



60 Case® Shafting



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Thomson RoundRail Linear Guides and Components

60 Case Product Overview

For more than 70 years, Thomson has been producing precision linear shafting for the Thomson Linear Ball Bushing® and 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 more than 70 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, 440C Stainless Steel, 52100 Tubular, 316 Stainless Steel, carbon steel chrome plated, carbon steel predrilled and 440C 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



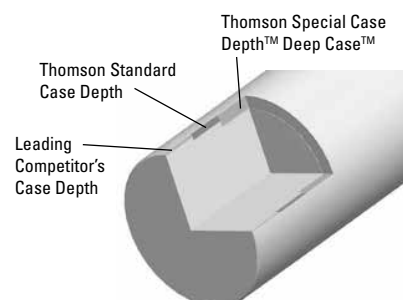
Thomson 60 Case carbon steel shafting is made of high-quality, specially developed alloy steel. When it comes to linear shafting, no other manufacturers have set such high standards or specifications for the raw steel used in the production of linear shafting. The chemical properties of the steel are 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.





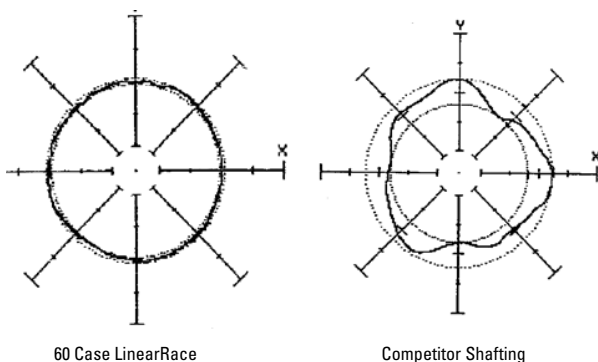
Surface Finish

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 microinch max. Excellent surface finish and hardness maximize the efficiency and life of linear bearings, shaft riding seals and overall visual appearance. When 8 Ra microinch is not good enough, we can provide 6 Ra microinch 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.

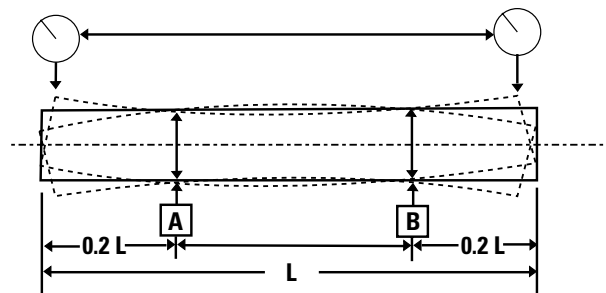


Straightness

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.

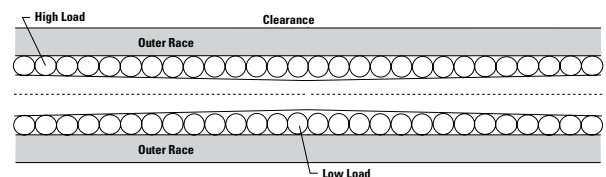
60 Case LinearRace® shafting is inspected to ensure that it meets the highest quality standards. Standard straightness for all 60 Case LinearRace shafting is .001 inch per foot (.025 mm/300 mm) cumulative (.002 inch [.05 mm] TIR), with special straightness of .0005 inch per foot (.012 mm/300 mm) cumulative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



Thomson RoundRail Linear Guides and Components

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 440C 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 more than 70 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 205 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 204 for more information.

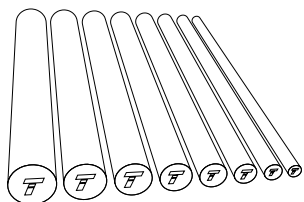
How does Thomson 60 Case compare to our leading competitor shafting?

	Thomson	Competitor 1	Competitor 2
Materials	Carbon Steel	Carbon Steel	Carbon Steel
	440C SS	440C SS	440C SS or equiv.
	316 SS		52100 Tubular
	52100 Tubular		
	Ultra Light Aluminum*		
Tolerance Classes	L, N, S, D, G, MM	L, S, MM	L, S, MM
Case Depth	.080"	.080"	.035"
Surface Finish	8 Ra microinch 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"

* See page 183 for aluminum specifications

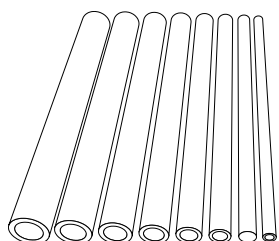


60 Case® LinearRace® Shafting for End-Supported Applications



Solid 60 Case LinearRace Shafting Features:

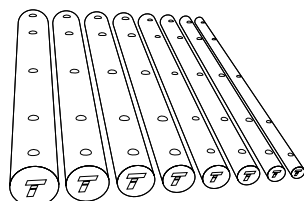
- Diameter range between 3/16 and 4 inch.
- Roundness 80 millionths of an inch.
- Case hardness 60 HRC minimum.
- Surface finish 8 Ra microinch.
- Available in corrosion-resistant 440C stainless steel (50 HRC minimum).
- Available with PrePlate™ chrome option.
- Standard straightness is .001 inch per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



60 Case Tubular Lite™ LinearRace Shafting Features:

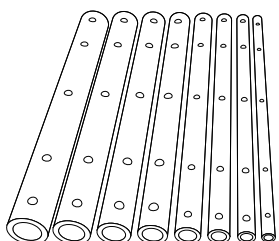
- Hollow inner diameter reduces weight and inertia.
- Diameter range between 3/4 and 4 inch.
- Roundness 80 millionths of an inch.
- Case hardness 58 HRC minimum.
- Surface finish 8 Ra microinch.
- Standard straightness is .001 inch per foot cumulative (.002" TIR) with special straightness at .0005 inch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

60 Case LinearRace Shafting (Predrilled) for Continuously Supported Applications



Solid 60 Case LinearRace Shafting with Mounting Holes Features:

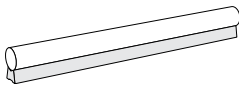
- Radial drilled and tapped holes ready for immediate use with standard hole spacing to match standard 60 Case LinearRace support rails.
- Diameter range between 1/2 and 4 inches, special machining (SM) required over 2 inches.
- Surface finish 8 Ra microinch.
- Hardness 60 HRC minimum.
- Roundness 80 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:

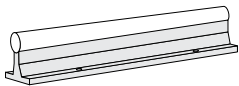
- Hollow design reduces weight and inertia.
- Can be supplied with radial drilled and tapped holes, ready for immediate use.
- Standard hole spacing to match standard 60 Case LinearRace support rails.
- Diameter range between 1 1/2 and 4 inch.
- Roundness 80 millionths of an inch.
- Case hardness 58 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.

60 Case LinearRace Support Rails and Assemblies for Continuously Supported Applications



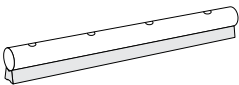
LSR Low Profile 60 Case LinearRace Support Rail Features:

- 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:

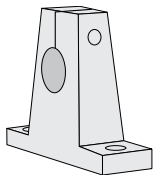
- Diameter range between 1/2 and 2 inch.
- Available with standard mounting holes for immediate use.
- Available without mounting holes for customized hole spacing.
- Available as a pre-engineered, ready to install assembly.
- Lightweight, high-strength aluminum alloy rail.
- Unlimited travel lengths.



LSRA Smart Rail* Assembly Features:

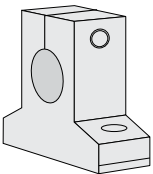
- Diameter range between 5/8 and 1 1/2 inch.
- Bolt-down-from-the-top mounting.
- Single piece lengths up to 15 feet long.
- Low-profile design.

60 Case LinearRace Supports for End Supported Applications



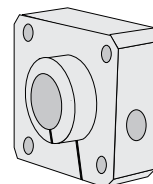
SB 60 Case LinearRace Shafting End Support Block Features:

- 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.
- Lightweight, 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.
- Lightweight, 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.
- Lightweight, high-strength aluminum alloy construction.