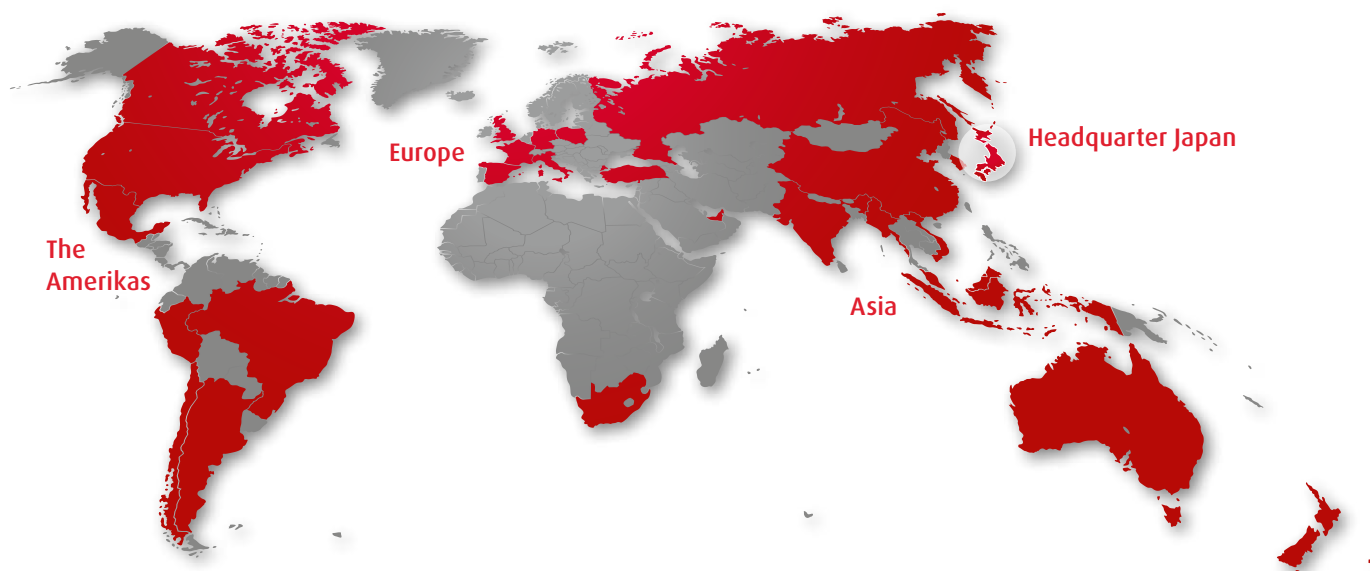


LINEAR GUIDES
+ NH SERIES, NS SERIES



Our most important product: Our customers' satisfaction

We are among the leading manufacturers for rolling bearings, linear technology components and steering systems worldwide. We can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



The NSK Company

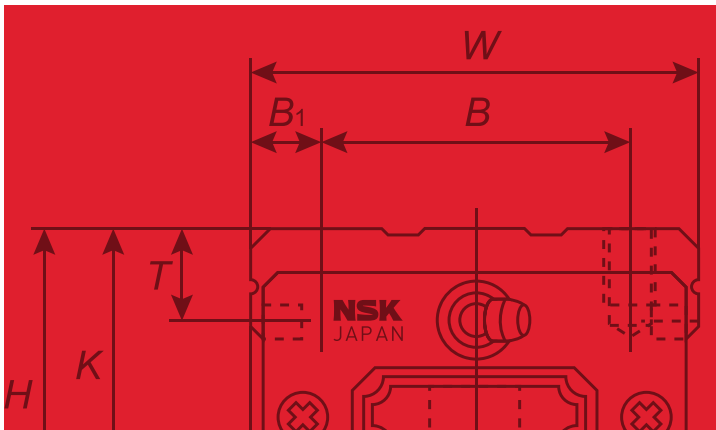
NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context our worldwide research and production facilities are linked together in a global network. Here we concentrate not only on the development of new

technologies, but also on the continuous optimisation of quality – at every process stage. Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

More about NSK under: www.nskeurope.com

NSK SUPPORT – CUSTOMISED BENEFITS

For your customised rotating or linear solutions with NSK you can rely on the optimum interaction of a wide spectrum of products and a range of engineering and other added value services. To do so, we work closely with you as a partner and provide detailed industry expertise, intensive project management and comprehensive support, such as technical calculations, analysis and training. We aim to offer you the ideal motion solution anytime to give you a crucial step ahead among the market.



RESEARCH & DEVELOPMENT

- › Product design
- › Component analysis
- › Applications simulation
- › Material technologies



PROJECT MANAGEMENT

- › Detailed calculation tools for
 - Fatigue life
 - Static system verification
 - Load distribution
 - System deflection
- › Lubrication and seal designs
- › Test centre
- › Project Management



AFTER SALES

- › Global customer service
- › Logistic concepts
- › Training
- › Failure analysis/troubleshooting

Features of NH and NS Series

Using NSK's cumulated knowledge and state of the art technology, a new series of standard linear guides has been designed. Based on the LH and LS series which were characterised by high reliability and performance, NSK has achieved a significant increase in durability. Inheriting features such as random matching and the NSK K1 lubrication unit, this new series of linear guides can be used in numerous industrial applications.

1. Excellent durability

Super-long life, twice as long as compared with the conventional series

Compared to the conventional LH and LS series, a load rating 1.3 times greater and a lifetime two times longer have been achieved. These improvements allow the design of machines with longer lifetime and reliability, and also allow the opportunity to downsize while retaining or even improving the original lifetime.

Maintenance-free

The NSK K1 unit (optional), which has an excellent track record in a wide range of application types, assures long term maintenance free operation. As well as maintenance savings, the K1 unit is also environmentally friendly.

What is "NSK K1" lubrication unit?

NSK K1 is a lubrication device which combines oil and resin in a single unit. The porous resin contains a large amount of lubrication oil. Through contact between the surface of the K1 unit and the rail raceway close to the ball contact point, the NSK K1 unit constantly supplies fresh oil to where it is needed most.

2. Easy-to-use "Standard Linear Guides"

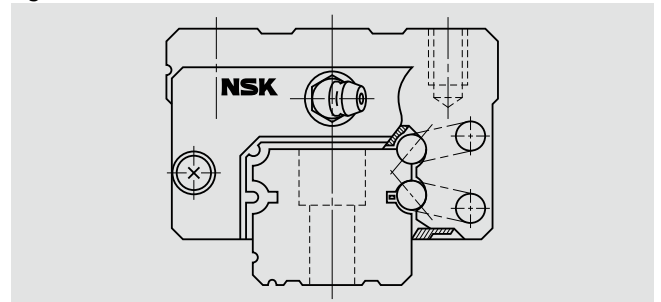
Random matching (interchangeable) types are available

Rails and ball slides can be selected in any combination. Random matching is available for all models. Various combinations of different ball slide types, accuracy grades and preload can be made. Short delivery times are also available.

Robust design to absorb mounting errors

Similar to a DF arrangement using angular contact ball bearings, the self aligning capability of the new NH and NS series is high, as the intersection point of the contact lines of the ball and grooves is inside the slider, and thus reduces moment rigidity (Fig. 1). This allows the linear guide to accept greater errors in installation, and results in less effort in achieving a high precision when mounting the linear guide.

Fig. 1



Abundant options

Abundant options are available, including an NSK K1 lubrication unit, double seal, protector, surface treatment, etc. We offer the configuration best suited to the customer's needs.

All mounting dimensions are the same as those for the LH and LS Series

All mounting dimensions such as the mounting height, mounting width, mounting hole diameter/pitch of the linear guide etc., of the new NH series are identical to those of the conventional LH series. The mounting dimensions of the NS series are also identical to the conventional LS series. Therefore the new NH/NS series is fully interchangeable, and no design changes are required.

Enhanced performance – Revised K1-L for better results in your machine

In 1996, NSK became the first linear guide company to develop a long-term maintenance-free solution: the K1. After more than 20 years of success in the market, we present the revised version of our time-proven K1 lubrication unit with even better results.

New outstanding characteristics:

Increased supply of lubrication oil due to newly developed material

* Life is increased by 1.8 times compared to current K1 material

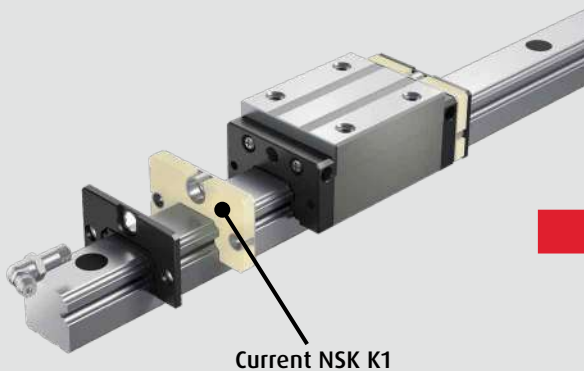
Lower friction force of the slider

- › 20% reduction of friction force through improved rail-contact design

Casing around advanced NSK K1-L

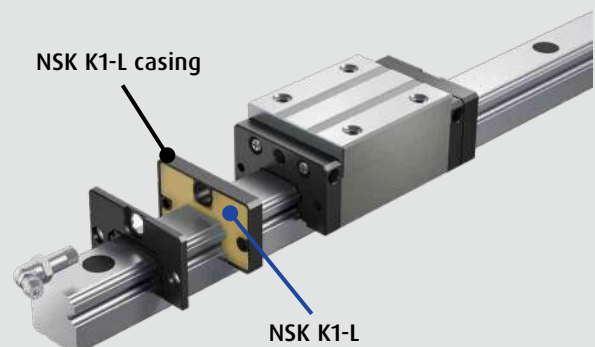
- › Prevents oil leakage while protecting oiled components from damage

Current NSK K1 Lubrication Unit



Oil share is 70% of total weight of K1

Advanced Lubrication Unit NSK K1-L



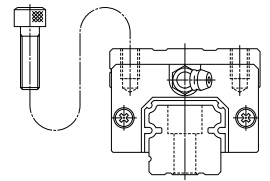
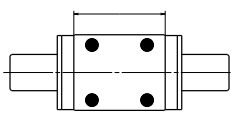
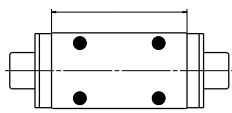
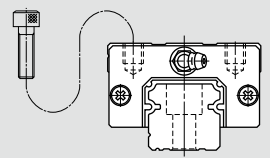
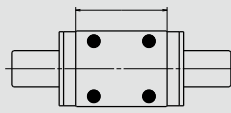
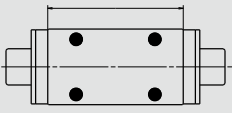
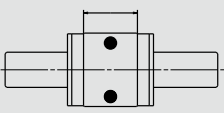
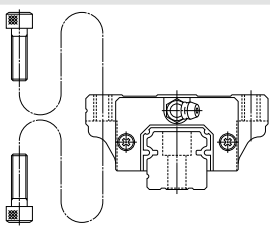
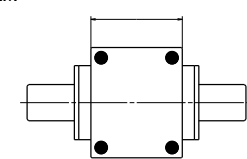
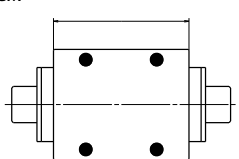
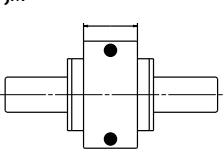
Maintains lubrication by optimising the resin content ratio and achieves 85% oil share of total weight of NSK K1-L.
Controls the amount of lubrication oil released per hour to double the oil supply period

Specifications

1. Ball Slide Shape

- › Two types of ball slides are available:
 - › Square type with tapped holes
 - › Flanged type
- › For the square type, a compact, low-profile model is also available.
- › On the mounting holes of the flange type, the tapped part is used to fix the ball slide from the top surface, while the minor diameter can be used as a bolt hole for mounting from the bottom. This enables mounting from either direction, top or bottom.
- › The ball slide length is available in three lengths: standard high-load, long super-high load or short medium-load. The ball slide length differs, depending on the type. Please refer to the dimension table.

Fig. 2 Ball slide shape

| Ball Slide Shape | Shape/installation method | Type (Upper row: Rating; Lower row: Ball slide length) | | |
|------------------|---|--|--|---|
| | | High-load Type | Super-high-load type | Medium-load-type |
| | | Standard | Long | Short |
| AN BN |  | AN  For NH | BN  For NH | |
| AL BL CL |  | AL  For NH/NS | BL  For NH | CL  For NS |
| EM GM JM |  | EM  For NH/NS | GM  For NH | JM  For NS |

2. Maximum Rail Length

- › Table 1 shows the limitations of rail length (maximum length).
- › Depending on the required accuracy grade, the available maximum rail length may be shorter than that shown in Table 1.

Table 1 Length limitations of rails

Unit: mm

| Series | Material | Size | | | | | | | |
|--------|---------------------------|------|------|------|------|------|------|------|------|
| | | 15 | 20 | 25 | 30 | 35 | 45 | 55 | 65 |
| NH | Special high carbon Steel | 3980 | 3960 | 3960 | 4000 | 4000 | 3990 | 3960 | 3900 |
| | Stainless steel | 1800 | 3500 | 3500 | 3500 | | | | |
| NS | Special high carbon steel | 3980 | 3960 | 3960 | 4000 | 4000 | | | |
| | Stainless steel | 1800 | 3500 | 3500 | 3500 | 3500 | | | |

Note: Rails can be butted if user requirement exceeds the rail length shown in the table. Please consult NSK.

3. Accuracy

- › The determination of the accuracy grade differs depending on whether the required type is a preloaded assembly or the random-matching type.
- › For the preloaded assembly, different accuracy grades are available: Ultra precision P3, Super precision P4, High precision P5, Precision P6, and Normal PN grades.
- › Random-matching type has High precision PH and Normal PC grade.

Table 2 Tolerance of preloaded assembly

Unit: μm

| Characteristics | Accuracy grade | | | | |
|---|------------------------------|--------------------|-------------------|--------------------|-----------------|
| | Ultra precision P3 | Super precision P4 | High precision P5 | Precision grade P6 | Normal grade PN |
| Mounting height H Variation of H (All ball slides on a set of rails) | ± 8 3 | ± 10 5 | ± 20 7 | ± 40 15 | ± 80 25 |
| Mounting width W_2 or W_3 Variation of W_2 or W_3 (All ball slides on reference rail) | ± 10 3 | ± 15 7 | ± 25 10 | ± 50 20 | ± 100 30 |
| Running parallelism of surface C to surface A Running parallelism of surface D to surface B | Refer to Fig. 3 and Table 4. | | | | |

Table 3 Tolerance of random-matching type

Unit: μm

| Characteristics | Accuracy grade | | | |
|--|--------------------------------------|------------|--------------------------------------|------------|
| | High precision grade (PH) | | Normal grade (PC) | |
| Model No. | NH15,20,25,30,35 NS15,20,25,30,35 | NH45,55,65 | NH15,20,25,30,35 NS15,20,25,30,35 | NH45,55,65 |
| Mounting height H | ± 20 | ± 30 | ± 20 | ± 30 |
| Variation of mounting height H | 15 | 20 | 15 | 20 |
| Mounting width W_2 or W_3 | ± 30 | ± 35 | ± 30 | ± 35 |
| Variation of mounting width W_2 or W_3 | 20 | 20 | 25 | 30 |
| Running parallelism of surface C to surface A Running parallelism of surface D to surface B | Refer to Fig. 3 and Table 4. | | | |

Note: Variation in the random-matching products means the variation among the values taken at the same position on the same rail.

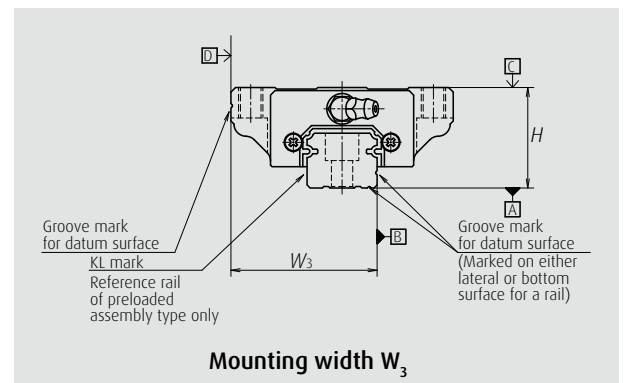
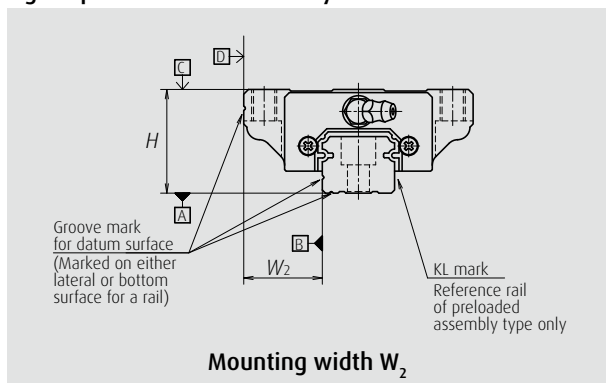
Specifications

Table 4 Running parallelism of ball slide

Unit: μm

| Rail length (mm) | Preload assembly | | | | | Random-matching type | |
|-------------------|--------------------|--------------------|-------------------|--------------------|-----------------|----------------------|-----------------|
| | Ultra precision P3 | Super precision P4 | High precision P5 | Precision grade P6 | Normal grade PN | High precision PH | Normal grade PC |
| Over ~ 50 or less | 2 | 2 | 2 | 4 | 5 | 2 | 5 |
| 50 ~ 80 | 2 | 2 | 3 | 4 | 5 | 3 | 5 |
| 80 ~ 125 | 2 | 2 | 3 | 4 | 5 | 3 | 5 |
| 125 ~ 200 | 2 | 2 | 3.5 | 5 | 6 | 3.5 | 6 |
| 200 ~ 250 | 2 | 2.5 | 4.5 | 6 | 7.5 | 4.5 | 7.5 |
| 250 ~ 315 | 2 | 2.5 | 5 | 6.5 | 8.5 | 5 | 8.5 |
| 315 ~ 400 | 2 | 3 | 5.5 | 7 | 9.5 | 5.5 | 9.5 |
| 400 ~ 500 | 2 | 3 | 6 | 7.5 | 11 | 6 | 11 |
| 500 ~ 630 | 2 | 3.5 | 6.5 | 8.5 | 12 | 6.5 | 12 |
| 630 ~ 800 | 2 | 4 | 7 | 9.5 | 13 | 7 | 13 |
| 800 ~ 1 000 | 2.5 | 4.5 | 7.5 | 10 | 15 | 7.5 | 15 |
| 1 000 ~ 1 250 | 3 | 5 | 8.5 | 12 | 16 | 8.5 | 16 |
| 1 250 ~ 1 600 | 3.5 | 5.5 | 9.5 | 13 | 17 | 9.5 | 17 |
| 1 600 ~ 2 000 | 4 | 6.5 | 11 | 14 | 19 | 11 | 19 |
| 2 000 ~ 2 500 | 4.5 | 7.5 | 12 | 16 | 21 | 12 | 21 |
| 2 500 ~ 3 150 | 5.5 | 8.5 | 13 | 18 | 23 | 13 | 23 |
| 3 150 ~ 4 000 | 6 | 9.5 | 14 | 19 | 25 | 14 | 25 |

Fig. 3 Specifications of accuracy



4. Preload and Rigidity

- › Preload setting differs between the preloaded assembly and random-matching types.
- › For the preloaded assembly, Medium preload Z3, Slight preload Z1 and Fine clearance Z0 are available.
- › For the random-matching type, Medium preload ZH, Slight preload ZZ and Fine clearance ZT are available.
- › Possible combinations between the accuracy and preload grades are shown in Table 9.

Table 5 Preload and rigidity of preloaded assembly (1) NH Series

| Model No. | Preload (N) | | Rigidity (N/μm) | | | |
|-----------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | | | Vertical direction | | Lateral direction | |
| | Slight preload (Z1) | Medium preload (Z3) | Slight preload (Z1) | Medium preload (Z3) | Slight preload (Z1) | Medium preload (Z3) |
| NH15 AN, EM | 78 | 490 | 137 | 226 | 98 | 186 |
| NH20 AN, EM | 147 | 835 | 186 | 335 | 137 | 245 |
| NH25 AL, AN, EM | 196 | 1,270 | 206 | 380 | 147 | 284 |
| NH30 AL, AN | 245 | 1,570 | 216 | 400 | 157 | 294 |
| NH30 EM | 294 | 1,770 | 265 | 480 | 186 | 355 |
| NH35 AL, AN, EM | 390 | 2,350 | 305 | 560 | 216 | 390 |
| NH45 AL, AN, EM | 635 | 3,900 | 400 | 745 | 284 | 540 |
| NH55 AL, AN, EM | 980 | 5,900 | 490 | 910 | 345 | 645 |
| NH65 AN, EM | 1,470 | 8,900 | 580 | 1,070 | 400 | 755 |
| NH15 BN, GM | 98 | 685 | 196 | 345 | 137 | 284 |
| NH20 BN, GM | 196 | 1,080 | 265 | 480 | 196 | 355 |
| NH25 BL, BN, GM | 245 | 1,570 | 294 | 560 | 216 | 400 |
| NH30 BL, BN, GM | 390 | 2,260 | 360 | 665 | 265 | 480 |
| NH35 BL, BN, GM | 490 | 2,940 | 430 | 795 | 305 | 570 |
| NH45 BL, BN, GM | 785 | 4,800 | 520 | 960 | 370 | 695 |
| NH55 BL, BN, GM | 1,180 | 7,050 | 635 | 1,170 | 440 | 835 |
| NH65 BN, GM | 1,860 | 11,300 | 805 | 1,480 | 550 | 1,040 |

Note: Clearance for Fine clearance Z0 is 0 to 3 μm, Therefore, preload is zero. However, Z0 of PN grade is 0 to 15 μm.

Table 6 Clearance and preload of random-matching type (1) NH Series

| Model No. | Fine clearance ZT | Slight preload ZZ | Medium preload ZH |
|-----------|-------------------|-------------------|-------------------|
| NH15 | -4 ~ 15 | -4 ~ 0 | -3 ~ -7 |
| NH20 | -5 ~ 15 | -5 ~ 0 | -3 ~ -8 |
| NH25 | | -5 ~ 0 | -4 ~ -9 |
| NH30 | | -7 ~ 0 | -5 ~ -12 |
| NH35 | | -7 ~ 0 | -5 ~ -12 |
| NH45 | | -7 ~ 0 | -7 ~ -14 |
| NH55 | | -9 ~ 0 | -9 ~ -18 |
| NH65 | | -9 ~ 0 | -10 ~ -19 |

Note: Minus sign denotes a value is an amount of preload (elastic deformation of balls).

Specifications

Table 7 Preload and rigidity of preloaded assembly (2) NS Series

| Model No. | Preload (N) | | Rigidity (N/μm) | | | |
|-------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | | | Vertical direction | | Lateral direction | |
| | Slight preload (Z1) | Medium preload (Z3) | Slight preload (Z1) | Medium preload (Z3) | Slight preload (Z1) | Medium preload (Z3) |
| NS15 AL, EM | 69 | 390 | 127 | 226 | 88 | 167 |
| NS20 AL, EM | 88 | 540 | 147 | 284 | 108 | 206 |
| NS25 AL, EM | 147 | 880 | 206 | 370 | 147 | 275 |
| NS30 AL, EM | 245 | 1,370 | 255 | 460 | 186 | 345 |
| NS35 AL, EM | 345 | 1,960 | 305 | 550 | 216 | 400 |
| NS15 CL, JM | 49 | 294 | 78 | 147 | 59 | 108 |
| NS20 CL, JM | 69 | 390 | 108 | 186 | 78 | 137 |
| NS25 CL, JM | 98 | 635 | 127 | 235 | 88 | 177 |
| NS30 CL, JM | 147 | 980 | 147 | 275 | 108 | 206 |
| NS35 CL, JM | 245 | 1,370 | 186 | 335 | 137 | 245 |

Note: Clearance for Fine clearance Z0 is 0 to 3 μm, Therefore, preload is zero. However, Z0 of PN grade is 0 to 15 μm.

Table 8 Clearance and preload of random-matching type (2) NS Series

Unit: μm

| Model No. | Fine clearance (ZT) | Slight preload (ZZ) | Medium preload (ZH) |
|-----------|---------------------|---------------------|---------------------|
| NS15 | -4 ~ 15 | -4 ~ 0 | -3 ~ -7 |
| NS20 | -4 ~ 15 | -4 ~ 0 | -3 ~ -7 |
| NS25 | -5 ~ 15 | -5 ~ 0 | -4 ~ -9 |
| NS30 | -5 ~ 15 | -5 ~ 0 | -4 ~ -9 |
| NS35 | -5 ~ 15 | -6 ~ 0 | -4 ~ -10 |

Note: Minus sign denotes a value is an amount of preload (elastic deformation of balls).

Table 9 Combinations of accuracy and preload

| | Accuracy grade | | | | | | | |
|--|---|-----------------|----------------|-----------------|--------------|----------------|--------------|---|
| | Ultra precision | Super precision | High precision | Precision grade | Normal grade | High precision | Normal grade | |
| Without NSK K1 lubrication unit | P3 | P4 | P5 | P6 | PN | PH | PC | |
| With NSK K1 lubrication unit | K3 | K4 | K5 | K6 | KN | KH | KC | |
| With NSK K1-L lubrication unit | L3 | L4 | L5 | L6 | LN | LH | LC | |
| With NSK K1 for food and medical equipment | F3 | F4 | F5 | F6 | FN | FH | FC | |
| Preload | Fine clearance Z0 | • | • | • | • | • | — | |
| | Slight preload Z1 | • | • | • | • | • | — | |
| | Medium preload Z3 | • | • | • | • | — | — | |
| | Random-matching type with fine clearance ZT | — | — | — | — | — | — | • |
| | Random-matching type with slight preload ZZ | — | — | — | — | — | • | • |
| | Random-matching type with medium preload ZH | — | — | — | — | — | • | • |

5. Dust-proof parts and Lubrication accessories

(1) Standard specification

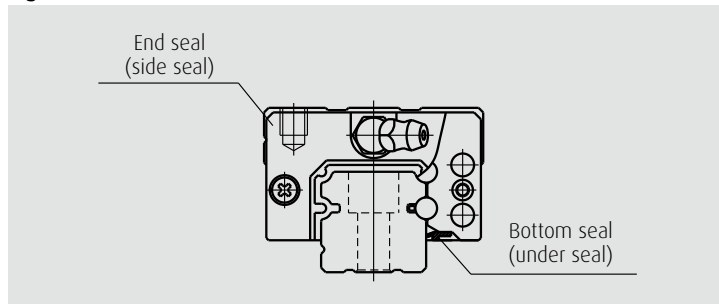
- › As standard, ball slides have an end seal on both ends and bottom seals underneath.
This standard configuration can be used for normal application conditions
- › For more challenging application conditions, optional dust proof parts are available as shown in Table 10

Table 10 Optional dust-proof parts

| Name | Purpose |
|---------------------------|---|
| NSK K1-L lubrication Unit | Made of oil impregnated resin. Enhances lubricating functions. |
| Double seal | Combines two end seals for enhanced sealing function. |
| Protector | Protects the end seal from hot and hard contaminants. |
| Rail cap | Prevents foreign matter such as swarf generated in cutting operation from clogging the rail-mounting holes. |
| Inner seal | Installed inside a slide, and prevents foreign matter from entering the rolling contact surface. |
| Bellows | Covers the linear guide. |

Note: Inner seals can be selected for NH20-65 and NS20-35.

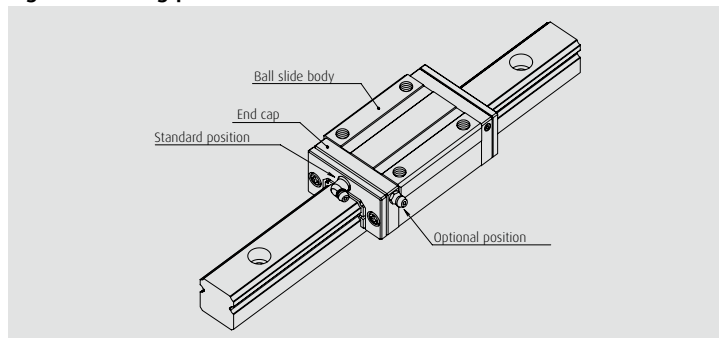
Fig. 4



(2) Mounting position of lubrication accessories

- › The standard position of grease fittings is the end face of ball slide.
Grease fittings can also be optionally mounted on the side of the end cap. (Fig. 5).
- › Please consult NSK for installation of grease or tube fittings to the ball slide body or side of end cap.

Fig. 5 Mounting position of lubrication accessories



Specifications

(3) NSK K1-L Lubrication unit

Table 11 shows the dimensions of linear guides equipped with the NSK K1-L lubrication unit.

Table 11

Unit: mm

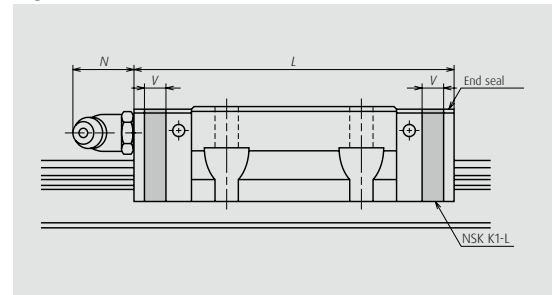
| Model No. | Standard ball slide length | Ball slide length installed with two NSK K1-L | NSK K1-L thickness V | Protruding area of the grease fitting N |
|-----------|----------------------------|---|----------------------|---|
| NH15 | AN, EM | 55 | 65.6 | 5.3 |
| | BN, GM | 74 | 84.6 | |
| NH20 | AN, EM | 69.8 | 80.4 | 5.3 |
| | BN, GM | 91.8 | 102.4 | |
| NH25 | AL, AN, EM | 79 | 90.6 | 5.8 |
| | BL, BN, GM | 107 | 118.6 | |
| NH30 | AL, AN | 85.6 | 97.6 | 6 |
| | EM | 98.6 | 110.6 | |
| | BL, BN, GM | 124.6 | 136.6 | |
| NH35 | AL, AN, EM | 109 | 122 | 6.5 |
| | BL, BN, GM | 143 | 156 | |
| NH45 | AL, AN, EM | 139 | 154 | 7.5 |
| | BL, BN, GM | 171 | 186 | |
| NH55 | AL, AN, EM | 163 | 178 | 7.5 |
| | BL, BN, GM | 201 | 216 | |
| NH65 | AN, EM | 193 | 211 | 9 |
| | BN, GM | 253 | 271 | |
| NS15 | AL, EM | 56.8 | 66.4 | 4.8 |
| | CL, JM | 40.4 | 50 | |
| NS20 | AL, EM | 65.2 | 75.8 | 5.3 |
| | CL, JM | 47.2 | 57.8 | |
| NS25 | AL, EM | 81.6 | 92.2 | 5.3 |
| | CL, JM | 59.6 | 70.2 | |
| NS30 | AL, EM | 96.4 | 108.4 | 6 |
| | CL, JM | 67.4 | 79.4 | |
| NS35 | AL, EM | 108 | 121 | 6.5 |
| | CL, JM | 77 | 90 | |

Notes:

(1) NSK K1 for food and medical equipment are available for NH15-35 and NS15-35.

(2) Ball slide length equipped with NSK K1-L = (Standard ball slide length) + (Thickness of NSK V x Number of NSK K1-L)

Fig. 6



6. Rust Prevention

(1) Stainless steel

Linear Guide components made of carbon steel can also be supplied in stainless steel material. The models which can be made with stainless steel are NH15-30 and NS15-35. However, the high precision (PH) grade and the medium preload (ZH) type of the random-matching type can not be made from stainless steel.

(2) Surface treatment

For surface treatment, NSK recommends low temperature chrome plating or fluoride low temperature chrome plating. Please consult NSK for other surface treatment.

Table 12 Material/surface treatment code

| Code | Description |
|------|--|
| C | Special high carbon steel (NSK standard) |
| K | Stainless steel |
| V | Bottom tapped rail |
| D | Special high carbon steel with surface treatment |
| H | Stainless steel with surface treatment |
| Z | Other, special |

7. Installation

(1) Permissible values of mounting error

Mounting errors may result in harmful effects, such as shortened operating life, deterioration of motion accuracy and/or friction variation. Using the mounting error types shown in Figures 7 and 8 as representative errors, Tables 13 and 14 show the mounting tolerances.

Fig. 7

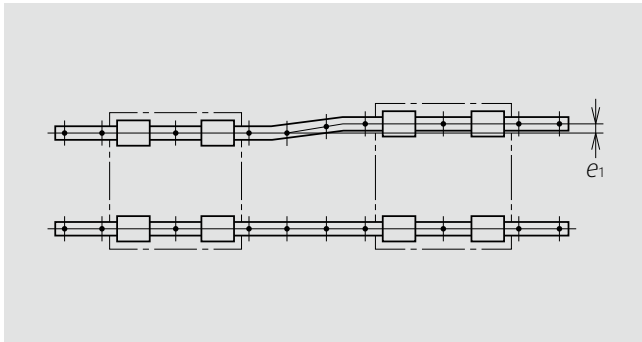


Fig. 8

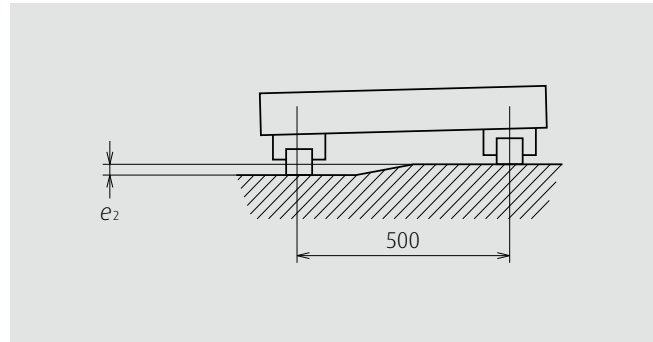


Table 13

Unit: μm

| Value | Preload | Model No. | | | | | | | |
|---|----------------|--------------------------------|------|------|------|------|------|------|------|
| | | NH15 | NH20 | NH25 | NH30 | NH35 | NH45 | NH55 | NH65 |
| Permissible values of parallelism in two rails e_1 | Z0, ZT | 22 | 30 | 40 | 45 | 55 | 65 | 80 | 110 |
| | Z1, ZZ | 18 | 20 | 25 | 30 | 35 | 45 | 55 | 70 |
| | Z3, ZH | 13 | 15 | 20 | 25 | 30 | 40 | 45 | 60 |
| Permissible values of parallelism (height) in two rails e_2 | Z0, ZT | 375 $\mu\text{m}/500\text{mm}$ | | | | | | | |
| | Z1, ZZ, Z3, ZH | 330 $\mu\text{m}/500\text{mm}$ | | | | | | | |

Table 14

Unit: μm

| Value | Preload | Model No. | | | | |
|---|----------------|--------------------------------|------|------|------|------|
| | | NS15 | NS20 | NS25 | NS30 | NS35 |
| Permissible values of parallelism in two rails e_1 | Z0, ZT | 20 | 22 | 30 | 35 | 40 |
| | Z1, ZZ | 15 | 17 | 20 | 25 | 30 |
| | Z3, ZH | 12 | 15 | 15 | 20 | 25 |
| Permissible values of parallelism (height) in two rails e_2 | Z0, ZT | 375 $\mu\text{m}/500\text{mm}$ | | | | |
| | Z1, ZZ, Z3, ZH | 330 $\mu\text{m}/500\text{mm}$ | | | | |

Specifications

(2) Shoulder height and corner radius of the mounting surface

When horizontally fixing a rail or ball slide by pushing it to the shoulder (the raised portion of the mounting surface) of the bed or table, refer to the shoulder height and corner radius specified in Fig. 9 and 10 and Table 15.

Shoulder height of the mounting surface and corner radius r

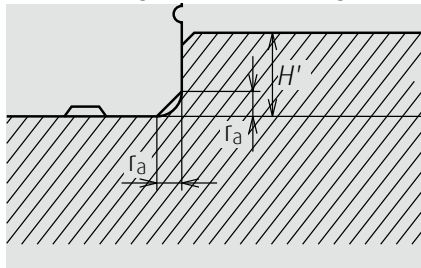


Fig. 9 Shoulder for the rail datum surface

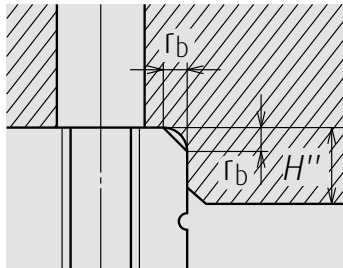


Fig. 10 Shoulder for the ball slide datum surface

Table 15

Unit: mm

| Model No. | Corner radius (maximum) | | Shoulder height | |
|-----------|-------------------------|-------|-----------------|-----|
| | r_a | r_b | H' | H'' |
| NH15 | 0.5 | 0.5 | 4 | 4 |
| NH20 | 0.5 | 0.5 | 4.5 | 5 |
| NH25 | 0.5 | 0.5 | 5 | 5 |
| NH30 | 0.5 | 0.5 | 6 | 6 |
| NH35 | 0.5 | 0.5 | 6 | 6 |
| NH45 | 0.7 | 0.7 | 8 | 8 |
| NH55 | 0.7 | 0.7 | 10 | 10 |
| NH65 | 1 | 1 | 11 | 11 |
| NS15 | 0.5 | 0.5 | 4 | 4 |
| NS20 | 0.5 | 0.5 | 4.5 | 5 |
| NS25 | 0.5 | 0.5 | 5 | 5 |
| NS30 | 0.5 | 0.5 | 6 | 6 |
| NS35 | 0.5 | 0.5 | 6 | 6 |

8. Maximum allowable speed

Table 16 shows an indication of the standard maximum allowable speed, considering a operational lifetime of 10000km with normal operating conditions. However, the maximum allowable speed can be affected by accuracy of installation, operating temperature, external load, etc. If the permissible distance or speed are exceeded, please contact NSK.

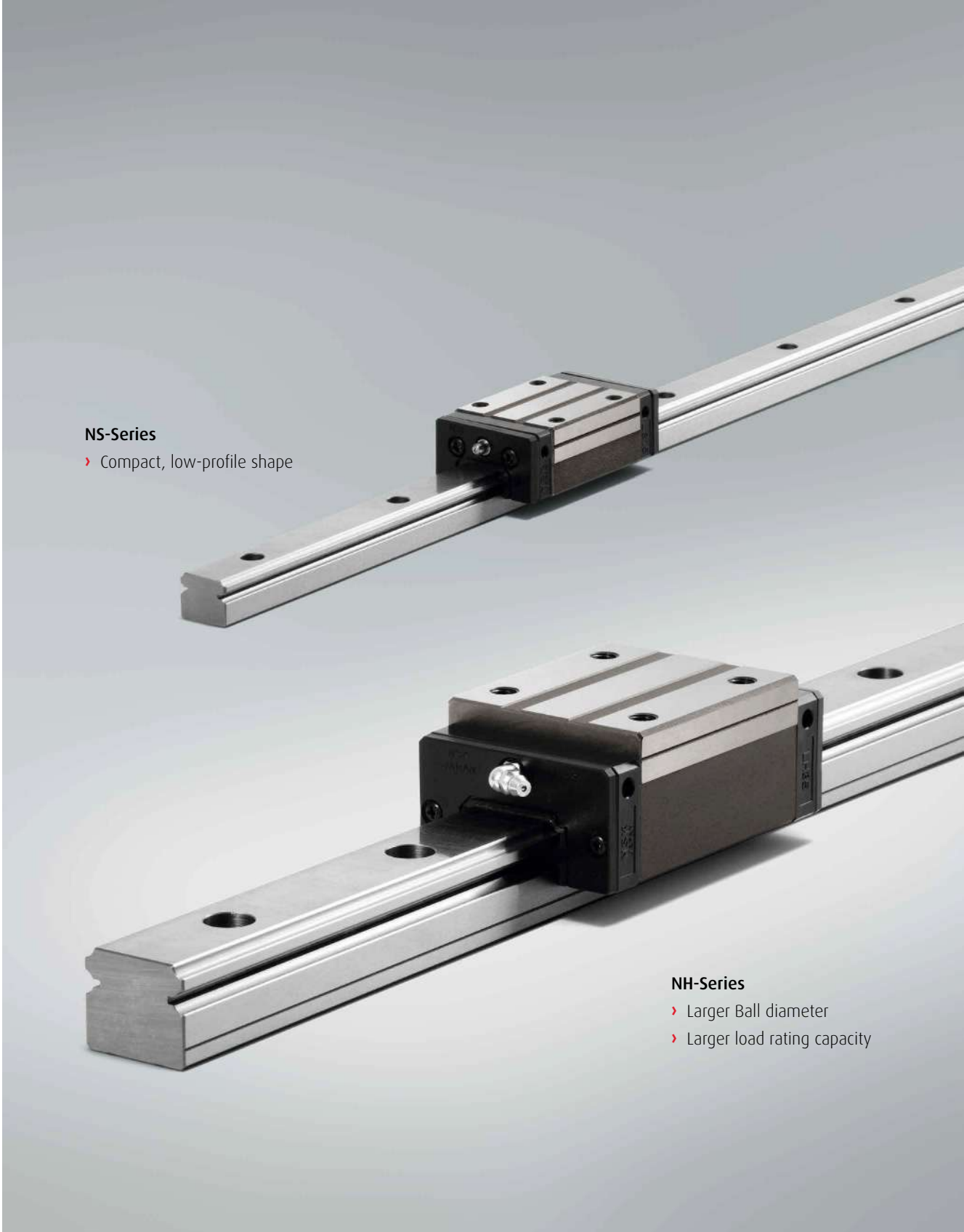
Table 16 Maximum allowable speed

Unit: m/min

| Series | Size | | | | | | | |
|--------|------|----|-----|----|----|----|-----|-----|
| | 15 | 20 | 25 | 30 | 35 | 45 | 55 | 65 |
| NH | | | 300 | | | | 200 | 150 |
| NS | | | 300 | | | | — | — |

9. Handling Precautions

- (1) Heavy impact or shock loads may damage the slide and rail.
- (2) Operating temperature should be less than 80°C. If this temperature is exceeded, the plastic components of the slide may be damaged.
- (3) If using NSK K1-L, maximum temperature in use : 50°C momentary maximum temperature in use: 80°C). Do not leave NSK K1-L lubrication unit in organic solvent, white kerosene such as hexane, thinner which removes oil, and rust prevention oil which contains white kerosene.
- (4) Regarding the handling of random-matching products.
 - a) Slides of random-matching type are assembled on a provisional rail (an inserting tool) when it is delivered.
 - b) When a slide is mounted on a rail, the provisional rail should always be used as a guide.
 - c) Sliders should not be removed from the provisional rail, except when mounting on a rail.



NS-Series

- › Compact, low-profile shape

NH-Series

- › Larger Ball diameter
- › Larger load rating capacity

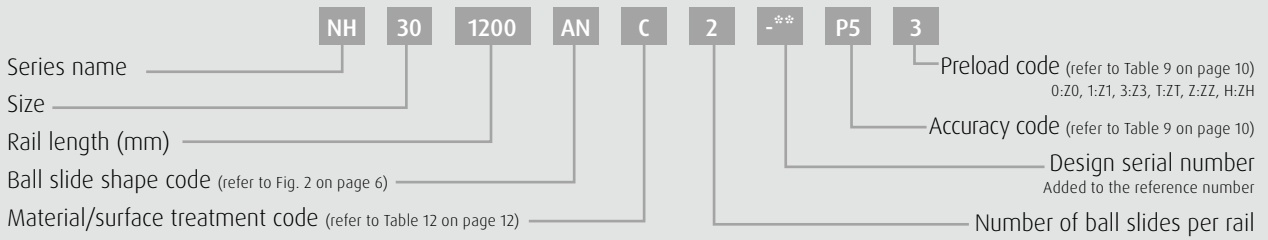
Specifications

11. Dimensions

NH-AN (High load type/standard, square type)

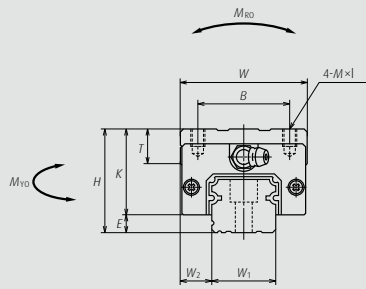
NH-BN (Super-high-load type/long, square type)

(1) Reference number for assembly

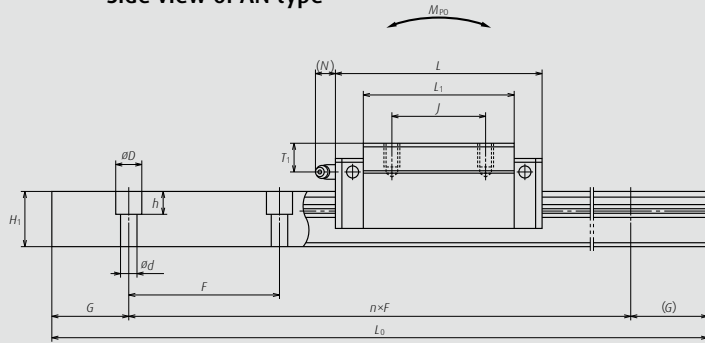


Assembly (Preloaded assembly, random-matching type)

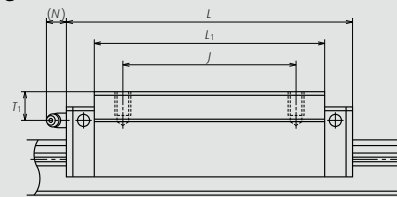
Front view of AN and BN types



Side view of AN type



Side view of BN type



| Model No. | Assembly | | | | | Ball slide | | | | | | | | | | Width W ₁ | Height H ₁ |
|------------------|----------|-----|----------------|---------|---------------|---------------|-----------|-------------|----------------|------|----|----------------|----------------|-----|----|----------------------|-----------------------|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | L ₁ | K | T | Grease fitting | | | | | |
| | | | | | | B | J | M×Pitch×l | | | | Hole size | T ₁ | N | | | |
| NH15AN NH15BN | 28 | 4.6 | 9.5 | 34 | 55 74 | 26 | 26 | M4×0.7×6 | 39 58 | 23.4 | 8 | ø3 | 8.5 | 3.3 | 15 | 15 | |
| NH20AN NH20BN | 30 | 5 | 12 | 44 | 69.8 91.8 | 32 | 36 50 | M5×0.8×6 | 50 72 | 25 | 12 | M6×0.75 | 5 | 11 | 20 | 18 | |
| NH25AN NH25BN | 40 | 7 | 12.5 | 48 | 79 107 | 35 | 35 50 | M6×1×9 | 58 86 | 33 | 12 | M6×0.75 | 10 | 11 | 23 | 22 | |
| NH30AN NH30BN | 45 | 9 | 16 | 60 | 85.6 124.6 | 40 | 40 60 | M8×1.25×10 | 59 98 | 36 | 14 | M6×0.75 | 10 | 11 | 28 | 26 | |
| NH35AN NH35BN | 55 | 9.5 | 18 | 70 | 109 143 | 50 | 50 72 | M8×1.25×12 | 80 114 | 45.5 | 15 | M6×0.75 | 15 | 11 | 34 | 29 | |
| NH45AN NH45BN | 70 | 14 | 20.5 | 86 | 139 171 | 60 | 60 80 | M10×1.5×17 | 105 137 | 56 | 17 | Rc1/8 | 20 | 13 | 45 | 38 | |
| NH55AN NH55BN | 80 | 15 | 23.5 | 100 | 163 201 | 75 | 75 95 | M12×1.75×18 | 126 164 | 65 | 18 | Rc1/8 | 21 | 13 | 53 | 44 | |
| NH65AN NH65BN | 90 | 16 | 31.5 | 126 | 193 253 | 76 | 70 120 | M16×2×20 | 147 207 | 74 | 23 | Rc1/8 | 19 | 13 | 63 | 53 | |

Notes: 1) External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

(2) Reference number for random-matching type

Ball Slide

Random-matching ball slide series code

NAH: NH Series random-matching ball slide

Size

Ball slide shape code

(refer to Fig. 2 on page 6)

NAH 30 AN S Z L

Option code

-L: Equipped with NSK K1-L

-K: Equipped with NSK K1

-F: Fluoride low temperature chrome plating + AS2 grease

-F50: Fluoride low temperature chrome plating + LG2 grease

Preload code

No code: Fine clearance, Z: Slight preload, H: Medium preload

Material code

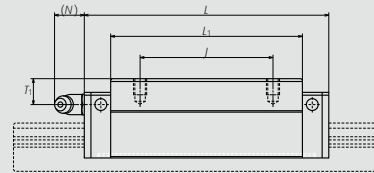
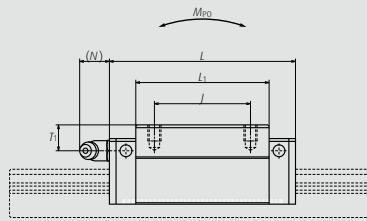
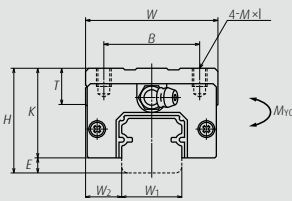
No code: Special high carbon steel (NSK standard),

S: Stainless steel

AN and BN types

AN type

BN type



Rail

Random-matching rail series code

N1H: NH Series random-matching rail

Size

Rail length (mm)

Rail shape code: L

L: Standard

Material/surface treatment code (refer to Table 12 on page 12)

N1H 30 1200 L C N - ** PC Z

Preload code

(refer to Table 9 on page 10)

T: Fine clearance,

Z: Slight preload

(common rail for slight or medium preload)

Accuracy code

PH: High precision grade random-matching type

PC: Normal grade random-matching type

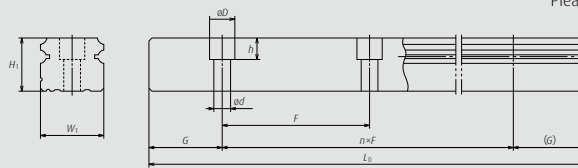
Design serial number

Added to the reference number

Butting rail specification*

N: Non-butting; L: Butting specification

*Please consult with NSK for butting rail specification.



Unit: mm

| Rail | | | | Basic load rating | | | | | | | | | Weight | |
|------------|--------------------------------|------------------|---|-------------------------------|---------------------------------|--------------------|-----------------|---------------------|--------------|-----------------|--------------|-----------------------|----------------|--|
| Pitch F | Mounting bolt hole d×D×h | G (reference) | Max. length L _{Dmax} (for stainless) | Dynamic | | Static | | Static moment (N-m) | | | | Ball slide (kg) | Rail (kg/m) | |
| | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | C ₀ (N) | M _{ro} | M _{po} | | M _{yo} | | | | |
| | | | | | | | | M _{po} | | M _{yo} | | | | |
| | | | | | | | | (One slide) | (Two slides) | (One slide) | (Two slides) | | | |
| 60 | 4.5×7.5×5.3 | 20.0 | 2,980 | 14,200 | 11,300 | 20,700 | 108 | 94.5 | 575 | 79.5 | 480 | 0.18 | 1.6 | |
| | | | (1,800) | 18,100 | 14,400 | 32,000 | 166 | 216 | 1,150 | 181 | 965 | 0.26 | | |
| 60 | 6×9.5×8.5 | 20.0 | 3,960 | 23,700 | 18,800 | 32,500 | 219 | 185 | 1,140 | 155 | 955 | 0.33 | 2.6 | |
| | | | (3,500) | 30,000 | 24,000 | 50,500 | 340 | 420 | 2,230 | 355 | 1,870 | 0.48 | | |
| 60 | 7×11×9 | 20.0 | 3,960 | 33,500 | 26,800 | 46,000 | 360 | 320 | 1,840 | 267 | 1,540 | 0.55 | 3.6 | |
| | | | (3,500) | 45,500 | 36,500 | 71,000 | 555 | 725 | 3,700 | 610 | 3,100 | 0.82 | | |
| 80 | 9×14×12 | 20.0 | 4,000 | 41,000 | 32,500 | 51,500 | 490 | 350 | 2,290 | 292 | 1,920 | 0.77 | 5.2 | |
| | | | (3,500) | 61,000 | 48,500 | 91,500 | 870 | 1,030 | 5,600 | 865 | 4,700 | 1.3 | | |
| 80 | 9×14×12 | 20.0 | 4,000 | 62,500 | 49,500 | 80,500 | 950 | 755 | 4,500 | 630 | 3,800 | 1.5 | 7.2 | |
| | | | | 81,000 | 64,500 | 117,000 | 1,380 | 1,530 | 8,350 | 1,280 | 7,000 | 2.1 | | |
| 105 | 14×20×17 | 22.5 | 3,990 | 107,000 | 84,500 | 140,000 | 2,140 | 1,740 | 9,750 | 1,460 | 8,150 | 3.0 | 12.3 | |
| | | | | 131,000 | 104,000 | 187,000 | 2,860 | 3,000 | 15,600 | 2,520 | 13,100 | 3.9 | | |
| 120 | 16×23×20 | 30.0 | 3,960 | 158,000 | 125,000 | 198,000 | 3,600 | 3,000 | 16,300 | 2,510 | 13,700 | 4.7 | 16.9 | |
| | | | | 193,000 | 153,000 | 264,000 | 4,850 | 5,150 | 26,300 | 4,350 | 22,100 | 6.1 | | |
| 150 | 18×26×22 | 35.0 | 3,900 | 239,000 | 190,000 | 281,000 | 6,150 | 4,950 | 27,900 | 4,150 | 23,400 | 7.7 | 24.3 | |
| | | | | 310,000 | 246,000 | 410,000 | 8,950 | 10,100 | 51,500 | 8,450 | 43,500 | 10.8 | | |

2) The basic load rating complies with ISO standard. (ISO14728-1 and ISO14728-2)

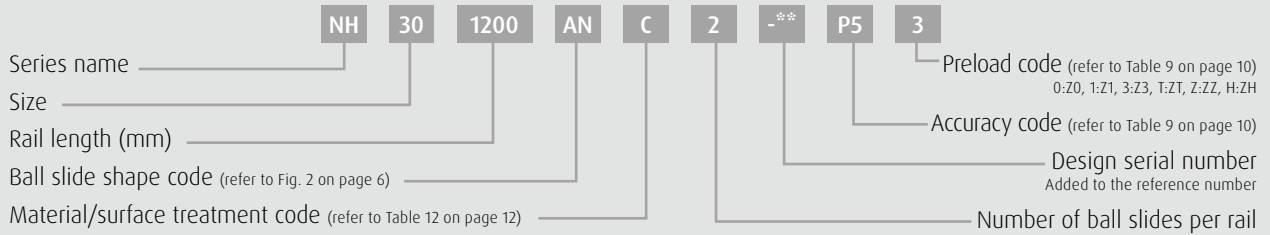
C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life.

Specifications

NH-AL (High load type/standard, square low-profile type)

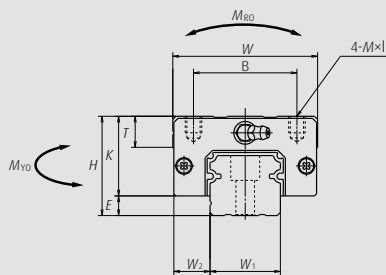
NH-BL (Super-high-load type/long, square low-profile type)

(1) Reference number for assembly

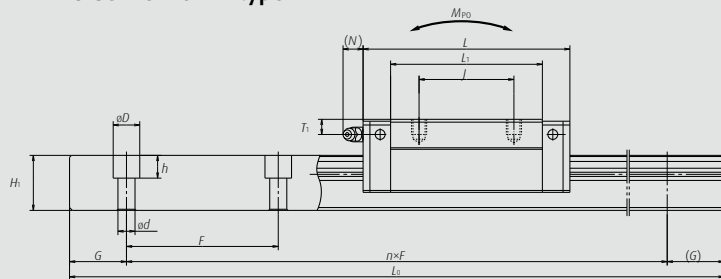


Assembly (Preloaded assembly, random-matching type)

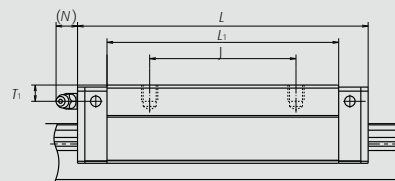
Front view of AL and BL types



Side view of AL type



Side view of BL type



| Model No. | Assembly | | | | | Ball slide | | | | | | | | | | |
|------------------|----------|-----|----------------|---------|---------------|---------------|----------|-------------|----------------|------|----|----------------|----------------|----|----------------------|-----------------------|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | L ₁ | K | T | Grease fitting | | | Width W ₁ | Height H ₁ |
| | | | | | | B | J | M×Pitch×I | | | | Hole size | T ₁ | N | | |
| NH25AL NH25BL | 36 | 7 | 12.5 | 48 | 79 107 | 35 | 35 50 | M6×1×6 | 58 86 | 29 | 12 | M6×0.75 | 6 | 11 | 23 | 22 |
| NH30AL NH30BL | 42 | 9 | 16 | 60 | 85.6 124.6 | 40 | 40 60 | M8×1.25×8 | 59 98 | 33 | 14 | M6×0.75 | 7 | 11 | 28 | 26 |
| NH35AL NH35BL | 48 | 9.5 | 18 | 70 | 109 143 | 50 | 50 72 | M8×1.25×8 | 80 114 | 38.5 | 15 | M6×0.75 | 8 | 11 | 34 | 29 |
| NH45AL NH45BL | 60 | 14 | 20.5 | 86 | 139 171 | 60 | 60 80 | M10×1.5×10 | 105 137 | 46 | 17 | Rc1/8 | 10 | 13 | 45 | 38 |
| NH55AL NH55BL | 70 | 15 | 23.5 | 100 | 163 201 | 75 | 75 95 | M12×1.75×13 | 126 164 | 55 | 15 | Rc1/8 | 11 | 13 | 53 | 44 |

Notes: 1) External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

(2) Reference number for random-matching type

Ball Slide

Random-matching ball slide series code

NAH: NH Series random-matching ball slide

Size

Ball slide shape code
(refer to Fig. 2 on page 6)

NAH 30 AL S Z L

Option code

-L: Equipped with NSK K1-L

-K: Equipped with NSK K1

-F: Fluoride low temperature chrome plating + AS2 grease

-F50: Fluoride low temperature chrome plating + LG2 grease

Preload code

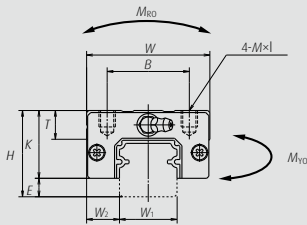
No code: Fine clearance, Z: Slight preload, H: Medium preload

Material code

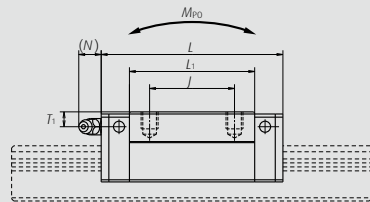
No code: Special high carbon steel (NSK standard),

S: Stainless steel

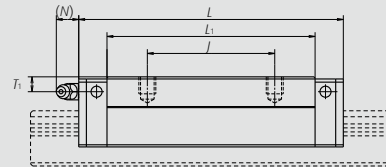
AL and BN types



AL type



BL type



Rail

Random-matching rail series code

N1H: NH Series random-matching rail

Size

Rail length (mm)

Rail shape code: L
L: Standard

Material/surface treatment code (refer to Table 12 on page 12)

N1H 30 1200 L C N - ** PC Z

Preload code

(refer to Table 9 on page 10)

T: Fine clearance,

Z: Slight preload

(common rail for slight or medium preload)

Accuracy code

PH: High precision grade random-matching type

PC: Normal grade random-matching type

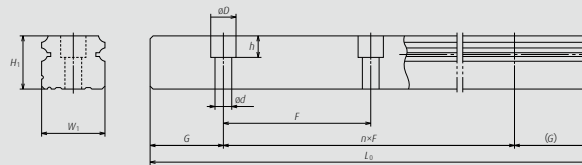
Design serial number

Added to the reference number

Butting rail specification*

N: Non-butting; L: Butting specification

*Please consult with NSK for butting rail specification.



Unit: mm

| Rail | Pitch F | Mounting bolt hole d×D×h | G (reference) | Max. length L _{0max} (for stainless) | Basic load rating | | | | | | | | Weight | |
|-------------|--------------|--------------------------------|------------------|---|-------------------------------|---------------------------------|-----------------------|-----------------|---------------------|-------|-----------------|------|-----------------------|----------------|
| | | | | | 2)Dynamic | | Static | M _{Ro} | Static moment (N·m) | | | | Ball slide (kg) | Rail (kg/m) |
| | | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | C ₀ (N) | | M _{P0} | | M _{V0} | | | |
| (One slide) | (Two slides) | (One slide) | (One slide) | (Two slides) | | | | | | | | | | |
| 60 | 7×11×9 | 20.0 | 3,960 (3,500) | 33,500 | 26,800 | 46,000 | 360 | 320 | 1,840 | 267 | 1,540 | 0.46 | 3.6 | |
| | | | | 45,500 | 36,500 | 71,000 | 555 | 725 | 3,700 | 610 | 3,100 | 0.69 | | |
| 80 | 9×14×12 | 20.0 | 4,000 (3,500) | 41,000 | 32,500 | 51,500 | 490 | 350 | 2,290 | 292 | 1,920 | 0.69 | 5.2 | |
| | | | | 61,000 | 48,500 | 91,500 | 870 | 1,030 | 5,600 | 865 | 4,700 | 1.16 | | |
| 80 | 9×14×12 | 20.0 | 4,000 | 62,500 | 49,500 | 80,500 | 950 | 755 | 4,500 | 630 | 3,800 | 1.2 | 7.2 | |
| | | | | 81,000 | 64,500 | 117,000 | 1,380 | 1,530 | 8,350 | 1,280 | 7,000 | 1.7 | | |
| 105 | 14×20×17 | 22.5 | 3,990 | 107,000 | 84,500 | 140,000 | 2,140 | 1,740 | 9,750 | 1,460 | 8,150 | 2.2 | 12.3 | |
| | | | | 131,000 | 104,000 | 187,000 | 2,860 | 3,000 | 15,600 | 2,520 | 13,100 | 2.9 | | |
| 120 | 16×23×20 | 30.0 | 3,960 | 158,000 | 125,000 | 198,000 | 3,600 | 3,000 | 16,300 | 2,510 | 13,700 | 3.7 | 16.9 | |
| | | | | 193,000 | 153,000 | 264,000 | 4,850 | 5,150 | 26,300 | 4,350 | 22,100 | 4.7 | | |

2) The basic load rating complies with ISO standard. (ISO14728-1 and ISO14728-2)

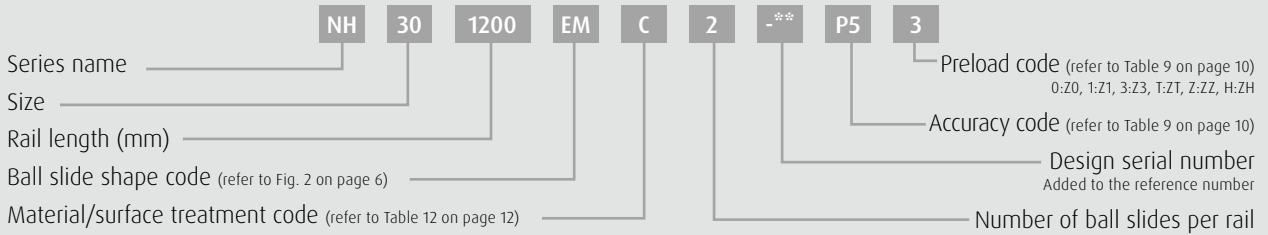
C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life;

Specifications

NH-EM (High-load type/standard, flange type)

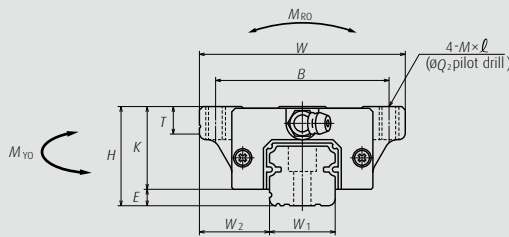
NH-GM (Super-high-load type/long, flange type)

(1) Reference number for assembly

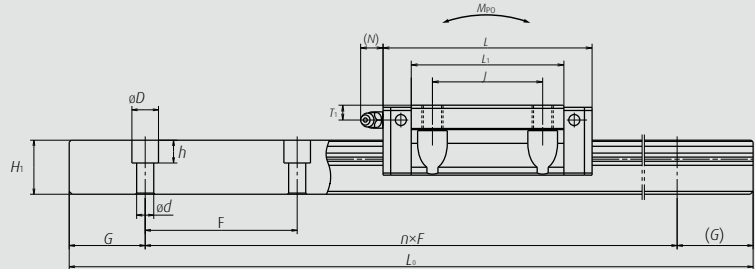


Assembly (Preloaded assembly, random-matching type)

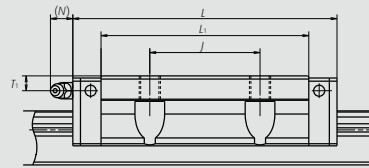
Front view of EM and GM types



Side view of EM type



Side view of GM type



| Model No. | Assembly | | | | | Ball slide | | | | | | | | | | | |
|------------------|----------|-----|----------------|---------|---------------|---------------|-----|------------------------------|----------------|----------------|------|------------|----------------|----------------|-----|----------------------|-----------------------|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | | L ₁ | K | T | Grease fitting | | | Width W ₁ | Height H ₁ |
| | | | | | | B | J | M×Pitch×l | Q ₂ | | | | Hole size | T ₁ | N | | |
| NH15EM NH15GM | 24 | 4.6 | 16 | 47 | 55 74 | 38 | 30 | M5×0.8×7 | 4.4 | 39 58 | 19.4 | 8 | ∅3 | 4.5 | 3.3 | 15 | 15 |
| NH20EM NH20GM | 30 | 5 | 21.5 | 63 | 69.8 91.8 | 53 | 40 | M6×1×9.5 | 5.3 | 50 72 | 25 | 10 | M6×0.75 | 5 | 11 | 20 | 18 |
| NH25EM NH25GM | 36 | 7 | 23.5 | 70 | 79 107 | 57 | 45 | M8×1.25×10 (M8×1.25×11.5) | 6.8 | 58 86 | 29 | 11 (12) | M6×0.75 | 6 | 11 | 23 | 22 |
| NH30EM NH30GM | 42 | 9 | 31 | 90 | 98.6 124.6 | 72 | 52 | M10×1.5×12 (M10×1.5×14.5) | 8.6 | 72 98 | 33 | 11 (15) | M6×0.75 | 7 | 11 | 28 | 26 |
| NH35EM NH35GM | 48 | 9.5 | 33 | 100 | 109 143 | 82 | 62 | M10×1.5×13 | 8.6 | 80 114 | 38.5 | 12 | M6×0.75 | 8 | 11 | 34 | 29 |
| NH45EM NH45GM | 60 | 14 | 37.5 | 120 | 139 171 | 100 | 80 | M12×1.75×15 | 10.5 | 105 137 | 46 | 13 | Rc1/8 | 10 | 13 | 45 | 38 |
| NH55EM NH55GM | 70 | 15 | 43.5 | 140 | 163 201 | 116 | 95 | M14×2×18 | 12.5 | 126 164 | 55 | 15 | Rc1/8 | 11 | 13 | 53 | 44 |
| NH65EM NH65GM | 90 | 16 | 53.5 | 170 | 193 253 | 142 | 110 | M16×2×24 | 14.6 | 147 207 | 74 | 23 | Rc1/8 | 19 | 13 | 63 | 53 |

Notes: 1) Parenthesized dimensions are for items made of stainless steel.
2) External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

(2) Reference number for random-matching type

Ball Slide

Random-matching ball slide series code

NAH: NH Series random-matching ball slide

Size

Ball slide shape code
(refer to Fig. 2 on page 6)

NAH 30 EM S Z L

Option code

-L: Equipped with NSK K1-L

-K: Equipped with NSK K1

-F: Fluoride low temperature chrome plating + AS2 grease

-F50: Fluoride low temperature chrome plating + LG2 grease

Preload code

No code: Fine clearance, Z: Slight preload, H: Medium preload

Material code

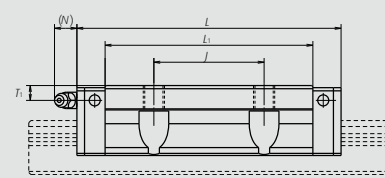
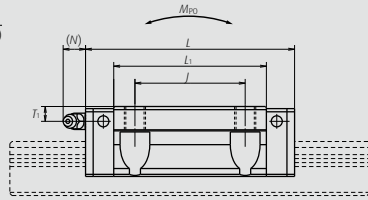
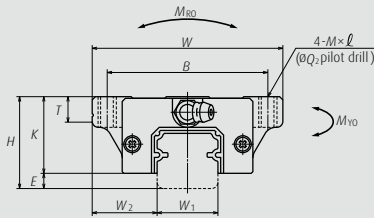
No code: Special high carbon steel (NSK standard),

S: Stainless steel

EM and GM types

EM type

GM type



Rail

Random-matching rail series code

N1H: NH Series random-matching rail

Size

Rail length (mm)

Rail shape code: L

L: Standard

Material/surface treatment code (refer to Table 12 on page 12)

N1H 30 1200 L C N - ** PC Z

Preload code

(refer to Table 9 on page 10)

T: Fine clearance,

Z: Slight preload

(common rail for slight or medium preload)

Accuracy code

PH: High precision grade random-matching type

PC: Normal grade random-matching type

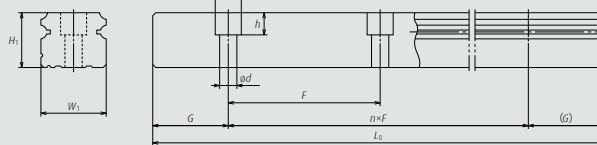
Design serial number

Added to the reference number

Butting rail specification*

N: Non-butting; L: Butting specification

*Please consult with NSK for butting rail specification.



Unit: mm

| Rail | Pitch F | Mounting bolt hole d×D×h | G (reference) | Max. length L _{0max} (for stainless) | Basic load rating | | | | | | | | Weight | |
|------|-------------|--------------------------|---------------|---|----------------------------|------------------------------|---------------------------|-----------------|-----------------------------|-------|------------------------------|------|-----------------|-------------|
| | | | | | Dynamic | | Static C ₀ (N) | M ₈₀ | Static moment (N-m) | | | | Ball slide (kg) | Rail (kg/m) |
| | | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | | | M ₈₀ (One slide) | | M ₁₀ (Two slides) | | | |
| 60 | 4.5×7.5×5.3 | 20.0 | 2,980 | 2,980 | 14,200 | 11,300 | 20,700 | 108 | 94.5 | 575 | 79.5 | 480 | 0.17 | 1.6 |
| | | | | (1,800) | 18,100 | 14,400 | 32,000 | 166 | 216 | 1,150 | 181 | 965 | 0.25 | |
| 60 | 6×9.5×8.5 | 20.0 | 3,960 | 23,700 | 18,800 | 32,500 | 219 | 185 | 1,140 | 155 | 955 | 0.45 | 2.6 | |
| | | | (3,500) | 30,000 | 24,000 | 50,500 | 340 | 420 | 2,230 | 355 | 1,870 | 0.65 | | |
| 60 | 7×11×9 | 20.0 | 3,960 | 33,500 | 26,800 | 46,000 | 360 | 320 | 1,840 | 267 | 1,540 | 0.63 | 3.6 | |
| | | | (3,500) | 45,500 | 36,500 | 71,000 | 555 | 725 | 3,700 | 610 | 3,100 | 0.93 | | |
| 80 | 9×14×12 | 20.0 | 4,000 | 47,000 | 37,500 | 63,000 | 600 | 505 | 3,150 | 425 | 2,650 | 1.2 | 5.2 | |
| | | | (3,500) | 61,000 | 48,500 | 91,500 | 870 | 1,030 | 5,600 | 865 | 4,700 | 1.6 | | |
| 80 | 9×14×12 | 20.0 | 4,000 | 62,500 | 49,500 | 80,500 | 950 | 755 | 4,500 | 630 | 3,800 | 1.7 | 7.2 | |
| | | | | 81,000 | 64,500 | 117,000 | 1,380 | 1,530 | 8,350 | 1,280 | 7,000 | 2.4 | | |
| 105 | 14×20×17 | 22.5 | 3,990 | 107,000 | 84,500 | 140,000 | 2,140 | 1,740 | 9,750 | 1,460 | 8,150 | 3 | 12.3 | |
| | | | | 131,000 | 104,000 | 187,000 | 2,860 | 3,000 | 15,600 | 2,520 | 13,100 | 3.9 | | |
| 120 | 16×23×20 | 30.0 | 3,960 | 158,000 | 125,000 | 198,000 | 3,600 | 3,000 | 16,300 | 2,510 | 13,700 | 5 | 16.9 | |
| | | | | 193,000 | 153,000 | 264,000 | 4,850 | 5,150 | 26,300 | 4,350 | 22,100 | 6.5 | | |
| 150 | 18×26×22 | 35.0 | 3,900 | 239,000 | 190,000 | 281,000 | 6,150 | 4,950 | 27,900 | 4,150 | 23,400 | 10 | 24.3 | |
| | | | | 310,000 | 246,000 | 410,000 | 8,950 | 10,100 | 51,500 | 8,450 | 43,500 | 14.1 | | |

3) The basic load rating complies with ISO standard. (ISO14728-1 and ISO14728-2).

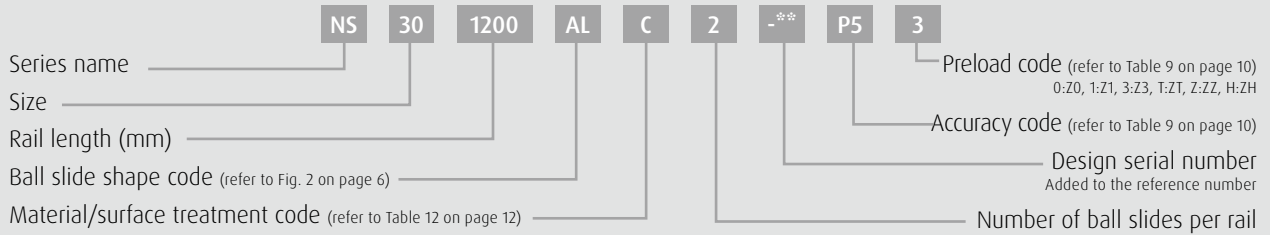
C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life;

Specifications

NS-CL (Medium-load type/short, square low-profile type)

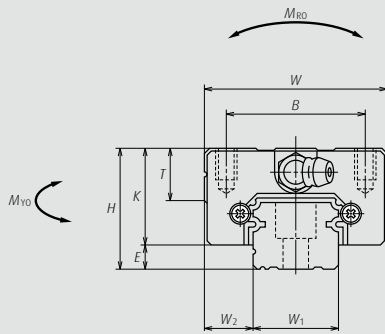
NS-AL (High-load type/standard, square low-profile type)

(1) Reference number for assembly

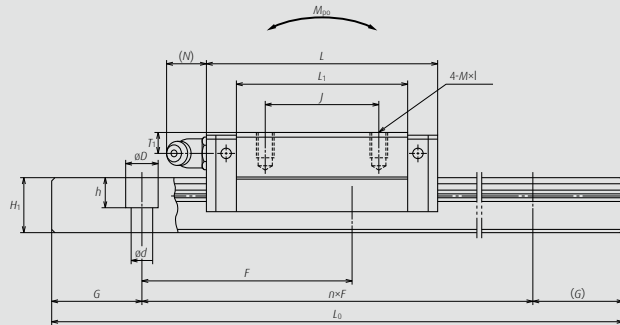


Assembly (Preloaded assembly, random-matching type)

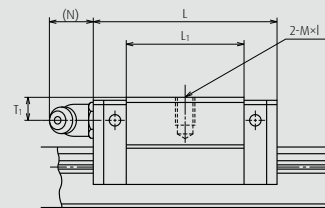
Front view of AL and CL types



Side view of AL type



Side view of CL type



| Model No. | Assembly | | | | | Ball slide | | | | | | | | | | |
|------------------|----------|------|----------------|---------|--------------|---------------|---------|------------|----------------|------|----|----------------|----------------|----|----------------------|-----------------------|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | L ₁ | K | T | Grease fitting | | | Width W ₁ | Height H ₁ |
| | | | | | | B | J | M×Pitch×l | | | | Hole size | T ₁ | N | | |
| NS15CL NS15AL | 24 | 4.6 | 9.5 | 34 | 40.4 56.8 | 26 | — 26 | M4×0.7×6 | 23.6 40 | 19.4 | 10 | ∅3 | 6 | 3 | 15 | 12.5 |
| NS20CL NS20AL | 28 | 6 | 11 | 42 | 47.2 65.2 | 32 | — 32 | M5×0.8×7 | 30 48 | 22 | 12 | M6×0.75 | 5.5 | 11 | 20 | 15.5 |
| NS25CL NS25AL | 33 | 7 | 12.5 | 48 | 59.6 81.6 | 35 | — 35 | M6×1×9 | 38 60 | 26 | 12 | M6×0.75 | 7 | 11 | 23 | 18 |
| NS30CL NS30AL | 42 | 9 | 16 | 60 | 67.4 96.4 | 40 | — 40 | M8×1.25×12 | 42 71 | 33 | 13 | M6×0.75 | 8 | 11 | 28 | 23 |
| NS35CL NS35AL | 48 | 10.5 | 18 | 70 | 77 108 | 50 | — 50 | M8×1.25×12 | 49 80 | 37.5 | 14 | M6×0.75 | 8.5 | 11 | 34 | 27.5 |

Notes: 1) External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

(2) Reference number for random-matching type

Ball Slide

Random-matching ball slide series code
NAS: NS Series random-matching ball slide

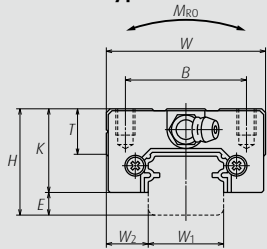
Size

Ball slide shape code
(refer to Fig. 2 on page 6)

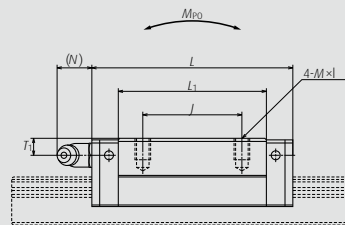
NAS 30 AL S Z L

Option code
-L: Equipped with NSK K1-L
-K: Equipped with NSK K1
-F: Fluoride low temperature chrome plating + AS2 grease
-F50: Fluoride low temperature chrome plating + LG2 grease
Preload code
No code: Fine clearance, Z: Slight preload, H: Medium preload
Material code
No code: Special high carbon steel (NSK standard),
S: Stainless steel

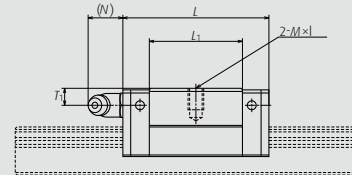
AL and CL types



AL type



CL type



Rail

Random-matching rail series code
N1S: NS Series random-matching rail

Size

Rail length (mm)

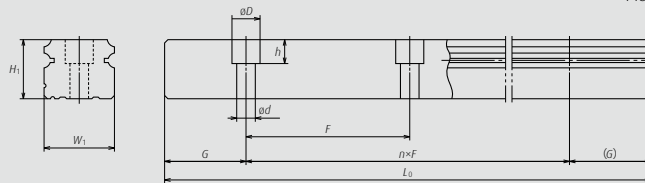
Rail shape code: L

L: Standard, T: The rail mounting bolt hole M4 for NS15

Material/surface treatment code (refer to Table 12 on page 12)

N1S 30 1200 L C N - ** PC Z

Preload code
(refer to Table 9 on page 10)
T: Fine clearance,
Z: Slight preload
(common rail for slight or medium preload)
Accuracy code
PH: High precision grade random-matching type
PC: Normal grade random-matching type
Design serial number
Added to the reference number
Butting rail specification*
N: Non-butting; L: Butting specification
*Please consult with NSK for butting rail specification.



Unit: mm

| Rail | | | | Basic load rating | | | | | | | | Weight | |
|------------|--------------------------------|------------------|---|----------------------------------|------------------------------------|---------------------------------|-----------------|---------------------|--------------|-----------------|--------------|-----------------------|----------------|
| Pitch F | Mounting bolt hole d×D×h | G (reference) | Max. length L _{0max} (for stainless) | 2) Dynamic | | Static C ₀ (N) | M _{Ro} | Static moment (N·m) | | | | Ball slide (kg) | Rail (kg/m) |
| | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | | | M _{Po} | | M _{Yo} | | | |
| | | | | | | | | (One slide) | (Two slides) | (One slide) | (Two slides) | | |
| 60 | 3.5×6×4.5 4.5×7.5×5.3 | 20.0 | 2,920 (1,700) | 7,250 | 5,750 | 9,100 | 45.5 | 24.5 | 196 | 20.5 | 165 | 0.14 | 1.4 |
| | | | | 11,200 | 8,850 | 16,900 | 84.5 | 77 | 470 | 64.5 | 395 | | |
| 60 | 6×9.5×8.5 | 20.0 | 3,960 (3,500) | 10,600 | 8,400 | 13,400 | 91.5 | 46.5 | 330 | 39 | 279 | 0.19 | 2.3 |
| | | | | 15,600 | 12,400 | 23,500 | 160 | 133 | 755 | 111 | 630 | 0.28 | |
| 60 | 7×11×9 | 20.0 | 3,960 (3,500) | 17,700 | 14,000 | 20,800 | 164 | 91 | 655 | 76 | 550 | 0.34 | 3.1 |
| | | | | 26,100 | 20,700 | 36,500 | 286 | 258 | 1,470 | 217 | 1,230 | 0.51 | |
| 80 | 7×11×9 | 20.0 | 4,000 (3,500) | 24,700 | 19,600 | 29,600 | 282 | 139 | 1,080 | 116 | 905 | 0.58 | 4.8 |
| | | | | 38,000 | 30,000 | 55,000 | 520 | 435 | 2,650 | 365 | 2,220 | 0.85 | |
| 80 | 9×14×12 | 20.0 | 4,000 (3,500) | 34,500 | 27,300 | 40,000 | 465 | 220 | 1,670 | 185 | 1,400 | 0.86 | 7.0 |
| | | | | 52,500 | 42,000 | 74,500 | 865 | 695 | 4,000 | 580 | 3,350 | 1.3 | |

2) The basic load rating complies with ISO standard. (ISO14728-1 and ISO14728-2)

C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life;

* Standard rail mounting bolt hole for NS15 is specified as hole for M3 (3.5 x 6 x 4.5).

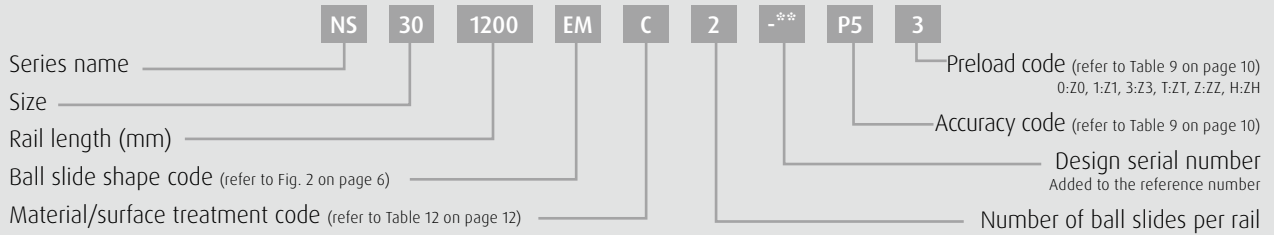
Please contact NSK to request a different hole for M4 (4.5 x 7.5 x 5.3).

Specifications

NS-JM (Medium-load type/short, square low-profile type)

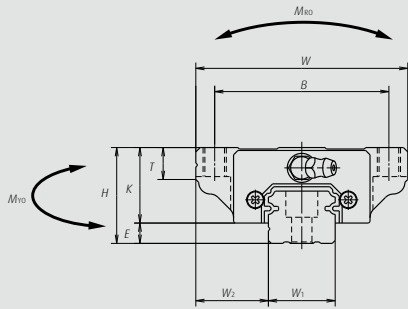
NS-EM (High-load type/standard, square low-profile type)

(1) Reference number for assembly

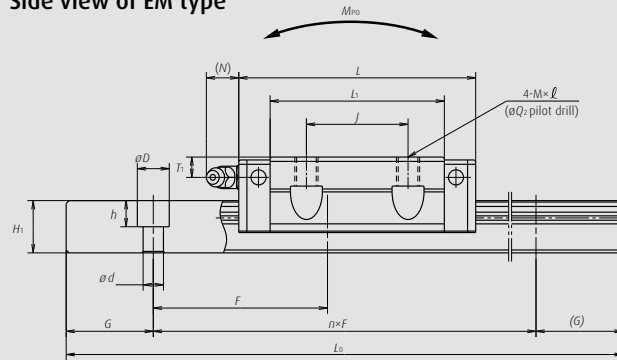


Assembly (Preloaded assembly, random-matching type)

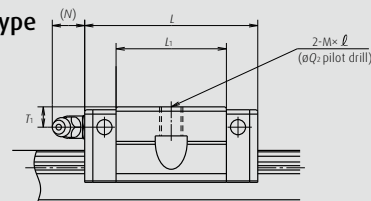
Front view of EM and JM types



Side view of EM type



Side view of JM type



| Model No. | Assembly | | | | | Ball slide | | | | | | | | | | | |
|------------------|----------|------|----------------|---------|--------------|---------------|---------|------------------------------|----------------|----------------|------|------------|----------------|----------------|----|----------------------|-----------------------|
| | Height H | E | W ₂ | Width W | Length L | Mounting hole | | | | L ₁ | K | T | Grease fitting | | | Width W ₁ | Height H ₁ |
| | | | | | | B | J | M×Pitch×l | Q ₂ | | | | Hole size | T ₁ | N | | |
| NS15JM NS15EM | 24 | 4.6 | 18.5 | 52 | 40.4 56.8 | 41 | — 26 | M5×0.8×7 | 4.4 | 23.6 40 | 19.4 | 8 | ø3 | 6 | 3 | 15 | 12.5 |
| NS20JM NS20EM | 28 | 6 | 19.5 | 59 | 47.2 65.2 | 49 | — 32 | M6×1×9 (M6×1×9.5) | 5.3 | 30 48 | 22 | 10 | M6×0.75 | 5.5 | 11 | 20 | 15.5 |
| NS25JM NS25EM | 33 | 7 | 25 | 73 | 59.6 81.6 | 60 | — 35 | M8×1.25×10 (M8×1.25×11.5) | 6.8 | 38 60 | 26 | 11 (12) | M6×0.75 | 7 | 11 | 23 | 18 |
| NS30JM NS30EM | 42 | 9 | 31 | 90 | 67.4 96.4 | 72 | — 40 | M10×1.5×12 (M10×1.5×14.5) | 8.6 | 42 71 | 33 | 11 (15) | M6×0.75 | 8 | 11 | 28 | 23 |
| NS35JM NS35EM | 48 | 10.5 | 33 | 100 | 77 108 | 82 | — 50 | M10×1.5×13 (M10×1.5×14.5) | 8.6 | 49 80 | 37.5 | 12 (15) | M6×0.75 | 8.5 | 11 | 34 | 27.5 |

Notes: 1) External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

2) Parenthesized dimensions are for items made of stainless steel.

(2) Reference number for random-matching type

Ball Slide

Random-matching ball slide series code

NAS: NS Series random-matching ball slide

Size

Ball slide shape code
(refer to Fig. 2 on page 6)

NAS 30 EM S Z L

Option code

-L: Equipped with NSK K1-L

-K: Equipped with NSK K1

-F: Fluoride low temperature chrome plating + AS2 grease

-F50: Fluoride low temperature chrome plating + LG2 grease

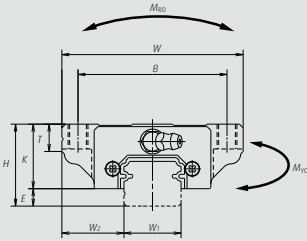
Preload code

No code: Fine clearance, Z: Slight preload, H: Medium preload

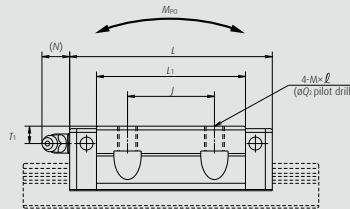
Material code

No code: Special high carbon steel (NSK standard), S: Stainless steel

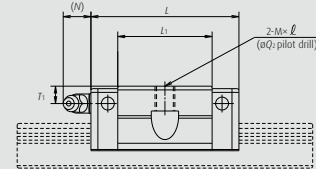
EM and JM types



EM type



JM type



Rail

Random-matching rail series code

N1S: NS Series random-matching rail

Size

Rail length (mm)

Rail shape code: L

L: Standard, T: The rail mounting bolt hole M4 for NS1S

Material/surface treatment code (refer to Table 12 on page 12)

N1S 30 1200 L C N - ** PC Z

Preload code

(refer to Table 9 on page 10)

T: Fine clearance,

Z: Slight preload

(common rail for slight or medium preload)

Accuracy code

PH: High precision grade random-matching type

PC: Normal grade random-matching type

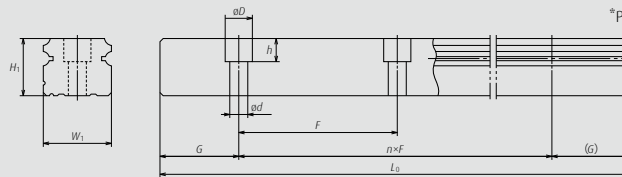
Design serial number

Added to the reference number

Butting rail specification*

N: Non-butting; L: Butting specification

*Please consult with NSK for butting rail specification.



Unit: mm

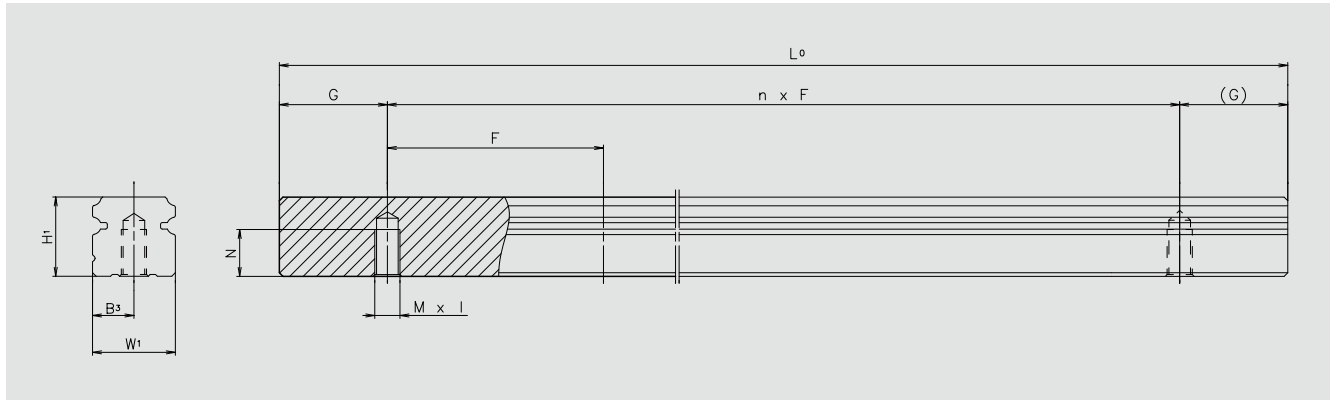
| Rail | | | | Basic load rating | | | | | | | | Weight | |
|------------|--------------------------------|------------------|---|-------------------------------|---------------------------------|---------------------------------|-----------------|---|-------|---|-------|-----------------------|----------------|
| Pitch F | Mounting bolt hole d×D×h | G (reference) | Max. length L _{0max} (for stainless) | 3)Dynamic | | Static C ₀ (N) | M _{RO} | Static moment (N-m) | | | | Ball slide (kg) | Rail (kg/m) |
| | | | | [50km] C ₅₀ (N) | [100km] C ₁₀₀ (N) | | | M _{P0} (One slide) (Two slides) | | M _{V0} (One slide) (Two slides) | | | |
| 60 | *3.5×6×4.5 4.5×7.5×5.3 | 20.0 | 2,920 (1,700) | 7,250 | 5,750 | 9,100 | 45.5 | 24.5 | 196 | 20.5 | 165 | 0.17 | 1.4 |
| | | | | 11,200 | 8,850 | 16,900 | 84.5 | 77 | 470 | 64.5 | 395 | 0.26 | |
| 60 | 6×9.5×8.5 | 20.0 | 3,960 (3,500) | 10,600 | 8,400 | 13,400 | 91.5 | 46.5 | 330 | 39 | 279 | 0.24 | 2.3 |
| | | | | 15,600 | 12,400 | 23,500 | 160 | 133 | 755 | 111 | 630 | 0.35 | |
| 60 | 7×11×9 | 20.0 | 3,960 (3,500) | 17,700 | 14,000 | 20,800 | 164 | 91 | 655 | 76 | 550 | 0.44 | 3.1 |
| | | | | 26,100 | 20,700 | 36,500 | 286 | 258 | 1,470 | 217 | 1,230 | 0.66 | |
| 80 | 7×11×9 | 20.0 | 4,000 (3,500) | 24,700 | 19,600 | 29,600 | 282 | 139 | 1,080 | 116 | 905 | 0.76 | 4.8 |
| | | | | 38,000 | 30,000 | 55,000 | 520 | 435 | 2,650 | 365 | 2,220 | 1.2 | |
| 80 | 9×14×12 | 20.0 | 4,000 (3,500) | 34,500 | 27,300 | 40,000 | 465 | 220 | 1,670 | 185 | 1,400 | 1.2 | 7 |
| | | | | 52,500 | 42,000 | 74,500 | 865 | 695 | 4,000 | 580 | 3,350 | 1.7 | |

3) The basic load rating complies with ISO standard. (ISO14728-1 and ISO14728-2)

C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life,

*) Standard rail mounting bolt hole for NS1S is specified as hole for M3 (3.5 x 6 x 4.5). Please contact NSK to request a different hole for M4 (4.5 x 7.5 x 5.3).

Bottom Tapped Rails from stock available



| Model No. | W1 | H1 | F | M×l | N | B3 | G | L0 | n | × | F |
|--------------------|----|----|-----|----------|----|------|------|------|----|---|-----|
| N1H152980LVNG01PCZ | 15 | 15 | 60 | M5×0.8 | 8 | 7.5 | 30 | 2980 | 49 | × | 60 |
| N1H203960LVNG01PCZ | 20 | 18 | 60 | M6×1 | 10 | 10.0 | 30 | 3960 | 65 | × | 60 |
| N1H253960LVNG01PCZ | 23 | 22 | 60 | M6×1 | 12 | 11.5 | 30 | 3960 | 65 | × | 60 |
| N1H304000LVNG01PCZ | 28 | 26 | 60 | M8×1.25 | 15 | 14.0 | 40 | 4000 | 49 | × | 80 |
| N1H354000LVNG01PCZ | 34 | 29 | 80 | M8×1.25 | 17 | 17.0 | 40 | 4000 | 49 | × | 80 |
| N1H453990LVNG01PCZ | 45 | 38 | 80 | M12×1.75 | 24 | 22.5 | 52.5 | 3990 | 37 | × | 105 |
| N1H553990LVNG01PCZ | 53 | 44 | 105 | M14×2 | 24 | 26.5 | 60 | 3990 | 32 | × | 120 |
| N1H653900LVNG01PCZ | 63 | 53 | 120 | M16×2 | 25 | 31.5 | 75 | 3900 | 25 | × | 150 |

For partnumber reference see Nomenclature for Rail - page 21

| Model No. | W1 | H1 | F | M×l | N | B3 | G | L0 | n | × | F |
|--------------------|----|------|----|---------|----|------|----|------|----|---|----|
| N1S152920LVNG01PCZ | 15 | 12.5 | 60 | M5×0.8 | 7 | 7.5 | 20 | 2920 | 48 | × | 60 |
| N1S203960LVNG01PCZ | 20 | 15.5 | 60 | M6×1 | 9 | 10.0 | 30 | 3960 | 65 | × | 60 |
| N1S253960LVNG01PCZ | 25 | 18 | 60 | M6×1 | 10 | 11.5 | 30 | 3960 | 65 | × | 60 |
| N1S304000LVNG01PCZ | 30 | 23 | 80 | M8×1.25 | 14 | 14.0 | 40 | 4000 | 49 | × | 80 |
| N1S354000LVNG01PCZ | 35 | 27.5 | 80 | M8×1.25 | 16 | 17.0 | 40 | 4000 | 49 | × | 80 |

For partnumber reference see Nomenclature for NS - page 23/25