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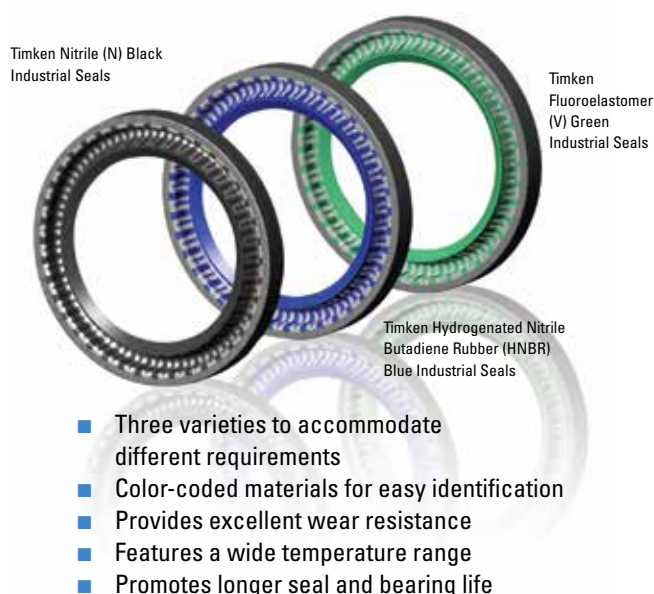
Sealing Technology for Primary Metals

Timken Industrial Seals for Primary Metals

Smelting and steel making is a tough job in an even tougher environment. Extreme temperatures and high levels of contamination can make or break your equipment and productivity. Choose from our selection of sealing products and Prophet software diagnostic tool to help improve the performance of your bearings and equipment while reducing downtime and maintenance costs.

Oil Seals

Timken's complete line of high-performance oil seals for primary metals applications helps improve machine efficiency, bearing life and productivity while reducing your maintenance time and costs.



Software Package

Prophet is a custom engineered software program that enables the customer to predict cost savings. Prophet utilizes customer driven data, such as annual power consumption and maintenance cost, to determine the total value of Timken Industrial Seals.



- Production losses
- Downtime costs
- Equipment repair expenditures
- Labor costs
- Power consumption

Metallic Bearing Isolators

Timken's metallic bearing isolators will help extend equipment life by blocking contaminants and decreasing frictional drag on the shaft.

Small Cross Section
Part #29607



Narrow Width
Part #29609



Flangeless
Part #29619



Vertical
Part #29620



Split Pillow Block
Part #29616



Step Shaft
Part #29697



TIMKEN INDUSTRIAL SEALS

Oil Seals

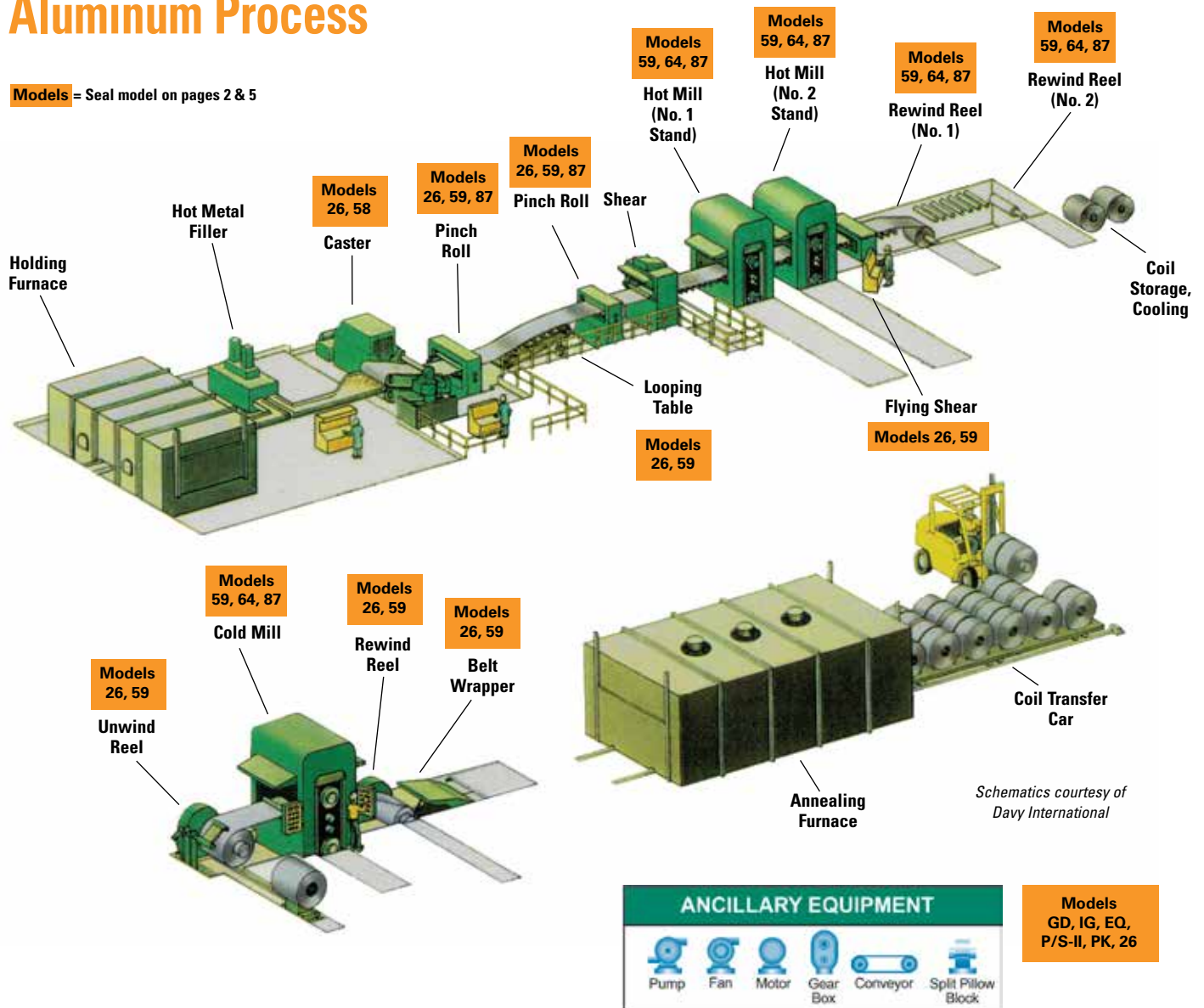
Oil Seals	Model	Features	Materials	Temp	Shaft Dia. inches (mm)	Surface Speed	Spring Material	Misalign & Runout in. @ fpm (mm @ mps)	Pressure
	23	- General purpose, split seal - Cover plate required - Over 300,000+ sizes, readily available	Timken N Black Timken ES Blue Timken V Green Silicone	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C) -75°F (-59.4°C) to 350°F (176.6°C)	3.000 and up (76.2 and up)	2,000 fpm (10.2 m/s)	Molded-in stainless steel finger	0.010 @ 1,000 (0.25 @ 5.10) 0.005 @ 2,000 (0.13 @ 10.20)	Ambient
	26	- General purpose seal - Solid or split design - Reverse bevel lip design prevents lip rollover - Reinforced rubber OD - Single and dual lip configurations available	Timken N Black Timken ES Blue Timken V Green	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C)	0.750 to 60.000 (19.0 to 1524.0)	5,000 fpm (25.4 m/s)	Molded-in stainless steel finger	0.015 @ 1,000 (0.38 @ 5.10) 0.010 @ 2,000 (0.25 @ 10.20) 0.008 @ 5,000 (0.20 @ 25.40)	To 7 psi (0.4 bar)
	53/63	- General purpose assembled seal - Heavy-duty metal outer case - Single and dual lip configurations available	Timken N Black Timken ES Blue Timken V Green Silicone	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C) -75°F (-59.4°C) to 350°F (176.6°C)	0.250 to 90.000 (6.4 to 2286.0)	3,000 fpm (15.2 m/s)	Stainless steel finger	0.015 @ 1,000 (0.38 @ 5.10) 0.010 @ 2000 (0.25 @ 10.20) 0.005 @ 3000 (0.13 @ 15.20)	To 7 psi (0.4 bar)
	58	- High-temperature, assembled seal - Heavy-duty metal outer case - THERMO-CERAM™ sealing element - Ideal for abrasive environments - Grease lubricated applications only	Thermo-Ceram™	To 1600°F (871°C)	2.000 to 12.000 (50.8 to 304.8)	500 fpm (2.5 m/s)	N/A	0.015 @ 500 (0.38 @ 2.50)	Ambient
	59	- Severe service assembled seal - Heavy-duty metal outer case - Reverse bevel lip design prevents lip rollover - Aggressive shaft-to-bore misalignment capability	Timken N Black Timken ES Blue Timken V Green	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C)	6.000 to 90.000 (152.4 to 2286.0)	5,000 fpm (25.4 m/s)	Molded-in stainless steel finger	0.093 Max. (2.36)	To 7 psi (0.4 bar)
	64®	- Severe service assembled seal - Heavy-duty metal outer case - Unique carrier/garter spring combination - Industry's highest shaft-to-bore misalignment capability	Timken N Black Timken ES Blue Timken V Green Silicone	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C) -75°F (-59.4°C) to 350°F (176.6°C)	8.000 to 90.000 (203.2 to 2286.0)	7,000 fpm (35.6 m/s)	Combination stainless steel garter & stainless steel finger	0.125 @ 5,000 (3.18 @ 25.40) 0.093 @ 7,000 (2.36 @ 35.60)	To 7 psi (0.4 bar)
	87	- Severe service seal - Metal reinforced rubber OD - Reverse bevel lip design prevents lip roll-over - Aggressive shaft-to-bore misalignment capability	Timken Black Timken Blue Timken Green	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C)	6.000 to 48.000 (152.4 to 1219.2)	5,000 fpm (25.4 m/s)	Molded-in garter	0.100 @ 2,500 (2.54 @ 12.70) 0.050 @ 5,000 (1.27 @ 25.40)	To 7 psi (0.4 bar)
	143	- Face-type, excluder seal - Split design - High-speed service - Stainless steel clamp	Nitrite Timken ES Blue Timken V Green	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C)	6.000 to 80.000 (152.4 to 2032.0)	5,000 fpm (25.4 m/s)	Stainless steel clamp	N/A	N/A
	145	- Face-type, excluder seal* - Solid design - High-speed service - Several configurations available	Nitrite Timken ES Blue Timken V Green	-40°F (-40°C) to 200°F (93°C) -40°F (-40°C) to 300°F (150°C) -22°F (-30°C) to 400°F (204°C)	7.000 to 80.000 (177.8 to 2032.0)	5,000 fpm (25.4 m/s)	Stainless steel garter	N/A	N/A

* Assembled Width 145 A1= 2.000" ±0.500" 145 A2 = 0.781"±0.156"

TIMKEN INDUSTRIAL SEALS

Aluminum Process

Models = Seal model on pages 2 & 5



	Usage	Range of Temperature		
		Min. Operating Temp	Max Spike Temp	Max Cont Operating Temp
Timken N Black	General purpose	-40°F (-40°C)	250°F (122°C)	200°F (95°C)
Timken ES Blue	Excellent heat and abrasion resistance	-40°F (-40°C)	350°F (175°C)	300°F (150°C)
Timken V Green	Excellent heat and chemical resistance	-22°F (-30°C)	450°F (232°C)	400°F (205°C)
Silicone	Wide temperature range	-75°F (-60°C)	400°F (205°C)	350°F (175°C)
PTFE	Superior chemical resistance	-120°F (-85°C)	450°F (232°C)	400°F (205°C)
THERMO-CERAM™	Ultra high-temp to 1600°F (871°C)			1600°F (871°C)

Other Equipment

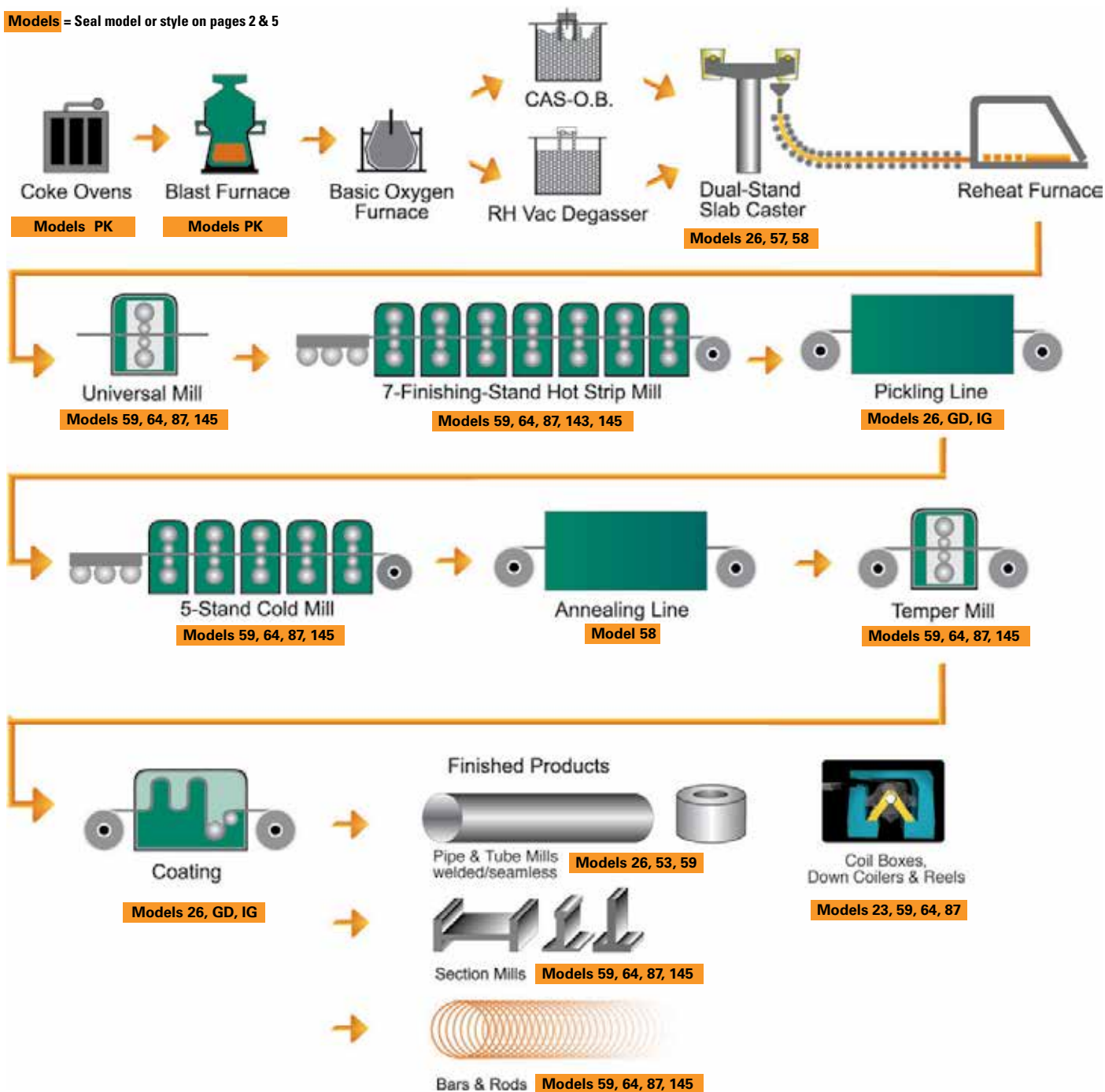
		Seal Materials					
		TIMKEN INDUSTRIAL SEALS	SILICONE	PTFE	Filled	THERMO-PTFE	BRONZE
Furnace Table Rolls	Model 58			N/R		●	
Run Out Table Rolls	Model 26 & Non-Metallic Bearing Isolator	●		N/R	●		●
Gearboxes	Model 26	●		N/R			
Motors	Non-Metallic Bearing Isolator			N/R	●		●
Pumps	Non-Metallic Bearing Isolator			N/R	●		●
Drive Systems	Model 26	●		N/R			

*N/R: Not recommended for service

TIMKEN INDUSTRIAL SEALS

Steel Process

Models = Seal model or style on pages 2 & 5



ANCILLARY EQUIPMENT



Models
GD, IG, EQ,
P/S-II, PK, 26

TIMKEN INDUSTRIAL SEALS

Non-Contact Bearing Isolators

Isolators	Model	Features	Standard Material	Temp	Shaft Dia inches (mm)	Surface Speed	Axial Motion	Misalign & Runout in. @ fpm (mm @ mps)	Pressure
Timken Metallic Isolator 	GD	- Meets NEMA MG 1-2003 - Surpasses IEEE 841-2001 test standards - Conforms to API 610 - No arbor press required for installation - No internal metal-to-metal contact	- Bronze** construction - Filled PTFE unitizing ring - Fluoroelastomer O-rings standard	-30°F (-34°C) to 400°F (204°C)	0.875 to 10.500* (22.2 to 266.7)	12,000 fpm (60.9 m/s)	± 0.025" (0.64mm)	± 0.020" (0.51mm)	Ambient
Timken Metallic Isolator 	MT II	- Unique microcellular filter technology - Protects against severely dusty environments - Meets NEMA MG 1-2003 - Surpasses IEEE 841-2001 test standards - Conforms to API 610 - No arbor press required for installation - No internal metal-to-metal contact	- Bronze or 316 stainless steel construction - Silicone foam - Filled PTFE Unitizing Ring - Fluoro-elastomer O-rings standard	-30°F (-34°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	4,500 f/m (22.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Timken Non-Metallic Isolator 	IG	- Excellent chemical resistance - Meets NEMA MG 1-2003 - Meets IEEE 841-2001 test standards - No arbor press required for installation	- FDA-compliant, blue glass-filled PTFE** - Fluoro-elastomer O-rings standard	-40°F (-40°C) to 400°F (204°C)	0.875 to 11.000* (22.2 to 279.4)	4,500 fpm (22.9 m/s)	± 0.015" (0.38mm)	± 0.020" (0.51mm)	Ambient
Timken Non-Metallic Isolator 	EQ	- Excellent chemical resistance - Multi-position capability - No arbor press required for installation - Unique pumping/fanning action	- Graphite-filled PTFE** - Fluoro-elastomer O-rings standard	-40°F (-40°C) to 400°F (204°C)	0.875 to 6.000* (22.2 to 152.4)	4,500 fpm (22.9 m/s)	± 0.015" (0.38mm)	± 0.015" (0.38mm)	Ambient

*For large sizes, contact your Timken sales representative. **Other materials available. Consult the Timken Technical Manual or contact your Timken sales representative.

TIMKEN INDUSTRIAL SEALS

General Engineering Data Tables

Table 1 - Shaft Data

Hardness	Rockwell C 30 to 40 (Rockwell C 45 minimum will provide extra protection against damage during handling or assembly)
Finish (Plunge grind is recommended as most satisfactory)	10-20 μ in. RA (0.25-0.50 μ m) with no machine lead, scratches, dents, corrosion, pits or other surface defects
Surface speed	Formula: Feet-Per-Min. = Shaft Dia. (in) x RPM x 0.262 Meters-Per-Sec. = Shaft Dia. (mm) x RPM x 0.0000524
Safe speed depends on*	1. Shaft finish 2. Misalignment and runout 3. Amount and kind of lubricant 4. Seal design 5. Pressure

* As shaft speed increases, the factors become more critical.

Table 2 - Operating Pressure Limits

Shaft Speed		Maximum* Pressure	
f/m	m/s	psi	kp (bar)
0 - 1000	0 - 5.1	7	48 (0.48)
1001 - 2000	5.2 - 10.2	5	35 (0.35)
2001 & Up	10.3 & Up	3	21 (0.21)

*Timken split oil seals are not recommended for applications involving fluid pressure.

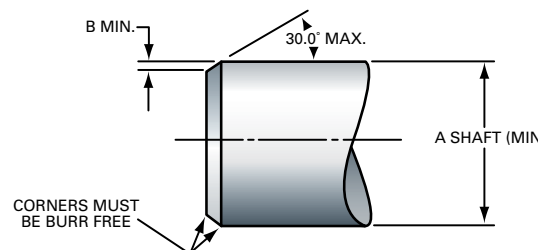
Table 3 - Shaft Diameter Tolerances

Shaft Diameter		Recommended Tolerance	
inch	mm	inch	mm
Up to 4.000	Up thru 101.60	± 0.003	± 0.08
4.001 - 6.000	101.61 - 152.40	± 0.004	± 0.10
6.001 - 10.000	152.41 - 254.00	± 0.005	± 0.13
10.001 & Up	254.01 & Up	± 0.006	± 0.15

Table 4 - Bore Tolerance

Bore Diameter	Bore Tolerances
inches (mm)	inches (mm)
Up to 2.000 (50.8)	± 0.001 (± 0.0254)
2.001 to 3.000 (50.8 to 76.2)	± 0.001 (± 0.0254)
3.001 to 5.000 (76.2 to 127)	± 0.0015 (± 0.0381)
5.001 to 7.000 (127 to 177.8)	± 0.0015 (± 0.0381)
7.001 to 12.000 (177.8 to 304.8)	± 0.002 (± 0.0508)
12.001 to 20.000 (304.8 to 508)	± 0.003 (± 0.0762)
20.001 to 40.000 (508 to 1016)	± 0.004 (± 0.1016)
40.001 to 60.000 (1016 to 1524)	± 0.006 (± 0.1524)

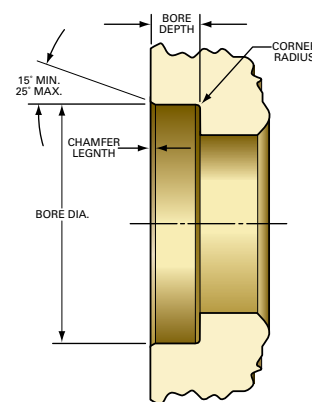
Table 5 - Recommended Shaft Lead Corner



A - Shaft Diameter		B - Minimum*	
inch	mm	inch	mm
Thru 0.394	Thru 10.00	0.030	0.75
0.395 - 0.787	10.01 - 20.00	0.040	1.00
0.788 - 1.181	20.01 - 30.00	0.050	1.25
1.182 - 1.575	30.01 - 40.00	0.060	1.50
1.576 - 1.969	40.01 - 50.00	0.070	1.75
1.970 - 2.756	50.01 - 70.00	0.080	2.00
2.757 - 3.740	70.01 - 95.00	0.090	2.25
3.741 - 5.118	95.01 - 130.00	0.110	2.75
5.119 - 9.449	130.01 - 240.00	0.140	3.50
9.450 & Up	240.01 & Up	0.220	5.50

*If a shaft lead-in radius is used, maintain the diametral difference to no less than indicated value.

Table 6 - Housing Bore Dimensions



Nominal Seal Width		Chamfer Length		Max. Housing Corner Radius	
inch	mm	inch	mm	inch	mm
Thru 0.394	Thru 10.00	0.03-0.04	0.7-1.0	0.020	0.50
Over 0.394	Over 10	0.05-0.06	1.2-1.5	0.030	0.75

Source: Rubber Manufacturers Association

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