

Precision Products



GLOBAL No.1

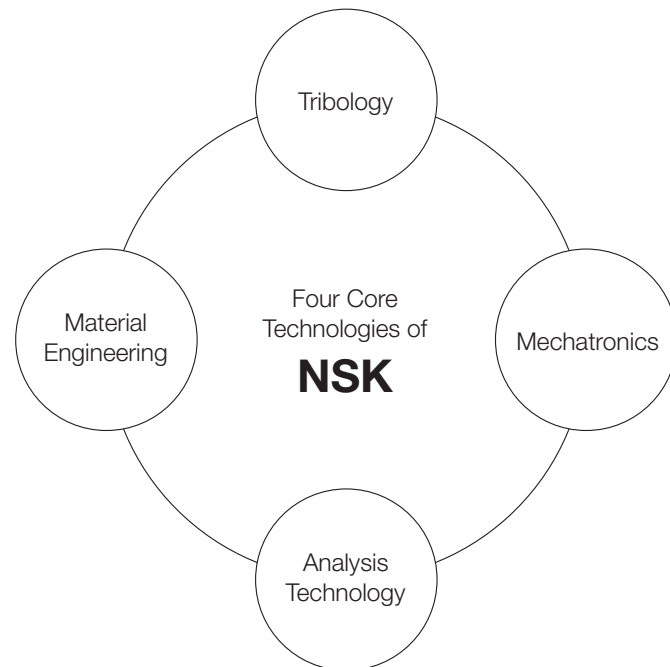
NSK is contributing to the growth of the manufacturing industry on a global scale by providing the world's No.1 ball screws.

NSK's ball screws—the fruit of the most advanced tribology (friction control technology)—are produced in greater numbers than those of any other maker based on the strength of the renowned production technology and quality control of NSK, widely recognized as the world's leading brand.

Every NSK ball screw product benefits from industry-leading production technology and therefore reflects the world's highest level of quality with unmatched adaptability for a wide variety of applications, including machine tools, injection molding machinery as well as semiconductor and liquid crystal production equipment.

The exceptional reliability of NSK's ball screws has earned them a solid reputation in the global precision machinery industry.

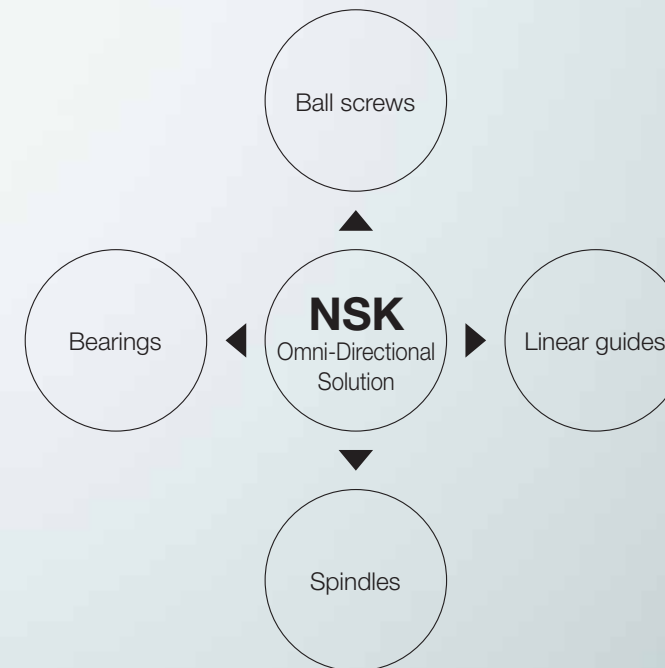
Advanced Technology Leading the World





NSK TOTAL SOLUTION

NSK is the only maker that comprehensively develops and provides a full range of precision products.



Ball screws, incorporating leading-edge technologies and recognized as No.1 in the world;

Linear guides, manufactured through a production technology that ensures high accuracy and premier quality;

Spindles, renowned for their high-speed rotation capability and acknowledged as the best in class; and

Bearings, reflecting the essence of NSK technological superiority and exhibiting unparalleled capabilities in extensive applications across the world.

NSK's full range of precision products responds to sophisticated customer requirements and ensures the smooth operation of precision machinery as well as total optimization.



NSK Technology for Machine Tools

- NSK Roller Guides—RA Series
- Ball Screws for High-Speed Machine Tools—HMD Series
- High-Speed and Low-Noise Ball Screws—BSS Series
- High-Accuracy and High-Rigidity NSK Linear Guides—High-Accuracy Series
- Precision Bearings for Machine Tools—Robust Series
- Grease Replenishing System—Fine-Lub II
- High-Speed Integrated Motor Spindles—B1 Series
- Ball Screw Support Bearings—TAC Series



Japan has long been the world's leader in the production of high-accuracy machine tools, and NSK's ball screws, linear guides and precision bearings have significantly contributed to the development and evolution of high-accuracy machine tools made in Japan. NSK has enjoyed a substantial share of the global market for precision products, a testament to its high reliability, while satisfying customer requirements for exceptional accuracy, outstanding rigidity, and high speed.

NSK Roller Guides

RA Series

>> CAT. No.E3328



The most advanced roller guides, the culmination of NSK's advanced craftsmanship, especially in analysis technology and tribology. Featuring high-load capacity, high rigidity and a complete lineup, the RA Series is appropriate for a wide range of applications.

NSK developed RA Series roller guides, the world leader in super high rigidity and high-load capacity, to switch the sliding guides of machine tools to roller guides. Specifically designed retaining pieces and roller circulation components ensure outstanding motion accuracy.

1. Long operating life

High-load capacity

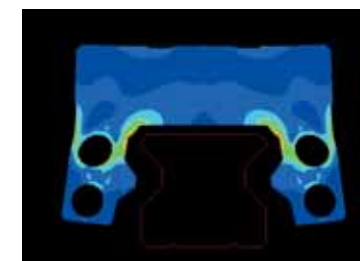
The world's premier high-load capacity, taking full advantage of NSK's analysis technology, ensures long operating life.

Maintenance free

Reliability of lubrication is improved through the use of NSK K1™ for long-term maintenance-free operation.

Highly dust-resistant specification

A high performance seal, provided as standard, prevents the entry of foreign matter and maintains the original level of sound performance for extended periods of time.



Example of bearing deformation analysis

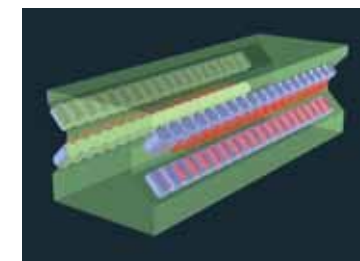
2. High accuracy and high rigidity

High rigidity

The optimum size of the roller used as a rolling element ensures high rigidity and supports more compact machinery.

High-motion accuracy

Vibrations generated by roller passage are substantially reduced by NSK's unique design method, thereby improving machining quality.



Example of analysis of pressure distribution on the roller contact surface

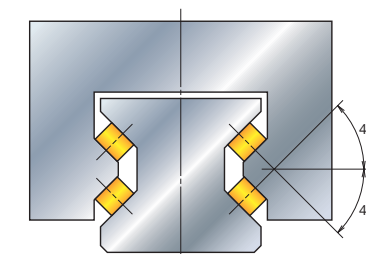
3. A wide range of applications

A complete lineup

A full lineup, from small and large options to low-profile units. A variety of products are available to choose from, according to the customer's specific application. (RA15, RA20, RA25, RA30, RA35, RA45, RA55 and RA65)

Mounting dimensions compatibility

RA Series dimensions are based on global standards allowing replacement without altering equipment design.



Cross-sectional view

Ball Screws for High-Speed Machine Tools

HMD Series

>> CAT. No.ESP-061105, 3236



Satisfying the high-speed, high-rigidity and high-load capacity requirements of the machine tool industry. Low-vibration ball screws specifically developed for machining centers.

HMD Series is an upgraded version of the best-selling HMC Series, the standard for machining centers. The series satisfies the high-speed operation requirements of machining centers, which continually demand higher performance.

1. High speed

Used with well accepted end deflectors, the HMD Series achieves the permissible rotational speed (d·n value) of 160 000 and the maximum feed speed of 120 m/min.

2. Low noise and low vibration

The end deflector recirculation circuit reduces noise and vibration levels by more than 5 dB compared with those of the conventional HMC Series.

3. High rigidity and high-load capacity

Because of a newly developed mid-deflector, a multi-row specification with various settings for preload and offset preload are available. This design affords tripled rigidity and doubled load capacity compared with conventional models. Use of NSK K1™ significantly improves lubrication life.

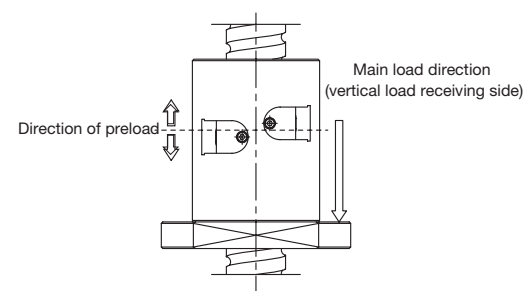
4. Vertical axis type (option)

HMD Series can accommodate compact, high-load capacity units in which the effective number of turns is increased only in the main load direction.

5. Hollow shaft type (option)

HMD Series can accommodate a hollow shaft unit for the forced cooling of the shaft center to handle ball screw heat and thermal expansion.

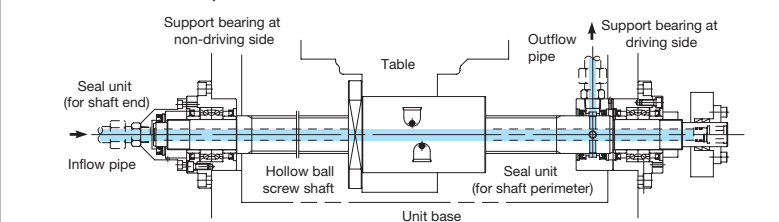
Vertical shaft example



Seal unit for hollow shaft

A special joint for hollow shaft coolant is available as an option.
For shaft end: shaft outer diameter $\phi 20$, $\phi 25$, $\phi 32$
For shaft perimeter: $\phi 32$, $\phi 40$, $\phi 50$

Installation example



High-Speed and Low-Noise Ball Screws

BSS Series

>> CAT. No.E3229

The ideal next-generation ball screws for light-load machine tools achieving high speed, low noise and compact size.

Redesigned ball circulation mechanism meets demand for even higher speeds than the HMD Series; BSS Series offers outstanding low-noise performance in machine tools and other machinery incorporating ball screws.

1. Low noise

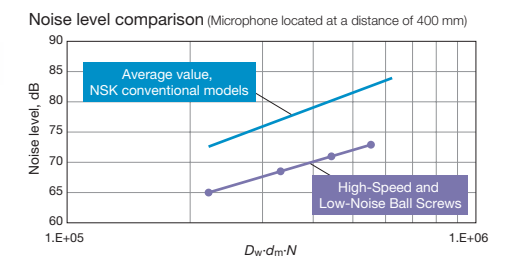
New ball circulation method ensures low-noise performance by reducing noise level by 6 dB, corresponding to an approximately 50% reduction in audible noise.

2. High speed

BSS Series ball screws can operate at super high speeds of 200 m/min, an outstanding performance compared to other ball screws.

3. Compact design

Ball nut outer diameter is 30% smaller than NSK's conventional models. Compact body allows low-profile table driving.



High-Accuracy and High-Rigidity NSK Linear Guides

High-Accuracy Series

>> CAT. No.E3329

Optimally designed ball circulation mechanism reduces vibration generated by the passage of steel balls to 1/3. Ball guides specifically designed for super high-speed machine tools or measuring equipment.

NSK's High-Accuracy Series linear guides were developed to provide rolling guides with motion accuracy equal to or better than that achieved by hydrostatic guides and sliding guides currently in vogue for high-speed machine tools. High motion accuracy and rigidity are realized by providing an extra long bearing to improve machinery motion accuracy.

1. High-accuracy rail

Pitch of mounting holes is 1/2 that of conventional models to reduce rail deformation, and NSK's ingenuity is evident in mounting holes that prevent rail deformation.

2. High rigidity

Rigidity is further improved by increasing the number of steel balls while maintaining low friction.

3. Compact design

Downsizing of machine tools and equipment can be realized while maintaining high-load capacity. Further downsizing is made possible by combining with BSS Series ball screws.



Precision Bearings for Machine Tools

Robust Series

>> CAT. No.E1257

The Robust Series represents the epitome of NSK's art, especially in material, assessment and analysis technologies and consistently supports high-performance machine tools.

This high-performance series was developed specifically for increasingly sophisticated machine tool spindles.



Super high-speed angular contact ball bearings (BNR Series) offer high-speed rotation while maintaining low heat generation.



Super high-speed single-row cylindrical roller bearings (RX Series) achieve a speed of 3 million $d_m n$.

1. Complete lineup with a wide range of products

A variety of products is available, including units that satisfy the high accuracy and high-speed rotation required by machining centers, and products that provide the high rigidity required by lathes. (Angular contact ball bearings, cylindrical roller bearings, angular contact ball bearings with seals)

2. High accuracy

More accurate ring roundness and the most advanced engineered polymer technology used for cages make rotation smoother.

3. High speed

Combination of small-diameter balls and specifically designed grooves boost speed by 20% over standard angular contact ball bearings. In addition, a light-weight ceramic rolling element for effective high-speed rotation provides a 1.5 times increase in speed.

4. Material technology

Super high-speed bearings use highly seizure-resistant SHX materials independently developed by NSK. The combination of SHX materials and lubrication technology has resulted in the Spin Shot Series of angular contact ball bearings and the RX Series of cylindrical roller bearings. RX Series achieves a speed of 3 million $d_m n$. (#40 spindle: 30 000 min^{-1})

Grease Replenishing System

Fine-Lub II

>> CAT. No.E1273

Enhanced eco-friendly performance; grease lubrication ensures energy-efficient, quiet and environmentally sound operation.

Spindle is automatically replenished with grease at high-speed rotation, a function that was previously thought impossible. System increases the longevity of a grease-lubricated, high-speed spindle.



1. Provides small quantities of grease

Feeding grease in small quantities of 0.01 cc per shot every 6 hours enables steady operation at 20 000 min^{-1} with no increase in heat generation during replenishment.

2. Maintenance free

Energy-efficient, quiet replenishing system delivers 20 000 continuous hours of maintenance-free performance at 20 000 min^{-1} .

High-Speed Integrated Motor Spindles

B1 Series

>> CAT. No.E2204

Energy-efficient, quiet performance achieved with grease lubrication. The world's highest-level, high-performance integrated motor spindle.

Outstanding in speed, cutting capability and reliability, and at the top level in the world, the B1 Series was specifically developed for #40 machining centers. B1 Series uses Robust Series precision bearings (ceramic ball specification).



1. Low noise, less environmental burden, maintenance-free operation

With a newly developed grease-replenishing lubrication method, B1 Series is quiet, exerts less impact on the environment and offers 20 000 hours of maintenance-free performance.

2. High rigidity

Combination of a highly heat-resistant precision bearing—the epitome of NSK's expertise—with a FANUC motor providing a wide range of cutting performance.

3. All-in-one unit

Tool specification complies with BT and HSK. The unclamp mechanism is durable enough to withstand 2 million rotations. Through-coolant capability (7 Mpa) is available as an option.

Ball Screw Support Bearings

TAC Series

>> CAT. No.E1254

High-rigidity, long-life angular contact thrust ball bearings developed specifically for machine tools.

TAC Series bearings are widely used worldwide as a result of their high rigidity, long life and ease-of-use. TAC Series features all the functions required of a ball screw support bearing.



1. High rigidity

High rigidity achieved by setting contact angle at 60° and using a larger number of small-diameter balls.

2. Long life

Long operating life is achieved by using durable EP Steel as standard material.

3. Ease-of-use

Bearings for universal combination are available for any type of combination to meet load conditions.

Support unit for high-load machine tools
A support unit comprising several TAC Series units is also available as a standard product. (Bearing inner diameter: $\phi 17$ to $\phi 40$)

NSK Technology for Injection Molding Machines

- Ball Screws for High Speed and Heavy Load—HTF-SRC Series
- Ball Screws for Heavy Load—HTF Series
- Ball Screws for Mold Clamping System in Injection Molding Machinery—HTF-SRD Series
- Ball Screw Support Bearings for Heavy Load—TAC 03 Series
- NSK Roller Guides—RA Series



Injection molding machinery driven by the electric servo is progressing to produce highly accurate plastic products and machinery components that must withstand hostile environments and operate with exceptional reliability.

From this point of view, NSK's high-load capacity components should be considered essential for every drive mechanism.

They are well suited not only for injection molding machines, but also press machines, die casting machines and other high-load applications.

Ball Screws for High Speed and High Load

HTF-SRC Series

>> CAT. No.E3238



Next-generation ball screws for heavy load applications, evolved from the best-selling HTF Series of high-load ball screws.

Innovative ball recirculation method has been developed in the quest to meet the recent demands for high-speed rotation and noise reduction required by injection molding machinery.

1. Specifically designed for high load

High-load capacity is achieved by inheriting all the features of the HTF Series, developed to handle severe load conditions.

2. High-speed rotation

Feed speed is more than 2 times faster than that of conventional models as a result of optimizing ball recirculation paths.

3. Quiet

Noise level is reduced to a maximum of 1/2 that of conventional models by adopting a newly developed ball recirculation method (SRC).

4. A wide variety

A wide variety of shaft diameters (50 to 120 mm) and leads (16 to 25 mm) are available.

5. Various shaft-end forms

Various types of shaft-end forms are available to ensure the perfect transmission of high torque from a drive motor.

Combination of shaft diameter and lead, and maximum feed speed

Shaft \ Lead	16 mm (dn 160 000)	20 mm (dn 140 000)	25 mm (dn 140 000)
ø50	860 mm/s	—	—
ø63	680 mm/s	740 mm/s	—
ø80	540 mm/s	590 mm/s	—
ø100	—	470 mm/s	590 mm/s

Note: d: outer diameter of screw shaft (mm); n: number of rotations (min⁻¹)

Ball Screws for Heavy Load

HTF Series

>> CAT. No.E3238

High-load capacity is achieved through high load-specific design. Smaller nuts are used for adapting to heavy load driving machinery, such as injection molding machines.

Development of a ball screw for heavy load started in the first half of the 1980s, when injection molding machinery was motor driven. The HTF Series, which was released in 1996, has established its position as the industry standard for heavy load ball screws.



1. Design dedicated to extremely heavy load

Ball diameter has been increased to the maximum. Rated load was extensively improved over the standard series by optimizing the configuration of recirculation paths and the use of ball grooves specially designed for heavy load.

2. Wide variety

A wide variety of shaft diameters (45 to 200 mm) and leads (10 to 25 mm) are available.

3. Various shaft-end forms

Various types of shaft-end forms are available to ensure the perfect transmission of high torque from a drive motor.

Ball Screws for Mold Clamping System in Injection Molding Machinery

HTF-SRD Series

>> CAT. No.E3238

SRD series employs new recirculation method that was proven in the BSS Series to allow even higher speeds for ball screws under heavy loads.

Developed to meet the demand for a larger lead than that of the HTF Series. High feed speeds over 100 m/min are possible.



1. High load-specific design

Rated load is improved by employing the same innovative ball groove design for high-load capacity used in the HTF Series.

2. Quiet and compact design

Noise level is reduced by up to 1/2 by employing the same new recirculation method used in the BSS Series. Outer diameter of nuts has been made smaller for compact design, and a protruding portion was removed.

3. Wide variety

A wide variety of shaft diameters (50 to 80 mm) and leads (40 to 50 mm) are available. Six to eight effective turns are also available.

Ball Screw Support Bearings for Heavy Load

TAC-HR, TAC-SHR Series

>> CAT. No.E3238

A series of high-load capacity, angular contact thrust ball bearings that support ball screws for heavy load under optimum conditions.

TAC-HR and TAC-SHR Series bearings offer high load-bearing capacity to support ball screws for heavy load. Use larger diameter steel balls than the TAC Series for machine tools, thereby reducing the number of combined rows.



1. Downsizing due to high-load capacity

High-load capacity facilitates compact design.

2. Improved reliability

Operating lifetime is 5 times longer than standard TAC Series.

3. Ease-of-use

Dramatically improved ease-of-use compared with tapered roller bearings or thrust self-aligning roller bearings. Required rigidity can be obtained by changing the number of rows as a result of its universal combination capability, which contributes to achieving longer operation life.

4. Reduction in torque through optimal ball bearing design

Torque is substantially reduced through optimal ball bearing design.

NSK Roller Guides

RA Series

>> CAT. No.E3328

RA Series incorporates NSK's leading-edge technology for high load-bearing capacity, high rigidity and environmentally friendly operation.

Capable of meeting the demand for roller guides used in mold-clamping system with no gap to prevent damage to the mold. RA Series roller guides offer the high load-bearing capacity required by injection molding machinery.



1. High load-bearing capacity

World's premier level high load-bearing capacity and long operating lifetime are achieved by the full application of analytic technology.

2. High rigidity

Optimum size rollers are used as rolling elements for high rigidity, which facilitates compact equipment design.

3. Highly dust-resistant

Standard highly dust-resistant seal prevents the entry of foreign matter and ensures original sound performance is maintained for a long time.

NSK Technology for Semiconductor or Liquid Crystal Production Equipment (Special Environments)

- Monocarriers—MCM Series / MCH Series
- NSK Linear Guides—Miniature—PU Series / PE Series
- Thin-Film Lubrication for Vacuum Environments—Ball Screws and NSK Linear Guides with E-DFO for Vacuum Environments
- Surface Treatment for Special Environments—Ball Screws and NSK Linear Guides for Special Environments
- NSK Clean Grease—LG2 / LGU



Meeting cleanness and anti-corrosion requirements in special environments for semiconductor and liquid crystal production equipment, in addition to offering short-term delivery through standard inventory. NSK's precision products contribute to the advance of precision machinery and respond to next-generation needs.

Monocarriers

MCM Series / MCH Series

Short-term delivery available

>> CAT. No.ESP-060920, 060921, E3419



MCM Series supports small-size transfer systems by making full use of their light weight, space-saving design and high accuracy. MCH Series delivers high rigidity with a rail that can be used as a beam.

NSK developed these carriers ahead of other manufacturers to contribute to the compact design of carrier equipment and reduce the time required for design and equipment manufacturing. Suitable for a wide range of applications because of an all-in-one structure of linear motion components.

1. Light weight and compact design

Integration of components achieves minimal cross-sectional dimensions and light weight; far superior to conventional models.

2. All-in-one structure

Ball screw, linear guide and bearing are integrated in an all-in-one structure, thereby reducing work during design and assembly.

3. Excellent rust resistance

Low-temperature chromium plating is applied to prevent rust and to handle other tough operating conditions.

4. Long-term, maintenance-free performance

Smooth lubrication performance can be maintained for a long time with the use of NSK K1™ lubrication unit.

MCM Series

Wide variety

A wide variety of rail widths (6 types: 28 to 100 mm) and leads (1 to 20 mm) are available.

High accuracy, high rigidity and light weight

The concave base-body is lightweight and resists bending. Rolling structure ensures less friction and high accuracy.

MCH Series

Improved rail rigidity

Rigidity of rail was improved to the extent it can also be used as a beam. MCH Series offers superior rigidity; 3 times more rigidity than that of the MCM Series.

Compact design

Compact design based on industry standard dimensions.

NSK Linear Guides—Miniature

PU Series / PE Series

Short-term delivery available, interchangeable parts

>> CAT. No.E3327

With excellent ease-of-use, light weight and compact design, NSK miniature linear guides ensure smooth movement.

Lighter-weight operating section is highly sought after to keep pace with the trend toward downsizing semiconductor manufacturing equipment. Use of resin materials for the bearing achieves light weight and softens the sound of operation.



1. Motion performance

Newly designed ball recirculation component facilitates smooth circulation of steel balls. A special cage is positioned for trouble-free removal of bearings.

2. Light weight

Bearing is about 20% lighter than conventional models as a portion of its body is made with resin material.

3. Highly corrosion resistant

Incorporates highly corrosion-resistant martensite stainless steel as a standard feature to provide outstanding resistance to corrosion.

4. Low dust emission

Entire structure including bearing section is designed to prevent dust emission.

5. Short-term delivery

Interchangeable types for freely matching rails and bearings are also available.

Thin-Film Lubrication for Vacuum Environments

Ball Screws and NSK Linear Guides with E-DFO for Vacuum Environments

>> CAT. No.ESP-051209

Further advanced DFO thin-film lubrication technology ensures significantly longer life and lower outgassing in vacuum environments.

Fluorine grease used for vacuum lubrication has the disadvantages of a short lifetime and produces significant friction resistance in proportion to the level of outgassing and rotational speed. DFO thin-film lubrication technology was developed to solve these technical problems, and E-DFO was developed to extend longevity.



1. Long life

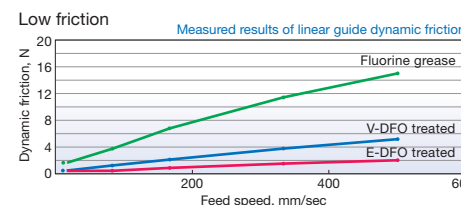
Operating lifetime up to 20 times longer than conventional types, thereby lengthening maintenance service intervals.

2. Low outgassing

Outgassing is suppressed under vacuum environments.

3. Low friction

Friction is significantly reduced compared with conventional models. Motor load is reduced and equipment efficiency is enhanced.



Operating environments

Maximum vacuum environment at room temperature	Recommended operating temperature range	Maximum instantaneous operating temperature (less than 10 hours)
10 ⁻⁴ Pa	-40 to 125°C	200°C

NSK Clean Grease

LG2 / LGU

>> CAT. No.3314

With excellent low dust emission and low torque, LG2 proves its worth in clean rooms—LGU can be used in a wide range of temperatures and offers superior durability.



In the past, grease could not be utilized in clean rooms, and fluorine grease was used in vacuum environments requiring superior low-dust performance. NSK Clean Grease was developed to have improved rust resistance and lower friction than fluorine grease.

1. Low dust emission

NSK Clean Grease is superior to fluorine grease in reliably ensuring low-dust emission for long periods of time.

2. Torque characteristics

NSK Clean Grease features stable torque characteristics that reduce load on the motor at high speeds.

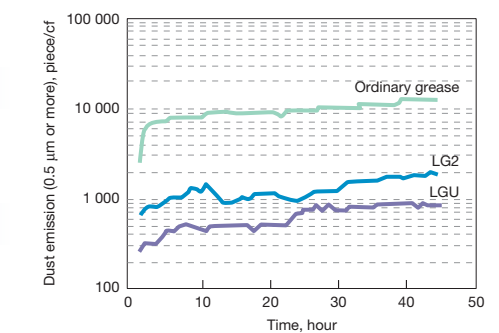
3. Long operating lifetime

Operating lifetime is more than 10 times longer than fluorine grease, thereby extending maintenance service intervals.

4. Ease-of-use

NSK Clean Grease in a bellows-type tube (80 g) can be attached to an NSK grease pump in a single motion.

Excellent low dust emission characteristics



	Operating temperatures	Puffing agent
LG2	-20 to 70°C	Lithium soap
LGU	-30 to 120°C	Theurea

LG2

Rust resistance

Contains the same high level of rust resistance capability as ordinary grease.

LGU

Metal elements

Contains an extremely small amount of metal elements.

NSK Technology for General Machinery

- NSK Ball Screws for Standard Stock—Compact FA Series
- Lubrication Unit—NSK K1™
- For Light Load and Small Equipment—Support Units
- NSK Standard Linear Guides—LH Series / LS Series
- Megatorque Motors—PS Series
- NSK Low-Noise Linear Guides—NSK S1 Series
- New Type of Rolling Element Linear Motion Bearing—Translide
- Highly Dust-Resistant Ball Screws and NSK Linear Guides—V1 Series



Ball screws and NSK linear guides include many standard inventory products that are ready for short-term delivery. Lubrication unit for maintenance-free operation and highly dust-resistant seals suitable for contaminated environments are also available to respond to the needs of machinery users.

NSK Ball Screws for Standard Stock

Compact FA Series

Short-term delivery available

>> CAT. No.E3230



Standard stock series for immediate delivery—next-generation compact ball screws offer quiet, high-speed operating performance.

Renowned for high-speed, low-noise performance, the BSS Series is maintained in standard inventory with pre-processed ball screw shaft ends available for immediate shipment. Many types of products are in stock for immediate use by customers. In addition, a low-profile support unit facilitates compact equipment design.

1. Compact design (low-profile type)

Outer diameter of the ball nut is reduced by up to 30% compared with NSK's conventional products, thereby contributing to compact equipment design.

2. Quiet

Noise level of ball screws has been reduced by 6 dB, nearly 1/2 the level that can be sensed by the human ear. Ball screws subsequently produce quieter, gentle sounds.

3. High speed

Ball screws offer 1.6 times faster permissible rotational speed than that of conventional models. This capability dramatically expands the range of service conditions.

4. Innovative contact seal

Innovative high-performance seals minimize grease dispersion and helps maintain clean work environments.

Low-profile support unit

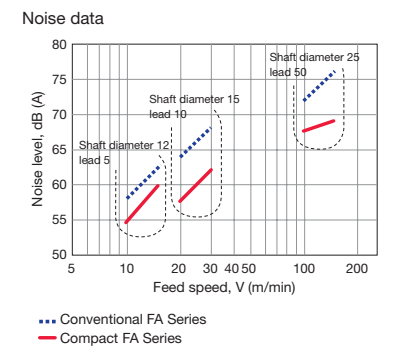
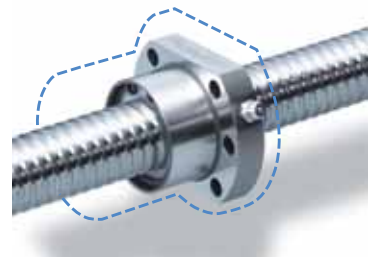
Support units, when combined with Compact FA Series, enable low-profile design.



Conventional support unit

Low-profile support unit

Ball nut downsized by up to 30%



Lubrication Units (Installed in Ball Screws, NSK Linear Guides and Monocarriers)

NSK K1™

>> CAT. No.9009



NSK K1™ ensures long-term, maintenance-free operation and the long lifetime of components working under tough lubrication environments. Clean lubrication method exerts less impact on the environment.

Grease lubrication requires frequent and periodical replenishment. NSK led the way to solve this problem by developing NSK K1™. Oil is fed from the resin-constructed NSK K1™ for more than 100 000 hours.

1. Long-term, maintenance-free operation

NSK K1™ eliminates the need for adding a lubricant for 5 years or 10 000 km. Long-term, maintenance-free operation saves lubricant costs.

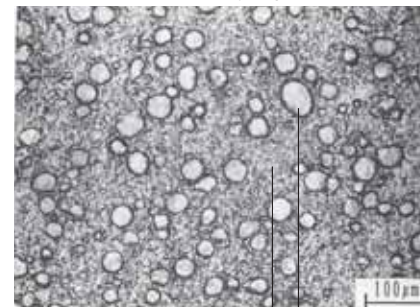
2. Long operating lifetime

NSK K1™ substantially extends the operating lifetime of components exposed to contaminated environments or other tough lubrication environments.

3. High safety

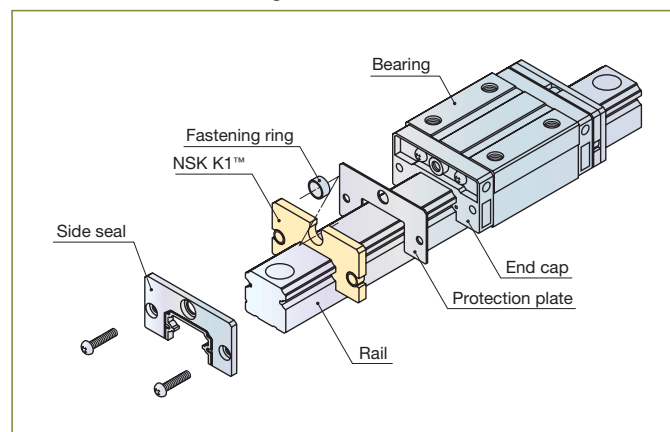
NSK K1™ for food processing or medical equipment is also available. Specifications comply with FDA standards for food processing and medical equipment, ensuring high safety.

Composition of NSK K1™ Lubrication Unit
Lubrication oil constitutes 70% by weight

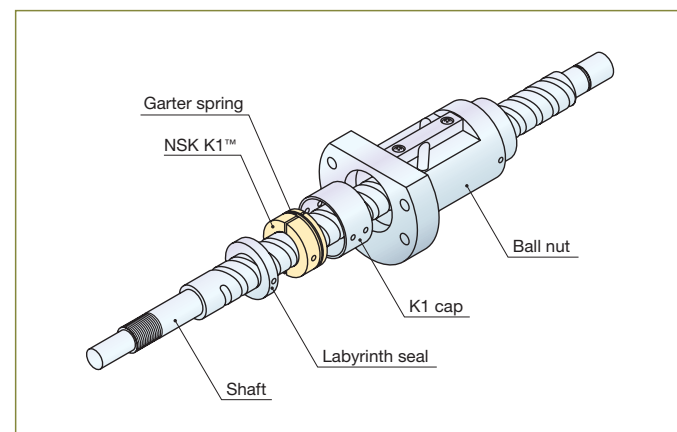


Portion containing additional lubrication oil
Portion containing additional polyolefin

Placement on NSK linear guide



Placement on ball screw



For Light Load and Small Equipment

Support Units

Short-term delivery available

>> CAT. No.E3281

Ball screw support unit is available as a standard product. Support unit for clean operation is also available to provide excellent low-dust emission, low torque and rust resistance.

Support unit for ball screw is designed independently, and required components are incorporated into a single unit. Today, support units are used worldwide as standard products. Support units with special features for clean operation, such as low dust emission, are also available.



1. Quick delivery

All support units are standard stock items.

2. Wide variety

A wide variety of internal diameters of support bearing diameters (4 to 25 mm) are available. Support units can be conveniently used with NSK's ball screws as standard stock.

Support units for clean operation

1. Low dust emission

Reduces dust emission to 1/10 that of general support units.

2. Low torque

Features low torque characteristics—50% lower than general support units—by using special angular contact ball bearings.

3. High rust resistance

High rust resistance is achieved by applying low-temperature chromium plating and using stainless steel parts.

NSK Standard Linear Guides

LH Series / LS Series

Short-term delivery available, interchangeable parts

>> CAT. No.3161

LH and LS Series afford outstanding impact-load resistance, self-aligning capability and high accuracy. These linear guides are designed for superior safety and ease-of-use.

Using internationally standard dimensions, this series is NSK's standard linear guide product.

1. Easy installation

Acceptable margin of error in mounting increases because of self-aligning capability.

2. Impact-load resistance

Non-contact areas also bear part of the impact load when high load acts on a linear guide from above.

3. Wide variety of types and sizes

A wide variety of types and sizes are available to respond to a wide range of applications. Long stainless products are included in the standard LS Series products (the maximum length: 3 500 mm). Products specifically designed for high-temperature or high-speed conditions are also available.



LH Series	#15 - #65
LS Series	#15 - #35

Megatorque Motors

PS Series

Short-term delivery available

>> CAT. No.E3510

Direct drive motors deliver both high-speed and high-resolution performance. Megatorque Motors contribute to reducing weight, saving space and improving productivity.

Megatorque Motors are high-output, compact, direct drive motors equipped with newly developed bearings and a high-resolution position sensor, enabling high-speed, high-accuracy positioning through innovative servo control; thereby improving the productivity of machinery or equipment.



1. Shorter positioning time

Innovative servo algorithm shortens positioning time by up to 1/5 compared with conventional motors.

2. Compact motor

Optimal magnetic-field design delivers twice the force density of conventional motors.

3. Highly accurate position sensor

PS Series incorporates an absolute position sensor with positioning accuracy of 90 seconds.

4. Compact drive unit

Combined with a special module, the drive unit body is 65% smaller than that of conventional units.

NSK Low-Noise Linear Guides

NSK S1 Series

Short-term delivery available, Interchangeable parts

>> CAT. No.E3320

NSK S1 Series features quiet, non-obtrusive sound and low dust emission for smooth operation.

Based on the LH/LS Series, this series incorporates retaining pieces to improve the quality of motion and suppress noise. It also reduces friction variation at fixed-speed driving.



1. Quiet and non-obtrusive sound

Placement of retaining pieces and newly designed ball recirculation paths reduce noise by 5 dB compared with conventional models.

2. Smooth motion

Improves dynamic friction characteristics and allows smooth, stable motion even at low-speed driving.

3. Low dust emission

Superior to conventional models in low dust emission.

4. Wide variety

A wide variety of types (SH Series: #15 to #55; SS Series: #15 to #35) and interchangeable types of rails and ball slides are available.

New Type of Rolling Element Linear Motion Bearing

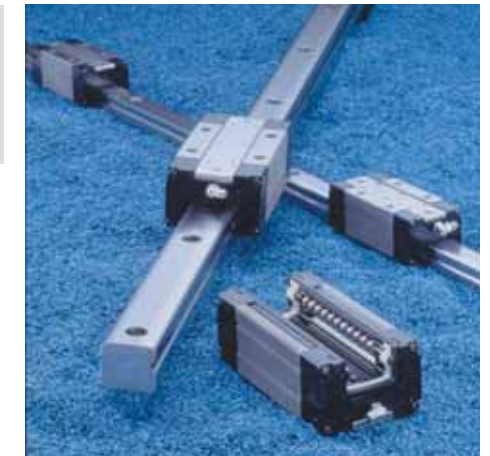
Translide

Short-term delivery available, Interchangeable parts

>> CAT. No.E3324

Translide features high dust-resistance and long-term, maintenance-free operation. Maximum ball diameter facilitates the transport of heavy load.

Translide is a new roller guide specifically developed to fulfill transfer system requirements, including high-load capacity, high dust-resistance and maintenance-free performance.



1. High dust-resistance and long operating lifetime

NSK K1™ and highly dust-resistant seals are featured as standard to ensure the long operating lifetime and high dust-resistance required for transfer systems.

2. High-load capacity

Ball diameter has been increased to the maximum size to enable the transport of heavy loads.

3. Interchangeability

Interchangeable types of rails and sliders are available for freely combining components.



Highly Dust-Resistant Ball Screws and NSK Linear Guides

V1 Series

>> CAT. No.E3233, E3330

NSK's most advanced high-performance seals deliver more than 4 times longer service life under contaminated environments than that of conventional models.

These high-performance seals were developed to cope with contaminated or adverse environments in which, for example, a woodworking machine or graphite processing machine produces dust that can shorten equipment operating life. Highly dust-resistant seal features a special lip structure that dramatically enhances sealing performance.



1. High dust-resistance

- (1) Ball screws
Specially profiled screw shaft grooves and high-performance seals prevent the entry of fine contaminants, reducing particle penetration rate by up to 1/5 compared with conventional standard models.
- (2) NSK linear guides
End seals with a multi-stage lip structure reduce particle penetration by up to 1/10 compared with conventional standard models.

2. Long life

Thanks to their high dust-resistance, ball screws and NSK linear guides provide longer operating lifetimes even under contaminated environments.

3. Option

- (1) Ball screws: protector (against high-temperatures and foreign matter)
- (2) NSK linear guides: protector (against high-temperatures and foreign matter); a type with tapped mounting holes on the backside of a rail is also available.

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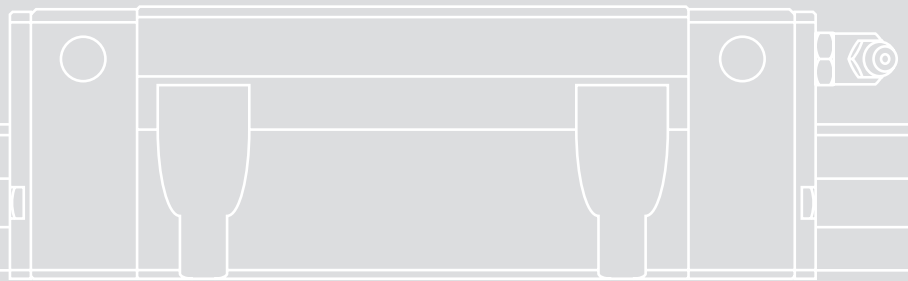
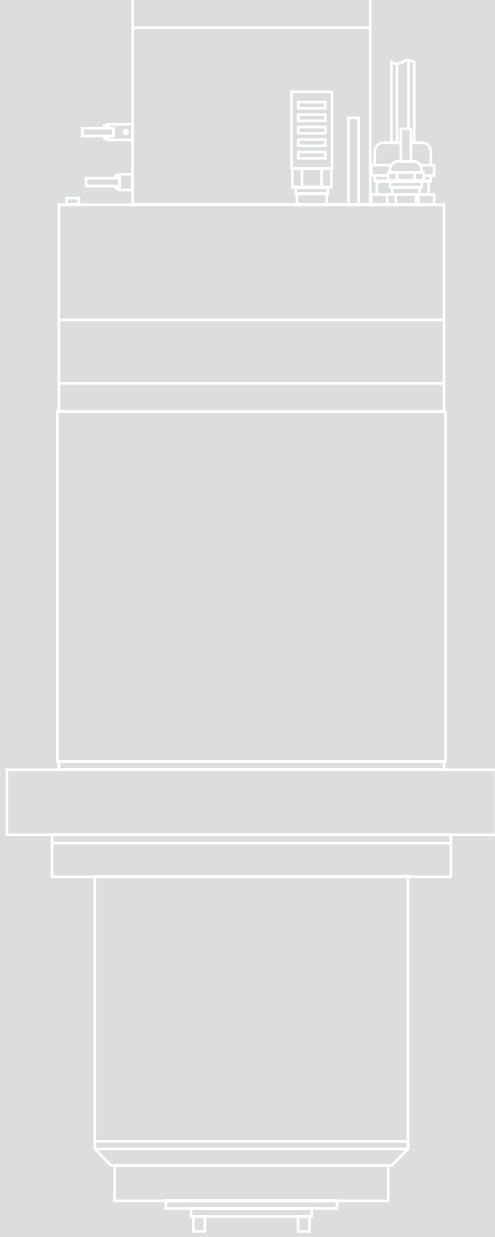
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