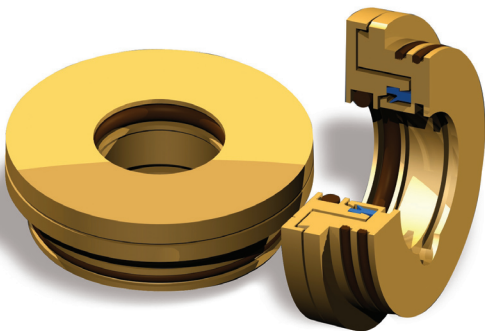




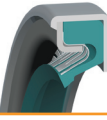






TIMKEN
Where You Turn



Sealing Technology for Primary Metals

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	<ul style="list-style-type: none">General purpose, split sealCover plate requiredOver 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	<ul style="list-style-type: none">General purpose sealSolid or split designReverse bevel lip design prevents lip rolloverReinforced rubber ODSingle 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	<ul style="list-style-type: none">General purpose assembled sealHeavy-duty metal outer caseSingle 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	<ul style="list-style-type: none">High-temperature, assembled sealHeavy-duty metal outer caseTHERMO-CERAM™ sealing elementIdeal for abrasive environmentsGrease 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	<ul style="list-style-type: none">Severe service assembled sealHeavy-duty metal outer caseReverse bevel lip design prevents lip rolloverAggressive 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®	<ul style="list-style-type: none">Severe service assembled sealHeavy-duty metal outer caseUnique carrier/garter spring combinationIndustry'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	<ul style="list-style-type: none">Severe service sealMetal reinforced rubber ODReverse bevel lip design prevents lip roll-overAggressive 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	<ul style="list-style-type: none">Face-type, excluder sealSplit designHigh-speed serviceStainless 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	<ul style="list-style-type: none">Face-type, excluder seal*Solid designHigh-speed serviceSeveral 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

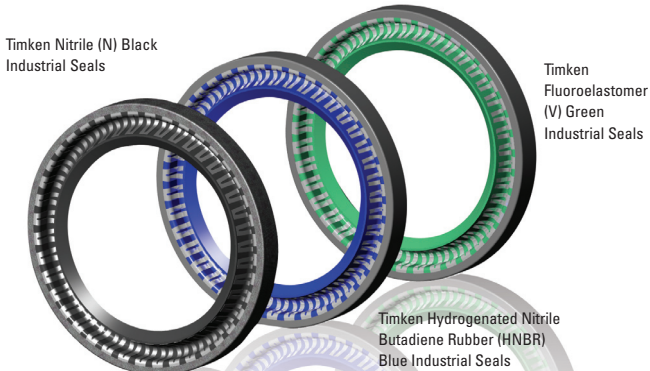
* Assembled Width 145 A1= 2.000" ±0.500" 145 A2 = 0.781"±0.156"

Timken Industrial Seals 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.



Timken Nitrile (N) Black Industrial Seals

Timken Fluoroelastomer (V) Green Industrial Seals

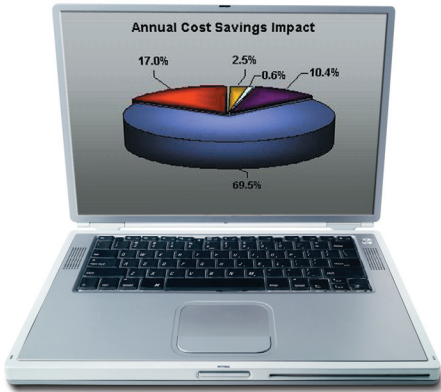
Timken Hydrogenated Nitrile Butadiene Rubber (HNBR) Blue Industrial Seals

Timken Silicone Industrial Seals

- Three varieties to accommodate different requirements
- Color-coded materials for easy identification
- Provides excellent wear resistance
- Features a wide temperature range
- Promotes longer seal and bearing life

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.

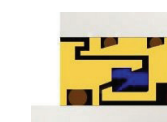
Small Cross Section
Part #29607



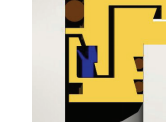
Narrow Width
Part #29609




Flangeless
Part #29619




Vertical
Part #29620



Split Pillow Block
Part #29616



Step Shaft
Part #29697

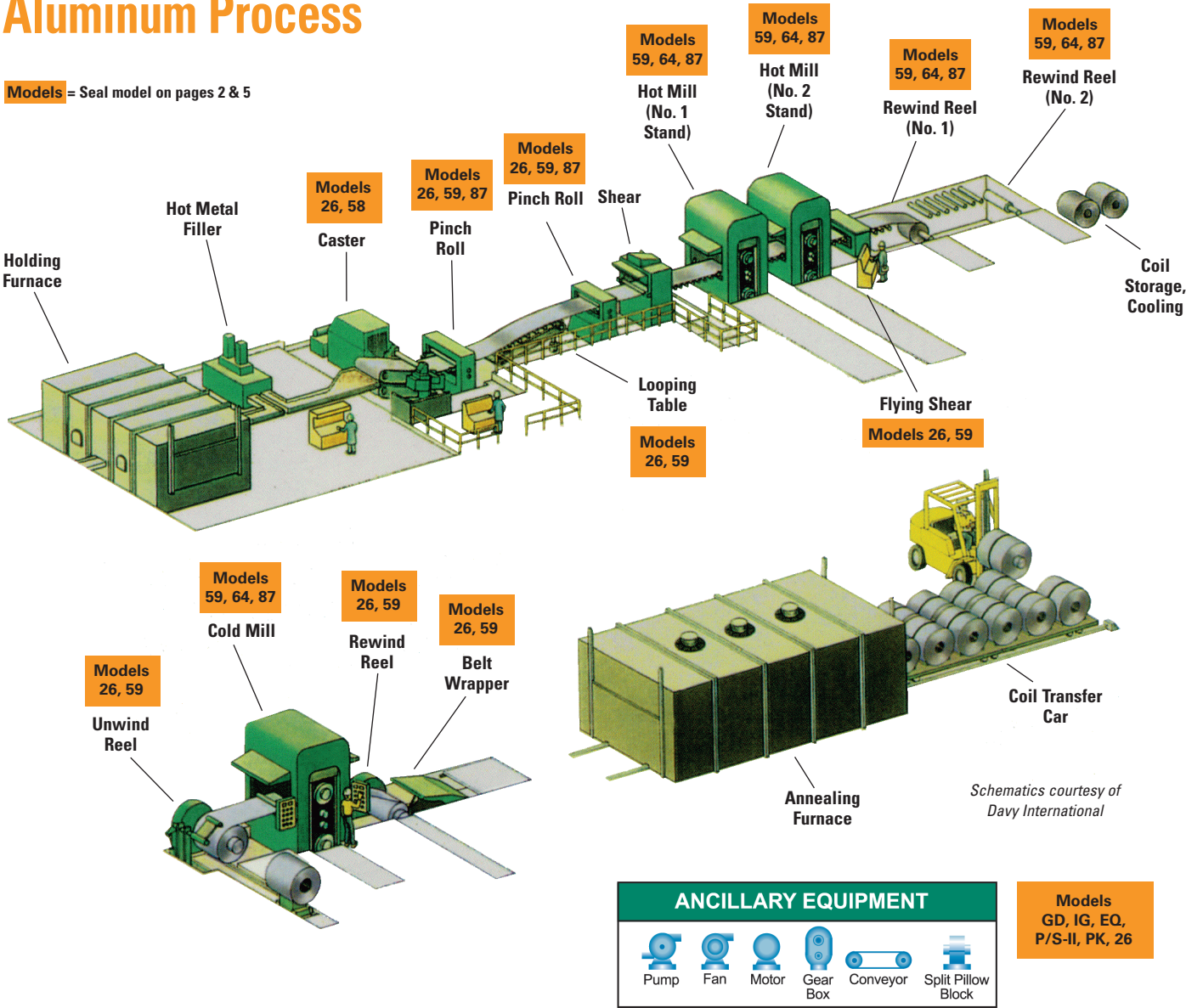


To learn more about our full line of Industrial Seals, call your Timken sales representative or visit us at www.timken.com/industrialseals.

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

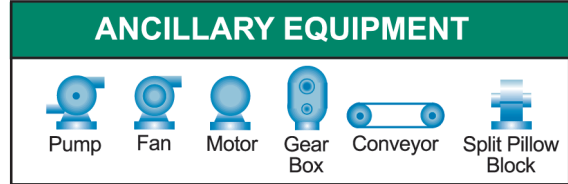
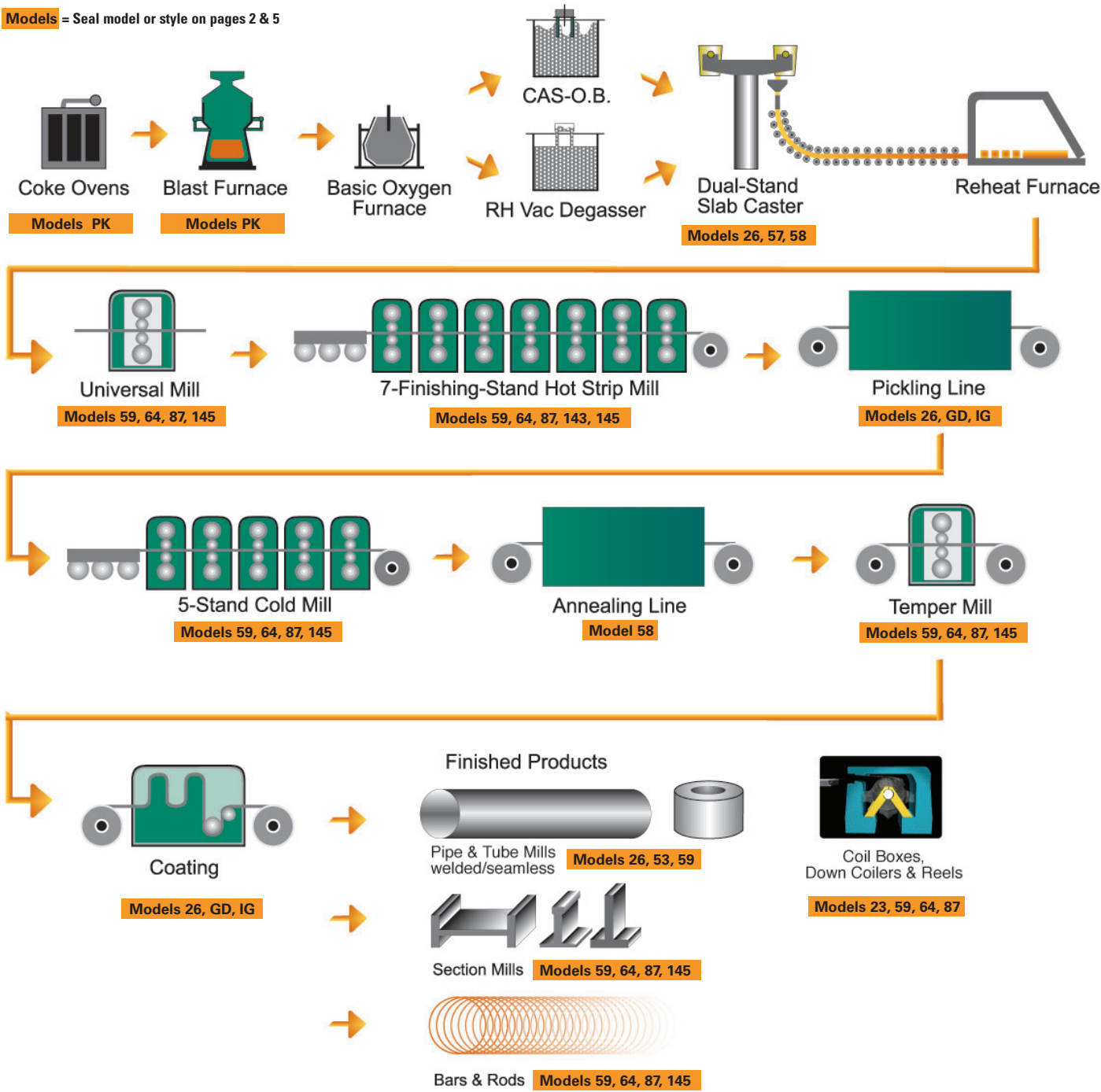
		Seal Materials					
		TIMKEN INDUSTRIAL SEALS	SILICONE	PTFE	Filled PTFE	THERMO-CERAM™	Bronze
Furnace Table Rolls	Model 58		N/R			●	
Run Out Table Rolls	Model 26 & Non-Metallic Bearing Isolator	●	N/R		●		●
Gearboxes	Model 26	●	N/R				
Motors	Non-Metallic Bearing Isolator		N/R	●			●
Pumps	Non-Metallic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

*N/R: Not recommended for service

TIMKEN INDUSTRIAL SEALS

Steel Process


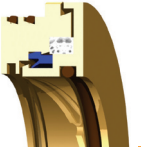

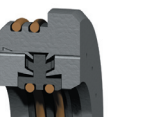
Models = Seal model or style on pages 2 & 5



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
<div>Timken Metallic Isolator</div> 	GD	<ul style="list-style-type: none">Meets NEMA MG 1-2003Surpasses IEEE 841-2001 test standardsConforms to API 610No arbor press required for installationNo internal metal-to-metal contact	<ul style="list-style-type: none">Bronze** constructionFilled PTFE unitizing ringFluor elastomer 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
<div>Timken Metallic Isolator</div> 	MT II	<ul style="list-style-type: none">Unique microcellular filter technologyProtects against severely dusty environmentsMeets NEMA MG 1-2003Surpasses IEEE 841-2001 test standardsConforms to API 610No arbor press required for installationNo internal metal-to-metal contact	<ul style="list-style-type: none">Bronze or 316 stainless steel constructionSilicone foamFilled PTFE Unitizing RingFluoro-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
<div>Timken Non-Metallic Isolator</div> 	IG	<ul style="list-style-type: none">Excellent chemical resistanceMeets NEMA MG 1-2003Meets IEEE 841-2001 test standardsNo arbor press required for installation	<ul style="list-style-type: none">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
<div>Timken Non-Metallic Isolator</div> 	EQ	<ul style="list-style-type: none">Excellent chemical resistanceMulti-position capabilityNo arbor press required for installationUnique pumping/fanning action	<ul style="list-style-type: none">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 μin. RA (0.25-0.50 μm) 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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