Linear Guideways
HG Series

2-1 HG Series - Heavy Load Ball Type Linear Guideway

HG series linear guideways are designed with load capacity and rigidity higher than other similar products with circular-arc groove and structure optimization. It features equal load ratings in the radial, reverse radial and lateral directions, and self-aligning to absorb installation-error. Thus, HIWIN HG series linear guideways can achieve a long life with high speed, high accuracy and smooth linear motion.

2-1-1 Features of HG Series
(1) Self-aligning capability
By design, the circular-arc groove has contact points at 45 degrees. HG series can absorb most installation errors due to surface irregularities and provide smooth linear motion through the elastic deformation of rolling elements and the shift of contact points. Self-aligning capability, high accuracy and smooth operation can be obtained with an easy installation.

(2) Interchangeability
Because of precision dimensional control, the dimensional tolerance of HG series can be kept in a reasonable range, which means that any blocks and any rails in a specific series can be used together while maintaining dimensional tolerance. And a retainer is added to prevent the balls from falling out when the blocks are removed from the rail.

(3) High rigidity in all four directions
Because of the four-row design, the HG series linear guideway has equal load ratings in the radial, reverse radial and lateral directions. Furthermore, the circular-arc groove provides a wide-contact width between the balls and the groove raceway allowing large permissible loads and high rigidity.

2-1-2 Construction of HG Series

2-1-3 Model Number of HG Series
HG series guideways can be classified into non-interchangeable and interchangeable types. The sizes are identical. The only difference between the two types is that the interchangeable type of blocks and rails can be freely exchanged, and their accuracy can reach up to P class. The model number of HG series contains the size, type, accuracy class, preload class, etc.
### (1) Non-interchangeable type

HG W 25 C A E 2 R 1600 E ZA P II + DD/E2/RC

- **HG Series**
- **Block Type**
  - **W**: Flange Type
  - **H**: Square Type
  - **L**: Square Type [Low]
- **Model size**
  - 15, 20, 25, 30, 35, 45, 55, 65
- **Load Type**
  - **C**: Heavy Load
  - **H**: Super Heavy Load
- **Block Mounting**
  - **A**: Mounting From Top
  - **B**: Bottom
  - **C**: Top or Bottom
  - **E**: Special Block
  - **None**: Standard Block
- **No. of Blocks per Rail**

![Diagram](image)

**Note:**
1. The roman numerals express a matched set of rails.
2. No symbol indicates standard protection (end seal and bottom seal).
3. ZZ : End seal, bottom seal and scraper
4. KK: Double seals, bottom seal and scraper.
5. DD: Double seals and bottom seal
6. Block type HGL is the low profile design of HGH (square type), the assembled height is same as HGW (flange type) in same size.

### (2) Interchangeable type

- **Model Number of HG Block**

HG W 25 C A E ZA P + ZZ/E2

- **HG Series**
- **Block Type**
  - **W**: Flange Type
  - **H**: Square Type
  - **L**: Square Type
- **Model size**
  - 15, 20, 25, 30, 35, 45, 55, 65
- **Load Type**
  - **C**: Heavy Load
  - **H**: Super Heavy Load
- **Block Mounting**
  - **A**: Mounting From Top
  - **B**: Bottom
  - **C**: Top or Bottom

- **Model Number of HG Rail**

HG R 25 R 1200 E P + RC

- **HG Series**
- **Interchangeable Rail**
- **Model size**
  - 15, 20, 25, 30, 35, 45, 55, 65
- **Rail Mounting Type**
  - **R**: Mounting From Top
  - **T**: Bottom

**Note:**
- **Precision Code**: C, H, P, SP, UP
- **Preload Code**: Z0, ZA, ZB
- **Rail Length (mm)**
- **Interchangeable Rail**
**Linear Guideways**

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**2-1-4 Types**

(1) Block types

HIWIN offers two types of linear guideway which are flange and square types. Because of the low assembly height and larger mounting surface, the flange type is suitable for heavy moment load application.

### Table 2-1-1 Block Types

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Shape</th>
<th>Height (mm)</th>
<th>Rail Length (mm)</th>
<th>Main Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square</td>
<td>HGH-CA HGH-HA</td>
<td>Flange</td>
<td>28</td>
<td>100</td>
<td>◦ Machine Centers ◦ NC Lathes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>↓</td>
<td>↓</td>
<td>◦ Grinding Machines ◦ Precision Machining Machines</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>90</td>
<td>4000</td>
<td>◦ Heavy Cutting Machines</td>
</tr>
<tr>
<td></td>
<td>HGL-CA HGL-HA</td>
<td>Square</td>
<td>24</td>
<td>100</td>
<td>◦ Automation Devices ◦ Transportation Equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>↓</td>
<td>↓</td>
<td>◦ Measuring Equipment ◦ Devices Requiring High Positional Accuracy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>70</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Flange</td>
<td>HGW-CA HGW-HA</td>
<td>Flange</td>
<td>24</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>↓</td>
<td>↓</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>90</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HGW-CB HGW-HB</td>
<td>Flange</td>
<td>24</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>↓</td>
<td>↓</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>90</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HGW-CC HGW-HC</td>
<td>Flange</td>
<td>24</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>↓</td>
<td>↓</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>90</td>
<td>4000</td>
<td></td>
</tr>
</tbody>
</table>
2-1-5 Accuracy Classes
The accuracy of HG series can be classified into normal (C), high (H), precision (P), super precision (SP), ultra precision (UP), five classes. Please choose the class by referring the accuracy of applied equipment.

(1) Accuracy of non-interchangeable guideways

<table>
<thead>
<tr>
<th>Item</th>
<th>HG - 15, 20</th>
<th>HG - 25, 30, 35</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (C)</td>
<td>High (H)</td>
</tr>
<tr>
<td>Dimensional tolerance of height H</td>
<td>±0.1</td>
<td>±0.04</td>
</tr>
<tr>
<td>Dimensional tolerance of width N</td>
<td>±0.1</td>
<td>±0.04</td>
</tr>
<tr>
<td>Variation of height H</td>
<td>0.02</td>
<td>0.015</td>
</tr>
<tr>
<td>Variation of width N</td>
<td>0.03</td>
<td>0.015</td>
</tr>
<tr>
<td>Running parallelism of block surface C to surface A</td>
<td>See Table 2-1-11</td>
<td>See Table 2-1-11</td>
</tr>
<tr>
<td>Running parallelism of block surface D to surface B</td>
<td>See Table 2-1-11</td>
<td>See Table 2-1-11</td>
</tr>
</tbody>
</table>

Table 2-1-3 Accuracy Standards
Unit: mm
# Linear Guideways
## HG Series

### Table 2-1-5 Accuracy Standards

<table>
<thead>
<tr>
<th>Item</th>
<th>HG - 45, 55</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy Classes</strong></td>
<td>Normal (\text{(C)})</td>
<td>High (\text{(H)})</td>
</tr>
<tr>
<td>Dimensional tolerance of height (H)</td>
<td>± 0.1</td>
<td>± 0.05</td>
</tr>
<tr>
<td>Dimensional tolerance of width (N)</td>
<td>± 0.1</td>
<td>± 0.05</td>
</tr>
<tr>
<td>Variation of height (H)</td>
<td>0.03</td>
<td>0.015</td>
</tr>
<tr>
<td>Variation of width (N)</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Running parallelism of block surface (C) to surface (A)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
<tr>
<td>Running parallelism of block surface (D) to surface (B)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2-1-6 Accuracy Standards

<table>
<thead>
<tr>
<th>Item</th>
<th>HG - 65</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy Classes</strong></td>
<td>Normal (\text{(C)})</td>
<td>High (\text{(H)})</td>
</tr>
<tr>
<td>Dimensional tolerance of height (H)</td>
<td>± 0.1</td>
<td>± 0.07</td>
</tr>
<tr>
<td>Dimensional tolerance of width (N)</td>
<td>± 0.1</td>
<td>± 0.07</td>
</tr>
<tr>
<td>Variation of height (H)</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Variation of width (N)</td>
<td>0.03</td>
<td>0.025</td>
</tr>
<tr>
<td>Running parallelism of block surface (C) to surface (A)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
<tr>
<td>Running parallelism of block surface (D) to surface (B)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
</tbody>
</table>

### (2) Accuracy of interchangeable guideways

### Table 2-1-7 Accuracy Standards

<table>
<thead>
<tr>
<th>Item</th>
<th>HG - 15, 20</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy Classes</strong></td>
<td>Normal (\text{(C)})</td>
<td>High (\text{(H)})</td>
</tr>
<tr>
<td>Dimensional tolerance of height (H)</td>
<td>± 0.1</td>
<td>± 0.03</td>
</tr>
<tr>
<td>Dimensional tolerance of width (N)</td>
<td>± 0.1</td>
<td>± 0.03</td>
</tr>
<tr>
<td>Variation of height (H)</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Variation of width (N)</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Running parallelism of block surface (C) to surface (A)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
<tr>
<td>Running parallelism of block surface (D) to surface (B)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2-1-8 Accuracy Standards

<table>
<thead>
<tr>
<th>Item</th>
<th>HG - 25, 30, 35</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy Classes</strong></td>
<td>Normal (\text{(C)})</td>
<td>High (\text{(H)})</td>
</tr>
<tr>
<td>Dimensional tolerance of height (H)</td>
<td>± 0.1</td>
<td>± 0.04</td>
</tr>
<tr>
<td>Dimensional tolerance of width (N)</td>
<td>± 0.1</td>
<td>± 0.04</td>
</tr>
<tr>
<td>Variation of height (H)</td>
<td>0.02</td>
<td>0.015</td>
</tr>
<tr>
<td>Variation of width (N)</td>
<td>0.03</td>
<td>0.015</td>
</tr>
<tr>
<td>Running parallelism of block surface (C) to surface (A)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
<tr>
<td>Running parallelism of block surface (D) to surface (B)</td>
<td>See Table 2-1-11</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2-1-9: Accuracy Standards

<table>
<thead>
<tr>
<th>Item</th>
<th>HG - 45, 55</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy Classes</strong></td>
<td>Normal (C)</td>
</tr>
<tr>
<td>Dimensional tolerance of height H</td>
<td>± 0.1</td>
</tr>
<tr>
<td>Dimensional tolerance of width N</td>
<td>± 0.1</td>
</tr>
<tr>
<td>Variation of height H</td>
<td>0.03</td>
</tr>
<tr>
<td>Variation of width N</td>
<td>0.03</td>
</tr>
<tr>
<td>Running parallelism of block surface C to surface A</td>
<td>See Table 2-1-11</td>
</tr>
<tr>
<td>Running parallelism of block surface D to surface B</td>
<td>See Table 2-1-11</td>
</tr>
</tbody>
</table>

### Table 2-1-10: Accuracy Standards

<table>
<thead>
<tr>
<th>Item</th>
<th>HG - 65</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy Classes</strong></td>
<td>Normal (C)</td>
</tr>
<tr>
<td>Dimensional tolerance of height H</td>
<td>± 0.1</td>
</tr>
<tr>
<td>Dimensional tolerance of width N</td>
<td>± 0.1</td>
</tr>
<tr>
<td>Variation of height H</td>
<td>0.03</td>
</tr>
<tr>
<td>Variation of width N</td>
<td>0.03</td>
</tr>
<tr>
<td>Running parallelism of block surface C to surface A</td>
<td>See Table 2-1-11</td>
</tr>
<tr>
<td>Running parallelism of block surface D to surface B</td>
<td>See Table 2-1-11</td>
</tr>
</tbody>
</table>

### [3] Accuracy of running parallelism

#### Table 2-1-11: Accuracy of Running Parallelism

<table>
<thead>
<tr>
<th>Rail Length (mm)</th>
<th>Accuracy (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
</tr>
<tr>
<td>~ 100</td>
<td>12</td>
</tr>
<tr>
<td>100 ~ 200</td>
<td>14</td>
</tr>
<tr>
<td>200 ~ 300</td>
<td>15</td>
</tr>
<tr>
<td>300 ~ 500</td>
<td>17</td>
</tr>
<tr>
<td>500 ~ 700</td>
<td>20</td>
</tr>
<tr>
<td>700 ~ 900</td>
<td>22</td>
</tr>
<tr>
<td>900 ~ 1,100</td>
<td>24</td>
</tr>
<tr>
<td>1,100 ~ 1,500</td>
<td>26</td>
</tr>
<tr>
<td>1,500 ~ 1,900</td>
<td>28</td>
</tr>
<tr>
<td>1,900 ~ 2,500</td>
<td>31</td>
</tr>
<tr>
<td>2,500 ~ 3,100</td>
<td>33</td>
</tr>
<tr>
<td>3,100 ~ 3,600</td>
<td>36</td>
</tr>
<tr>
<td>3,600 ~ 4,000</td>
<td>37</td>
</tr>
</tbody>
</table>
Linear Guideways
HG Series

2-1-6 Preload

(1) Definition
A preload can be applied to each guideway. Oversized balls are used. Generally, a linear motion guideway has a negative clearance between groove and balls in order to improve stiffness and maintain high precision. The figure shows the load is multiplied by the preload, the rigidity is doubled and the deflection is reduced by one half. The preload not larger than ZA would be recommended for the model size under HG20 to avoid an over-preload affecting the guideway’s life.

(2) Preload classes
HIWIN offers three classes of standard preload for various applications and conditions.

<table>
<thead>
<tr>
<th>Class</th>
<th>Code</th>
<th>Preload</th>
<th>Condition</th>
<th>Examples of Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Preload</td>
<td>Z0</td>
<td>0~0.02C</td>
<td>Certain load direction, low impact, low precision required</td>
<td>Transportation devices, auto-packing machines, X-Y axis for general industrial machines, welding machines, welders</td>
</tr>
<tr>
<td>Medium Preload</td>
<td>ZA</td>
<td>0.05C~0.07C</td>
<td>High precision required</td>
<td>Machining centers, Z axis for general industrial machines, EDM, NC lathes, Precision X-Y tables, measuring equipment</td>
</tr>
<tr>
<td>Heavy Preload</td>
<td>ZB</td>
<td>0.10C~0.12C</td>
<td>High rigidity required, with vibration and impact</td>
<td>Machining centers, grinding machines, NC lathes, horizontal and vertical milling machines, Z axis of machine tools, Heavy cutting machines</td>
</tr>
</tbody>
</table>

Note: The “C” in the preload column denotes basic dynamic load rating.

2-1-7 Lubrication

(1) Grease
- Grease nipple

Table 2-1-12 Preload Classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Interchangeable Guideway</th>
<th>Non-Interchangeable Guideway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preload classes</td>
<td>Z0, ZA</td>
<td>Z0, ZA, ZB</td>
</tr>
</tbody>
</table>

Note: The “C” in the preload column denotes basic dynamic load rating.
Mounting location

The standard location of the grease fitting is at both ends of the block, but the nipple can be mounted at each side of block. For lateral installation, we recommend that the nipple be mounted at the non-reference side, otherwise please contact us. It is possible to perform lubrication by using the oil-piping joint.

Table 2-1-13 O-Ring size and max. permissible depth for piercing

<table>
<thead>
<tr>
<th>Size</th>
<th>O-Ring</th>
<th>Lube hole at top: max. permissible depth for piercing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>do (mm)</td>
<td>W (mm)</td>
</tr>
<tr>
<td>HG15</td>
<td>2.5±0.15</td>
<td>1.5±0.15</td>
</tr>
<tr>
<td>HG20</td>
<td>4.5±0.15</td>
<td>1.5±0.15</td>
</tr>
<tr>
<td>HG25</td>
<td>4.5±0.15</td>
<td>1.5±0.15</td>
</tr>
<tr>
<td>HG30</td>
<td>4.5±0.15</td>
<td>1.5±0.15</td>
</tr>
<tr>
<td>HG35</td>
<td>4.5±0.15</td>
<td>1.5±0.15</td>
</tr>
<tr>
<td>HG45</td>
<td>4.5±0.15</td>
<td>1.5±0.15</td>
</tr>
<tr>
<td>HG55</td>
<td>4.5±0.15</td>
<td>1.5±0.15</td>
</tr>
<tr>
<td>HG65</td>
<td>4.5±0.15</td>
<td>1.5±0.15</td>
</tr>
</tbody>
</table>

The lubricant amount for a block filled with grease

Table 2-1-14 The lubricant Amount for a Block Filled with Grease

<table>
<thead>
<tr>
<th>Size</th>
<th>Heavy load (cm³)</th>
<th>Super heavy load (cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG15</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>HG20</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>HG25</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>HG30</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>HG35</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>HG45</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>HG55</td>
<td>26</td>
<td>33</td>
</tr>
<tr>
<td>HG65</td>
<td>50</td>
<td>61</td>
</tr>
</tbody>
</table>

Frequency of replenishment

Check the grease every 100 km, or every 3-6 months.
Linear Guideways
HG Series

[2] Oil
The recommended viscosity of oil is about 30~150cSt. If customers need to use oil-type lubrication, please inform us.

○ Types of oil piping joint
2-1-8 Dust Proof Accessories

(1) Codes of standard dust proof accessories
If the following accessories are needed, please add the code followed by the model number.

<table>
<thead>
<tr>
<th>Size</th>
<th>Refilling rate (cm³/hr)</th>
<th>Size</th>
<th>Refilling rate (cm³/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG15</td>
<td>0.2</td>
<td>HG35</td>
<td>0.3</td>
</tr>
<tr>
<td>HG20</td>
<td>0.2</td>
<td>HG45</td>
<td>0.4</td>
</tr>
<tr>
<td>HG25</td>
<td>0.3</td>
<td>HG55</td>
<td>0.5</td>
</tr>
<tr>
<td>HG30</td>
<td>0.3</td>
<td>HG65</td>
<td>0.6</td>
</tr>
</tbody>
</table>

No symbol: Standard Protection (End seal + Bottom Seal)

ZZ [End seal + Bottom Seal + Scraper]

KK (Double seals + Bottom Seal + Scraper)

DD (Double seals + Bottom Seal)
(2) Codes of high-dust proof accessories
HIWIN develops many kinds of dust proof accessories for different application and working environment to avoid dust or debris. If the following accessories are needed, please add the code followed by the model number.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KH</td>
<td>Double End Seal (High Dust Proof) + Bottom Seal (High Dust Proof) + Top Seal + Scraper</td>
</tr>
<tr>
<td>SH</td>
<td>End Seal (High-Dust Proof) + Bottom Seal (High Dust Proof) + Top Seal</td>
</tr>
<tr>
<td>ZH</td>
<td>End Seal (High-Dust Proof) + Bottom Seal (High Dust Proof) + Top Seal + Spacer</td>
</tr>
<tr>
<td>DH</td>
<td>Double End Seal (High Dust Proof) + Bottom Seal (High Dust Proof) + Top Seal</td>
</tr>
</tbody>
</table>

Note: 1. The available size for high dust proof accessories are HG20(C/H), 25(C/H), 30(C/H), 35(C/H) and 45C.
2. The value of friction force will increase 0.6~1.2 kgf.
(3) Codes of ultra-high dust proof accessories
Hiwin has developed high dust proof accessories which is used for environment that is full of dust and particle, such as wood working machinery and glass/stone machining equipment. These accessories show high performance of dust proof. If accessories are needed, please add the code followed by the model number.

(4) Function of dust proof accessories

○ End seal and bottom seal
To prevent life reduction caused by iron chips or dust entering the block.

○ Double seals
Enhances the wiping effect, foreign matter can be completely wiped off.

Table 2-1-16 Dimensions of end seal

<table>
<thead>
<tr>
<th>Size</th>
<th>Thickness (t1) [mm]</th>
<th>Size</th>
<th>Thickness (t1) [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG15 ES</td>
<td>3</td>
<td>HG35 ES</td>
<td>3.2</td>
</tr>
<tr>
<td>HG20 ES</td>
<td>3.5</td>
<td>HG45 ES</td>
<td>4.5</td>
</tr>
<tr>
<td>HG25 ES</td>
<td>3.5</td>
<td>HG55 ES</td>
<td>4.5</td>
</tr>
<tr>
<td>HG30 ES</td>
<td>3.2</td>
<td>HG65 ES</td>
<td>6</td>
</tr>
</tbody>
</table>

○ Scraper
The scraper removes high-temperature iron chips and larger foreign objects.

Table 2-1-17 Dimensions of scraper

<table>
<thead>
<tr>
<th>Size</th>
<th>Thickness (t2) [mm]</th>
<th>Size</th>
<th>Thickness (t2) [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG15 SC</td>
<td>1.5</td>
<td>HG35 SC</td>
<td>1.5</td>
</tr>
<tr>
<td>HG20 SC</td>
<td>1.5</td>
<td>HG45 SC</td>
<td>1.5</td>
</tr>
<tr>
<td>HG25 SC</td>
<td>1.5</td>
<td>HG55 SC</td>
<td>1.5</td>
</tr>
<tr>
<td>HG30 SC</td>
<td>1.5</td>
<td>HG65 SC</td>
<td>1.5</td>
</tr>
</tbody>
</table>

○ Top Seal
Top seal can efficiently avoid dust from the surface of rail or tapping hole getting inside the block.
Linear Guideways
HG Series

- Bolt caps for rail mounting holes
  Caps are used to cover the mounting holes to prevent chips or other foreign objects from collecting in the holes. The caps will be enclosed in each rail package.

<table>
<thead>
<tr>
<th>Rail size</th>
<th>Bolt size</th>
<th>Diameter (D) (mm)</th>
<th>Thickness (H) (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGR15</td>
<td>M4</td>
<td>7.65</td>
<td>1.1</td>
</tr>
<tr>
<td>HGR20</td>
<td>M5</td>
<td>9.65</td>
<td>2.2</td>
</tr>
<tr>
<td>HGR25</td>
<td>M6</td>
<td>11.20</td>
<td>2.5</td>
</tr>
<tr>
<td>HGR30</td>
<td>M8</td>
<td>14.25</td>
<td>3.3</td>
</tr>
<tr>
<td>HGR35</td>
<td>M8</td>
<td>14.25</td>
<td>3.3</td>
</tr>
<tr>
<td>HGR45</td>
<td>M12</td>
<td>20.25</td>
<td>4.6</td>
</tr>
<tr>
<td>HGR55</td>
<td>M14</td>
<td>23.50</td>
<td>5.5</td>
</tr>
<tr>
<td>HGR65</td>
<td>M16</td>
<td>26.60</td>
<td>5.5</td>
</tr>
</tbody>
</table>

(5) Dimensions of block equipped with the dustproof parts

<table>
<thead>
<tr>
<th>Size</th>
<th>Overall block length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard/SH</td>
</tr>
<tr>
<td>H615C</td>
<td>61.4</td>
</tr>
<tr>
<td>*HG20C</td>
<td>77.5</td>
</tr>
<tr>
<td>*HG20H</td>
<td>92.2</td>
</tr>
<tr>
<td>*HG25C</td>
<td>84</td>
</tr>
<tr>
<td>*HG25H</td>
<td>104.6</td>
</tr>
<tr>
<td>*HG30C</td>
<td>97.4</td>
</tr>
<tr>
<td>*HG30H</td>
<td>120.4</td>
</tr>
<tr>
<td>*HG35C</td>
<td>112.4</td>
</tr>
<tr>
<td>*HG35H</td>
<td>138.2</td>
</tr>
<tr>
<td>*HG45C</td>
<td>139.4</td>
</tr>
<tr>
<td>HG45H</td>
<td>171.2</td>
</tr>
<tr>
<td>HG55C</td>
<td>166.7</td>
</tr>
<tr>
<td>HG55H</td>
<td>204.8</td>
</tr>
<tr>
<td>HG65C</td>
<td>200.2</td>
</tr>
<tr>
<td>HG65H</td>
<td>259.6</td>
</tr>
</tbody>
</table>

Note: For the marking of “*”, it means this specification is available for SH/ZH/DH/KH dust proof accessories.
2-1-9 Friction
The maximum value of resistance per end seal are as shown in the table.

Table 2-1-20 Seal Resistance

<table>
<thead>
<tr>
<th>Size</th>
<th>Resistance N (kgf)</th>
<th>Size</th>
<th>Resistance N (kgf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG15</td>
<td>1.18 (0.12)</td>
<td>HG35</td>
<td>3.04 (0.31)</td>
</tr>
<tr>
<td>HG20</td>
<td>1.57 (0.16)</td>
<td>HG45</td>
<td>3.83 (0.39)</td>
</tr>
<tr>
<td>HG25</td>
<td>1.96 (0.2)</td>
<td>HG55</td>
<td>4.61 (0.47)</td>
</tr>
<tr>
<td>HG30</td>
<td>2.65 (0.27)</td>
<td>HG65</td>
<td>5.79 (0.59)</td>
</tr>
</tbody>
</table>

Note: 1kgf=9.81N

2-1-10 The Accuracy Tolerance of Mounting Surface

(1) The accuracy tolerance of rail-mounting surface
Because of the Circular-arc contact design, the HG linear guideway can compensate for some surface-error on installation and still maintain smooth linear motion. As long as the accuracy requirements for the mounting surface are followed, high accuracy and rigidity of linear motion of the guideway can be obtained without any difficulty. In order to satisfy the needs of fast installation and smooth movement, HIWIN offers the normal clearance type of preload to customers of its high absorption ability of the deviation in mounting surface accuracy.

(2) The parallelism tolerance of reference surface (P)

Table 2-1-21 Max. Parallelism Tolerance (P) unit: μm

<table>
<thead>
<tr>
<th>Size</th>
<th>Preload classes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z0</td>
</tr>
<tr>
<td>HG15</td>
<td>25</td>
</tr>
<tr>
<td>HG20</td>
<td>25</td>
</tr>
<tr>
<td>HG25</td>
<td>30</td>
</tr>
<tr>
<td>HG30</td>
<td>40</td>
</tr>
<tr>
<td>HG35</td>
<td>50</td>
</tr>
<tr>
<td>HG45</td>
<td>60</td>
</tr>
<tr>
<td>HG55</td>
<td>70</td>
</tr>
<tr>
<td>HG65</td>
<td>80</td>
</tr>
</tbody>
</table>

(3) The accuracy tolerance of reference surface height

Table 2-1-22 Max. Tolerance of Reference Surface Height (S₁) unit: μm

<table>
<thead>
<tr>
<th>Size</th>
<th>Preload classes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z0</td>
</tr>
<tr>
<td>HG15</td>
<td>130</td>
</tr>
<tr>
<td>HG20</td>
<td>130</td>
</tr>
<tr>
<td>HG25</td>
<td>130</td>
</tr>
<tr>
<td>HG30</td>
<td>170</td>
</tr>
<tr>
<td>HG35</td>
<td>210</td>
</tr>
<tr>
<td>HG45</td>
<td>250</td>
</tr>
<tr>
<td>HG55</td>
<td>300</td>
</tr>
<tr>
<td>HG65</td>
<td>350</td>
</tr>
</tbody>
</table>
Linear Guideways
HG Series

2-1-11 Cautions for Installation
(1) Shoulder heights and fillets
Improper shoulder heights and fillets of mounting surfaces will cause a deviation in accuracy and the interference with the chamfered part of the rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

<table>
<thead>
<tr>
<th>Size</th>
<th>Max. radius of fillets ( r_1 ) (mm)</th>
<th>Max. radius of fillets ( r_2 ) (mm)</th>
<th>Shoulder height of the rail ( E_1 ) (mm)</th>
<th>Shoulder height of the block ( E_2 ) (mm)</th>
<th>Clearance under block ( H_1 ) (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG15</td>
<td>0.5</td>
<td>0.5</td>
<td>3</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>HG20</td>
<td>0.5</td>
<td>0.5</td>
<td>3.5</td>
<td>5</td>
<td>4.6</td>
</tr>
<tr>
<td>HG25</td>
<td>1.0</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>5.5</td>
</tr>
<tr>
<td>HG30</td>
<td>1.0</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>HG35</td>
<td>1.0</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>7.5</td>
</tr>
<tr>
<td>HG45</td>
<td>1.0</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>9.5</td>
</tr>
<tr>
<td>HG55</td>
<td>1.5</td>
<td>1.5</td>
<td>10</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>HG65</td>
<td>1.5</td>
<td>1.5</td>
<td>10</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

(2) Tightening Torque of Bolts for Installation
Improper tightening of bolts will seriously influence the accuracy of Linear Guideway installation. The following tightening torques for different sizes of bolts are recommended.

<table>
<thead>
<tr>
<th>Size</th>
<th>Bolt size</th>
<th>Torque N-cm (kgf-cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Iron</td>
<td>Casting</td>
</tr>
<tr>
<td>HG15</td>
<td>M4×0.7P×16L</td>
<td>392 [40]</td>
</tr>
<tr>
<td>HG20</td>
<td>M5×0.8P×16L</td>
<td>883 [90]</td>
</tr>
<tr>
<td>HG25</td>
<td>M6×1P×20L</td>
<td>1373 [140]</td>
</tr>
<tr>
<td>HG45</td>
<td>M12×1.75P×35L</td>
<td>11772 [1200]</td>
</tr>
<tr>
<td>HG55</td>
<td>M14×2P×45L</td>
<td>15696 [1600]</td>
</tr>
</tbody>
</table>
2-1-12 Standard and Maximum Lengths of Rail

HIWIN offers standard rail lengths for customer needs. For non-standard E-values, the recommended dimension should not be greater than 1/2 of the pitch (P) dimension. This will prevent an unstable rail end.

\[ L = (n-1)xP + 2xE \]  \hspace{2cm} \text{Eq.2.1}

L : Total length of rail (mm)
\( n \) : Number of mounting holes
P : Distance between any two holes (mm)
E : Distance from the center of the last hole to the edge (mm)

Table 2-1-25 Rail Standard Length and Max. Length  \hspace{2cm} \text{unit: mm}

<table>
<thead>
<tr>
<th>Item</th>
<th>HG15</th>
<th>HG20</th>
<th>HG25</th>
<th>HG30</th>
<th>HG35</th>
<th>HG45</th>
<th>HG55</th>
<th>HG65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Length L(n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>160 (3)</td>
<td>220 (4)</td>
<td>220 (4)</td>
<td>280 (4)</td>
<td>280 (4)</td>
<td>570 (6)</td>
<td>780 (7)</td>
<td>1,270 (9)</td>
<td></td>
</tr>
<tr>
<td>220 (4)</td>
<td>280 (5)</td>
<td>280 (5)</td>
<td>440 (6)</td>
<td>440 (6)</td>
<td>885 (9)</td>
<td>1,020 (9)</td>
<td>1,570 (11)</td>
<td></td>
</tr>
<tr>
<td>280 (5)</td>
<td>340 (6)</td>
<td>340 (6)</td>
<td>600 (8)</td>
<td>600 (8)</td>
<td>1,200 (12)</td>
<td>1,260 (11)</td>
<td>2,020 (14)</td>
<td></td>
</tr>
<tr>
<td>340 (6)</td>
<td>460 (8)</td>
<td>460 (8)</td>
<td>760 (10)</td>
<td>760 (10)</td>
<td>1,620 (16)</td>
<td>1,500 (13)</td>
<td>2,620 (18)</td>
<td></td>
</tr>
<tr>
<td>460 (8)</td>
<td>640 (11)</td>
<td>640 (11)</td>
<td>1,000 (13)</td>
<td>1,000 (13)</td>
<td>2,040 (20)</td>
<td>1,980 (17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>640 (11)</td>
<td>820 (14)</td>
<td>820 (14)</td>
<td>1,640 (21)</td>
<td>1,640 (21)</td>
<td>2,460 (24)</td>
<td>2,580 (22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>820 (14)</td>
<td>1,000 (17)</td>
<td>1,000 (17)</td>
<td>2,040 (26)</td>
<td>2,040 (26)</td>
<td>2,985 (29)</td>
<td>2,940 (25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,240 (21)</td>
<td>1,240 (21)</td>
<td>2,520 (32)</td>
<td>2,520 (32)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,600 (27)</td>
<td>3,000 (38)</td>
<td>3,000 (38)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pitch (P) 60 60 60 80 80 105 120 150
Distance to End (E) 20 20 20 20 20 22.5 22.5 30
Max. Standard Length 1,960 (33) 1,960 (50) 3,960 (50) 3,930 (38) 3,900 (33) 3,970 (27)
Max. Length 2,000 4,000 4,000 4,000 4,000 4,000 4,000

Note:
1. Tolerance of E value for standard rail is 0.5~0.5 mm. Tolerance of E value for jointed rail is 0~0.3 mm.
2. Maximum standard length means the max. rail length with standard E value on both sides.
3. If different E value is needed, please contact HIWIN.
## Linear Guideways

### HG Series

### 2-1-13 Dimensions for HIWIN HG Series

(1) HGH-CA / HGH-HA

![Diagram of linear guideways]

### Table: HG Series Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Dimensions of Assembly (mm)</th>
<th>Dimensions of Block (mm)</th>
<th>Dimensions of Rail (mm)</th>
<th>Mounting Bolt for Rail</th>
<th>Basic Dynamic Load Rating (kN)</th>
<th>Basic Static Load Rating (kN)</th>
<th>Static Rated Moment (kN-m)</th>
<th>Weight (kg)</th>
<th>Rail Weight (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGH15CA</td>
<td>28 4.3 9.5 34 26 4 26 26 394 61.4 10 4.85 5.3 M4x5 6 7.95 7.7 15 15 7.5 5.3 4.5 60 20 M4x16</td>
<td>11.38 16.97 0.12 0.10 0.10 0.18 1.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH20CA</td>
<td>30 4.6 12 44 32 6 36 50.5 77.5 12.25 6 12 12 M5x6 8 6 6 20 17.5 9.5 8.5 6 6 20 M5x16</td>
<td>17.75 27.76 0.27 0.20 0.20 0.30 2.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH20HA</td>
<td>21.18 35.90 0.35 0.35 0.35 0.39 10.39</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>HGH25CA</td>
<td>40 5.5 12.5 48 35 6.5 35 58 84 15.7 6 12 12 M6x8 8 10 9 23 22 11 9 7 60 20 M6x20</td>
<td>26.48 36.49 0.42 0.33 0.33 0.51 3.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH25HA</td>
<td>32.75 49.44 0.56 0.57 0.57 0.69 2.69</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH30CA</td>
<td>45 6 16 60 40 10 40 70 97.4 20.25 6 12 12 M8x10 8.5 9.5 13.8 28 26 14 12 9 80 20 M8x25</td>
<td>38.74 52.19 0.66 0.53 0.53 0.88 4.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH30HA</td>
<td>47.27 69.16 0.88 0.92 0.92 1.16 0.85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>HGH35CA</td>
<td>55 7.5 18 70 50 10 50 80 112.4 20.6 7 12 12 M8x12 10.2 16 19.6 34 29 14 12 9 80 20 M8x25</td>
<td>49.52 69.16 1.16 0.81 0.81 1.45 1.63</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH35HA</td>
<td>60.21 91.63 1.54 1.40 1.40 1.92 1.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH45CA</td>
<td>70 9.5 20.5 86 60 13 60 97 139.4 23 10 12 12 M10x17 16 18.5 30.5 45 38 20 17 14 105 22.5 M10x35</td>
<td>77.57 102.71 1.98 1.55 1.55 2.73 1.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH45HA</td>
<td>94.54 136.46 2.63 2.68 2.68 3.61 2.68</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH55CA</td>
<td>80 13 23.5 100 75 12.5 75 157.7 167.7 27.35 11 12 12 M12x18 22 29 23 16 120 30 M12x45</td>
<td>144.4 148.33 3.69 2.44 2.44 4.17 2.44</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH55HA</td>
<td>139.35 196.20 4.88 4.57 4.57 5.49 4.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGH65CA</td>
<td>90 15 31.5 126 76 25 70 144.2 200 43.1 14 12 12 M16x20 25 15 15 63 53 26 22 18 150 35 M16x50</td>
<td>163.63 215.33 6.65 4.27 4.27 7.00 4.27</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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Note: 1 kgf = 9.81 N
Note: 1 kgf = 9.81 N
## Linear Guideways

### HG Series

### (3) HGW-CA / HGW-HA

![Diagram of Linear Guideways](image)

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<th>Model No.</th>
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<th>Dimensions of Block (mm)</th>
<th>Dimensions of Rail (mm)</th>
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Note: 1 kgf = 9.81 N
### Model No. Details

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<th>Dimensions of Rail (mm)</th>
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<th>Basic Static Load Rating</th>
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Note: 1 kgf = 9.81 N
# Linear Guideways

## HG Series

(5) HGW-CC / HGW-HC

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Note: 1 kgf = 9.81 N
(6) Dimensions for HGR-T (Rail Mounting from Bottom)

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