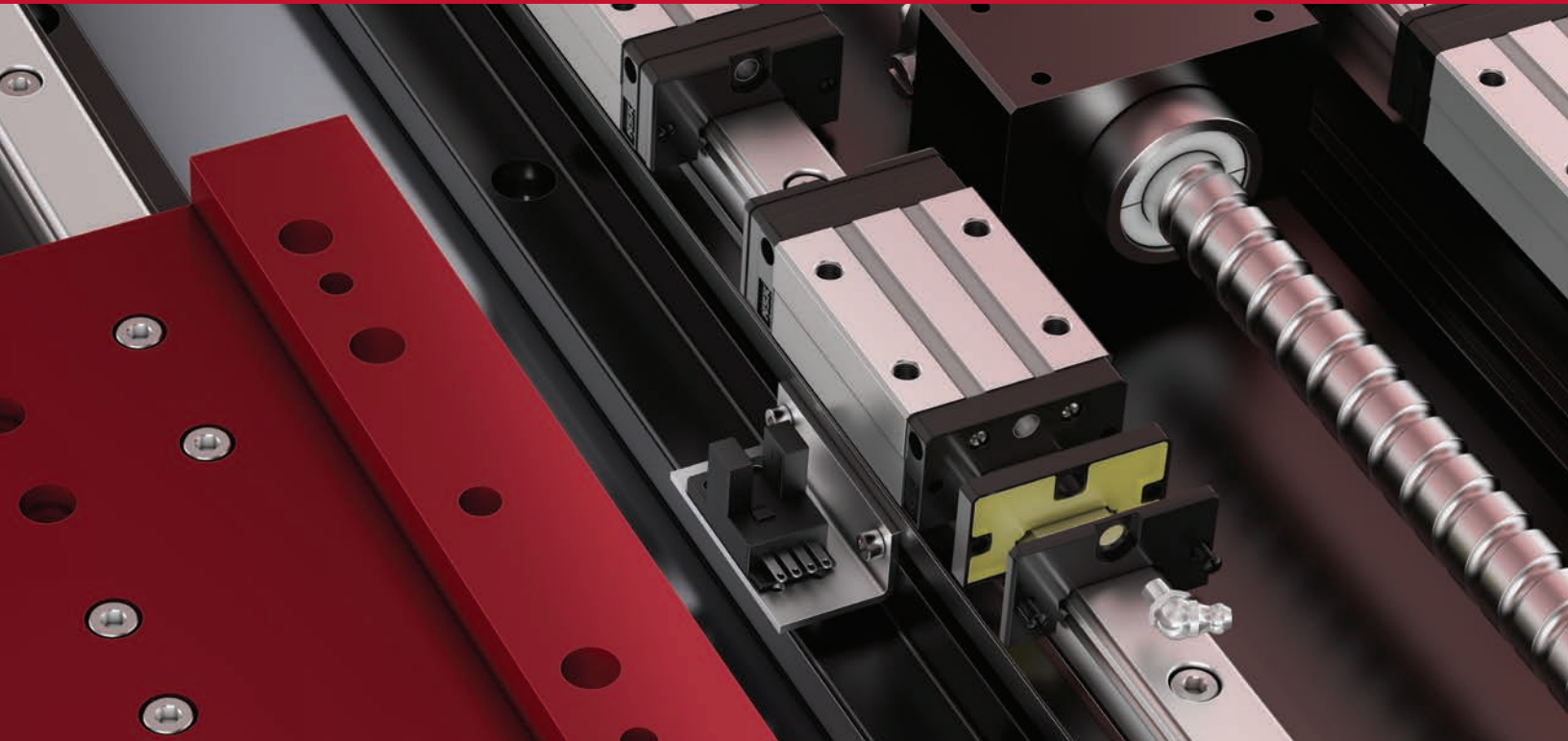


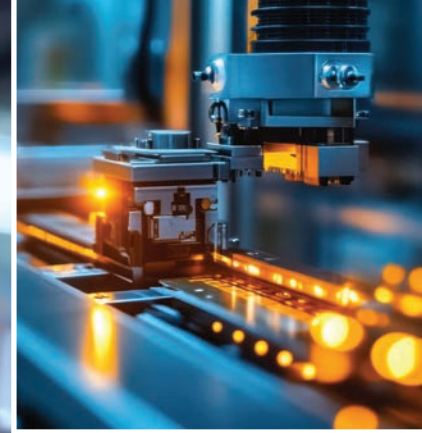
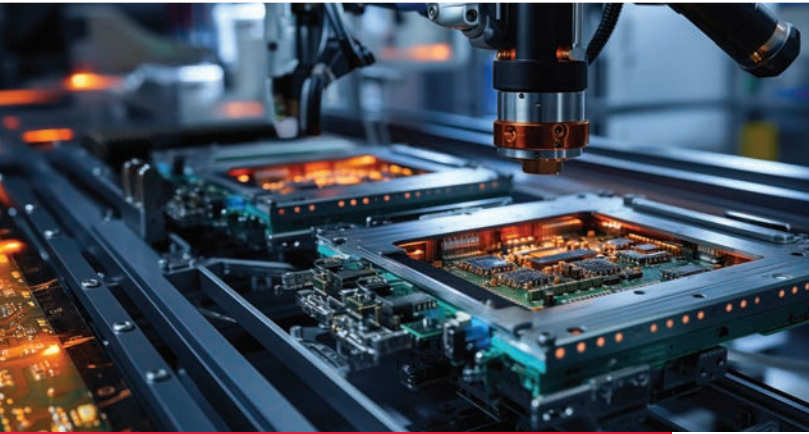


# PRECISION MACHINE COMPONENTS

CORE PRODUCTS AND INTEGRATED SYSTEMS SOLUTIONS



ENABLING AUTOMATION IN MOTION & CONTROL



## ENABLING INNOVATION AND AUTOMATION

## PRECISION MACHINE COMPONENTS AND INTEGRATED SYSTEMS

For decades, NSK has specialized in developing electromechanical solutions – integrating our precision machine components with control technology – to deliver advanced, reliable and precise motion and control.

Robotic surgery. Medical imaging. Biomedicine. Semiconductor. 3D printing. Factory automation. Our customers are vast and diverse, united by precision-critical applications and NSK's ability to achieve coherent mechatronic solutions that offer:

- › Augmented machine function and accuracy
- › Optimized system performance, space and life
- › Reduced costs and complexity

From complex systems to single-axis solutions, NSK delivers innovative and ideal integrated motion solutions to enable automation and accuracy in machine function, for a competitive edge to our customers.

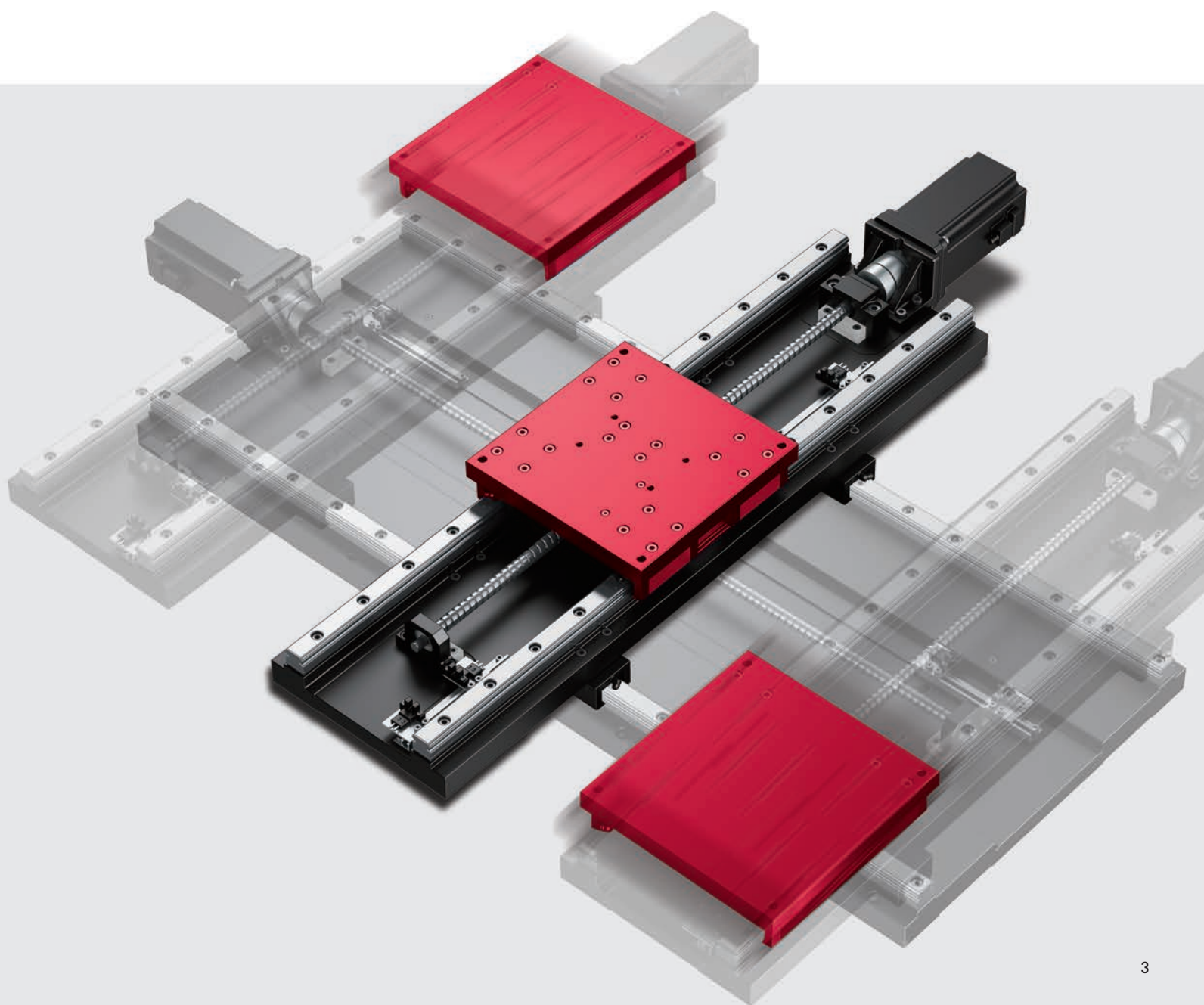


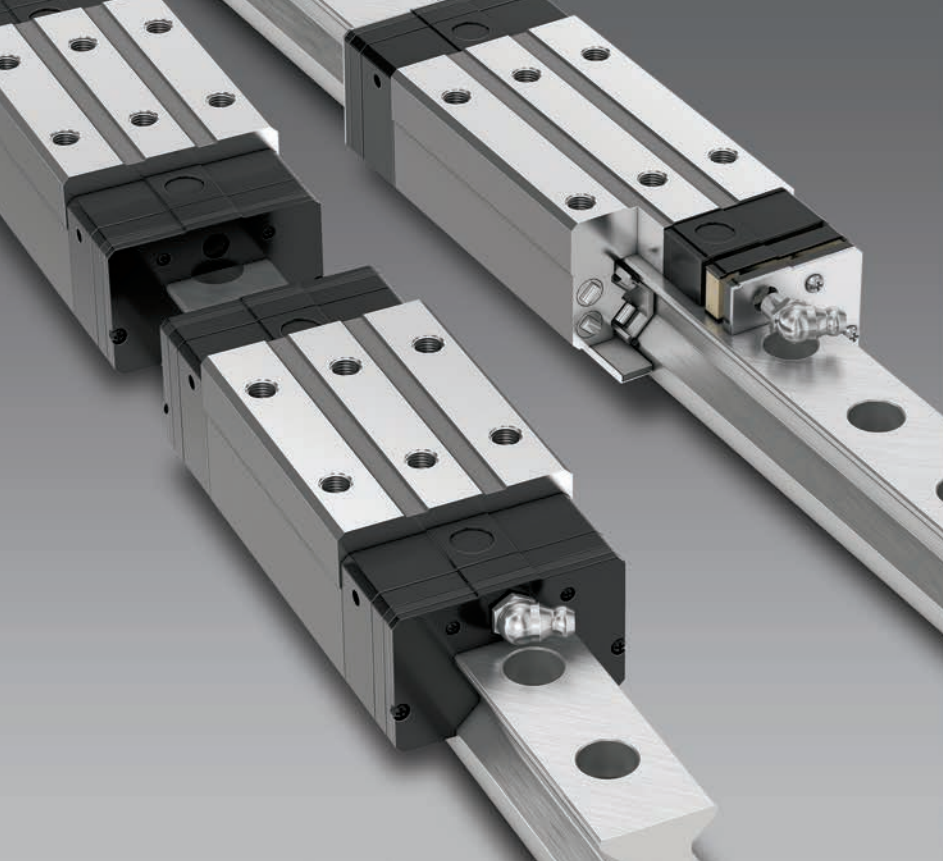
## CORE PRODUCT TECHNOLOGIES

NSK applies accumulated expertise in rolling bearing and friction control technologies to deliver smooth and precise linear motion and indexing from a wide range of core products and integrated solutions.

### FEATURED PRODUCT LINEUP

- › Linear ball and roller guides
- › Precision ground ball screws
- › Linear actuators





Pictured above, clockwise from left: RA series roller guides; long-life DH/DS series ball guides; K1-L lubrication units

## NSK LINEAR GUIDES

### INTERCHANGEABLE NH/NS SERIES

- › Long-life linear guides offering maximum precision with extremely high load ratings

### LONG-LIFE DH/DS SERIES

- › With TF heat treatment technology for longer life in contaminated environments

### DUST-RESISTANT VH SERIES

- › Unrivalled protection against the ingress of contaminants

### MINIATURE PU/PE SERIES

- › Light-weight and compact for semiconductor and medical equipment

### HIGH RIGIDITY RA ROLLER GUIDES

- › Super-high load capacity and rigidity for high durability in machine tools

## OPTIMIZED PRECISION AND RATING LIFE: NH/NS

NSK'S NH/NS series linear guides deliver unparalleled performance for a long, reliable service life. Advanced ball circulation geometry enables smooth and quiet performance at high speeds. Optimized distribution of contact surface pressures accommodates extremely high loads. Outstanding accuracy ensures precise positioning and optimally controlled motion.

### PROVEN ADVANTAGES

- › Higher load capacity delivers a safe and longer service life and enables potential for downsizing
- › Optimum absorption of impact loads, withstanding crash events
- › Advanced ball recirculation delivers higher speeds
- › Inherent aligning ability facilitates easy assembly with lower mounting preparation costs



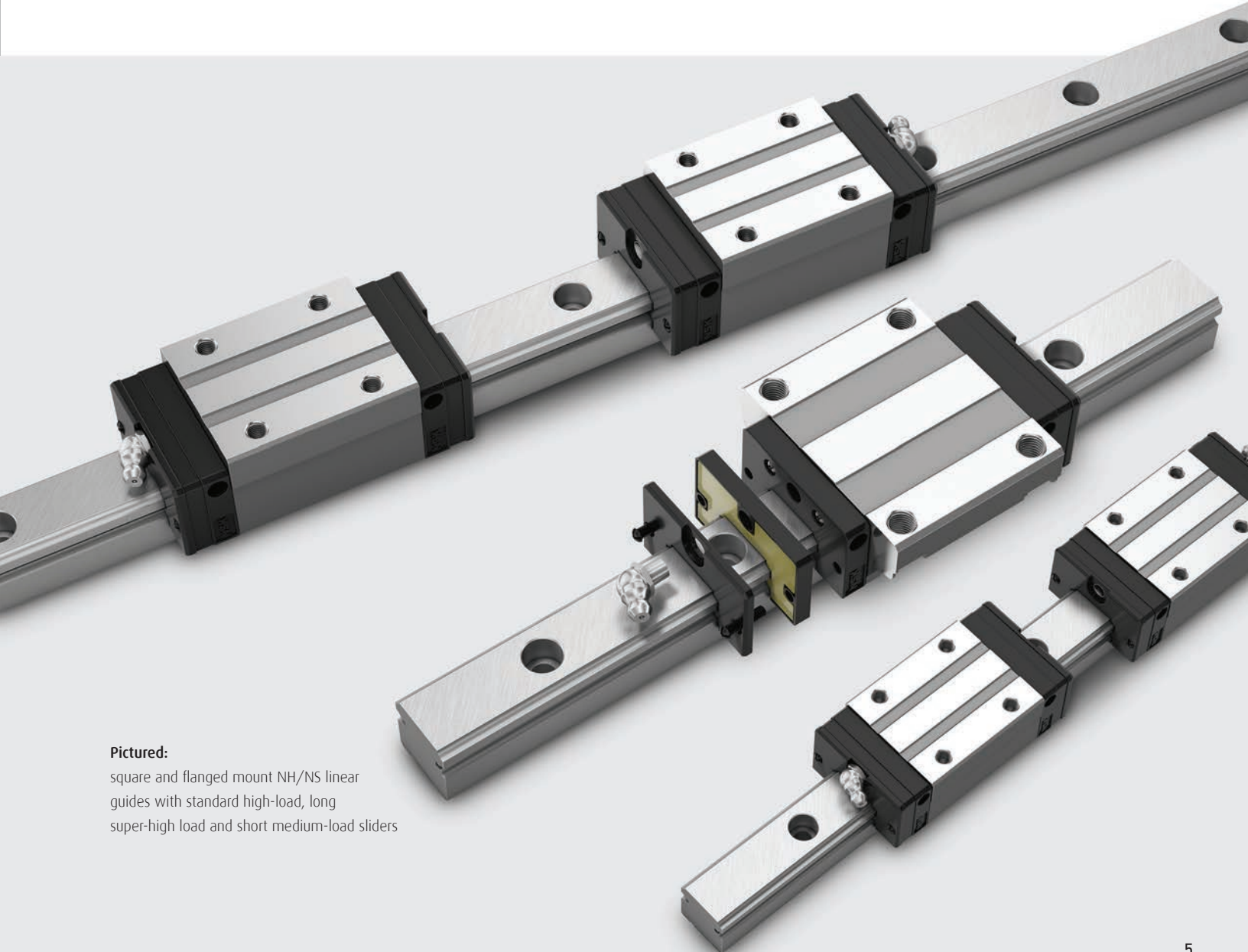
Contact NSK for "Quick Ship" delivery of standard linear guides with 3-5 day lead time

## LONG-TERM, LOW MAINTENANCE LUBRICATION: K1-L

NSK K1-L lubricating units are made of a porous synthetic resin containing abundant lubricating oil. Through contact with the rail raceway close to the ball contact point, a constant supply of fresh oil increases mean time between maintenance with reduced energy and environmental impacts.

### PROVEN ADVANTAGES

- › Maintenance-free operation up to 5 years / 10,000 kilometers
- › Lowers operating costs, maximizes up-time and throughput
- › Suitable for clean room, vacuum and high temperature environments



**Pictured:**  
square and flanged mount NH/NS linear  
guides with standard high-load, long  
super-high load and short medium-load sliders





Pictured above from left: BSBD series ball screw support bearings; dust-resistant X1 seals

## NSK PRECISION GROUND BALL SCREWS

### COMPACT FA SERIES

- › High-speed and low-noise operation for a range of applications

### HMD / HMS / HSS SERIES

- › High-speed and high-load capacity for machine tools

### HTF SERIES

- › Super high-load capacity with high-speed operation for injection molding machines

### PRECISION SUPPORT BEARINGS

- › High-accuracy positioning of workpieces or machine components

### SUPPORT UNITS

- › For fixed and simple support ends in small equipment and machine tools

## PIONEERING FRICTION CONTROL TECHNOLOGY FOR HIGH EFFICIENCY

NSK is renowned globally for unmatched precision accuracy and durability in ball screws for general machinery, machine tools, injection molding, semiconductor and life sciences.

### PROVEN ADVANTAGES

- › Precision-machined with C0 to C7 accuracy for high rigidity and smooth, quiet operation
- › Wide-ranging design solutions from miniature to ultra-large sizes with screw shaft diameters as great as 250 mm for lengths up to 14 meters
- › NSK Precision Americas - the largest domestic manufacturing and design partner for precision ground ball screws with shaft diameters up to 63 mm and lengths of 2 meters
- › K1 lubrication units and high performance seal solutions deliver reliability even under extremely challenging environments



**Contact NSK** for "Quick Ship" delivery of standard series modification with 2-4 week lead time

## LONG-LIFE CONTAMINATION RESISTANCE: X1 SEALS

NSK's optimized X1 seal design combines high dust-proof performance with high grease retention, delivering wear-resistant, long-term sealing performance with reduced environmental impact to ball screws for machine tool and comparable applications.

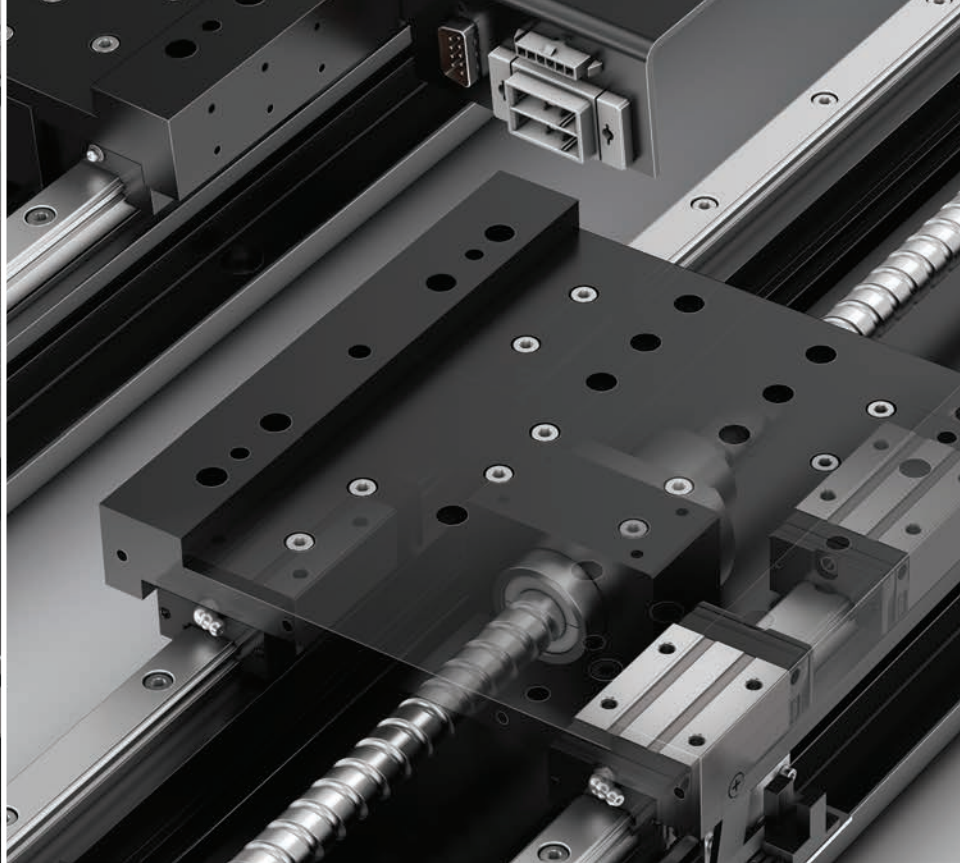
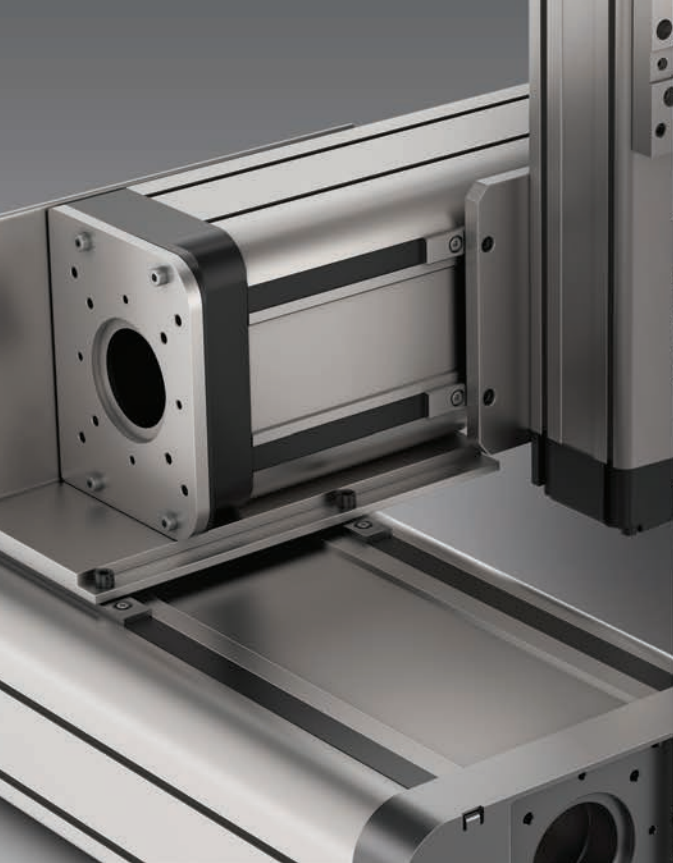
### PROVEN ADVANTAGES

- › Particle contaminant penetration is reduced to 1/30th of standard seals
- › Superior grease retention reduces consumption and splatter
- › Optimized geometry for low torque



**Pictured:**

high-speed, low-noise series HSS ball screws with return tube (top) and deflector (bottom) recirculation



Pictured above from left: MR series robot modules in an XYZ configuration; AXIS series ball screw drive and linear motor drive actuators

## NSK LINEAR ACTUATORS

### MONOCARRIER™ SERIES MCM

- › Compact, low-profile type

### MONOCARRIER™ SERIES MCH

- › Interchangeable type

### TOUGHCARRIER™ SERIES TCH

- › Heavy-duty roller guide type

### AXIS SERIES LMAX

- › Linear motor drive technology

### AXIS SERIES BMAX

- › Precision ball screw drive technology

### ROBOT MODULE SERIES MR

- › Motor-ready and XYZ configurable

## TURNKEY, INTEGRATED PRECISION: MONOCARRIER

With our pioneering Monocarrier series, NSK seamlessly integrates our accumulated expertise with ball screws, linear guides, and support bearings into a lightweight, compact, highly precise and ready-to-install single-axis actuator.

### PROVEN ADVANTAGES

- › All series offer a wide selection of ball screw leads
- › With single and double sliders for most model sizes
- › Equipped with long-term, maintenance-free K1™ lubrication units
- › All can be fully accessorized with cover units, sensor kits, motor mounts to plug-and-play, and combining brackets to create multi-axis solutions



**Contact NSK** for “Quick Ship” delivery of standard linear actuators with 2-4 week lead time



## PRECISION ENGINEERED POWER: AXIS SERIES

NSK AXIS series delivers robust, ultra-accurate, high-speed linear motion with revolutionary linear motor and ball screw drive technology options. Modular and interchangeable, they offer seamless integration with servo / stepper motor compatibility (BMAX) and universal position feedback (LMAX).

### PROVEN ADVANTAGES

- › Wide-reaching positioning with travel distances up to 3.8 meters
- › Indexing speed as high as 5 m/s with sub-micron accuracy
- › Effortless, accurate installation with multiple base datum planes



**Pictured from right:**  
double slider compact MCM Monocarrier, interchangeable  
MCH Monocarrier and heavy-duty TCH Toughcarrier



## PARTNERING TO ACCELERATE INNOVATION

NSK Americas automation experts and integration teams bring decades of accumulated expertise in materials engineering, tribology and mechatronic integration. With the capacity and prowess to manufacture domestically at our Franklin, Indiana facility, our ability to respond quickly and precisely to customer needs is unsurpassed in the industry.

### PROVEN ADVANTAGES

- › **Experience** – NSK partners with companies in virtually every industry. Our depth of experience enables us to bring field-proven solutions to our customers, supporting them with accelerated innovation and automation in robotics, medical, semiconductor, material handling, electronics, automotive assembly and limitless automation applications
- › **Fit** – We tailor our solutions to meet the performance requirements of our customers. We bring robust resources to bear on design, deployment and speed to market
- › **End-to-end optimization** – With NSK experts our customers can count on life-cycle optimization with solution design and development, project management and after-sales technical support and service

**NSK**





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