

60 Case Shafting

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Standard 60 Case Shaft Size and Availability Chart

Material	Carbon Steel											440 C Stainless Steel				52100 Tubular		316 SS		
Hardness	60 min.											50 min.			55 min.	58 min.		20-25		
Tolerance Class	L					S	N		D	XL	G	L		S	G	Instrument	L	S	L	
Optional Features	L	DC	PD CPPE	CPPE	PD	S	DC	N				L	PD							
1/8"																				
3/16"	•																			
1/4"	•					•		•				•	•		•	•				
3/8"	•					•		•				•	•		•	•				•
1/2"	•		•	•	•	•		•				•	•	•	•	•				•
5/8"	•		•	•	•	•		•				•	•	•	•	•				
3/4"	•	•	•	•	•	•	•	•				•	•	•	•	•		•	•	•
7/8"	•	•						•	•											
1"	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•		•	•	•
1 1/8"	•	•						•	•											
1 1/4"	•	•	•	•	•	•	•	•	•	•			•	•	•					
1 3/8"	•																			
1 1/2"	•	•	•	•	•	•	•	•	•	•			•	•	•			•	•	•
1 5/8"	•																			
1 3/4"	•	•						•	•											
2"	•	•	•	•	•	•	•	•	•	•			•	•	•			•	•	
2 1/4"	•	•						•	•											
2 1/2"	•	•						•	•				•		•			•	•	
3"	•	•						•	•		•							•	•	
3 1/2"	•	•						•												
4"	•										•									
Catalog Page	165	167	166	166	166	165	167	165	165	165	165	167	168	168	168	169	169	169	169	170

Material	Carbon Steel			440 C SS
Hardness	60 min.			50 min.
Tolerance Class	MM (ISO h6)			MM (ISO h6)
Optional Features	MM	T1	T2	
5 mm	•			•
8 mm	•			•
10 mm	•			•
12 mm	•	•	•	•
15 mm	•	•	•	•
16 mm	•	•	•	•
20 mm	•	•	•	•
25 mm	•	•	•	•
30 mm	•	•	•	•
40 mm	•	•	•	•
50 mm	•			•
60 mm	•			•
80 mm	•			
Catalog Page	178	179	179	180

Thomson 60 Case shafting is sold as cut-to-length (CTL), random length (RL), special machined (SM), and as quick shaft (QS).

Since Thomson grinds and hardens all of its own shafting, diameters and tolerances not listed are available as special grind and are made to order. Minimum lots may apply.

Tolerance Classes:

- L - For use with XA, Open and Adjustable Ball Bushing bearings and Pillow Blocks as well as Super Ball Bushing bearings and Super Smart Ball Bushing bearings
- S - For use with A type ball bushings
- N - For use with needle roller bearings
- D - For use with Thomson Die Set Ball Bushing bearings
- G - Ball Grooved for use with Thomson Super Ball bushing
- XL - For use with XR bearing (Carbon Steel)

Optional Features:

- PD - Predrilled
- CPPE - Chrome Plated Plain Ends
- DC - Deep Case

Standard Support Rail Size and Availability Chart

Type	SR	SR-PD	SRA	SRA-SS	SRA-TU	LSR	LSR-PD	LSRA	LSRA-CR	XSR	XSRA
Description	Aluminum Support Rail	Aluminum Support Rail with Pre-drilled Holes	Aluminum Support Rail Carbon Steel Shaft	Aluminum Support Rail Assembly 440C SS Shaft	Aluminum Support Rail 51200 Tubular Shaft	Steel Lower Support Rail	Steel Lower Support Rail with Pre-drilled Holes	Steel Lower Support Rail Assembly Carbon Steel Shaft	Corrosion Resistant Steel Lower Support Rail Assembly 440C SS Shaft	Extra Rigid Cast Steel Support Rail	Extra Rigid Cast Steel Support Rail Assembly
1/2"	•	•	•	•		•	•				
5/8"	•	•	•	•		•	•	•	•		
3/4"	•	•	•	•	•	•	•	•	•		
1"	•	•	•	•	•	•	•	•	•		
1 1/4"	•	•	•	•		•	•	•	•		
1 1/2"	•	•	•	•	•	•	•	•	•		
2"	•	•	•	•	•	•	•			•	•
2 1/2"						•	•				
3"						•	•			•	•
4"						•	•				
Catalog Page	173	173	174	174	174	173	173	174	174	173	174

Standard Support Rail Assembly Size and Availability Chart

Type	SRM	SRM T1	SRM T2	SRAM T1	SRAM T2	LSRM	LSRM T1	LSRM T2	LSRA M	LSRA M CR
Description		Steel Lower Support Rail Assembly Carbon Steel Shaft	Steel Lower Support Rail with Pre-drilled Holes T2 Hole Pattern	Aluminum Support Rail Assembly with Pre-drilled Holes T1 Hole Pattern	Aluminum Support Rail Assembly with Pre-drilled Holes T2 Hole Pattern	Steel Lower Support Rail	Steel Lower Support Rail with Pre-drilled Holes T1 Hole Pattern	Steel Lower Support Rail with Pre-drilled Holes T2 Hole Pattern	Steel Lower Support Rail Assembly Carbon Steel Shaft	Corrosion Resistant Steel
12mm	•	•	•	•	•	•	•	•	•	•
16mm	•	•	•	•	•	•	•	•	•	•
20mm	•	•	•	•	•	• ¹	• ¹	• ¹	• ¹	• ¹
25mm	•	•	•	•	•	•	•	•	•	•
30mm	•	•	•	•	•	•	•	•	•	•
40mm	•	•	•	•	•	• ¹	• ¹	• ¹	• ¹	• ¹
Catalog Page	183	183	183	183	183	183	183	183	183	183

Standard Support Block Size and Availability Chart

Type	ASB	FSB	SB	WM	Type	ASBM	SBM
Description	Aluminum Support Block	Flanged Aluminum Support Block	Steel Support Block	Waymount Support	Description	Aluminum Support Block	Steel Support Block
1/4"	•		•		8mm	•	•
3/8"	•		•		12mm	•	•
1/2"	•	•	•	•	16mm	•	•
5/8"			•		20mm	•	•
3/4"	•	•	•		25mm	•	•
1"	•	•	•	•	30mm	•	•
1 1/4"		•	•		40mm	•	•
1 1/2"	•		•		Catalog Page	184	184
2"				•			
3"				•			
4"				•			
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¹ Not all sizes are stocked, minimum order quantities may apply.

60 Case Product Overview

For over 50 years Thomson has been producing Precision Linear Shafting for the Thomson Linear Ball Bushing and various other applications.

- We are one of a few Linear Motion component suppliers producing their own shafting.
- We offer the largest selection of linear shafting, not just the popular sizes.
- We offer a complete Linear Motion solution not just one component of a linear system.
- We offer the widest range of inch and metric shafting, support rails and support blocks in the market today.
- We continually optimize our processes to ensure optimal bearing performance and extended life.
- We perform thousands of hours of laboratory testing per year to continually evaluate our products.

While shafts may appear the same to the untrained eye on the surface, there are significant performance differences due to the manufacturer's selected standards and the manufacturing processes used to achieve them. Thomson 60 Case was developed and is continually enhanced because of our goal to provide a consistent finish, roundness, straightness, cylindricity case hardness and depth on all shafting for the demands of a linear bearing. Unlike common shafting, Thomson 60 Case shafting is manufactured to the highest quality standards in an ISO 9000:2000 registered facility. Our techniques have been continuously upgraded with proprietary knowledge gained from over 50 years of manufacturing experience. Using Thomson 60 Case with Thomson Ball Bushing bearings ensures optimal bearing performance and travel life.

Assortment

Thomson 60 Case is available from stock in Carbon Steel, 440 C Stainless Steel, 52100 Tubular, 316 Stainless Steel, Carbon Steel Chrome Plated, Carbon Steel Predrilled, and 440 C Stainless Predrilled from 3/16 to 4". Thomson 60 Case can be mounted or delivered pre-assembled, in three configurations: type SR standard support rails, type LSR low profile support rails and type XSR extra rigid support rails. Contact Thomson or review the catalog datasheets to see available diameters for the different materials. Thomson has the widest range of materials and diameters available on the market from one source.

Material



Thomson 60 Case carbon steel shafting is made of high quality specially developed alloy steel. When it comes to linear shafting no other manufacturers have set such high standards or specifications for the raw steel used in the production of linear shafting. The chemical properties of the steel are customized to provide consistent, homogenous microstructure and proper response to thermal processing. When you use Thomson 60 Case you can be confident you get consistent material from shaft to shaft.

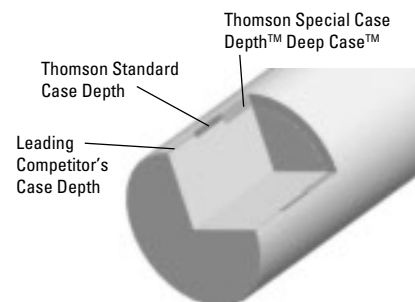
Case Hardness

All Thomson 60 Case is induction hardened and the

hardness varies by material type. Thomson 60 Case carbon steel shaft is induction hardened to a 60 Rc min. The Thomson 440C "corrosion resistant" stainless steel shafting is hardened to a 50 Rc min. The 316 Thomson "corrosion proof" stainless steel is not hardened. The Thomson 52100 Tubular shafting is hardened to a 58 Rc min.

Case Depth

The case depth on all Thomson 60 Case Shafting is precisely controlled for consistent quality and optimal performance. The extremely hard surface minimizes wear when acting as an inner race of a linear bearing, is resistant to seal lip wear, nicks and scratches for your application needs. The Thomson 60 Case standard case depth is, in some cases, double competitor shafting. This deeper standard case depth provides a stronger, more consistent homogenous microstructure for a linear bearing to run on leading to an increase in shaft life. For special applications Thomson offers deep case in carbon steel, where the case depth is two times the normal depth. For specific case depths refer to catalog datasheets.



Introduction

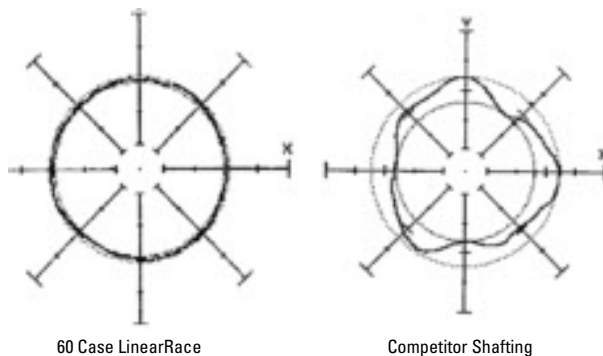
Surface Finish

Surface is the key factor affecting travel life, load levels, frictional resistance, and smoothness of travel. Thomson 60 Case shafting is centerless ground for a consistent smooth and industry leading cataloged surface finish of 8 Ra max. Excellent surface finish and hardness maximize the efficiency and life of linear bearings, shaft riding seals, and overall visual appearance. When 8 Ra is not good enough we can provide 6 Ra surface finishes at an additional cost. Smoother equals longer bearing life.

Roundness

Shaft roundness is vital for linear race applications such as spindles and guide rods where accuracy, life or precision is paramount. Roundness ensures uniform distribution of bearing loads for maximized bearing life, longer travel life and improved positional accuracy. Shafts that look round can be deceiving to the eye and anything but round when properly evaluated, using precision tracing techniques. Thomson 60 Case shaft roundness is within 0.000080" for Class L, S, D, M and .000050" for Class N. Our leading competitors don't catalog roundness and some are .0002". Rounder equals longer bearing life.

These two graphs taken from a roundness trace display the major roundness difference between Thomson 60 Case LinearRace shafting products and competitor shafting.

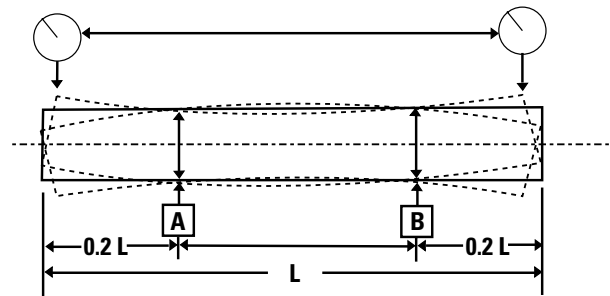


Straightness

Straightness is the most vital parameter to positioning accuracy for a linear ball bushing system. Thomson 60 Case shafts are straight within 0.001" per foot cumulative (TIR .002") when shipped from the factory. Handling or machining of shafting can cause the material to bend once they leave the factory. When straightness is critical let Thomson provide the special machined shaft; let us machine and straighten the shaft for you using our proprietary straightening and measurement techniques.

Our leading competitor does not catalog straightness. Straighter equals higher precision.

60 Case LinearRace shafting is inspected to ensure that it meets the highest quality standards. Standard straightness for all 60 Case LinearRace shafting is .001 inch per foot (.025mm/300mm) cumulative .002 inch (.05mm) TIR, with special straightness of .0005 inch per foot (.012 mm/300mm) cumulative .001 inch (.025mm) TIR

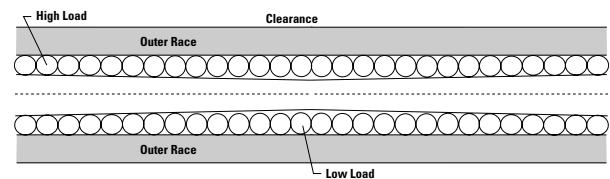


available.

Cylindricity

Cylindricity is a measure of the degree of conformance of the outside surface (diameter along the length of the shaft) to a true cylinder. True conformance (high cylindricity) ensures the benefits of roundness, diameter and straightness are present over the shaft length, or working surface, and not just in a particular location. This ensures uniform distribution of bearing loads, increases load capacity in the working area of the bearing, maximizes bearing life, and increases travel life. Taper is a component of cylindricity and all Thomson 60 Case shafts are produced with a maximum taper of 1/2 the diameter tolerance over the entire length of the shaft.

In linear bearing applications, taper found in competitor shafting can cause one portion of the linear bearing to be loaded higher than the other. This can cause dramatic reduction in travel life or load capacity. As

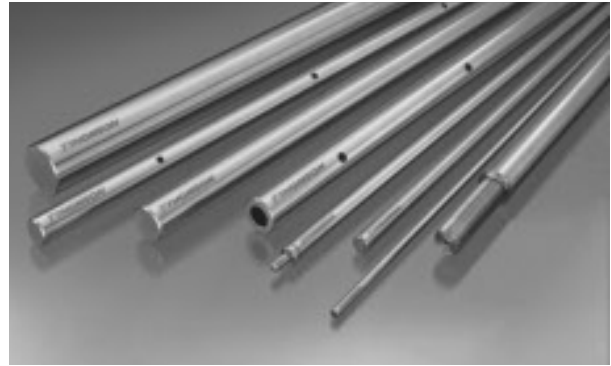


taper increases, balls go in and out of preload causing premature wear and reduction in travel life.

60 Case Product Overview (continued)

Length Tolerance

Thomson 60 Case shafting can be cut to your specified length. It will have a standard length tolerance of $\pm 1/32"$ for diameters less than 2 inches and $\pm 1/16"$ for all larger diameters. Special length tolerances are available for an additional charge. All cut shafting is subject to a deburring process to remove sharp edges. The size of the standard chamfer is approximately $1/32" \times 45$ degrees for diameters less than 1" and $1/16" \times 45$ degrees for diameters 1" and larger. Special chamfer sizes can be provided for an additional charge.



Predrilled and Tapped Holes

Thomson 60 Case shafting is stocked with radial holes drilled and tapped to accept a continuous shaft support rail in both carbon steel and 440 C stainless steel. Continuous support prevents shaft deflection when used to support heavy loads or for long travel lengths.

Precision Special Machining

Thomson 60 Case can be supplied specially machined to your drawing and or application requirements. Leave your special machining needs to us. With over 50 years of experience, we can provide a high quality special machined shaft to your specifications allowing you to focus on your core competency. Fax us a detailed sketch or drawing and let our engineers provide you with a quotation. See page 189 for a sample of machining offered.

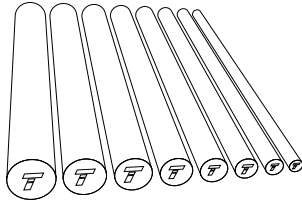
Special Coatings

Thomson offers a variety of corrosion resistant products to meet the needs of specific corrosive environments. Thomson 60 Case is available as thin dense chrome plated with plain ends from stock or 100% chrome plated, black oxide, or Armoloy™ plated to name a few. Contact our application engineering team or see page 191 for more information.

How does Thomson 60 Case compare to our leading competitor shafting?

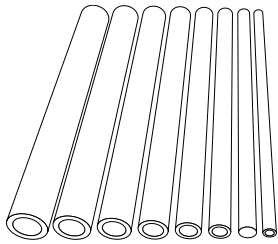
	Thomson	Competitor 1	Competitor 2
Materials	Carbon Steel	Carbon Steel	Carbon Steel
	440 C SS	440 C SS	440 C SS or equiv.
	316 SS		52100 Tubular
	52100 Tubular		
Tolerance Classes	L, N, S, D, G, MM	L, S, MM	L, S, MM
Case Depth	.080"	.080"	.035"
Surface Finish	8 Ra Max	10-12 RMS	12 RMS
Roundness (L class)	.000080"	not cataloged	.0002"
Straightness	.001"/foot	.001-.002"/foot .0012"	not cataloged
Taper	.0001"	not cataloged	.0004"

60 Case LinearRace Shafting for End Supported Applications



Solid 60 Case LinearRace Shafting Features:

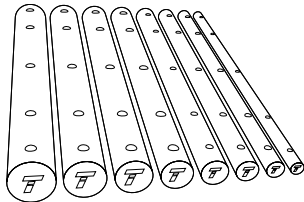
- Diameter range between 3/16 and 4 inch.
- Roundness 80 millionths of an inch.
- Case hardness 60 HRC minimum.
- Surface finish 8 Ra microinch.
- Available in corrosion resistant 440C stainless steel (50 HRC minimum).
- Available with PrePlate* chrome option.
- Standard straightness is .001 inch per foot cumulative (.002 TIR) with special straightness at .0005 inch per foot cumulative (.001 TIR) available.



60 Case Tubular Lite* LinearRace Shafting Features:

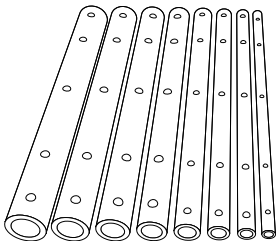
- Hollow inner diameter reduces weight and inertia.
- Diameter range between 3/4 and 4 inch.
- Roundness 80 millionths of an inch.
- Case hardness 58 HRC minimum.
- Surface finish 8 Ra microinch.
- Standard straightness is .001 inch per foot cumulative (.002 TIR) with special straightness at .0005 inch per foot cumulative (.001 TIR) available.

60 Case LinearRace Shafting (PreDrilled) for Continuously Supported Applications



Solid 60 Case LinearRace Shafting with Mounting Holes Features:

- Radial drilled and tapped holes ready for immediate use with standard hole spacing to match standard 60 Case LinearRace support rails.
- Diameter range between 1/2 and 4 inches, special machining (SM) required over 2 inches.
- Surface finish 8 Ra microinch.
- Hardness 60 HRC minimum.
- Roundness 80 millionths of an inch.
- Available in corrosion resistant 440C stainless steel (50 HRC min).
- Available with Preplate chrome option.
- Standard straightness .001 inch per foot cumulative (.002 TIR) with special straightness at .0005 inch per foot cumulative (.001 TIR) available.

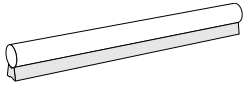


60 Case Tubular Lite LinearRace Shafting with Mounting Holes Features:

- Hollow design reduces weight and inertia.
- Can be supplied with radial drilled and tapped holes, ready for immediate use.
- Standard hole spacing to match standard 60 Case LinearRace support rails.
- Diameter range between 1 1/2 and 4 inch.
- Roundness 80 millionths of an inch.
- Case hardness 58 HRC minimum.
- Surface finish 8 Ra microinch.
- Standard straightness .001 inch per foot cumulative (.002 TIR) with special straightness at .0005 inch per foot cumulative (.001 TIR) available.

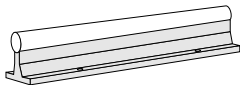
*Trademark of Danaher Motion. DANAHER MOTION is registered in the U.S. Patent and Trademark Office and in other countries.

60 Case LinearRace Support Rails and Assemblies for Continuously Supported Applications



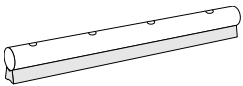
LSR Low Profile 60 Case LinearRace Support Rail Features:

- Diameter range between 1/2 and 4 inch.
- Available with standard mounting holes for immediate use.
- Available without mounting holes for custom hole spacing.
- Low Profile design.
- Unlimited travel lengths.



SR 60 Case LinearRace Support Rail and SRA 60 Case LinearRace Support Rail Assembly Features:

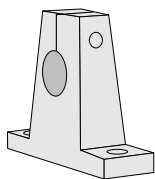
- Diameter range between 1/2 and 2 inch.
- Available with standard mounting holes for immediate use.
- Available without mounting holes for customized hole spacing.
- Available as a pre-engineered, ready to install assembly.
- Light weight, high strength aluminum alloy rail.
- Unlimited travel lengths.



LSRA Smart Rail* Assembly Features:

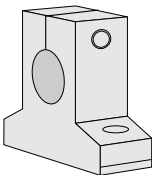
- Diameter range between 5/8 and 1 1/2 inch.
- Bolt-down-from-the-top mounting.
- Single piece lengths up to 15 feet long.
- Low profile design.

60 Case LinearRace Supports for End Supported Applications



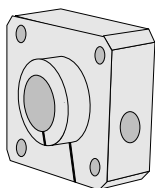
SB 60 Case LinearRace Shafting End Support Block Features:

- Size range between 1/4 and 2 inch.
- Easily secured with two mounting bolts.
- Malleable iron alloy for sizes 1/2 to 2 inch diameter.
- Protected by corrosion resistant coating.
- Light weight, high strength aluminum alloy construction for sizes 1/4 and 3/8 inch.



ASB Low Profile 60 Case LinearRace Shafting End Support Block Features:

- Size range between 1/4 and 1 1/2 inch.
- Low profile design.
- Easily secured with two mounting bolts.
- Protected by corrosion resistant anodized coating.
- Light weight, high strength aluminum alloy construction.



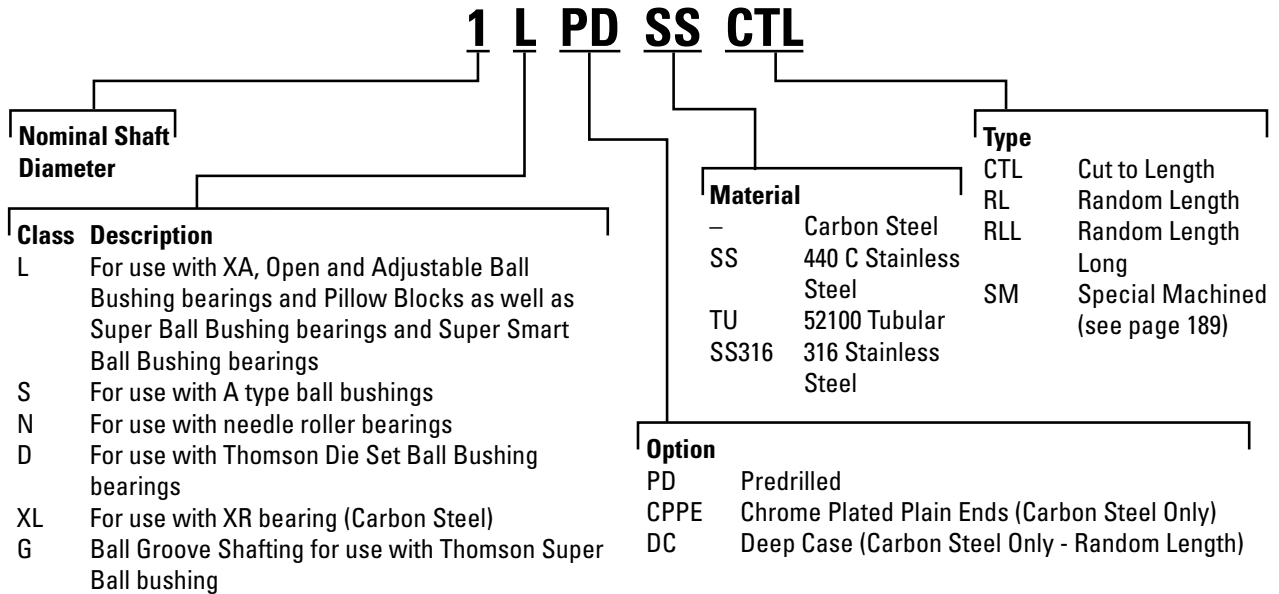
FSB Flanged 60 Case LinearRace End Support Block Features:

- Available in 1/2, 3/4, 1 and 1 1/4 inch diameters.
- Flanged mounting surface for easy assembly.
- Easily secured with four mounting bolts.
- Designed specifically for use with Super Smart Flanged Pillow Blocks
- Protected by corrosion resistant coating.
- Light weight, high strength aluminum alloy construction.

Inch - 60 Case Shafting

Hardened and Ground 60 Case Precision LinearRace Shafting

Part Number Description



CTL = Cut to length is Thomson 60 Case cut to your specified length.

RL = Random length is full bar or long length shafting. It is called random length because we start with a raw bar 4" to 6" longer than the min. usable but guarantee only the min. usable. We mark the ends of what is out of our own tolerance. This is the result of the manufacturing process and tightly controlled roundness specifications.

Look for the Brand Logo



If you specify Thomson, look for the logo. Do not be fooled when ordering linear shafting. All Thomson 60 Case LinearRace shafting is etched with the Thomson logo as shown in the picture. If the shaft you have does not have the logo, it may not be a true Thomson 60 Case. Thomson 60 Case is etched approximately every 18 to 22 inches.

Inch - 60 Case Shafting

Solid Carbon Steel

Hardness: 60 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Roundness: .000080" Class L and S / .000050" Class N

Straightness: .001" Per Foot Cumulative (.002" TIR)

Taper: .0001"

Nominal Diameter (in)	Class L			Class S			Class N			Min. Hardness Depth (in)	Weight Per Inch (lb)
	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)		
3/16"	3/16 L	.1870 .1865	22	-	-	-	-	-	-	.027	.008
1/4"	1/4 L	.2495 .2490	94	1/4 S	.2490 .2485	94	1/4 N	.2500 .2498	94	.027	.014
3/8"	3/8 L	.3745 .3740	166	3/8 S	.3740 .3735	166	3/8 N	.3750 .3748	166	.027	.031
1/2"	1/2 L	.4995 .4990	166	1/2 S	.4990 .4985	166	1/2 N	.5000 .4998	166	.040	.055
5/8"	5/8 L	.6245 .6240	178	5/8 S	.6240 .6235	178	5/8 N	.6250 .6248	178	.040	.086
3/4"	3/4 L	.7495 .7490	178/202	3/4 S	.7490 .7485	178	3/4 N	.7500 .7498	178	.060	.125
7/8"	7/8 L	.8745 .8740	178	-	-	-	7/8 N	.8750 .8748	178	.060	.170
1"	1 L	.9995 .9990	178/202	1 S	.9990 .9985	178	1 N	1.0000 .9998	178	.080	.222
1 1/8"	1 1/8 L	1.1245 1.1240	178	-	-	-	-	1.1250 1.1248	178	.080	.281
1 1/4"	1 1/4 L	1.2495 1.2490	178/202	1 1/4 S	1.2490 1.2485	178	1 1/4 N	1.2500 1.2498	178	.080	.348
1 3/8"	1 3/8 L	1.3745 1.3740	178	-	-	-	1 3/8 N	1.3750 1.3747	178	.080	.420
1 1/2"	1 1/2 L	1.4994 1.4989	178/202	1 1/2 S	1.4989 1.4984	178	1 1/2 N	1.5000 1.4997	178	.080	.500
1 5/8"	1 5/8 L	1.6245 1.6240	178	-	-	-	1 5/8 N	1.6250 1.6247	178	.080	.587
1 3/4"	1 3/4 L	1.7495 1.7490	178	-	-	-	1 3/4 N	1.7500 1.7497	178	.100	.681
2"	2 L	1.9994 1.9987	178/202	2 S	1.9987 1.9980	178	2 N	2.0000 1.9997	178	.100	.890
2 1/4"	2 1/4 L	2.2494 2.2487	178/202	-	-	-	2 1/4 N	2.2500 2.2497	178	.100	1.153
2 1/2"	2 1/2 L	2.4993 2.4985	178/202	2 1/2 S	2.4985 2.4977	178	2 1/2 N	2.5000 2.4996	178	.100	1.391
3"	3 L	2.9992 2.9983	178/202	3 S	2.9983 2.9974	178	3 N	3.0000 2.9996	178	.100	2.003
3 1/2"	3 1/2 L	3.4990 3.4980	202	-	-	-	-	-	-	.100	2.726
4"	4 L	3.9988 3.9976	202	4 S	3.9976 3.9964	202	-	-	-	.100	3.560

Standard random length (RL) min usable length is 178", optional extra long random length (RL) min usable length is 202"

Solid Carbon Steel

Hardness: 60 ROCKWELL C Min.

Straightness: .001" Per Foot Cumulative (.002" TIR)

Taper: .0001"

Roundness: .000080" Class D

.0002" 2" and 3" Class XL

.0003" for 4" Class XL

Nominal Diameter (in)	Basic Part Number	Class D			Min. Hardness Depth (in)	Weight Per Inch (lb)
		Diameter Tolerance (in)	Surface Finish	Max. Length (in)		
1"	1 D	1.0003 1.0000	8 Ra Max.	178	.080	.222
1 1/4"	1 1/4 D	1.2503 1.2500	8 Ra Max.	178	.080	.348
1 1/2"	1 1/2 D	1.5003 1.5000	8 Ra Max.	178	.080	.500
2"	2 D	2.0003 2.0000	8 Ra Max.	178	.100	.890

Nominal Diameter (in)	Basic Part Number	Class XL			Min. Hardness Depth (in)	Weight Per Inch (lb)
		Diameter Tolerance (in)	Surface Finish	Max. Length (in)		
2"	2 XL	1.9994 1.9991	4-8 Ra Max.	178	.100	.890
3"	3 XL	2.9992 2.9989	4-8 Ra Max.	178	.100	2.003
4"	4 XL	3.9988 3.9983	6-10 Ra Max.	202	.100	3.560

Inch - 60 Case Shafting

Standard Options for Carbon Steel Shafting Chrome Plated Ends (CPPE), Predrilled (PD), Predrilled Chrome Plated Plain Ends (PDCPPE), Solid Steel

Hardness: 60 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Roundness: .000080"

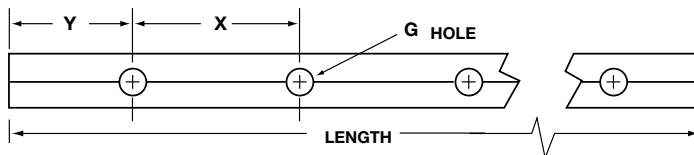
Straightness: .001" Per Foot Cumulative (.002" TIR)

Taper: .0001"

Nominal Diameter (in)	Chrome Plated Plain Ends			Min. Hardness Depth (in)	Weight Per Inch (lb)
	Part Number	Tolerance Class L	Max. Length (in)		
1/2"	1/2 L CPPE	.4995	166	.040	.055
		.4990			
5/8"	5/8 L CPPE	.6245	178	.040	.086
		.6240			
3/4"	3/4 L CPPE	.7495	178	.060	.125
		.7490			
1"	1 L CPPE	.9995 .9990	178	.080	.222
1 1/4"	1 1/4 L CPPE	1.2495	178	.080	.348
		1.2490			
1 1/2"	1 1/2 L CPPE	1.4994 1.4989	178	.080	.500
2"	2 L CPPE	1.9994	178	.100	.890
		1.9987			

CPPE - Chrome Plated Plain Ends which means ends and chamfers are not plated.

Completely plated chamfers are available as a special machine part. See page 33.



Nominal Diameter (in)	Predrilled		Predrilled Chrome Plated		Hole Spacing		G Standard Thread Size	Length Tolerance (in)	Max. Length (in)	Min. Hardness Depth (in)	Weight Per Inch (lb)
	Part Number Predrilled	L PD Tolerance Class	Part Number Predrilled Chrome Plated Ends	L PD Tolerance Class	X (inch +/- 1/64) (noncumulative)	Standard Y (in)					
1/2"	1/2 L PD	.4995	1/2 L PDCPPE	.4995	4	2	#6-32	+/- 1/32	166	.040	.055
		.4990		.4990							
5/8"	5/8 L PD	.6245	5/8 L PDCPPE	.6245	4	2	#8-32	+/- 1/32	178	.040	.086
		.6240		.6240							
3/4"	3/4 L PD	.7495	3/4 L PDCPPE	.7495	6	3	#10-32	+/- 1/32	178	.060	.125
		.7490		.7490							
1"	1 L PD	.9995 .9990	1 L PDCPPE	.9995 .9990	6	3	1/4-20	+/- 1/32	178	.080	.222
1 1/4"	1 1/4 L PD	1.2495	1 1/4 L PDCPPE	1.2495	6	3	5/16-18	+/- 1/32	178	.080	.348
		1.2490		1.2490							
1 1/2"	1 1/2 L PD	1.4994 1.4989	1 1/2 L PDCPPE	1.4994 1.4989	8	4	3/8-16	+/- 1/32	178	.080	.500
2"	2 L PD	1.9994	2 L PDCPPE	1.9994	8	4	1/2-13	+/- 1/16	178	.100	.890
		1.9987		1.9987							

Holes are drilled and tapped to the center of the shaft. Different 'Y' dimensions are available upon request. Please specify when ordering. Chrome plating is thin, dense chrome with an average thickness of .0005".

Inch - 60 Case Shafting

Solid Steel Deep Case - Available in Random Length Only

Hardness: 60 ROCKWELL C Min.

Straightness: .001" Per Foot Cumulative (.002" TIR)

Surface Finish: 8 Ra Max

Taper: .0001"

Roundness: .000080" Class L and S / .000050" Class N

Nominal Diameter (in)	Class L Deep Case			Class N Deep Case			Min. Hardness SS Depth (in)	Weight Per Inch (lb)
	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)		
3/4"	3/4 L DC	.7495	178/202	3/4 N DC	.7500	178	.120	.125
		.7490			.7498			
7/8"	7/8 L DC	.8745	178	7/8 N DC	.8750	178	.120	.170
		.8740			.8748			
1"	1 L DC	.9995	178/202	1 N DC	1.0000	178	.160	.222
		.9990			.9998			
1 1/8"	1 1/8 L DC	1.1245	178	1 1/8 N DC	1.1250	178	.160	.281
		1.1240			1.1248			
1 1/4"	1 1/4 L DC	1.2495	178/202	1 1/4 N DC	1.2500	178	.180	.348
		1.2490			1.2498			
1 1/2"	1 1/2 L DC	1.4994	178/202	1 1/2 N DC	1.5000	178	.180	.500
		1.4989			1.4997			
1 3/4"	1 3/4 L DC	1.7495	178	1 3/4 N DC	1.7500	178	.250	.681
		1.7490			1.7497			
2"	2 L DC	1.9994	178/202	2 N DC	2.0000	178	.250	.890
		1.9987			1.9997			
2 1/4"	2 1/4 L DC	2.2494	202	2 1/4 N DC	2.2500	178	.250	1.153
		2.2487			2.2497			
2 1/2"	2 1/2 L DC	2.4993	178/202	2 1/2 N DC	2.5000	178	.250	1.391
		2.4985			2.4996			
3"	3 L DC	2.9992	178/202	3 N DC	3.0000	178	.250	2.003
		2.9983			2.9996			
3 1/2"	3 1/2 L DC	3.4990	202	-	-	-	.250	2.726
		3.4980			-			

Standard random length (RL) min usable length is 178", optional extra long random length (RLL) min usable length is 202"

Ball Groove LinearRace Shaft - Solid Carbon Steel

Hardness: 60 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Roundness: .000080"

Straightness: Shaft Groove .002" Per Foot Cumulative (.002" TIR)

Taper: .0001"

Nominal Diameter (in)	Basic Part Number	Class G		Min. Hardness Depth (in)	Weight Per Inch (lb)
		Diameter Tolerance (in)	Max. Length (in)		
1/4"	1/4 G	.2495	45	.027	.014
		.2490			
3/8"	3/8 G	.3745	45	.027	.031
		.3740			
1/2"	1/2 G	.4995	45	.040	.055
		.4990			
5/8"	5/8 G	.6245	45	.040	.086
		.6240			
3/4"	3/4 G	.7495	45	.060	.125
		.7490			
1"	1 G	.9995	45	.080	.222
		.9990			

Inch - 60 Case Shafting

440C Stainless Steel

Hardness: 50 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Roundness: .000080"

Straightness: .001" Per Foot Cumulative (.002" TIR)

Taper: .0001"

Nominal Diameter (in)	Class L			Class S			Min. Hardness SS Depth (in)	Weight Per Inch (lb)
	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)		
3/16"	3/16 L SS	.1870	54					
		.1865						
1/4"	1/4 L SS	.2495	54	1/4 S SS	.2490	54	.027	.014
		.2490			.2485			
3/8"	3/8 L SS	.3745	166	3/8 S SS	.3740	166	.027	.031
		.3740			.3735			
1/2"	1/2 L SS	.4995	166	1/2 S SS	.4990	166	.040	.055
		.4990			.4985			
5/8"	5/8 L SS	.6245	178	5/8 S SS	.6240	178	.040	.086
		.6240			.6235			
3/4"	3/4 L SS	.7495	178	3/4 S SS	.7490	178	.060	.125
		.7490			.7485			
1"	1 L SS	.9995	178	1 S SS	.9990	178	.080	.222
		.9990			.9985			
1 1/4"	1 1/4 L SS	1.2495	178	1 1/4 S SS	1.2490	178	.080	.348
		1.2490			1.2485			
1 1/2"	1 1/2 L SS	1.4994	178	1 1/2 S SS	1.4989	178	.080	.500
		1.4989			1.4984			
2"	2 L SS	1.9994	178	2 S SS	1.9987	178	.100	.890
		1.9987			1.9980			
2 1/2"	2 1/2 L SS	2.4993	178	2 1/2 S SS	2.4985	178	.100	1.391
		2.4985			2.4977			

440C stainless is "corrosion resistant"; it contains some carbon which allows for hardening. Carbon can result in corrosion over time.

Standard Options for 440C Stainless Steel Predrilled (PD)

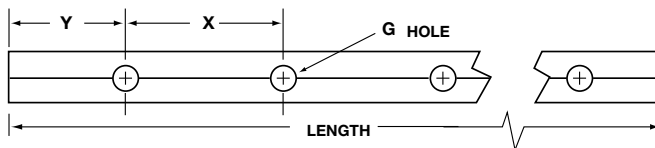
Hardness: 50 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Straightness: .001" Per Foot Cumulative (.002" TIR)

Roundness: .000080"

Taper: .0001"



Nominal Diameter (in)	Predrilled		Hole Spacing		G Standard Thread Size	Length Tolerance (in)	Max. Length (in)	Min. Hardness Depth (in)	Weight Per Inch (lb)
	Part Number Predrilled	L PD Tolerance Class	X (inch +/- 1/64) (noncumulative)	Standard Y (in)					
1/2"	1/2 L PD SS	.4995	4	2	#6-32	+/- 1/32	166	.040	.055
		.4990							
5/8"	5/8 L PD SS	.6245	4	2	#8-32	+/- 1/32	178	.040	.086
		.6240							
3/4"	3/4 L PD SS	.7495	6	3	#10-32	+/- 1/32	178	.060	.125
		.7490							
1"	1 L PD SS	.9995	6	3	1/4-20	+/- 1/32	178	.080	.222
		.9990							
1 1/4"	1 1/4 L PD SS	1.2495	6	3	5/16-18	+/- 1/32	178	.080	.348
		1.2490							
1 1/2"	1 1/2 L PD SS	1.4994	8	4	3/8-16	+/- 1/32	178	.080	.500
		1.4989							
2"	2 L PD SS	1.9994	8	4	1/2-13	+/- 1/16	178	.100	.890
		1.9987							

Holes are drilled and tapped to the center of the shaft. Different 'Y' dimensions are available upon request. Please specify when ordering.

Inch - 60 Case Shafting

Ball Groove LinearRace Shaft - 440C Stainless Steel

Hardness: 50 ROCKWELL C Min.

Roundness: .000080"

Surface Finish: 8 Ra Max

Taper: .0001"

Straightness: Shaft Groove .002" Per Foot Cumulative

Nominal Diameter (in)	Basic Part Number	Class G		Max. Length (in)	Min. Hardness Depth (in)	Weight Per Inch (lb)
		Diameter Tolerance (in)				
1/4"	1/4 G SS	.2495		45	.027	.014
		.2490				
3/8"	3/8 G SS	.3745		45	.027	.031
		.3740				
1/2"	1/2 G SS	.4995		45	.040	.055
		.4990				
5/8"	5/8 G SS	.6245		45	.040	.086
		.6240				
3/4"	3/4 G SS	.7495		45	.060	.125
		.7490				
1"	1 G SS	.9995		45	.080	.222
		.9990				

Instrument 440C Stainless Steel LinearRace shafting for use with Thomson Instrument

Ball bushing bearings

Hardness: 55 ROCKWELL C Min.

Straightness: .001" Per Inch Cumulative

Surface Finish: 4 Ra Max

Taper: .0001"

Roundness: .000080"

Nominal Diameter (in)	Basic Part Number	INST Class		Max. Length (in)	Min. Hardness Depth (in)	Weight Per Inch (lb)
		Diameter Tolerance (in)	Length Tolerance (in)			
1/8"	1/8 INST	.1248	+/- .005	12	.027	.004
		.1247				
3/16"	3/16 INST	.1873	+/- .005	12	.027	.008
		.1872				
1/4"	1/4 INST	.2498	+/- .005	12	.027	.014
		.2497				

52100 Tubular

Hardness: 58 ROCKWELL C Min.

Roundness: .000080" Class L and S

Surface Finish: 8 Ra Max

Taper: .0001"

Straightness: .001" Per Foot Cumulative (.002" TIR)

Nominal Diameter (in)	Nominal I.D. (in)	Class L			Class S			Min. Hardness Depth (in)	Weight Per Inch (lb)
		Basic Part Number	Diameter Tolerance (in)	Max. Length (in)	Basic Part Number	Diameter Tolerance (in)	Max. Length (in)		
3/4"	.438 +/- 5%	3/4 L TU	.7495	142	3/4 S TU	.7490	142	.060	.0754
			.7490			.7485			
1"	.599 +/- 5%	1 L TU	.9995	173	1 S TU	.9990	173	.080	.158
			.9990			.9985			
1 1/2"	.890 +/- 5%	1 1/2 L TU	1.4994	173	1 1/2 S TU	1.4989	173	.080	.328
			1.4989			1.4984			
2"	1.250 +/- 5%	2 L TU	1.9994	173	2 S TU	1.9987	173	.100	.542
			1.9987			1.9980			
2 1/2"	1.750 +/- 5%	2 1/2 L TU	2.4993	173	2 1/2 S TU	2.4985	173	.100	.749
			2.4985			2.4977			
3"	2.000 +/- 10%	3 L TU	2.9992	173	3 S TU	2.9983	173	.100	1.112
			2.9983			2.9974			
4"	3.000 +/- 10%	4 L TU	3.9988	173	4 S TU	3.9976	173	.100	1.558
			3.9976			3.9964			

Inch - 60 Case Shafting

316 Stainless Steel

Hardness: 20-25 ROCKWELL C Min.

Roundness: .00008"

Surface Finish: 8 Ra Max

Straightness: .001" Per Foot Cumulative (.002" TIR)

Taper: .0001"

Nominal Diameter (in)	Basic Part Number	Class L		Weight Per Inch (lb)
		Diameter Tolerance (in)	Max. Length (in)	
1/4"	1/4 L SS316	.2495	94	.014
		.2490		
3/8"	3/8 L SS316	.3745	166	.031
		.3740		
1/2"	1/2 L SS316	.4995	166	.055
		.4990		
5/8"	5/8 L SS316	.6245	178	.086
		.6240		
3/4"	3/4 L SS316	.7495	178	.125
		.7490		
1"	1 L SS316	.9995	178	.222
		.9990		
1 1/4"	1 1/4 L SS316	1.2495	178	.348
		1.2490		
1 1/2"	1 1/2 L SS316	1.4994	178	.500
		1.4989		
2"	2 L SS316	1.9994	178	.890
		1.9987		

316 Stainless Steel is corrosion proof steel and has no carbon content which will result in corrosion.

Standard Options for 316 Stainless Steel Predrilled (PD)

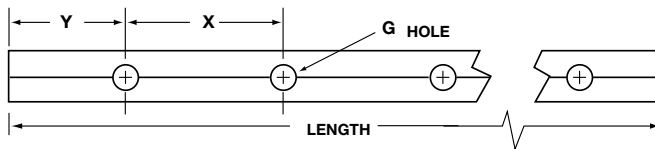
Hardness: 20-25 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Roundness: .000080"

Straightness: .001" Per Foot Cumulative (.002" TIR)

Taper: .0001"



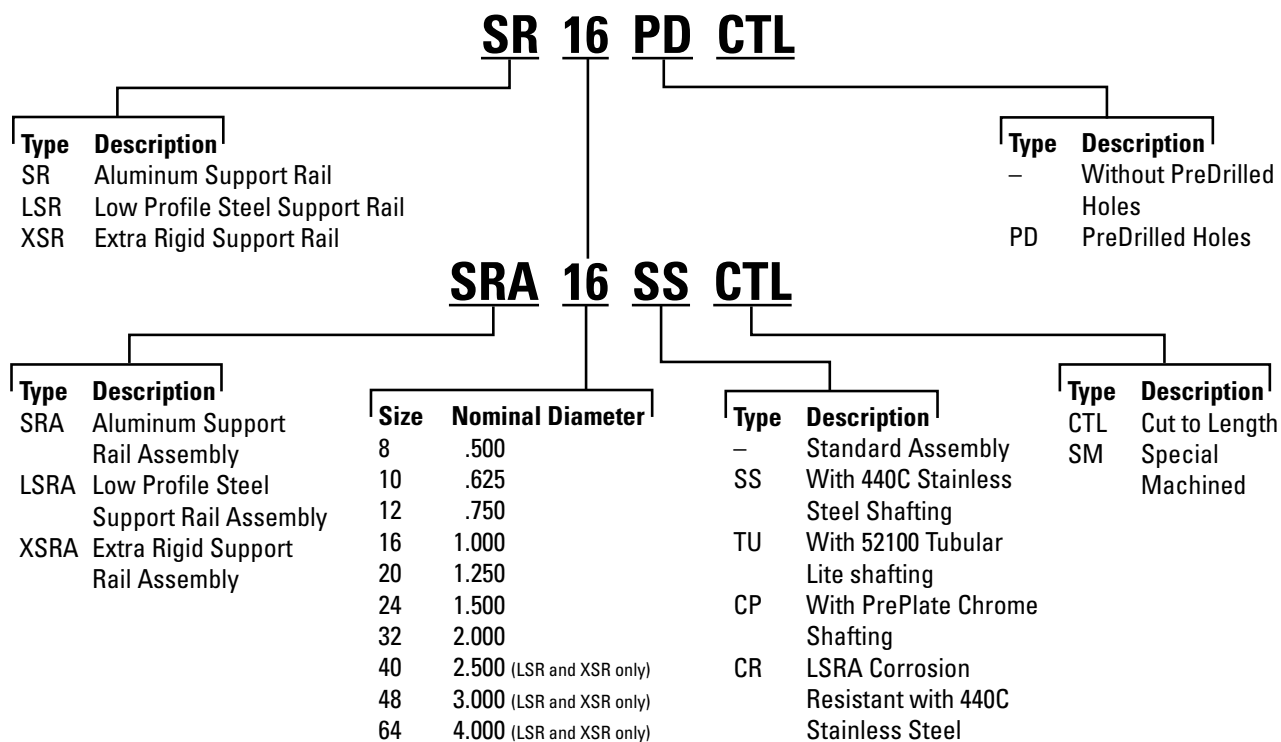
Nominal Diameter (in)	Predrilled		Hole Spacing		G Standard Thread Size	Length Tolerance (in)	Max. Length (in)	Weight Per Inch (lb)
	Part Number Predrilled	L PD Tolerance Class	X (inch +/- 1/64) (noncumulative)	Standard Y (in)				
1/2"	1/2 L SS316PD	.4995	4	2	#6-32	+/- 1/32	166	.055
		.4990						
5/8"	5/8 L SS316PD	.6245	4	2	#8-32	+/- 1/32	178	.086
		.6240						
3/4"	3/4 L SS316PD	.7495	6	3	#10-32	+/- 1/32	178	.125
		.7490						
1"	1 L SS316PD	.9995	6	3	1/4-20	+/- 1/32	178	.222
		.9990						
1 1/4"	1 1/4 SS316PD	1.2495	6	3	5/16-18	+/- 1/32	178	.348
		1.2490						
1 1/2"	1 1/2 SS316PD	1.4994	8	4	3/8-16	+/- 1/32	178	.500
		1.4989						
2"	2 L SS316PD	1.9994	8	4	1/2-13	+/- 1/16	178	.890
		1.9987						

Holes are drilled and tapped to the center of the shaft. Different 'Y' dimensions are available upon request. Please specify when ordering.

Inch - Support Rails and Support Rail Assemblies

Support Rails and Assemblies for Continuously Supported Applications

Part Number Description



Inch 60 Case Shafting

Inch - Support Rails and Support Rail Assemblies

Shaft Rail Supports Type SR & SR-PD

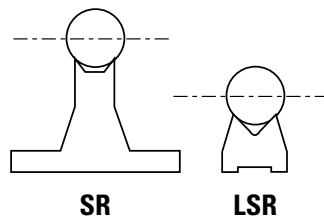
The low cost way of mounting Thomson 60 Case Shafts

Shaft supports simplify mounting of Thomson 60 Case shafts. Users of Thomson 60 Case shafting should carefully consider the use of these low cost shaft supports. They are standard, available from stock, and simplify shaft mounting. In addition to other benefits, they eliminate many problems encountered in designing and manufacturing shaft supporting devices. These versatile mounts can be used horizontally or vertically, and in many different arrangements. Shaft support rails are available without pre-drilled holes (SR) or pre-drilled (SR-PD) shaft rails to support 1/2 inch through 2 inch diameter shafts are available in standard 24, 48 and 72 inch lengths. Where shorter lengths are needed, rails are easily cut to length. For longer shafts they can be mounted end to end, using shims or grout, if necessary, to compensate for slight variation within manufacturing tolerance. Thomson offers shaft support rails with pre-drilled holes to simplify shaft mounting.

Low Shaft Support Rails Type LSR & LSR-PD

For compact designs

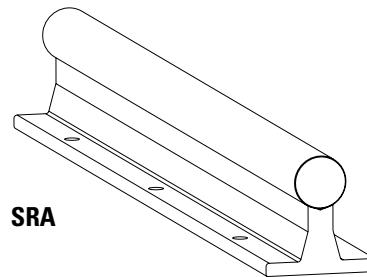
Low Shaft Rails allow the design of more compact linear motion systems. The height from the base to the mean shaft center ranges from 9/16 inch for supporting a 1/2 inch diameter shaft to a maximum 3 1/2 inches when supporting a 4 inch diameter shaft – 40% lower than standard support rails. Low Shaft Rails are made of steel to maintain optimum shaft rigidity. Either continuous or intermittent support is possible when using Thomson open-type linear ball bearings. Low Shaft Rails are furnished in standard 4-foot lengths. Where shorter lengths are required, rails can easily be cut. For supporting longer shafts, rails can be mounted end-to-end without limit. Low Shaft Rails are available without pre-drilled mounting holes (LSR) or with pre-drilled mounting holes (LSR-PD) to match Thomson drilled and tapped shafts (PD). When using LSR-PD, the attachment bolts are underneath, so you must have access under your machine base plate. The LSRA assemblies highlighted below utilize attachment bolts from above. If one of the standard pre-drilled Low Shaft Rails is not appropriate for your design needs, Low Shaft Rails can be custom drilled by Thomson to your specifications. Send a print with all required dimensions, tolerances, and quantities needed to our application engineering team.



Extra-Rigid Shaft Support Rails

For XR Ball Bushing bearing systems

Extra-rigid shaft support rails (XSR) are designed specifically for use with our extra-rigid Series XR Ball Bushing bearings. XSR support rails are available in nominal 24 inch lengths and are made of ductile iron and powder epoxy coated to provide the most deflection-resistant shaft support of all Thomson supports. To facilitate quick and easy installation, each extra-rigid shaft support is drilled and counter-bored for securing a drilled and tapped shaft into it and for bolting it to a flat, rigid base. For supporting long shafts, XSR support rails can be mounted end-to-end.



SRA

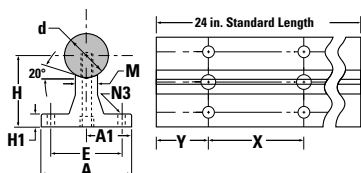
Pre-Assembled Shaft Rail Assemblies Type SRA & LSRA

Thomson 60 Case steel shafts mounted on shaft support rails are now available for instant bolt-down installation. Assemblies are supplied cut to any length, with no limit on the overall length (long lengths are butt jointed together unless specified otherwise). Either solid or light-weight tubular shafting can be assembled to the standard Thomson support rails, which come with base mounting holes spaced evenly along the overall length of the assembly. The LSRA uses a special shaft unlike the LSR-PD. The attachment bolts for the LSRA are from the top down so you can easily mount into a machine base plate. The LSRA bolt pattern closely matches Profile Rail Linear Guides and can easily be used as a drop-in substitute to replace linear guides (ensure you review loading requirements). Corrosion resistant lower support rail assemblies (LSRA) are available. The support is zinc plated and shaft is 440C.

Inch - Support Rails and Support Rail Assemblies

Support Rails and Assemblies for Continuously Supported Applications

Type SR/SR-PD 60 Case LinearRace Support Rails and Assemblies (Dimensions in inches)

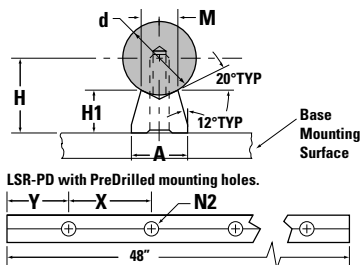


Material: Aluminum Alloy
(Longer Lengths are Available)

SR Without Holes	SR-PD With PreDrilled Holes	Nominal LinearRace Diameter d	H ±.002	H1	A	A1	E	M	N3		LinearRace Mounting Bolt N1 (PD only)	X	Y	Weight lb/ft
									Hole	Bolt				
SR8	SR8-PD	.500	1.125	.19	1.50	.750	1.00	.25	.17	#6	#6-32 x .88	4	2	.60
SR10	SR10-PD	.625	1.125	.25	1.63	.813	1.13	.31	.19	#8	#8-32 x .88	4	2	.80
SR12	SR12-PD	.750	1.500	.25	1.75	.875	1.25	.38	.22	#10	#10-32 x 1.25	6	3	1.00
SR16	SR16-PD	1.000	1.750	.25	2.13	1.063	1.50	.50	.28	1/4	1/4-20 x 1.5	6	3	1.40
SR20	SR20-PD	1.250	2.125	.31	2.50	1.250	1.88	.56	.34	5/16	5/16-18 x 1.75	6	3	2.10
SR24	SR24-PD	1.500	2.500	.38	3.00	1.500	2.25	.69	.34	5/16	3/8-16 x 1.75	8	4	2.60
SR32	SR32-PD	2.000	3.250	.50	3.75	2.750	2.75	.88	.406	3/8	1/2-13 x 2.50	8	4	4.20

N1 Hole Dia. includes counterbore for socket head cap screw. Alignment and location of holes are ± .010, noncumulative.

Type LSR and LSR-PD 60 Case LinearRace Support Rails (Dimensions in inches)



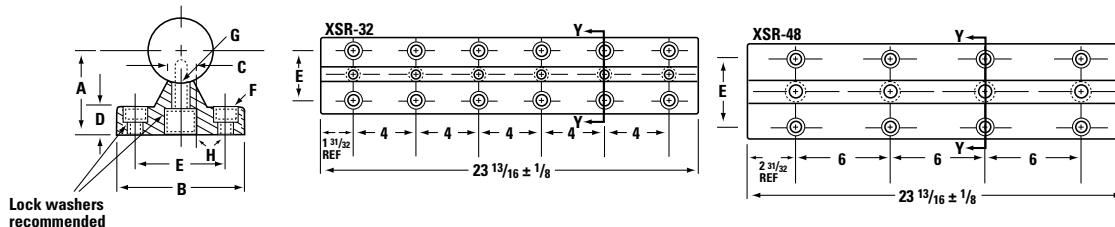
Material: Steel Alloy
(Longer Lengths are Available)

LSR Standard Without Holes	LSR-PD Standard w/PreDrilled Holes	Nominal LinearRace Diameter d	H ±.002	H1	A	M	N2		N1	X	Y	Weight lb/ft
							Hole	Bolt				
LSR-8	LSR-8-PD	.500	.562	.34	.37	.25	.17	#6-32	4	2	.32	
LSR-10	LSR-10-PD	.625	.687	.41	.45	.31	.19	#8-32	4	2	.49	
LSR-12	LSR-12-PD	.750	.750	.42	.51	.38	.22	#10-32	6	3	.59	
LSR-16	LSR-16-PD	1.000	1.000	.56	.69	.50	.28	1/4-20	6	3	1.01	
LSR-20	LSR-20-PD	1.250	1.187	.63	.78	.56	.34	5/16-18	6	3	1.27	
LSR-24	LSR-24-PD	1.500	1.375	.70	.93	.69	.41	3/8-16	8	4	1.68	
LSR-32	LSR-32-PD	2.000	1.750	.845	1.180	.875	.531	1/2-13	8	4	2.59	
LSR-40	LSR-40-PD	2.500	2.250	1.125	1.500	1.125	.687	5/8-11	8	4	4.48	
LSR-48	LSR-48-PD	3.000	2.750	1.404	1.875	1.375	.812	3/4-10	8	4	6.68	
LSR-64	LSR-64-PD	4.000	3.500	1.750	2.500	1.875	1.060	1-8	8	4	11.8	

Type XSR Shaft Support Rails (Dimensions in inches)

Part Number	Nominal Shaft Diameter	A† ±.000/- .001	B	C	D	E	Screw Diameter	F Hole	C Bore	Recommended Screw	G Hole	C Bore	H Degrees	Weight lb/ft
XSR-32	2	2.750	4-1/2	7/8	1	3-1/8	1/2	9/16	1 x 5/8 DP	1/2-13 x 2	9/16	1 x 3/4 DP	15	16
XSR-48	3	4.000	6	1-1/4	1-5/16	4-1/4	5/8	11/16	1 1/4 x 3/4 DP	3/4-10 x 2-3/4	13/16	1 7/16 x 1 1/8 DP	25	31

† Centerline of shaft will be parallel to base within .0005.
Surface dimensions as cast



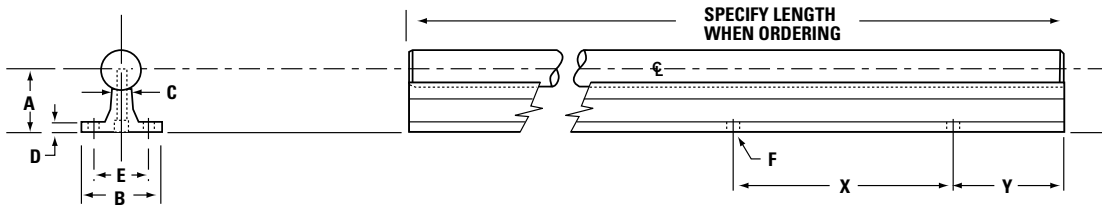
Lock washers recommended

Inch - Support Rails and Support Rail Assemblies

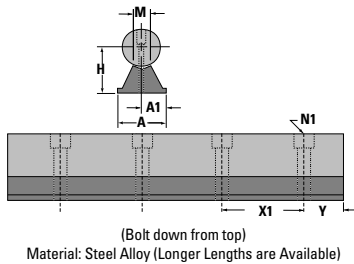
Standard Shaft Rail Assemblies (Dimensions in inches)

Assembly Number			Nominal Linear Bearing Race Dia.	Dimensions							Base Holes		Weight lb/ft	
With Solid Carbon Steel Shaft	With Solid Stainless Steel Shaft	With Tubular 52100		A ±.002	B	C	D	E	F		X	Y	SRA and SRA-SS	SRA-TU
									Bolt	Hole				
SRA-8	SRA-8-SS	—	1/2	1.125	1 1/2	1/4	3/16	1	#6	.169	4	2	1.26	—
SRA-10	SRA-10-SS	—	5/8	1.125	1 5/8	5/16	1/4	1 1/8	#8	.193	4	2	1.83	—
SRA-12	SRA-12-SS	SRA-12-TU	3/4	1.500	1 3/4	3/8	1/4	1 1/4	#10	.221	6	3	2.50	1.90
SRA-16	SRA-16-SS	SRA-16-TU	1	1.750	2 1/8	1/2	1/4	1 1/2	1/4	.281	6	3	4.06	3.30
SRA-20	SRA-20-SS	—	1 1/4	2.125	2 1/2	9/16	5/16	1 7/8	5/16	.343	6	3	6.28	—
SRA-24	SRA-24-SS	SRA-24-TU	1 1/2	2.500	3	11/16	3/8	2 1/4	5/16	.343	8	4	8.60	6.54
SRA-32	SRA-32-SS	SRA-32-TU	2	3.250	3 3/4	7/8	1/2	2 3/4	3/8	.406	8	4	14.88	10.70

Support Rail Material: Aluminum alloy extrusion. Base mounting hole locations are within ±.010 (noncumulative).
Notes: Lengths longer than 48" will use end to end support rails.



Type LSRA 60 Case Smart Rail Guides (Dimensions in inches)



Part Number (3)		LinearRace Shafting Diameter	H ±.002	A	A1	M	Mounting Holes		Weight lb/ft
Smart Rail Assembly (1)	Smart Rail Assembly (2)						X1	N1	
LSRA10	LSRA10 CR	.625	.687	.45	.225	.31	2	#5	1.57
LSRA12	LSRA12 CR	.750	.750	.51	.255	.38	3	#6	2.09
LSRA16	LSRA16 CR	1.000	1.000	.69	.345	.5	3	#10	3.67
LSRA20	LSRA20 CR	1.250	1.187	.78	.390	.56	3	5/16	5.86
LSRA24	LSRA24 CR	1.500	1.375	.93	.465	.69	4	3/8	7.68

(1) Consists of black oxide steel rail and high carbon steel LinearRace shafting (HRC 60 min.).

(2) Consists of zinc plated steel rail and 440C stainless steel LinearRace shafting (HRC 50 min.).

(3) Specify length of assembly when ordering. For example, LSRA12CR x 24.00 inches.

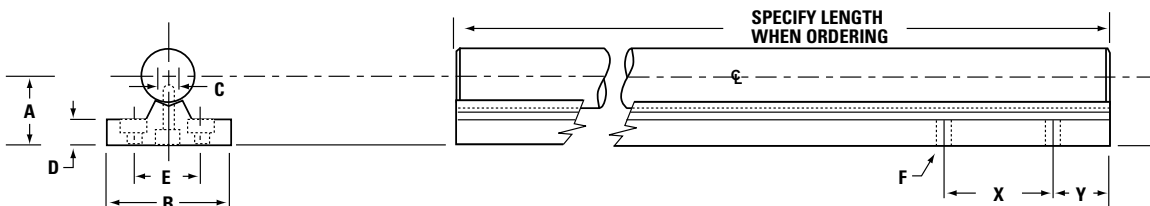
Y dimension is equal on each end unless specified by customer.

NOTE: LSRAAs do not use standard "PD" shafting. The shafting requires a different hole pattern and configuration.

XSRA Extra Rigid Shaft Rail Assemblies (Dimensions in inches)

Assembly Number		LinearRace Shafting Diameter	Dimensions							Base Holes		Weight lb/ft		
With Solid Carbon Steel Shaft	With Tubular Carbon Steel Shaft		A +.000/- .001	B	C	D	E	F			X	Y	XSRA	XSRA-TU
								Screw Dia.	Hole	C Bore				
XSRA-32	XSRA-32-TU	2	2.750	4 1/2	7/8	1	3 1/8	1/2	9/16	1 x 5/8 DP	4	1 31/32	40.04	22.50
XSRA-48	XSRA-48-TU	3	4.000	6	1 1/4	1 5/16	4 1/4	5/8	11/16	1 1/4 x 3/4 DP	6	2 31/32	73.72	49.70

Note: Lengths longer than 24" will use end to end support rails.



Inch - Support Blocks

Support Blocks for End Supported Applications

Part Number Description

ASB 16

Type	Description	Size	Nominal Diameter
ASB	Low Profile 60 Case LinearRace End Support Block	4	.250
SB	Standard 60 Case LinearRace End Support Block	6	.375
FSB	Flanged 60 Case LinearRace End Support Block	8	.500
WM	Waymount Support	10	.625
		12	.750
		16	1.000
		20	1.250
		24	1.500
		32	2.000
		48	3.000
		64	4.000

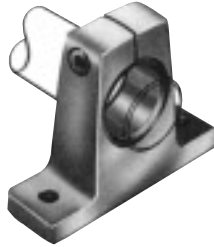
All sizes are not available for all support block types.
See specific product charts for size availability.

Inch - Support Blocks

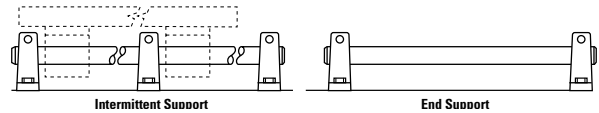
Shaft Support Blocks – Type ASB and SB

For end support or intermittent support

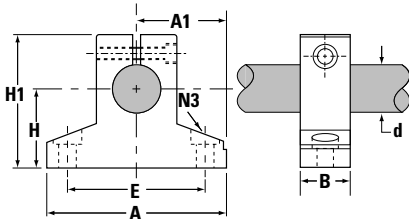
Shaft support blocks are used for end or intermittent support where loads are light and deflection between supports is not a problem. Unlike shaft support rails, blocks do not permit longitudinal passage of open-type Ball Bushing bearings. Type SB shaft support blocks enable clamping of shafts and eliminate the need for bolts, etc. to maintain shaft position. Shimming is suggested for high precision applications to eliminate the effect of variations in surface of base or manufacturing tolerances between supports.



Type ASB shaft blocks, manufactured from high strength extruded aluminum, provide either end or intermittent support in applications where loads are designed with a reference edge on one side of the base. This provides a surface parallel to the center of the shaft within $\pm.001$ " that can be used to simplify shaft alignment.



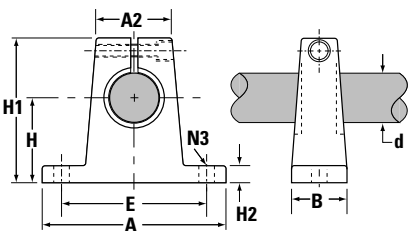
Type ASB 60 Case LinearRace Shaft End Support Blocks (Dimensions in inches)



Material: Aluminum Alloy

Part ⁽²⁾ Number	Nominal LinearRace Diameter d	H $\pm.001$	H1	A	A1 $\pm.001$	B	E	N3		Weight lb
								Hole	Bolt	
ASB-4	.250	.500	.89	1.50	.750	.50	1.12	.16	#6	.06
ASB-6	.375	.562	1.00	1.62	.813	.56	1.25	.16	#6	.08
ASB-8	.500	.875	1.48	2.00	1.000	.63	1.50	.19	#8	.11
ASB-12	.750	1.125	1.95	2.50	1.250	.75	2.00	.22	#10	.22
ASB-16	1.000	1.375	2.48	3.25	1.625	1.00	2.50	.28	1/4	.44
ASB-24	1.500	2.000	3.50	4.75	2.375	1.25	3.50	.34	5/16	1.16

Type SB 60 Case LinearRace Shaft End Support Blocks (Dimensions in inches)



Material: Malleable Iron for sizes .5 to 2 in.
Aluminum Alloy for sizes .25 and .375 in.

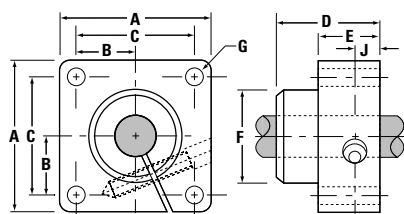
Part ⁽²⁾ Number	Nominal LinearRace Diameter d	H $\pm.002$	H1	H2	A	A2	B	E $\pm.010$	N3		Weight lb
									Hole	Bolt	
SB-4	.250	.687	1.06	.25	1.50	.63	.50	1.125	.16	#6	.03
SB-6	.375	.750	1.19	.25	1.63	.69	.56	1.250	.16	#6	.05
SB-8	.500	1.000	1.63	.25	2.00	.75	.63	1.500	.19	#8	.30
SB-10	.625	1.000	1.75	.31	2.50	.88	.69	1.875	.22	#10	.40
SB-12	.750	1.250	2.13	.31	2.75	1.00	.75	2.000	.22	#10	.50
SB-16	1.000	1.500	2.56	.38	3.25	1.38	1.00	2.500	.28	.25	1.0
SB-20	1.250	1.750	3.00	.44	4.00	1.75	1.13	3.000	.34	.31	2.0
SB-24	1.500	2.000	3.50	.50	4.75	2.00	1.25	3.500	.34	.31	2.6
SB-32	2.000	2.500	4.50	.63	6.00	2.63	1.50	4.500	.41	3/8	4.8

Inch - Shaft Support Blocks

Shaft Support Blocks – Type FSB

Thomson Flanged Support Blocks offer perpendicular mounting without the need for special adaptor brackets.

Type FSB Flanged 60 Case LinearRace Shaft End Support Blocks (Dimensions in inches)



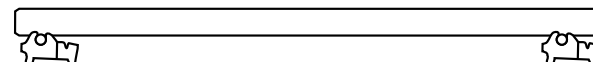
Material: Aluminum Alloy

Part Number	Nominal LinearRace Diameter d	A ±.001	B	C ±.010	D	E	F	G		J	Weight lb
								Hole	Bolt		
FSB-8	.500	1.63	.63	1.250	.88	.50	1.00	.81	#8	.25	.3
FSB-12	.750	2.38	.88	1.750	1.00	.63	1.25	.21	#10	.31	.6
FSB-16	1.000	2.75	1.06	2.125	1.25	.63	1.50	.27	1/4	.31	.8
FSB-20	1.250	3.13	1.19	2.375	1.38	.75	1.75	.27	1/4	.38	.9

Waymount Support For adjustable support



Designed for use with Roundway bearings. Two or more can be used to provide intermittent support and adjustment along the length of the shaft. Unlike shaft support rails, Waymount supports do not permit longitudinal passage of open-type Ball Bushing bearings. When it is necessary to travel over Waymount supports, Roundway bearings should be used. Open-type Ball Bushing bearings can be used only if side loads are light and an adaptor block is used (consult factory for recommendation).



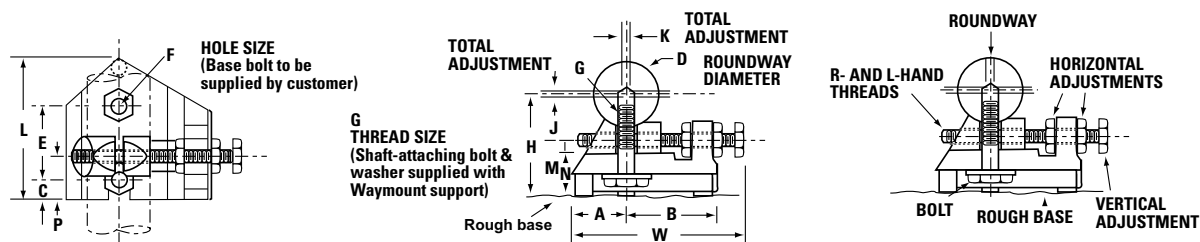
End Support

Waymount Supports (Dimensions in inches)

Waymount Part Number	D RoundWay Diameter	L	H†	W	A	B	C	E	F	G	J	K	M	N	P	Weight (lbs)
WM-8	1/2	1 1/2	1 1/16	1 3/4	1/2	7/8	1/4	3/4	7/32	8-32	3/64	3/32	11/16	1/2	7/16	.2
WM-16	1	2	1 1/2	2 1/2	3/4	1 1/4	5/16	1 1/16	9/32	1/4-28	1/16	1/8	13/16	11/16	11/16	.5
WM-24	1 1/2	2 1/2	2	3 1/2	1 3/16	1 5/8	7/16	1 3/16	11/32	5/16-24	1/8	1/8	1	3/4	3/4	1.1
WM-32	2	3	2 1/2	4	1 7/16	1 7/8	1/2	1 3/8	13/32	3/8-24	1/8	1/8	1 1/4	15/16	1	1.8
WM-48	3	5	4 5/16	6 3/4	2 3/8	3 3/8	3/4	2 5/8	21/32	5/8-18	1/8	1/8	2 1/4	1 5/8	1 1/2	10.2
WM-64	4	6 1/2	5 7/16	8 1/2	3	4 1/4	1	3 1/8	25/32	3/4-16	1/8	1/8	2 3/4	2	2	21.2

In-Between Shaft Sizes: Waymount supports will accommodate all shaft sizes from approximately 3/8" to 6" diameter. Use the Waymount support size nearest to your particular shaft diameter. Favor the next largest Waymount support if the shaft size falls midway between two of them. The mean centering height "H" will vary somewhat with different diameter shafts.

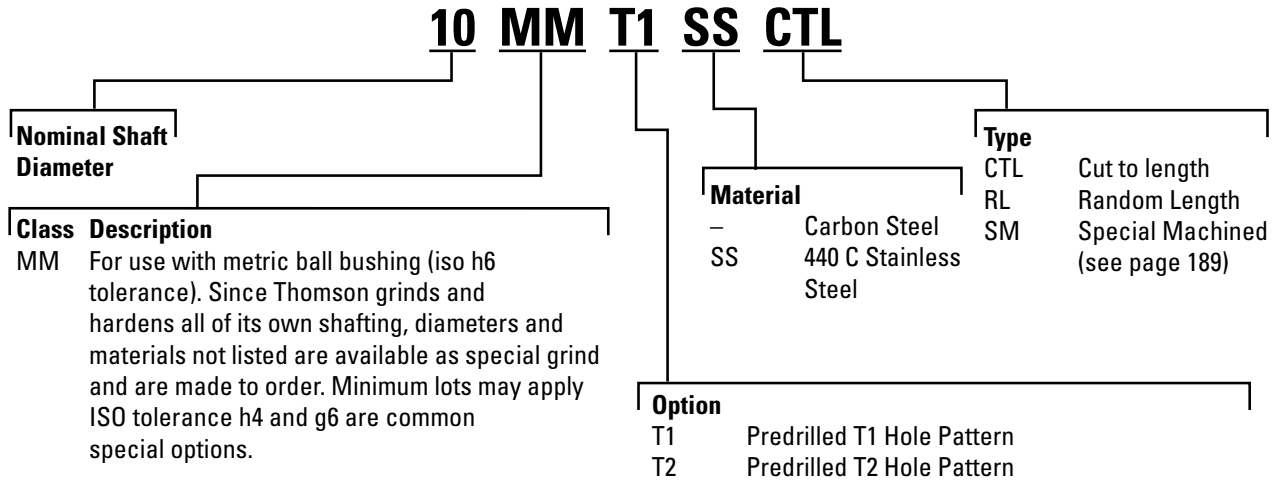
† Please note difference in dimension between shaft centerline of rails, blocks and Waymount supports. Shimming or blocking is suggested when these are used on a single shaft.



Metric - 60 Case Shafting

Hardened and Ground 60 Case Precision LinearRace Shafting

Part Number Description



CTL = Cut to length is Thomson 60 Case cut to your specified length.

RL = Random length is full bar or long length shafting. It is called random length because we start with a raw bar 4" to 6" longer than the minimum usable but guarantee only the minimum visible. We mark the ends of what is out of our own tolerance. This is the result of the manufacturing process and tightly controlled roundness specifications.

Solid Carbon Steel

Hardness: 60 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Straightness: .0254mm (.001") Per Foot Cumulative
(.051mm (.002") TIR)

Roundness: .0020mm (.000080") Class MM

Taper: .0025mm (.001")

Nominal Diameter (mm)	Basic Part Number	Diameter Tolerance		Min. Usable Length		Min. Hardness Depth		Weight per m (kg)	Weight per inch (lb)
		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
5	5 MM	5.00	.1969	1905	75	0.69	0.027	0.16	0.009
		4.99	.1965						
8	8 MM	8.00	.3150	4216	166	0.69	0.027	0.39	0.022
		7.99	.3146						
10	10 MM	10.00	.3937	4216	166	0.69	0.027	0.63	0.035
		9.99	.3932						
12	12 MM	12.00	.4724	4216	166	1.02	0.04	0.89	0.050
		11.99	.4720						
15	15 MM	15.00	.5906	4521	178	1.02	0.04	1.38	0.077
		14.99	.5902						
16	16 MM	16.00	.6299	4521	178	1.02	0.04	1.57	0.088
		15.99	.6295						
20	20 MM	20.00	.7874	4521	178	1.52	0.06	2.47	0.138
		19.99	.7869						
25	25 MM	25.00	.9843	4521	178	2.03	0.08	3.87	0.216
		24.99	.9838						
30	30 MM	30.00	1.1811	4521	178	2.03	0.08	5.57	0.311
		29.99	1.1806						
40	40 MM	40.00	1.5748	4521	178	2.03	0.08	9.90	0.553
		39.99	1.5743						
50	50 MM	50.00	1.9685	4521	178	2.54	0.1	15.46	0.864
		49.98	1.9679						
60	60 MM	60.00	2.3622	4521	178	2.54	0.1	22.19	1.240
		59.98	2.3615						
80	80 MM	80.00	3.1496	5130	202	2.54	0.1	39.55	2.210
		79.97	3.1486						

Standard random length (RL) minimum usable length is 4521mm (178").

Metric - 60 Case Shafting

Standard Options for Carbon Steel Shafting Predrilled (T1 and T2)

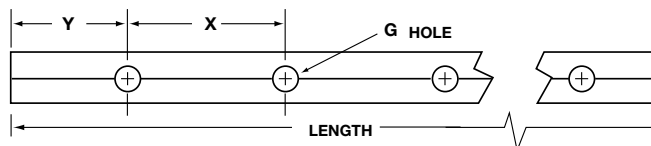
Hardness: 60 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Roundness: .0020mm (.000080") Class MM

Straightness: .0254mm (.001") Per Foot Cumulative
(.051mm (.002") TIR)

Taper: .0025mm (.001")



T1 Predrilled

Nominal Diameter (mm)	Basic Part Number	MMT1 Diameter Tolerance		X		Standard Y		G Standard Size	Min. Usable Length		Min. Hardness Depth		Weight Per m (kg)	Weight Per in (lb)
		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		(mm)	(in)	(mm)	(in)		
12	12 MM T1	12.00	0.4724	75	2.953	37.5	1.476	M4	4216	166	1.02	0.04	0.89	0.050
		11.99	0.4720											
16	16 MM T1	16.00	0.6299	100	3.937	50	1.968	M5	4521	178	1.02	0.04	1.57	0.088
		15.99	0.6295											
20	20 MM T1	20.00	0.7874	100	3.937	50	1.968	M6	4521	178	1.52	0.06	2.47	0.138
		19.99	0.7869											
25	25 MM T1	25.00	0.9843	120	4.724	60	2.362	M8	4521	178	2.03	0.08	3.87	0.216
		24.99	0.9838											
30	30 MM T1	30.00	1.1811	150	5.906	75	2.953	M10	4521	178	2.03	0.08	5.57	0.311
		29.99	1.1806											
40	40 MM T1	40.00	1.5748	200	7.874	100	3.937	M10	4521	178	2.03	0.08	9.90	0.553
		39.99	1.5743											

T2 Predrilled

Nominal Diameter (mm)	Basic Part Number	MMT1 Diameter Tolerance		X		Standard Y		G Standard Size	Min. Usable Length		Min. Hardness Depth		Weight Per m (kg)	Weight Per in (lb)
		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		(mm)	(in)	(mm)	(in)		
12	12 MM T2	12.00	0.4724	120	4.724	60.0	2.362	M4	4216	166	1.02	0.04	0.89	0.050
		11.99	0.4720											
16	16 MM T2	16.00	0.6299	150	5.906	75	2.953	M5	4521	178	1.02	0.04	1.57	0.088
		15.99	0.6295											
20	20 MM T2	20.00	0.7874	150	5.906	75	2.953	M6	4521	178	1.52	0.06	2.47	0.138
		19.99	0.7869											
25	25 MM T2	25.00	0.9843	200	7.874	100	3.937	M8	4521	178	2.03	0.08	3.87	0.216
		24.99	0.9838											
30	30 MM T2	30.00	1.1811	200	7.874	100	3.937	M10	4521	178	2.03	0.08	5.57	0.311
		29.99	1.1806											
40	40 MM T2	40.00	1.5748	300	11.811	150	5.906	M10	4521	178	2.03	0.08	9.90	0.553
		39.99	1.5743											

Metric - 60 Case Shafting

440 C Stainless Steel

Hardness: 50 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Straightness: .0254mm (.001") Per Foot Cumulative
(.051mm (.002") TIR)

Roundness: .0020mm (.000080") Class MM

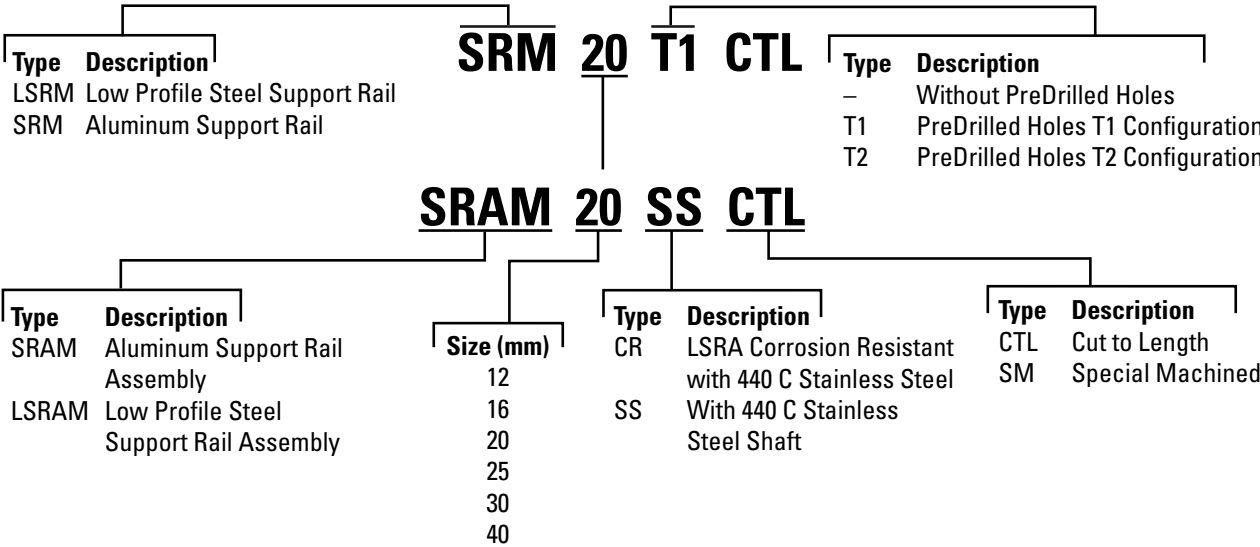
Taper: .0025mm (.001")

Nominal Dia. (mm)	Basic Part Number	Diameter Tolerance		Min. Usable Length		Min. Hardness Depth		Weight Per m (kg)	Weight Per in (lb)
		(mm)	(inch)	(mm)	(in)	(mm)	(in)		
5	5 MM SS	5.00	0.1969	1905	75	0.69	0.027	0.16	0.009
		4.49	0.1965						
8	8 MM SS	8.00	0.3150	4216	166	0.69	0.027	0.39	0.022
		7.99	0.3146						
10	10 MM SS	10.00	.03937	4216	166	0.69	0.027	0.63	0.035
		9.99	0.3932						
12	12 MM SS	12.00	0.4724	4216	166	1.02	0.04	0.89	0.050
		11.99	0.4720						
16	16 MM SS	16.00	0.6299	4521	178	1.02	0.04	1.57	0.088
		15.99	0.6295						
20	20 MM SS	20.00	0.7874	4521	178	1.52	0.06	2.47	0.138
		19.99	0.7869						
25	25 MM SS	25.00	0.9843	4521	178	2.03	0.08	3.87	0.216
		24.99	0.9838						
30	30 MM SS	30.00	1.1811	4521	178	2.03	0.08	5.57	0.311
		29.99	1.1806						
40	40 MM SS	40.00	1.5748	4521	178	2.03	0.08	9.90	0.553
		39.99	1.5743						
50	50 MM SS	50.00	1.9685	4521	178	2.54	0.1	15.46	0.864
		49.98	1.9679						
60	60 MM SS	60.00	2.3622	4521	178	2.54	0.1	22.19	1.240
		59.98	2.3615						

Metric - Support Rails and Support Rail Assemblies

Support Rails and Assemblies for Continuously Supported Applications

Part Number Description



Shaft Rail Supports Type SRM, SRM-T1 & SRM-T2

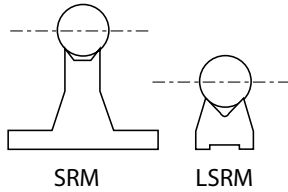
The low cost way of mounting Thomson 60 Case shafts

Shaft supports simplify mounting of Thomson 60 Case shafts. Users of Thomson 60 Case shafting should carefully consider the use of these low cost shaft supports. They are standard, available from stock, and simplify shaft mounting. In addition to many other benefits, they eliminate many problems encountered in designing and manufacturing shaft supporting devices. These versatile mounts can be used horizontally or vertically, and in many different arrangements. Shaft support rails are available without pre-drilled holes(SR) or pre-drilled (SR-PD) shaft rails to support 12mm to 40mm diameter shafts are available in standard 600mm where shorter lengths are needed, rails are easily cut to length. For longer shafts they can be mounted end to end, using shims or grout, if necessary, to compensate for slight variation within manufacturing tolerance. Thomson offers shaft support rails with pre-drilled holes to simplify shaft mounting.

Metric - Support Rails and Support Rail Assemblies

Low Shaft Support Rails Type LSR, LSR-T2

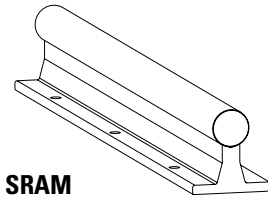
For compact designs



Low Shaft Rails allow the design of more compact linear motion systems. The height from the base to the mean shaft center ranges from 14mm for supporting a 12mm diameter shaft to a maximum 39mm when supporting a 40mm diameter shaft – 40% lower than standard support rails. Low Shaft Rails are made of steel to maintain optimum shaft rigidity. Either continuous or intermittent support is possible when using Thomson open-type linear ball bearings. Low Shaft Rails are furnished in standard 1200mm lengths. Where shorter lengths are required, rails can easily be cut. For supporting longer shafts, rails can be mounted end-to-end without limit. Low Shaft Rails are available without pre-drilled mounting holes (LSRM) or with pre-drilled mounting holes (LSRM-T2) to match Thomson drilled and tapped shafts (T2).

Note: When using LSRM-T2, the attachment bolts are from underneath, so you must have access under your machine base plate. The LSRM assemblies highlighted below utilize attachment bolts from above. If one of the standard pre-drilled Low Shaft Rails is not appropriate for your design needs, Low Shaft Rails can be custom drilled by Thomson to your specifications. Send a print with all required dimensions, tolerances, and quantities needed to our application engineering team.

Pre-Assembled Shaft Rail Assemblies Type SRAM & LSRAM



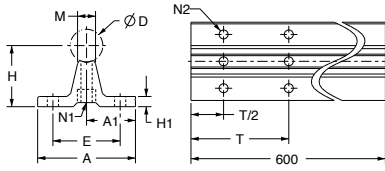
SRAM

Thomson 60 Case steel shafts mounted on shaft support rails are now available for instant bolt-down installation. Assemblies are supplied cut to any length, with no limit on the overall length (long lengths are butt jointed together unless specified otherwise). Either solid or light-weight tubular shafting can be assembled to the standard Thomson support rails, which come with base mounting holes spaced evenly along the overall length of the assembly. The LSRAM uses a special shaft unlike the LSRM-T2. The attachment bolts for the LSRA are from the top down so you can easily mount into a machine base plate. The LSRAM bolt pattern closely matches Profile Rail Linear Guides and can easily be used as a drop-in substitute to replace linear guides (ensure you review loading requirements).

Metric - 60 Case LinearRace Support Rails

60 Case LinearRace Support Rails for Continuously Supported Applications

Type SRM/SRM-PD LinearRace Support Rails and Assemblies (Dimensions in mm)

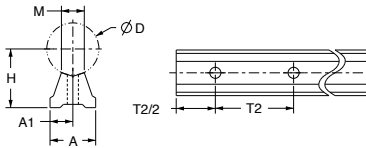


Material: Aluminum Alloy
(Longer Lengths are Available)

Without Holes	With T1 Hole Spacing	With T2 Hole Spacing	D h6	H ±.02	H1	A	A1 ±.02	M	E ±.015	Bolt Hole				Shaft ⁽¹⁾ Rail Mass (kg)
										Spacing		Sizes		
										T1	T2	N1	N2	
SRM12	SRM12 T1	SRM12 T2	12	28	5	43	21.5	9	29	75	120	M4	4.5	1.9
SRM16	SRM16 T1	SRM16 T2	16	30	5	48	24.0	10	33	100	150	M5	5.5	2.8
SRM20	SRM20 T1	SRM20 T2	20	38	6	56	28.0	11	37	100	150	M6	6.6	4.2
SRM25	SRM25 T1	SRM25 T2	25	42	6	60	30.0	14	42	120	200	M8	6.6	5.9
SRM30	SRM30 T1	SRM30 T2	30	53	8	74	37.0	14	51	150	200	M10	8.6	8.7
SRM40	SRM40 T1	SRM40 T2	40	60	8	78	39.0	18	55	200	300	M10	8.6	13.6

N1 Hole Dia. includes counterbore for socket head cap screw. Mounting hole patterns for various sizes. Alignment and location of holes are ±.010, noncumulative.
(1) Standard Length 600mm.

Type LSRM/LSRM-T2 LinearRace Support Rails and Assemblies (Dimensions in mm)



Material: Steel

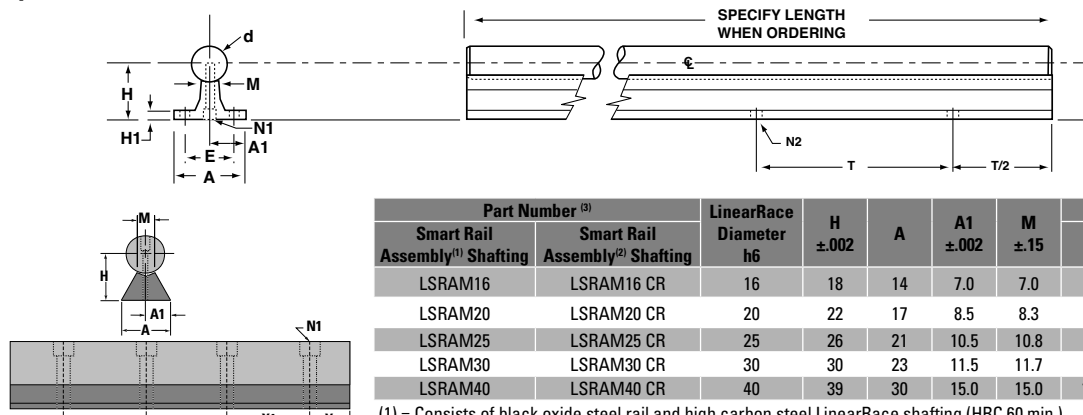
Without Holes	With T2 Hole Spacing	D h6	H ±.02	A	A1 ±.02	M ±.15	Bolt Hole		Shaft ⁽²⁾ Rail Mass (kg)
							Spacing		
							T2	N	
LSRM12	LSRM12 T2	12	14	12	6.0	6.0	120	M4	1.5
LSRM16	LSRM16 T2	16	18	14	7.0	7.0	150	M5	2.4
LSRM20	LSRM20 T2	20	22	17	8.5	8.3	150	M6	3.7
LSRM25	LSRM25 T2	25	26	21	10.5	10.8	200	M8	5.6
LSRM30	LSRM30 T2	30	30	23	11.5	11.0	200	M10	9.0
LSRM40	LSRM40 T2	40	39	30	15.0	15.0	300	M12	13.3

(2) Standard Length 1200mm

Type SRAMT1 or SRAMT2 LinearRace Shafting Support Rail Assemblies (Dimensions in mm)

Part Number		d	H ±.02	H1	A	A1 ±.02	M	E ±.015	N1	N2	T1	T2	Mass (kg/m)
SRAM T1 Assembly with LinearRace shafting	SRAM T2 Assembly with LinearRace shafting												
SRAM12 T1	SRAM12 T2	12	28	5	43	21.5	9	29	M4	4.5	75	120	4.06
SRAM16 T1	SRAM16 T2	16	30	5	48	24	10	33	M5	5.5	100	150	6.24
SRAM20 T1	SRAM20 T2	20	38	6	56	28	11	37	M6	6.6	100	150	10.44
SRAM25 T1	SRAM25 T2	25	42	6	60	30	14	42	M8	6.6	120	200	13.69
SRAM30 T1	SRAM30 T2	30	53	8	74	37	14	51	M10	8.6	150	200	20.02
SRAM40 T1	SRAM40 T2	40	60	8	78	39	18	55	M10	8.6	200	300	32.54

Type LSRAM Smart Rail Assemblies (Dimensions in mm)



Material: Steel Alloy (Longer Lengths are Available)

Part Number ⁽³⁾		LinearRace Diameter h6	H ±.002	A	A1 ±.002	M ±.15	Bolt Hole		Mass (kg)
Smart Rail Assembly ⁽¹⁾ Shafting	Smart Rail Assembly ⁽²⁾ Shafting						T4	N1	
LSRAM16	LSRAM16 CR	16	18	14	7.0	7.0	40	M3	3.6
LSRAM20	LSRAM20 CR	20	22	17	8.5	8.3	60	M4	5.5
LSRAM25	LSRAM25 CR	25	26	21	10.5	10.8	80	M5	8.5
LSRAM30	LSRAM30 CR	30	30	23	11.5	11.7	60	M6	13.0
LSRAM40	LSRAM40 CR	40	39	30	15.0	15.0	105	M10	21.0

(1) = Consists of black oxide steel rail and high carbon steel LinearRace shafting (HRC 60 min).
(2) = Consists of zinc plated steel rail and 440C stainless steel LinearRace shafting (HRC 50 min).
(3) = Specify length of Smart Rail when ordering. For example, LSRAM M20 x 1200mm.
S dimension is equal on each end unless specified by customer.

Metric - Support Block

Support Block for End Supported Applications

Part Number Description

ASBM 16

Type	Description	Size	mm
ASBM	Low Profile 60 Case LinearRace End Support Block	8	12
SBM	Standard 60 Case LinearRace End Support Block	6	20
		20	25
		30	40

All sizes are not available for all support block types. See specific product charts for size availability.

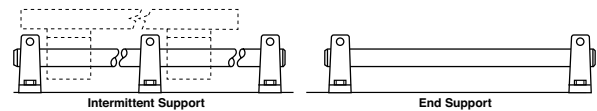
Shaft Support Blocks – Type SBM and ASBM

For end support or intermittent support

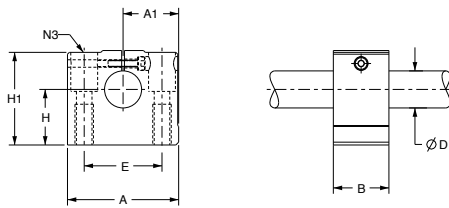
Shaft support blocks are used for end or intermittent support where loads are light and deflection between supports is not a problem. Unlike shaft support rails, blocks do not permit longitudinal passage of open-type Ball Bushing bearings. Type SBM shaft support blocks enable clamping of shafts and eliminate the need for bolts, etc. to maintain shaft position. Shimming is suggested for high precision applications to eliminate the effect of variations in surface of base or manufacturing tolerances between supports.



Type ASBM shaft blocks, manufactured from high strength extruded aluminum, provide either end or intermittent support in applications where loads are designed with a reference edge on one side of the base. This provides a surface parallel to the center of the shaft within $\pm 0.01''$ that can be used to simplify shaft alignment.



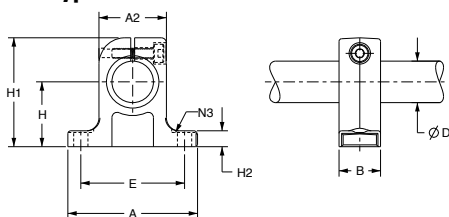
Type ASBM 60 Case LinearRace Shaft End Support Blocks (Dimensions in mm)



Material: Aluminum Alloy

Part Number	d	H ± 0.01	H1	H2	A	A1 ± 0.12	B	E ± 0.12	N	N2	Support Block Mass (kg)
ASBM08	8	15	28	9	32	16.0	18	22	3.5	M4	0.04
ASBM12	12	20	36	13	43	21.5	20	30	5.3	M6	0.10
ASBM16	16	25	43	18	53	26.5	24	38	6.6	M8	0.15
ASBM20	20	30	51	22	60	30.0	30	42	8.4	M10	0.23
ASBM25	25	35	61	26	78	39.0	38	56	10.5	M12	0.41
ASBM30	30	40	71	26	87	43.5	40	64	10.5	M12	0.53
ASBM40	40	50	88	34	108	54.0	48	82	13.5	M16	0.99

Type SBM 60 Case LinearRace Shaft End Support Blocks (Dimensions in mm)



Material: Malleable Iron

Part Number	d	H ± 0.01	H1	H2	A	A1 ± 0.12	B	E ± 0.12	N	Support Block Mass (kg)
SBM08	8	15	27	5.2	32	16	10	25	4.5	0.03
SBM12	12	20	35	5.5	40	21	12	32	5.5	0.06
SBM16	16	25	42	6.5	50	25	16	40	5.5	0.11
SBM20	20	30	50	8.0	60	30	20	45	5.5	0.21
SBM25	25	35	58	9.0	74	37	25	60	6.6	0.35
SBM30	30	40	68	10.0	84	42	28	68	9.0	0.52
SBM40	40	50	86	12.0	108	54	32	86	11.0	0.92

Quick Shaft

Thomson 60 Case Quick Shaft

“Quick shaft” is precut and packaged stock length shafting in popular:

- Inch and metric sizes
- L tolerance class and MM tolerance class
- Materials (carbon steel, 440C stainless steel, lightweight 52100 tubular)
- Standard options (predrilled and chrome plated plain ends)

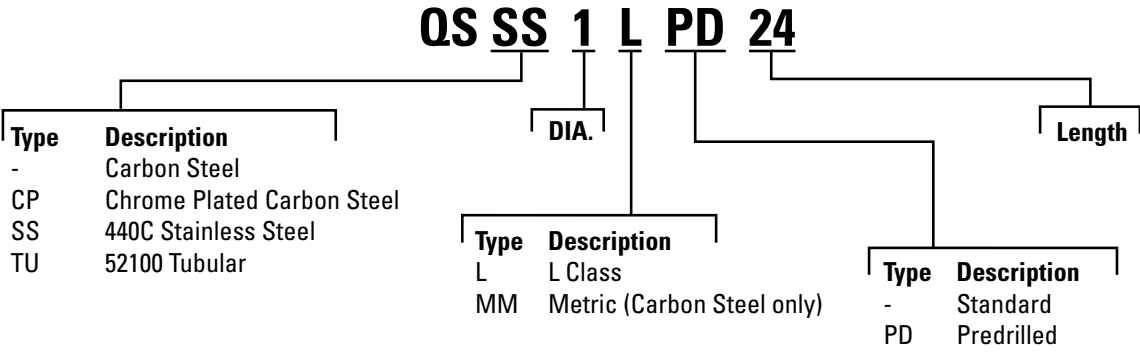


Thomson 60 Case Quick Shaft can be easily stocked by authorized Thomson distributors or end users.

You may want to have a few pieces of Thomson Quick Shaft in your stock room if you are not sure of the exact length you may need for that potential 3rd shift breakdown or you perform your own special machining of various lengths and do not want to carry different cut to length sizes.

All Thomson Quick Shaft shafting are oil preserved and placed in a VCI bag for long-term storage and labeled for your convenience.

Part Number Description



Quick Shaft

60 Case Quick Shaft

Carbon Steel - Inch

Hardness: 60 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Straightness: .001" Per Foot Cumulative

Roundness: .000080"

Taper: .0001"

Part Number	Stock Lengths (in)	Diameter Tolerance (in)	Min. Hardness Depth (in)	Weight Per Inch (lb)
QS 1/4 L	6, 9, 12, 15, 18, 24, 30, 36, 42, 48, 60	.2495	.027	.014
		.2490		
QS 3/8 L	6, 12, 18, 24, 30, 36, 48, 60	.3745	.027	.031
		.3740		
QS 1/2 L	6, 9, 12, 15, 18, 24, 30, 36, 42, 48, 54, 60	.4995	.040	.055
		.4990		
QS 5/8 L	12, 15, 18, 24, 30, 36, 42, 48, 54, 60	.6245	.040	.086
		.6240		
QS 3/4 L	12, 15, 18, 24, 30, 36, 42, 48, 60, 66, 72	.7495	.060	.125
		.7490		
QS 1 L	12, 18, 24, 30, 36, 42, 48, 60, 66, 72	.9995	.080	.222
		.9990		
QS 1 1/4 L	12, 18, 24, 30, 36, 42, 48, 54, 60, 72	1.2495	.080	.348
		1.2490		
QS 1 1/2 L	12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72	1.4994	.080	.500
		1.4989		
QS 1 3/4 L	12, 18, 24, 30, 36, 42, 48, 60, 72	1.7495	.100	.681
		1.7490		
QS 2 L	12, 18, 24, 30, 36, 42, 48, 60, 72	1.9994	.100	.890
		1.9987		

Carbon Steel - Metric

Hardness: 60 ROCKWELL C Min.

Surface Finish: 8 Ra Max

Straightness: .001" Per Foot Cumulative

Roundness: .000080"

Taper: .0001"

Part Number	Stock Lengths (mm)	Diameter		Min. Hardness Depth		Weight Per m (kg)	Weight Per inch (lb)
		(mm)	(in)	(mm)	(in)		
QS10MM	500, 1000	10.00	.3937	.069	.027	0.63	.035
		9.99	.3932				
		12.00	.4724				
QS12MM	250, 500, 750, 1000, 1200, 1500, 2000	11.99	.4720	1.02	.040	0.89	.05
		16.00	.6299				
QS16MM	250, 500, 750, 1000, 1200, 1500, 2000	15.99	.6295	1.02	.040	1.57	.088
		20.00	.7874				
QS20MM	250, 500, 750, 1000, 1200, 1500, 2000	19.99	.7869	1.52	.060	2.33	.13
		25.00	.9843				
QS25MM	500, 750, 1000, 1200, 1500, 2000	24.99	.9838	2.03	.080	3.87	.216
		30.00	1.1811				
QS30MM	500, 750, 1000, 1500, 2000	29.99	1.1806	2.03	.080	5.57	.311
		40.00	1.5748				
QS40MM	500, 750, 1000, 1500, 2000	39.99	1.5743	2.03	.080	9.90	.553

Quick Shaft

440C Stainless Steel - Inch

Hardness: 50 ROCKWELL C Min.
 Surface Finish: 8 Ra Max
 Roundness: .000080"

Straightness: .001" Per Foot Cumulative
 Taper: .0001"

Part Number	Stock Lengths (in)	Diameter Tolerance (in)	Min. Hardness Depth (in)	Weight Per Inch (lb)
QSSS 1/4 L	6, 12, 18, 24, 30, 36, 48, 60	.2495	.027	.014
		.2490		
QSSS 3/8 L	6, 12, 18, 24, 30, 36, 48, 60	.3745	.027	.031
		.3740		
QSSS 1/2 L	12, 18, 24, 30, 36, 42, 48, 54, 60	.4995	.040	.055
		.4990		
QSSS 5/8 L	12, 18, 24, 30, 36, 42, 48, 54, 60	.6245	.040	.086
		.6240		
QSSS 3/4 L	12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72	.7495	.060	.125
		.7490		
QSSS 1 L	18, 24, 30, 36, 42, 48, 54, 60, 66, 72	.9995	.080	.222
		.9990		
QSSS 1 1/4 L	12, 18, 24, 30, 36, 42, 48, 54, 60, 72	1.2495	.080	.348
		1.2490		
QSSS 1 1/2 L	18, 24, 30, 36, 42, 48, 54, 60, 66, 72	1.4994	.080	.500
		1.4989		

52100 Tubular - Inch

Hardness: 58 ROCKWELL C Min.
 Surface Finish: 8 Ra Max
 Roundness: .000080"

Straightness: .001" Per Foot Cumulative
 Taper: .0001"

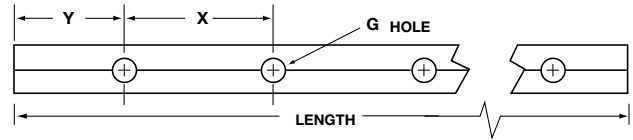
Part Number	Stock Lengths (in)	Nominal I.D.	Diameter Tolerance (in)	Min. Hardness Depth (in)	Weight Per Inch (lb/in)
QSTU 1 L	12, 18, 24, 48, 60	.599 ± 5%	.9995	.080	.158
			.9990		
QSTU 1 1/2 L	12, 18, 24, 48, 60	.890 ± 5%	1.4994	.080	.328
			1.4989		
QSTU 2 L	12, 24, 48, 60	1.250 ± 5%	1.9994	.100	.542
			1.9987		

60 Case Quick Shaft

Quick Shaft

Carbon Steel Predrilled - Inch

Hardness: 60 ROCKWELL C Min.
Surface Finish: 8 Ra Max
Straightness: .001" Per Foot Cumulative
Roundness: .000080"
Taper: .0001"



Part Number	Stock Lengths (in)	Diameter Tolerance (in)	X (in)	Y (in)	G Thread Size	Min. Hardness Depth (in)	Weight Per Inch (lb)
QS 1/2 L PD	12, 18, 24, 30, 36, 42, 48, 54, 60, 72	.4995	4	2	#6-32	.040	.055
		.4990					
QS 5/8 L PD	12, 18, 24, 30, 36, 42, 48, 54, 60, 72	.6245	4	2	#8-32	.040	.086
		.6240					
QS 3/4 L PD	12, 18, 24, 30, 36, 42, 48, 54, 60, 72	.7490	6	3	#10-32	.060	.125
		.7485					
QS 1 L PD	18, 24, 30, 36, 42, 48, 54, 60, 72	.9995	6	3	1/4-20	.080	.222
		.9990					
QS 1 1/4 L PD	18, 24, 30, 36, 42, 48, 54, 60, 72	1.2490	6	3	5/16-18	.080	.348
		1.2485					
QS 1 1/2 L PD	18, 24, 30, 36, 42, 48, 54, 60, 72	1.4994	8	4	3/8-16	.080	.500
		1.4989					

440C Stainless Steel Predrilled - Inch

Hardness: 50 ROCKWELL C Min.
Surface Finish: 8 Ra Max
Roundness: .000080"

Straightness: .001" Per Foot Cumulative
Taper: .0001"

Part Number	Stock Lengths (in)	Diameter Tolerance (in)	X (in)	Y (in)	G Thread Size	Min. Hardness Depth (in)	Weight Per Inch (lb)
QSSS 1/2 L PD	24, 30, 36, 42, 48, 60, 72	.4995	4	2	#6-32	.040	.055
		.4990					
QSSS 5/8 L PD	24, 30, 36, 42, 48, 54, 60, 72	.6245	4	2	#8-32	.040	.086
		.6240					
QSSS 3/4 L PD	24, 30, 36, 42, 48, 54, 60, 72	.7490	6	3	#10-32	.060	.125
		.7485					
QSSS 1 L PD	18, 24, 30, 36, 42, 48, 54, 60, 72	.9995	6	3	1/4-20	.080	.222
		.9990					
QSSS 1 1/4 L PD	18, 24, 30, 36, 42, 48, 54, 60, 72	1.2490	6	3	5/16-18	.080	.348
		1.2485					
QSSS 1 1/2 L PD	18, 24, 30, 36, 42, 48, 54, 60, 72	1.4994	8	4	3/8-16	.080	.500
		1.4989					

Chrome Plated Plain Ends - Inch

Hardness: 60 ROCKWELL C Min.
Surface Finish: 8 Ra Max
Straightness: .001" Per Foot Cumulative

Roundness: .000080"
Taper: .0001"

Part Number	Stock Lengths (in)	Diameter Tolerance (in)	Min. Hardness Depth (in)	Weight Per Inch (lb)
QSCP 1/2 L PD	6, 12, 18, 24, 30, 36, 42, 48, 60	.4995	.040	.055
		.4990		
QSCP 5/8 L PD	12, 18, 24, 30, 36, 42, 48, 54, 60	.6245	.040	.086
		.6240		
QSCP 3/4 L PD	12, 18, 24, 30, 36, 42, 48, 54, 60	.7595	.060	.125
		.7490		
QSCP 1 L PD	12, 18, 24, 30, 36, 42, 48, 54, 60, 72	.9995	.080	.222
		.9990		
QSCP 1 1/4 L PD	18, 24, 30, 36, 42, 48, 54, 60, 66, 72	1.2495	.080	.348
		1.2490		
QSCP 1 1/2 L PD	18, 24, 30, 36, 42, 48, 54, 60, 66, 72	1.4994	.080	.500
		1.4989		

Special Machining

Special Machining

For over 50 years Thomson has been providing custom special machining on 60 Case Linear Shafting. Our skilled machinists can perform a wide variety of special machining operations on the ends or along the length of the 60 Case Shaft to provide exactly the part needed for your application.

Standard 60 Case shafting, which is available from stock, can be cut with special length tolerances. 60 Case shafting may also be drilled with a variety of radial holes and tapped if needed. Shafts can be supplied with flats, keyways and reduced diameters. Shafts can also be plated.

There is an extra charge for all special machining operations. For specific prices, send your drawing or technical description to Thomson or utilize a copy of the request for quotation and templates found on pages 38-54.

Special Length Tolerances

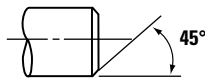
Standard length tolerance is for $\pm 1/32"$ for shafts less than 2" diameter and $\pm 1/16"$ for 2" diameter and larger. Special length tolerances of $\pm .010"$, $\pm .005"$ and $\pm .002"$ can be achieved on shafts up to 4" in diameter.

Special Straightness Tolerances

Standard straightness is .001" per foot., cumulative (.002" TIR). Special straightness tolerances is .0005" per foot, cumulative (.001" TIR), for all diameters.

Special Chamfer

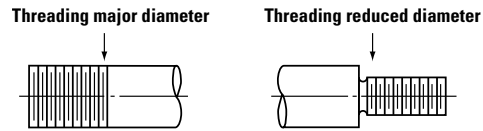
$1/32" \times 45^\circ$ for diameters less than 1" and $1/16" \times 45^\circ$ for diameters 1" and larger. Special chamfers at any angle can be supplied for an additional charge.



Machining Shaft Ends

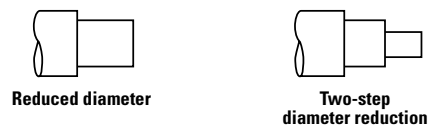
For all machining requirements with turned ends, Thomson will anneal the end. The annealing process may cause approximately $1/4"$ to $1/2"$ of heat travel from machined area (depending on major shaft O.D.). Hardness of major shaft diameter near the machined area will be below the Rockwell for the material. If annealing effects are objectionable, alternate machining processes can be used which prevent major diameter softening. Contact factory for special options. (See relevant sections following).

Threaded Shaft Diameter



Standard threads are either Unified National Coarse or Unified National Fine, Class 2-A fit. Shafts will be annealed and soft around the circumference of threaded areas within the case.

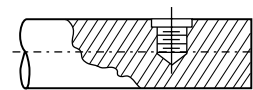
Reduced Shaft Diameter



Standard diameter tolerance on turned down diameters is $\pm .001"$. Special tolerance of $\pm .0001"$ is available. Concentricity is within .001" total indicator reading roundness and taper of $\pm .0001"$ min. capability exists. Shafts are annealed and soft in turned down sections within case. Two-step shaft diameter reduction is also available.

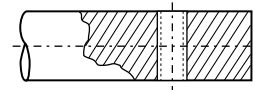
Radial Holes Drilled and Tapped to Center of Shaft

U.N.C. or U.N.F. Class 2-B thread. Tolerances for hole alignment and location are $\pm 1/64"$, $\pm .010"$ and $\pm .005"$.



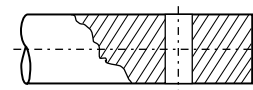
Radial Holes Drilled and Tapped thru Shaft

U.N.C. or U.N.F. Class 2-B thread. Alignment and location tolerance $\pm .010"$ shaft annealed and soft around circumference in hole area.



Radial Holes Drilled through Shaft

Alignment and location tolerance $\pm .010"$.

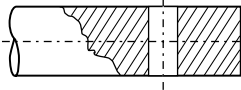


For requests for quotation and ordering custom machined 60 Case LinearRace shafting see the convenient templates on pages 194 through 210.

Special Machining

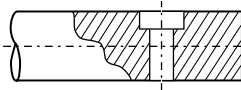
Radial Holes Drilled and Reamed through Shafts

Alignment and location tolerance $\pm .010"$. Hole diameter tolerance $\pm .001"$. Shaft annealed and soft around circumference in hole area.



Radial Holes Drilled through Shaft and Counterbored for Cap Screw

Alignment and location tolerance $\pm .010"$. Tolerance for body diameter and head diameter for American Std. cap screw is $+ 1/32"$. Shaft remains hard in hole area (not annealed).

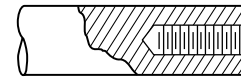


Radial Hole Location Tolerance

Unless specified standard location tolerance between holes is $\pm .1/64"$, optional $\pm .010"$ capability exists for all through hole $\pm .005"$ for hole to center.

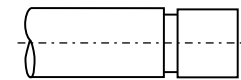
Coaxial Holes Drilled and Tapped in Center of End of Shaft

U.N.C. or U.N.F. Class 2-B thread. Concentricity $\pm .005"$. Certain diameters and materials will be annealed and remain soft around the circumference. Note: Holes may also be located on a "bolt" circle. Location tolerance is $.010"$.



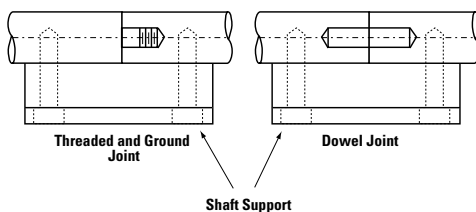
Retaining Ring Groove

Location tolerances between grooves $\pm 1/64"$ or $\pm .005"$. Tolerance of $\pm .005"$ for maximum ring groove spacing is $96"$.



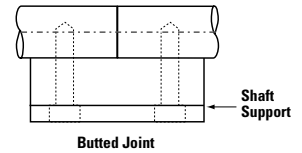
Joining Shafts to Obtain Longer Lengths

Threaded and ground joints for $3/4"$ through $4"$ and 20mm thru 80mm diameter shaft for lengths up to 20 feet. Dowled joints with concentricity $\pm .010"$ for $1/2"$ thru $4"$ and 12mm thru 80mm diameter shaft. The feasibility of butted joints should be considered as possibly the most economical solution before considering either of the previous alternatives.



Butted Joints

Ends machined square, no chamfer. Available for all nominal shaft diameters.

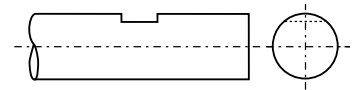


Flats

Flats are available. Flats extending over large portion or entire length of shaft are not available. Cutting into hardened layer would cause considerable warping and subsequent straightening cost is prohibitive.

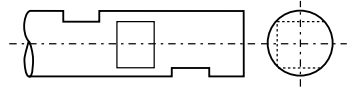
One Flat on a Shaft

Location tolerance $\pm .015"$.



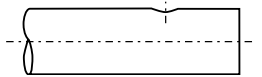
Multiple Flats on a Shaft

Alignment and location tolerance $\pm .005"$.



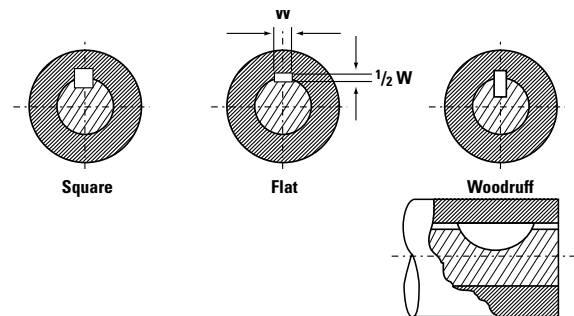
Drilled Spot for Set Screws

Location tolerance $\pm .1/64"$. Capability exists for $\pm .002"$. Drill sizes $1/8"$ thru $3/4"$.



Keyways

Keyways may be square, flat or American Standard Woodruff. Available for nominal shaft diameters from $1/2"$ through $4"$.



For requests for quotation and ordering custom machined 60 Case LinearRace shafting see the convenient templates on pages 194 through 210.

Example of Our Popular Plating Options

Chrome Plating

The standard chrome plating option is offered per AMS 2460, Class 1 (Corrosion Protective Plating), Type II (Satin finish). Other plating options are available for quote, including, but not limited to Thin Dense Chrome plating per MIL-S-13165 and MIL-R-81841..

As a result of the plating process and the need to hold parts during plating, coaxial holes may be added as follows:

- Up to 1 1/4" diameter shaft any length over 72".
- Over 1 1/4" to 2" diameter shaft any length over 48".
- Over 2" diameter shaft all lengths.

Note: Our CPPE (chrome plated with plain ends) do not have coaxial holes in any length, but the chamfered edges are not plated.

Black Oxide

The benefits of black oxide is corrosion resistance and black color. Military and industrial specifications satisfied with our Black Oxide are Mil-C13924C and AMS-2485.

ARMOLOY™

The benefit of Armoloy™ plating are a 78 RC surface finish, reduction of wear and friction in moving parts, and absolute adhesion to base metal (no chipping, cracking, flaking, or peeling will occur). The Armoloy thickness is .0001". Final plated shaft is within specified tolerance class.

As a result of the plating process and the need to hold parts during plating, coaxial holes may be added as follows:

- Up to 1 1/4" diameter shaft any length over 66".
- Over 1 1/4" all lengths.

Military and industrial specifications satisfied with Armoloy™ plating are AMS-2438, AMS QQ-C-320 and AMS-2406.

Each supplier used for plating has different capabilities to hold the parts, so requirements for coaxial holes may change over time. These should be used as a rule of thumb with an understanding that longer lengths may have coaxial holes. These holes allow the plater to hold the shaft during the plating process. When a coaxial hole is not used it means special tooling is available or the ability exists to pinch the part. If coaxial holes are a problem, please contact us and we can work with our supplier to determine what options exist.

Special Machining

Special Machining Quoting

Thomson will be happy to quote any of your special machining needs. In order for us to properly quote the product, we will require an original product drawing or technical description to be sent to our Application Engineering support team at 1-540-639-4162 (fax). Our Application Engineering team will contact you if they have any questions, require more information, or a better drawing or sketch. This drawing is important to us to ensure we quote exactly what is required at time of quotation instead of when you place your order. Upon ordering, it is important that you reference the quotation number listed at the top right of the quote and have reviewed the entire quotation, including all the notes associated and exceptions to the line item you are ordering. Quantity quoted and price listed is based on one time manufacturing lot quantity not blanket order unless otherwise stated. Thomson reserves the right to requote if quantity ordered is less than quoted quantity. Upon receipt of order, Thomson assumes you have read and understand the quotation and Thomson will assume no responsibility of exceptions on quotation and failure by customer to read.

Our standard quotations are in the format shown below.

Q U O T A T I O N					
Customer Information			Quotation Number		
Thomson 203A West Rock Road Radford, VA 24141 USA Phone: 540 633-3400 Fax: 540-639-4162 Email: thomson@danahermotion.com			Quote Number 20080XXX		
Customer			Quote Date		
Customer #			01/01/2007		
Customer Name			Valid From		
Customer Address			01/01/2007		
Attention			Valid To		
Phone No.			01/01/2007		
Fax No.			Validity Period of Quote		
District Manager			District Manager's Name		
Customer #			000000000000		
Customer Name			Payable 30 days net		
Customer Address			FOB from plant		
Payment Terms			Your Thomson Territory Manager		
Delivery Terms					
THOMSON IS PLEASED TO SUBMIT THE FOLLOWING QUOTATION SUBJECT TO OUR STANDARD TERMS AND CONDITIONS					
I am pleased to quote Thomson 60 Case LinearRace shafting, the specified inner race for Thomson Ball Bushing bearings, providing superior smoothness, hardness, and straightness. Use of 60 Case will preserve your bearing warranty and significantly extend life. When used with: Thomson SuperSmart Ball Bushing bearings, shaft life is extended up to five times.					
LINE	PART NUMBER	DESCRIPTION	QUANTITY	U/M	UNIT PRICE
		FINISH OF 8Ra OR SMOOTHER AND STRAIGHT TO WITHIN .001/.002" PER FOOT CUMULATIVE			
10	7/8 L SM	7/8 L SM X 1.560" Customer Part: PER TEMPLATE	88	EA	16.00
		Length 3.500 in.			25.00
		** SHAFT DIAMETER MAY BE OUT OF TOLERANCE OR DISTORTED ALONG THE LENGTH OF THE 1/2" COAXIAL BORED HOLE			
		** BORED HOLE DIAMETER TOLERANCE WILL BE +/- .005"			
		ESTIMATED SHIPMENT: 3-4 WK			
		Notes: 1. Quoted lead items are based on current factory backlog and are subject to change. Please contact Thomson for current lead time. 2. Price is net to Customer Name 3. Price valid for releases through 01/01/2007			
		If you need any further information, please contact me immediately. Thank You.			
		Engineer's Name Applications Engineer			
IMPORTANT. QUOTATION NO. MUST APPEAR ON ORDER TO INSURE PROPER BILLING. PRICES QUOTED ARE CONSIDERED FIRM FOR 30 DAYS. Prices apply to quantities of each size released for shipment at one time one destination. No returns or cancellations accepted without consent. The terms and conditions set forth herein shall constitute the entire agreement between the Buyer and the Seller. In the event you receive this information by facsimile only, please refer to our Standard Terms and Conditions appearing on the reverse side of our invoices, quotations, order acknowledgements, and product literature. Any provision or condition of Buyer's order which is in any way different from or in addition to these Standard Terms and Conditions is expressly rejected by Seller unless negotiated as part of this quotation and so noted hereon. SEE REVERSE SIDE FOR TERMS AND CONDITIONS Trademark of Danaher Motion. Danaher Motion is a trademark. WORLD'S LARGEST MANUFACTURER OF LINEAR BEARINGS AND SHAFTS					
QC FORM 063 Rev. A PAGE 1					

Special Machining

Request for Quotation

Custom Machined Thomson 60 Case LinearRace Shafting

Customer: _____

Address: _____

City: _____ State: _____ Zip: _____

Contact Name: _____

Phone: _____ Fax: _____

E-mail: _____

Template Number	Quantity
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

1. Send a copy of your drawing or sketch. If you do not have one, select the Thomson 60 Case LinearRace shaft template that best matches your requirements.

- A. Fill in all available data with tolerances in either inch or metric units.
- B. If a feature is not on the template that you are using, add it, and the applicable dimensions.
- C. If a feature is not required but is on the template, draw a line through the feature, and mark the dimension block with a line or N/A.
- D. Make any additional notes to the template to aid in quoting and manufacturing.

2. Fax this information with the template drawing to: Quotation Department at 1-540-639-4162.

For any questions or help in determining the best solution to your Thomson 60 Case LinearRace shafting requirements, please contact Application Engineering at:

Phone: 1-540-633-3400

E-mail: DMAC@danahermotion.com

Special Machining

1	2	3	4	E	F
<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'C' (TYP.)</p>			<p>DANAHER MOTION</p>		
<p>LENGTH 'A': _____</p> <p>DIAMETER 'D': _____</p> <p>CLASS: _____</p> <p>ANGLE 'C': _____</p> <p>CHAMFER 'B': _____</p>			<p>TITLE: MACHINED TO LENGTH 60 CASE TEMPLATE 1</p>		
<p>DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" -H= ±.015" -HH= ±.010" -HHH= ±.005" ANGLES: ± 1/2°</p>			<p>OTHER MATERIALS AVAILABLE UPON REQUEST</p> <p>MATERIAL: <input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 <input type="checkbox"/> OTHER: _____ <input type="checkbox"/> TUBING</p>		
<p>CUSTOMER AUTHORIZATION: _____</p>			<p>PLATING TYPE: _____ APPROVAL _____ DATE _____</p> <p>DO NOT SCALE DRAWING DRAWN BY _____ DATE _____</p>		
1	2	3	4	E	F

FAX A COPY OF THIS FORM TO QUOTATION DEPARTMENT, THOMSON 1-540-639-4162

Special Machining

1	2	3	4	F	E	D	C	B	A
<p>STD. MACHINED CHAMFERS UNLESS NOTED IN ANGLE 'H' (TYP)</p>									
<p>LENGTH 'A':</p> <p>DIAMETER 'D':</p> <p>CLASS:</p> <p>THREAD 'C':</p> <p>MIN. DEPTH 'E':</p> <p>THREAD 'F':</p> <p>MIN. DEPTH 'G':</p> <p>ANGLE 'H':</p> <p>CHAMFER 'B':</p>									
<p>DEFAULT PRINT TOL: (INCH)</p> <p>FRACTIONS: ± 1/32"</p> <p>.X= ±.015"</p> <p>.XX= ±.010"</p> <p>.XXX= ±.005"</p> <p>ANGLES: ± 1/2°</p>			<p>DEFAULT PRINT TOL: (METRIC)</p> <p>FRACTIONS: ± 1mm</p> <p>.H= ±.25mm</p> <p>.HX= ±.13mm</p> <p>ANGLES: ± 1/2°</p>			<p>CUSTOMER AUTHORIZATION: _____</p>			
<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING</p> <p><input type="checkbox"/> OTHER: _____</p>			<p>PLATING TYPE: _____</p> <p>APPROVAL _____ DATE _____</p> <p>DRAWN BY _____ DATE _____</p>			<p>DO NOT SCALE DRAWING</p>			
<p>DANAHER MOTION</p>			<p>CO-AXIAL DRILL and TAP 60 CASE TEMPLATE 2</p> <p>DRUG NO. _____</p>						
<p>FAX A COPY OF THIS FORM TO QUOTATION DEPARTMENT, THOMSON 1-540-639-4162</p>									

Special Machining

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LENGTH 'A':																	
DIAMETER 'D':																	
CLASS:	HOLE PATTERN																
THREAD 'E':	LENGTH 'Y':																
ANGLE 'C':	LENGTH 'X':																
CHAMFER 'B':	No. of REPEATS for 'X':																
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DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" .X= ±.015" .XX= ±.010" .XXX= ±.005" ANGLES: ± 1/2°	DEFAULT PRINT TOL: (METRIC) FRACTIONS: ± 1mm .X= ±.25mm .XX= ±.13mm ANGLES: ± 1/2°	MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST) <input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING <input type="checkbox"/> OTHER: _____															
CUSTOMER AUTHORIZATION: _____																	
PLATING TYPE: _____ APPROVAL _____ DATE _____ DO NOT SCALE DRAWING DRAWN BY _____ DATE _____																	
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	TITLE: RADIAL DRILL & TAP 60 CASE TEMPLATE 3 DRUG NO. _____																
1	2	3	4	E	F												

FAX A COPY OF THIS FORM TO QUOTATION DEPARTMENT, THOMSON 1-540-639-4162

Special Machining

1	2	3	4																		
A	B	C	D																		
E	F																				
<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE H (TYP)</p> <p>ØF</p> <p>ØC</p> <p>D</p> <p>B (TYP)</p> <p>E</p> <p>A</p> <p>G</p>																					
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">LENGTH 'A':</td> <td style="width: 50%;"></td> </tr> <tr> <td>DIAMETER 'D':</td> <td></td> </tr> <tr> <td>CLASS:</td> <td></td> </tr> <tr> <td>DIAMETER 'C':</td> <td></td> </tr> <tr> <td>MIN. DEPTH 'E':</td> <td></td> </tr> <tr> <td>DIAMETER 'F':</td> <td></td> </tr> <tr> <td>MIN. DEPTH 'G':</td> <td></td> </tr> <tr> <td>ANGLE 'H':</td> <td></td> </tr> <tr> <td>CHAMFER 'B':</td> <td></td> </tr> </table>				LENGTH 'A':		DIAMETER 'D':		CLASS:		DIAMETER 'C':		MIN. DEPTH 'E':		DIAMETER 'F':		MIN. DEPTH 'G':		ANGLE 'H':		CHAMFER 'B':	
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CHAMFER 'B':																					
<p>DEFAULT PRINT TOL: (INCH)</p> <p>FRACTIONS: ± 1/32"</p> <p>.H= ±.015"</p> <p>.HX= ±.010"</p> <p>.HH= ±.005"</p> <p>ANGLES: ± 1/2°</p>		<p>DEFAULT PRINT TOL: (METRIC)</p> <p>FRACTIONS: ± 1mm</p> <p>.H= ±.25mm</p> <p>.HX= ±.13mm</p> <p>ANGLES: ± 1/2°</p>																			
<p>CUSTOMER AUTHORIZATION: _____</p>		<p>DO NOT SCALE DRAWING</p>																			
<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING</p> <p><input type="checkbox"/> OTHER: _____</p>		<p>DANAHER MOTION</p> <p>CO-AXIAL DRILLED HOLES 60 CASE TEMPLATE 4</p>																			
<p>PLATING TYPE: _____</p>		<p>APPROVAL DATE</p> <p>DRAWN BY DATE</p>																			
<p>DATE</p>		<p>DATE</p>																			
A	B	C	D																		
E	F																				

FAX A COPY OF THIS FORM TO QUOTATION DEPARTMENT, THOMSON 1-540-639-4162

Special Machining

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LENGTH 'A':	DIAMETER 'D':	CLASS	DIAMETER 'C':														
LENGTH 'Y':	WIDTH 'Y':	ANGLE 'F':	CHAMFER 'B':														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"> DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" .X= ±.015" .XX= ±.010" .XXX= ±.005" ANGLES: ± 1/2° </td> <td style="width: 25%;"> DEFAULT PRINT TOL: (METRIC) FRACTIONS: ± 1mm .X= ±.25mm .XX= ±.13mm </td> <td style="width: 25%;"> MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST) <input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING <input type="checkbox"/> OTHER: _____ </td> <td style="width: 25%;"> DANAHER MOTION TITLE: SNAP RING GROOVE 60 CASE TEMPLATE 5 </td> </tr> <tr> <td colspan="3">PLATING TYPE: _____</td> <td>DO NOT SCALE DRAWING</td> </tr> </table>										DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" .X= ±.015" .XX= ±.010" .XXX= ±.005" ANGLES: ± 1/2°	DEFAULT PRINT TOL: (METRIC) FRACTIONS: ± 1mm .X= ±.25mm .XX= ±.13mm	MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST) <input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING <input type="checkbox"/> OTHER: _____	DANAHER MOTION TITLE: SNAP RING GROOVE 60 CASE TEMPLATE 5	PLATING TYPE: _____			DO NOT SCALE DRAWING
DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" .X= ±.015" .XX= ±.010" .XXX= ±.005" ANGLES: ± 1/2°	DEFAULT PRINT TOL: (METRIC) FRACTIONS: ± 1mm .X= ±.25mm .XX= ±.13mm	MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST) <input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING <input type="checkbox"/> OTHER: _____	DANAHER MOTION TITLE: SNAP RING GROOVE 60 CASE TEMPLATE 5														
PLATING TYPE: _____			DO NOT SCALE DRAWING														
CUSTOMER AUTHORIZATION: _____																	
1	2	3	4	F	E	D	C	B	A								

FAX A COPY OF THIS FORM TO QUOTATION DEPARTMENT, THOMSON 1-540-639-4162

Special Machining

	<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'H'</p> <p>.015 RAD. TYP.</p>	<p>1</p> <p>2</p> <p>3</p>	<p>4</p>
<p>LENGTH 'A':</p> <p>DIAMETER 'D':</p> <p>CLASS:</p> <p>DIAMETER 'C':</p> <p>LENGTH 'G':</p> <p>DIAMETER 'E':</p> <p>LENGTH 'F':</p> <p>ANGLE 'H':</p> <p>CHAMFER 'B':</p>			
<p>DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" .X= ±.015" .XX= ±.010" .XXX= ±.005" ANGLES: ± 1/2°</p>	<p>DEFAULT PRINT TOL: (METRIC) FRACTIONS: ± 1mm .X= ±.25mm .XX= ±.13mm ANGLES: ± 1/2°</p>	<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C</p> <p><input type="checkbox"/> OTHER:</p>	<p>DANAHER MOTION</p> <p>TITLE: SHAFT REDUCTION 60 CASE TEMPLATE 6</p> <p>DRAWG NO.</p>
<p>CUSTOMER AUTHORIZATION: _____</p>		<p>PLATING TYPE: _____</p> <p>DO NOT SCALE DRAWING</p>	<p>APPROVAL _____ DATE _____</p> <p>DRAWN BY _____ DATE _____</p>

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Special Machining

1	2	3	4
A	B	C	D
E	F		
<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'F' (TYP.)</p>		<p>.015 RAD. TYP.</p>	
<p>LENGTH 'A':</p>		<p>DEFAULT PRINT TOL: (METRIC)</p>	
<p>DIAMETER 'D':</p>		<p>FRACTIONS: ± 1mm</p>	
<p>CLASS:</p>		<p>.R= ±.25mm</p>	
<p>DIAMETER 'C':</p>		<p>.RH= ±.13mm</p>	
<p>LENGTH 'E':</p>		<p>ANGLES: ± 1/2°</p>	
<p>ANGLE 'F':</p>		<p>CUSTOMER AUTHORIZATION:</p>	
<p>CHAMFER 'B':</p>		<p>DO NOT SCALE DRAWING</p>	
<p>PLATING TYPE:</p>		<p>APPROVAL</p>	
<p>MATERIAL:</p>		<p>DATE</p>	
<p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING</p>		<p>DRAWN BY</p>	
<p><input type="checkbox"/> OTHER:</p>		<p>DATE</p>	
<p>DANAHER MOTION</p>		<p>TITLE:</p>	
<p>SHAFT REDUCTION</p>		<p>60 CASE TEMPLATE 7</p>	
<p>DRUG NO.</p>		<p>DATE</p>	
<p>DO NOT SCALE DRAWING</p>		<p>DATE</p>	
<p>DO NOT SCALE DRAWING</p>		<p>DATE</p>	

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Special Machining

	<p>1</p> <p>2</p> <p>3</p>	<p>4</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p>
<p>LENGTH 'A':</p> <p>DIAMETER 'D':</p> <p>CLASS:</p> <p>MIN. KEYWAY LENGTH 'C':</p> <p>WIDTH 'E':</p> <p>KEYWAY DEPTH 'F':</p> <p>ANGLE 'G':</p> <p>CHAMFER 'B':</p>	<p>DEFULT PRINT TOL: (METRIC)</p> <p>FRACTIONS: ± 1mm .K= ±.25mm .KH= ±.13mm</p> <p>ANGLES: ± 1/2°</p>	<p>DEFULT PRINT TOL: (INCH)</p> <p>FRACTIONS: ± 1/32" .K= ±.015" .KH= ±.010" .KHH= ±.005"</p> <p>ANGLES: ± 1/2°</p>	<p>CUSTOMER AUTHORIZATION: _____</p>
<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'G' (TYP.)</p>		<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING</p> <p><input type="checkbox"/> OTHER: _____</p>	
<p>PLATING TYPE: _____</p> <p>DO NOT SCALE DRAWING</p>		<p>APPROVAL DATE</p> <p>DRAWN BY DATE</p>	
<p>DANAHER MOTION</p>		<p>TITLE: KEYWAY SLOT</p> <p>60 CASE TEMPLATE 8</p> <p>DRAWG NO. _____</p>	

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Special Machining

1	2	3	4	F	E	D	C	B	A																												
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Special Machining

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<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'H'</p> <p>.015 RAD. TYP.</p> <p>STD.</p> <p>A</p> <p>B</p> <p>C</p> <p>D</p> <p>E</p> <p>F</p> <p>G</p>		<p>DANAHER MOTION</p> <p>SHAFT REDUCTION With THREAD 60 CASE TEMPLATE 10 DRAWG NO.</p>	
<p>LENGTH 'A':</p> <p>DIAMETER 'D':</p> <p>CLASS:</p> <p>DIAMETER 'C':</p> <p>LENGTH 'G':</p> <p>THREAD 'E':</p> <p>MIN. THREAD LENGTH 'F':</p> <p>ANGLE 'H':</p> <p>CHAMFER 'B':</p>		<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C</p> <p><input type="checkbox"/> OTHER: _____</p> <p>PLATING TYPE: _____</p> <p>APPROVAL: _____ DATE: _____</p> <p>DRAWN BY: _____ DATE: _____</p> <p>DO NOT SCALE DRAWING</p>	
<p>DEFAULT PRINT TOL: (INCH)</p> <p>FRACTIONS: ± 1/32"</p> <p>.R= ±.015"</p> <p>.RR= ±.010"</p> <p>.RRR= ±.005"</p> <p>ANGLES: ± 1/2°</p>		<p>DEFAULT PRINT TOL: (METRIC)</p> <p>FRACTIONS: ± 1mm</p> <p>.R= ±.25mm</p> <p>.RR= ±.13mm</p> <p>ANGLES: ± 1/2°</p>	
<p>CUSTOMER AUTHORIZATION: _____</p>		<p>CUSTOMER AUTHORIZATION: _____</p>	

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Special Machining

1	2	3	4	F	E	D	C	B	A																		
<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'H' (TYP.)</p> <p>.015 RAD. (TYP.)</p>																											
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<p>DEFAULT PRINT TOL: (INCH)</p> <p>FRACTIONS: $\pm 1/32"$</p> <p>.H = $\pm .015"$</p> <p>.HH = $\pm .010"$</p> <p>.HHH = $\pm .005"$</p> <p>ANGLES: $\pm 1/2^\circ$</p>			<p>DEFAULT PRINT TOL: (METRIC)</p> <p>FRACTIONS: $\pm 1mm$</p> <p>.H = $\pm .25mm$</p> <p>.HH = $\pm .15mm$</p> <p>ANGLES: $\pm 1/2^\circ$</p>			<p>DANAHER MOTION</p>																					
<p>CUSTOMER AUTHORIZATION: _____</p>			<p>PLATING TYPE: _____</p> <p>APPROVAL _____ DATE _____</p> <p>DRAWN BY _____ DATE _____</p>			<p>TITLE: SHAFT REDUCTION</p> <p>60 CASE TEMPLATE 11</p> <p>DRWG NO. _____</p>																					
<p>DO NOT SCALE DRAWING</p>																											
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Special Machining

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DEFAULT PRINT TOL: (INCH)	DEFAULT PRINT TOL: (METRIC)	MATERIAL:	DANAHER <small>MOTION</small>																													
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		DRAWN BY	DATE																													
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Special Machining

1	2	3	4	E	F
<p>STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'E' (TYP)</p>			<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING</p> <p><input type="checkbox"/> OTHER: _____</p>		
<p>LENGTH 'A': _____</p> <p>DIAMETER 'D': _____</p> <p>CLASS: _____</p> <p>DIAMETER 'C': _____</p> <p>LENGTH 'Y': _____</p> <p>ANGLE 'E': _____</p> <p>CHAMFER 'B': _____</p>			<p>PLATING TYPE: _____</p> <p>APPROVAL: _____</p> <p>DATE: _____</p>		
<p>DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" .X= ±.015" .XX= ±.010" .XXX= ±.005" ANGLES: ± 1/2°</p>			<p>DEFAULT PRINT TOL: (METRIC) FRACTIONS: ± 1mm .X= ±.25mm .XX= ±.13mm ANGLES: ± 1/2°</p>		
<p>CUSTOMER AUTHORIZATION: _____</p>			<p>DO NOT SCALE DRAWING</p> <p>DRAWN BY: _____</p> <p>DATE: _____</p>		
			<p>TITLE: THRU PIN HOLE 60 CASE TEMPLATE 13</p> <p>DRAWG NO.: _____</p>		
1	2	3	4	E	F

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Special Machining

<p style="text-align: center;">STD. MACHINED CHAMFER UNLESS NOTED IN ANGLE 'E' (TYP.)</p>	<p>B (TYP)</p> <p style="text-align: center;">A</p>	<p>1</p>	<p>2</p>	<p>3</p>	<p>4</p>	
<p>LENGTH 'A':</p> <p>DIAMETER 'D':</p> <p>CLASS:</p> <p>THREAD 'C':</p> <p>LENGTH 'Y':</p> <p>ANGLE 'E':</p> <p>CHAMFER 'B':</p>	<p>DEFAULT PRINT TOL: (METRIC)</p> <p>FRACTIONS: ± 1mm</p> <p>.R= ±.25mm</p> <p>.RH= ±.13mm</p> <p>ANGLES: ± 1/2°</p>	<p>DEFAULT PRINT TOL: (INCH)</p> <p>FRACTIONS: ± 1/32"</p> <p>.R= ±.015"</p> <p>.RH= ±.010"</p> <p>.RHH= ±.005"</p> <p>ANGLES: ± 1/2°</p>	<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING</p> <p><input type="checkbox"/> OTHER: _____</p>			<p>DANAHER MOTION</p> <p>TITLE: DRILL & TAP 60 CASE TEMPLATE 14</p> <p>DRUG NO. _____</p>
<p>CUSTOMER AUTHORIZATION: _____</p>		<p>PLATING TYPE: _____</p> <p>APPROVAL: _____ DATE: _____</p> <p>DO NOT SCALE DRAWING</p> <p>DRAWN BY: _____ DATE: _____</p>		<p>APPROVAL: _____ DATE: _____</p>		

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1	2	3	4	F	E	D	C	B	A					
<p>LENGTH 'A': _____</p> <p>DIAMETER 'D': _____</p> <p>CLASS: _____</p> <p>LENGTH 'Y': _____</p> <p>LENGTH 'C': _____</p> <p>DEPTH 'E': _____</p> <p>ANGLE 'F': _____</p> <p>CHAMFER 'B': _____</p>														
<p>DEFAULT PRINT TOL: (INCH) FRACTIONS: ± 1/32" -X= ±.015" -HX= ±.010" -HH= ±.005" ANGLES: ± 1/2°</p>			<p>DEFAULT PRINT TOL: (METRIC) FRACTIONS: ± 1mm -X= ±.25mm -HX= ±.13mm ANGLES: ± 1/2°</p>			<p>MATERIAL: (OTHER MATERIALS AVAILABLE UPON REQUEST)</p> <p><input type="checkbox"/> 1566 <input type="checkbox"/> 440C <input type="checkbox"/> 52100 TUBING</p> <p><input type="checkbox"/> OTHER: _____</p>				<p>PLATING TYPE: _____</p> <p>APPROVAL _____ DATE _____</p> <p>DRAWN BY _____ DATE _____</p>			<p>DANAHER MOTION</p> <p>TITLE: MACHINED SLOTS 60 CASE TEMPLATE 15 DRUG NO. _____</p>	
<p>CUSTOMER AUTHORIZATION: _____</p> <p>DO NOT SCALE DRAWING</p>														
1	2	3	4	F	E	D	C	B	A					

FAX A COPY OF THIS FORM TO QUOTATION DEPARTMENT, THOMSON 1-540-639-4162