	0	△
Ketones	XX	XX	△	X

0: Applicable

△: Applicable but must be observed

X: Applicable in a limited amount of time

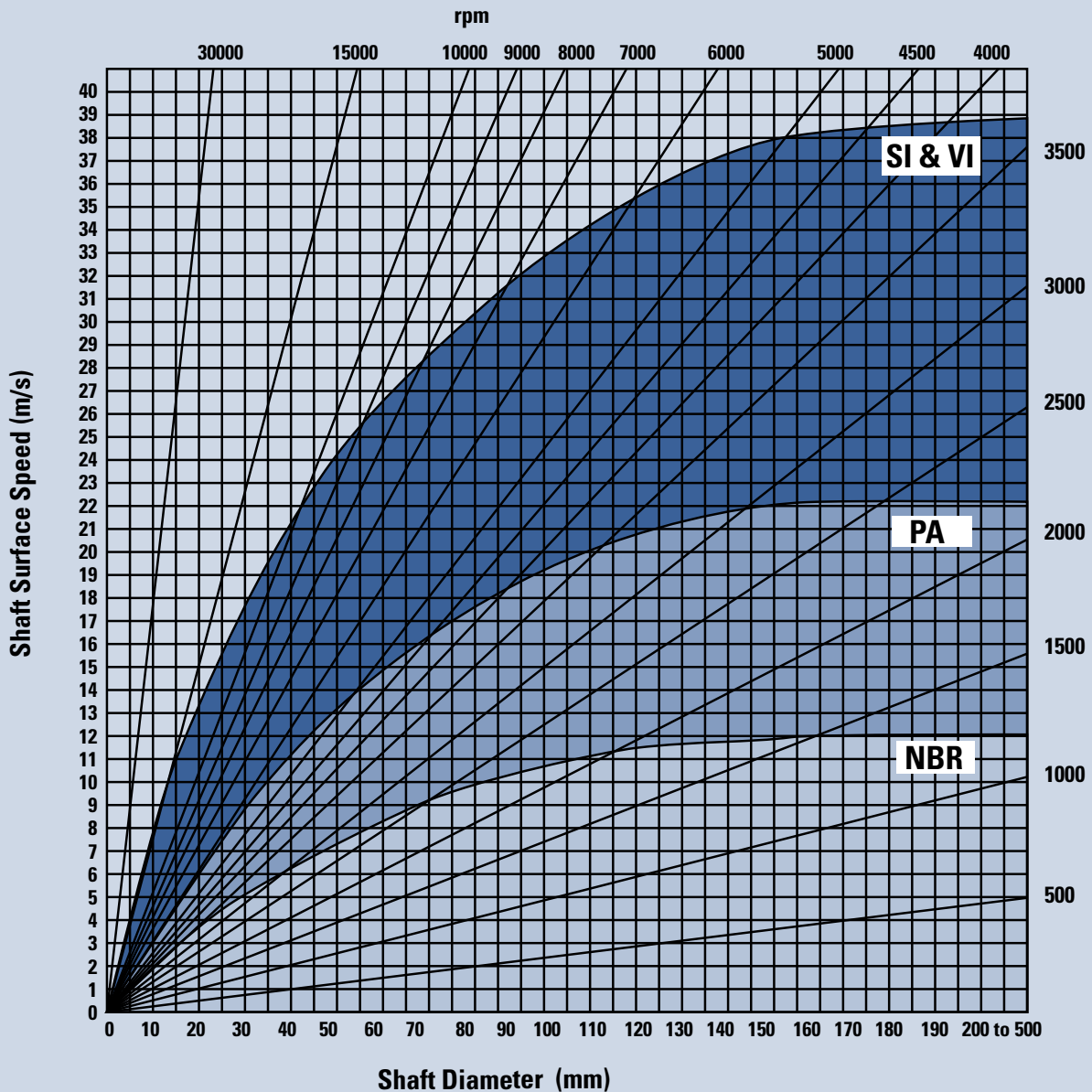
XX: Not applicable

Lubrication

Oil seals are designed to operate with either oil or grease lubrication. Insufficient levels of lubrication cause excessive heat build up and reduce the life expectancy of the seal lip and the shaft. When selecting a lubricant ensure that the lip material is compatible with the lubricant base materials. Before installation both the seal and shaft should be sufficiently lubricated.

RPM AND SURFACE SPEED

The following table shows the permissible surface speed and RPM's for various sealing element materials and shaft diameters.



FPM = shaft diameter in inches X RPM X .262
 m/s = shaft diameter in millimeters X RPM X 0.0000523

Tolerance of DMR™ Shaft Seals

Seal O.D. Tolerance – Metric

Bore Diameter	Tolerance	
	Metal Cased Seal O.D.	Rubber Covered Seal O.D.
up to 50	+0.20	+0.30
	+0.10	+0.15
50 to 80	+0.23	+0.35
	+0.13	+0.20
80 to 120	+0.25	+0.35
	+0.15	+0.20
120 to 180	+0.28	+0.45
	+0.18	+0.25
180 to 300	+0.30	+0.45
	+0.20	+0.25
300 to 500	+0.35	+0.55
	+0.23	+0.30

Seal Width (mm)	Tolerance
up to 10	+/- 0.20
over 10	+/- 0.30

Seal Width (inch)	Tolerance
up to 1.000	+/- 0.015

Seal O.D. Tolerance – 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

The Design of the Shaft

Proper application design assures proper sealing performance. Using the following guide will ensure the best possible sealing environment.

Shaft Material and Finish

Seals perform best on medium to high carbon steel (SAE 1035, 1045) or stainless steel. The shaft must be hardened to Rockwell C45 minimum. We recommend the shaft to be machined to a surface roughness of 0.20 to 0.8 $\mu\text{m Ra}$ (8 to 32 $\mu\text{in Ra}$). This shaft finish can be best obtained by plunge grinding.

Shaft Tolerance in Inches

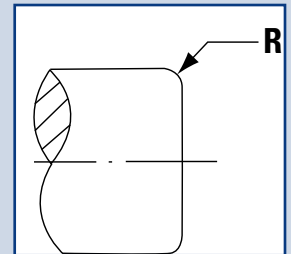
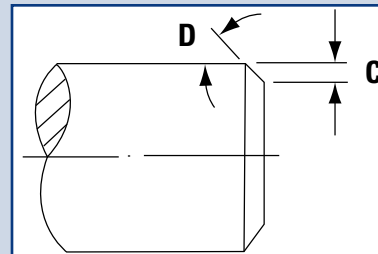
Nominal Shaft Diameter	Tolerance
up to 4.000	+/- 0.003
4.000 to 6.000	+/- 0.004
6.000 to 10.000	+/- 0.005
over 10.000	+/- 0.006

Shaft Tolerance in Metric

Nominal Shaft Diameter	Tolerance
0 to 3	+ 0.000 / -0.060
3 to 6	+ 0.000 / -0.075
6 to 10	+ 0.000 / -0.090
10 to 18	+ 0.000 / -0.110
18 to 30	+ 0.000 / -0.130
30 to 50	+ 0.000 / -0.160
50 to 80	+ 0.000 / -0.190
80 to 120	+ 0.000 / -0.220
120 to 180	+ 0.000 / -0.250
180 to 250	+ 0.000 / -0.290
250 to 315	+ 0.000 / -0.320
315 to 400	+ 0.000 / -0.360
400 to 500	+ 0.000 / -0.400

Shaft Lead-in Chamfer

The end of the shaft must be chamfered, corners must be rounded, free from burrs and sharp edges to protect seals from damage during assembly.



Shaft Diameter (mm)	C (mm)	R (mm)	D
up to 30.0	1.5	4.5	15°
30.1 to 80.0	2.0		
80.1 to 120.0	2.5	6.0	
120.1 to 250.0	3		
250.1 to 500.0	5	9.5	

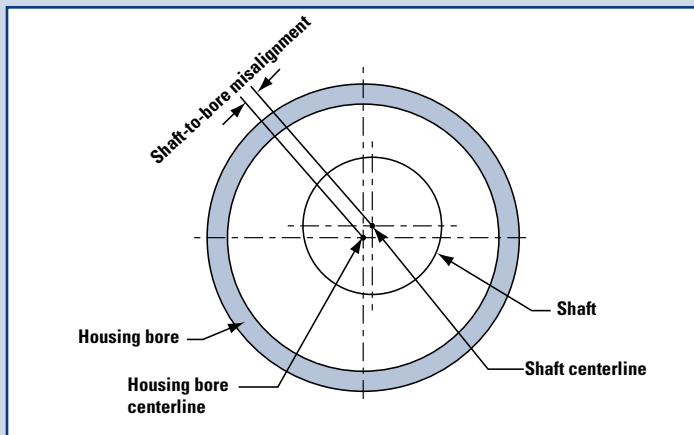
Shaft Diameter (inches)	C (inches)	R (inches)	D
up to 1.182	0.060	0.177	15°
1.183 to 3.151	0.079		
3.152 to 4.726	0.098	0.236	
4.727 to 9.846	0.118		
9.847 to 19.693	0.197	0.374	

Shaft Eccentricity

There are two types of shaft eccentricities that affect the seal's performance. They are Shaft to Bore Misalignment and Dynamic Run-Out.

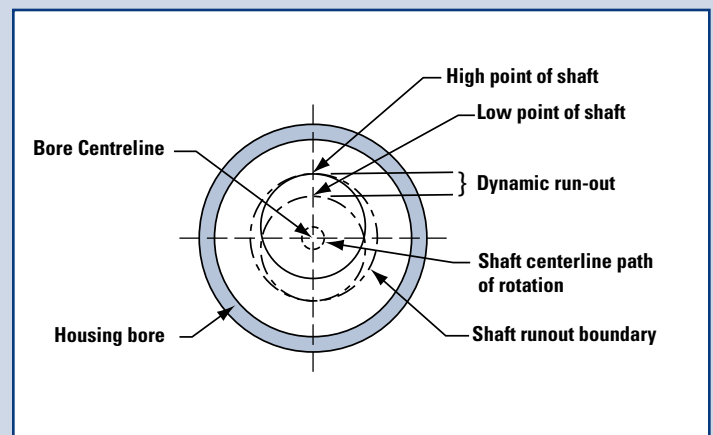
Shaft-to-Bore Misalignment

Shaft-to-bore misalignment is the distance that the centre of shaft rotation is from the centre of the bore. This situation causes excess sealing lip wear, and poor contact between the lip and shaft on the opposite side.

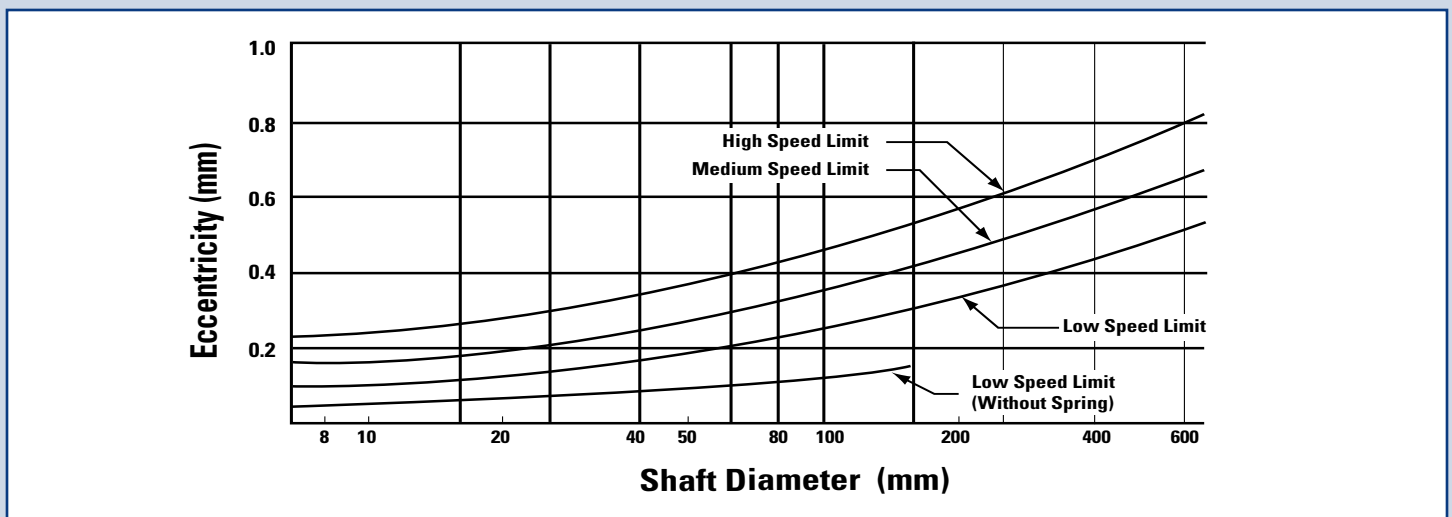


Dynamic Run-Out

Dynamic run-out is twice the distance the centre of shaft is displaced from the actual centre of rotation. Meaning that the shaft is not rotating around its centre, causing the lip to flex in and out in order to maintain shaft contact. In the extreme the lip will not be able to provide the required seal.



Shaft Eccentricity Limits



Bore Material

Steel and cast iron are typically used for bore housings as they provide a good surface for accepting both metal and rubber O.D. seals. For soft metal, such as Aluminum, a rubber O.D. is recommended. There is no recommended Rockwell hardness for the bore. However, the bore should be of sufficient hardness to withstand the seal's O.D.

Bore Finish

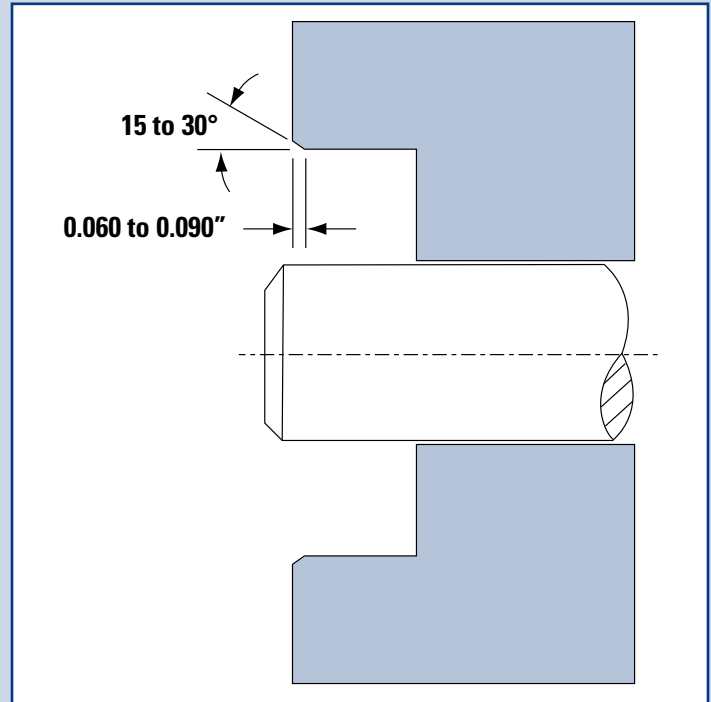
The bore finish should be 0.8 to 1.6 $\mu\text{m Ra}$ (32 to 64 $\mu\text{in Ra}$) for metal O.D. seals and should be 2.5 to 5.0 $\mu\text{m Ra}$ (100 to 200 $\mu\text{in Ra}$) for rubber O.D. seals. If surface roughness exceeds this then paint sealant can be added to the O.D. of the metal seal.

Bore Tolerances in Metric

Bore Diameter	Bore Tolerance
up to 6	+ 0.018 / - 0.000
6 to 10	+ 0.022 / - 0.000
10 to 18	+ 0.027 / - 0.000
18 to 30	+ 0.033 / - 0.000
30 to 50	+ 0.039 / - 0.000
50 to 80	+ 0.046 / - 0.000
80 to 120	+ 0.054 / - 0.000
120 to 180	+ 0.063 / - 0.000
180 to 250	+ 0.072 / - 0.000
250 to 315	+ 0.081 / - 0.000
315 to 400	+ 0.089 / - 0.000
400 to 500	+ 0.097 / - 0.000

Bore Lead-in Chamfer

The lead corner, or entering edge of the bore should be chamfered and free of burrs (See figure below).



Bore Tolerance in Inches

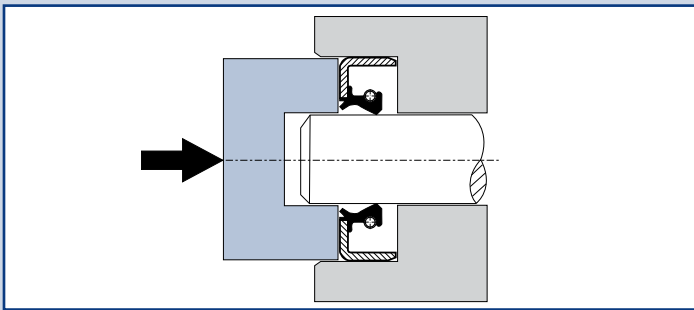
Bore Diameter	Bore Tolerance
up to 3.000	+/- 0.001
3.001 to 6.000	+/- 0.0015
6.001 to 10.000	+/- 0.002
10.001 to 20.000	+ 0.002 - 0.004
20.001 to 40.000	+0.002 - 0.006
40.001 to 60.000	+0.002 - 0.010

1. Clean seal bore and shaft and remove all burrs and nicks.
2. Pre-lubricate the seal ID and shaft before installing the seal into the cavity. Use a pre-lube that is compatible with the system lubricant. The pre-lube will make the seal easier to install and prevent dry running during initial start-up.
3. Protect seal lip against damage from sharp keyways, splines and screw threads. This can be done by either taping the keyway, inserting an element into the keyway or using an assembly sleeve that fits over the shaft.
4. Point seal lip in correct direction and push to edge of the counterbore.
5. Slide the seal over the shaft to the seal housing. With finger pressure, start seal into housing with a slight rotating motion until seal has a light press fit in the housing. Be sure seal is square or perpendicular to the shaft. If the seal is crooked or cocked, continuing with installation will damage the seal.
6. Finish installation by using a tool appropriate for your seal/

housing configuration. Drive seal to final position. If using a plate, the plate diameter should be large enough so it contacts the face of seal housing. This will ensure seal is positioned straight and perpendicular to the shaft.

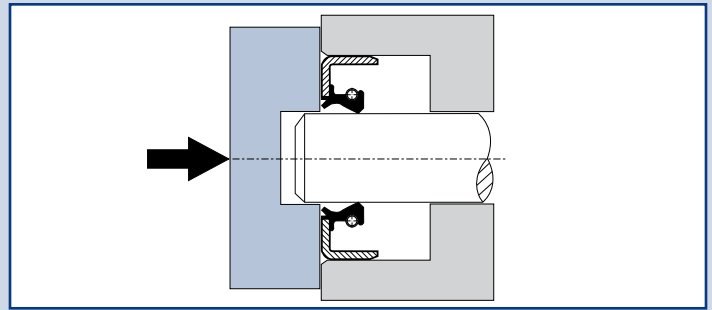
Counter Bore Installation

Seal is positioned square by seating against counter bore.



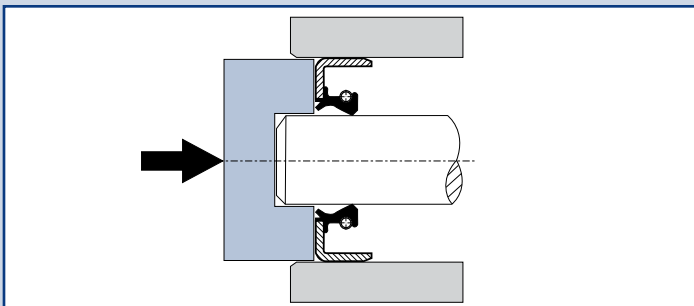
Counter Bore Installation – Flush Mount

Tool bottoms out against machined face of housing to position seal.



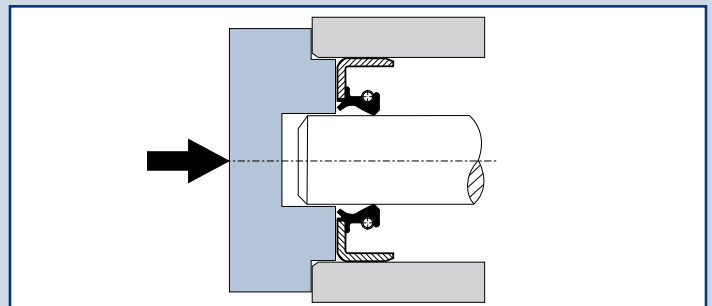
Through Bore – Recessed Installation

Tool bottoms out against end of shaft to position seal in housing.

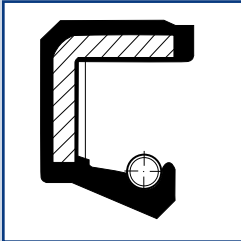


Through Bore – Tool Flush Installation

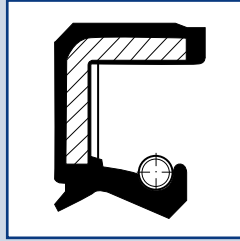
Tool bottoms out against machined face of housing to position seal.



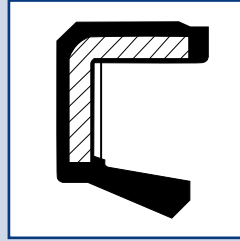
Type A



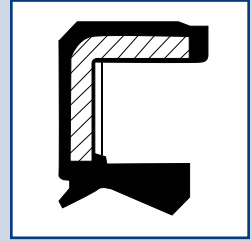
Type AS



Type AO



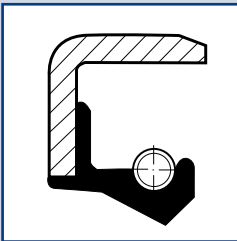
Type AOS



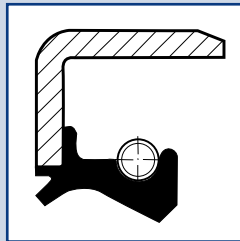
A Series

The rubber elastomer outer covering tolerates thermal expansion as well as roughness in the housing bore. There will be no fretting corrosion. Furthermore, damage of the housing bore will be prevented when frequently replaced. This qualifies for sealing gaseous or liquid media.

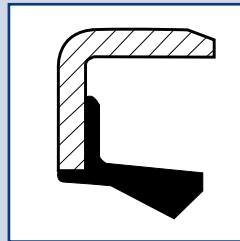
Type B



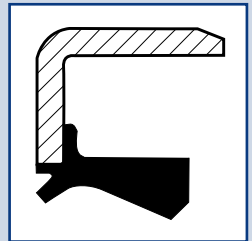
Type BS



Type BO



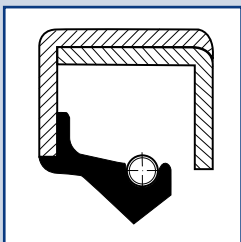
Type BOS



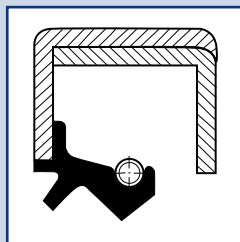
B Series

Metallic casing enables easier fitting. However, this type of seal demands closer tolerances in the housing bore to ensure proper sealing on the outer covering.

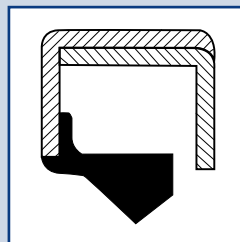
Type C



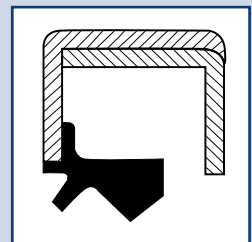
Type CS



Type CO



Type COS



C SERIES

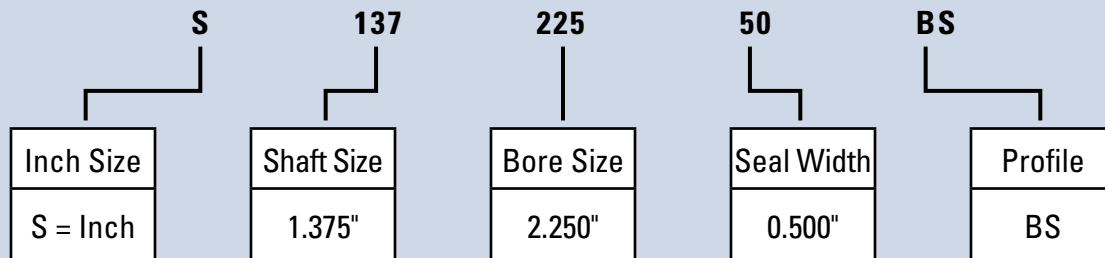
Metallic casing and reinforcing cap. Sealing and mounting identical with type B. Preferentially applied in case of rougher operating conditions and where larger dimensions are utilized. Less delicate in case of incorrect mounting due to reinforcing cap.

Cross Reference / Interchange Table

DMR™	BS	CS	B	A	C	AS
CR/SKF	CRWA1	CRWA1	CRW1	HMS4	CRWH1	HMSA7
NAK/TCM	TB	TA	SB	SC	SA	TC
National	47	41	48	35	45	32
NOK	TB	TA	SB	SC	SA	TC
Garlock	76	-	71, 91	92	68	94

PART NUMBERING SYSTEM – DMR INCH OIL SEALS

Example: S13722550BS



DMR SEAL #	I.D.	O.D.	W
S01806631AS	0.189	0.669	0.315
S01807031AS	0.189	0.709	0.315
S02305719A	0.236	0.571	0.197
S02307529A	0.233	0.750	0.295
S02505727AS	0.256	0.571	0.276
S02507425B	0.250	0.749	0.252
S02507524A	0.250	0.750	0.244
S02507525B	0.250	0.750	0.252
S02508725B	0.250	0.875	0.252
S02511839AS	0.250	1.181	0.394
S02806225B	0.281	0.626	0.252
S03105612A	0.310	0.563	0.126
S03106215A	0.312	0.625	0.157
S03106326AS	0.312	0.635	0.264
S03106527A	0.315	0.650	0.276
S03106831BS	0.311	0.686	0.311
S03107517B	0.313	0.751	0.173
S03107525A	0.313	0.750	0.252
S03108625A	0.313	0.865	0.252
S03108627B	0.315	0.866	0.276
S03108725B	0.313	0.875	0.252
S03408219AS	0.348	0.827	0.197
S03508627A	0.354	0.866	0.276
S03706815AS	0.372	0.687	0.157
S03707518A	0.375	0.750	0.189
S03707525A	0.375	0.750	0.252
S03707525BS	0.375	0.750	0.252
S03707819A	0.375	0.787	0.197
S03708125A	0.375	0.817	0.252
S03708231B	0.374	0.827	0.315
S03708731A	0.375	0.875	0.311
S03709931B	0.375	0.999	0.311
S03906621B	0.394	0.669	0.217
S03907015A	0.391	0.700	0.157
S03907017B	0.394	0.705	0.170

DMR SEAL #	I.D.	O.D.	W
S03907418B	0.394	0.746	0.189
S04006615B	0.406	0.669	0.157
S04208721A	0.427	0.875	0.213
S04308725AS	0.437	0.875	0.252
S04309024A	0.436	0.906	0.248
S04309418A	0.437	0.940	0.189
S04309925AS	0.434	0.999	0.252
S04309937B	0.434	0.999	0.374
S04310025AS	0.437	1.000	0.252
S04311219A	0.433	1.124	0.197
S04312525AS	0.437	1.259	0.252
S04408725A	0.442	0.875	0.252
S04509439AS	0.457	0.945	0.394
S04607819AS	0.469	0.787	0.197
S04609819A	0.469	0.984	0.197
S04708627B	0.472	0.866	0.276
S04907419AS	0.492	0.748	0.197
S04908623A	0.492	0.866	0.236
S04908623AS	0.492	0.866	0.236
S04908831BS	0.496	0.881	0.312
S04909925BS	0.494	0.991	0.250
S04910025BS	0.494	1.003	0.250
S04911027A	0.492	1.102	0.276
S04911835A	0.492	1.181	0.354
S05007416B	0.500	0.749	0.165
S05007416BS	0.500	0.749	0.165
S05008618A	0.500	0.863	0.189
S05008725A	0.500	0.875	0.252
S05008725A	0.500	0.875	0.252
S05008725AS	0.500	0.875	0.252
S05008731A	0.500	0.871	0.311
S05008731B	0.500	0.875	0.311
S05009318BS	0.500	0.936	0.189
S05009827A	0.504	0.984	0.276
S05009925A	0.500	0.999	0.252

DMR SEAL #	I.D.	O.D.	W
S05009925B	0.500	0.999	0.252
S05009925BS	0.500	0.999	0.252
S05010022A	0.500	1.000	0.220
S05010025A	0.500	1.000	0.252
S05010025AS	0.500	1.000	0.252
S05010025B	0.500	1.000	0.252
S05010025BS	0.500	1.000	0.252
S05010031AS	0.500	1.000	0.311
S05010037B	0.500	1.000	0.374
S05011027A	0.504	1.102	0.276
S05011224A	0.508	1.127	0.244
S05011225A	0.500	1.124	0.252
S05011225B	0.500	1.124	0.252
S05011225BS	0.500	1.124	0.252
S05011231A	0.500	1.125	0.311
S05011835A	0.500	1.181	0.354
S05012525B	0.500	1.250	0.252
S05012525BS	0.500	1.250	0.252
S05012625A	0.500	1.260	0.252
S05013740AS	0.500	1.378	0.406
S05309419AS	0.539	0.945	0.197
S05507813B	0.551	0.787	0.138
S05508923AS	0.551	0.894	0.236
S05509427B	0.551	0.945	0.276
S05512525B	0.559	1.250	0.252
S05608718B	0.563	0.875	0.189
S05609925A	0.563	0.995	0.252
S05609937B	0.563	0.999	0.374
S05610018B	0.563	1.000	0.189
S05610025AS	0.563	1.000	0.252
S05610031B	0.563	1.000	0.311
S05611225BS	0.563	1.125	0.252
S05611231A	0.562	1.124	0.311
S05611231B	0.563	1.125	0.311
S05611253BS	0.563	1.124	0.531

DMR SEAL #	I.D.	O.D.	W
S05613725BS	0.563	1.378	0.252
S05615525BS	0.563	1.558	0.252
S05708917A	0.571	0.890	0.177
S05709423AS	0.575	0.945	0.236
S05710218AS	0.571	1.024	0.189
S05711619BS	0.578	1.161	0.197
S05810527A	0.580	1.051	0.276
S05810625AS	0.581	1.063	0.256
S05811819A	0.580	1.181	0.197
S05811821AS	0.583	1.181	0.217
S05811827A	0.580	1.181	0.276
S05811831A	0.583	1.181	0.315
S05812627AS	0.583	1.260	0.276
S05814127A	0.580	1.417	0.276
S05910019AS	0.591	1.004	0.197
S05911225A	0.594	1.124	0.252
S05913722BS	0.591	1.377	0.224
S05915031BS	0.594	1.500	0.315
S06010018A	0.609	1.000	0.189
S06112423A	0.610	1.249	0.236
S06201025A	0.625	0.102	0.252
S06209318A	0.625	0.938	0.189
S06209925A	0.625	0.999	0.252
S06209925BS	0.625	0.999	0.252
S06210018A	0.625	1.000	0.189
S06210025A	0.625	1.000	0.252
S06210025AS	0.625	1.000	0.252
S06210025BS	0.625	1.003	0.250
S06210629BS	0.625	1.062	0.299
S06211225A	0.625	1.125	0.252
S06211225AS	0.625	1.125	0.252
S06211225B	0.625	1.124	0.252
S06211225BS	0.625	1.124	0.252
S06211227A	0.628	1.125	0.276
S06211228BS	0.625	1.124	0.280

DMR SEAL #	I.D.	O.D.	W
S06211231B	0.625	1.125	0.311
S06211231C	0.625	1.125	0.311
S06211237B	0.625	1.126	0.375
S06212125B	0.624	1.216	0.250
S06212525A	0.625	1.250	0.252
S06212525AS	0.625	1.250	0.252
S06212525B	0.625	1.250	0.252
S06212525BS	0.625	1.250	0.252
S06212531B	0.625	1.250	0.311
S06213725A	0.625	1.375	0.252
S06213725AS	0.625	1.375	0.252
S06213725B	0.625	1.375	0.252
S06213725BS	0.625	1.375	0.252
S06213727A	0.627	1.378	0.276
S06213731B	0.625	1.375	0.311
S06213737AS	0.625	1.377	0.374
S06213740A	0.625	1.375	0.406
S06214925B	0.625	1.499	0.252
S06214925BS	0.625	1.499	0.252
S06215029B	0.625	1.500	0.299
S06215731BS	0.625	1.575	0.311
S06215737AS	0.625	1.575	0.374
S06308613B	0.630	0.866	0.138
S06311027A	0.630	1.102	0.276
S06411231BS	0.647	1.124	0.311
S06510031A	0.650	1.004	0.315
S06511825AS	0.659	1.181	0.256
S06515725AS	0.656	1.575	0.252
S06609918B	0.669	0.999	0.189
S06610625B	0.669	1.063	0.252
S06611021B	0.661	1.102	0.217
S06611023BS	0.661	1.102	0.236
S06611023AS	0.665	1.102	0.236
S06611027B	0.669	1.102	0.276
S06611818A	0.667	1.187	0.189

DMR SEAL #	I.D.	O.D.	W
S06611818B	0.667	1.187	0.189
S06612227BS	0.665	1.220	0.276
S06613743A	0.661	1.378	0.433
S06711218B	0.672	1.125	0.189
S06809918B	0.687	0.999	0.189
S06810018B	0.687	1.000	0.189
S06810620A	0.687	1.063	0.209
S06810620A	0.687	1.063	0.209
S06811225A	0.687	1.125	0.252
S06811225AS	0.687	1.125	0.252
S06811225BS	0.687	1.124	0.252
S06811818B	0.687	1.187	0.189
S06811827AS	0.685	1.181	0.276
S06812525A	0.687	1.250	0.252
S06812525BS	0.687	1.250	0.252
S06813737B	0.680	1.373	0.374
S07012525AS	0.709	1.252	0.252
S07316231A	0.730	1.625	0.311
S07411019A	0.744	1.102	0.197
S07411019AS	0.744	1.102	0.197
S07411819A	0.744	1.181	0.197
S07411819AS	0.744	1.181	0.197
S07510015BS	0.750	1.000	0.150
S07510018B	0.750	1.000	0.189
S07511217B	0.750	1.124	0.177
S07511218A	0.750	1.125	0.189
S07511218B	0.750	1.125	0.189
S07511218B	0.750	1.128	0.188
S07511218BS	0.750	1.124	0.189
S07511225AS	0.750	1.125	0.252
S07511225AS	0.750	1.125	0.252
S07511225BS	0.750	1.125	0.252
S07511825B	0.750	1.187	0.252
S07512423A	0.750	1.248	0.236
S07512425AS	0.750	1.248	0.252

DMR SEAL #	I.D.	O.D.	W
S07512525A	0.750	1.250	0.252
S07512525A	0.750	1.250	0.252
S07512525AS	0.750	1.250	0.252
S07512525B	0.750	1.250	0.252
S07512525BS	0.750	1.250	0.252
S07512531AS	0.750	1.250	0.311
S07512531BS	0.750	1.250	0.311
S07512543BS	0.750	1.254	0.437
S07513131BS	0.750	1.311	0.311
S07513725A	0.750	1.375	0.252
S07513725B	0.750	1.375	0.252
S07513725BS	0.750	1.375	0.252
S07513731A	0.750	1.375	0.311
S07513731A	0.750	1.375	0.311
S07513731BS	0.750	1.379	0.312
S07513737B	0.750	1.373	0.374
S07513831BS	0.750	1.381	0.312
S07514931BS	0.750	1.499	0.311
S07514953CS	0.750	1.499	0.531
S07515025AS	0.750	1.500	0.252
S07515025AS	0.750	1.500	0.252
S07515031A	0.750	1.500	0.311
S07515031B	0.750	1.500	0.311
S07515031CS	0.750	1.500	0.311
S07515731AS	0.750	1.575	0.311
S07516231B	0.750	1.625	0.311
S07517827AS	0.750	1.781	0.276
S07520431AS	0.750	2.047	0.311
S07611627B	0.768	1.161	0.276
S07612627AS	0.768	1.260	0.276
S07713727A	0.772	1.378	0.276
S07811023B	0.787	1.102	0.236
S07811819AS	0.780	1.181	0.197
S07812227B	0.787	1.220	0.276
S07813721B	0.780	1.378	0.217

DMR SEAL #	I.D.	O.D.	W
S07814127AS	0.780	1.417	0.276
S07815733AS	0.783	1.575	0.335
S07816217A	0.787	1.624	0.177
S07816223AS	0.787	1.624	0.236
S07816227AS	0.787	1.624	0.276
S07817531BS	0.781	1.752	0.311
S07818531AS	0.781	1.850	0.311
S07818537AS	0.781	1.850	0.374
S07820433AS	0.780	2.047	0.335
S08011427AS	0.807	1.142	0.276
S08111218BS	0.813	1.124	0.189
S08111825A	0.813	1.188	0.252
S08112523BS	0.813	1.250	0.232
S08112531BS	0.813	1.251	0.315
S08112537A	0.813	1.251	0.374
S08112539A	0.813	1.250	0.390
S08113725BS	0.813	1.375	0.252
S08215031B	0.822	1.500	0.311
S08612621B	0.866	1.260	0.217
S08613125B	0.865	1.312	0.252
S08613731B	0.866	1.378	0.315
S08616223AS	0.866	1.624	0.236
S08624421A	0.866	2.442	0.213
S08712518A	0.875	1.250	0.189
S08712518B	0.875	1.250	0.189
S08712518BS	0.875	1.250	0.189
S08712518AS	0.878	1.250	0.189
S08712522AS	0.875	1.253	0.220
S08712525B	0.874	1.250	0.252
S08712525A	0.875	1.250	0.252
S08712525B	0.875	1.250	0.252
S08712615A	0.874	1.260	0.157
S08712625B	0.875	1.260	0.252
S08713025AS	0.875	1.308	0.252
S08713725A	0.875	1.375	0.252

DMR SEAL #	I.D.	O.D.	W
S08713725B	0.875	1.375	0.252
S08713725BS	0.875	1.375	0.252
S08713731A	0.874	1.378	0.315
S08713731B	0.875	1.376	0.311
S08713731BS	0.875	1.375	0.311
S08713737A	0.875	1.375	0.374
S08713825AS	0.875	1.381	0.252
S08713837AS	0.875	1.384	0.374
S08714925B	0.870	1.499	0.252
S08714931AS	0.871	1.499	0.311
S08715025A	0.875	1.500	0.252
S08715031AS	0.874	1.500	0.311
S08715031BS	0.875	1.500	0.311
S08715037A	0.875	1.500	0.374
S08715718B	0.875	1.575	0.185
S08715728AS	0.875	1.578	0.283
S08716225BS	0.875	1.624	0.252
S08718725BS	0.875	1.875	0.252
S08813731B	0.882	1.378	0.315
S08813731AS	0.886	1.378	0.315
S08824437AS	0.889	2.441	0.374
S09014935B	0.909	1.499	0.358
S09215023A	0.925	1.500	0.236
S09313725BS	0.937	1.375	0.252
S09314925AS	0.937	1.499	0.252
S09318243B	0.937	1.828	0.437
S09320431AS	0.937	2.048	0.311
S09414925BS	0.942	1.496	0.252
S09616231B	0.969	1.624	0.311
S09616831BS	0.969	1.685	0.311
S09620437AS	0.969	2.048	0.374
S09624425AS	0.969	2.440	0.252
S09812525BS	0.985	1.259	0.252
S09813723A	0.984	1.377	0.236
S09816223AS	0.984	1.624	0.236

DMR SEAL #	I.D.	O.D.	W
S09816227AS	0.984	1.622	0.276
S09816227BS	0.984	1.622	0.276
S09816231AS	0.984	1.624	0.315
S09817531A	0.984	1.752	0.315
S09820425AS	0.984	2.047	0.252
S09917537BS	0.997	1.750	0.374
S10013116AS	1.000	1.312	0.161
S10013718B	1.000	1.375	0.189
S10013725BS	1.000	1.375	0.252
S10014324A	1.000	1.437	0.248
S10014325AS	1.000	1.437	0.252
S10014325B	1.000	1.437	0.252
S10014331BS	1.000	1.437	0.311
S10014925AS	1.000	1.499	0.252
S10014925B	1.000	1.499	0.252
S10014925BS	1.000	1.499	0.252
S10014931AS	1.000	1.499	0.315
S10014937BS	1.000	1.499	0.374
S10015025A	1.000	1.500	0.252
S10015025B	1.000	1.503	0.250
S10015031AS	1.000	1.500	0.311
S10015031B	1.000	1.500	0.311
S10015031BS	1.000	1.503	0.312
S10015040B	1.000	1.500	0.406
S10015050BS	1.000	1.500	0.500
S10015637B	1.000	1.562	0.374
S10015727AS	1.000	1.575	0.276
S10015731BS	1.000	1.573	0.311
S10016225AS	1.000	1.629	0.252
S10016225BS	1.000	1.624	0.252
S10016231AS	1.000	1.625	0.311
S10016231BS	1.000	1.624	0.311
S10017520A	1.000	1.750	0.205
S10017525BS	1.000	1.750	0.252
S10017537A	1.000	1.750	0.374

DMR SEAL #	I.D.	O.D.	W
S10017537AS	1.000	1.750	0.374
S10017825AS	1.000	1.782	0.252
S10018243B	1.000	1.828	0.437
S10018325AS	1.000	1.833	0.252
S10018525AS	1.000	1.851	0.252
S10018725B	1.000	1.874	0.252
S10019625AS	1.000	1.967	0.252
S10019725AS	1.000	1.979	0.252
S10019831AS	1.000	1.983	0.311
S10020025A	1.000	2.000	0.252
S10020427AS	1.000	2.047	0.276
S10020437AS	1.000	2.047	0.374
S10024437AS	1.000	2.441	0.374
S10214931AS	1.024	1.495	0.315
S10314618A	1.033	1.469	0.189
S10614925A	1.063	1.498	0.252
S10615118A	1.063	1.515	0.189
S10616225AS	1.063	1.624	0.252
S10616831BS	1.063	1.686	0.311
S10618529AS	1.063	1.850	0.295
S10618725B	1.063	1.875	0.252
S10618731BS	1.063	1.875	0.311
S10620037AS	1.062	2.000	0.374
S11016231AS	1.102	1.624	0.315
S11214920A	1.129	1.496	0.201
S11215025A	1.125	1.500	0.252
S11215625AS	1.125	1.563	0.252
S11215731AS	1.126	1.575	0.315
S11216224B	1.126	1.625	0.248
S11216224B	1.126	1.625	0.248
S11216225A	1.125	1.622	0.256
S11216225B	1.125	1.628	0.250
S11216225BS	1.125	1.624	0.252
S11216231B	1.125	1.625	0.311
S11216250BS	1.125	1.625	0.500

DMR SEAL #	I.D.	O.D.	W
S11216325B	1.125	1.630	0.250
S11216831AS	1.125	1.686	0.311
S11217525AS	1.125	1.752	0.252
S11217531CS	1.125	1.752	0.311
S11217825AS	1.125	1.781	0.252
S11217840AS	1.125	1.781	0.409
S11217850AS	1.125	1.781	0.500
S11218231B	1.125	1.828	0.311
S11218531AS	1.125	1.850	0.311
S11218731BS	1.125	1.874	0.311
S11218736B	1.125	1.873	0.362
S11218737A	1.125	1.875	0.374
S11218737AS	1.125	1.875	0.374
S11218743B	1.125	1.875	0.437
S11219725AS	1.125	1.979	0.252
S11220431AS	1.125	2.047	0.311
S11220650CS	1.125	2.062	0.500
S11224431AS	1.125	2.441	0.311
S11415723AS	1.142	1.575	0.236
S11515018AS	1.156	1.500	0.189
S11515731AS	1.156	1.575	0.311
S11515731BS	1.156	1.575	0.311
S11516831BS	1.156	1.686	0.311
S11520625AS	1.156	2.062	0.252
S11814919AS	1.187	1.496	0.197
S11816231BS	1.181	1.624	0.315
S11816531BS	1.187	1.654	0.315
S11816825A	1.187	1.687	0.252
S11816825B	1.187	1.687	0.252
S11816837B	1.187	1.686	0.374
S11817149AS	1.187	1.715	0.492
S11818427AS	1.181	1.843	0.276
S11818725B	1.187	1.875	0.252
S11818731B	1.187	1.875	0.311
S11820037AS	1.187	2.000	0.374

DMR SEAL #	I.D.	O.D.	W
S11820043B	1.187	2.000	0.437
S11820437AS	1.187	2.041	0.374
S11821037AS	1.187	2.106	0.374
S11916825BS	1.190	1.687	0.252
S12119825AS	1.219	1.983	0.252
S12417539AS	1.246	1.751	0.390
S12417731AS	1.240	1.772	0.315
S12417731AS	1.240	1.772	0.315
S12420431AS	1.240	2.047	0.315
S12516218AS	1.250	1.625	0.189
S12516539AS	1.252	1.654	0.394
S12516825A	1.250	1.686	0.252
S12516825AS	1.250	1.687	0.252
S12516825AS	1.250	1.687	0.252
S12516825AS	1.250	1.687	0.252
S12516831AS	1.250	1.687	0.311
S12516831BS	1.250	1.687	0.311
S12516925B	1.250	1.690	0.250
S12517425A	1.250	1.748	0.256
S12517425BS	1.250	1.749	0.252
S12517525A	1.250	1.750	0.252
S12517525AS	1.250	1.753	0.252
S12517525BS	1.250	1.752	0.252
S12517531BS	1.250	1.756	0.312
S12517539AS	1.250	1.752	0.390
S12518725BS	1.250	1.878	0.250
S12518737AS	1.250	1.879	0.374
S12518843AS	1.250	1.880	0.437
S12518931AS	1.250	1.890	0.315
S12519825A	1.250	1.980	0.252
S12520025A	1.250	2.000	0.252
S12520025BS	1.250	2.000	0.252
S12520031AS	1.250	2.000	0.311
S12520037A	1.250	2.000	0.374
S12520043A	1.250	2.000	0.437

DMR SEAL #	I.D.	O.D.	W
S12520043CS	1.250	2.000	0.437
S12520429AS	1.250	2.047	0.295
S12523731AS	1.250	2.374	0.311
S12524331BS	1.250	2.437	0.311
S12524337B	1.250	2.437	0.374
S12524431AS	1.250	2.440	0.311
S12528337AS	1.250	2.835	0.374
S12617547AS	1.260	1.752	0.472
S12618727AS	1.260	1.870	0.276
S12819350AS	1.281	1.937	0.500
S12820037AS	1.281	2.000	0.374
S12917331BS	1.299	1.732	0.315
S12920031BS	1.290	2.000	0.311
S13116825AS	1.311	1.686	0.252
S13118237B	1.313	1.828	0.374
S13118425A	1.313	1.843	0.252
S13121231AS	1.313	2.125	0.311
S13121231BS	1.313	2.125	0.311
S13121637BS	1.319	2.165	0.374
S13421231A	1.344	2.124	0.311
S13520631A	1.358	2.063	0.315
S13521243A	1.358	2.126	0.433
S13622425A	1.363	2.242	0.252
S13717327BS	1.378	1.732	0.276
S13717418B	1.375	1.749	0.189
S13717522BS	1.375	1.750	0.220
S13717525AS	1.375	1.753	0.252
S13718225A	1.375	1.828	0.252
S13718237B	1.375	1.828	0.374
S13718725A	1.375	1.875	0.252
S13718725AS	1.375	1.875	0.252
S13718731A	1.375	1.874	0.311
S13718731B	1.375	1.874	0.311
S13719323B	1.375	1.937	0.232
S13719437AS	1.375	1.947	0.374

DMR SEAL #	I.D.	O.D.	W
S13719450BS	1.375	1.947	0.500
S13719531AS	1.375	1.959	0.311
S13719931BS	1.375	1.996	0.311
S13719937A	1.375	1.998	0.374
S13720031A	1.375	2.000	0.311
S13720031AS	1.375	2.000	0.311
S13720625A	1.375	2.062	0.252
S13720631A	1.375	2.063	0.311
S13720631AS	1.375	2.062	0.311
S13720635AS	1.372	2.061	0.354
S13720637A	1.375	2.062	0.374
S13720662A	1.375	2.062	0.622
S13720662AS	1.375	2.062	0.622
S13721225AS	1.375	2.125	0.252
S13721225C	1.375	2.125	0.252
S13721227AS	1.375	2.125	0.276
S13721231AS	1.375	2.125	0.311
S13721231BS	1.375	2.125	0.311
S13721234BS	1.375	2.125	0.343
S13721237A	1.375	2.125	0.374
S13721237B	1.375	2.125	0.374
S13721262CS	1.375	2.125	0.626
S13722531AS	1.375	2.250	0.311
S13722550A	1.375	2.250	0.500
S13722550B	1.375	2.250	0.500
S13723237AS	1.375	2.328	0.374
S13723737AS	1.375	2.374	0.374
S13724331A	1.378	2.436	0.315
S13724346CS	1.375	2.437	0.469
S13724425A	1.374	2.440	0.252
S13724431AS	1.375	2.441	0.311
S13724936B	1.376	2.498	0.362
S13725637AS	1.375	2.561	0.374
S13727137AS	1.375	2.717	0.374
S13728331AS	1.375	2.835	0.311

DMR SEAL #	I.D.	O.D.	W
S13728337AS	1.375	2.835	0.374
S13919449BS	1.398	1.949	0.492
S14117327BS	1.417	1.732	0.276
S14217321BS	1.427	1.732	0.213
S14220625A	1.423	2.062	0.252
S14318725AS	1.437	1.875	0.252
S14320025BS	1.437	2.000	0.252
S14320619AS	1.437	2.067	0.197
S14320625A	1.437	2.062	0.252
S14320631AS	1.437	2.069	0.311
S14321225A	1.437	2.125	0.252
S14321243A	1.437	2.126	0.433
S14322550B	1.437	2.250	0.500
S14323225AS	1.437	2.328	0.252
S14323237AS	1.437	2.328	0.374
S14818939AS	1.488	1.890	0.394
S14919335BS	1.496	1.937	0.354
S14920625AS	1.496	2.062	0.252
S14922543A	1.496	2.252	0.433
S15018718B	1.500	1.875	0.189
S15019818B	1.500	1.983	0.189
S15020025A	1.500	2.000	0.252
S15020031AS	1.500	2.000	0.311
S15020625A	1.500	2.062	0.252
S15020625AS	1.500	2.062	0.252
S15020643BS	1.500	2.062	0.437
S15021243CS	1.500	2.125	0.437
S15022525A	1.500	2.250	0.252
S15022525AS	1.500	2.250	0.252
S15022537A	1.500	2.250	0.374
S15022537AS	1.500	2.250	0.374
S15023337AS	1.500	2.334	0.374
S15023731AS	1.500	2.374	0.311
S15023737A	1.500	2.375	0.374
S15023750AS	1.502	2.377	0.500

DMR SEAL #	I.D.	O.D.	W
S15024446CS	1.500	2.441	0.469
S15025043AS	1.500	2.500	0.433
S15025050A	1.500	2.500	0.500
S15025050CS	1.500	2.502	0.500
S15027237AS	1.500	2.721	0.374
S15027537A	1.500	2.750	0.374
S15621243A	1.562	2.125	0.437
S15621243CS	1.563	2.125	0.437
S15623743BS	1.565	2.373	0.433
S15624443AS	1.563	2.441	0.433
S15625059CS	1.563	2.500	0.594
S15626245AS	1.569	2.625	0.453
S15626250AS	1.569	2.625	0.500
S15627537A	1.563	2.750	0.374
S15631525B	1.563	3.156	0.250
S15631531AS	1.563	3.150	0.311
S15724643AS	1.575	2.461	0.433
S15823731B	1.587	2.375	0.311
S15922027A	1.594	2.205	0.276
S16220018B	1.625	2.000	0.189
S16220026B	1.620	2.000	0.264
S16221225AS	1.625	2.125	0.252
S16221225B	1.625	2.125	0.252
S16221831A	1.625	2.187	0.311
S16222537A	1.625	2.250	0.374
S16223731C	1.625	2.374	0.311
S16223732BS	1.625	2.375	0.327
S16223737A	1.625	2.375	0.374
S16223737AS	1.625	2.379	0.374
S16223737BS	1.625	2.375	0.374
S16224337CS	1.625	2.437	0.374
S16224346CS	1.625	2.437	0.469
S16225031AS	1.625	2.502	0.311
S16225547AS	1.625	2.559	0.472
S16526238AS	1.656	2.623	0.382

DMR SEAL #	I.D.	O.D.	W
S16622027AS	1.661	2.205	0.276
S16725043A	1.673	2.500	0.433
S16821218A	1.687	2.125	0.189
S16822531A	1.688	2.254	0.311
S16824331A	1.687	2.437	0.315
S16825050A	1.687	2.502	0.500
S17325031A	1.732	2.500	0.315
S17421221B	1.749	2.126	0.217
S17521218A	1.750	2.126	0.189
S17521218B	1.750	2.125	0.189
S17522531A	1.750	2.250	0.311
S17522531B	1.750	2.250	0.311
S17523225AS	1.750	2.328	0.252
S17523550AS	1.750	2.356	0.500
S17523731CS	1.750	2.375	0.311
S17523737A	1.750	2.378	0.374
S17523743B	1.750	2.374	0.437
S17524431AS	1.750	2.444	0.311
S17525031A	1.750	2.500	0.312
S17525031AS	1.750	2.502	0.311
S17525037A	1.750	2.500	0.374
S17525050AS	1.750	2.502	0.500
S17526236B	1.750	2.627	0.362
S17526237CS	1.750	2.625	0.374
S17526243A	1.752	2.626	0.433
S17526243AS	1.752	2.626	0.433
S17527143AS	1.750	2.715	0.437
S17527550A	1.750	2.750	0.500
S17527550AS	1.750	2.750	0.500
S17527550BS	1.750	2.750	0.500
S17527550CS	1.750	2.750	0.500
S17528750B	1.750	2.875	0.500
S17528750B	1.750	2.875	0.500
S17530037B	1.750	3.000	0.374
S17624137AS	1.766	2.412	0.374

DMR SEAL #	I.D.	O.D.	W
S17629531AS	1.767	2.953	0.311
S17721621B	1.771	2.165	0.217
S17721625A	1.772	2.165	0.256
S17724431A	1.772	2.441	0.315
S17726827AS	1.772	2.685	0.276
S17728327A	1.772	2.835	0.276
S17822537AS	1.781	2.258	0.374
S17822825A	1.783	2.285	0.252
S18228448AS	1.825	2.843	0.484
S18423719A	1.846	2.370	0.197
S18424724A	1.843	2.470	0.244
S18523241BS	1.857	2.328	0.417
S18526250A	1.850	2.626	0.500
S18722518B	1.875	2.250	0.189
S18723925A	1.875	2.397	0.252
S18723925AS	1.875	2.397	0.252
S18725031A	1.874	2.500	0.315
S18726237B	1.875	2.625	0.374
S18727835AS	1.870	2.781	0.354
S18728942A	1.870	2.890	0.429
S18730037A	1.875	3.000	0.374
S18730050B	1.875	3.000	0.500
S18730636B	1.875	3.060	0.362
S18822821B	1.889	2.283	0.217
S18924435AS	1.890	2.441	0.354
S19324731BS	1.938	2.471	0.311
S19326231AS	1.937	2.623	0.311
S19330050CS	1.937	3.000	0.500
S19335450CS	1.937	3.543	0.500
S19425650A	1.941	2.562	0.500
S19427543A	1.949	2.752	0.433
S19830043A	1.988	3.000	0.433
S19924421B	1.999	2.441	0.217
S20023718AS	2.000	2.375	0.189
S20025025A	2.000	2.502	0.252

DMR SEAL #	I.D.	O.D.	W
S20026850CS	2.000	2.686	0.500
S20027156AS	2.000	2.717	0.563
S20027531AS	2.000	2.750	0.311
S20027537A	2.000	2.750	0.374
S20027537BS	2.000	2.750	0.374
S20027537AS	2.002	2.750	0.374
S20027550B	2.000	2.750	0.500
S20028759CS	2.000	2.875	0.591
S20029931AS	2.000	2.996	0.311
S20029950B	2.000	2.996	0.500
S20029950CS	2.000	2.995	0.500
S20030031BS	2.000	3.000	0.311
S20030037AS	2.000	3.000	0.374
S20030050A	2.000	3.000	0.500
S20030050AS	2.000	3.000	0.500
S20030050B	2.000	3.000	0.500
S20030050CS	2.000	3.000	0.500
S20033746AS	2.000	3.371	0.469
S20033746CS	2.000	3.370	0.469
S20328856AS	2.031	2.888	0.563
S20626719AS	2.062	2.674	0.193
S20628737A	2.063	2.875	0.374
S20629931AS	2.063	2.995	0.311
S20633725AS	2.063	3.375	0.252
S20928735A	2.093	2.874	0.354
S21126621AS	2.110	2.661	0.217
S21226218B	2.125	2.625	0.185
S21226931A	2.125	2.692	0.311
S21228737B	2.125	2.875	0.374
S21228743CS	2.125	2.875	0.437
S21229131B	2.126	2.913	0.315
S21230050B	2.125	3.000	0.500
S21230050BS	2.125	3.000	0.500
S21230650CS	2.125	3.061	0.500
S21231637A	2.125	3.160	0.374

DMR SEAL #	I.D.	O.D.	W
S21231846BS	2.125	3.189	0.469
S21231846CS	2.125	3.188	0.469
S21232537A	2.125	3.250	0.374
S21330662CS	2.130	3.060	0.626
S21426621AS	2.142	2.661	0.217
S21633455B	2.165	3.346	0.551
S21635437AS	2.162	3.544	0.374
S21825618B	2.187	2.562	0.185
S21830050CS	2.189	3.000	0.500
S21831250B	2.187	3.123	0.500
S22028339B	2.205	2.835	0.394
S22130037AS	2.219	3.000	0.374
S22426321B	2.249	2.638	0.217
S22430043A	2.244	3.000	0.433
S22528725BS	2.250	2.877	0.252
S22529543AS	2.250	2.953	0.433
S22529950B	2.250	2.996	0.500
S22530037A	2.250	3.000	0.374
S22530037BS	2.250	3.002	0.374
S22530043A	2.250	3.000	0.437
S22531836B	2.250	3.187	0.362
S22532137AS	2.250	3.219	0.375
S22532546CS	2.250	3.252	0.465
S22532550CS	2.250	3.251	0.500
S22533546CS	2.250	3.350	0.469
S22533743CS	2.250	3.371	0.437
S22534950AS	2.250	3.499	0.500
S22535050AS	2.250	3.500	0.500
S22537550B	2.250	3.750	0.500
S22540046CS	2.250	4.003	0.469
S22826721B	2.283	2.677	0.217
S22828331A	2.283	2.835	0.315
S23131237BS	2.313	3.125	0.374
S23132550B	2.313	3.251	0.500
S23133528AS	2.312	3.350	0.283

DMR SEAL #	I.D.	O.D.	W
S23331250A	2.337	3.125	0.500
S23431243A	2.344	3.125	0.437
S23730637B	2.375	3.062	0.374
S23731242A	2.375	3.129	0.421
S23731250CS	2.375	3.126	0.500
S23733470BS	2.375	3.349	0.701
S23733546BS	2.375	3.350	0.469
S23733546CS	2.375	3.350	0.469
S23733737CS	2.375	3.375	0.374
S23734850CS	2.375	3.483	0.500
S23735043CS	2.375	3.500	0.437
S24335050B	2.438	3.500	0.500
S25032537A	2.500	3.250	0.374
S25032537AS	2.500	3.251	0.374
S25032543A	2.500	3.250	0.437
S25032550AS	2.500	3.250	0.500
S25033435A	2.500	3.346	0.354
S25033447AS	2.500	3.346	0.472
S25034950CS	2.500	3.499	0.500
S25035043A	2.500	3.500	0.437
S25035050A	2.500	3.500	0.500
S25035050AS	2.500	3.500	0.500
S25035050B	2.500	3.500	0.500
S25035050CS	2.500	3.500	0.500
S25035443AS	2.500	3.543	0.437
S25037550CS	2.500	3.750	0.500
S25038746AS	2.500	3.875	0.469
S25635050B	2.563	3.500	0.500
S25636270CS	2.562	3.623	0.701
S25934843CS	2.598	3.481	0.437
S26136251AS	2.610	3.628	0.512
S26236243CS	2.625	3.623	0.437
S26236246BS	2.625	3.623	0.469
S26431237B	2.648	3.124	0.374
S27438770BS	2.748	3.874	0.709

DMR SEAL #	I.D.	O.D.	W
S27532529BS	2.750	3.250	0.295
S27535037B	2.750	3.500	0.374
S27535050A	2.750	3.500	0.500
S27535050B	2.750	3.500	0.500
S27535439AS	2.750	3.543	0.394
S27535443CS	2.750	3.543	0.437
S27535450AS	2.750	3.543	0.500
S27537543A	2.750	3.752	0.433
S27537550AS	2.750	3.750	0.500
S27537550B	2.750	3.751	0.500
S27538743CS	2.750	3.876	0.437
S27538746BS	2.750	3.876	0.469
S27538750B	2.750	3.876	0.500
S27538754CS	2.750	3.876	0.547
S27540043CS	2.750	4.003	0.437
S27542462CS	2.750	4.249	0.626
S27547543CS	2.750	4.751	0.437
S28135037AS	2.812	3.500	0.374
S28735647AS	2.875	3.563	0.472
S28737543BS	2.875	3.751	0.437
S28738743CS	2.875	3.876	0.437
S28738750B	2.875	3.876	0.500
S28740043CS	2.875	4.000	0.437
S28740046B	2.875	4.000	0.469
S29036023A	2.901	3.601	0.232
S29339350CS	2.937	3.938	0.500
S29340065BS	2.938	4.000	0.657
S29537439A	2.953	3.740	0.394
S29545237AS	2.953	4.528	0.374
S29940250A	2.992	4.024	0.500
S30037534A	3.000	3.750	0.343
S30037537A	3.000	3.750	0.374
S30037543AS	3.000	3.750	0.437
S30037550AS	3.000	3.751	0.500
S30037550B	3.000	3.751	0.500

DMR SEAL #	I.D.	O.D.	W
S30037550CS	3.000	3.751	0.500
S30038750AS	3.000	3.876	0.500
S30038837B	3.000	3.881	0.374
S30040036B	3.000	4.000	0.362
S30040037A	3.000	4.000	0.374
S30040037C	3.000	4.000	0.374
S30040045CS	3.000	4.008	0.453
S30040046BS	3.000	4.000	0.469
S30040050A	3.000	4.000	0.500
S30040050B	3.000	4.000	0.500
S30041250B	3.000	4.122	0.500
S30043762BS	3.000	4.374	0.626
S30045043CS	3.000	4.501	0.433
S31240046CS	3.125	4.000	0.469
S31241256B	3.125	4.122	0.563
S31241256BS	3.125	4.122	0.563
S31242462A	3.125	4.248	0.626
S31246256CS	3.124	4.626	0.563
S31539339A	3.150	3.937	0.394
S31842450B	3.187	4.248	0.500
S32540050C	3.250	4.000	0.500
S32542437BS	3.250	4.248	0.374
S32542446CS	3.250	4.249	0.469
S32542447A	3.252	4.248	0.472
S32542450A	3.250	4.248	0.500
S32542450B	3.250	4.248	0.500
S32542450CS	3.250	4.249	0.500
S32542462B	3.250	4.248	0.626
S32542531AS	3.252	4.250	0.315
S32545046CS	3.250	4.500	0.469
S33440037A	3.344	4.000	0.374
S33441351A	3.346	4.134	0.512
S33451139A	3.346	5.118	0.394
S33743725AS	3.378	4.374	0.252
S33745062B	3.375	4.500	0.626

DMR SEAL #	I.D.	O.D.	W
S33746246A	3.375	4.626	0.469
S33746850CS	3.375	4.688	0.500
S34344949A	3.438	4.496	0.492
S34345046B	3.437	4.500	0.469
S34347550CS	3.437	4.751	0.500
S34445251AS	3.445	4.528	0.512
S35043737A	3.500	4.375	0.374
S35043737B	3.500	4.374	0.374
S35044946B	3.500	4.496	0.469
S35045037AS	3.500	4.500	0.374
S35045043A	3.500	4.500	0.437
S35045050A	3.500	4.500	0.500
S35045050B	3.500	4.500	0.500
S35047459AS	3.504	4.748	0.591
S35049950A	3.500	4.996	0.500
S36247450AS	3.625	4.748	0.500
S36247450BS	3.625	4.748	0.500
S36249946CS	3.625	4.996	0.469
S36249946CS	3.625	4.996	0.469
S36451250CS	3.647	5.126	0.500
S36847462C	3.687	4.748	0.626
S36856250CS	3.687	5.626	0.500
S37545046CS	3.750	4.500	0.469
S37547450AS	3.750	4.748	0.500
S37547450B	3.750	4.748	0.500
S37547462C	3.750	4.748	0.626
S37549946B	3.750	4.996	0.469
S38749946B	3.875	4.996	0.469
S38751350CS	3.875	5.131	0.500
S38752462B	3.875	5.248	0.626
S38753743CS	3.874	5.376	0.433
S38756950CS	3.875	5.691	0.500
S39353750CS	3.937	5.374	0.500
S39353768BS	3.937	5.374	0.689
S39355056BS	3.937	5.500	0.563

DMR SEAL #	I.D.	O.D.	W
S40049943BS	4.000	4.996	0.437
S40050047B	4.000	5.000	0.472
S40050050A	4.000	5.000	0.500
S40052462B	4.000	5.248	0.626
S40052550C	4.000	5.256	0.500
S41655061CS	4.166	5.501	0.610
S41852450B	4.185	5.248	0.500
S42457456B	4.248	5.748	0.563
S42555056CS	4.250	5.501	0.563
S43153150AS	4.311	5.319	0.500
S43359059B	4.331	5.906	0.591
S43452443A	4.343	5.248	0.437
S45054949B	4.500	5.496	0.492
S45055050A	4.500	5.500	0.500
S45055050B	4.500	5.500	0.500
S45055056B	4.500	5.500	0.563
S45055062A	4.500	5.500	0.626
S45057456B	4.500	5.748	0.563
S45059962CS	4.500	5.999	0.626
S45059962CS	4.500	5.999	0.626
S45060062B	4.500	6.000	0.626
S46256250A	4.622	5.622	0.500
S46257450BS	4.622	5.748	0.500
S46257456B	4.622	5.748	0.563
S47462456B	4.748	6.248	0.563
S47555037A	4.750	5.500	0.374
S47560056CS	4.750	6.006	0.563
S48759962B	4.874	5.996	0.626
S48762456CS	4.874	6.248	0.563
S49362456B	4.937	6.248	0.563
S50060050A	5.000	6.000	0.500
S50062450B	5.000	6.248	0.500
S50062556A	5.000	6.252	0.563
S51261250AS	5.125	6.128	0.500
S51275062B	5.122	7.500	0.626

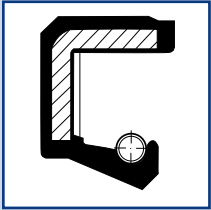
DMR SEAL #	I.D.	O.D.	W
S51862450A	5.185	6.248	0.500
S52462450A	5.248	6.248	0.500
S52462450AS	5.248	6.248	0.500
S52465062AS	5.248	6.500	0.626
S53763750A	5.375	6.375	0.500
S53766257BS	5.374	6.626	0.571
S53766262B	5.374	6.622	0.626
S55065050B	5.500	6.500	0.500
S55067450C	5.500	6.748	0.500
S55067462B	5.500	6.748	0.626
S55067462CS	5.500	6.748	0.626
S55567463A	5.559	6.748	0.630
S56266250A	5.622	6.622	0.500
S56266250AS	5.622	6.622	0.500
S56266251BS	5.622	6.626	0.516
S56268762B	5.622	6.874	0.626
S57470062B	5.748	7.000	0.626
S58567143B	5.850	6.717	0.433
S58770056A	5.878	7.000	0.563
S60067446BS	6.000	6.748	0.469
S60070050A	6.000	7.000	0.500
S60070050B	6.000	7.000	0.500
S60073774BS	6.000	7.374	0.748
S60075050B	6.000	7.500	0.500
S60075056B	6.000	7.500	0.563
S60075062BS	6.000	7.500	0.626
S61271262B	6.122	7.122	0.626
S61471250B	6.142	7.122	0.500
S62570037AS	6.250	7.000	0.374
S62571862AS	6.250	7.187	0.626
S64874350BS	6.480	7.437	0.500
S64975060B	6.496	7.500	0.602
S64976749A	6.496	7.677	0.492
S65075062A	6.500	7.500	0.626
S65075062B	6.500	7.500	0.626

DMR SEAL #	I.D.	O.D.	W
S66176749A	6.614	7.677	0.492
S66978749A	6.693	7.874	0.492
S67477457B	6.748	7.748	0.579
S68783774B	6.874	8.374	0.748
S68978747A	6.890	7.874	0.472
S70080062A	7.000	8.000	0.626
S70080074B	7.000	8.000	0.748

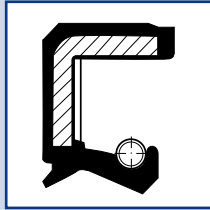
DMR SEAL #	I.D.	O.D.	W
S70083329B	7.000	8.331	0.295
S70083762A	7.000	8.374	0.626
S70085074B	7.000	8.500	0.748
S70882649A	7.087	8.268	0.492
S72485062B	7.248	8.500	0.626
S72487462B	7.248	8.748	0.626
S75085050B	7.500	8.500	0.500

DMR SEAL #	I.D.	O.D.	W
S75087462C	7.500	8.748	0.626
S75090062B	7.500	9.000	0.622
S75090074B	7.500	9.000	0.748
S77490062B	7.748	9.000	0.626
S77492474BS	7.748	9.248	0.748
S77492574B	7.748	9.252	0.748
S78790549A	7.874	9.055	0.492

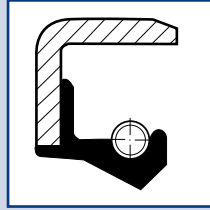
Type " "



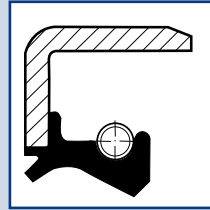
Type "DL"



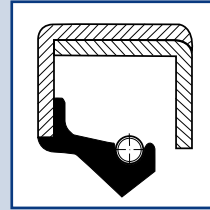
Type "B"



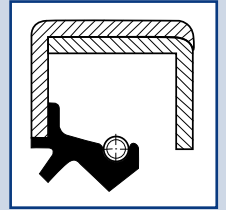
Type "BS"



Type "C"

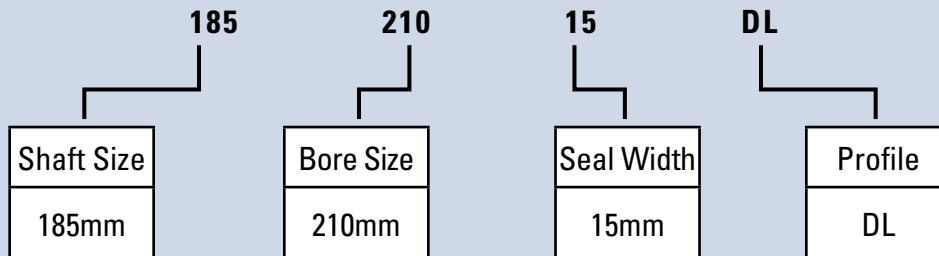


Type "CS"



PART NUMBERING SYSTEM – DMR METRIC OIL SEALS

Example: 18521015-DL



DMR SEAL #	I.D.	O.D.	W
4116	4	11	6
4126	4	12	6
4167	4	16	7
5144-DL	5	14	4
5156	5	15	6
5167-B	5	16	7
5178-DL	5	17	8
5195	5	19	5
5228	5	22	8
6146	6	14	6
6165	6	16	5
6165-DL	6	16	5
6166	6	16	6
6167	6	16	7
6185	6	18	5
6196	6	19	6
6196.3	6	19	6.3
6197	6	19	7
6197-B	6	19	7
6205.5	6	20	5.5
6217.5	6	21	7.5
6227	6	22	7
6227-DL	6	22	7
6228	6	22	8
7165	7	16	5
7165-DL	7	16	5
7166-B	7	16	6
7167	7	16	7
7175	7	17	5
7187	7	18	7
7187-B	7	18	7
7207	7	20	7
7207-DL	7	20	7
7207-B	7	20	7

DMR SEAL #	I.D.	O.D.	W
7226	7	22	6
7227	7	22	7
7228-DL	7	22	8
7246-BS	7	24	6
7297-DL	7	29	7
7317	7	31	7
8144	8	14	4
8144-B	8	14	4
8156-B	8	15	6
8158-B	8	15	8
8165	8	16	5
8165-DL	8	16	5
8165-B	8	16	5
8166	8	16	6
8166-DL	8	16	6
8167	8	16	7
8167-DL	8	16	7
8175-DL	8	17	5
8184-DL	8	18	4
8184.5	8	18	4.5
8185	8	18	5
8185-DL	8	18	5
8186	8	18	6
8187	8	18	7
8187-DL	8	18	7
8187-B	8	18	7
8187-BS	8	18	7
8189-B	8	18	9
8198-BS	8	19	8
8205-DL	8	20	5
8208	8	20	8
8226	8	22	6
8226-DL	8	22	6
8226.4-DL	8	22	6.4

DMR SEAL #	I.D.	O.D.	W
8227	8	22	7
8227-DL	8	22	7
8227-B	8	22	7
8227-BS	8	22	7
8228	8	22	8
8228-DL	8	22	8
8247	8	24	7
8256-DL	8	25	6
8258-DL	8	25	8
8258-BS	8	25	8
8348-DL	8	34	8
9176-DL	9	17	6
9185-DL	9	18	5
9186	9	18	6
9187	9	18	7
9195-B	9	19	5
9207-B	9	20	7
9225-DL	9	22	5
9227	9	22	7
9227-DL	9	22	7
9227-B	9	22	7
9247	9	24	7
9267	9	26	7
9288-DL	9	28	8
10164	10	16	4
10174.5	10	17	4.5
10175-B	10	17	5
10184	10	18	4
10185	10	18	5
10186	10	18	6
10196.5	10	19	6.5
10197	10	19	7
10197-DL	10	19	7
10204	10	20	4

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
10204-DL	10	20	4
10205	10	20	5
10205-DL	10	20	5
10205-B	10	20	5
10206	10	20	6
10207	10	20	7
10207-DL	10	20	7
10207-B	10	20	7
10207-BS	10	20	7
10215	10	21	5
10216-DL	10	21	6
10218	10	21	8
10226-DL	10	22	6
10227	10	22	7
10227-DL	10	22	7
10227-B	10	22	7
10228	10	22	8
10228-DL	10	22	8
10228-B	10	22	8
10245	10	24	5
10247	10	24	7
10256-DL	10	25	6
10257	10	25	7
10257-DL	10	25	7
10257-B	10	25	7
10257-BS	10	25	7
10258	10	25	8
10265-DL	10	26	5
10265.5	10	26	5.5
10265.5-DL	10	26	5.5
10267	10	26	7
10267-DL	10	26	7
10267-B	10	26	7
10268	10	26	8

DMR SEAL #	I.D.	O.D.	W
10287	10	28	7
10288-DL	10	28	8
10288-BS	10	28	8
10307	10	30	7
10307-DL	10	30	7
10307-B	10	30	7
103010	10	30	10
11174	11	17	4
11174-B	11	17	4
11184	11	18	4
11184-DL	11	18	4
11204.5-BS	11	20	4.5
11206-B	11	20	6
11227	11	22	7
11227-DL	11	22	7
11227-B	11	22	7
11228	11	22	8
11256-DL	11	25	6
11257	11	25	7
11257-DL	11	25	7
11257-BS	11	25	7
11267	11	26	7
11267-DL	11	26	7
11289-DL	11	28	9
11307	11	30	7
113010-DL	11	30	10
12194.5	12	19	4.5
12195	12	19	5
12195-DL	12	19	5
12205	12	20	5
12205-DL	12	20	5
12205-B	12	20	5
12205.5-BS	12	20	5.5
12206	12	20	6

DMR SEAL #	I.D.	O.D.	W
12207	12	20	7
12214	12	21	4
12215	12	21	5
12224	12	22	4
12224.5	12	22	4.5
12225	12	22	5
12225-DL	12	22	5
12226.5	12	22	6.5
12227	12	22	7
12227-DL	12	22	7
12227-B	12	22	7
12227-BS	12	22	7
12229-DL	12	22	9
12238-DL	12	23	8
12238-BS	12	23	8
12243.6	12	24	3.6
12245-DL	12	24	5
12246	12	24	6
12246-DL	12	24	6
12246.5	12	24	6.5
12247	12	24	7
12247-DL	12	24	7
12247-B	12	24	7
12254.5	12	25	4.5
12255-DL	12	25	5
12256-BS	12	25	6
12257	12	25	7
12257-DL	12	25	7
12257-B	12	25	7
12257-BS	12	25	7
12258	12	25	8
12268	12	26	8
12275	12	27	5
12285	12	28	5

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
12286-DL	12	28	6
12287	12	28	7
12287-DL	12	28	7
12287-B	12	28	7
12307	12	30	7
12309	12	30	9
12309-DL	12	30	9
12309-B	12	30	9
12309-BS	12	30	9
123010	12	30	10
123012	12	30	12
12326-B	12	32	6
12327	12	32	7
12327-DL	12	32	7
123210	12	32	10
123510	12	35	10
12365	12	36	5
12377	12	37	7
12425	12	42	5
12428-DL	12	42	8
13205-BS	13	20	5
13224	13	22	4
13225	13	22	5
13225-DL	13	22	5
13225.5-BS	13	22	5.5
13227-DL	13	22	7
13236	13	23	6
13255	13	25	5
13257	13	25	7
13257-DL	13	25	7
13257-B	13	25	7
13257-BS	13	25	7
13267	13	26	7
13267-DL	13	26	7

DMR SEAL #	I.D.	O.D.	W
13267-B	13	26	7
13287	13	28	7
13287-DL	13	28	7
13308	13	30	8
13308-DL	13	30	8
13309	13	30	9
13309-B	13	30	9
133010	13	30	10
13327	13	32	7
14224	14	22	4
14225-DL	14	22	5
14226-DL	14	22	6
14237	14	23	7
14244.8-DL	14	24	4.8
14245	14	24	5
14246	14	24	6
14246-DL	14	24	6
14247	14	24	7
14247-DL	14	24	7
14247-B	14	24	7
14248	14	24	8
14248-DL	14	24	8
14255	14	25	5
14255-DL	14	25	5
14256-DL	14	25	6
14257	14	25	7
14257-DL	14	25	7
14257-B	14	25	7
14257-BS	14	25	7
14266	14	26	6
14266-B	14	26	6
14267	14	26	7
14267-DL	14	26	7
14284	14	28	4

DMR SEAL #	I.D.	O.D.	W
14287	14	28	7
14287-DL	14	28	7
14287-B	14	28	7
14287-BS	14	28	7
142810-DL	14	28	10
142811-DL	14	28	11
14307	14	30	7
14308	14	30	8
14308-DL	14	30	8
143010	14	30	10
14327	14	32	7
14327-DL	14	32	7
14327-B	14	32	7
14329	14	32	9
14329-DL	14	32	9
14329-B	14	32	9
143210	14	32	10
14357	14	35	7
143510	14	35	10
15214	15	21	4
15214.4-BS	15	21	4.4
15245	15	24	5
15245-DL	15	24	5
15246-DL	15	24	6
15246-B	15	24	6
15247	15	24	7
15247-DL	15	24	7
15247-B	15	24	7
15254.4-DL	15	25	4.4
15255	15	25	5
15255-DL	15	25	5
15256	15	25	6
15256-DL	15	25	6
15256-BS	15	25	6

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
15257	15	25	7
15257-DL	15	25	7
15257-B	15	25	7
15257-BS	15	25	7
15266	15	26	6
15266-DL	15	26	6
15266-BS	15	26	6
15267	15	26	7
15267-DL	15	26	7
15277	15	27	7
15277-DL	15	27	7
15286	15	28	6
15286-DL	15	28	6
15287	15	28	7
15287-DL	15	28	7
15287-B	15	28	7
15289	15	28	9
152810-B	15	28	10
15304.5	15	30	4.5
15305	15	30	5
15305-DL	15	30	5
15307	15	30	7
15307-DL	15	30	7
15307-B	15	30	7
15307-BS	15	30	7
15307-C	15	30	7
15308-DL	15	30	8
15308-B	15	30	8
15308-BS	15	30	8
15309	15	30	9
153010	15	30	10
153010-DL	15	30	10
153010-B	15	30	10
153012-DL	15	30	12

' - Single lip, rubber covered
'-B' - Single lip, metal covered

DMR SEAL #	I.D.	O.D.	W
15327	15	32	7
15327-DL	15	32	7
15328	15	32	8
15329	15	32	9
15329-DL	15	32	9
15329-BS	15	32	9
153210	15	32	10
153410	15	34	10
15354	15	35	4
15356-DL	15	35	6
15356-BS	15	35	6
15357	15	35	7
15357-DL	15	35	7
15357-B	15	35	7
15358	15	35	8
15358-DL	15	35	8
153510	15	35	10
153510-DL	15	35	10
153510-B	15	35	10
15377	15	37	7
154010	15	40	10
154011-DL	15	40	11
15427	15	42	7
15428-DL	15	42	8
154210	15	42	10
15478-DL	15	47	8
15485-DL	15	48	5
16244	16	24	4
16244-B	16	24	4
16245	16	24	5
16246	16	24	6
16247	16	24	7
16267	16	26	7
16267-DL	16	26	7

'-DL' - Double lip, rubber covered
'-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
16267-B	16	26	7
16267-BS	16	26	7
16276	16	27	6
16277-B	16	27	7
16286	16	28	6
16287	16	28	7
16287-DL	16	28	7
16287-B	16	28	7
16287-BS	16	28	7
16306	16	30	6
16307	16	30	7
16307-DL	16	30	7
16307-BS	16	30	7
16308	16	30	8
16308-DL	16	30	8
16308-B	16	30	8
16308-BS	16	30	8
163010	16	30	10
163010-DL	16	30	10
163010-CS	16	30	10
16325	16	32	5
16327	16	32	7
16327-DL	16	32	7
16327-B	16	32	7
16328	16	32	8
16328-B	16	32	8
163210	16	32	10
163211-B	16	32	11
16357	16	35	7
16357-DL	16	35	7
16359	16	35	9
16359-BS	16	35	9
163510	16	35	10
164010	16	40	10

DMR SEAL #	I.D.	O.D.	W
16477	16	47	7
17254	17	25	4
17265	17	26	5
17266	17	26	6
17275.5-BS	17	27	5.5
17285-BS	17	28	5
17286	17	28	6
17286-B	17	28	6
17286-BS	17	28	6
17287	17	28	7
17287-B	17	28	7
17287-BS	17	28	7
17306	17	30	6
17306-BS	17	30	6
17307	17	30	7
17308	17	30	8
17308-BS	17	30	8
173010-B	17	30	10
17326-BS	17	32	6
17327	17	32	7
17327-B	17	32	7
17327-BS	17	32	7
17327.5-B	17	32	7.5
17328	17	32	8
17328-B	17	32	8
17328-BS	17	32	8
17329-BS	17	32	9
173210	17	32	10
17338-B	17	33	8
17344.5-B	17	34	4.5
17347	17	34	7
17347-BS	17	34	7
17356	17	35	6
17357	17	35	7

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

DMR SEAL #	I.D.	O.D.	W
17358	17	35	8
17358-B	17	35	8
173510	17	35	10
17377	17	37	7
17387	17	38	7
17387-B	17	38	7
17387-BS	17	38	7
173810	17	38	10
173810-B	17	38	10
17406	17	40	6
17407	17	40	7
17407-B	17	40	7
17408	17	40	8
17408.5	17	40	8.5
174010	17	40	10
174010-B	17	40	10
17477	17	47	7
174710	17	47	10
18275	18	27	5
18286.5	18	28	6.5
18287	18	28	7
18287-B	18	28	7
18288-BS	18	28	8
18307	18	30	7
18308	18	30	8
18308-B	18	30	8
18308-BS	18	30	8
18327	18	32	7
18328	18	32	8
18328-B	18	32	8
18329	18	32	9
18357	18	35	7
18357-B	18	35	7
18358	18	35	8

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
18358-B	18	35	8
18359	18	35	9
183510	18	35	10
183610	18	36	10
183710	18	37	10
18387	18	38	7
18387-B	18	38	7
18387-BS	18	38	7
183810	18	38	10
183810-B	18	38	10
183810-BS	18	38	10
18407	18	40	7
184010	18	40	10
19275	19	27	5
19276	19	27	6
19276-B	19	27	6
19306	19	30	6
19307	19	30	7
19308	19	30	8
19308-B	19	30	8
19326	19	32	6
19327	19	32	7
19328	19	32	8
19328-B	19	32	8
19358	19	35	8
19358-B	19	35	8
193510	19	35	10
19367	19	36	7
19387-B	19	38	7
193810-BS	19	38	10
194010	19	40	10
20284.8-B	20	28	4.8
20285-B	20	28	5
20286	20	28	6

DMR SEAL #	I.D.	O.D.	W
20304	20	30	4
20305	20	30	5
20305-DL	20	30	5
20305-B	20	30	5
20306	20	30	6
20306-DL	20	30	6
20306-BS	20	30	6
20307	20	30	7
20307-DL	20	30	7
20307-B	20	30	7
20307-BS	20	30	7
20309	20	30	9
20309-B	20	30	9
20317-B	20	31	7
20317-BS	20	31	7
20326	20	32	6
20327	20	32	7
20327-DL	20	32	7
20327-B	20	32	7
20327.6-DL	20	32	7.6
20328	20	32	8
20328-B	20	32	8
20328-BS	20	32	8
203310	20	33	10
20346	20	34	6
20347	20	34	7
20347-DL	20	34	7
20355.5-DL	20	35	5.5
20356	20	35	6
20357	20	35	7
20357-DL	20	35	7
20357-B	20	35	7
20357-BS	20	35	7
20358	20	35	8

DMR SEAL #	I.D.	O.D.	W
20358-B	20	35	8
20358-BS	20	35	8
203510	20	35	10
203510-DL	20	35	10
203510-B	20	35	10
203511-BS	20	35	11
20367	20	36	7
20377	20	37	7
20377-DL	20	37	7
203710	20	37	10
20385-DL	20	38	5
20387	20	38	7
20387-DL	20	38	7
20388	20	38	8
20406	20	40	6
20406-DL	20	40	6
20407	20	40	7
20407-DL	20	40	7
20407-B	20	40	7
20407-BS	20	40	7
20408	20	40	8
20408-DL	20	40	8
20408-B	20	40	8
204010	20	40	10
204010-DL	20	40	10
204010-BS	20	40	10
204010-C	20	40	10
204011	20	40	11
204011-B	20	40	11
20427	20	42	7
20427-DL	20	42	7
20428-B	20	42	8
204210	20	42	10
204210-B	20	42	10

DMR SEAL #	I.D.	O.D.	W
204512	20	45	12
20475	20	47	5
20477	20	47	7
20477-DL	20	47	7
20477-B	20	47	7
20478	20	47	8
20478-DL	20	47	8
20479-DL	20	47	9
204710	20	47	10
204710-DL	20	47	10
204710-B	20	47	10
20527	20	52	7
20527-B	20	52	7
20528	20	52	8
20528-DL	20	52	8
20529-DL	20	52	9
205210	20	52	10
21325-DL	21	32	5
21326-BS	21	32	6
21327	21	32	7
21328	21	32	8
21328-DL	21	32	8
21328-BS	21	32	8
21357	21	35	7
21357-B	21	35	7
21358	21	35	8
213510-B	21	35	10
21367	21	36	7
21388-DL	21	38	8
21388-B	21	38	8
21388-BS	21	38	8
21406-DL	21	40	6
21407-DL	21	40	7
214010	21	40	10

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
21529-DL	21	52	9
21549-DL	21	54	9
216010-DL	21	60	10
22294	22	29	4
22295-B	22	29	5
22325	22	32	5
22325-DL	22	32	5
22325.1	22	32	5.1
22325.5	22	32	5.5
22325.5-B	22	32	5.5
22326	22	32	6
22326-DL	22	32	6
22326-B	22	32	6
22327	22	32	7
22327-DL	22	32	7
22327-B	22	32	7
22327-BS	22	32	7
22328	22	32	8
22328-DL	22	32	8
22337	22	33	7
22337-DL	22	33	7
22347-DL	22	34	7
22347-B	22	34	7
22355	22	35	5
22355-DL	22	35	5
22356-DL	22	35	6
22356.5	22	35	6.5
22357	22	35	7
22357-DL	22	35	7
22357-B	22	35	7
22358	22	35	8
22358-DL	22	35	8
22358-BS	22	35	8
223510	22	35	10

DMR SEAL #	I.D.	O.D.	W
22367	22	36	7
22367-DL	22	36	7
223610	22	36	10
22377	22	37	7
22378	22	37	8
22386-DL	22	38	6
22388	22	38	8
22388-DL	22	38	8
22388-B	22	38	8
22388-BS	22	38	8
223810-B	22	38	10
223812	22	38	12
22406-DL	22	40	6
22407	22	40	7
22407-DL	22	40	7
22408	22	40	8
22408-DL	22	40	8
22408-B	22	40	8
22409	22	40	9
22409-DL	22	40	9
224010	22	40	10
224010-B	22	40	10
224011-DL	22	40	11
22427	22	42	7
22427-DL	22	42	7
22427-B	22	42	7
224210	22	42	10
224210-DL	22	42	10
224210-B	22	42	10
224210-BS	22	42	10
224211	22	42	11
224211-DL	22	42	11
224211-BS	22	42	11
224411	22	44	11

DMR SEAL #	I.D.	O.D.	W
22457	22	45	7
22477	22	47	7
22477-DL	22	47	7
224710	22	47	10
22505-DL	22	50	5
22527-DL	22	52	7
22608-DL	22	60	8
23327	23	32	7
23327-DL	23	32	7
23335-DL	23	33	5
23356-DL	23	35	6
23367-DL	23	36	7
23377-DL	23	37	7
23408	23	40	8
234010	23	40	10
23426-DL	23	42	6
23427-DL	23	42	7
23427-B	23	42	7
23427-BS	23	42	7
234210	23	42	10
234211	23	42	11
234211-DL	23	42	11
234211-BS	23	42	11
23478-DL	23	47	8
234710	23	47	10
24347-BS	24	34	7
24356	24	35	6
24356-B	24	35	6
24357	24	35	7
24358	24	35	8
24358-DL	24	35	8
24358-BS	24	35	8
24366-BS	24	36	6
24367-DL	24	36	7

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
24368-DL	24	36	8
24369	24	36	9
24377	24	37	7
24386	24	38	6
24387	24	38	7
24388	24	38	8
24388-DL	24	38	8
24388-BS	24	38	8
24388.5-DL	24	38	8.5
243810	24	38	10
243810-DL	24	38	10
24397-DL	24	39	7
24407	24	40	7
24407-DL	24	40	7
24407-B	24	40	7
24408	24	40	8
24408-DL	24	40	8
24408-BS	24	40	8
24409-DL	24	40	9
244010	24	40	10
24428	24	42	8
244210	24	42	10
24457	24	45	7
24457-DL	24	45	7
24457-B	24	45	7
244510	24	45	10
244510-DL	24	45	10
244510-B	24	45	10
24476	24	47	6
24477	24	47	7
244710	24	47	10
244710-B	24	47	10
244811-BS	24	48	11
245010	24	50	10

DMR SEAL #	I.D.	O.D.	W
246210	24	62	10
24786.5	24	78	6.5
25334	25	33	4
25336	25	33	6
25336-BS	25	33	6
25337-DL	25	33	7
25347-DL	25	34	7
25347-BS	25	34	7
25354	25	35	4
25355-DL	25	35	5
25356	25	35	6
25356-DL	25	35	6
25356-B	25	35	6
25357	25	35	7
25357-DL	25	35	7
25357-B	25	35	7
25357-BS	25	35	7
25358	25	35	8
25358-DL	25	35	8
25366-DL	25	36	6
25367	25	36	7
25367-DL	25	36	7
25369-DL	25	36	9
25375	25	37	5
25375-DL	25	37	5
25376	25	37	6
25376-DL	25	37	6
25377	25	37	7
25377-B	25	37	7
25378	25	37	8
25378-DL	25	37	8
25378-B	25	37	8
25385-DL	25	38	5
25386	25	38	6

DMR SEAL #	I.D.	O.D.	W
25386-B	25	38	6
25387	25	38	7
25387-DL	25	38	7
25387-BS	25	38	7
25388	25	38	8
25388-DL	25	38	8
25388-BS	25	38	8
25405	25	40	5
25406	25	40	6
25406-DL	25	40	6
25407	25	40	7
25407-DL	25	40	7
25407-B	25	40	7
25407-BS	25	40	7
25408	25	40	8
25408-DL	25	40	8
25408-B	25	40	8
25408-BS	25	40	8
25409-DL	25	40	9
254010	25	40	10
254010-DL	25	40	10
254010-B	25	40	10
254010-BS	25	40	10
25425-B	25	42	5
25426	25	42	6
25427	25	42	7
25427-DL	25	42	7
25428	25	42	8
25428-DL	25	42	8
25428-BS	25	42	8
25428.5	25	42	8.5
25428.5-DL	25	42	8.5
254210	25	42	10
254210-DL	25	42	10

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
254210-B	25	42	10
254210-BS	25	42	10
254211	25	42	11
254211-DL	25	42	11
254310	25	43	10
25447	25	44	7
25447-DL	25	44	7
25448-DL	25	44	8
25449	25	44	9
25449-B	25	44	9
25456-DL	25	45	6
25457	25	45	7
25457-DL	25	45	7
25458	25	45	8
25458-DL	25	45	8
25459	25	45	9
25459-DL	25	45	9
254510	25	45	10
254510-DL	25	45	10
254510-B	25	45	10
254510-BS	25	45	10
254511	25	45	11
254511-DL	25	45	11
254511-B	25	45	11
254511-BS	25	45	11
254512-DL	25	45	12
25467	25	46	7
25467-DL	25	46	7
25476	25	47	6
25476.5	25	47	6.5
25476.5-DL	25	47	6.5
25477	25	47	7
25477-DL	25	47	7
25478	25	47	8

DMR SEAL #	I.D.	O.D.	W
25478-DL	25	47	8
254710	25	47	10
254710-DL	25	47	10
254710-B	25	47	10
254710-CS	25	47	10
25487-DL	25	48	7
25487-BS	25	48	7
25488	25	48	8
254912-DL	25	49	12
25507-DL	25	50	7
25509	25	50	9
255010	25	50	10
255010-B	25	50	10
255012	25	50	12
255012-DL	25	50	12
255012-B	25	50	12
25526-DL	25	52	6
25526.4	25	52	6.4
25527	25	52	7
25527-DL	25	52	7
25528	25	52	8
25528-DL	25	52	8
255210	25	52	10
255210-DL	25	52	10
255212	25	52	12
255212-DL	25	52	12
255510-DL	25	55	10
25618.5-DL	25	61	8.5
25627	25	62	7
25627-DL	25	62	7
25628-DL	25	62	8
25629-DL	25	62	9
25629.5	25	62	9.5
256210	25	62	10

DMR SEAL #	I.D.	O.D.	W
256210-DL	25	62	10
256211-DL	25	62	11
256213	25	62	13
26357-DL	26	35	7
26357-B	26	35	7
26364-DL	26	36	4
26365-DL	26	36	5
26367	26	36	7
26368-B	26	36	8
26377	26	37	7
26377-DL	26	37	7
26385	26	38	5
26385-DL	26	38	5
26387-DL	26	38	7
26387-B	26	38	7
26387-BS	26	38	7
26388	26	38	8
26388-DL	26	38	8
26388-B	26	38	8
26388-BS	26	38	8
26405-DL	26	40	5
26406-DL	26	40	6
26407-DL	26	40	7
26407-BS	26	40	7
26408	26	40	8
26408-B	26	40	8
26408-BS	26	40	8
26409-BS	26	40	9
26427	26	42	7
26427-DL	26	42	7
26427-B	26	42	7
26428	26	42	8
26428-DL	26	42	8
26428-B	26	42	8

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
264210	26	42	10
264210-DL	26	42	10
26438-DL	26	43	8
26456-DL	26	45	6
26457	26	45	7
26477	26	47	7
26478-DL	26	47	8
264710	26	47	10
264811	26	48	11
264811-DL	26	48	11
264811-BS	26	48	11
265010	26	50	10
26528	26	52	8
26528-DL	26	52	8
265210	26	52	10
265212-B	26	52	12
27377	27	37	7
27377-DL	27	37	7
27386-DL	27	38	6
27387-DL	27	38	7
27406	27	40	6
27408	27	40	8
27408-DL	27	40	8
274110	27	41	10
27427-DL	27	42	7
27428	27	42	8
274210	27	42	10
27439	27	43	9
27439-DL	27	43	9
27459-DL	27	45	9
27476	27	47	6
27477	27	47	7
274710	27	47	10
274711	27	47	11

DMR SEAL #	I.D.	O.D.	W
274711-DL	27	47	11
274711-B	27	47	11
27528	27	52	8
275210	27	52	10
28355-B	28	35	5
28377-DL	28	37	7
28386-B	28	38	6
28387	28	38	7
28387-DL	28	38	7
28387-B	28	38	7
28388	28	38	8
28405	28	40	5
28406-DL	28	40	6
28407	28	40	7
28407-DL	28	40	7
28408	28	40	8
28408-DL	28	40	8
28408-BS	28	40	8
28409-DL	28	40	9
28417-DL	28	41	7
28426.5-DL	28	42	6.5
28427-DL	28	42	7
28428	28	42	8
28428-DL	28	42	8
284210-DL	28	42	10
28438	28	43	8
284310	28	43	10
28446-DL	28	44	6
28447-DL	28	44	7
28448	28	44	8
28448-DL	28	44	8
284411	28	44	11
284411-DL	28	44	11
284411-BS	28	44	11

DMR SEAL #	I.D.	O.D.	W
28456-DL	28	45	6
28457-DL	28	45	7
28458	28	45	8
28458-DL	28	45	8
28458-BS	28	45	8
284510-DL	28	45	10
284511-DL	28	45	11
28466-DL	28	46	6
28475	28	47	5
28477	28	47	7
28477-DL	28	47	7
28478-DL	28	47	8
28479	28	47	9
284710	28	47	10
284710-DL	28	47	10
28488	28	48	8
28488-DL	28	48	8
28489-DL	28	48	9
284810-DL	28	48	10
284811	28	48	11
284811-DL	28	48	11
284811-B	28	48	11
284813-DL	28	48	13
28508	28	50	8
285010	28	50	10
28527	28	52	7
28527-DL	28	52	7
285210	28	52	10
285210-DL	28	52	10
28547-DL	28	54	7
28558-DL	28	55	8
28559	28	55	9
287210	28	72	10
29406-DL	29	40	6

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
29417-BS	29	41	7
29428	29	42	8
29437	29	43	7
29457	29	45	7
29459-DL	29	45	9
295211-DL	29	52	11
30396	30	39	6
30397	30	39	7
30406-DL	30	40	6
30407	30	40	7
30407-DL	30	40	7
30407-BS	30	40	7
30408	30	40	8
30408-DL	30	40	8
30424.5	30	42	4.5
30425.5-DL	30	42	5.5
30425.7	30	42	5.7
30426	30	42	6
30427	30	42	7
30427-DL	30	42	7
30428	30	42	8
30428-DL	30	42	8
30428-BS	30	42	8
304212-DL	30	42	12
30445.8-BS	30	44	5.8
30447-DL	30	44	7
30447-BS	30	44	7
30449	30	44	9
30449-DL	30	44	9
304410-DL	30	44	10
30456-DL	30	45	6
30457	30	45	7
30457-DL	30	45	7
30458	30	45	8

DMR SEAL #	I.D.	O.D.	W
30458-DL	30	45	8
30459	30	45	9
30459-DL	30	45	9
30459.5	30	45	9.5
30459.5-DL	30	45	9.5
304510	30	45	10
304511	30	45	11
304511-DL	30	45	11
304511-BS	30	45	11
304512	30	45	12
304513-DL	30	45	13
30467-DL	30	46	7
30468-DL	30	46	8
30469	30	46	9
30469-DL	30	46	9
304610-DL	30	46	10
30476	30	47	6
30477	30	47	7
30477-DL	30	47	7
30478	30	47	8
30478-DL	30	47	8
304710	30	47	10
304710-DL	30	47	10
304712	30	47	12
30487-DL	30	48	7
30487-BS	30	48	7
30488	30	48	8
30488-DL	30	48	8
30488-BS	30	48	8
304810	30	48	10
304811	30	48	11
304811-DL	30	48	11
30506-DL	30	50	6
30507	30	50	7

DMR SEAL #	I.D.	O.D.	W
30507-DL	30	50	7
30507-BS	30	50	7
30507.5-DL	30	50	7.5
30508	30	50	8
30508-DL	30	50	8
30508-BS	30	50	8
30509	30	50	9
305010	30	50	10
305010-DL	30	50	10
305011	30	50	11
305011-DL	30	50	11
305011-BS	30	50	11
305011-C	30	50	11
305012	30	50	12
305013-DL	30	50	13
305013-CS	30	50	13
30527	30	52	7
30527-DL	30	52	7
30528	30	52	8
30528-DL	30	52	8
30529-DL	30	52	9
30529-CS	30	52	9
305210	30	52	10
305210-DL	30	52	10
305211-DL	30	52	11
305211-BS	30	52	11
305212	30	52	12
305212-DL	30	52	12
305212-BS	30	52	12
30556.5	30	55	6.5
30557	30	55	7
30557-DL	30	55	7
305510	30	55	10
305510-DL	30	55	10

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
305512	30	55	12
305512-DL	30	55	12
305514-DL	30	55	14
30565	30	56	5
30566-DL	30	56	6
30567-DL	30	56	7
30568-DL	30	56	8
305610	30	56	10
30586-DL	30	58	6
30608-DL	30	60	8
306010	30	60	10
30627	30	62	7
30627-DL	30	62	7
306210	30	62	10
306210-DL	30	62	10
306211-DL	30	62	11
306212	30	62	12
306510-DL	30	65	10
306810-DL	30	68	10
30728-DL	30	72	8
307210	30	72	10
307210-DL	30	72	10
30759-DL	30	75	9
30779-DL	30	77	9
31438-DL	31	43	8
31459-DL	31	45	9
31477	31	47	7
31508	31	50	8
31517-DL	31	51	7
32405-DL	32	40	5
32425-DL	32	42	5
32427	32	42	7
32427-DL	32	42	7
32435.5	32	43	5.5

DMR SEAL #	I.D.	O.D.	W
32436	32	43	6
32437-DL	32	43	7
32437-BS	32	43	7
32446-DL	32	44	6
32448-DL	32	44	8
32449	32	44	9
32449-DL	32	44	9
32456	32	45	6
32456-DL	32	45	6
32457	32	45	7
32457-DL	32	45	7
32457-BS	32	45	7
32458	32	45	8
32458-DL	32	45	8
32458-BS	32	45	8
324510-DL	32	45	10
324511-BS	32	45	11
32468	32	46	8
32468-DL	32	46	8
324610-DL	32	46	10
32477	32	47	7
32477-DL	32	47	7
32478	32	47	8
32478-DL	32	47	8
324710	32	47	10
32485	32	48	5
32487	32	48	7
32487-DL	32	48	7
32488	32	48	8
32488-DL	32	48	8
32489-DL	32	48	9
324810-DL	32	48	10
32507	32	50	7
32508	32	50	8

DMR SEAL #	I.D.	O.D.	W
325010	32	50	10
325010-DL	32	50	10
325110	32	51	10
32525	32	52	5
32527	32	52	7
32527-DL	32	52	7
32528	32	52	8
32528-DL	32	52	8
32528-BS	32	52	8
325210	32	52	10
325210-DL	32	52	10
325211	32	52	11
325211-DL	32	52	11
325211-BS	32	52	11
325410-DL	32	54	10
32558	32	55	8
325510	32	55	10
325610	32	56	10
325610-DL	32	56	10
325810-DL	32	58	10
32627	32	62	7
32627-DL	32	62	7
326210	32	62	10
326210-DL	32	62	10
327011-DL	32	70	11
33437-BS	33	43	7
33448	33	44	8
33448-BS	33	44	8
33457	33	45	7
33466-DL	33	46	6
33506-DL	33	50	6
33507	33	50	7
33508	33	50	8
335010-DL	33	50	10

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
335011-DL	33	50	11
33526	33	52	6
33527	33	52	7
33529-DL	33	52	9
335210	33	52	10
335612	33	56	12
33577-DL	33	57	7
344511-DL	34	45	11
34468	34	46	8
34477.5-DL	34	47	7.5
34487.5	34	48	7.5
34488	34	48	8
34488-DL	34	48	8
34489-DL	34	48	9
34507	34	50	7
34507-DL	34	50	7
345010	34	50	10
34525-DL	34	52	5
34528	34	52	8
345210	34	52	10
345210-DL	34	52	10
345211-DL	34	52	11
34538-DL	34	53	8
345411	34	54	11
345411-DL	34	54	11
345411-BS	34	54	11
34558-DL	34	55	8
346210	34	62	10
34639	34	63	9
35457	35	45	7
35457-BS	35	45	7
35474.5	35	47	4.5
35474.5-DL	35	47	4.5
35477	35	47	7

' - Single lip, rubber covered
'-B' - Single lip, metal covered

DMR SEAL #	I.D.	O.D.	W
35477-DL	35	47	7
35477-BS	35	47	7
35478-DL	35	47	8
35479-DL	35	47	9
35487-DL	35	48	7
35487-BS	35	48	7
35488	35	48	8
35488-DL	35	48	8
35488-BS	35	48	8
35496-DL	35	49	6
35507	35	50	7
35507-DL	35	50	7
35508	35	50	8
35508-DL	35	50	8
35508-BS	35	50	8
35508.5-DL	35	50	8.5
355010	35	50	10
355010-DL	35	50	10
355011	35	50	11
355011-DL	35	50	11
355012-DL	35	50	12
35526	35	52	6
35527	35	52	7
35527-DL	35	52	7
35527-BS	35	52	7
35527.5-DL	35	52	7.5
35528	35	52	8
35528-DL	35	52	8
35529	35	52	9
35529-DL	35	52	9
35529-BS	35	52	9
35529-CS	35	52	9
35529.5-DL	35	52	9.5
355210	35	52	10

'-DL' - Double lip, rubber covered
'-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
355210-DL	35	52	10
355211-DL	35	52	11
355211-BS	35	52	11
355212-DL	35	52	12
355212-BS	35	52	12
35546-DL	35	54	6
35547-DL	35	54	7
35555	35	55	5
35557-DL	35	55	7
35558	35	55	8
35558-DL	35	55	8
35558-BS	35	55	8
35559	35	55	9
35559-DL	35	55	9
35559-BS	35	55	9
355510	35	55	10
355510-DL	35	55	10
355511	35	55	11
355511-DL	35	55	11
355511-BS	35	55	11
355511-CS	35	55	11
355512-DL	35	55	12
355512-CS	35	55	12
355562-DL	35	55	62
35566-DL	35	56	6
355610	35	56	10
355610-DL	35	56	10
355612	35	56	12
355710	35	57	10
35588-DL	35	58	8
35589	35	58	9
355810	35	58	10
355812-DL	35	58	12
355813	35	58	13

DMR SEAL #	I.D.	O.D.	W
35608	35	60	8
356010	35	60	10
356012	35	60	12
356012-DL	35	60	12
356014-DL	35	60	14
35627	35	62	7
35627-DL	35	62	7
35628-DL	35	62	8
35629.5-DL	35	62	9.5
356210	35	62	10
356210-DL	35	62	10
356210.5-DL	35	62	10.5
356212	35	62	12
356212-DL	35	62	12
35648-DL	35	64	8
35659-DL	35	65	9
356510	35	65	10
356510-DL	35	65	10
356512-DL	35	65	12
35668-DL	35	66	8
35707	35	70	7
35727	35	72	7
357210	35	72	10
357210-DL	35	72	10
357212	35	72	12
357212-DL	35	72	12
358010-DL	35	80	10
358011-DL	35	80	11
358012-DL	35	80	12
351067	35	106	7
36445-DL	36	44	5
36477	36	47	7
36507	36	50	7
36507-DL	36	50	7

' - Single lip, rubber covered
 'B' - Single lip, metal covered

DMR SEAL #	I.D.	O.D.	W
36509	36	50	9
365010	36	50	10
365010-DL	36	50	10
36527	36	52	7
36547	36	54	7
36548	36	54	8
36558-DL	36	55	8
365610	36	56	10
365812-DL	36	58	12
36627	36	62	7
36627-DL	36	62	7
366810	36	68	10
366810-DL	36	68	10
37528	37	52	8
375212-DL	37	52	12
37537-DL	37	53	7
37569	37	56	9
375710-DL	37	57	10
37585.8-DL	37	58	5.8
376210	37	62	10
376212	37	62	12
38507	38	50	7
38508	38	50	8
38508-DL	38	50	8
38508-BS	38	50	8
38516.4	38	51	6.4
38526	38	52	6
38527	38	52	7
38527-DL	38	52	7
38528	38	52	8
38529-DL	38	52	9
385210	38	52	10
385210-DL	38	52	10
38546.5	38	54	6.5

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
38548-DL	38	54	8
385410	38	54	10
38556	38	55	6
38557	38	55	7
38558	38	55	8
38558-DL	38	55	8
38558-BS	38	55	8
38559	38	55	9
38559-DL	38	55	9
385510	38	55	10
385510-DL	38	55	10
385511-BS	38	55	11
385610	38	56	10
38587-DL	38	58	7
38588	38	58	8
38588-DL	38	58	8
38588-BS	38	58	8
385810	38	58	10
385811	38	58	11
385811-DL	38	58	11
385811-BS	38	58	11
385813-DL	38	58	13
38607	38	60	7
386010	38	60	10
386011	38	60	11
386011-DL	38	60	11
38626.4-DL	38	62	6.4
38627	38	62	7
38627-DL	38	62	7
38629-DL	38	62	9
386210	38	62	10
386211	38	62	11
386211-DL	38	62	11
386212	38	62	12

DMR SEAL #	I.D.	O.D.	W
38648-DL	38	64	8
386410-DL	38	64	10
386412	38	64	12
386510	38	65	10
386510-DL	38	65	10
387212	38	72	12
387410-DL	38	74	10
388012	38	80	12
389012	38	90	12
39517-DL	39	51	7
39526.5	39	52	6.5
39527-DL	39	52	7
39539.5-DL	39	53	9.5
404612.8	40	46	12.8
40505-DL	40	50	5
40506-DL	40	50	6
40506.5-DL	40	50	6.5
40507	40	50	7
40508-DL	40	50	8
40526	40	52	6
40527	40	52	7
40527-DL	40	52	7
40527-CS	40	52	7
40528	40	52	8
40528-DL	40	52	8
40528-BS	40	52	8
40528.5-DL	40	52	8.5
40546-BS	40	54	6
40546.5	40	54	6.5
40547-BS	40	54	7
405410-DL	40	54	10
40557	40	55	7
40557-DL	40	55	7
40558	40	55	8

DMR SEAL #	I.D.	O.D.	W
40558-DL	40	55	8
40558-BS	40	55	8
40559	40	55	9
40559-DL	40	55	9
405510	40	55	10
405510-DL	40	55	10
405512	40	55	12
40568	40	56	8
40568-DL	40	56	8
405610	40	56	10
405610-DL	40	56	10
40587	40	58	7
40588	40	58	8
40588-DL	40	58	8
40588-BS	40	58	8
40589-DL	40	58	9
405812	40	58	12
405812-DL	40	58	12
405812-BS	40	58	12
40608	40	60	8
406010	40	60	10
406010-DL	40	60	10
406010-CS	40	60	10
406012	40	60	12
406012-DL	40	60	12
40627	40	62	7
40627-DL	40	62	7
40627-BS	40	62	7
40628	40	62	8
40628-DL	40	62	8
40628-BS	40	62	8
40629-DL	40	62	9
40629-CS	40	62	9
406210	40	62	10

DMR SEAL #	I.D.	O.D.	W
406210-DL	40	62	10
406211	40	62	11
406211-DL	40	62	11
406211-BS	40	62	11
406211.5-DL	40	62	11.5
406212	40	62	12
406212-DL	40	62	12
406212-BS	40	62	12
40637-DL	40	63	7
40638-DL	40	63	8
406410-DL	40	64	10
406412-DL	40	64	12
40657.5	40	65	7.5
406510	40	65	10
406510-DL	40	65	10
406512	40	65	12
406512-DL	40	65	12
406512-CS	40	65	12
406514	40	65	14
406514-DL	40	65	14
40687-DL	40	68	7
40688-DL	40	68	8
406810	40	68	10
406812-DL	40	68	12
406813-CS	40	68	13
40708	40	70	8
407010	40	70	10
40727	40	72	7
40727-DL	40	72	7
407210	40	72	10
407212	40	72	12
407512-DL	40	75	12
408010	40	80	10
408010-DL	40	80	10

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
408012-DL	40	80	12
408510	40	85	10
40908-DL	40	90	8
409010	40	90	10
409012	40	90	12
409012-DL	40	90	12
41537-CS	41	53	7
41568-DL	41	56	8
415610	41	56	10
416512	41	65	12
42516-BS	42	51	6
42517-DL	42	51	7
42557	42	55	7
42557-DL	42	55	7
42557-BS	42	55	7
42558	42	55	8
42558-DL	42	55	8
42559	42	55	9
42559-DL	42	55	9
42559-C	42	55	9
42567	42	56	7
42567-DL	42	56	7
42588-DL	42	58	8
425810	42	58	10
42607-DL	42	60	7
42609	42	60	9
42609-DL	42	60	9
42609-BS	42	60	9
426010	42	60	10
426011-DL	42	60	11
426012-DL	42	60	12
42627-DL	42	62	7
42628	42	62	8
42628-DL	42	62	8

DMR SEAL #	I.D.	O.D.	W
426210	42	62	10
426210-DL	42	62	10
426210-BS	42	62	10
426210-CS	42	62	10
426212	42	62	12
42659	42	65	9
42659-DL	42	65	9
426510	42	65	10
426510-DL	42	65	10
426512	42	65	12
426512-DL	42	65	12
426512-BS	42	65	12
426512-C	42	65	12
426514-BS	42	65	14
42688	42	68	8
42727	42	72	7
42728	42	72	8
42728-DL	42	72	8
427210	42	72	10
427210-DL	42	72	10
43557	43	55	7
436010	43	60	10
43619	43	61	9
437011	43	70	11
445810	44	58	10
445810-DL	44	58	10
4458.41	44	58.4	10
44607-BS	44	60	7
44609-DL	44	60	9
446010	44	60	10
44628-DL	44	62	8
44629-DL	44	62	9
446210	44	62	10
446210-DL	44	62	10

DMR SEAL #	I.D.	O.D.	W
44658	44	65	8
446510	44	65	10
446511-DL	44	65	11
446812.8	44	68	12.8
447210	44	72	10
448013	44	80	13
45557	45	55	7
45557-DL	45	55	7
45557.5-BS	45	55	7.5
45577.5-DL	45	57	7.5
45587	45	58	7
45587-DL	45	58	7
45607	45	60	7
45607-DL	45	60	7
45607-BS	45	60	7
45608	45	60	8
45608-DL	45	60	8
45608-CS	45	60	8
45609	45	60	9
45609-DL	45	60	9
456010	45	60	10
456010-DL	45	60	10
456070-DL	45	60	70
45619	45	61	9
45619-DL	45	61	9
45619-BS	45	61	9
45627	45	62	7
45627.5	45	62	7.5
45628	45	62	8
45628-DL	45	62	8
45629	45	62	9
45629-DL	45	62	9
45629-BS	45	62	9
456210	45	62	10

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
456210-DL	45	62	10
456210-CS	45	62	10
456212	45	62	12
456212-CS	45	62	12
45657-BS	45	65	7
45658	45	65	8
456510	45	65	10
456510-DL	45	65	10
456512	45	65	12
45666	45	66	6
45669	45	66	9
45688.5-DL	45	68	8.5
45689	45	68	9
45689-DL	45	68	9
45689-BS	45	68	9
456810	45	68	10
456812	45	68	12
456812-DL	45	68	12
456812-BS	45	68	12
456812-CS	45	68	12
456814	45	68	14
456814-DL	45	68	14
456814-BS	45	68	14
457010-DL	45	70	10
457012	45	70	12
457012-DL	45	70	12
457014	45	70	14
457014-DL	45	70	14
457014-BS	45	70	14
45728	45	72	8
45728-DL	45	72	8
45729-DL	45	72	9
457210	45	72	10
457210-DL	45	72	10

DMR SEAL #	I.D.	O.D.	W
457212	45	72	12
457212-DL	45	72	12
457212-BS	45	72	12
45747-DL	45	74	7
45757	45	75	7
45757-DL	45	75	7
45758	45	75	8
45758-DL	45	75	8
457510	45	75	10
457510-DL	45	75	10
457512-DL	45	75	12
457612-DL	45	76	12
457810	45	78	10
45808	45	80	8
45808-DL	45	80	8
458010	45	80	10
458010-DL	45	80	10
458012	45	80	12
458012-DL	45	80	12
458013	45	80	13
458510	45	85	10
458510-DL	45	85	10
4510010	45	100	10
46608	46	60	8
46628-BS	46	62	8
46648	46	64	8
466411-DL	46	64	11
46659	46	65	9
466510	46	65	10
466812	46	68	12
467212	46	72	12
47567-BS	47	56	7
47607-DL	47	60	7
47626	47	62	6

DMR SEAL #	I.D.	O.D.	W
476510-DL	47	65	10
477012	47	70	12
478012	47	80	12
478012-DL	47	80	12
479010-DL	47	90	10
48587-BS	48	58	7
48627-DL	48	62	7
48627-CS	48	62	7
48628	48	62	8
48628-DL	48	62	8
48629	48	62	9
48629-DL	48	62	9
48629-BS	48	62	9
48658	48	65	8
48658-DL	48	65	8
48658.1-BS	48	65	8.1
48659	48	65	9
48659-DL	48	65	9
48659-BS	48	65	9
486510	48	65	10
486510-DL	48	65	10
486510-B	48	65	10
486510-CS	48	65	10
486612-DL	48	66	12
48688-DL	48	68	8
486810	48	68	10
486810-DL	48	68	10
486810-B	48	68	10
486812-B	48	68	12
48709	48	70	9
48709-DL	48	70	9
487010	48	70	10
487012	48	70	12
487012-DL	48	70	12

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
487012-B	48	70	12
487012-BS	48	70	12
487014-DL	48	70	14
487014-BS	48	70	14
48727	48	72	7
48728	48	72	8
48728-DL	48	72	8
48728.5-DL	48	72	8.5
48729.25-DL	48	72	9.25
487210	48	72	10
487210-DL	48	72	10
487212	48	72	12
487212-DL	48	72	12
487212-B	48	72	12
487410-DL	48	74	10
488010	48	80	10
488010-B	48	80	10
488014-BS	48	80	14
488612-DL	48	86	12
49659	49	65	9
496510	49	65	10
496810-B	49	68	10
497011-DL	49	70	11
497212	49	72	12
50588-DL	50	58	8
50606-DL	50	60	6
50627-DL	50	62	7
50627-BS	50	62	7
506410	50	64	10
506410-DL	50	64	10
506410-BS	50	64	10
50658	50	65	8
50658-DL	50	65	8
50659	50	65	9

DMR SEAL #	I.D.	O.D.	W
50659-DL	50	65	9
50659-BS	50	65	9
506510	50	65	10
506510-DL	50	65	10
506510-B	50	65	10
50679-BS	50	67	9
50688	50	68	8
50688-DL	50	68	8
50688.5-CS	50	68	8.5
50689	50	68	9
50689-DL	50	68	9
50689-BS	50	68	9
50689-CS	50	68	9
506810	50	68	10
506810-DL	50	68	10
506810-B	50	68	10
506811	50	68	11
506812	50	68	12
506812-DL	50	68	12
506812-B	50	68	12
50708	50	70	8
50709-DL	50	70	9
507010	50	70	10
507010-DL	50	70	10
507010-B	50	70	10
507011-DL	50	70	11
507012	50	70	12
507012-DL	50	70	12
507012-B	50	70	12
50726-DL	50	72	6
50727-DL	50	72	7
50728	50	72	8
50728-DL	50	72	8
50729	50	72	9

DMR SEAL #	I.D.	O.D.	W
50729-DL	50	72	9
507210	50	72	10
507210-DL	50	72	10
507210-B	50	72	10
507210-CS	50	72	10
507212	50	72	12
507212-DL	50	72	12
507212-B	50	72	12
507212-BS	50	72	12
507212-CS	50	72	12
507213	50	72	13
507214-DL	50	72	14
507214.5-DL	50	72	14.5
507412	50	74	12
50758-DL	50	75	8
507510	50	75	10
507512-B	50	75	12
507810	50	78	10
507813-B	50	78	13
50807.5	50	80	7.5
50808	50	80	8
50808-DL	50	80	8
508010	50	80	10
508010-DL	50	80	10
508010-B	50	80	10
508010.5-DL	50	80	10.5
508012	50	80	12
508012-DL	50	80	12
508012-B	50	80	12
508013	50	80	13
508013-DL	50	80	13
508013-B	50	80	13
508013-CS	50	80	13
508014	50	80	14

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
508014-DL	50	80	14
508014-BS	50	80	14
508513-B	50	85	13
50908-DL	50	90	8
509010	50	90	10
509010-DL	50	90	10
509013-B	50	90	13
516513-DL	51	65	13
52638-DL	52	63	8
52638-BS	52	63	8
52649-BS	52	64	9
52658	52	65	8
52659	52	65	9
52659-DL	52	65	9
52659-BS	52	65	9
52669	52	66	9
52688	52	68	8
52688-DL	52	68	8
526810	52	68	10
526810-B	52	68	10
526912-B	52	69	12
52709	52	70	9
52709-DL	52	70	9
52709-BS	52	70	9
527010-B	52	70	10
52728	52	72	8
52728-DL	52	72	8
52729-DL	52	72	9
527210	52	72	10
527210-DL	52	72	10
527210-B	52	72	10
527212	52	72	12
527212-B	52	72	12
52759	52	75	9

DMR SEAL #	I.D.	O.D.	W
52759-DL	52	75	9
52759-BS	52	75	9
527510	52	75	10
527510-B	52	75	10
527512	52	75	12
527512-DL	52	75	12
527512-B	52	75	12
527512-BS	52	75	12
527514-DL	52	75	14
52789	52	78	9
527812	52	78	12
527812-DL	52	78	12
528010	52	80	10
528010-B	52	80	10
528013-B	52	80	13
528510	52	85	10
528510-DL	52	85	10
528510-B	52	85	10
528513-B	52	85	13
529013-B	52	90	13
5210010-DL	52	100	10
5210015-DL	52	100	15
536513-BS	53	65	13
536810	53	68	10
536810-B	53	68	10
537212-B	53	72	12
537812	53	78	12
537812-DL	53	78	12
538013-B	53	80	13
546513-BS	54	65	13
54709-DL	54	70	9
547010	54	70	10
547012-B	54	70	12
547210-DL	54	72	10

DMR SEAL #	I.D.	O.D.	W
547210-B	54	72	10
547212	54	72	12
547213-DL	54	72	13
54768-DL	54	76	8
547610-DL	54	76	10
548010-B	54	80	10
548013-B	54	80	13
548110-DL	54	81	10
548210	54	82	10
548510-B	54	85	10
55688	55	68	8
55688-DL	55	68	8
55708	55	70	8
55708-DL	55	70	8
55709	55	70	9
55709-DL	55	70	9
55709-BS	55	70	9
55709-C	55	70	9
557010	55	70	10
557010.3	55	70	10.3
55727	55	72	7
55727-DL	55	72	7
55728	55	72	8
55728-DL	55	72	8
55729	55	72	9
55729-DL	55	72	9
557210	55	72	10
557210-DL	55	72	10
557210-B	55	72	10
557212-DL	55	72	12
557212-B	55	72	12
557212-BS	55	72	12
55758-DL	55	75	8
55759-DL	55	75	9

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
557510	55	75	10
557510-B	55	75	10
557512-DL	55	75	12
557512-B	55	75	12
557512-BS	55	75	12
557513	55	75	13
55789	55	78	9
55789-DL	55	78	9
557810	55	78	10
557810-DL	55	78	10
557810-BS	55	78	10
557812	55	78	12
557812-DL	55	78	12
557812-BS	55	78	12
557812-CS	55	78	12
557813-B	55	78	13
557814-DL	55	78	14
557814-BS	55	78	14
557913-DL	55	79	13
55808	55	80	8
55808-DL	55	80	8
558010	55	80	10
558010-DL	55	80	10
558010-B	55	80	10
558010-CS	55	80	10
558012	55	80	12
558012-DL	55	80	12
558012-B	55	80	12
558013	55	80	13
558013-B	55	80	13
558014	55	80	14
558214-B	55	82	14
55858	55	85	8
558510	55	85	10

DMR SEAL #	I.D.	O.D.	W
558510-B	55	85	10
558513	55	85	13
558513-B	55	85	13
558514	55	85	14
558514-DL	55	85	14
558516-DL	55	85	16
558516-BS	55	85	16
55908	55	90	8
55908-DL	55	90	8
559010	55	90	10
559010-DL	55	90	10
559013-B	55	90	13
5510010	55	100	10
5510010-DL	55	100	10
5510013-B	55	100	13
5511010-DL	55	110	10
56708	56	70	8
56708-DL	56	70	8
56709-DL	56	70	9
56709-B	56	70	9
56728	56	72	8
56728-DL	56	72	8
56728-B	56	72	8
56729-DL	56	72	9
567210	56	72	10
567210-B	56	72	10
56789-DL	56	78	9
56789-BS	56	78	9
567812	56	78	12
567812-DL	56	78	12
567813-B	56	78	13
56808	56	80	8
568010-B	56	80	10
568013	56	80	13

DMR SEAL #	I.D.	O.D.	W
56858	56	85	8
568512	56	85	12
568512-DL	56	85	12
569013-B	56	90	13
57676-DL	57	67	6
57728-DL	57	72	8
57728.4-BS	57	72	8.4
577210-B	57	72	10
577511	57	75	11
5776.211-DL	57	76.2	11
577712-DL	57	77	12
577810	57	78	10
578012-B	57	80	12
578512-B	57	85	12
578616-B	57	86	16
579013-DL	57	90	13
579013-B	57	90	13
58726-DL	58	72	6
58728	58	72	8
58728-DL	58	72	8
58729	58	72	9
58729-DL	58	72	9
58729-B	58	72	9
58729-BS	58	72	9
58759	58	75	9
58759-DL	58	75	9
58759-B	58	75	9
58759-BS	58	75	9
587510	58	75	10
587512-DL	58	75	12
587512-B	58	75	12
587813-B	58	78	13
58808	58	80	8
58808-DL	58	80	8

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
58808-B	58	80	8
58809	58	80	9
58809-DL	58	80	9
58809-B	58	80	9
58809-BS	58	80	9
588010	58	80	10
588010-DL	58	80	10
588010-B	58	80	10
588010-CS	58	80	10
588012	58	80	12
588012-DL	58	80	12
588012-B	58	80	12
588012-BS	58	80	12
588013-B	58	80	13
588013-CS	58	80	13
588510-B	58	85	10
588513-B	58	85	13
589010	58	90	10
589011	58	90	11
589011-DL	58	90	11
589013-B	58	90	13
60706-DL	60	70	6
60707-B	60	70	7
60728-B	60	72	8
607218-B	60	72	18
60747-DL	60	74	7
60758	60	75	8
60758-DL	60	75	8
60758-B	60	75	8
60759	60	75	9
60759-DL	60	75	9
60759-BS	60	75	9
60769	60	76	9
60789	60	78	9

DMR SEAL #	I.D.	O.D.	W
60789-DL	60	78	9
60789-B	60	78	9
607810	60	78	10
607813-B	60	78	13
60808	60	80	8
60808-DL	60	80	8
608010	60	80	10
608010-DL	60	80	10
608010-B	60	80	10
608012	60	80	12
608012-DL	60	80	12
608012-B	60	80	12
608013-DL	60	80	13
608013-B	60	80	13
608013-CS	60	80	13
60829	60	82	9
60829-DL	60	82	9
60829-B	60	82	9
60829-BS	60	82	9
608212	60	82	12
608212-DL	60	82	12
608212-B	60	82	12
608212-BS	60	82	12
608214-DL	60	82	14
608413-DL	60	84	13
60858	60	85	8
60858-DL	60	85	8
60858-B	60	85	8
608510	60	85	10
608510-DL	60	85	10
608510-B	60	85	10
608512	60	85	12
608512-DL	60	85	12
608512-B	60	85	12

DMR SEAL #	I.D.	O.D.	W
608513	60	85	13
608513-B	60	85	13
60908	60	90	8
60908-DL	60	90	8
609010	60	90	10
609010-DL	60	90	10
609010-B	60	90	10
609011	60	90	11
609011-DL	60	90	11
609012-B	60	90	12
609013	60	90	13
609013-DL	60	90	13
609014	60	90	14
609014-DL	60	90	14
609014-B	60	90	14
609016-BS	60	90	16
60957.5	60	95	7.5
60958-DL	60	95	8
609510	60	95	10
609510-DL	60	95	10
609512	60	95	12
609513-B	60	95	13
6010010	60	100	10
6010013.5-DL	60	100	13.5
6011012-DL	60	110	12
6011013	60	110	13
61789-DL	61	78	9
618513-B	61	85	13
618913	61	89	13
627410-BS	62	74	10
62759	62	75	9
62759-DL	62	75	9
62759-B	62	75	9
62809	62	80	9

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
62809-DL	62	80	9
628010	62	80	10
628010-B	62	80	10
628012-B	62	80	12
62859	62	85	9
62859-DL	62	85	9
628510	62	85	10
628510-DL	62	85	10
628510-B	62	85	10
628510-CS	62	85	10
628512	62	85	12
628512-DL	62	85	12
628512-B	62	85	12
628512-BS	62	85	12
628513-B	62	85	13
628513-CS	62	85	13
628913	62	89	13
629010	62	90	10
629010-B	62	90	10
629012-DL	62	90	12
629012-B	62	90	12
629013-B	62	90	13
629513-B	62	95	13
6210013-B	62	100	13
6210014-DL	62	100	14
6212012-DL	62	120	12
63758	63	75	8
63759	63	75	9
63759-DL	63	75	9
63759-B	63	75	9
63809	63	80	9
63809-DL	63	80	9
63809-B	63	80	9
63809-BS	63	80	9

DMR SEAL #	I.D.	O.D.	W
63859	63	85	9
63859-DL	63	85	9
63859-BS	63	85	9
638510	63	85	10
638510-B	63	85	10
638512	63	85	12
638512-DL	63	85	12
638512-B	63	85	12
638512-BS	63	85	12
638513-B	63	85	13
639010	63	90	10
639010-DL	63	90	10
639012-B	63	90	12
64746-DL	64	74	6
64808	64	80	8
648012	64	80	12
648012-B	64	80	12
648013-B	64	80	13
648510-B	64	85	10
648513-B	64	85	13
649010	64	90	10
649010-B	64	90	10
649013-B	64	90	13
649013-CS	64	90	13
65756-DL	65	75	6
65759-B	65	75	9
657712-BS	65	77	12
65805-B	65	80	5
65806	65	80	6
65808	65	80	8
65808-DL	65	80	8
658010	65	80	10
658210	65	82	10
658210-DL	65	82	10

DMR SEAL #	I.D.	O.D.	W
658210-B	65	82	10
658212	65	82	12
658212-DL	65	82	12
658410-DL	65	84	10
658510	65	85	10
658510-DL	65	85	10
658510-B	65	85	10
658512	65	85	12
658512-DL	65	85	12
658512-B	65	85	12
658513	65	85	13
658513-DL	65	85	13
658513-B	65	85	13
658812	65	88	12
658812-DL	65	88	12
658812-BS	65	88	12
658814-DL	65	88	14
658814-BS	65	88	14
659010	65	90	10
659010-DL	65	90	10
659010-B	65	90	10
659011	65	90	11
659012	65	90	12
659012-DL	65	90	12
659012-B	65	90	12
659012-CS	65	90	12
659013	65	90	13
659013-DL	65	90	13
659013-B	65	90	13
659013-BS	65	90	13
659014-B	65	90	14
659510	65	95	10
659512	65	95	12
659513-B	65	95	13

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
659514	65	95	14
659514-DL	65	95	14
659514-BS	65	95	14
651007	65	100	7
651009.5-DL	65	100	9.5
6510010	65	100	10
6510010-DL	65	100	10
6510010-B	65	100	10
6510013-BS	65	100	13
6512010	65	120	10
6512010-DL	65	120	10
6514012	65	140	12
6514012-DL	65	140	12
66809-CS	66	80	9
668610	66	86	10
669013-B	66	90	13
678510-B	67	85	10
679010	67	90	10
679010-B	67	90	10
679013-B	67	90	13
688510	68	85	10
68878-DL	68	87	8
68889.5-CS	68	88	9.5
689010	68	90	10
689010-DL	68	90	10
689010-B	68	90	10
689010-CS	68	90	10
689012	68	90	12
689012-DL	68	90	12
689012-B	68	90	12
689012-BS	68	90	12
689012-CS	68	90	12
689013-B	68	90	13
689014-BS	68	90	14

DMR SEAL #	I.D.	O.D.	W
689513	68	95	13
689513-DL	68	95	13
689513-B	68	95	13
689513-BS	68	95	13
6810010	68	100	10
6810010-B	68	100	10
6811513	68	115	13
699010	69	90	10
70826-DL	70	82	6
70857	70	85	7
70858	70	85	8
70858-DL	70	85	8
70858-BS	70	85	8
708512-B	70	85	12
708710-DL	70	87	10
70888-DL	70	88	8
70889-DL	70	88	9
708810	70	88	10
708812	70	88	12
708812-DL	70	88	12
708812-BS	70	88	12
7088130-DL	70	88	130
709010	70	90	10
709010-DL	70	90	10
709010-B	70	90	10
709010-BS	70	90	10
709010.3-CS	70	90	10.3
709012	70	90	12
709012-DL	70	90	12
709012-B	70	90	12
709013	70	90	13
709013-DL	70	90	13
709013-B	70	90	13
709013-CS	70	90	13

DMR SEAL #	I.D.	O.D.	W
709210-DL	70	92	10
709212	70	92	12
709212-DL	70	92	12
709212-B	70	92	12
709214-DL	70	92	14
709220-BS	70	92	20
709510	70	95	10
709510-B	70	95	10
709512-DL	70	95	12
709513	70	95	13
709513-DL	70	95	13
709513-B	70	95	13
709611-DL	70	96	11
709813-B	70	98	13
701006	70	100	6
7010010	70	100	10
7010010-DL	70	100	10
7010010-B	70	100	10
7010013-BS	70	100	13
7010513-B	70	105	13
701108	70	110	8
7011010-DL	70	110	10
7011012	70	110	12
7011013-B	70	110	13
7011515-DL	70	115	15
7012010-DL	70	120	10
7012512	70	125	12
7012512-DL	70	125	12
7013012-DL	70	130	12
719513	71	95	13
719513-DL	71	95	13
719513-B	71	95	13
72847	72	84	7
728418-B	72	84	18

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
72888-DL	72	88	8
729010	72	90	10
729010-B	72	90	10
729013-B	72	90	13
729412-DL	72	94	12
729413-DL	72	94	13
729510	72	95	10
729510-DL	72	95	10
729510-B	72	95	10
729512-DL	72	95	12
729512-B	72	95	12
729513-B	72	95	13
7210010	72	100	10
7210010-DL	72	100	10
7210010-B	72	100	10
7210513-B	72	105	13
7211013-B	72	110	13
7214012-DL	72	140	12
739510-B	73	95	10
739514-B	73	95	14
7310013-B	73	100	13
749010	74	90	10
749010-B	74	90	10
749510	74	95	10
749510-B	74	95	10
7410013-B	74	100	13
75908	75	90	8
75908-B	75	90	8
759010	75	90	10
759010-DL	75	90	10
759012-B	75	90	12
759212-DL	75	92	12
75959-DL	75	95	9
759510	75	95	10

DMR SEAL #	I.D.	O.D.	W
759510-DL	75	95	10
759510-B	75	95	10
759512	75	95	12
759512-DL	75	95	12
759512-B	75	95	12
759513-DL	75	95	13
759513-B	75	95	13
759611-BS	75	96	11
751008	75	100	8
7510010	75	100	10
7510010-DL	75	100	10
7510010-B	75	100	10
7510013-BS	75	100	13
7510013-CS	75	100	13
7510510-B	75	105	10
7510512	75	105	12
7510512-CS	75	105	12
7510513-DL	75	105	13
7510515-BS	75	105	15
7511012	75	110	12
7511013-DL	75	110	13
7511013-B	75	110	13
7511512-DL	75	115	12
7511513-B	75	115	13
7512012	75	120	12
7512012-DL	75	120	12
7512113-DL	75	121	13
7513012-DL	75	130	12
769410-BS	76	94	10
769412-DL	76	94	12
76959-B	76	95	9
7610010	76	100	10
7610013-B	76	100	13
7610212-B	76	102	12

DMR SEAL #	I.D.	O.D.	W
7610512-DL	76	105	12
7611013-B	76	110	13
77929-B	77	92	9
779510-B	77	95	10
7710010-B	77	100	10
789513-B	78	95	13
7810010	78	100	10
7810012-B	78	100	12
7810013-DL	78	100	13
7810013-BS	78	100	13
7810513-B	78	105	13
7811013-B	78	110	13
7811515-B	78	115	15
80958	80	95	8
809510-B	80	95	10
801008-B	80	100	8
801009	80	100	9
8010010	80	100	10
8010010-DL	80	100	10
8010010-B	80	100	10
8010010-BS	80	100	10
8010013-CS	80	100	13
801058-DL	80	105	8
8010513	80	105	13
8010513-DL	80	105	13
8010513-B	80	105	13
8010513-BS	80	105	13
8010513-C	80	105	13
8010513-CS	80	105	13
8011010	80	110	10
8011010-DL	80	110	10
8011012-B	80	110	12
8011510	80	115	10
8011513-B	80	115	13

' - Single lip, rubber covered
 -B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
8011515	80	115	15
8011515-DL	80	115	15
8011517-BS	80	115	17
8012013	80	120	13
8012013-B	80	120	13
8012512-DL	80	125	12
8012513	80	125	13
8012513-B	80	125	13
8014013	80	140	13
8014013-DL	80	140	13
8017013-DL	80	170	13
81916-DL	81	91	6
8110010-B	81	100	10
821008	82	100	8
8210010	82	100	10
8210510-DL	82	105	10
8210512	82	105	12
8210513-B	82	105	13
8211013-B	82	110	13
8212013-DL	82	120	13
8216013-DL	82	160	13
8410513-B	84	105	13
8411012-B	84	110	12
851007-DL	85	100	7
851009	85	100	9
851009-B	85	100	9
851009-BS	85	100	9
8510013-B	85	100	13
8510512-DL	85	105	12
8510513	85	105	13
8510513-B	85	105	13
8510513-BS	85	105	13
8510513-CS	85	105	13
851108	85	110	8

DMR SEAL #	I.D.	O.D.	W
851108-DL	85	110	8
8511010	85	110	10
8511012-DL	85	110	12
8511013-B	85	110	13
8511013-BS	85	110	13
8511013-CS	85	110	13
8511513	85	115	13
8511513-B	85	115	13
8511515-DL	85	115	15
8512012	85	120	12
8512013-B	85	120	13
8512015-DL	85	120	15
8512017-BS	85	120	17
8512513-B	85	125	13
8512514-DL	85	125	14
8513010	85	130	10
8513010-DL	85	130	10
8513013-B	85	130	13
8514012	85	140	12
8514012-DL	85	140	12
8515012	85	150	12
8515012-DL	85	150	12
8610513	86	105	13
8611013	86	110	13
87976-DL	87	97	6
8711013-B	87	110	13
8711513-DL	87	115	13
8811010	88	110	10
8811013-B	88	110	13
8811416	88	114	16
8811513	88	115	13
8811513-DL	88	115	13
8811513-B	88	115	13
8812013-B	88	120	13

DMR SEAL #	I.D.	O.D.	W
8816013-DL	88	160	13
8911013-B	89	110	13
901026-DL	90	102	6
901058-B	90	105	8
901108	90	110	8
901108-DL	90	110	8
901108-B	90	110	8
9011010	90	110	10
9011010-DL	90	110	10
9011013-B	90	110	13
9011013-BS	90	110	13
9011013-CS	90	110	13
90112.7113-B	90	112.71	13
901159-B	90	115	9
9011511-DL	90	115	11
9011512	90	115	12
9011513-B	90	115	13
9011513-BS	90	115	13
9012012	90	120	12
9012012-DL	90	120	12
9012013-B	90	120	13
9012013-BS	90	120	13
9012013-CS	90	120	13
9012513-B	90	125	13
9012515	90	125	15
9012515-DL	90	125	15
9012517-BS	90	125	17
9013012	90	130	12
9013012-DL	90	130	12
9013013-B	90	130	13
9013013-BS	90	130	13
9013515-DL	90	135	15
9013515-CS	90	135	15
9014013	90	140	13

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
9014013-B	90	140	13
9211210	92	112	10
9212012	92	120	12
9212013-B	92	120	13
9311013-B	93	110	13
941045-DL	94	104	5
9412013-B	94	120	13
9511013-BS	95	110	13
9511210-DL	95	112	10
951158-DL	95	115	8
9511510	95	115	10
9511512-DL	95	115	12
9511513-B	95	115	13
9512012	95	120	12
9512012-DL	95	120	12
9512013-B	95	120	13
9512013-BS	95	120	13
9512013-CS	95	120	13
9512512	95	125	12
9512512-DL	95	125	12
9512513-B	95	125	13
9513013-B	95	130	13
9513015	95	130	15
9513015-DL	95	130	15
9513017-BS	95	130	17
9513515-B	95	135	15
9514513	95	145	13
9514513-DL	95	145	13
9517013-DL	95	170	13
961106.5-DL	96	110	6.5
961159-B	96	115	9
9612513-B	96	125	13
971115-DL	97	111	5
9711412-BS	97	114	12

DMR SEAL #	I.D.	O.D.	W
9711512-DL	97	115	12
9712013-B	97	120	13
9812013-B	98	120	13
9812512	98	125	12
9812513-B	98	125	13
1001127-DL	100	112	7
1001145-B	100	114	5
10011410-DL	100	114	10
1001154-BS	100	115	4
1001159-B	100	115	9
1001208-B	100	120	8
10012010	100	120	10
10012012-DL	100	120	12
10012012-BS	100	120	12
10012512	100	125	12
10012513-DL	100	125	13
10012513-B	100	125	13
10012513-CS	100	125	13
10012515-BS	100	125	15
10013010	100	130	10
10013012-DL	100	130	12
10013013-CS	100	130	13
10013015-B	100	130	15
10013510-DL	100	135	10
10013513	100	135	13
10013517-BS	100	135	17
10015012	100	150	12
10016014	100	160	14
10016014-DL	100	160	14
10018012	100	180	12
10018012-DL	100	180	12
10211614-BS	102	116	14
10212010	102	120	10
10412510	104	125	10

DMR SEAL #	I.D.	O.D.	W
1051258.5	105	125	8.5
10512510	105	125	10
10512513-DL	105	125	13
10512513-B	105	125	13
10513010-B	105	130	10
10513012	105	130	12
10513012-DL	105	130	12
10513510-DL	105	135	10
10513514	105	135	14
10513514-B	105	135	14
10513514-BS	105	135	14
10514012	105	140	12
10514012-B	105	140	12
10514013-CS	105	140	13
10514015-DL	105	140	15
10516012-DL	105	160	12
10814015-DL	108	140	15
10817015-DL	108	170	15
1101226-DL	110	122	6
1101227-DL	110	122	7
1101258-DL	110	125	8
11012812	110	128	12
11013012	110	130	12
11013012-DL	110	130	12
11013012-B	110	130	12
11013013-BS	110	130	13
11013512-DL	110	135	12
11014012	110	140	12
11014012-DL	110	140	12
11014013-CS	110	140	13
11014014-B	110	140	14
11014014-BS	110	140	14
11014514-B	110	145	14
11014514-BS	110	145	14

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
11014515	110	145	15
11014515-DL	110	145	15
11015012	110	150	12
11020013	110	200	13
11020013-DL	110	200	13
11214013	112	140	13
11214214-DL	112	142	14
11214514	112	145	14
11214514-DL	112	145	14
11214514-B	112	145	14
11214514-BS	112	145	14
1131339-B	113	133	9
1151306-DL	115	130	6
11514011-CS	115	140	11
11514012	115	140	12
11514012-DL	115	140	12
11514013-B	115	140	13
1151458	115	145	8
11514514	115	145	14
11514514-DL	115	145	14
11514514-B	115	145	14
11514514-BS	115	145	14
11515012	115	150	12
11515012-DL	115	150	12
11515012-B	115	150	12
11613212-DL	116	132	12
1171358.5-DL	117	135	8.5
11814013-B	118	140	13
11815012	118	150	12
11815012-DL	118	150	12
11914614.3-B	119	146	14.3
12014010	120	140	10
12014013-DL	120	140	13
12014013-BS	120	140	13

DMR SEAL #	I.D.	O.D.	W
12014515-B	120	145	15
12014612-B	120	146	12
12015012	120	150	12
12015012-DL	120	150	12
12015014-B	120	150	14
12015014-BS	120	150	14
12015015-CS	120	150	15
12015516	120	155	16
12015516-DL	120	155	16
12015516-BS	120	155	16
12016012	120	160	12
12016012-DL	120	160	12
12018015-DL	120	180	15
12020014	120	200	14
12020014-DL	120	200	14
12213812-DL	122	138	12
12215015-DL	122	150	15
12220015-DL	122	200	15
1251438.5-DL	125	143	8.5
12515012	125	150	12
12515012-DL	125	150	12
12515012-B	125	150	12
12515015-CS	125	150	15
12515512.5-DL	125	155	12.5
12515514	125	155	14
12515514-B	125	155	14
12515514-BS	125	155	14
12515514-CS	125	155	14
12516012	125	160	12
12516015-DL	125	160	15
12516016-BS	125	160	16
12520015-DL	125	200	15
12715514-B	127	155	14
12814613.5-DL	128	146	13.5

DMR SEAL #	I.D.	O.D.	W
12815013	128	150	13
12815318-B	128	153	18
12816014	128	160	14
1301427-DL	130	142	7
13015012-DL	130	150	12
13015014-B	130	150	14
13016012	130	160	12
13016012-DL	130	160	12
13016012-B	130	160	12
13016014-BS	130	160	14
13016014-CS	130	160	14
13017012	130	170	12
13017012-DL	130	170	12
13017015-CS	130	170	15
13020015-DL	130	200	15
13023014	130	230	14
13023014-DL	130	230	14
13315310.5-BS	133	153	10.5
1351518-DL	135	151	8
13515510-B	135	155	10
13516012	135	160	12
13516013-CS	135	160	13
13516514	135	165	14
13516514-DL	135	165	14
13516514-B	135	165	14
13516514-BS	135	165	14
13517012	135	170	12
13517012-DL	135	170	12
13517015-B	135	170	15
13517516-B	135	175	16
13517516-BS	135	175	16
13815212-BS	138	152	12
1401557.5-DL	140	155	7.5
1401578-DL	140	157	8

' - Single lip, rubber covered
 '-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
14016010-B	140	160	10
14016014-DL	140	160	14
14016512	140	165	12
14016512-DL	140	165	12
14017010-B	140	170	10
14017013	140	170	13
14017013-DL	140	170	13
14017014-BS	140	170	14
14017015-CS	140	170	15
14017117	140	171	17
14018012	140	180	12
14018015-CS	140	180	15
14018516	140	185	16
14018516-DL	140	185	16
14018516-BS	140	185	16
14023015-DL	140	230	15
14025015	140	250	15
14025015-DL	140	250	15
1431618.5-DL	143	161	8.5
1451607-B	145	160	7
14516012-BS	145	160	12
14516014-DL	145	160	14
14516510	145	165	10
14516513-B	145	165	13
14516713-DL	145	167	13
14517013-CS	145	170	13
14517015	145	170	15
14517015-B	145	170	15
1451758	145	175	8
14517514	145	175	14
14517514-DL	145	175	14
14517514-B	145	175	14
14517514-BS	145	175	14
14517614-BS	145	176	14

DMR SEAL #	I.D.	O.D.	W
14518013-DL	145	180	13
14519016	145	190	16
14519016-DL	145	190	16
14523017-DL	145	230	17
14617212-B	146	172	12
14617813-DL	146	178	13
14817014.5-CS	148	170	14.5
14817015	148	170	15
15017015-B	150	170	15
15017218-DL	150	172	18
15017512.5-DL	150	175	12.5
15018012	150	180	12
15018014-DL	150	180	14
15018014-B	150	180	14
15018014-BS	150	180	14
15018014-CS	150	180	14
15018518	150	185	18
15019520-B	150	195	20
15022515-DL	150	225	15
15217210-B	152	172	10
15517412	155	174	12
15518015-DL	155	180	15
15518113-B	155	181	13
15518510-B	155	185	10
15518515-DL	155	185	15
15519013	155	190	13
15520020	155	200	20
15520020-DL	155	200	20
15920019.4-CS	159	200	19.4
16018413-B	160	184	13
16018510	160	185	10
16018510-B	160	185	10
16018514-DL	160	185	14
16019012.5-DL	160	190	12.5

DMR SEAL #	I.D.	O.D.	W
16019013-B	160	190	13
16019014	160	190	14
16019015-CS	160	190	15
16019016-BS	160	190	16
16019515-DL	160	195	15
16019518	160	195	18
16019620-BS	160	196	20
16020014-B	160	200	14
16020015	160	200	15
16021020	160	210	20
16021020-B	160	210	20
16021022.5-CS	160	210	22.5
16024014-DL	160	240	14
16029018	160	290	18
16029018-DL	160	290	18
16219012	162	190	12
16518512-B	165	185	12
16518516-BS	165	185	16
16519012-B	165	190	12
16519013	165	190	13
16519016-BS	165	190	16
16519514-DL	165	195	14
16519514-B	165	195	14
16519515	165	195	15
16519515-BS	165	195	15
16520015	165	200	15
16520015-B	165	200	15
16520120-B	165	201	20
16522020	165	220	20
16522020-B	165	220	20
16522022.5-DL	165	220	22.5
16522022.5-BS	165	220	22.5
16819513	168	195	13
17020013-B	170	200	13

' - Single lip, rubber covered
 'B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
 '-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
17020014-DL	170	200	14
17020015	170	200	15
17020015-CS	170	200	15
17020016-BS	170	200	16
17020516-DL	170	205	16
17020516-B	170	205	16
17020518-BS	170	205	18
17020620	170	206	20
17021015	170	210	15
17022520	170	225	20
17022520-B	170	225	20
17022520-BS	170	225	20
17022522.5-DL	170	225	22.5
1731918.5-DL	173	191	8.5
1741905-DL	174	190	5
1741919-DL	174	191	9
17519518-BS	175	195	18
17520013-DL	175	200	13
17520015	175	200	15
17520515	175	205	15
17521016	175	210	16
17521016-DL	175	210	16
17523020-B	175	230	20
1761949-DL	176	194	9
17821619-BS	178	216	19
18020015-CS	180	200	15
18020016-BS	180	200	16
18020515-BS	180	205	15
18021015	180	210	15
18021015-DL	180	210	15
18021015-B	180	210	15
18021016-BS	180	210	16
18021515-CS	180	215	15
18021516	180	215	16

DMR SEAL #	I.D.	O.D.	W
18021516-B	180	215	16
18021518-BS	180	215	18
18021518.5-DL	180	215	18.5
18021817-DL	180	218	17
18022015-B	180	220	15
18022015-BS	180	220	15
18022020	180	220	20
18022520-B	180	225	20
18023520-B	180	235	20
18023522.5-BS	180	235	22.5
1812019.5-DL	181	201	9.5
18521013	185	210	13
18521015-DL	185	210	15
18521515-DL	185	215	15
18521516	185	215	16
18521516-CS	185	215	16
18521518-BS	185	215	18
18524022	185	240	22
18524022-B	185	240	22
18524024.5-DL	185	240	24.5
18524024.5-BS	185	240	24.5
19021515-B	190	215	15
19022012-DL	190	220	12
19022012-B	190	220	12
19022012.5	190	220	12.5
19022014-BS	190	220	14
19022515	190	225	15
19022515-DL	190	225	15
19022515-B	190	225	15
19022515-BS	190	225	15
19022620	190	226	20
19023015-B	190	230	15
19024522	190	245	22
19024522-B	190	245	22

DMR SEAL #	I.D.	O.D.	W
19024524.5-BS	190	245	24.5
19522016-DL	195	220	16
19522515	195	225	15
19523016	195	230	16
19523016-B	195	230	16
19523120-BS	195	231	20
19525022-B	195	250	22
2002219-DL	200	221	9
20022516-B	200	225	16
20023014	200	230	14
20023015-DL	200	230	15
20023015-CS	200	230	15
20023016-B	200	230	16
20023016-BS	200	230	16
20023515-DL	200	235	15
20023516	200	235	16
20023516-B	200	235	16
20023619	200	236	19
20024015-DL	200	240	15
20024020	200	240	20
20024020-B	200	240	20
20024020-BS	200	240	20
20024220	200	242	20
20025016	200	250	16
20025522-B	200	255	22
20025525-BS	200	255	25
20423212-DL	204	232	12
20522510-B	205	225	10
20523015	205	230	15
20526023-B	205	260	23
20526025-BS	205	260	25
21023516-B	210	235	16
21024012-B	210	240	12
21024014-BS	210	240	14

' - Single lip, rubber covered
'-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
'-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
21024015	210	240	15
21024015-DL	210	240	15
21024515-B	210	245	15
21025015	210	250	15
21025016-DL	210	250	16
21025016-B	210	250	16
21025016-BS	210	250	16
21026020-C	210	260	20
21026025	210	260	25
21026025-B	210	260	25
21026523-DL	210	265	23
21026523-B	210	265	23
21026525	210	265	25
21026525-BS	210	265	25
21224516	212	245	16
21224516-B	212	245	16
21524012-B	215	240	12
21524515	215	245	15
21525016	215	250	16
21525016-B	215	250	16
21525016-BS	215	250	16
21525516-B	215	255	16
21525525-BS	215	255	25
21527023-B	215	270	23
21625014-B	216	250	14
21625519-B	216	255	19
2182469	218	246	9
22024020-B	220	240	20
22024514-B	220	245	14
22024515-BS	220	245	15
22025015	220	250	15
22025015-DL	220	250	15
22025015-B	220	250	15
22025015-CS	220	250	15

DMR SEAL #	I.D.	O.D.	W
22025016-BS	220	250	16
22025516	220	255	16
22025516-B	220	255	16
22025518-DL	220	255	18
22025518-BS	220	255	18
22025518-CS	220	255	18
22025813-B	220	258	13
22025922	220	259	22
22026014-DL	220	260	14
22026022-B	220	260	22
22026022-BS	220	260	22
22027523	220	275	23
22027523-DL	220	275	23
22027523-B	220	275	23
22027526-BS	220	275	26
22227225-C	222	272	25
22426018-BS	224	260	18
22525016-B	225	250	16
22525518-B	225	255	18
22528023-B	225	280	23
23025110-DL	230	251	10
23025515	230	255	15
23025515-B	230	255	15
23026015	230	260	15
23026015-DL	230	260	15
23026015-BS	230	260	15
23026020-B	230	260	20
23027016-DL	230	270	16
23027016-B	230	270	16
23028523	230	285	23
23028523-B	230	285	23
23028525-BS	230	285	25
23127016-BS	231	270	16
23526515-B	235	265	15

DMR SEAL #	I.D.	O.D.	W
23526518-BS	235	265	18
23527012-B	235	270	12
23529023-B	235	290	23
23529025-BS	235	290	25
23627016-B	236	270	16
23627018-BS	236	270	18
24027015	240	270	15
24027015-BS	240	270	15
24027016-B	240	270	16
24027020-DL	240	270	20
24027510-BS	240	275	10
24027516	240	275	16
24027516-DL	240	275	16
24027516-B	240	275	16
24028019-DL	240	280	19
24028019-B	240	280	19
24028019-BS	240	280	19
24028020	240	280	20
24030025	240	300	25
24030025-B	240	300	25
24030028-BS	240	300	28
24527315-DL	245	273	15
24530528-BS	245	305	28
25028015	250	280	15
25028015-DL	250	280	15
25028015-B	250	280	15
25028018-BS	250	280	18
25028516	250	285	16
25028516-B	250	285	16
25028518-DL	250	285	18
25028518-BS	250	285	18
25029016	250	290	16
25029020-DL	250	290	20
25031025	250	310	25

' - Single lip, rubber covered
'-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
'-BS' - Double lip, metal covered

DMR SEAL #	I.D.	O.D.	W
25031025-B	250	310	25
25031025-BS	250	310	25
25529010-BS	255	290	10
25529012	255	290	12
25530017-B	255	300	17
25530023-BS	255	300	23
25531525-B	255	315	25
25628816-B	256	288	16
26028010	260	280	10
26029015-DL	260	290	15
26029016-B	260	290	16
26030018-B	260	300	18
26030018-BS	260	300	18
26030020	260	300	20
26030020-DL	260	300	20
26030420-B	260	304	20
26032025-DL	260	320	25
26032025-B	260	320	25
26032025-BS	260	320	25
26529016-DL	265	290	16
26530518-B	265	305	18
26532525-BS	265	325	25
27030015	270	300	15
27030015-B	270	300	15
27030518-BS	270	305	18
27031016-CS	270	310	16
27031018-B	270	310	18
27031320-BS	270	313	20
27032020-DL	270	320	20
27033025	270	330	25
27033025-B	270	330	25

DMR SEAL #	I.D.	O.D.	W
27033025-BS	270	330	25
27230415	272	304	15
27233214-B	272	332	14
27530515-B	275	305	15
27531016-B	275	310	16
27631615-B	276	316	15
27827614-CS	278	276	14
28031015-B	280	310	15
28031015-BS	280	310	15
28031016-DL	280	310	16
28031618	280	316	18
28031618-B	280	316	18
28032015	280	320	15
28032018-B	280	320	18
28032020-DL	280	320	20
28032020-CS	280	320	20
28032022-BS	280	320	22
28033020-C	280	330	20
28033024	280	330	24
28034025-B	280	340	25
28034028-DL	280	340	28
28034028-BS	280	340	28
28531620-BS	285	316	20
28532516	285	325	16
29033016-BS	290	330	16
29033018-B	290	330	18
29033020	290	330	20
29033418-B	290	334	18
29035025-B	290	350	25
29035025-BS	290	350	25
29234220-B	292	342	20

' - Single lip, rubber covered
'-B' - Single lip, metal covered

'-DL' - Double lip, rubber covered
'-BS' - Double lip, metal covered

Cross Section	Type	Application	Shaft Surface Speed (m/min)	Shaft Size Range Inches (mm)
	LUP	General Purpose	Thru 3200 F.P.M (976)	5/8" -60" (16-1524)
	LPD without spring retainer	General Purpose	Thru 3200 F.P.M. (976)	5/8" -60" (16-1524)
	LPD with spring retainer	General Purpose	Thru 3200 F.P.M. (976)	5/8" -60" (16-524)
	RUP	General Purpose, Split Design	Thru 2000 F.P.M. (610)	1-5/16" -60" (33-1524)
	RPD	General Purpose, Split Design	Thru 2000 F.P.M. (610)	1-5/16" -60" (33-1524)
	SS	General Purpose, Springless – for small flange dimensions.	Thru 2000 F.P.M. (610)	1/4" -60" (33-1524)
	ST-LUP	Heavy Duty Steel Mill Roll Neck Bearing Service. Steel bands offer greater retention in bore.	Thru 3200 F.P.M (976)	5" - 50" (127-1270)
	ST-LPD	Heavy Duty Steel Mill Roll Neck Bearing Service. Steel bands offer greater retention in bore.	Thru 3200 F.P.M (976)	5" - 50" (127-1270)
	LDS	General Purpose. Dual lip – used against fluid & dust conditions.	Thru 2500 F.P.M (762)	3/4" -25" (19-635)
	LUPW	Oscillating or angular movement at low surface speed.	Thru 1000 F.P.M (306)	1-5/8" - 50" (41-1270)
	LPDW	Oscillating or angular movement at low surface speed.	Thru 1000 F.P.M (306)	1-5/8" - 50" (41-1270)
	HP (High pressure seal)	The type HP high-pressure seal is a sophisticated design to handle rotary and reciprocating motion.	Thru 4,000 FPM	N/A



MATERIAL STYLES

Style	Type of Elastomer	Typical Shore A Hardness	Temperature Range °F (°C)	Relative Price
Outer Heel				
H1	Hard, dense, rugged aramid fiber Oil resistant – composition	100+	-65 to +350 (-54 to +177)	Low
H3	Rigid dense – aramid fiber Oil resistant – composition	93	-20 to 250 (-29 to +121)	Medium
H5	Hard, dense, special aramid fiber – High temperature rubber composition of Resistance (Special formulation of Fluoroelastomer)	100+	-40 to +500 (-40 to +260)	High
STH1	Style H1 with metal reinforcement in heel, body	100+	-65 to +300 (-54 to +149)	Low
Lip Element				
L3	Neoprene Nitrile	55	-40 to +200	Medium
L5	Nitrile (replaces Style L10)	77	-20 to +300 (-29 to +149)	Low
L7	Nitrile	89	-30 to +250 (-34 to 121)	Low
L8	Neoprene – Fiber	93	-20 to +250 -29 to +121	Medium
L16*	Resistan® (special formulation of fluoroelastomer)	85	-40 to +500 (-40 to +260)	High
L17	Teflon* (Types TMA-L and TMA-S only)	100+	-300 to +350 (-184 to +177)	High
L50	Arctic Nitrile® (Special formulation of Nitrile Elastomer)	85	-50 to +250 (-46 to +121)	Medium
L70	Alaska Nitrile® (Special formulation of Nitrile Elastomer)	75	-70 to +250 (-57 to +121)	Medium

*Registered DuPont trademark

*Style H5/L16 marked with narrow white band on heel body for identification purposes



OIL SEAL SELECTION GUIDE

Follow the **SMART** method of selecting the correct seal for your service conditions.

First Step	
Speed	In FPM
Media	Oil <input type="checkbox"/> Grease <input type="checkbox"/> Air <input type="checkbox"/> Other <input type="checkbox"/>
Application	General Purpose <input type="checkbox"/> Double Lip <input type="checkbox"/> Split <input type="checkbox"/> Heavy Duty <input type="checkbox"/> Springless <input type="checkbox"/> Other <input type="checkbox"/>
Run out	Inches T.I.R. (mm)
Temp	°F (°C)

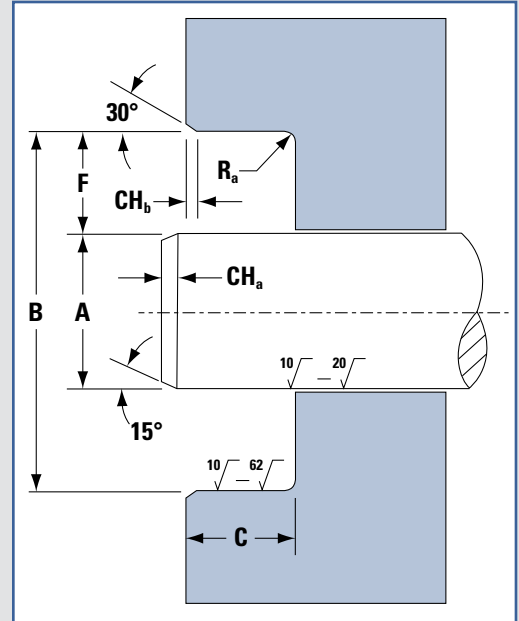
Second Step
1. Determine bore and shaft diameter, cavity depth and shaft speed in RPM.
2. Convert to FPM.
3. Use Table I below to determine design type.
4. Use Table II below to determine material style.
5. Using Mold list in back section. Select the proper mold for your size, design type and style.

Table I				
Application	Maximum Speed FPM (m/min)	Maximum Temperature °F* (°C)	Total Eccentricity (mm)	Design Types Recommended
General Purpose	3200 (975)	300 (149)	.008 (.20)	LUP, LPD
Heavy Duty	3200 (975)	300 (149)	.008 (.20)	STLUP, STLPD
Dual Lip	2500 (762)	300 (149)	.005 (.13)	LDS
Springless	2000 (610)	250 (121)	.008 (.20)	SS
Split	2000 (610)	300 (149)	.005 (.13)	RUP, RPD
Other	*Style H5/L16 available for 500°F service.			

Table II			
Service Media	Suggested Material Styles For Various Media*		
	H1/L5	H1/L7	H1/L16
Mild Oils or Greases (ASTM#1)	Yes	Yes	Yes
Intermediate Oils or Greases (ASTM #2)	Yes	Yes	Yes
Severe Oils or Greases (ASTM #3)	Yes	Yes	Yes
Mild Chemicals	Yes	Yes	Yes
Diesel Base Oils	Yes	Yes	Yes
Water	Yes	Yes	Yes
Air	Yes	Yes	Yes
Phosphate Ester Fluids (Pydraul)	No	No	Yes
(Skydrol)	No	No	Use style L17
(Cellu Lube)	No	No	Yes

When giving dimensions for a packing space, in which an Oil Seal is to be used, the nominal dimensions A, B and C should be specified.

- A – Nominal Shaft Diameter
- B – Nominal Bore Diameter
- C – Nominal Cavity Width
- F – Nominal Flange Size
- CH_b – Bore Entrance Chamfer Width
- CH_a – Shaft Entrance Chamfer Width
- R_b – Inner Bore Face Radius



Shaft Tolerance				
Shaft Speeds – F.P.M., (m/min)	Under 2800 (854)			Over 2800 (854)
Shaft Diameters – Inches (mm)	To 5.999 (152)	6.000 To 15.999 (152 to 466)	16.000 & Up (406 & over)	All Diameters
Design Types				
LUP, LPD, LPD-ST, LDS,	+/- .003 (.08)	+/- .005 (.13)	+/- .010 (.25)	+/- .003 (.08)
LUPW, LPDW, RUP, RPD,	+/- .005 (.13)	+/- .007 (.18)	+/- .012 (.30)	+/- .005 (.13)
RPDT, SS, H, P, SDS, DS,	+/- .002 (.05)	+/- .002 (.05)	+/- .002 (.05)	+/- .002 (.05)
SSW	+/- .002 (.05)	+/- .002 (.05)		+/- .002 (.05)
	+/- .002 (.05)	+/- .005 (.13)		
Bore Tolerance				
Cavity Bore Diameter – Inches (mm)	To 5.999 (152)	6.000 To 15.999 (152 to 406)	16.000 To 30.999 (406 To 787)	31.000 & Up (787 & Over)
All design H1 types – (mm)	+/- .002 (.05)	+/- .005 (.13)	+/- .008 (.20)	+/- .010 (.25)
Metal reinforced type – ST-H1	+/- .002 (.05)	+/- .002 (.05)	+/- .005 (.13)	+/- .005 (.13)
Cavity Depth Tolerance		Shaft and Bore Finishes		
Nominal Bore	Depth "C" Tolerance	Shaft Finish Range 10 to 20 = 10 to 20 RMS		
Range	Inches (mm)	Bore Finish Range 10 to 62 = 10 to 62 RMS		
Up to 5.999	-.000 +.031 (.79)			
Over 6.000	-.000 +.062 (1.57)			



SHAFT ECCENTRICITY

Optimum seal performance is obtained when shaft misalignment, run-out and whip are kept to a minimum.

Static measurements will reflect shaft to bore misalignment due to:

1. Poor tolerances of bearing and bore locating dimensions.
2. Bearing-shaft clearances
3. Shaft out of round condition.

Dynamic measurements reflect some degree of the static measurements and shaft run-out and whip due to:

1. Shaft deflections
2. Shaft vibrations

Dynamic measurements cannot be predicted by equipment

Shaft Speed RPM (m/min)	Shaft to Bore Misalignment – Static Measurement T.I.R. Ins. (mm)	Shaft Run-Out & Whip – Dynamic Measurement T.I.R. Ins. (mm)	Total Eccentricity Static & Dynamic Ins. (mm)
0 to 800 (0 to 244)	.010 (.254)	.010 (.254)	.020 (.508)
800 to 2000 (244 to 610)	.005 (.127)	.005 (.127)	.010 (.254)
2000 to 4200 (610 to 1280)	.005 (.127)	.003 (.076)	.008 (.203)

design. They are extremely difficult to measure on operating equipment, but they do exist.

In seal applications the basic guidance and control limits are the static measurement of shaft to bore misalignment. Measurements are made with dial instruments and readings are expressed in inches (mm) as “Total Indicator Reading” (T.I.R.)

The following table lists the maximum values of misalignment, run-out and whip which are considered practical for seal lip types LUP, LPD and SS. For eccentricity above these values use types LUPW and LPDW to a maximum of 1000 F.P.M.

CHAMFERS The bore entrance must be chamfered to facilitate proper entrance of the seal into the cavity. Use the following recommendations:

Diameters – Range In Inches	Chamfer (Cha)	Chamfer (Chb)	Angle	Radius (Rb)
Shaft (mm)	Inches (mm)	Inches (mm)	Degrees	Inches (mm)
1/4 to 1 (6 to 25)	.062 (1.57)		15	
1 to 3 (25 to 75)	.093 (2.36)		15	
3 to 5 (75 to 125)	.125 (3.18)		15	
5 to 10 (125 to 250)	.250 (6.35)		15	
10 to 20 (250 to 500)	.375 (9.53)		15	
20 and up (500 & up)	.500 (12.70)		15	
Bore (mm)				
3/4 to 5 (19 to 125)		.040 (1.02)	30	.008 (.20) Max.
5 to 10 (125 to 250)		.062 (1.57)	30	.015 (.38) Max
10 to 20 (250 to 500)		.094 (2.39)	30	.031 (.79)
29 and up (500 & up)		.125 (3.18)	30	.048 (1.22) Max.

**** Special seal designs are required for high pressure sealing service. ****

PROTECH LABYRINTH SEALS

UNIQUE SOLUTIONS FOR EXTENDED BEARING LIFE

PROBLEM: PREMATURE BEARING FAILURE

Bearings are at risk whenever seals allow lubricant leakage or contaminant intrusion into the housing. Until now, there has been no comprehensive solution.

Partial Solutions

Standard radial lip seals are an acceptable solution for most shafts sealing requirements; however, they have two drawbacks in some applications. First, standard radial lip oil seals are designed for one-way performance. They keep lubricants in, but they do not keep contaminants out. Second, they ride on the shaft causing wear on both the shaft and the seal. Eventually, this causes lubricant leakage.

Even though labyrinth seals were developed to address these problems, they have performance weaknesses. Not only are many labyrinth seals costly and complicated, they also allow some contamination to reach lubricants. (See extreme testing information to follow.) The use of metal in labyrinth seals results in costly designs, close tolerances, and difficult installations. Some manufactures offer two-piece, non-unitized labyrinth seals. However with one exception, unitized labyrinth seals have at least three components and up to four O-Rings.

SOLUTION: PROTECH LABYRINTH







SEALS




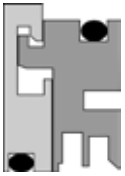
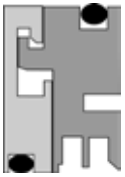


JM Clipper uniquely designed ProTech to protect bearings with zero lubricant leakage and total exclusion of contaminants. Only ProTech is based on a simple, unitized, two-piece PTFE design with only two O-Rings. Only ProTech has four unique designs that provide outstanding performance and lower cost.



Multiple ProTech Designs

ProTech labyrinth seals are available in four designs to meet virtually all application requirements – standard flanged design, non-flanged design, multi-port design and split pillow block design. In addition, JM Clipper offers other special designs for specific applications. For example, we have a stepped-shaft design generally found on electric motors and some pumps.

Series	Features	Applications
LS 	Flanged — General purpose sealing in flanged design. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
LN 	Non-flanged — Specifically designed for flush mount applications. General purpose sealing in non-flanged design. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
LM 	Step Shaft — Specifically designed to accommodate step shaft application. Flanged designs. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
LW, LX 	Wrap Around — Specifically designed for heavier water spray exclusion. Vertical up optional design is "LX," same as "LW" but with no drain port. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drainback or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
LD 	Multi Port — For use in applications where drain port cannot be fixed at six o'clock position. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
LB 	Pillow Block — Solid seal design for sealing split pillow block bearings. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Drop in replacement for LER ring for split pillow block bearings. Easily interchanged by LER number and shaft diameter.

Series	Features	Applications
SB 	Pillow Block — Split seal design for sealing split pillow block bearings. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Drop in replacement for LER ring for split pillow block bearings. Easily interchanged by LER number and shaft diameter.
SL 	Split — Split design for field retrofits where equipment can not be uncoupled or disassembled. Requires no wear sleeves or shaft refurbishment. PTFE material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
WD 	Wash Down — Wash down purpose in narrow flanged designs. PTFE material. Specifically designed to exclude high pressure water spray and dry contaminants in limited space applications. For grease retention.	Small disposable electric motors and equipment for food processing industry. Economical for 140 & 480 frame IEEE 841 electric motors.
ML 	Flanged Millennium — Specifically designed for heavier water spray exclusion. Bronze material. Also excludes dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
MN 	Non-flanged Millennium — Specifically designed for flush mount applications. General purpose sealing in non-flanged design. Bronze material. Excludes heavy water spray and dry contaminants from the bearing cavity. Retains grease and oil splash (oil level must be below inboard oil drain-back or non-flooded).	Electric motors, pumps, mixers, gear boxes, blowers and custom equipment.
FS 	Flanged 360 — Specifically designed for oil flooded and oil mist applications. Maximum 5 psi (0.3 bar) internal pressure. PTFE material with stainless steel rotor. Excludes heavy water spray and dry contaminants from the bearing cavity.	Electric motors, pumps, mixers, gear boxes, blowers, cooling towers, aerators and custom equipment. Oil mist lubrication systems.
FN 	Non-flanged 360 — Specifically designed for oil flooded and oil mist applications where seal must be flush mounted. Maximum 5 psi (0.3 bar) internal pressure. PTFE material with stainless steel rotor. Excludes heavy water spray and dry contaminants from the bearing cavity.	Electric motors, pumps, mixers, gear boxes, blowers, cooling towers, aerators and custom equipment. Oil mist lubrication systems.

Benefits of Simplified Design

Compared to past approaches, the simple design of ProTech provides important efficiencies:

- Fewer working components
- Significantly lower cost
- Easy installation
- Accommodates greater shaft misalignment and eccentricity – up to 0.020" TIR
- Easier to retrofit in standard bore housings
- Self aligning
- Requires no lubrication
- Non contact means no wear and no heat build up
- Tested for total exclusion of contaminants
- Tested for zero oil leakage

Additional Benefits of PTFE Construction

- Chemical resistance
- Foreign materials will not stick to the seal
- Low density reduces both initial torque consumption and dynamic balance problems
- Non-sparking

Applications

Chemical Resistance

Advanced proprietary PTFE compounds mean ProTech is well suited for caustic environments such as citric acids found in juice processing and strong sulfides in pulp and paper processing. ProTech's superior chemical resistance allows for the standardization of a single material within a plant, eliminating the need to stock duplicate sizes in expensive stainless steel, Hastelloy® or other exotic materials. PTFE is compatible with over 160 chemicals vs. 11 for bronze and 30 for stainless steel.

Food Processing

ProTech's unique designs and superior performance are "eating the competition's lunch" in the food processing market. The WD is an economical profile for high volume, disposable equipment such as wash down grade motors and drives. It also greatly reduces maintenance costs and downtime in food processing applications such as picker hubs in poultry processing. Antimicrobial and FDA materials are readily available.

Pumps, Motors and Gearbox

The isolator protection you rely on for protecting bearings in pumps and motors is also available for gearbox applications. ProTech 360 is a hybrid design that incorporates an outboard labyrinth for contaminant exclusion and PTFE lip technology for positive oil retention, even in vertical down applications. ProTech 360 is used by numerous OEMs for their most demanding gearbox applications.

PROTECH DESIGNS

Design Breakthrough

The standard ProTech is a single-port expulsion design with and external flange or a flush-mount design. In addition, ProTech is available in a multi-port expulsion design for applications in which orientation is a problem.

Standard Operation Parameters – Flanged and

Non – Flanged Designs

A – Shaft Tolerances = +/- .002" (+/- .05mm)

B – Bore Tolerances = +/- .002" (+/- .05mm)

C - Cavity Width

D – Seal Into Bore Depth

E – Seal Width

F – Overall Diameter (B + _")

Shaft Size	Flanged Design		Non-Flanged
	Seal Depth Into Bore(D)**	Seal Width (E)	Seal Width (D) = (E)
.5" (13mm) to 1.375" (35mm)	.312" (8mm)	.688" (17mm)	.563" (14mm)
1.376" (35mm) to 2.125" (54mm)	.375" (10mm)	.750" (19mm)	.563" (14mm)
2.126" (54mm) to 4.0" (102mm)	.438" (11mm)		
.815" (21mm)	.563" (14mm)		
Over 4.0" (102mm)	.438" (11mm)	.815" (21mm)	.625" (16mm)

* The depth & before & bore dimension will equal the total width of the seal.

** Standard design only.

Total Eccentricity: .020" TIR (0.51mm)

Shaft Speed: Up to 5,000 fpm

Pressure: 0 psi

Temperature Range: -40 degrees to 250 degrees F
(-40 degrees to 121 degrees C)

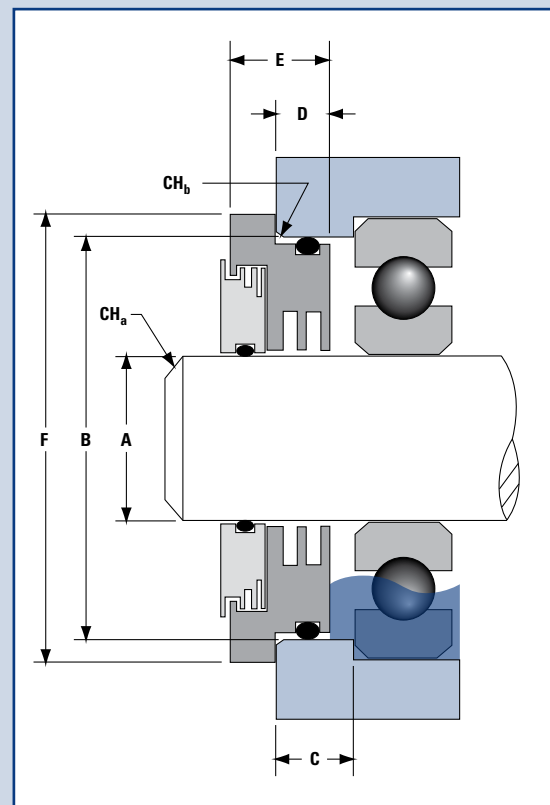
Chamfer Width – Cha: .032" to .063" (0.81mm-1.6mm)

Bore Width – CHb: .032" to .063" (0.81mm - 1.6mm)

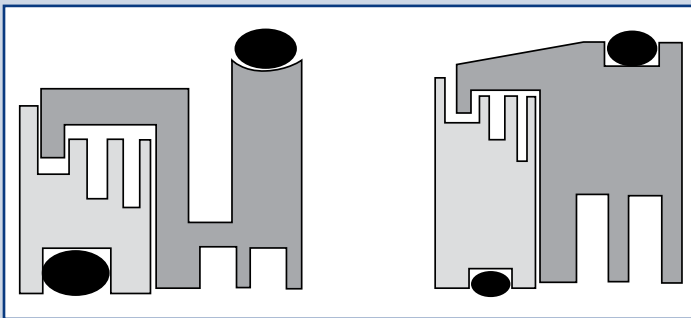
Compatibility: Compatible with most bore and shaft materials

FLANGED DESIGN

- Single expulsion port
- External flange
- Non-contact



Split Pillow Block Design	Non-Flanged Design
<ul style="list-style-type: none"> • Meets manufacturers' specifications 	<ul style="list-style-type: none"> • Single Port
<ul style="list-style-type: none"> • Successfully tested for taconite 	<ul style="list-style-type: none"> • Less space required outside bore
<ul style="list-style-type: none"> • Accommodates variations in casting tolerances 	<ul style="list-style-type: none"> • Non-Contact



ProTech Standard Sizes	
Minimum Standard Shaft Size:	.500" (12.5mm) and up
Maximum Standard Shaft Size *:	6.0" (152mm)
Standard Cross Section:	.312" (8MM) to .750" (19mm)
For Shaft Diameters Over 4":	.438" (11mm) to .750" (19mm)
Non-Flange Cross Section:	.375" (10mm) to .750" (19mm)
Standard Seal Width:	.688" (17mm) to .815" (21mm) Varies with shaft size
Minimum Extension into Bore:	.312" (8mm) nominal

*Note: Special sizes are available.

ProTech Material Availability

Graphite-reinforced PTFE
 Mineral-reinforced PTFE
 Stainless steel-reinforced PTFE
 Bronze-reinforced PTFE
 New high-temp and large-diameter reinforced PTFE

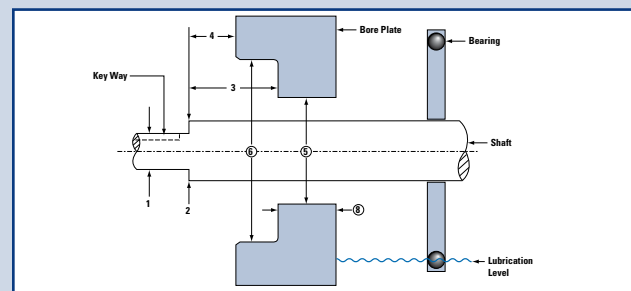
EQUIPMENT MODIFICATION

If housing modification is required, this is the recommended bore selection process:

- Range of standard bore selection:
 Smallest=shaft diameter + 0.625"
 Largest = shaft diameter + 1.500"
- Example – Standard bore dimensions for a 2" shaft:
 Smallest= 2" + 0.625" = 2.625"
 Largest = 2" + 1.500" = 3.500"
- Choose a bore dimension between 2.625" and 3.500". We recommend a 3.000" bore.
- Specify on drawings to machine bore to 3.000" +/- .002".
- Correct ProTech part number to order is LSE-2000-3000-1-1

Ordering a Seal

- Measure a shaft, bore, and gland length.
- Note any deviations from these dimensions outside the bore (i.e. shaft step down or housing counter bore).
- Provide dimensional descriptions and distance from the end of the housing.
- A small sketch would be helpful.



- ① Step shaft diameter (if applicable)
- ② Seal Shaft diameter
- ③ Location of step from CB housing (if applicable)
- ④ Location of step from end of housing (if applicable)
- ⑤ Bore Diameter
- ⑥ Counter bore diameter (if applicable)
- ⑦ Counter bore depth (if applicable) = ③ minus ④
- ⑧ Gland depth

EXTREME TESTING

Laboratory testing has significant advantages over field-testing. The lab effectively compresses time and more easily explores limits. Before ProTech saw its first field test, we put it through laboratory tests that were far more severe than seals ever encountered in the field. ProTech has also been tested by an independent lab.

ProTech and competitive seals were subjected to three extreme in-house tests with ProTech clearly the seal of choice.

1. Oil Leakage Test

ProTech and other seals were subjected to critical oil seal testing using a test machine built to SAE J110 standards. One hundred-hour tests were conducted with severe oil splash.

2. Water Exclusion Test

The test was modified by mounting five nozzles at various positions relative to the exterior of the seal to simulate a most severe external house down. Using water at pressures of 30 to 62 psi, these nozzles individually sprayed each seal from a distance of 3" in both a static mode and while the shafts rotated at various speeds up to 3525 rpm. The nozzles tried to force water past the seal for nearly two hours.

3. Dust Exclusion Test

The test machine was modified with an enclosed chamber containing a large quantity of fine dust and sand which was vigorously agitated with the chamber attached to the outside of each seal area. The equipment operated at speed up to 3525 rpm for a period of 70 hours in an environment that was literally a dense dust storm.

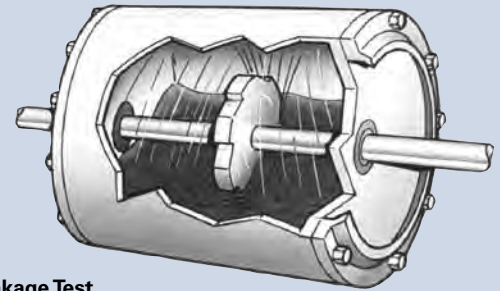
ProTech was the only seal that passed all three torture tests. After lab testing, it was ready to confirm its performance superiority in field trials.

Severe-Duty Electric Motor Applications

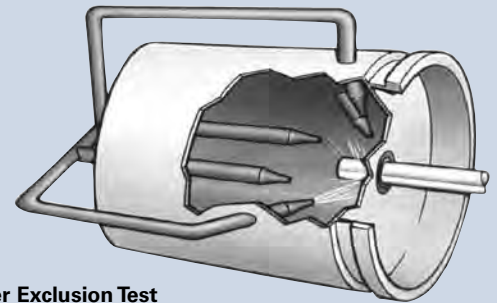
Based on outside testing, ProTech meets IEEE-841 standards and exceeds under IP-56

Extreme Test Results:

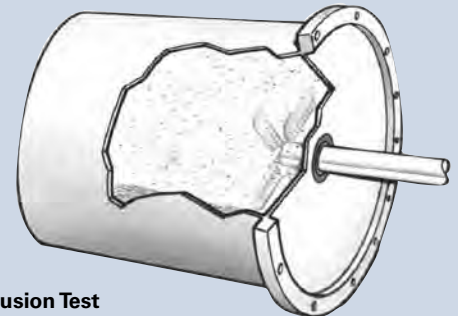
Material Expulsion Method: Design Type: Brand:	PTFE Single-Port 2-Pc. Unitized JM Clipper	Brass Single-Port 2-Pc. Non-Unitized Brand A	PTFE Multi-Port 3-Pc. Unitized Brand B	Brass Single-Port 3-Pc. Unitized Brand C
Oil Leak Test	Pass	Fail	Pass	Fail
Water Pressure Test	Pass	Fail	Fail	Fail
Dust Test	Pass	Pass	Fail	Fail



Oil Leakage Test



Water Exclusion Test



Dust Exclusion Test

Characteristics	Features	Benefits
<p>The patented, unitized design of JM Clipper ProTech seal has many unique features not found in other labyrinth seals. Pro Tech is a custom-blended reinforced PTFE seal made to perform in high speed, high temperature, and chemical environments. Because of its non-contact design and PTFE construction, the equipment experiences negligible energy loss.</p> <p>ProTech can replace standard radial lip oil seals when performance and reliability are critical. In addition, ProTech can be made for a wide range of industrial applications.</p> <p>ProTech is available in multiple designs to meet specific design requirements and geometry constraints.</p>	<p>PTFE Materials</p> <p>Non-Contact Design</p> <p>Two-Piece Unitized</p> <p>Greatest Axial Movement in Industry</p> <p>Fluorelastomer O-Rings</p> <p>Multiple PTFE Compounds</p> <p>No Lubrication Required</p> <p>High Shaft Speeds</p> <p>Precision-Machined Seal</p> <p>Available With or Without Flange</p> <p>Single and Multiple Expulsion Ports</p> <p>Exceeds IEEE-841</p> <p>New Split Pillow Block Design</p>	<ul style="list-style-type: none"> • Chemical resistant • Lower seal cost • Provides alternative materials for specific applications • Low coefficient of friction and low heat build up • Virtually no torque consumption • Will not wear out or groove shafts • Complete exclusion of dust and water • Zero oil leakage • Fewer components • Reduces a major factor causing labyrinth seal leakage • Static elastomer seal for the most severeservices • Pulp and paper • Petrochemical • Food Service • Can run dry because of non-contact design • Operates far beyond shaft speed limits of standard radial lip seals • Liberal specifications for shaft and bore finish resulting in low shaft cost • Allows retrofit of most bore and shaft combinations • No tooling charges • Provides labyrinth sealing in restricted gland width • Available in multiple port if directional installation is a problem • Provides premium bearing protection on severe-duty electric motors • Meets split pillow block OEM specifications

ProTech Materials

ProTech's standard reinforced PTFE construction provides a wide range of operating capabilities including high or low temperatures and extreme chemical environments. The addition of other PTFE fillers extends the capability to special designs and services with enhanced physical properties. Two examples are large-diameter seals and food service requirements.

Quality

ProTech is manufactured in a modern plastics facility where the entire process from raw materials to finished product is tightly controlled. The highest quality and absolute consistency from lot to lot are assured by:

- Many years of seal manufacturing experience
- The use of only first-grade virgin PTFE resins
- Sophisticated system for controlling the critical sintering process
- Specialized CNC production equipment

ProTech Design Data Sheet

Completing this data sheet will assist in identifying the correct ProTech seal for your particular application.

Customer	Contact:
Address	Telephone ()
City/State/Zip	email

Select Design Type (circle one)

LS LN LM LW,LX LD LB SB SL WD ML MN FS FN Other _____

A. Shaft Diameter _____ B. Step Shaft Diameter _____ C. Bore Diameter _____
 D. Distance to 1st Obstruction _____ E. Cavity Width _____ F. Distance to Step _____

Shaft Position:

Horizontal Vertical Up Vertical Down

Shaft Movement:

Rotating Static Reciprocating Oscillating

Shaft Speed rpm _____ FPM _____

Lube Type:

Grease Oil None/Dry Running

Oil Level:

Below Shaft Above Bottom of Shaft

Lube Method:

Grease, No Purge Grease, Purge Used Oil Splash Oil Mist

Material to Seal Out: _____

Material Form to Seal Out:

Dust, Light Dust, Heavy Liquid, Light Spray
 Liquid, Heavy Spray Liquid, Washdown

Average Running Lube Temp. _____ °C °F

Maximum Temp. _____ °C °F

Internal Pressure:

0 psi 1-2 psi 3-5 psi over 5 psi

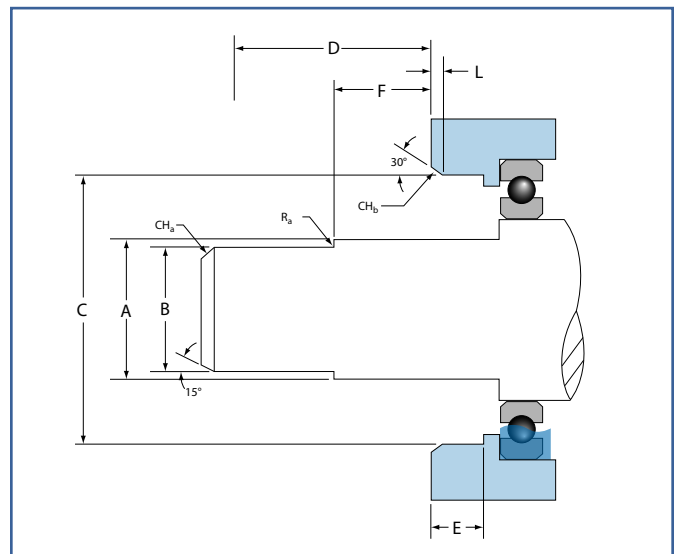
Average Running Lube Temp:

0 psi 1-2 psi 3-5 psi over 5 psi

Axial Shaft Movement (.000"): _____

Total Eccentricity (.000"): _____

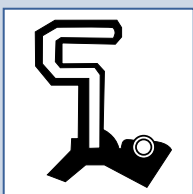
Notes:



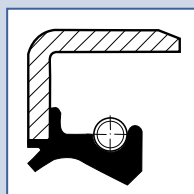
Industrial PN	National PN	SKF / CR PN	Shaft	Bore	Width	Profile	DMR PN
SE-09	-	-	1.500	1.983	.180	BS	S15019818BS
SE-10	NAT-203025	CR-12165	1.219	1.983	.406	A85	S12119747A85
SE-11	NAT-204013	CR-14974	1.500	2.332	0.500	M18	S15023250M18
SE-12	NAT-204017	CR-16069	1.625	2.332	0.438	M18	S16223243M18
SE-13	NAT-204038	CR-17617	1.750	2.722	0.359	M18	S17527135M18
SE-14	NAT-204500	CR-16284	1.625	2.566	0.250	M21	S16225625M21
SE-16	NAT-204506	CR-20148	2.000	3.628	0.250	M21	S20036225M21
SE-17	NAT-415082	CR-25100	2.500	3.881	0.483	C	S25038743C
SE-18	NAT-413470	CR-21352	2.125	3.376	0.375	BS	S21233737BS
SE-19	NAT-204005	CR-10035	1.000	1.785	0.469	M18	S10017846M18
SE-22	-	-	1.687	2.566	0.500	BS	S16825650BS
SE-24	NAT-204078	CR-20952	2.094	2.722	0.359	M18	S20927135M18
SE-26	-	-	2.250	3.376	0.438	BS	S22533744BS
SE-28	NAT-41461S	CR-15190	1.500	2.627	0.250	M21	S15026225M21
SE-29	-	CR-20078	2.000	3.153	0.250	M14	S20031425M14
SE-30	NAT-455253	CR-20140	2.000	3.548	0.438	C	S20035443C
SE-33	-	-	1.500	2.566	0.290	X15	S15025629X15
SE-35	-	-	1.870	2.754	0.310	BS	S18727531BS
SE-38	-	-	2.000	3.628	0.250	M21	S20036225M21
SE-39	-	-	1.620	2.566	0.290	X15	S16225629X15
SE-40	-	-	2.090	2.754	0.250	M21	S20927525M21
SE-44	-	-	2.000	3.066	0.250	M21	S20030625M21
SE-46	-	-	1.870	3.005	0.250	M21	S18730025M21
SE-48	-	-	3.000	4.505	0.438	M21	S30045044M21
SE-55	-	-	4.370	6.007	0.500	M21	S43760050M21
SE-57	-	-	2.000	3.630	0.438	M21	S20036344M21
SE-58	-	-	2.750	3.756	0.250	M21	S27537525M21
SE-63	-	-	2.250	3.066	0.250	M21	S22530625M21
SE-65	-	-	1.120	1.785	0.469	M21	S11217847M21
SE-67	-	-	3.370	4.620	0.438	C	S33746243C

Seal Profiles

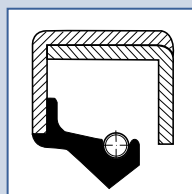
Type A85



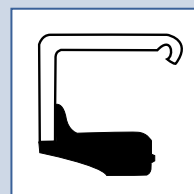
Type BS



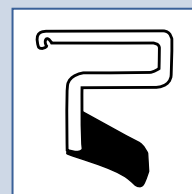
Type C



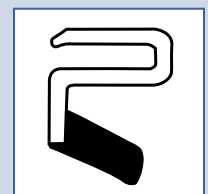
Type M14



Type M18



Type M21



Product Description:

DMR™ Axle Seals are a unitized, one-piece design, used in environments where outside contamination can damage the sealing lip. The seal design features a spring loaded sealing lip running against the inner wall of the metal casing, with dirt exclusion provided by two wiper lips.

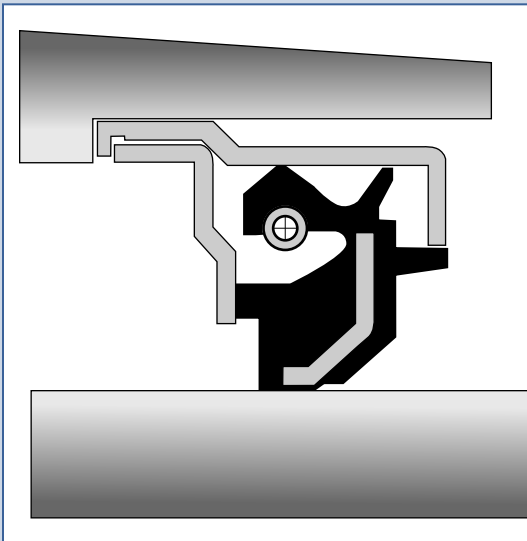
The seal configuration incorporates metal on metal contact around the OD to prevent leaks between the seal and the hub. Metal on metal contact also occurs between the seal and the shaft. This ensures that the seal is stationary with respect to the shaft, thus protecting the shaft from wear.

Typical Applications:

Typically applications where equipment and machinery operating in severe environments, these include:

- Trucks
- Trailers
- Agricultural Tractors
- Mining Bogies
- Construction Machinery
- Other Machinery operating in severe environments

Lip Design:



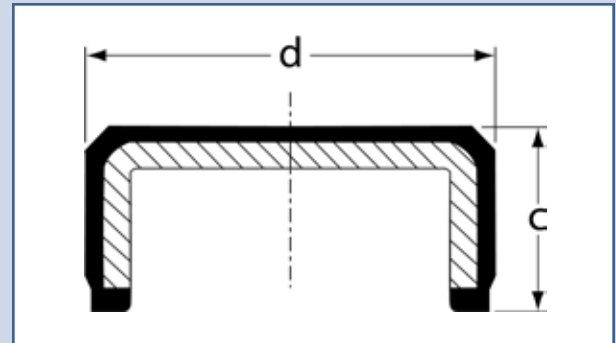
Product Description:

DMR™ End Covers are designed for applications where the shaft does not pass through the housing wall of the bore, the end covers provide protection for the bearings. The covers were developed to fit into housing bores for rotary shaft seals and they have the same tolerances as those for the O.D. of a seal. The inner housing is carbon steel and the outer seal is nitrile rubber.

Applications:

End covers are typically used in gear boxes, industries include:

- automotive
- agricultural equipment
- exercise equipment
- trucks
- buses
- trailers



DMR SEAL #	Diameter (d)	Height (c)
VK-13x4.5	13	4.5
VK-19x3.2	19	3.2
VK-19x7	19	7
VK-22x4	22	4
VK-22x5	22	6
VK-22x6	22	7
VK-25x7	25	7
VK-26x4	26	4
VK-28x4	28	4
VK-28x5	28	5
VK-28x7	28	7
VK-30x6	30	6
VK-30x8	30	8
VK-32x5	32	5
VK-32x7	32	7
VK-32x9.5	32	9.5
VK-35x5	35	5
VK-35x7	35	7
VK-35x8	35	8
VK-37x5	37	5
VK-37x7	37	7
VK-37x10	37	10
VK-40x7	40	7
VK-42x7	42	7
VK-42x9.5	42	9.5
VK-45x5	45	5
VK-45x7	45	7
VK-47x6.5	47	6.5

DMR SEAL #	Diameter (d)	Height (c)
VK-47x7	47	7
VK-47x10	47	10
VK-48x4	48	4
VK-48x5	48	5
VK-50x5	50	5
VK-50x10	50	10
VK-52x6.5	52	6.5
VK-52x7	52	7
VK-52x10	52	10
VK-55x9	55	9
VK-55x10	55	10
VK-60x7	60	7
VK-60x8	60	8
VK-60x10	60	10
VK-62x7	62	7
VK-62x8	62	8
VK-62x10	62	10
VK-62x12	62	12
VK-68x8	68	8
VK-69x10	69	10
VK-72x7	72	7
VK-72x9	72	9
VK-72x10	72	10
VK-75x7	75	7
VK-75x12	75	12
VK-80x7	80	7
VK-80x10	80	10
VK-80x12	80	12

DMR SEAL #	Diameter (d)	Height (c)
VK-85x12	85	12
VK-90x8	90	8
VK-90x10	90	10
VK-90x12	90	12
VK-92x10	92	10
VK-100x10	100	10
VK-100x12	100	12
VK-110x10	110	10
VK-110x12	110	12
VK-120x12	120	12
VK-125x12	125	12
VK-128.6x12	128.6	12
VK-130x12	130	12
VK-140x15	140	15
VK-150x15	150	15
VK-150x18-TD	150	18
VK-150x18	150	18
VK-150x25-TD	150	25
VK-150x25	150	25
VK-160x15	160	15
VK-170x15	170	15
VK-180x12	180	12
VK-200x13	200	13
VK-200x31	200	31
VK-231x31	231	31
VK-243x31	243	31
VK-262x31	262	31
VK-350x37	350	7

Product Description:

Rubber ring for shaft requiring a dynamic seal (primary or back-up) in the axial direction. The body of V seals rotate with the shaft and holds itself in position by its elastic fit on the shaft. Sealing is produced by the contact between the lip and the counterface. Additionally, the V Series seal has good sealing action when the shaft is eccentric and/or there is some misalignment. Combined with radial shaft seals, these axial face seal designs provide excellent excluding characteristics against all types of liquids, greases, oils, dirt, sand and other foreign materials.

Material:

V-Rings are available in both Buna 'N' and Viton

VA – standard style, VA seal has a straight back for shaft from 3 to 2000mm



VS – wide body (angled back) for higher speed applications



VL – narrow cross-section where space is limited



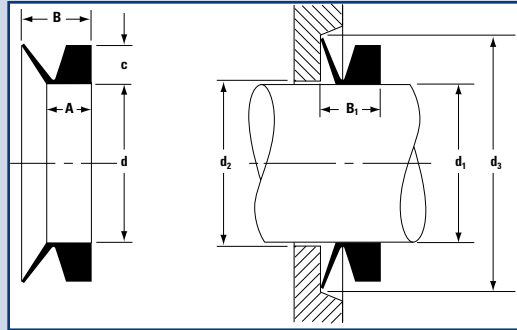
VE – heavy duty design for large diameter applications (longer lip can accommodate greater shaft misalignment)



Typical Applications

Conveyor Rollers, Appliances, Motors, agriculture, wheel hubs, appliances, pumps and gear boxes

VA Series – Profile Dimensions

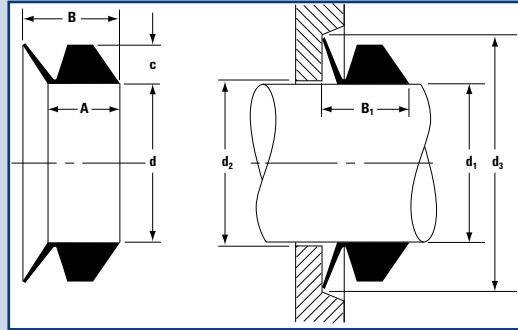


VA Series – Assembly Dimensions

DMR PN	Shaft Dia. d1		I.D. d		Height c		Dim. A		Free Width B		Max. d2 = d1 +		Min. d3 = d1 +		Fitted Width B1	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
VA-3	2.8 – 3.6	0.11 – 0.14	2.5	0.10	1.5	0.06	2.1	0.08	3	0.12	1	0.04	4	0.16	2.5 ± 0.3	0.10 ± .012
VA-4	3.6 – 4.6	0.14 – 0.18	3.2	0.13	2	0.08	2.4	0.09	3.7	0.15	1	0.04	6	0.25	3.0 ± 0.4	0.12 ± .016
VA-5	4.6 – 5.3	0.18 – 0.21	4	0.16												
VA-6	5.3 – 6.6	0.21 – 0.26	5	0.20												
VA-7	6.6 – 7.9	0.26 – 0.31	6	0.24												
VA-8	7.9 – 9.4	0.31 – 0.37	7	0.28												
VA-10	9.4 – 11.4	0.37 – 0.45	9	0.35												
VA-12	11.4 – 12.4	0.45 – 0.49	10.5	0.41	3	0.12	3.4	0.13	5.5	0.22	2	0.08	9	0.35	4.5 ± 0.6	0.18 ± .02
VA-13	12.4 – 13.5	0.49 – 0.53	11.7	0.46												
VA-14	13.5 – 15.5	0.53 – 0.61	12.5	0.49												
VA-16	15.5 – 17.5	0.61 – 0.69	14	0.55												
VA-18	17.5 – 19	0.69 – 0.75	16	0.63												
VA-20	19 – 21	0.75 – 0.83	18	0.71												
VA-22	21 – 24	0.83 – 0.95	20	0.79	4	0.16	4.7	0.18	7.5	0.30	2	0.08	12	0.45	6.0 ± 0.8	0.24 ± .03
VA-25	24 – 27	0.95 – 1.07	22	0.87												
VA-28	27 – 29	1.07 – 1.14	25	0.98												
VA-30	29 – 31	1.14 – 1.22	27	1.06												
VA-32	31 – 33	1.22 – 1.30	29	1.14												
VA-35	33 – 36	1.30 – 1.42	31	1.22												
VA-38	36 – 38	1.42 – 1.50	34	1.34	5	0.20	5.5	0.21	9	0.35	3	0.12	15	0.60	7.0 ± 1.0	0.28 ± .04
VA-40	38 – 43	1.50 – 1.70	36	1.42												
VA-45	43 – 48	1.70 – 1.89	40	1.57												
VA-50	48 – 5	1.89 – 2.09	45	1.77												
VA-55	53 – 58	2.09 – 2.29	49	1.93												
VA-60	58 – 63	2.29 – 2.48	54	2.13												
VA-65	63 – 68	2.48 – 2.68	58	2.28	6	0.24	6.8	0.26	11	0.43	4	0.16	18	0.70	9.0 ± 1.2	0.35 ± .05
VA-70	68 – 73	2.68 – 2.88	63	2.48												
VA-75	73 – 78	2.88 – 3.07	67	2.64												
VA-80	78 – 83	3.07 – 3.27	72	2.83												
VA-85	83 – 88	3.27 – 3.47	76	2.99												
VA-90	88 – 93	3.47 – 3.66	81	3.19												
VA-95	93 – 98	3.66 – 3.86	85	3.35												

DMR PN	Shaft Dia. d1		I.D. d		Height c		Dim. A		Free Width B		Max. d2 = d1 +		Min. d3 = d1 +		Fitted Width B1	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
VA-95	93 – 98	3.66 – 3.86	85	3.35	6	0.24	6.8	0.26	11	0.43	4	0.16	18	0.70	9.0 ± 1.2	0.35 ± .05
VA-100	98 – 105	3.86 – 4.14	90	3.54												
VA-110	105 – 115	4.14 – 4.53	99	3.90	7	0.28	7.9	0.31	12.8	0.50	4	0.16	21	0.80	10.5 ± 1.5	0.41 ± .06
VA-120	115 – 125	4.53 – 4.92	108	4.25												
VA-130	125 – 135	4.92 – 5.32	117	4.61												
VA-140	135 – 145	5.32 – 5.71	126	4.96												
VA-150	145 – 154	5.71 – 6.10	135	5.31												
VA-160	154 – 165	6.10 – 6.50	144	5.67	8	0.32	9	0.35	14.5	0.57	5	0.20	24	0.95	12 ± 1.8	0.47 ± .07
VA-170	165 – 175	6.50 – 6.89	153	6.02												
VA-180	175 – 185	6.89 – 7.29	162	6.38												
VA-190	185 – 195	7.29 – 7.68	171	6.73												
VA-199	195 – 210	7.68 – 8.27	180	7.09												
VA-200	190 – 210	7.48 – 8.27	180	7.09	15	0.59	14.3	0.56	25	0.98	10	0.39	45	1.75	20 ± 4.0	0.79 ± .16
VA-220	210 – 235	8.27 – 9.25	198	7.80												
VA-250	235 – 264	9.25 – 10.43	225	8.86												
VA-275	264 – 290	10.43 – 11.42	247	9.72												
VA-300	290 – 309	11.42 – 12.20	270	10.63												
VA-325	309 – 335	12.20 – 13.19	292	11.50												
VA-350	335 – 365	13.19 – 14.37	315	12.40												
VA-375	365 – 389	14.37 – 15.35	337	13.27												
VA-400	389 – 430	15.35 – 16.93	360	14.17												
VA-450	430 – 480	16.93 – 18.90	405	15.94												
VA-500	480 – 530	18.90 – 20.87	450	17.72												
VA-550	530 – 579	20.87 – 22.83	495	19.49												
VA-600	579 – 629	22.83 – 24.80	540	21.26												
VA-650	629 – 665	24.80 – 26.18	600	23.62												
VA-700	665 – 705	26.18 – 27.76	630	24.80												
VA-725	705 – 745	27.76 – 29.33	670	26.38												
VA-750	745 – 785	29.33 – 30.91	705	27.76												
VA-800	785 – 830	30.91 – 32.68	745	29.33												
VA-850	830 – 875	32.68 – 34.45	785	30.91												
VA-900	875 – 920	34.45 – 36.22	825	32.48												
VA-950	920 – 964	36.22 – 37.99	865	34.06												
VA-1000	964 – 1015	37.99 – 39.96	910	35.83												
VA-1050	1015 – 1065	39.96 – 41.93	955	37.60												
VA-1100	1065 – 1115	41.93 – 43.90	1000	39.37												
VA-1150	1115 – 1165	43.90 – 45.87	1045	41.14												
VA-1200	1165 – 1215	45.87 – 47.84	1090	42.91												
VA-1250	1215 – 1270	47.84 – 50.00	1135	44.69												
VA-1300	1270 – 1320	50.00 – 51.97	1180	46.46												
VA-1350	1320 – 1370	51.97 – 53.94	1225	48.23												
VA-1400	1370 – 1420	53.94 – 55.91	1270	50.00												
VA-1450	1420 – 1469	55.91 – 57.87	1315	51.77												
VA-1500	1469 – 1519	57.87 – 59.84	1360	53.54												
VA-1550	1519 – 1570	59.84 – 61.81	1405	55.32												
VA-1600	1570 – 1620	61.81 – 63.78	1450	57.09												
VA-1650	1620 – 1670	63.78 – 65.75	1495	58.86												
VA-1700	1670 – 1720	65.75 – 67.72	1540	60.63												
VA-1750	1720 – 1770	67.72 – 69.69	1585	62.40												
VA-1800	1770 – 1819	69.69 – 71.65	1630	64.17												
VA-1850	1819 – 1869	71.65 – 73.62	1675	65.95												
VA-1900	1869 – 1920	73.62 – 75.59	1720	67.72												
VA-1950	1920 – 1970	75.59 – 77.56	1765	69.49												
VA-2000	1970 – 2020	77.56 – 79.53	1810	71.26												

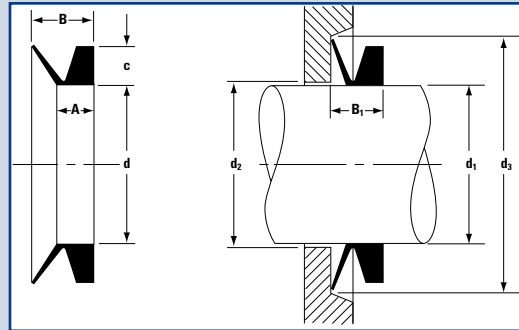
VS Series – Profile Dimensions



VS Series – Assembly Dimensions

DMR PN	Shaft Dia. d1		I.D. d		Height c		Dim. A		Free Width B		Max. d2 = d1 +		Min. d3 = d1 +		Fitted Width B1	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
VS-5	4.6 – 5.3	0.18 – 0.21	4	0.16	2	0.08	3.9	0.15	5.2	0.21	1	0.04	6.3	0.25	4.5 ± 0.4	0.18 ± .016
VS-6	5.3 – 6.6	0.21 – 0.26	5	0.20												
VS-7	6.6 – 7.9	0.26 – 0.31	6	0.24												
VS-8	7.9 – 9.4	0.31 – 0.37	7	0.28												
VS-10	9.4 – 11.4	0.37 – 0.45	9	0.35												
VS-12	11.4 – 13.5	0.45 – 0.53	10.5	0.41	3	0.12	5.6	0.22	7.7	0.30	2	0.08	9	0.35	6.7 ± 0.6	0.26 ± .020
VS-14	13.5 – 15.5	0.53 – 0.61	12.5	0.49												
VS-16	15.5 – 17.5	0.61 – 0.69	14	0.55												
VS-18	17.5 – 19	0.69 – 0.77	16	0.63												
VS-20	19 – 21	0.77 – 0.83	18	0.71												
VS-22	21 – 24	0.83 – 0.95	20	0.79												
VS-25	24 – 27	0.95 – 1.07	22	0.87												
VS-28	27 – 29	1.07 – 1.14	25	0.98	4	0.16	7.9	0.31	10.5	0.41	2	0.08	12	0.45	9.0 ± 0.8	0.35 + .030
VS-30	29 – 31	1.14 – 1.22	27	1.06												
VS-32	31 – 33	1.22 – 1.30	29	1.14												
VS-35	33 – 36	1.30 – 1.42	31	1.22												
VS-38	36 – 38	1.42 – 1.50	34	1.34												
VS-40	38 – 43	1.50 – 1.70	36	1.42												
VS-45	43 – 48	1.70 – 1.89	40	1.57												
VS-50	48 – 53	1.89 – 2.09	45	1.77	5	0.20	9.5	0.37	13	0.51	3	0.12	15	0.60	11.0 ± 1.0	0.43 + .040
VS-55	53 – 58	2.09 – 2.29	49	1.93												
VS-60	58 – 63	2.29 – 2.48	54	2.13												
VS-65	63 – 68	2.48 – 2.68	58	2.28												
VS-70	68 – 73	2.68 – 2.88	63	2.48												
VS-80	78 – 83	3.07 – 3.27	72	2.83												
VS-85	83 – 88	3.27 – 3.47	76	2.94												
VS-90	88 – 93	3.47 – 3.66	81	3.19	6	0.24	11.3	0.44	15.5	0.61	4	0.16	18	0.70	13.5 ± 1.2	0.53 + .050
VS-95	93 – 98	3.66 – 3.86	85	3.35												
VS-100	98 – 105	3.86 – 4.14	90	3.54												
VS-110	105 – 115	4.14 – 4.53	99	3.90												
VS-120	115 – 125	4.53 – 4.92	108	4.25												
VS-130	125 – 135	4.92 – 5.32	117	4.61												
VS-140	135 – 145	5.32 – 5.71	126	4.96												
VS-150	145 – 155	5.71 – 6.10	135	5.31	7	0.28	13.1	0.52	18	0.71	4	0.16	21	0.80	15.5 ± 1.5	0.61 + .060
VS-160	155 – 165	6.10 – 6.50	144	5.67												
VS-170	165 – 175	6.50 – 6.89	153	6.02												
VS-180	175 – 185	6.89 – 7.29	162	6.38												
VS-190	185 – 195	7.29 – 7.68	171	6.73												
VS-199	195 – 210	7.68 – 8.27	180	7.09	8	0.32	15	0.59	20	0.81	5	0.20	24	0.95	18.0 ± 1.8	0.71 + .070

VL Series – Profile Dimensions



VL Series – Assembly Dimensions

DMR PN	Shaft Dia. d1		I.D. d		Height c		Dim. A		Free Width B		Max. d2 = d1 +		Min. d3 = d1 +		Fitted Width B1	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
VL-110	105 - 115	4.14 - 4.53	99	3.90												
VL-120	115 - 125	4.53 - 4.92	108	4.25												
VL-130	125 - 135	4.92 - 5.32	117	4.61												
VL-140	135 - 145	5.32 - 5.71	126	4.96												
VL-150	145 - 155	5.71 - 6.10	135	5.31												
VL-160	155 - 165	6.10 - 6.50	144	5.67												
VL-170	165 - 175	6.50 - 6.89	153	6.02												
VL-180	175 - 185	6.89 - 7.29	162	6.38												
VL-190	185 - 195	7.29 - 7.68	171	6.73												
VL-200	195 - 210	7.68 - 8.27	182	7.17												
VL-220	210 - 233	8.27 - 9.17	198	7.80												
VL-250	233 - 260	9.17 - 10.24	225	8.86	6.5	0.26	6	0.24	10.5	0.41	5	0.20	20	0.79	8 ± 1.5	0.31 ± .06
VL-275	260 - 285	10.24 - 11.22	247	9.72												
VL-300	285 - 310	11.22 - 12.20	270	10.63												
VL-325	310 - 335	12.20 - 13.19	292	11.50												
VL-350	335 - 365	13.19 - 14.37	315	12.40												
VL-375	365 - 385	14.37 - 15.15	337	13.27												
VL-400	385 - 425	15.15 - 16.73	360	14.17												
VL-450	425 - 475	16.73 - 18.70	405	15.94												
VL-500	475 - 510	18.70 - 20.09	450	17.72												
VL-525	510 - 540	20.09 - 21.27	472	18.59												
VL-550	540 - 575	21.27 - 22.65	495	19.50												
VL-600	575 - 625	22.65 - 24.62	540	21.27												

DMR Shaft Repair Sleeves

DMR Sleeves are precision stainless steel wear sleeves designed to prolong the life of damaged shafts and yokes by providing a new sealing surface that is superior to most original finishes and materials. Over time sealing lips can groove shafts due to factors such as dirt, heat, excessive water, lack of lubrication and high shaft speeds. DMR Sleeves offer a cost effective alternative to resizing, metalizing or replacing severely damaged surfaces. DMR Sleeve's low profile design means that the same size seal can be utilized and multi-lip oil seals can be accommodated.

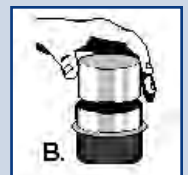


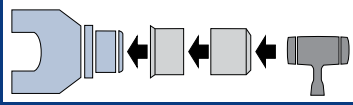
Material and Sizes

The DMR Sleeve is made from 304 Stainless Steel. Available for shaft diameters ranging from 1 inch to 7 inches.

Installation

- Clean all surfaces where the seal contacts the shaft. File down all burrs or rough spots.
 - Measure the diameter of worn and unworn part of the shaft in 3 locations. Fig.A The average diameter should be within the range printed on the box label to ensure sufficient press-fit. (Cement not required)
 - Mark the exact location on the shaft where the sleeve must be placed to cover the worn area.
 - If the wear is deep, fill the worn area with metal type filler & install the sleeve before the filler sets.
 - Place the installation tool over the sleeve. Fig.B
 - Hammer gently on the installation tool (or squared off tube of same diameter for longer reach) until the sleeve reaches the right location on the shaft. Fig.C
 - **Only if the flange removal is necessary:**
 - a) Use side cutters to cut all the way to grooved line (preferably prior to beginning installation).
 - b) Fold the flange back & forth progressively along the groove to obtain clean undistorted break. Fig.D
- Pulling action alone may cause unwanted damage.
- Keep the repaired area smooth & free of burrs.
 - Lubricate before installing the seal.



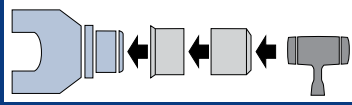


INCH

Part Number	Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
99058	0.622	0.630	0.315	0.437	2.032
99062	0.621	0.627	0.312	0.406	2.032
99076	0.746	0.752	0.312	0.437	2.032
99078	0.783	0.789	0.312	0.437	2.032
99087	0.871	0.877	0.312	0.437	2.032
99098	0.980	0.986	0.312	0.437	2.032
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
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

METRIC

Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
15.80	16.00	8.0	11.1	51.6
15.77	15.93	7.9	10.3	51.6
18.95	19.10	7.9	11.1	51.6
19.89	20.04	7.9	11.1	51.6
22.12	22.28	7.9	11.1	51.6
24.89	25.04	7.9	11.1	51.6
25.27	25.45	7.9	11.1	51.6
25.27	25.45	7.9	11.1	51.6
28.52	28.63	7.9	11.1	17.5
28.52	28.63	9.5	12.7	17.5
31.62	31.83	7.9	11.1	22.2
31.85	32.08	7.9	11.1	22.2
34.75	34.90	12.7	15.9	25.4
34.85	35.00	12.7	1.6	25.4
36.37	36.53	14.3	17.5	25.8
36.45	36.60	9.5	12.7	25.8
38.00	38.18	14.3	17.5	25.8
38.02	38.18	9.5	12.7	25.8
38.58	38.76	11.1	14.3	25.8
39.34	39.50	11.1	14.3	25.8
39.60	39.75	14.3	17.5	25.8
39.93	40.08	13.0	16.0	26.0
41.20	41.35	14.3	17.5	20.6
42.77	42.93	14.3	17.5	22.2
41.83	41.99	14.3	17.5	21.0
44.07	44.25	9.5	12.7	26.2
44.32	44.53	9.5	12.7	26.2
44.32	44.53	22.2	25.4	26.2
44.32	44.53	14.3	17.5	26.2
44.32	44.53	19.1	22.2	26.2
44.68	44.88	14.3	17.5	26.2
44.88	45.09	14.0	17.0	26.2
45.90	46.10	14.3	17.5	31.8
47.47	47.70	14.3	17.5	31.8
47.93	48.08	14.0	17.0	25.0
48.49	48.64	9.5	12.7	25.4
49.07	49.28	14.3	17.5	31.8
49.91	50.06	14.0	17.0	25.0

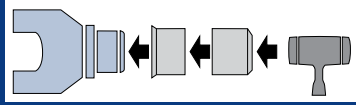


INCH

Part Number	Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
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
99241	2.359	2.365	0.370	0.450	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
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
99259	2.595	2.601	0.781	0.938	1.250
99261	2.618	2.624	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
99284	2.826	2.836	0.748	0.868	1.339
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

METRIC

Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
50.70	50.88	14.3	17.5	52.3
50.70	50.88	22.23	25.40	52.32
52.25	52.40	20.65	23.83	34.93
53.90	54.05	12.70	19.05	32.51
53.90	54.10	19.81	23.80	34.93
55.50	55.68	19.8	23.8	33.3
55.83	56.01	12.7	15.9	33.3
57.10	57.28	19.8	23.8	34.9
57.12	57.28	7.7	11.1	33.3
59.92	60.07	20.0	23.0	34.9
60.25	60.40	19.8	23.8	34.9
60.25	60.40	15.1	19.1	34.9
60.30	60.45	13.4	17.3	34.9
59.92	60.07	9.4	11.4	34.9
61.85	62.00	12.7	15.9	36.2
61.82	61.98	19.8	23.8	35.4
61.80	62.00	12.7	15.9	36.2
63.42	63.65	12.7	16.7	35.4
63.17	63.65	19.8	23.8	35.4
63.42	63.65	19.81	23.80	34.93
63.73	63.91	19.81	23.01	34.93
63.42	63.65	14.10	16.51	22.61
64.87	65.07	20.0	23.0	34.9
65.00	65.18	19.8	23.8	34.9
65.91	66.07	19.8	23.8	31.8
66.50	66.65	19.8	23.8	34.9
66.62	66.83	19.81	23.80	38.10
66.55	66.73	19.8	23.0	38.1
69.85	70.00	10.3	14.3	31.8
69.67	69.88	19.8	23.8	34.9
69.80	70.00	19.8	23.8	34.9
69.85	70.08	20.0	24.0	34.9
72.06	72.24	12.7	16.7	31.8
71.78	72.03	19.0	22.0	34.0
72.92	73.13	19.8	23.8	34.9
74.55	74.75	19.8	23.8	38.1
74.90	75.08	22.0	26.0	33.3
75.87	76.10	20.6	25.4	31.8

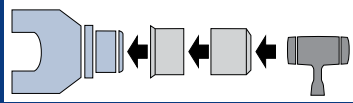


INCH

Part Number	Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
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
99351	3.540	3.546	0.710	0.906	1.812
99353	3.540	3.546	0.526	0.667	1.750
99354	3.540	3.546	0.906	1.102	1.750
99356	3.560	3.566	0.812	1.000	1.750
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
99387	3.873	3.879	0.812	1.000	1.875
99393	3.935	3.941	0.812	1.000	2.050
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
99424	4.248	4.256	0.812	1.000	1.438

METRIC

Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
76.15	76.35	20.6	25.4	32.5
76.15	76.35	15.9	20.6	27.0
79.32	79.55	14.0	18.0	51.6
79.22	79.40	17.5	20.7	50.8
79.22	79.40	20.6	25.4	50.8
79.78	80.01	19.1	22.5	34.9
79.88	80.09	21.0	24.0	34.9
79.88	80.09	11.0	15.0	34.9
82.45	82.63	20.6	25.4	34.9
82.50	82.70	15.1	18.3	38.1
82.50	82.70	20.6	25.4	38.1
84.76	85.01	17.0	21.0	35.0
84.76	85.01	21.0	22.7	35.0
85.62	85.83	20.6	25.4	38.1
88.77	88.98	15.9	20.6	34.2
88.85	89.05	7.9	12.7	34.2
88.87	89.08	15.9	20.6	34.2
88.85	89.05	20.6	25.4	34.2
89.92	90.07	18.0	23.0	46.0
89.92	90.07	13.4	16.9	44.5
89.92	90.07	23.0	28.0	44.5
90.42	90.58	20.6	25.4	44.5
91.90	92.05	20.6	25.4	44.5
92.00	92.18	20.6	25.4	44.5
92.00	92.18	12.7	15.9	44.5
94.97	95.15	11.9	15.1	44.5
95.20	95.40	8.7	12.7	44.5
94.89	95.07	21.0	24.0	44.5
95.20	95.40	17.5	22.2	47.6
94.97	95.15	8.7	12.7	44.5
95.12	95.30	14.3	17.5	44.5
98.37	98.53	20.6	25.4	47.6
99.95	100.10	20.6	25.4	52.1
101.47	101.75	15.2	18.4	54.0
101.47	101.75	20.6	25.4	54.0
101.47	101.75	16.5	19.7	54.0
101.47	101.75	12.7	15.9	54.0
107.90	108.10	20.6	25.4	36.5



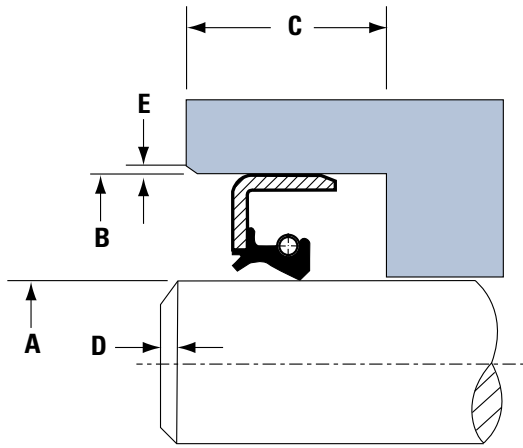
INCH

Part Number	Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
99437	4.370	4.378	0.812	1.000	1.650
99450	4.496	4.504	0.813	1.000	1.250
99452	4.523	4.531	0.813	0.938	1.250
99492	4.916	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
99525	5.246	5.254	0.812	1.000	1.250
99549	5.498	5.506	0.812	1.000	1.250
99550	5.498	5.506	0.518	0.705	1.250
99552	5.508	5.516	0.807	1.000	1.250
99599	5.995	6.004	1.000	1.250	1.750
99601	5.995	6.004	0.500	0.750	1.750
99650	6.495	6.505	1.000	1.250	1.375
99700	6.994	7.005	1.000	1.250	1.688

METRIC

Minimum Shaft Dia.	Maximum Shaft Dia.	Width	Length	Installation Tool Depth
111.00	111.20	20.6	25.4	41.9
114.20	114.40	20.7	25.4	31.8
114.88	115.09	20.7	23.8	31.8
124.87	125.10	26.0	32.0	36.5
126.95	127.15	17.5	22.2	36.5
126.95	127.15	20.7	25.4	36.5
133.25	133.45	20.6	25.4	31.8
139.65	139.85	20.6	25.4	31.8
139.65	139.85	13.2	17.9	31.8
139.90	140.11	20.5	25.4	31.8
152.27	152.50	25.4	31.8	44.5
152.27	152.50	12.7	19.1	44.5
164.97	165.23	25.4	31.8	34.9
177.65	177.93	25.4	31.8	42.9

Bonded Seal:	Design feature of a type of radial lip seal. The heel of the sealing element is attached (Bonded) to the seal case by and adhesive during the molding operation.
Bore, Housing: (Bore, Seal)	A cylindrical surface which mates with the outside surface of the seal outer case.
Case, Inner: (Shell, Inner)	A rigid, cup-shaped component of a seal assembly, which is placed inside the outer seal case. It can function as: reinforcing member, shield, spring retainer, lip-clamping device.
Case, Outer: (Shell, Outer)	The outer, cup-shaped, rigid structure of the lip seal assembly. Acts as a protective cover for the head of the sealing element.
Dynamic Seal:	A seal which has rotating, oscillating, or reciprocating motion acting upon it.
Durometer:	An instrument which measures with an indenter point the hardness of rubber by penetration, without puncturing the surface of the rubber.
Elastomer:	An elastic rubber like substance, such as natural or synthetic rubber.
F.P.M.:	Feet Per Minute; used as a measure of shaft speed instead of R.P.M. To convert R.P.M into F.P.M., use formula $.262 \times \text{R.P.M.} \times \text{diameter (inches)} = \text{F.P.M.}$
Fluid Side:	Side of the seal which in normal use faces toward the fluid being sealed.
Garter Spring:	Coiled wire spring with its ends connected. It is used for maintaining a sealing force between the sealing element and a sealing surface.
Machine Lead:	Spiral grooves similar to a screw thread on a shaft surface that can result from improper finishing process; may result in early leakage.
Primary Lip:	The flexible elastomeric component of a lip seal, which contacts the rotating surface.
RA:	The average of all peaks and valleys from the mean line within cut-off (.010" of .254mm). Ra does not describe the surface profile (texture) and two shafts with the same Ra value can have very different surface characteristic.
RPM:	Revolutions per minute.
Run-In:	The period of initial operation during which the seal-lip wear rate is greatest and the contact surface is developed.
Run-Out:	That run-out to which the seal lip is subjected due to the outside diameter of the shaft not rotating in a true circle. Usually expressed as T.I.R. (Total Indicator Reading).
RZ (din):	Average peak to valley height
Scoring:	A type of wear in which is generally defined by the inside and outside lip surfaces and the spring groove.
Seal, Heel Section:	The portion of the lip seal which is attached to the seal case.
Seal, Outside Diameter:	The external diameter of a lip seal assembly. Usually the outside diameter of the outer seal case.
Seal Width:	The over-all axial dimension of the lip-seal assembly. Normally the total width measurement of the outer seal case.
Sealing Element:	The normally flexible elastomeric component of a lip-seal assembly which rides against the shaft.
Secondary Lip:	A short, non-spring loaded lip, which is located at the outside seal face of a radial lip seal. Used to exclude contaminants.
Shaft Diameter:	The outside diameter of the shaft at the location where the seal is mounted.
Shaft Finish:	The relative roughness, usually expressed in micro inches, of the outside diameter of the shaft. The smaller the number, the smoother the finish.
Shaft Seal:	Generally considered to be a lip seal or an oil seal, but a broad definition could include and sealing device mounted on a shaft or sealing a shaft.
Sleeve, Wear:	A replaceable metal ring. Generally used in assemblies to eliminate expensive shaft replacement caused by grooving that may occur at the seal-shaft interface.
S.T.B.M.	Shaft-to-Bore-Misalignment, the amount by which the shaft is off centre, with respect to the bore's centre.



Customer & Division	
Address	
City/State/Zip	
Contact	
Telephone ()	
Customer P/N	
Type of Equipment	
Application	

A. Shaft Diameter _____ D. Shaft Chamfer & Angle _____
 B. Bore Diameter _____ E. Bore Chamfer & Angle _____
 C. Seal Width _____

<input type="checkbox"/> OEM	Date Required
<input type="checkbox"/> Aftermarket	

Annual Usage	Peak Month Usage
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Material	Finish	Hardness
----------	--------	----------

Material	Finish	Hardness
----------	--------	----------

<input type="checkbox"/> Rotating	RPM Normal Max	Direction From Air Side: <input type="checkbox"/> Clockwise <input type="checkbox"/> Counter-Clockwise <input type="checkbox"/> Bi-Rotational
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Shaft Runout TIR	Misalignment	Frequency of Rotation <input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent
------------------	--------------	----------------------------------------------------------------------------------------------------

<input type="checkbox"/> Reciprocating	Stroke Length	Cycles/Min
<input type="checkbox"/> Oscillating	Degrees of Arc	Cycles/Min.

Internal	Type	<input type="checkbox"/> Dry <input type="checkbox"/> Mist <input type="checkbox"/> Flooded
----------	------	------------------------------------------------------------------------------------------------

External	Type
----------	------

Temp.	<input type="checkbox"/> °C <input type="checkbox"/> °F	Min. Normal Max.
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Pressure	Normal PSI	Maximum PSI
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Bearing	<input type="checkbox"/> Ball or Roller Bearing <input type="checkbox"/> Bushing
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SLIDE

SEAL

PROTECT

RETAIN

ALIGN



Dryslide™



Oil Seals



Tapered Caps and Plugs



Rotor Clip®



Woodruff Keys



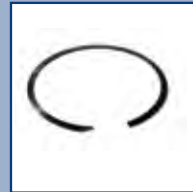
Fiber-Lube™



O-Ring Kits



Caps



Spirolox®



Slotted Shim



Linear Motion



DMR Bearing Isolators



Plugs



Ring Masters®



Slotted Shim Kits



Powdered Metal



V-Rings



Finishing



Rotor Clamp®



Shim Stock Rolls



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Shaft Repair Sleeves



Electronics



Retaining Ring Kits & Packs



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