

○ Oil refilling rate

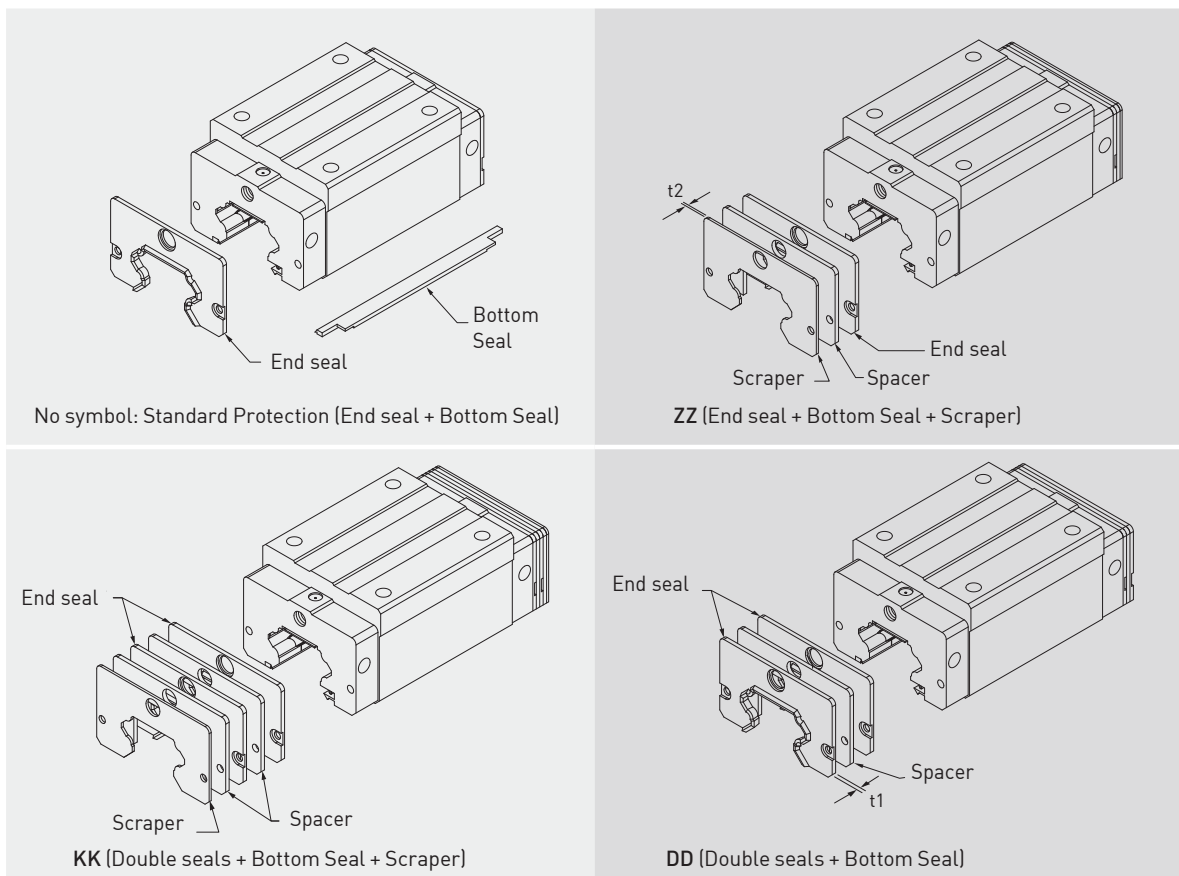
Table 2-1-15

Size	Refilling rate (cm <sup>3</sup> /hr)	Size	Refilling rate (cm <sup>3</sup> /hr)
HG15	0.2	HG35	0.3
HG20	0.2	HG45	0.4
HG25	0.3	HG55	0.5
HG30	0.3	HG65	0.6

## 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.

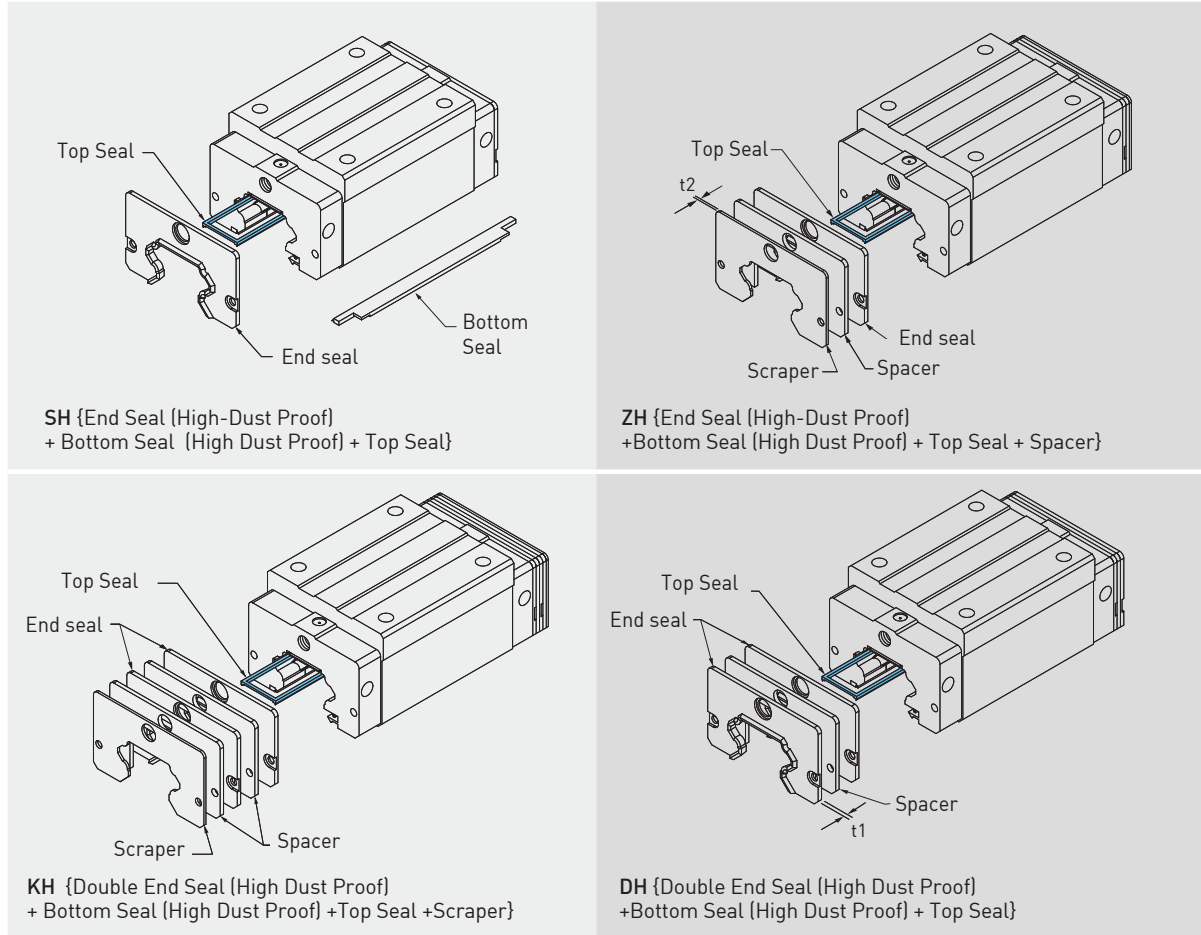


# Linear Guideways

## HG Series

### (2) Codes of high-dust proof accessories

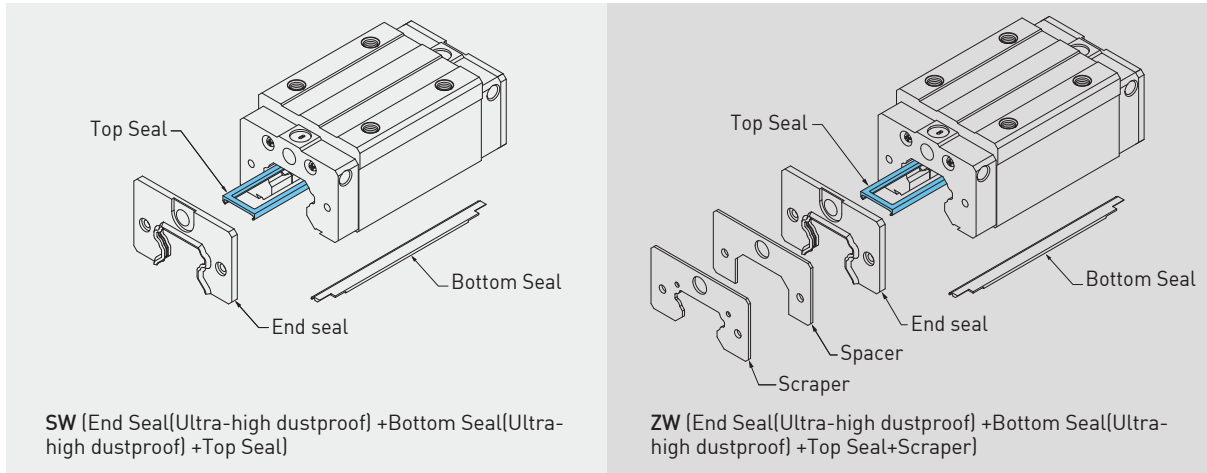
HIWIN develops many kinds of dust proof accessories for different application and working environment to avoid dust or debris. If the following accessories are needed, please add the code followed by the model number.



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.



Note : 1. The available size for high dust proof accessories are HG15C, HG20(C/H), HG30(C/H), HG35(C/H), HG45(C/H).  
2. The value of friction force will increase 1.5~4.0 kgf.

### (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

Size	Thickness (t1) (mm)	Size	Thickness (t1) (mm)
HG15 ES	3	HG35 ES	3.2
HG20 ES	3.5	HG45 ES	4.5
HG25 ES	3.5	HG55 ES	4.5
HG30 ES	3.2	HG65 ES	6

#### ○ Scraper

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

Table 2-1-17 Dimensions of scraper

Size	Thickness (t2) (mm)	Size	Thickness (t2) (mm)
HG15 SC	1.5	HG35 SC	1.5
HG20 SC	1.5	HG45 SC	1.5
HG25 SC	1.5	HG55 SC	1.5
HG30 SC	1.5	HG65 SC	1.5

#### ○ 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.

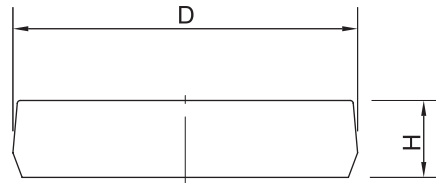


Table 2-1-18 Dimensions of Bolt Caps for Rail Mounting Holes

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

(5) Dimensions of block equipped with the dustproof parts

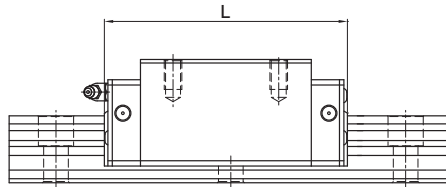


Table 2-1-19 Overall block length

unit: mm

Size	Overall block length (L)					
	Standard/SH	ZZ/ZH	DD/DH	KK/KH	SW	ZW
HG15C	61.4	69	68	75.6	63.2	71
*HG20C	77.5	82.5	82.5	87.5	78.5	86.3
*HG20H	92.2	97.2	97.5	102.2	93.2	101
*HG25C	84	89	89	94	85	92.8
*HG25H	104.6	109.6	109.6	114.6	105.6	113.4
*HG30C	97.4	105.4	104.8	112.8	99	107.2
*HG30H	120.4	128.4	127.8	135.8	122	99.6
*HG35C	112.4	120.4	119.8	127.8	115.2	123.4
*HG35H	138.2	146.2	145.6	153.6	141	149.2
*HG45C	139.4	150	149.4	160	140	148.8
HG45H	171.2	181.8	181.2	191.8	171.8	180.6
HG55C	166.7	177.1	177.1	187.5	-	-
HG55H	204.8	215.2	215.2	225.5	-	-
HG65C	200.2	208.2	209.2	217.2	-	-
HG65H	259.6	267.6	268.6	276.6	-	-

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

Size	Resistance N (kgf)	Size	Resistance N (kgf)
HG15	1.18 (0.12)	HG35	3.04 (0.31)
HG20	1.57 (0.16)	HG45	3.83 (0.39)
HG25	1.96 (0.2)	HG55	4.61 (0.47)
HG30	2.65 (0.27)	HG65	5.79 (0.59)

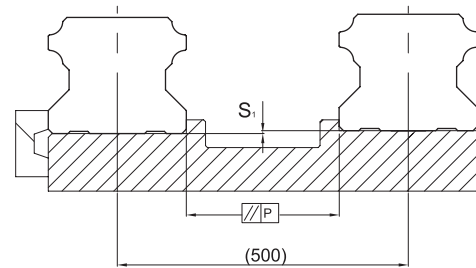
Note: 1kgf=9.81N

## 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:  $\mu\text{m}$

Size	Preload classes		
	Z0	ZA	ZB
HG15	25	18	-
HG20	25	20	18
HG25	30	22	20
HG30	40	30	27
HG35	50	35	30
HG45	60	40	35
HG55	70	50	45
HG65	80	60	55

### (3) The accuracy tolerance of reference surface height

Table 2-1-22 Max. Tolerance of Reference Surface Height ( $S_1$ )

unit:  $\mu\text{m}$

Size	Preload classes		
	Z0	ZA	ZB
HG15	130	85	-
HG20	130	85	50
HG25	130	85	70
HG30	170	110	90
HG35	210	150	120
HG45	250	170	140
HG55	300	210	170
HG65	350	250	200

# 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.

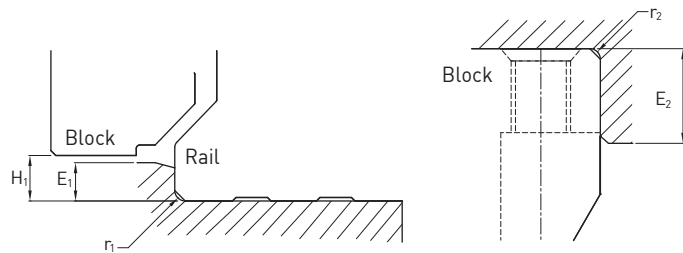


Table 2-1-23 Shoulder Heights and Fillets

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

#### (2) Tightening Torque of Bolts for Installation

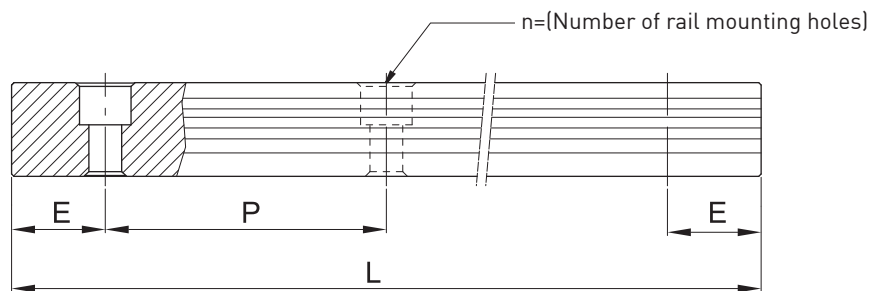
Improper tightening of bolts will seriously influence the accuracy of Linear Guideway installation. The following tightening torques for different sizes of bolts are recommended.

Table 2-1-24 Mounting Torque

Size	Bolt size	Torque N-cm (kgf-cm)		
		Iron	Casting	Aluminum
HG15	M4×0.7P×16L	392 (40)	274 (28)	206 (21)
HG20	M5×0.8P×16L	883 (90)	588 (60)	441 (45)
HG25	M6×1P×20L	1373 (140)	921 (94)	686 (70)
HG30	M8×1.25P×25L	3041 (310)	2010 (205)	1470 (150)
HG35	M8×1.25P×25L	3041 (310)	2010 (205)	1470 (150)
HG45	M12×1.75P×35L	11772 (1200)	7840 (800)	5880 (600)
HG55	M14×2P×45L	15696 (1600)	10500 (1100)	7840 (800)
HG65	M16×2P×50L	19620 (2000)	13100 (1350)	9800 (1000)

## 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.



$$L = (n-1) \times P + 2 \times E \quad \text{Eq.2.1}$$

- 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

unit: mm

Item	HG15	HG20	HG25	HG30	HG35	HG45	HG55	HG65
Standard Length L(n)	160 (3)	220 (4)	220 (4)	280 (4)	280 (4)	570 (6)	780 (7)	1,270 (9)
	220 (4)	280 (5)	280 (5)	440 (6)	440 (6)	885 (9)	1,020 (9)	1,570 (11)
	280 (5)	340 (6)	340 (6)	600 (8)	600 (8)	1,200 (12)	1,260 (11)	2,020 (14)
	340 (6)	460 (8)	460 (8)	760 (10)	760 (10)	1,620 (16)	1,500 (13)	2,620 (18)
	460 (8)	640 (11)	640 (11)	1,000 (13)	1,000 (13)	2,040 (20)	1,980 (17)	
	640 (11)	820 (14)	820 (14)	1,640 (21)	1,640 (21)	2,460 (24)	2,580 (22)	
	820 (14)	1,000 (17)	1,000 (17)	2,040 (26)	2,040 (26)	2,985 (29)	2,940 (25)	
		1,240 (21)	1,240 (21)	2,520 (32)	2,520 (32)			
			1,600 (27)	3,000 (38)	3,000 (38)			
Pitch (P)	60	60	60	80	80	105	120	150
Distance to End (E <sub>s</sub> )	20	20	20	20	20	22.5	30	35
Max. Standard Length	1,960 (33)	4,000 (67)	4,000 (67)	3,960 (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	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.