

# SFT

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Standard Type  
Linear Guideway

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# **SFT** Standard Type Linear Guideway

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## Introduction

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Linear guideway is the motion product by rolling elements. By using recirculated rolling elements such as balls or rollers between the rail and the carriages can achieve much lower friction. Which compared with the traditional slide and provide much smoother operation. Furthermore, depending to our outstanding process capability, we can offer the interchange of high accuracy to customers for easy maintenance and replacing.

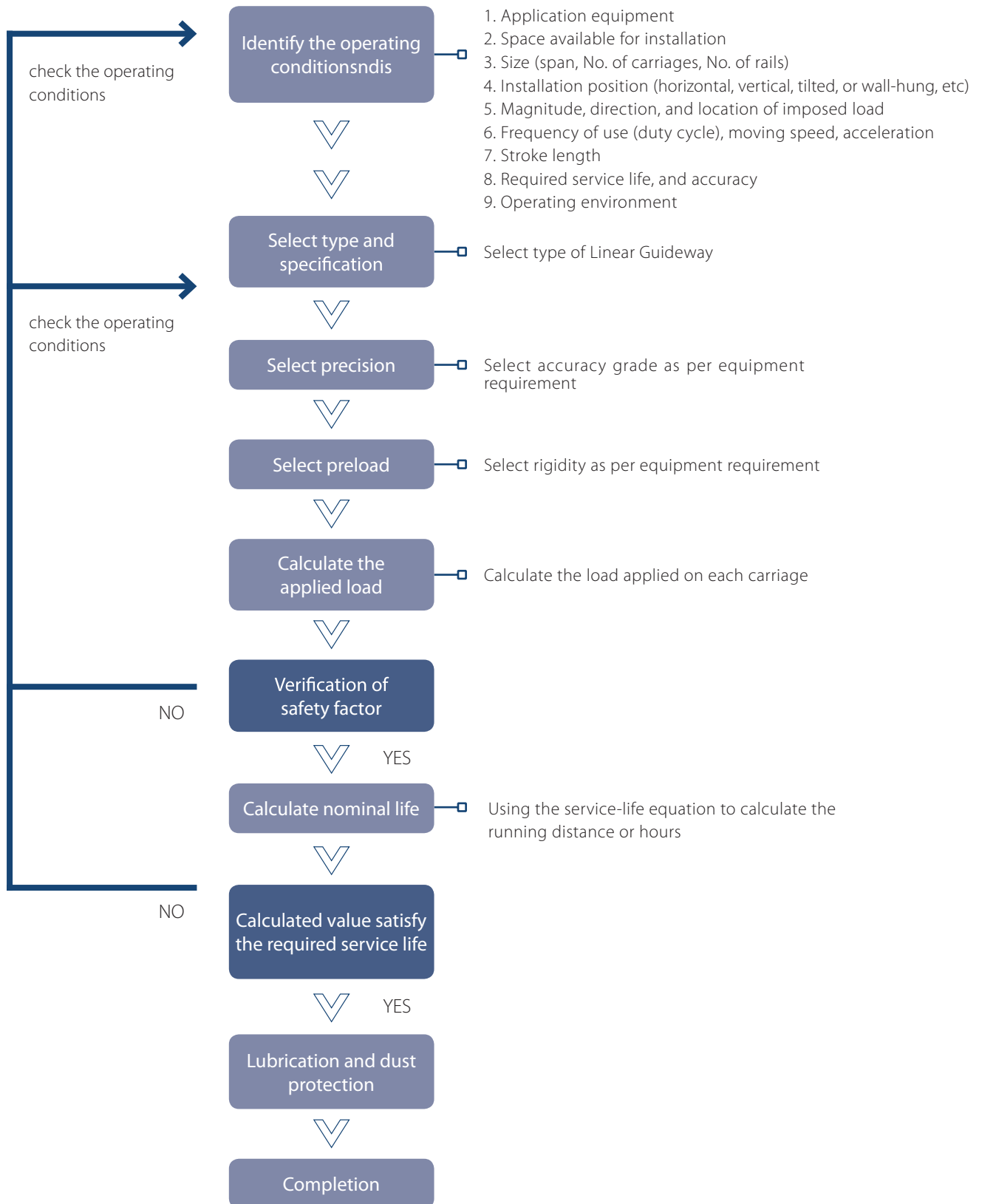
## Features

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1. Low frictional resistance-With using the rolling contact to replace of the traditional sliding one, the friction coefficient is only 1/50 of tradition contact.
2. High positioning accuracy-The rolling motion with a low friction coefficient, and the difference between dynamic and static friction is very small. Therefore, there would be no slippage while the load is moving.
3. Low power consumption-Due to the characteristic of low frictional resistance, the required driving force is much lower than in other systems, thus the power consumption is small. Moreover, the emperature rising effect is small even under high speed operation.
4. Four-way equal load-The optimum design of geometric mechanics makes the linear guideway to bear the load in all four directions, radial, reversed radial, and two lateral directions.
5. Interchangeability-Superior processing ability can offer the linear guideway high precision and make the customers use and maintain easily, and also achieve original highly accurate linear motion.
6. Easy lubrication-With a special lubricating design linear guideway, it is possible to equip various grease nipples and piping joints, and then to effectively inject grease or lubrication oil into the interior of the carriages.



## Selection Process



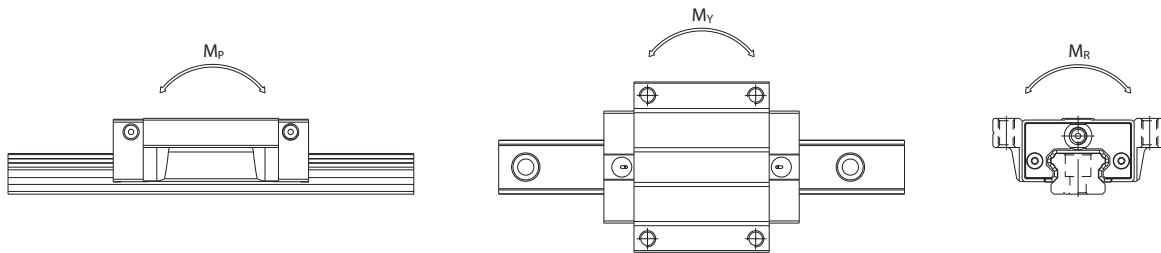
## Rated Load and Life

### 1. Basic Static Load Rating ( $C_0$ )

The basic static load rating ( $C_0$ ) refers to a static load in a given direction with a specific magnitude applied at the contact area under the most stress where the sum of permanent deformation develops between the raceway and rolling elements is 0.0001 times of the diameter of rolling ball. Therefore, the basic static load rating sets a limit on the static permissible load.

### 2. Static Permissible Moment ( $M_0$ )

When a moment is applied to a linear guideway, the rolling balls on both ends will receive the most stress among the stress distribution over the rolling elements in the system. The static permissible moment ( $M_0$ ) refers to a static moment in a given direction with specific magnitude applied at the contact area under the most stress where the sum of permanent deformation develops between the raceway and rolling elements is 0.0001 times the diameter of rolling elements. Therefore, the static permissible moment sets a limit on the static moment. In linear guideway system, the static permissible moment is dened as  $M_p$ ,  $M_y$ ,  $M_R$  three directions. See the gure below.



### 3. Static Safety Factor ( $f_s$ )

Due to the impact and vibration while the guideway at rest or moving, or the inertia from start and stop, the linear guideway may encounter with an unexpected external force. Therefore, the safety factor should be taken into consideration for effects of such operating loads. The static safety factor ( $f_s$ ) is a ratio of the basic static load rating ( $C_0$ ) to the calculated working load. The static safety factor for different kinds of application is shown as Table.

$$f_s = \frac{C_0}{P} \quad \text{OR} \quad f_s = \frac{M_0}{M}$$

|       |                                |
|-------|--------------------------------|
| $f_s$ | Static safety factor           |
| $C_0$ | Basic static loadrating(N)     |
| $M_0$ | Static permissible moment(N-m) |
| $P$   | Calculated working load(N)     |
| $M$   | Calculated moment(N-m)         |

| Load Condition            | $f_s$ |
|---------------------------|-------|
| Normal loading condition  | 1~3   |
| With impact and vibration | 3~7   |

### 4. Basic Dynamic Load Rating

The basic dynamic load rating ( $C$ ) is dened as a load in a given direction and with a given magnitude that when a group of linear guideways operate under the same conditions. As the rolling element is ball, the nominal life of the linear guideway is 50 km.

## 5. Calculation of Nominal Life

The life of linear guideway is defined as the total distance traveled until fatigue flaking appears on the surface of the raceway or rolling elements. Even when the linear guideways are manufactured in the same way or operated under the same motion conditions. For this reason, nominal life is used as the criteria for prediction the service of a linear guideway. The nominal life is the total distance that 90% of a group of identical linear guideways, operated under the identical conditions, can travel without flaking. Based on the selected basic dynamic rated load (C) and actual load (P), the nominal life of linear guideway can be calculated.

$$L = \left( \frac{f_h \times f_t \times C}{f_w \times P} \right)^3 \times 50 \text{ (km)}$$

|   |                               |       |                    |
|---|-------------------------------|-------|--------------------|
| L | Nominal life (km)             | $f_h$ | Hardness factor    |
| C | Basic dynamic load rating (N) | $f_t$ | Temperature factor |
| P | Working load (N)              | $f_w$ | Loading factor     |

## 6. Factors of normal life

As the above mentioned about the calculation of nominal life of the linear guideway, which the factors about the hardness, temperature and load will affect the nominal life of the linear guideway, the related coefficient is as the following explanation.

### 6.1 Hardness factor

In order to ensure the optimum load capacity of linear guideway system, the hardness of raceway must be HRC58~64. If the hardness is lower than this range, the permissible load and nominal life will be decreased. For this reason, the basic dynamic load rating and the basic static load rating should be multiplied by hardness factor for rating calculation. See figure below. The hardness requirement of SFT linear guideway is above HRC58~64, thus the  $f_h=1.0$ .

### 6.2 Temperature factor

When operating temperature higher than 100°C, the nominal life will be degraded. Therefore, the basic dynamic and static load rating should be multiplied by temperature factor for rating calculation. See figure below. The assemble parts of SFT guideway are made of plastic and rubber, therefore, the operating temperature below 100°C is strongly recommend. For special need, please contact us.

### 6.3 Load factor

Although the working load of linear guideway system can be obtained by calculation, the actual load is mostly higher than calculated value. This is because the vibration and impact, caused by mechanical reciprocal motion, are difficult to be estimated. This is especially true when the vibration from high speed operation and the impact from repeated start and stop. Therefore, for consideration of speed and vibration, the basic dynamic load rating should be divided by the empirical load factor. See the table below.

| Motion Condition             | Operating Speed (m/min) | $f_w$   |
|------------------------------|-------------------------|---------|
| No impact & smooth operation | $V \leq 15$             | 1.0~1.2 |
| Slight impact & vibration    | $15 < V \leq 60$        | 1.2~1.5 |
| Moderate impact              | $60 < V \leq 120$       | 1.5~2.0 |
| Strong impact & vibration    | $120 < V$               | 2.0~3.5 |

## Preloading and Rigidity

The rigidity of a linear guideway could be enhanced by increasing the preload. The preload is represented by negative clearance resulting from the increase of rolling element diameter. Therefore, the preload should be considered in calculation service life. Selecting proper preload from table below to adapt the specific application and condition.

| Preload Grade        | Preload     | Operating Condition   | Application   |
|----------------------|-------------|---|---|
| Light preload<br>Z0  | 0~0.02C     | The loading direction is fixed, vibration and impact are light, and two axes are applied in parallel.<br>High precision is not required, and the low frictional resistance is needed. | Semiconductor Manufacturing, Medical equipment, Punching press, Welding machine, Industrial Robot, Auto packing machine, XY axis of ordinary industrial machine, Pallet changer, material handling equipments, and other small sliding systems. |
| Medium preload<br>Z1 | 0.03C~0.05C | Applied in one-axis configuration.<br>The need of light preload and high precision.   | Z axis of industrial machines, precision XY table, Industrial Robot, NC Lathe, measuring equipment, grinding machine, auto painting machine \ Precision XY table.   |
| Heavy preload<br>Z2  | 0.06C~0.08C | Machine is subjected to vibration and impact, and high rigidity required.<br>Application of heavy load or heavy cutting.  | Machining center, NC Lathe, Milling machine, Boring machine, Z axis of industrial machines.   |

## Accuracy Standard

The accuracy of linear guideway includes the dimensional tolerance of height, width, and the running accuracy of the carriage on the rail. The standard of the dimension difference is built for two or more carriages on a rail or a number of rails are used on the same plane. The accuracy of linear guideway is divided into 5 classes, normal grade (N), high precision (H), precision (P), super precision (SP), and ultra precision (UP). When two or more linear guideways are used on the same plane, the tolerance of N and difference of  $\Delta W$  is applicable to master rail only. The accuracy is measured at the center or central area of carriage. The accuracy grade for different applications shown as table below.

|          | Normal<br>C | High<br>H | Precision<br>P | Super Precision<br>SP | Ultra Precision<br>UP |
|----------|-------------|-----------|----------------|-----------------------|-----------------------|
| G Series | ◎           | ◎         | ◎              | ◎                     | ◎                     |

## Lubrication

Supplying the sufficient lubrication to the linear guideway will greatly reduce the rolling friction and increase the service life. Otherwise, the lubrication also prevent from corrosion. Generally, the linear guideway usually use lubrication grease and lubrication oil. It will be chosen by customers' options.

### 1. Grease

After the linear guideway installed, we recommend the guideway be re-lubricated every 100 km. It is possible to carry out the lubrication through the grease nipple. Generally, grease is applied for speed that do not exceed 60 m/min faster speed will require high-viscosity oil with a lubricant. The standard grease is lithium-based grease No.2.

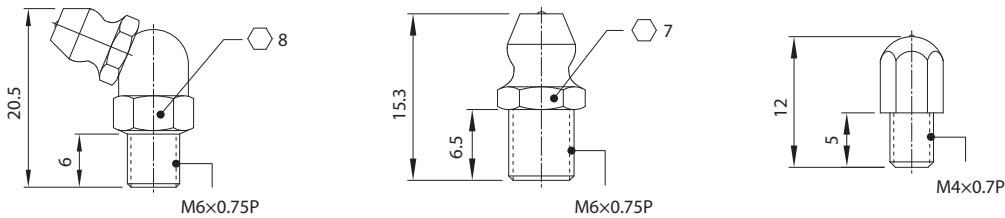
### 2. Oil

The recommend viscosity of oil is about 30~150 cST, and the recommend oil.

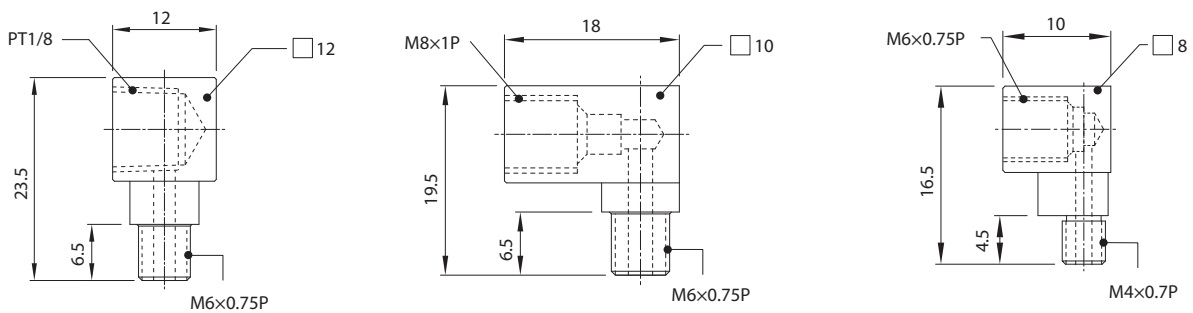
### 3. Grease nipples and piping

SFT offers the following various grease nipples and piping joints to customers' options.

Grease Type



Piping Type

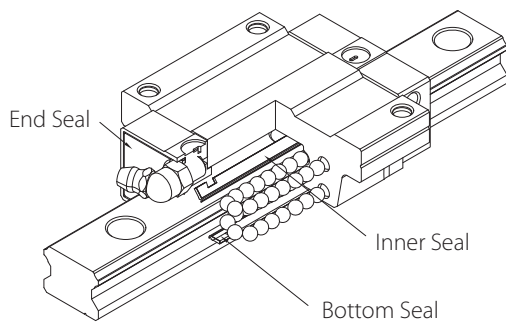




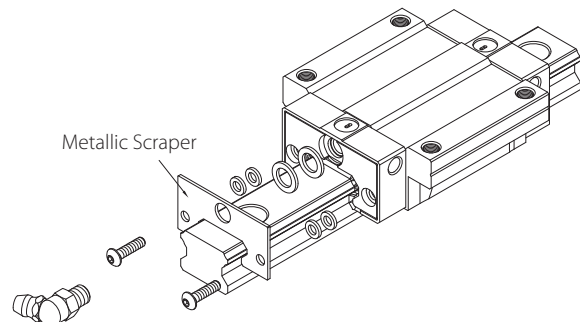
## Dustproof Accessories

SFT offers various contamination protection against different environments for linear guideway.

| Code      | Contamination protection                                 | Applied condition   |
|-----------|--|---|
| No symbol | Metallic scraper (both ends)                             | Low resistance and cleaner environments                     |
| UU        | Bidirectional end seal(both ends)                        | Low resistance  |
| SS        | Bidirectional end seal+Bottom seal                       | Normal environments   |
| ZZ        | SS + Inner seal+ Metallic scraper                        | Prevent large steel chips                                   |
| DD        | Double bidirectional end seal + Bottom seal + Inner seal | Highly dust-proof requirement                               |
| KK        | DD + Metallic scraper                                    | Prevent large steel chips and highly dust-proof requirement |



SS Layout



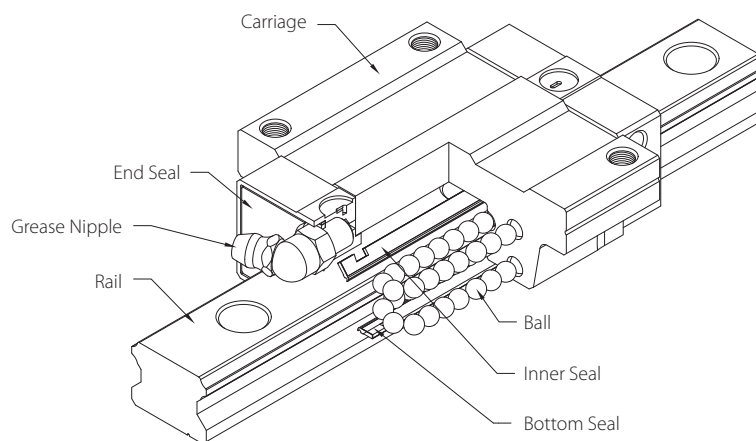
ZZ Layout

## Standard Linear Guideway

Standard linear guideway are designed with load capacity and rigidity higher than other similar product with circular-arc groove and structure optimization. It features equal load rating, reverse radial and lateral direction, self-aligning to absorb the installation-error, and use and install easily.

### 1. Characteristics of G Series

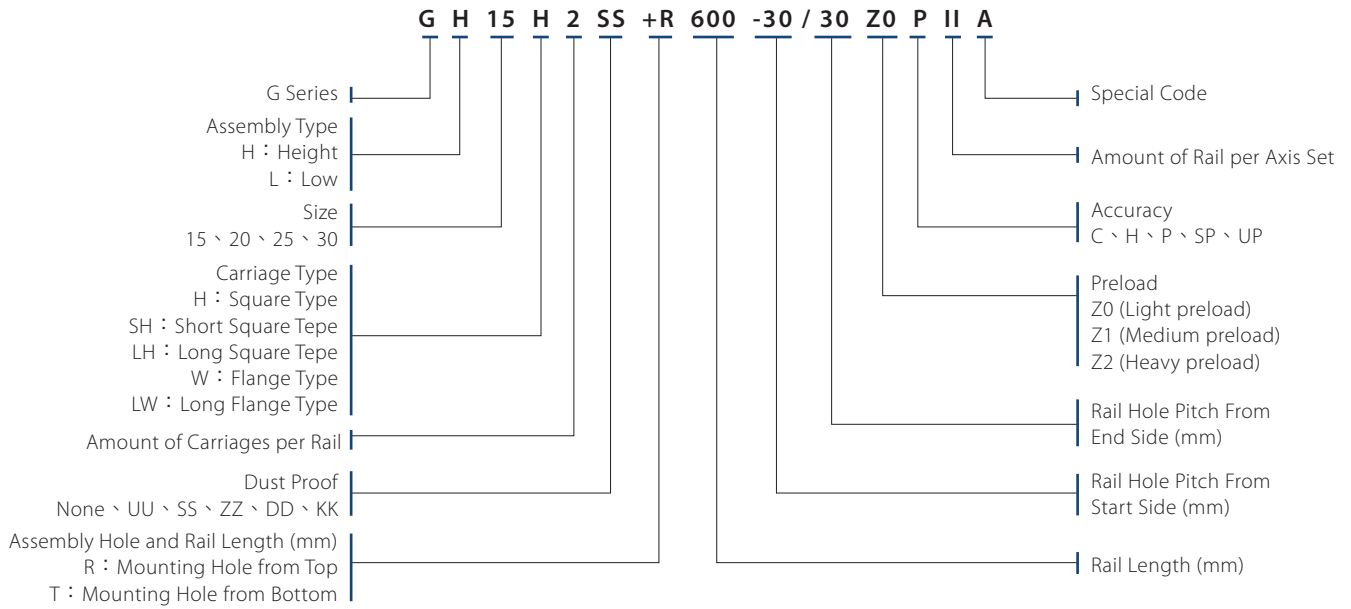
- (1) With the design of DF circular-arc groove, G Series can absorb most installation errors due to surface irregularities and provide the smooth linear motion through the shift of contact points and the elastic deformation of rolling elements.
- (2) Four-way Equal Load the G Series linear guideway has equal load rating in the radial and lateral direction.
- (3) Optimal Design compact type linear guide have heavy load and anti-torque ability could extend life.
- (4) High precision interchangeability linear guideway made by sophisticated production process and quality control.
- (5) Common rail suit for heavy load type and compact type could reduce Inventory costs.
- (6) Excellent smooth reflux design could reduce the running vibration.



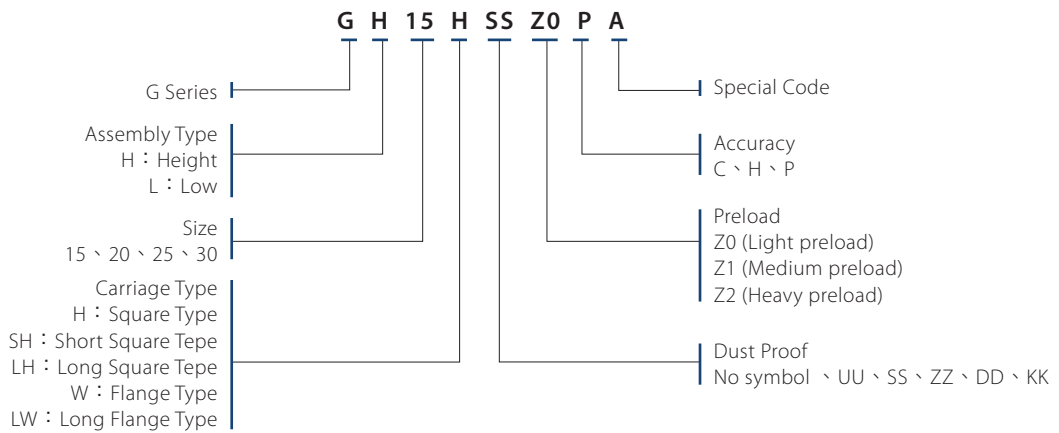
### 2. Description of Specification

SFT guideway can be classified into non-interchangeable and interchangeable types. The size is identical. The only difference between the two types is that the interchangeable type of blocks and rails can be freely exchanged, and their accuracy reach up to P class. The model number of GA Series contains the size, type, accuracy, class, preload class, and so on.

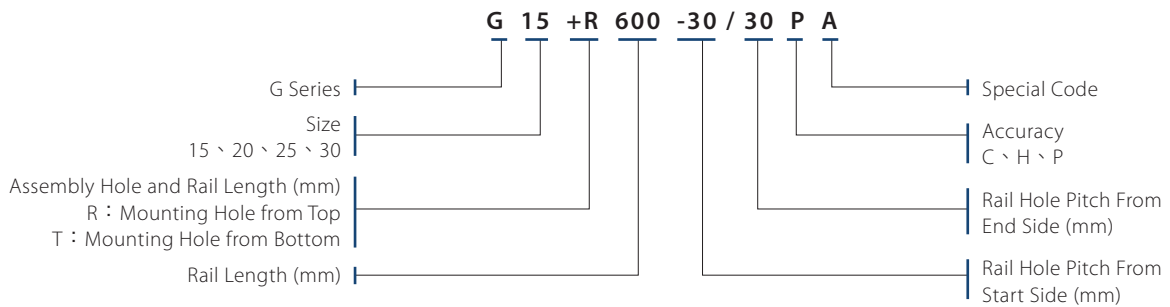
(1) Non-Interchangeable Type of Guideway



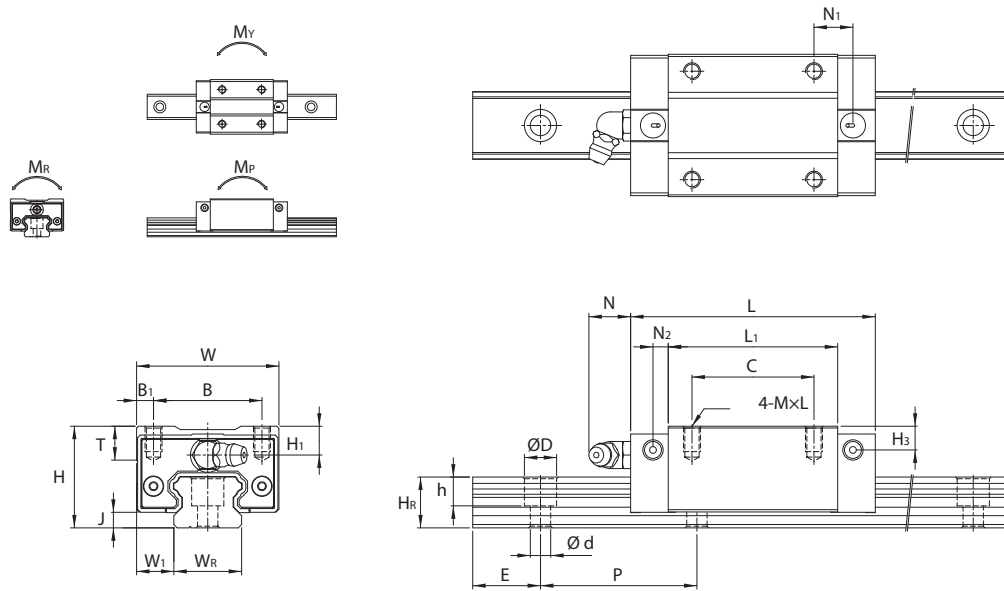
(2) Interchangeable Type of Carriage



(3) Interchangeable Type of Rail



## Dimension of GH-H



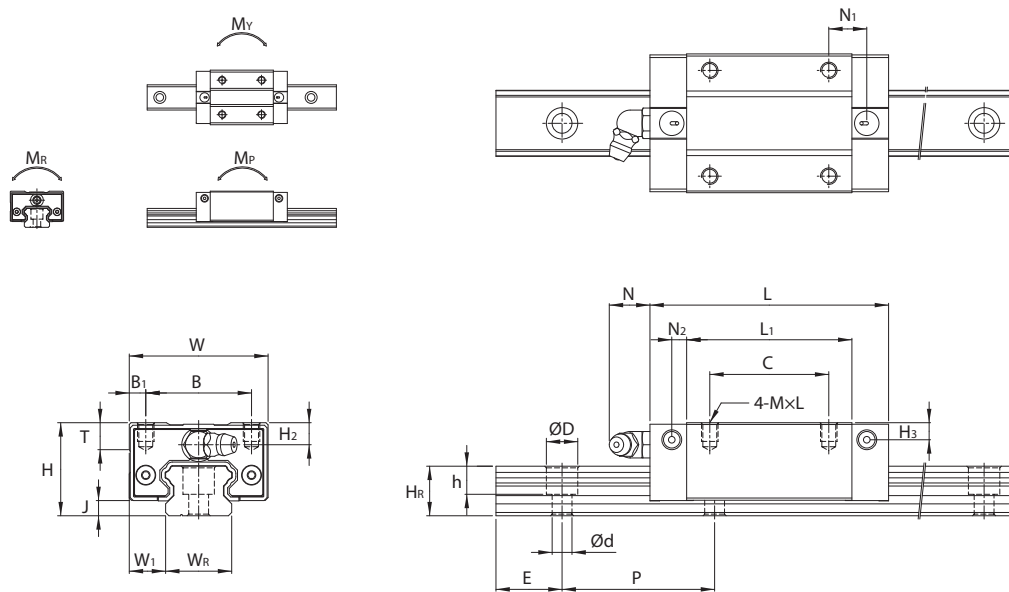
Unit: mm

| Model  | Assembly dimension |            |             |                |     | Basic load rating  |                                | Static moment rating  |      |                       |      | Weight                   |                |              |
|--------|--------------------|------------|-------------|----------------|-----|--------------------|--------------------------------|-----------------------|------|-----------------------|------|--------------------------|----------------|--------------|
|        | Height<br>H        | Width<br>W | Length<br>L | W <sub>1</sub> | J   | Dynamic<br>C<br>KN | Static<br>C <sub>0</sub><br>KN | M <sub>p</sub> (KN-m) |      | M <sub>v</sub> (KN-m) |      | M <sub>r</sub><br>(KN-m) | Carriage<br>Kg | Rail<br>Kg/m |
|        |                    |            |             |                |     |                    |                                | 1*                    | 2*   | 1*                    | 2*   |                          |                |              |
| GH15H  | 28                 | 34         | 58.5        | 9.5            | 4.5 | 11.8               | 18.9                           | 0.13                  | 0.78 | 0.13                  | 0.78 | 0.16                     | 0.18           | 1.28         |
| GH20H  | 30                 | 44         | 72.2        | 12             | 4.5 | 19.8               | 31.9                           | 0.28                  | 1.64 | 0.28                  | 1.64 | 0.32                     | 0.32           | 1.90         |
| GH20LH | 30                 | 44         | 86.2        | 12             | 4.5 | 22.5               | 38.6                           | 0.43                  | 2.33 | 0.43                  | 2.33 | 0.39                     | 0.39           | 1.90         |
| GH25H  | 40                 | 48         | 83.5        | 12.5           | 6.5 | 27.1               | 41.9                           | 0.42                  | 2.43 | 0.42                  | 2.43 | 0.50                     | 0.52           | 2.64         |
| GH25LH | 40                 | 48         | 102.5       | 12.5           | 6.5 | 33.3               | 55.8                           | 0.74                  | 3.95 | 0.74                  | 3.95 | 0.65                     | 0.70           | 2.64         |
| GH30H  | 45                 | 60         | 98.4        | 16             | 7   | 38.9               | 57.8                           | 0.69                  | 3.87 | 0.69                  | 3.87 | 0.79                     | 0.92           | 4.29         |
| GH30LH | 45                 | 60         | 121         | 16             | 7   | 47.5               | 77.1                           | 1.21                  | 6.27 | 1.21                  | 6.27 | 1.05                     | 1.15           | 4.29         |

| Model  | Rail dimension          |                          |            |             |                         | Carriage dimension |    |       |                |     |                |                |    |                |                |                       |
|--------|-------------------------|--------------------------|------------|-------------|-------------------------|--------------------|----|-------|----------------|-----|----------------|----------------|----|----------------|----------------|-----------------------|
|        | Width<br>W <sub>R</sub> | Height<br>H <sub>R</sub> | Pitch<br>P | E std.<br>E | Hole dimension<br>D×h×d | B                  | C  | M×L   | L <sub>1</sub> | T   | H <sub>2</sub> | H <sub>3</sub> | N  | N <sub>1</sub> | N <sub>2</sub> | Grease<br>Nipple Size |
| GH15H  | 15                      | 13                       | 60         | 20          | 7.5x5.3x4.5             | 26                 | 26 | M4x7  | 39             | 7.5 | 9              | 8              | 5  | 10             | 3.5            | M4x0.7P               |
| GH20H  | 20                      | 15                       | 60         | 20          | 9.5x8.5x6               | 32                 | 36 | M5x7  | 50             | 10  | 8.5            | 7              | 12 | 11.5           | 4.5            | M6x0.75P              |
| GH20LH | 20                      | 15                       | 60         | 20          | 9.5x8.5x6               | 32                 | 50 | M5x7  | 64             | 10  | 8.5            | 7              | 12 | 11.5           | 4.5            | M6x0.75P              |
| GH25H  | 23                      | 18                       | 60         | 20          | 11x9x7                  | 35                 | 35 | M6x9  | 58.5           | 10  | 14.5           | 12.5           | 12 | 13.5           | 4.5            | M6x0.75P              |
| GH25LH | 23                      | 18                       | 60         | 20          | 11x9x7                  | 35                 | 50 | M6x9  | 77.5           | 10  | 14.5           | 12.5           | 12 | 13.5           | 4.5            | M6x0.75P              |
| GH30H  | 28                      | 23.5                     | 80         | 20          | 14x12x9                 | 40                 | 40 | M8x10 | 70.4           | 10  | 10             | 12.5           | 12 | 22             | 4.5            | M6x0.75P              |
| GH30LH | 28                      | 23.5                     | 80         | 20          | 14x12x9                 | 40                 | 60 | M8x10 | 93             | 10  | 10             | 12.5           | 12 | 32             | 4.5            | M6x0.75P              |

\*1 is for one carriage, and 2 is for two carriages closely contacting.

## Dimension of GL-H



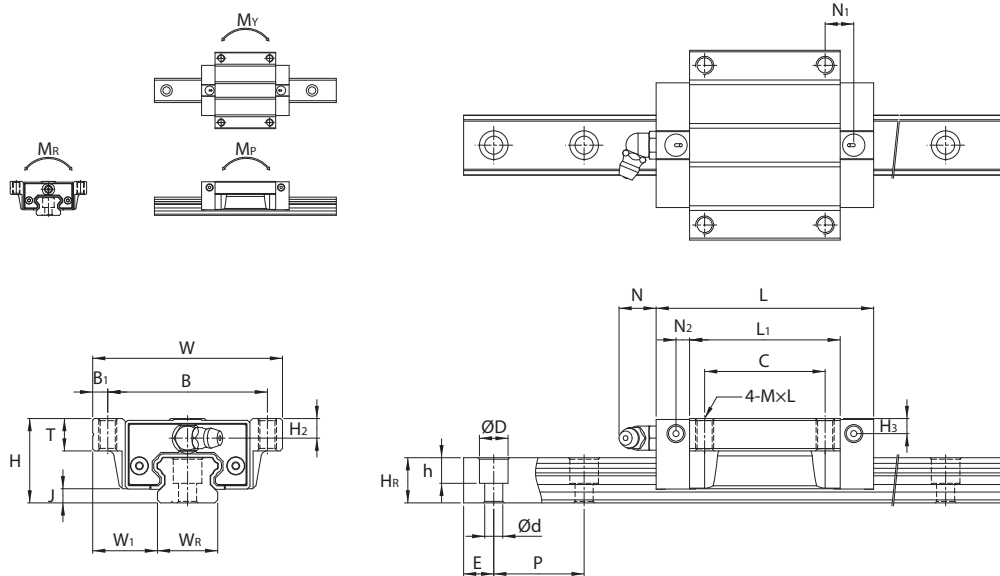
Unit: mm

| Model  | Assembly dimension |            |             |                |     | Basic load rating  |                                | Static moment rating  |      |                       |      |                          | Weight         |              |
|--------|--------------------|------------|-------------|----------------|-----|--------------------|--------------------------------|-----------------------|------|-----------------------|------|--------------------------|----------------|--------------|
|        | Height<br>H        | Width<br>W | Length<br>L | W <sub>1</sub> | J   | Dynamic<br>C<br>KN | Static<br>C <sub>0</sub><br>KN | M <sub>P</sub> (KN-m) |      | M <sub>V</sub> (KN-m) |      | M <sub>R</sub><br>(KN-m) | Carriage<br>Kg | Rail<br>Kg/m |
|        |                    |            |             |                |     |                    |                                | 1*                    | 2*   | 1*                    | 2*   |                          |                |              |
| GL15SH | 24                 | 34         | 41          | 9.5            | 4.5 | 7.8                | 9.4                            | 0.04                  | 0.28 | 0.04                  | 0.28 | 0.08                     | 0.09           | 1.28         |
| GL15H  | 24                 | 34         | 58.5        | 9.5            | 4.5 | 11.8               | 18.9                           | 0.13                  | 0.78 | 0.13                  | 0.78 | 0.16                     | 0.15           | 1.28         |
| GL20SH | 28                 | 42         | 47          | 11             | 4.5 | 11.4               | 14.5                           | 0.07                  | 0.5  | 0.07                  | 0.5  | 0.13                     | 0.14           | 1.90         |
| GL20H  | 28                 | 42         | 72.2        | 11             | 4.5 | 19.8               | 31.9                           | 0.28                  | 1.64 | 0.28                  | 1.64 | 0.32                     | 0.28           | 1.90         |
| GL25SH | 33                 | 48         | 55          | 12.5           | 6.5 | 18.6               | 24.4                           | 0.15                  | 1.06 | 0.15                  | 1.06 | 0.28                     | 0.24           | 2.64         |
| GL25H  | 33                 | 48         | 83.5        | 12.5           | 6.5 | 27.1               | 41.9                           | 0.42                  | 2.43 | 0.42                  | 2.43 | 0.5                      | 0.39           | 2.64         |
| GL30H  | 42                 | 60         | 98.4        | 16             | 7   | 38.9               | 57.8                           | 0.69                  | 3.87 | 0.69                  | 3.87 | 0.79                     | 0.92           | 4.29         |

| Model  | Rail dimension          |                          |            |             |                         | Carriage dimension |    |       |                |    |                |                |    |                |                |                       |
|--------|-------------------------|--------------------------|------------|-------------|-------------------------|--------------------|----|-------|----------------|----|----------------|----------------|----|----------------|----------------|-----------------------|
|        | Width<br>W <sub>R</sub> | Height<br>H <sub>R</sub> | Pitch<br>P | E std.<br>E | Hole Dimension<br>D×h×d | B                  | C  | M×L   | L <sub>1</sub> | T  | H <sub>2</sub> | H <sub>3</sub> | N  | N <sub>1</sub> | N <sub>2</sub> | Grease<br>Nipple Size |
| GL15SH | 15                      | 13                       | 60         | 20          | 7.5x5.3x4.5             | 26                 | -  | M4x5  | 21.5           | 7  | 5              | 4              | 5  | 10             | 3.5            | M4x0.7P               |
| GL15H  | 15                      | 13                       | 60         | 20          | 7.5x5.3x4.5             | 26                 | 26 | M4x5  | 39             | 7  | 5              | 4              | 5  | 10             | 3.5            | M4x0.7P               |
| GL20SH | 20                      | 15                       | 60         | 20          | 9.5x8.5x6               | 32                 | -  | M5x7  | 24             | 8  | 6.5            | 5              | 12 | 11.5           | 4.5            | M6x0.75P              |
| GL20H  | 20                      | 15                       | 60         | 20          | 9.5x8.5x6               | 32                 | 32 | M5x7  | 50             | 8  | 6.5            | 5              | 12 | 11.5           | 4.5            | M6x0.75P              |
| GL25SH | 23                      | 18                       | 60         | 20          | 11x9x7                  | 35                 | -  | M6x8  | 29.4           | 9  | 7.5            | 5.5            | 12 | 13.5           | 4.5            | M6x0.75P              |
| GL25H  | 23                      | 18                       | 60         | 20          | 11x9x7                  | 35                 | 35 | M6x8  | 58.5           | 9  | 7.5            | 5.5            | 12 | 13.5           | 4.5            | M6x0.75P              |
| GL30H  | 28                      | 23.5                     | 80         | 20          | 14x12x9                 | 40                 | 40 | M8x10 | 70.4           | 10 | 7              | 9.5            | 12 | 22             | 4.5            | M6x0.75P              |

\*1 is for one carriage, and 2 is for two carriages closely contacting.

## Dimension of GH-W



Unit: mm

| Model  | Assembly dimension |            |             |                |     | Basic load rating  |                                | Static moment rating  |      |                       |      | Weight                   |                |              |
|--------|--------------------|------------|-------------|----------------|-----|--------------------|--------------------------------|-----------------------|------|-----------------------|------|--------------------------|----------------|--------------|
|        | Height<br>H        | Width<br>W | Length<br>L | W <sub>1</sub> | J   | Dynamic<br>C<br>KN | Static<br>C <sub>0</sub><br>KN | M <sub>p</sub> (KN-m) |      | M <sub>v</sub> (KN-m) |      | M <sub>R</sub><br>(KN-m) | Carriage<br>Kg | Rail<br>Kg/m |
|        |                    |            |             |                |     |                    |                                | 1*                    | 2*   | 1*                    | 2*   |                          |                |              |
| GH15W  | 24                 | 47         | 58.5        | 16             | 4.5 | 11.8               | 18.9                           | 0.13                  | 0.78 | 0.13                  | 0.78 | 0.16                     | 0.18           | 1.28         |
| GH20W  | 30                 | 63         | 72.2        | 21.5           | 4.5 | 19.8               | 31.9                           | 0.28                  | 1.64 | 0.28                  | 1.64 | 0.32                     | 0.39           | 1.90         |
| GH20LW | 30                 | 63         | 86.2        | 21.5           | 4.5 | 22.5               | 38.6                           | 0.43                  | 2.33 | 0.43                  | 2.33 | 0.39                     | 0.48           | 1.90         |
| GH25W  | 36                 | 70         | 83.5        | 23.5           | 6.5 | 27.1               | 41.9                           | 0.42                  | 2.43 | 0.42                  | 2.43 | 0.50                     | 0.58           | 2.64         |
| GH25LW | 36                 | 70         | 102.5       | 23.5           | 6.5 | 33.3               | 55.8                           | 0.74                  | 3.95 | 0.74                  | 3.95 | 0.65                     | 0.76           | 2.64         |
| GH30W  | 42                 | 90         | 98.4        | 31             | 7   | 38.9               | 57.8                           | 0.69                  | 3.87 | 0.69                  | 3.87 | 0.79                     | 0.92           | 4.29         |
| GH30LW | 42                 | 90         | 121         | 31             | 7   | 47.5               | 77.1                           | 1.21                  | 6.27 | 1.21                  | 6.27 | 1.05                     | 1.15           | 4.29         |

| Model  | Rail dimension          |                          |            |             |                         | Carriage dimension |    |        |                |     |                |                |    |                |                |                       |
|--------|-------------------------|--------------------------|------------|-------------|-------------------------|--------------------|----|--------|----------------|-----|----------------|----------------|----|----------------|----------------|-----------------------|
|        | Width<br>W <sub>R</sub> | Height<br>H <sub>R</sub> | Pitch<br>P | E std.<br>E | Hole dimension<br>D×h×d | B                  | C  | M×L    | L <sub>1</sub> | T   | H <sub>2</sub> | H <sub>3</sub> | N  | N <sub>1</sub> | N <sub>2</sub> | Grease<br>Nipple Size |
| GH15W  | 15                      | 13                       | 60         | 20          | 7.5x5.3x4.5             | 38                 | 30 | M5x7   | 39             | 7.5 | 9              | 8              | 5  | 8              | 3.5            | M4x0.7P               |
| GH20W  | 20                      | 15                       | 60         | 20          | 9.5x8.5x6               | 53                 | 40 | M6x10  | 50             | 10  | 8.5            | 7              | 12 | 9.5            | 4.5            | M6x0.75P              |
| GH20LW | 20                      | 15                       | 60         | 20          | 9.5x8.5x6               | 53                 | 40 | M6x10  | 64             | 10  | 8.5            | 7              | 12 | 16.5           | 4.5            | M6x0.75P              |
| GH25W  | 23                      | 18                       | 60         | 20          | 11x9x7                  | 57                 | 45 | M8x10  | 58.5           | 10  | 14.5           | 12.5           | 12 | 13             | 4.5            | M6x0.75P              |
| GH25LW | 23                      | 18                       | 60         | 20          | 11x9x7                  | 57                 | 45 | M8x10  | 77.5           | 10  | 14.5           | 12.5           | 12 | 22.5           | 4.5            | M6x0.75P              |
| GH30W  | 28                      | 23.5                     | 80         | 20          | 14x12x9                 | 72                 | 52 | M10x10 | 70.4           | 10  | 7              | 9.5            | 12 | 16.2           | 4.5            | M6x0.75P              |
| GH30LW | 28                      | 23.5                     | 80         | 20          | 14x12x9                 | 72                 | 52 | M10x10 | 93             | 10  | 7              | 9.5            | 12 | 27.5           | 4.5            | M6x0.75P              |

\*1 is for one carriage, and 2 is for two carriages closely contacting.

### 3. Accuracy Grade

The accuracy of G Series can be classified into three classes: normal (C), high (H), precision (P), Super precision (SP), Ultra precision (UP). Choices for different classes are available according to various requirements.

#### Non-Interchangeable Type

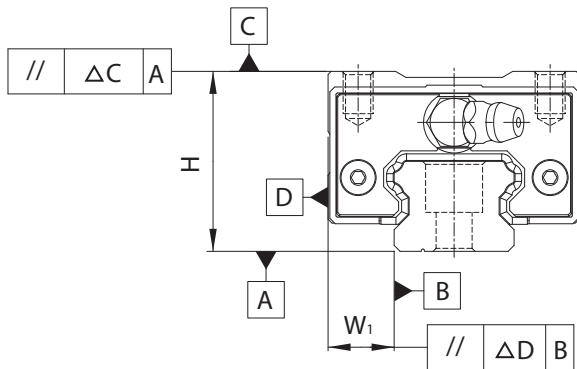
Unit: mm

| Model    | Item  | Accuracy Grade          |           |                |                       |                       |
|----------|---|-------------------------|-----------|----------------|-----------------------|-----------------------|
|          |   | Norm<br>C               | High<br>H | Precision<br>P | Super Precision<br>SP | Ultra Precision<br>UP |
| 15<br>20 | Tolerance for height H                          | ±0.1                    | ±0.03     | 0<br>-0.03     | 0<br>-0.015           | 0<br>-0.008           |
|          | Height difference (ΔH)                          | 0.02                    | 0.01      | 0.006          | 0.004                 | 0.003                 |
|          | Tolerance for width W <sub>1</sub>              | ±0.1                    | ±0.03     | 0<br>-0.03     | 0<br>-0.015           | 0<br>-0.008           |
|          | Width difference (ΔW <sub>1</sub> )             | 0.02                    | 0.01      | 0.006          | 0.004                 | 0.003                 |
|          | Running parallelism of surface C with Surface A | ΔC( Show bellow Table ) |           |                |                       |                       |
|          | Running parallelism of surface D with Surface B | ΔD( Show bellow Table ) |           |                |                       |                       |
| 25<br>30 | Tolerance for height H                          | ±0.1                    | ±0.04     | 0<br>-0.04     | 0<br>-0.02            | 0<br>-0.01            |
|          | Height difference (ΔH)                          | 0.02                    | 0.015     | 0.007          | 0.005                 | 0.003                 |
|          | Tolerance for width W <sub>1</sub>              | ±0.1                    | ±0.04     | 0<br>-0.04     | 0<br>-0.02            | 0<br>-0.01            |
|          | Width difference (ΔW <sub>1</sub> )             | 0.03                    | 0.015     | 0.007          | 0.005                 | 0.003                 |
|          | Running parallelism of surface C with Surface A | ΔC( Show bellow Table ) |           |                |                       |                       |
|          | Running parallelism of surface D with Surface B | ΔD( Show bellow Table ) |           |                |                       |                       |

#### Interchangeable Type

Unit: mm

| Model    | Item  | Accuracy Grade          |           |                |
|----------|---|-------------------------|-----------|----------------|
|          |   | Norm<br>C               | High<br>H | Precision<br>P |
| 15<br>20 | Tolerance for height H                          | ±0.1                    | ±0.03     | 0<br>-0.03     |
|          | Height difference (ΔH)                          | 0.02                    | 0.01      | 0.006          |
|          | Tolerance for width W <sub>1</sub>              | ±0.1                    | ±0.03     | 0<br>-0.03     |
|          | Width difference (ΔW <sub>1</sub> )             | 0.02                    | 0.01      | 0.006          |
|          | Running parallelism of surface C with Surface A | ΔC( Show bellow Table ) |           |                |
|          | Running parallelism of surface D with Surface B | ΔD( Show bellow Table ) |           |                |
| 25<br>30 | Tolerance for height H                          | ±0.1                    | ±0.04     | 0<br>-0.04     |
|          | Height difference (ΔH)                          | 0.02                    | 0.015     | 0.007          |
|          | Tolerance for width W <sub>1</sub>              | ±0.1                    | ±0.04     | 0<br>-0.04     |
|          | Width difference (ΔW <sub>1</sub> )             | 0.03                    | 0.015     | 0.007          |
|          | Running parallelism of surface C with Surface A | ΔC( Show bellow Table ) |           |                |
|          | Running parallelism of surface D with Surface B | ΔD( Show bellow Table ) |           |                |



| Rail Length (mm) |       | Running Parallelism (μm) |    |    |    |    |
|------------------|-------|--------------------------|----|----|----|----|
| Above            | Below | C                        | H  | P  | SP | UP |
| 0                | 100   | 12                       | 7  | 3  | 2  | 2  |
| 100              | 200   | 14                       | 9  | 4  | 2  | 2  |
| 200              | 300   | 15                       | 10 | 5  | 3  | 2  |
| 300              | 500   | 17                       | 12 | 6  | 3  | 2  |
| 500              | 700   | 20                       | 13 | 7  | 4  | 2  |
| 700              | 900   | 22                       | 15 | 8  | 5  | 3  |
| 900              | 1100  | 24                       | 16 | 9  | 6  | 3  |
| 1100             | 1500  | 26                       | 18 | 11 | 7  | 4  |
| 1500             | 1900  | 28                       | 20 | 13 | 8  | 4  |
| 1900             | 2500  | 31                       | 22 | 15 | 10 | 5  |
| 2500             | 3000  | 33                       | 25 | 18 | 11 | 6  |

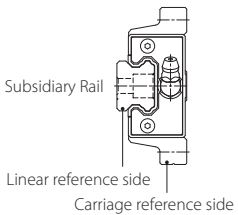
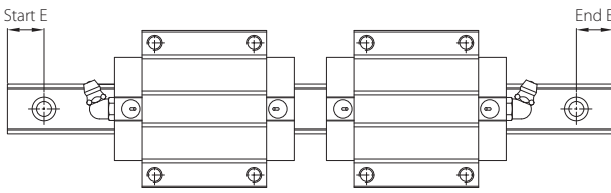
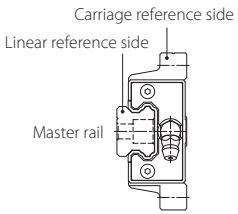
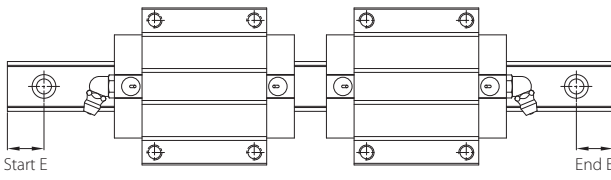
#### 4. The Recommended Tightening Torque for Rails

The improper tightening torque could affect the mounting accuracy, so tightening the bolts by torque wrench to specified torque is highly recommended.

| Model | Bolt Spec.   | Torque N-m (kg-cm) |           |          |
|-------|--------------|--------------------|-----------|----------|
|       |              | Iron               | Cast Iron | Aluminum |
| G15   | M4×0.7P×16L  | 4 (41)             | 2.7 (28)  | 2 (20)   |
| G20   | M5×0.8P×16L  | 8.8 (89)           | 5.9 (60)  | 4.4 (45) |
| G25   | M6×1P×20L    | 13.7 (140)         | 9.2 (94)  | 6.8 (69) |
| G30   | M8×1.25P×25L | 30 (306)           | 20 (204)  | 15 (153) |



## Linear Guideway Request Form

|  |   |  |                              |                             |                                 |                             |  |
|--|---|--|------------------------------|-----------------------------|---------------------------------|-----------------------------|--|
| Customer   |   |  |                              | Contact                     |                                 |                             |  |
| Tel  |   |  |                              | Fax                         |                                 |                             |  |
| Add  |   |  |                              |                             |                                 |                             |  |
| Machine Type   |   |  | Drawing No.                  |                             |                                 | Name of axis                |  |
| Carriage Type  |   |  |                              |                             |                                 |                             |  |
| Size   | <input type="checkbox"/> 15                           | <input type="checkbox"/> 20  | <input type="checkbox"/> 25  | <input type="checkbox"/> 30 |                                 |                             |  |
| Carriage Amount  | <input type="checkbox"/> 1                            | <input type="checkbox"/> 2   | <input type="checkbox"/> 3   | <input type="checkbox"/> 4  | <input type="checkbox"/> Other: |                             |  |
| Dust Proof for Carriage  | <input type="checkbox"/> None                         | <input type="checkbox"/> UU  | <input type="checkbox"/> SS  | <input type="checkbox"/> ZZ | <input type="checkbox"/> DD     | <input type="checkbox"/> KK |  |
| Preload Grade  | <input type="checkbox"/> Z0                           | <input type="checkbox"/> Z1  | <input type="checkbox"/> Z2  |                             |                                 |                             |  |
| Rail Type  | <input type="checkbox"/> R <input type="checkbox"/> T |  |                              |                             |                                 |                             |  |
| Rail Length  |   |  |                              |                             |                                 |                             |  |
| Rail Pitch   | Start E   |  |                              |                             |                                 | End E                       |  |
| Accuracy Grade   | <input type="checkbox"/> C                            | <input type="checkbox"/> H   | <input type="checkbox"/> P   | <input type="checkbox"/> SP | <input type="checkbox"/> UP     |                             |  |
| Rail per Axis  | <input type="checkbox"/> I                            | <input type="checkbox"/> II  | <input type="checkbox"/> III | <input type="checkbox"/> IV | <input type="checkbox"/> Other: |                             |  |
| Standard reference side and lubrication position   |   |  |                              |                             |                                 |                             |  |
|  <p>Subsidiary Rail</p> <p>Linear reference side</p> <p>Carriage reference side</p> |   |  |                              |                             |                                 |                             |  |
|  <p>Carriage reference side</p> <p>Linear reference side</p> <p>Master rail</p>     |   |  |                              |                             |                                 |                             |  |

Above drawing is the layout for standard design . Please contact us for customized design.



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