

## Miniature Components and Systems

Thomson performance, precision and reliability – in miniature form

## Thomson - Your Single Source for Miniature Machine Components Engineered to Work Together

Thomson produces the widest selection of miniature linear components that are engineered to work together. This equates to faster design times, less installation problems, and higher performance and reliability.

The Thomson family of miniature products provide linear thrust and guidance motion control in the smallest packages available. They all benefit from Thomson's long experience in motion control engineering and have all the advantages and features offered for standard size products.

Thomson also provides customized solutions. Whether you need alternative materials, customized nut geometry, custom configured bearings, special end machining or mounting features, we have the solution.

### Miniature Metric Rolled Ball Screws



This line of rolled ball screws from Thomson are designed to offer industry leading capacity, smoothness and quiet operation. The design allows for simple customization and cost effectiveness.

### Glide Screw™



By combining a lead screw and a linear guide, the Glide Screw allows designers to reduce the footprint of their equipment, improve uptime and reduce cost of ownership of the end product.

## The Thomson Advantage

Smaller components enable designers to reduce the size and weight of their end product, resulting in products that are smaller, lighter and less expensive to produce. A smaller product will also reduce packaging and transportation cost, while lessening the overall environmental impact of the equipment. Choosing Thomson as your supplier brings some additional advantages as well.

Thomson Advantages	
Advantage	Benefits
Widest variety of miniature linear products on the market	<ul style="list-style-type: none"> <li>• Expedited design time</li> <li>• Single source of engineering support</li> <li>• Consolidated supply base</li> </ul>
Products designed to work together	<ul style="list-style-type: none"> <li>• Online sizing and selection tools for easy design</li> <li>• Fewer installation problems</li> <li>• Higher-performance equipment</li> </ul>
Easy customization	<ul style="list-style-type: none"> <li>• Custom sizes, finishes, materials and more</li> <li>• Optimized cost, size and performance</li> </ul>
Genuine Thomson quality	<ul style="list-style-type: none"> <li>• Fewer defects and field failures</li> <li>• Lower overall cost of ownership</li> </ul>
Global company	<ul style="list-style-type: none"> <li>• Sales and support around the globe</li> <li>• Safe partner with proven track record</li> <li>• Knowledge about local standards and preferences</li> </ul>

### Miniature Lead Screws



Thomson is a global leader in lead screw technology. Our broad offering, high quality and ability to customize set us apart.

### Miniature Metric Linear Bearings



Compact and cost competitive, these bearings can help bring high-performance linear guidance to miniature equipment.

### Miniature Linear Motion Systems



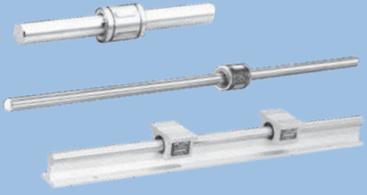
Thomson was the first company in the world to present a linear motion system. Today we offer a large range of different models, including miniature sizes.

### Customization



Thomson offers customized solutions for all of our products – from a minor adjustment to a completely new design. See page 14 or contact us for more information.

# Miniature Components and Systems Overview

Linear Motion Miniature Products Overview*					
Product Image	Product Group	Product Line Name (Product Suffix)	See Page	Basic Specifications	
	Lead Screws	Thomson BSA Lead Screw and MTS Flange Mount Supernut (MTS)	8	6 – 20 mm 3/16 – 3/4 in.	
		Thomson BSA Lead Screw and AFT Anti-Backlash Supernut (AFT)	8	10 mm 3/8 – 1/2 in.	
		Thomson BSA Lead Screw and XC Anti-Backlash Supernut (XC)	8	6 – 24 mm 3/16 – 1 in.	
	Ball Screws	Miniature Metric Rolled - Flanged Miniature Metric Rolled - Threaded Miniature Metric Rolled - Cylindrical	9	10– 12 mm	
	Linear Bearings	60 Case® Linear Race Shafting and Miniature Instrument Bearing (INST)	10	1/8 – 1/4 in.	
		60 Case® Linear Race Shafting and Miniature Metric Bearing (MM)	10	3 – 12 mm	
		60 Case® Linear Race Shafting and Super Ball Bushing Bearing (SP)	10	12 – 40 mm 1/2 – 1-1/2 in.	
	Profile Rail Guides	Microguide™ (TSR)	11	5 – 15 mm	
	Glide Screws	Glide Screw™ (GS)	12	4 – 10 mm 3/16 – 3/8 in.	
	Linear Motion Systems	MicroStage® (MS)	13	MS25: 50 x 25 MS33: 60 x 33	

 Products providing thrust  
 Products providing guidance

 Products providing both thrust and guidance

	Unit of Measure		Anti-backlash or Preload Feature	No or Low Maintenance Required	Noise Level	Product Cost Level	Stiffness Properties	Accuracy Properties	Corrosion Resistance Properties	Thrust Capacity Level	Guidance Capacity Level
	Metric	Inch									
	•	•		•	★ ★ ★	★ ★ ★	★	★	★ ★ ★	★ ★	–
	•	•	•	•	★ ★ ★	★ ★	★	★ ★	★ ★ ★	★	–
	•	•	•	•	★ ★ ★	★ ★	★	★ ★	★ ★ ★	★ ★	–
	•				★	★ ★	★	★ ★ ★	★	★ ★ ★	–
		•			★ ★	★	★ ★	★ ★ ★	★ ★ ★	–	★
	•				★ ★	★ ★ ★	★ ★	★ ★	★ ★	–	★ ★
	•	•	•		★ ★	★ ★ ★	★	★ ★	★ ★	–	★ ★
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	•	•		•	★ ★ ★	★ ★	★	★	★ ★ ★	★ ★	★ ★
	•		•	•	★ ★	★	★	★ ★	★ ★	★ ★	★

- ★ Good
- ★ ★ Better
- ★ ★ ★ Best

\*These are a small selection from our standard product ranges. More product ranges are available, and most products also come in additional sizes and versions. Thomson specializes in making customized products to meet your exact specifications. See page 14 for more information.

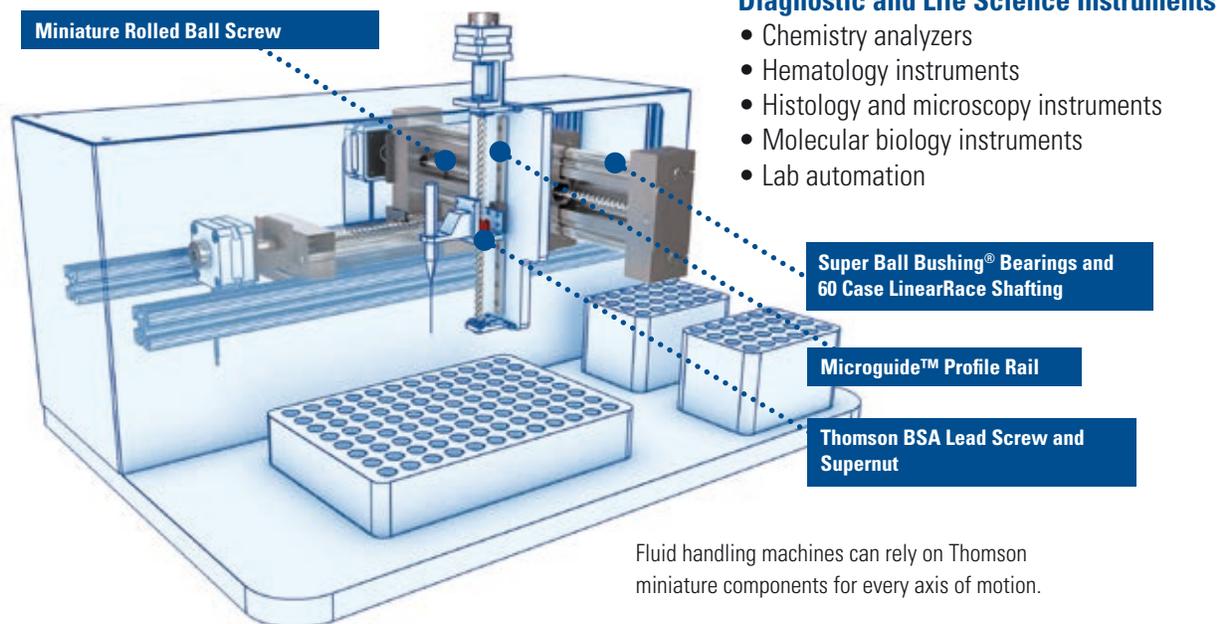
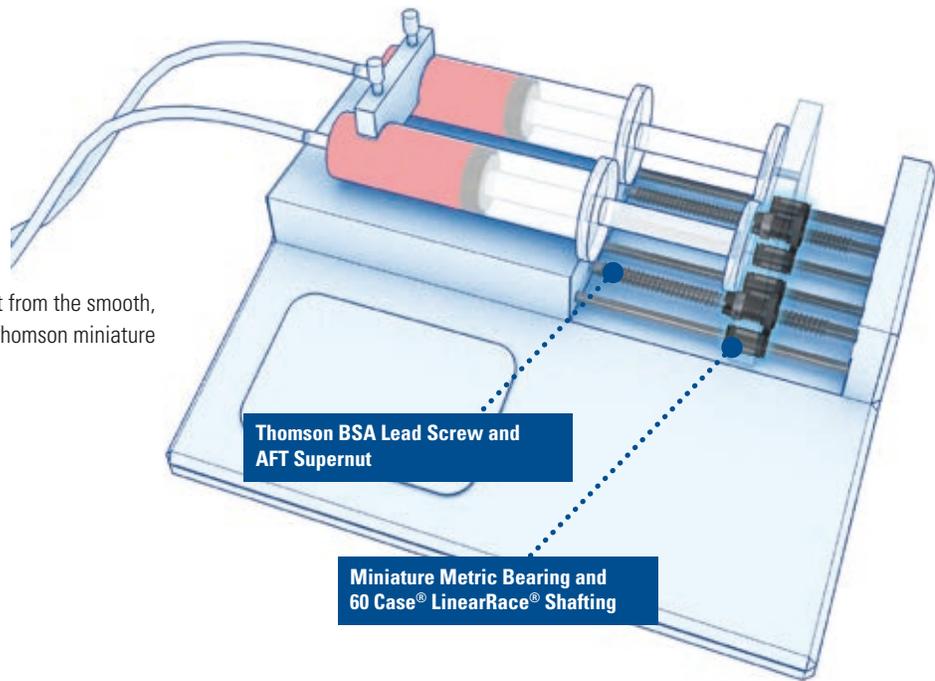
## Applications

Miniature linear motion components are ideal for applications where precise movement of small loads is critical. In particular, they add value in instruments for medical diagnostics, test and measurement equipment, and engraving and printing, as well as a broad range of fluid pumping and pick-and-place applications.

### Fluid Pumping

- Medical infusion pumps
- Industrial fluid pumps
- Lubrication pumps
- Syringe pumps

Fluid pumps benefit from the smooth, precise motion of Thomson miniature components.



### Diagnostic and Life Science Instruments

- Chemistry analyzers
- Hematology instruments
- Histology and microscopy instruments
- Molecular biology instruments
- Lab automation

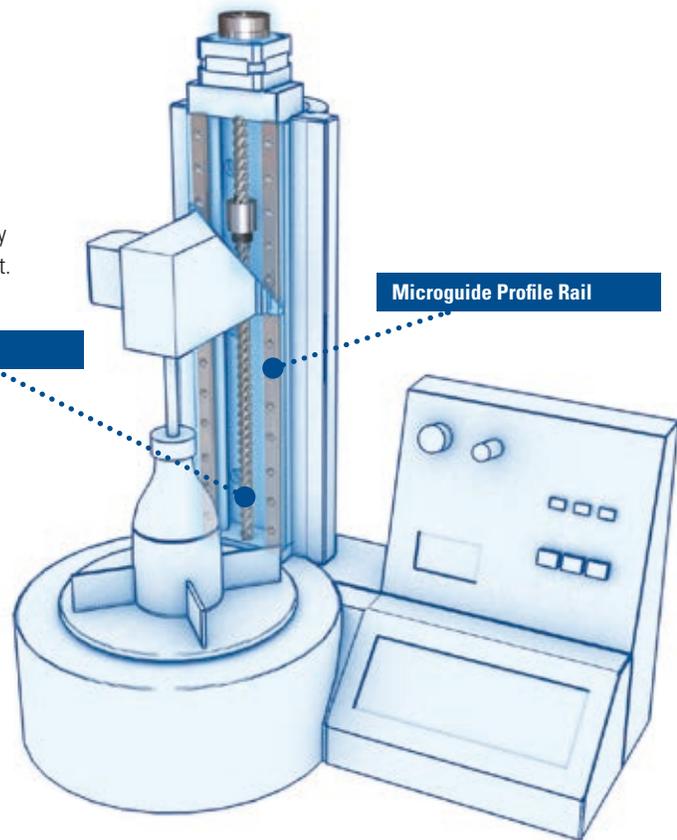
Fluid handling machines can rely on Thomson miniature components for every axis of motion.

# Applications

## Test and Measurement Equipment

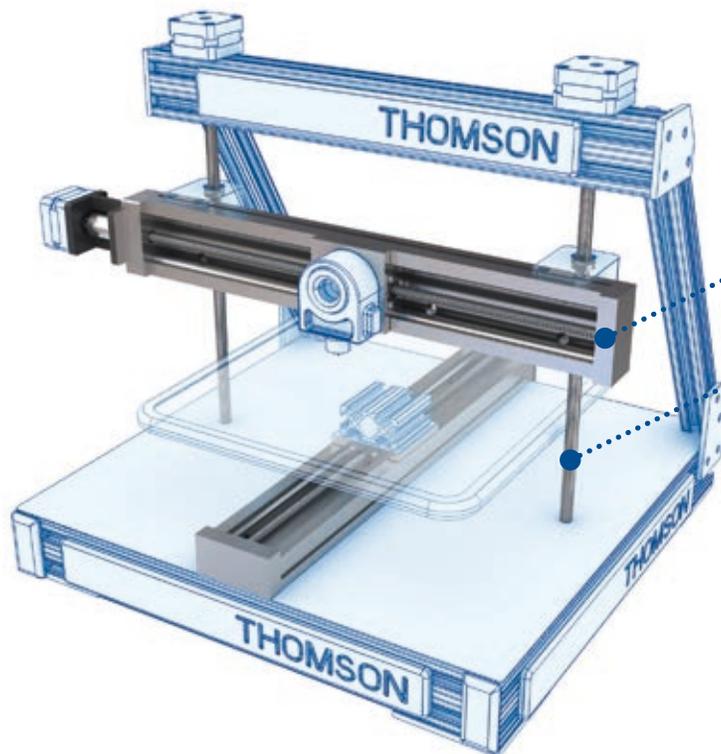
- Torque testers
- Load and pull testers

Cap tightening/inspection machines utilize a system of miniature Thomson components that have been engineered to work together, thereby reducing design time and overall time to market.



## Robotics and Pick & Place Equipment

- Engraving, scanning and printing machines
- Electronics manufacturing equipment
- Medical surgery manipulators/robots
- Manipulators for use in hazardous areas
- Camera inspection equipment



MicroStage® Linear Motion System

Glide Screw™

Thomson provides custom sizes, finishes and materials for engraving/printing machines to deliver an optimized solution.

## Other Applications

- Portable installations (e.g. bedside scanner)
- Portable ventilators
- Dosage equipment
- Electronics manufacturing equipment
- Inspection, scanning and printing equipment
- Packaging and dispensing equipment
- Aerospace and defense applications
- Vending machines

# Lead Screws

## Thomson BSA Lead Screw and Supernut (MTS, AFT and XC)



### Main Features

#### Thomson BSA Lead Screw

- Lead accuracy up to 0.003 in./ft. (75 µm/300 mm)
- Highly customizable solutions for OEM applications
- Precision screw machining
- Optional materials and coatings available

#### Supernut MTS

- Excellent lubricity and dimensional stability
- Cost-effective manufacturing, including integral flange

#### Supernut AFT

- Designed for light load applications
- Offers smooth movement and low drag torque
- Anti-backlash adjusts for wear for the life of the nut

#### Supernut XC

- Utilizes Thomson BSA patented ActiveCAM technology
- Offers low drag torque and high axial stiffness
- Anti-backlash ensures consistent performance and repeatability

Microsite: [www.thomsonlinear.com/mini](http://www.thomsonlinear.com/mini)

Visit our microsite for more information on our miniature products offering.

Website: [www.thomsonlinear.com](http://www.thomsonlinear.com)

Visit the lead screw section on our website to see our complete range of lead screws and find useful resources such as:

- Product selector
- Linear Motioneering sizing and selection software
- CAD models
- Webinars
- Literature and technical articles

### Performance Specifications

Product Line		Supernut		
Model		MTS	AFT	XC
Screw diameter range				
metric version	[mm]	6 – 20	10	6 – 24
inch version	[in.]	3/16 – 3/4	3/8 – 1/2	3/16 – 1
Lead range				
metric version	[mm]	1 – 50	2 – 20	1 – 50
inch version	[in.]	0.031 – 2.000	0.050 – 1.200	0.050 – 2.000
Backlash		[mm]	0	0
Axial design load, maximum		[N]	110	1560
Accuracy, standard rolled (precision rolled)		[µm/300 mm]	250 (75)	
Maintenance		Designed to minimize preventative maintenance		

# Ball Screws

## Miniature Metric Rolled Ball Screws



### Main Features

- Design maximizes load capacity
- Quiet and smooth performance
- Flexible ball nut mounting configurations and rapid prototyping
- Exceeds 100% more capacity than competition in most sizes
- Higher load capacity equates to longer life
- Precision rolled screws to T7 accuracy class

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### Performance Specifications

Product Line					
Screw diameter, nominal	[mm]	10	10	10	12
Lead	[mm]	2	3	10	2
Nut size (diameter × length)	[mm]	∅19.5 × 22	∅21 × 29	∅23 × 35	∅20 × 40
Dynamic load capacity <sup>(1)</sup>	[kN]	2.0	4.8	2.9	6.8
Static load capacity	[kN]	3.4	8.6	5.2	13.1
Length of screw, maximum	[mm]	1800			
Axial backlash, maximum	[mm]	0.05			
Material		Carbon Steel			
Maintenance		High load density ensures maximum life			

(1) L10 life is based on one million revolutions.

# Linear Bearings

## 60 Case® LinearRace® Shafting and Linear Bearings (INST, MM and SP)



### Main Features

#### 60 Case LinearRace Shafting

- Manufactured to the highest quality standards
- Different materials, surface treatments and special machining available

#### Miniature Instrument Bearing (INST)

- High accuracy and responsiveness
- For smaller loads

#### Miniature Metric Bearing (MM)

- Light and compact
- Up to 27 times longer life than conventional linear bearings

#### Super Ball Bushing® Bearing (SP)

- Low cost, easy to install and long life
- Industry standard for self-aligning linear bearings

Microsite: [www.thomsonlinear.com/mini](http://www.thomsonlinear.com/mini)

Visit our microsite for more information on our miniature products offering.

Website: [www.thomsonlinear.com](http://www.thomsonlinear.com)

Visit the linear bearings and guides section on our website to see our complete range of linear bearings and guides and find useful resources such as:

- Product selector
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- CAD models
- Webinars
- Literature and technical articles

### Performance Specifications

Product Line	Unit of measure version	Miniature Instrument (INST)		Miniature Metric (MM)		Super Ball Bushing (SP)	
		Inch	Metric	Metric	Inch		
Shafting size range							
metric version	[mm]	-	3 – 12	12 – 40	-		
inch version	[in.]	1/8 – 1/4	-	-	1/2 – 1-1/2		
Dynamic bearing load, maximum							
metric version	[N]	84	650	14700	-		
inch version	[lbf]			-	3000		
Linear speed, maximum	[m/s]	3					
Friction coefficient		0.001 - 0.004					
Bearing material (standard configuration)		440 stainless steel		Carbon steel and delrin			
Maintenance		Light lubrication					

# Profile Rail Guides

## Microguide™ (TSR)



### Main Features

- Low profile
- Comes in two profile styles - standard and wide
- Available in two accuracy classes - H and P
- Quiet and smooth operation
- Low weight
- Industry standard, drop-in replacement
- High moment load capacity
- Two-track, gothic-arch ball groove geometry enables single rail application

Microsite: [www.thomsonlinear.com/mini](http://www.thomsonlinear.com/mini)

Visit our microsite for more information on our miniature products offering.

Website: [www.thomsonlinear.com](http://www.thomsonlinear.com)

Visit the profile rail bearings section on our website to see our complete range of linear bearings and guides and find useful resources such as:

- Product selector
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- Webinars
- Literature and technical articles

### Performance Specifications

Product Line		Microguide								
Model		TSR5Z	TSR7Z	TSR7ZW	TSR9Z	TSR9ZW	TSR12Z	TSR12ZW	TSR15Z	TSR15ZW
Size of carriage and rail (width × height)	[mm]	6 × 12	8 × 17	9 × 25	10 × 20	12 × 30	13 × 27	14 × 40	16 × 32	16 × 60
Rail length, minimum/maximum	[mm]	40/160	40/1000	50/1010	55/1015	50/1010	70/1020	70/1030	150/1030	110/1030
Dynamic load, maximum	[N]	336	924	1370	1544	2450	2780	4020	4410	6660
Linear speed, maximum	[m/s]	3								
Acceleration, maximum	[m/s <sup>2</sup> ]	50								
Accuracy	[± mm]	up to 0.01								
Material	[kg/m]	440 stainless steel								
Maintenance		Little or no lubrication								

# Glide Screws

## Glide Screw™ (GS)



### Main Features

- Lead screw and linear bearing combined
- Patented design
- Aligned from factory
- Side load and moment load capable
- Integrated lubrication block - no maintenance required
- Smooth and quiet motion
- Cylindrical or flanged nuts available
- Versions for high temperature, clean room and food grade applications available

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Visit our microsite for more information on our miniature products offering.

Website: [www.thomsonlinear.com](http://www.thomsonlinear.com)

Visit the Glide Screw section on our website to see our complete range of glide screws and find useful resources such as:

- Product selector
- CAD models
- Webinars
- Literature and technical articles

### Performance Specifications

Product Line		Glide Screw					
Model		GS4	GS6	GS10	GS18	GS25	GS37
Screw diameter							
metric version	[mm]	4	6	10	-	-	-
inch version	[in.]	-	-	-	0.188	0.250	0.375
Screw lead							
metric version	[mm]	1, 4, 8	1, 6, 12	2, 6, 12	-	-	-
inch version	[in.]	-	-	-	0.05, 0.125	0.05, 0.5, 0.75	0.063, 0.5, 1
Screw length, maximum							
metric version	[mm]	150	250	450	-	-	-
inch version	[in.]	-	-	-	6	10	18
Axial load, maximum							
metric version	[N]	89.0	133.4	311.4	-	-	-
inch version	[lbs]	-	-	-	30	45	70
Moment load, maximum							
metric version	[Nm]	2.3	5.4	15.5	-	-	-
inch version	[in-lbs]	-	-	-	20.5	47.5	137.5
Maintenance		Maintenance free					

# Linear Motion Systems

## MicroStage® (MS25 and MS33)



### Main Features

- Ultra compact
- Low cost
- Low weight
- High accuracy and repeatability
- Smooth motion
- Corrosion-resistant options available
- RediMount™ motor mounting kit included

Microsite: [www.thomsonlinear.com/mini](http://www.thomsonlinear.com/mini)

Visit our microsite for more information on our miniature products offering.

Website: [www.thomsonlinear.com](http://www.thomsonlinear.com)

Visit the linear motion systems section on our website to see our complete range of linear motion systems and find useful resources such as:

- Product selector
- Linear Motioneering sizing and selection software
- CAD models
- Webinars
- Literature and technical articles

### Performance Specifications

Product Line		MicroStage	
Model		MS25	MS33
Profile size (width × height)	[mm]	50 × 25	60 × 33
Dynamic carriage load, maximum	[N]	100	150
Stroke length, maximum	[mm]	705.5	704
Linear speed, maximum	[m/s]	0.85	1.02
Accuracy	[± mm]	0.18 / 300	
Repeatability	[± mm]	0.005	
Type of screw		Lead screw	
Maintenance		Lubrication of screws and guides	

## Customization

Applications often have unique challenges that cannot always be solved by an off-the-shelf solution. Thomson specializes in providing custom-engineered solutions quickly and cost effectively to address these requirements.

Thomson has proven that custom designs can offer optimum performance at a low overall cost. 3D CAD design, rapid prototyping and flexible manufacturing have made customization a faster process. Once the product is ready and approved, it will be manufactured and shipped as quickly as a standard product.



A selection of custom lead screw nuts

### Selection of Customization Possibilities

Type of customization	Examples
Custom materials	<ul style="list-style-type: none"> <li>• Stainless steel bearings or an aluminium/plastic housing</li> <li>• Nuts or bushings made in a special metal, plastic, composite or ceramic material</li> <li>• Replacement of hardware to meet demands in special environments</li> </ul>
Custom surface treatment	<ul style="list-style-type: none"> <li>• Paint of different quality and/or color</li> <li>• Thicker anodization on aluminum parts</li> <li>• Specially coated screws or sliding surfaces (PTFE, chrome, black oxide, etc.)</li> </ul>
Custom size or geometry	<ul style="list-style-type: none"> <li>• Non-standard stroke lengths</li> <li>• Custom end machining or motor/mounting interfaces</li> <li>• Special nut, carriage or flange designs</li> </ul>
Custom assemblies	<ul style="list-style-type: none"> <li>• Product shipped with mounting brackets, gearboxes and/or motors mounted</li> <li>• Product shipped in parts or sub-assemblies for the customer to assemble</li> <li>• Product shipped mounted to the customer's equipment</li> </ul>
Custom services	<ul style="list-style-type: none"> <li>• Special lubrication</li> <li>• Special stocking or transportation program</li> <li>• Training of engineers, maintenance or other personnel</li> <li>• Special service, repair and/or maintenance program</li> <li>• Special packaging, testing, certification or quality control procedures</li> <li>• Engineering evaluation</li> </ul>
New designs	<ul style="list-style-type: none"> <li>• Change or combine one or several products into a new product</li> <li>• Clean sheet designs</li> </ul>



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