

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 Ball Screws



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

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 - Flanged Miniature Metric - Threaded Miniature Metric - Cylindrical | 9 | 8 – 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.



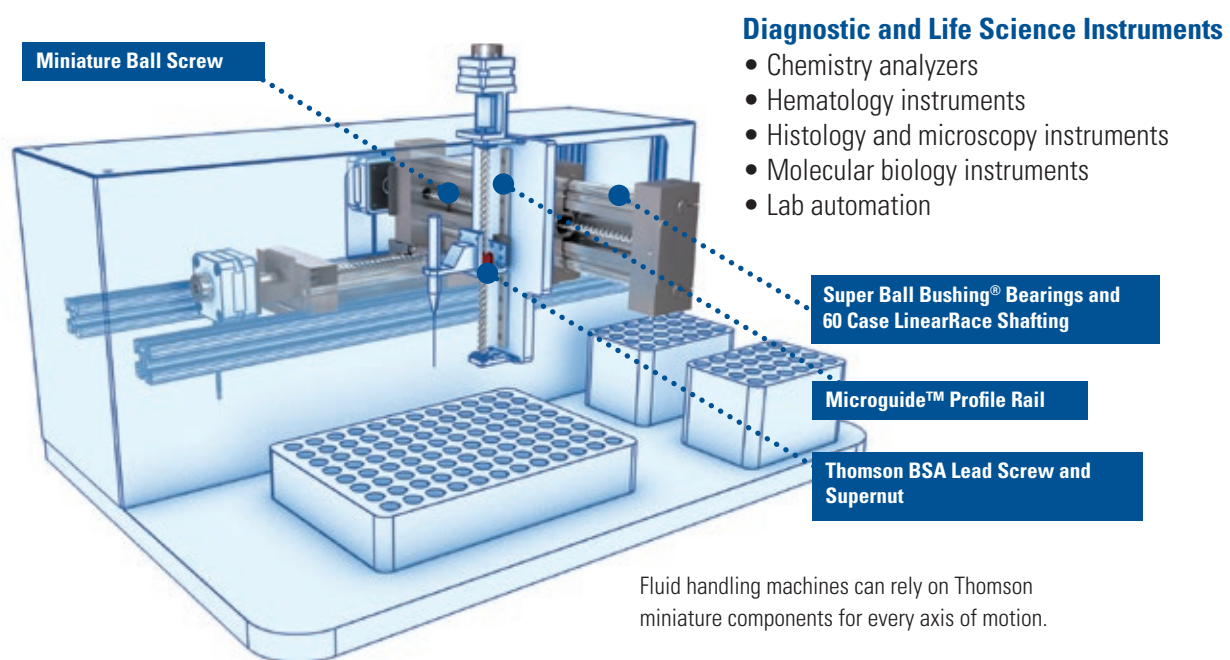
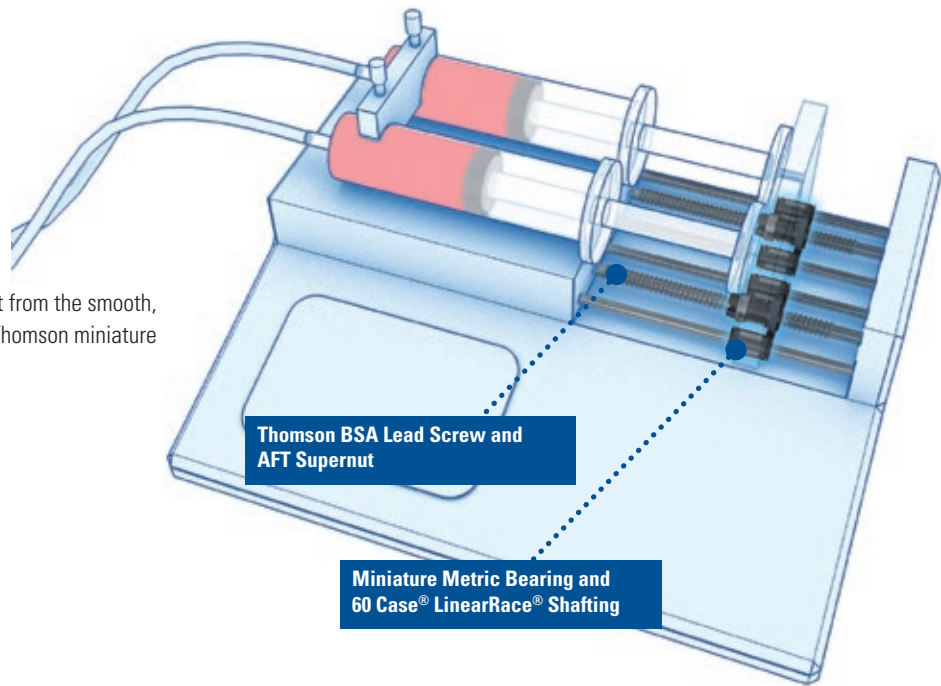
Applications

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.

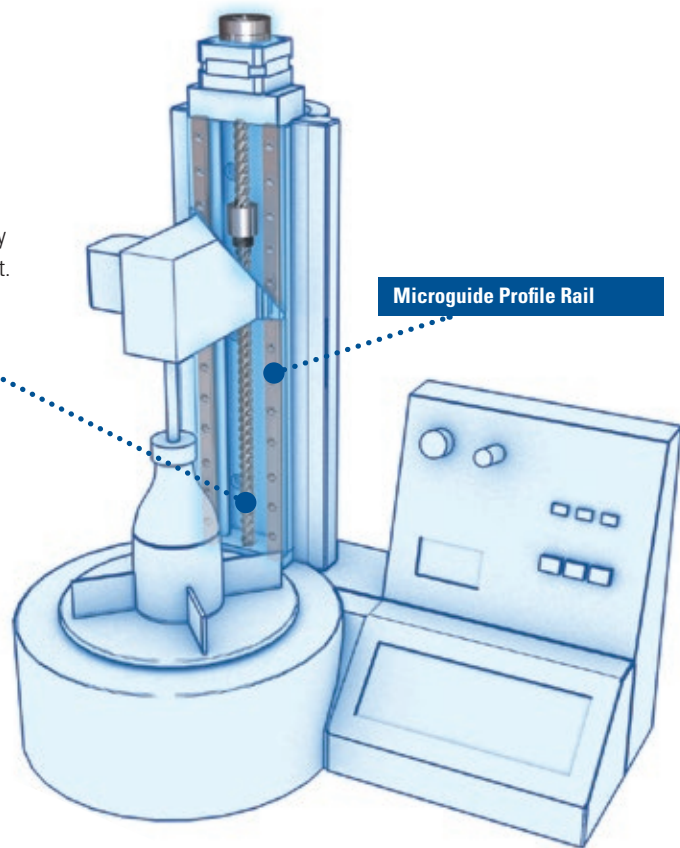


Applications

Test and Measurement Equipment

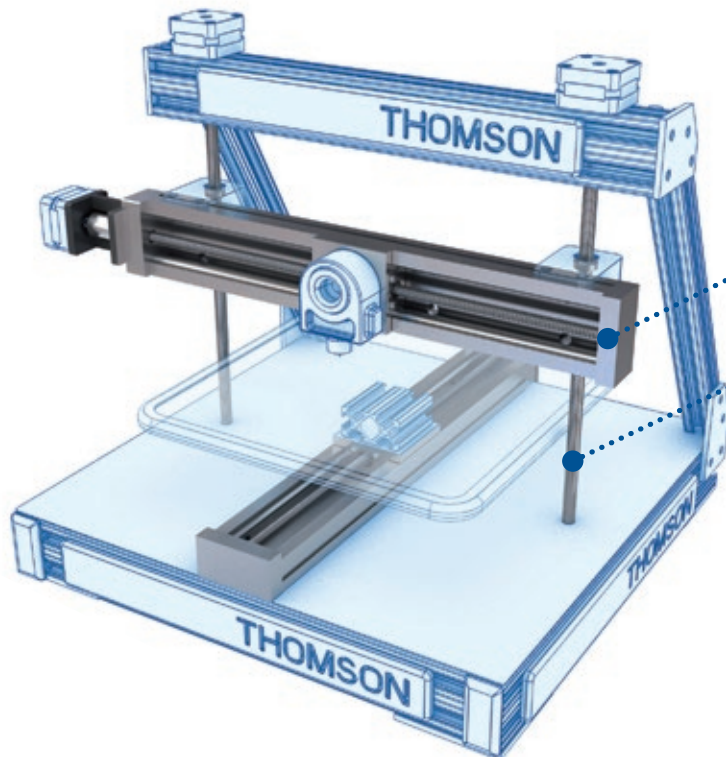
- Torque testers
- Load and pull testers

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

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

Website: 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] | < 0.254 | 0 | 0 |
| Axial design load, maximum | [N] | 1225 | 110 | 1560 |
| Accuracy, standard rolled (precision rolled) | [µm/300 mm] | 250 (75) | | |
| Maintenance | Designed to minimize preventative maintenance | | | |

Ball Screws

Miniature Metric Ball Screws (Rolled/Ground)



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 ball screws to P5 accuracy class

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Performance Specifications

| Product Line | | Miniature, metric, rolled/ground | | | | |
|---------------------------------------|------|----------------------------------|--------|---------------------|--------|--------|
| Screw diameter, nominal | [mm] | 8 | 8 | 10 | 10 | 12 |
| Lead | [mm] | 2,5 | 5 | 2 | 3 | 2 |
| Nut size (diameter × length) | [mm] | ∅16×18 | ∅16×23 | ∅19×24 | ∅19×29 | ∅24×34 |
| Dynamic load capacity ^{(1)*} | [kN] | 2.1 | 2.5 | 3.7 | 5.2 | 5.9 |
| Static load capacity* | [kN] | 2.2 | 2.8 | 4.6 | 6.9 | 8.9 |
| Ball diameter | [mm] | 1.588 | 1.588 | 1.588 | 1.588 | 1.588 |
| Length of screw, maximum | [mm] | 280 | 280 | 3000 | 3000 | 3000 |
| Axial backlash, maximum | [mm] | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| Material | | Carbon Steel - AISI 1566 | | Carbon Steel - CF53 | | |

Maintenance

High load density ensures maximum life

(1) Based on one million revolutions.

* Load rating calculations comply with ISO 3408-5.



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

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

Website: 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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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

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

Website: 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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- 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 ²] | 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

Microsite: www.thomsonlinear.com/mini

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

Website: 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

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Website: www.thomsonlinear.com

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

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