

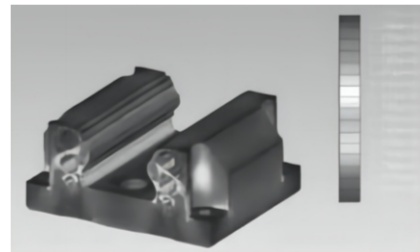
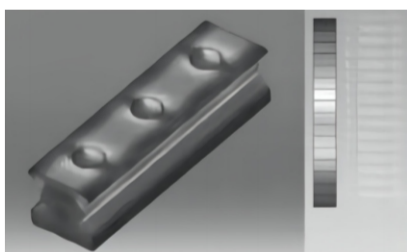
## 4. TZ Series - Roller Type Linear Guideway

### 4.1 The Features of TZ Series Linear Guideway

TZ series linear guides replace steel balls with roller-type rolling elements, which are designed to achieve ultra-high rigidity and super-heavy load capacity. The slight elastic deformation and the design of the contact angle of 45 degrees allow the overall linear guide to achieve the characteristics of high rigidity and high load capacity in four directions. Through the realization of ultra-high rigidity, the machining accuracy can be greatly improved and the demands of high precision can be achieved; due to the characteristics of super heavy load, the service life of the linear guide can be extended. It is very suitable for high-speed automated industrial machinery and equipment with high rigidity requirements.

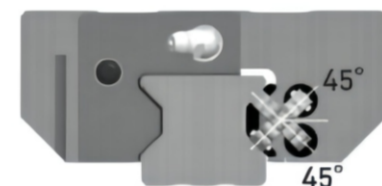
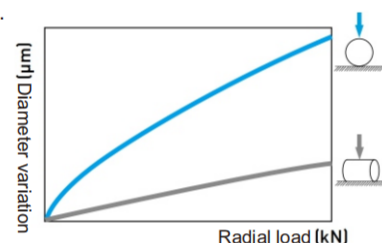
#### (1) Optimized design

The reflow module of the TZ series linear guide has obtained multi-national patents. It ensures smooth endless rolling of roller-type rolling elements. Using the advanced finite element method to analyze the structural stress, and obtain the optimal design of the Slider and rail structure.



#### (2) Ultra-high rigidity in all four directions

TZ series linear guides replace the balls with roller-type rolling elements. With the linear contact between the rollers and the rail and the slider the rollers only form a small amount of elastic deformation when under high load, which can not only greatly improve the linear guide's performance. The rigidity value can maintain high-precision machining. The figure on the left shows the rigidity of balls and rollers of equal volume.



#### (3) Super heavy load capacity in all directions

TZ series linear guides are combined with DB (45°-45°), which can bear the loads in the up and down and left and right directions, so that the linear guides have ultra-high load capacity. Under the requirements of the same working load, the TZ rail can have a smaller volume than the ball type rail, and can evenly bear high loads.

#### (4) Extended life

TZ series linear guides are based on ISO standard (ISO14728-1) to formulate the basic dynamic load rating, which is calculated based on the rated life of 100 kilometers. The life of the linear guide will vary depending on the actual working load. The calculation of the life of the roller type linear guide can be calculated based on the basic dynamic load rating and working load of the selected linear guide.

- Without considering the influence of environmental factors, the life calculation is as follows.

$$L = \left( \frac{C}{P} \right)^{\frac{10}{3}} \cdot 100\text{km} = \left( \frac{C}{P} \right)^{\frac{10}{3}} \cdot 62\text{mile}$$

L : life  
P : work load  
C : basic dynamic load rating  
 $f_h$  : hardness factor  
 $f_t$  : temperature coefficient  
 $f_w$  : load factor

- If the environmental factors of linear guide use are considered, its life will vary with the state of motion, the hardness of the bead surface and the temperature of the system.

$$L = \left( \frac{f_h \cdot f_t \cdot C}{f_w \cdot P} \right)^{\frac{10}{3}} \cdot 100\text{km} = \left( \frac{f_h \cdot f_t \cdot C}{f_w \cdot P} \right)^{\frac{10}{3}} \cdot 62\text{mile}$$

Among them, the hardness coefficient, temperature coefficient and load coefficient are the same as the ball type linear guide. Compared with the ball type linear guide, the TZ series has the super heavy load capacity, which can greatly extend the service life.

#### (5) Durability Test

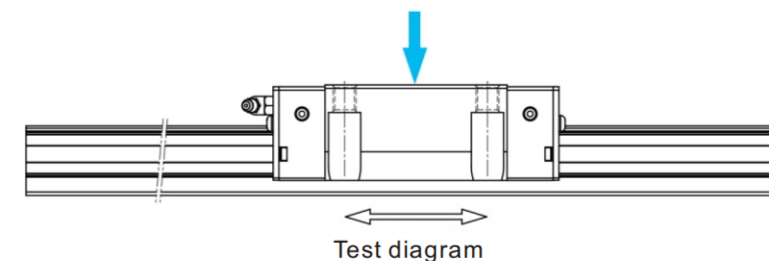


Table 2.70 Test data

Sample 1: TZH35CA  
Preload class: ZA  
Moving speed: 60m/min  
Acceleration: 1G  
Stroke: 0.55m  
Lubricating grease: replenish every 100 kilometers  
Additional load: 15kN  
Running distance: 1135 kilometers

#### Test Results :

According to the basic dynamic rated load, preload and working load of TZH35CA, its life value is calculated to be 1000 kilometers. After running for 1,135 kilometers, the surface of the bead track and the surface of the roller did not peel off the scale-like flakes.



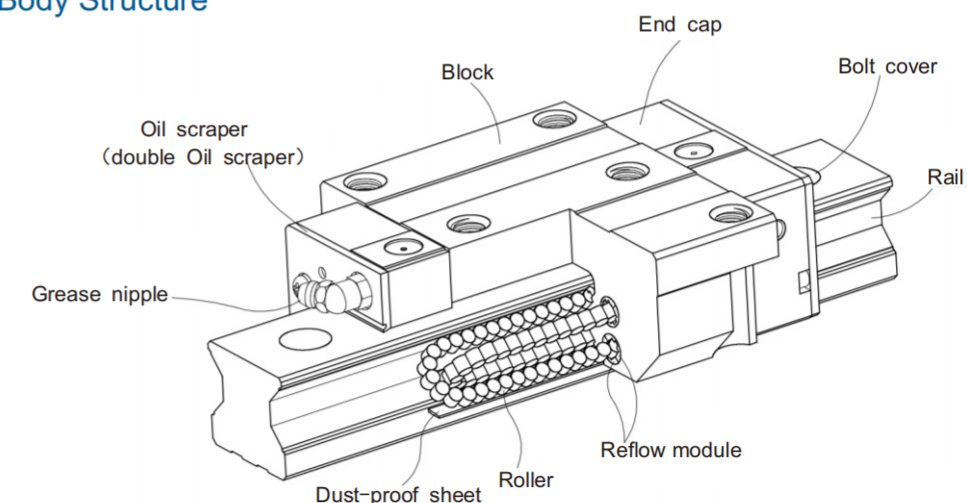
Sample 2: TZW35CC  
Preload class: ZA  
Moving speed: 120m/min  
Acceleration: 1G  
Stroke: 2m  
Frequency of lubricating oil: 0.3cm3/hr  
Applied load: no load  
Running distance: 15000km

#### Test Results :

After running for 15,000 kilometers, the surface of the bead track and the surface of the roller did not peel off the scale-like flakes.



### 4.2 TZ Body Structure

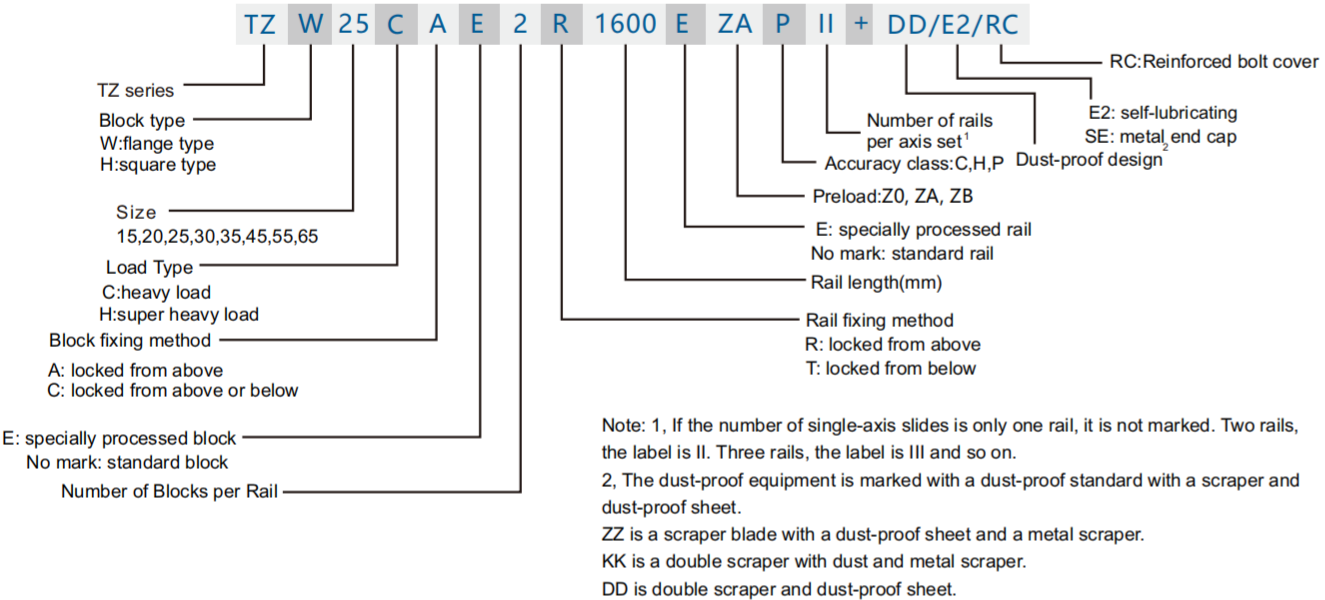


- Rolling circulation system: block, rail, end cap, reflow module, roller
- Lubrication system: grease nipple, oil connection
- Dust protection system: End seal, Bottom Seal, Bolt Cap, Metal scraper

### 4.3 TZ Series Type Specifications

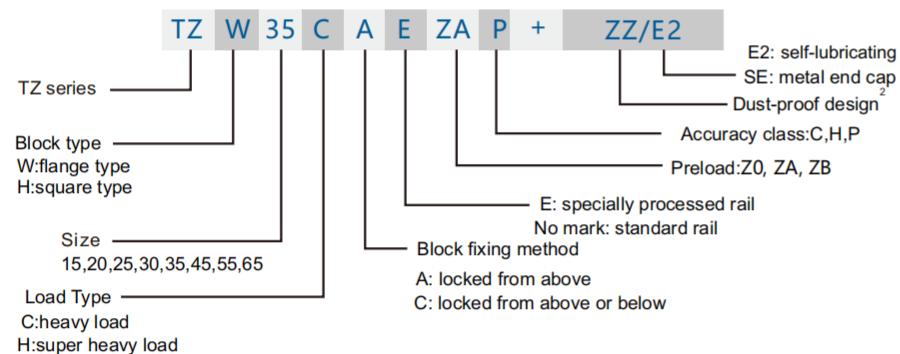
The TZ series is divided into two types of linear guides, the non-interchangeable and the interchangeable type. The specifications and dimensions of the two are the same. The main difference is that the interchangeable type of sliders and slides can be used interchangeably, which is more convenient, but the combination accuracy cannot reach the same level. The accuracy of the interchangeable type is above the ultra-precision level, but since the combined accuracy of the IMTEK interchangeable type has reached a certain level, it is a convenient choice for customers who do not need to install linear guides in pairs. The product specification and model of the linear guide mainly indicate the size, type, accuracy grade, preload and other specifications of the linear guide, so as to facilitate the confirmation of the product by both parties when ordering.

#### (1)Non-interchangeable linear guide models

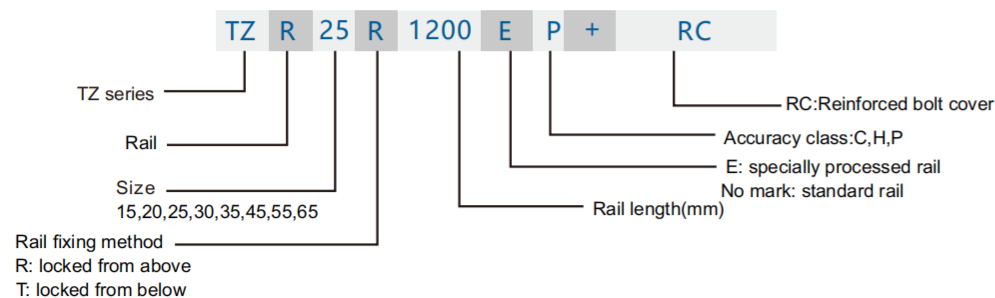


#### (2)Interchangeable linear guide product models

##### ○ Interchangeable block product model



##### ○ Interchangeable rail product model



### 4.4 Block Type

#### (1)Block Type

TZ series provides two types of linear guides: flange type and square type.

Table 2.71 Block Type

| Type   | Spec.            | Shape | Height (mm)   | Length (mm)      | Application                                                                                                                                                                                                                                                                                                                                       |
|--------|------------------|-------|---------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Square | TZH-CA<br>TZH-HA |       | 28<br>↓<br>90 | 100<br>↓<br>4000 | <ul style="list-style-type: none"> <li>Automatic device</li> <li>Heavy Handling Equipment</li> <li>CNC processing machine</li> <li>Heavy cutting machine</li> <li>CNC Grinder</li> <li>Injection molding machine</li> <li>EDM</li> <li>Large Gantry Machine Tool</li> <li>Work machines with high rigidity and heavy load requirements</li> </ul> |
| Flange | TZW-CC<br>TZW-HC |       | 24<br>↓<br>90 | 100<br>↓<br>4000 |                                                                                                                                                                                                                                                                                                                                                   |

#### (2) Rail Type

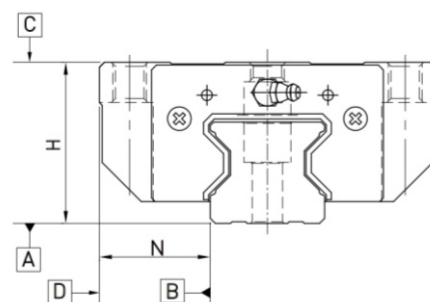
In addition to the general locking bolt hole rails, the TZ series also provides bottom locking bolt hole rails, which are convenient for customers to install and use.

Table 2.72 Rail Type

| Above locking bolt hole | Bottom locking bolt hole |
|-------------------------|--------------------------|
|                         |                          |

## 4. 5 Accuracy Class

The precision of TZ series is divided into two levels: H (high level) and P (precision level). Customers can choose accuracy according to equipment.



### (1)Accuracy of non-interchangeable linear guides

Table 2.73 Accuracy table of matched complete sets Uint: mm

| Spec.                                               | TZ - 15、20                            |               |                      |                      |
|-----------------------------------------------------|---------------------------------------|---------------|----------------------|----------------------|
| Accuracy Class                                      | High (H)                              | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimension Tolerance of Height H                     | ±0.03                                 | 0~-0.03       | 0~-0.015             | 0~-0.008             |
| Dimension Tolerance of Width N                      | ±0.03                                 | 0~-0.03       | 0~-0.015             | 0~-0.008             |
| Pair Variation of Height H                          | 0.01                                  | 0.006         | 0.004                | 0.003                |
| Pair Variation of Width N (reference rail)          | 0.01                                  | 0.006         | 0.004                | 0.003                |
| Running parallelism of block surface C to surface A | Running Parallelism (See table 2. 79) |               |                      |                      |
| Running parallelism of block surface D to surface B | Running Parallelism (See table 2. 79) |               |                      |                      |

Table 2.74 Accuracy table of matched complete sets Uint: mm

| Spec.                                               | TZ-25、30、35                           |               |                      |                      |
|-----------------------------------------------------|---------------------------------------|---------------|----------------------|----------------------|
| Accuracy Class                                      | High (H)                              | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimension Tolerance of Height H                     | ±0.04                                 | 0~-0.04       | 0~-0.02              | 0~-0.01              |
| Dimension Tolerance of Width N                      | ±0.04                                 | 0~-0.04       | 0~-0.02              | 0~-0.01              |
| Pair Variation of Height H                          | 0.015                                 | 0.007         | 0.005                | 0.003                |
| Pair Variation of Width N (reference rail)          | 0.015                                 | 0.007         | 0.005                | 0.003                |
| Running parallelism of block surface C to surface A | Running Parallelism (See table 2. 79) |               |                      |                      |
| Running parallelism of block surface D to surface B | Running Parallelism (See table 2. 79) |               |                      |                      |

Table 2.75 Accuracy table of matched complete sets Uint: mm

| Spec.                                               | TZ-45                                 |               |                      |                      |
|-----------------------------------------------------|---------------------------------------|---------------|----------------------|----------------------|
| Accuracy Class                                      | High (H)                              | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimension Tolerance of Height H                     | ±0.05                                 | 0~-0.05       | 0~-0.03              | 0~-0.02              |
| Dimension Tolerance of Width N                      | ±0.05                                 | 0~-0.05       | 0~-0.03              | 0~-0.02              |
| Pair Variation of Height H                          | 0.015                                 | 0.007         | 0.005                | 0.003                |
| Pair Variation of Width N (reference rail)          | 0.02                                  | 0.01          | 0.007                | 0.005                |
| Running parallelism of block surface C to surface A | Running Parallelism (See table 2. 79) |               |                      |                      |
| Running parallelism of block surface D to surface B | Running Parallelism (See table 2. 79) |               |                      |                      |

### (2) Accuracy of interchangeable linear guides

Table 2.76 Accuracy table of complete sets (or separate parts) Uint: mm

| Spec.                                               | TZ-15、20                              |               |
|-----------------------------------------------------|---------------------------------------|---------------|
| Accuracy Class                                      | High (H)                              | Precision (P) |
| Dimension Tolerance of Height H                     | ±0.03                                 | ±0.015        |
| Dimension Tolerance of Width N                      | ±0.03                                 | ±0.015        |
| Pair Variation of Height H                          | 0.01                                  | 0.006         |
| Pair Variation of Width N (reference rail)          | 0.01                                  | 0.006         |
| Running parallelism of block surface C to surface A | Running Parallelism (See table 2. 79) |               |
| Running parallelism of block surface D to surface B | Running Parallelism (See table 2. 79) |               |

Table 2.77 Accuracy table of complete sets (or separate parts) Uint: mm

| Spec.                                               | TZ-25、30、35                           |               |
|-----------------------------------------------------|---------------------------------------|---------------|
| Accuracy Class                                      | High (H)                              | Precision (P) |
| Dimension Tolerance of Height H                     | ±0.04                                 | ±0.02         |
| Dimension Tolerance of Width N                      | ±0.04                                 | ±0.02         |
| Pair Variation of Height H                          | 0.015                                 | 0.007         |
| Pair Variation of Width N (reference rail)          | 0.015                                 | 0.007         |
| Running parallelism of block surface C to surface A | Running Parallelism (See table 2. 79) |               |
| Running parallelism of block surface D to surface B | Running Parallelism (See table 2. 79) |               |

Table 2.78 Accuracy table of complete sets (or separate parts) Uint: mm

| Spec.                                               | TZ-45                                 |               |
|-----------------------------------------------------|---------------------------------------|---------------|
| Accuracy Class                                      | High (H)                              | Precision (P) |
| Dimension Tolerance of Height H                     | ±0.05                                 | ±0.025        |
| Dimension Tolerance of Width N                      | ±0.05                                 | ±0.025        |
| Pair Variation of Height H                          | 0.015                                 | 0.007         |
| Pair Variation of Width N (reference rail)          | 0.02                                  | 0.01          |
| Running parallelism of block surface C to surface A | Running Parallelism (See table 2. 79) |               |
| Running parallelism of block surface D to surface B | Running Parallelism (See table 2. 79) |               |

(3) Accuracy of walking parallelism

Table 2.79 Parallelism of walking

| Length (mm) | Accuracy Level(μm) |     |      |      |
|-------------|--------------------|-----|------|------|
|             | (H)                | (P) | (SP) | (UP) |
| ~100        | 7                  | 3   | 2    | 2    |
| 100~200     | 9                  | 4   | 2    | 2    |
| 200~300     | 10                 | 5   | 3    | 2    |
| 300~500     | 12                 | 6   | 3    | 2    |
| 500~700     | 13                 | 7   | 4    | 2    |
| 700~900     | 15                 | 8   | 5    | 3    |
| 900~1,100   | 16                 | 9   | 6    | 3    |
| 1,100~1,500 | 18                 | 11  | 7    | 4    |
| 1,500~1,900 | 20                 | 13  | 8    | 4    |
| 1,900~2,500 | 22                 | 15  | 10   | 5    |
| 2,500~3,100 | 25                 | 18  | 11   | 6    |
| 3,100~3,600 | 27                 | 20  | 14   | 7    |
| 3,600~4,000 | 28                 | 21  | 15   | 7    |

4.6 Preload

(1) Preload definition

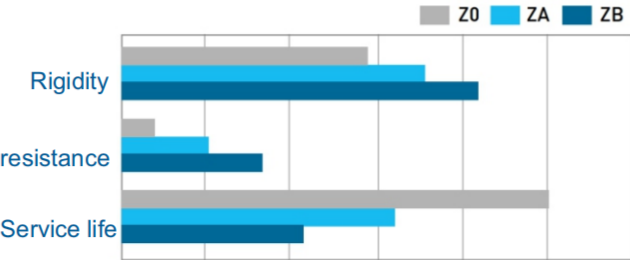
The preload is to give the roller load force in advance, that is, to increase the diameter of the roller, and use the negative gap between the roller and the raceway to give the preload, which can improve the rigidity of the linear guide and eliminate the gap. RG series linear guides provide the following three standard preload.

Table 2.80 Preload Level

| PreloadLevel   | Mark | Preload     | Using Condition                                                                       |
|----------------|------|-------------|---------------------------------------------------------------------------------------|
| Light preload  | Z0   | 0.02C~0.04C | The load direction is fixed, the impact is small, the precision requirements are low. |
| Medium preload | ZA   | 0.07C~0.09C | High rigidity requirements and light load, high precision requirements.               |
| Heavy preload  | ZB   | 0.12C~0.14C | High rigidity requirements, and the use environment of vibration and shock.           |

Note: C in the preload is the dynamic load rating.

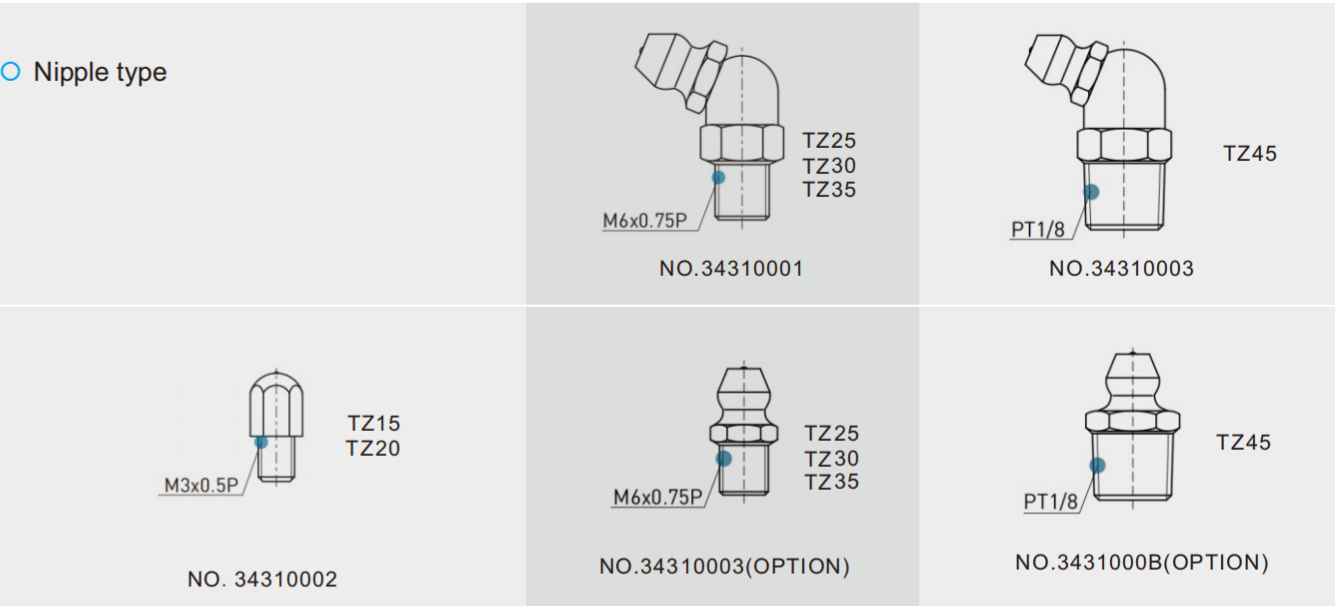
The picture on the right shows the relationship between the rigidity performance, frictional resistance and service life of the linear guide under different preload conditions. Customers can choose the appropriate preload grade according to the rigidity and service life of the equipment, but it is recommended to use the preload below the medium preload for small sizes. In order to avoid the preload selection is too heavy and reduce its life.



4.7 Lubrication Method

(1) Grease

○ Nipple type



○ Position

According to customer needs, a grease nipple can be installed at the front or back end of the slider for lubricating. The TZ series is especially equipped with a lubricating nipple (usually a straight lubricating nipple) on the side of the end cover to provide side lubrication and lateral lubrication. It is recommended that the position be on the non-reference side, but if you have special needs, it can also be placed on the side reference side. If customers have the above-mentioned lateral refueling needs, please contact us. If you use a linear guide that automatically supplies lubricating grease to the pipe, you can choose to install the oil pipe joint according to the connection pipe type.

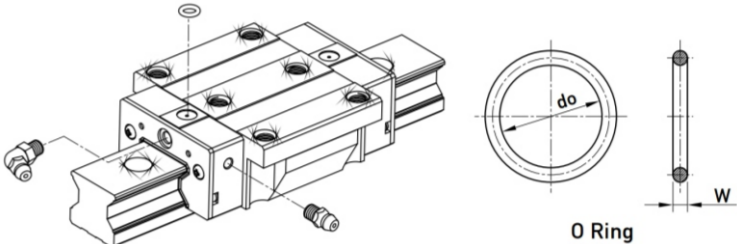
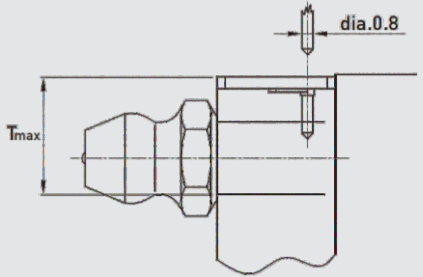


Table 2.57 O-Ring size and max. Permissible depth for piercing.

| Specification | O-Ring Spec. |          | Lube hole at top: max. permissible depth for piercing<br>T <sub>max</sub> (mm) |
|---------------|--------------|----------|--------------------------------------------------------------------------------|
|               | do(mm)       | W(mm)    |                                                                                |
| TZ15          | 2.5±0.15     | 1.5±0.15 | 3.45                                                                           |
| TZ20          | 2.5±0.15     | 1.5±0.15 | 4                                                                              |
| TZ25          | 7.5±0.15     | 1.5±0.15 | 5.8                                                                            |
| TZ30          | 7.5±0.15     | 1.5±0.15 | 6.2                                                                            |
| TZ35          | 7.5±0.15     | 1.5±0.15 | 8.65                                                                           |
| TZ45          | 7.5±0.15     | 1.5±0.15 | 9.5                                                                            |
| TZ35          | 7.5±0.15     | 1.5±0.15 | 11.6                                                                           |
| TZ45          | 7.5±0.15     | 1.5±0.15 | 14.5                                                                           |



## ○ The lubricant amount for a block filled with grease

Table 2.82 The lubricant amount for a block filled with grease

| Specification | Medium load (cm <sup>3</sup> ) | Heavy load (cm <sup>3</sup> ) | Specification | Medium load (cm <sup>3</sup> ) | Heavy load (cm <sup>3</sup> ) |
|---------------|--------------------------------|-------------------------------|---------------|--------------------------------|-------------------------------|
| TZ15C         | 3                              | -                             | TZ35C         | 9                              | 14                            |
| TZ20C         | 5                              | 6                             | TZ45C         | 12                             | 23                            |
| TZ25C         | 7                              | 8                             | TZ55C         | 19                             | 35                            |
| TZ30C         | 9                              | 10                            | TZ65C         | 19                             | 63                            |

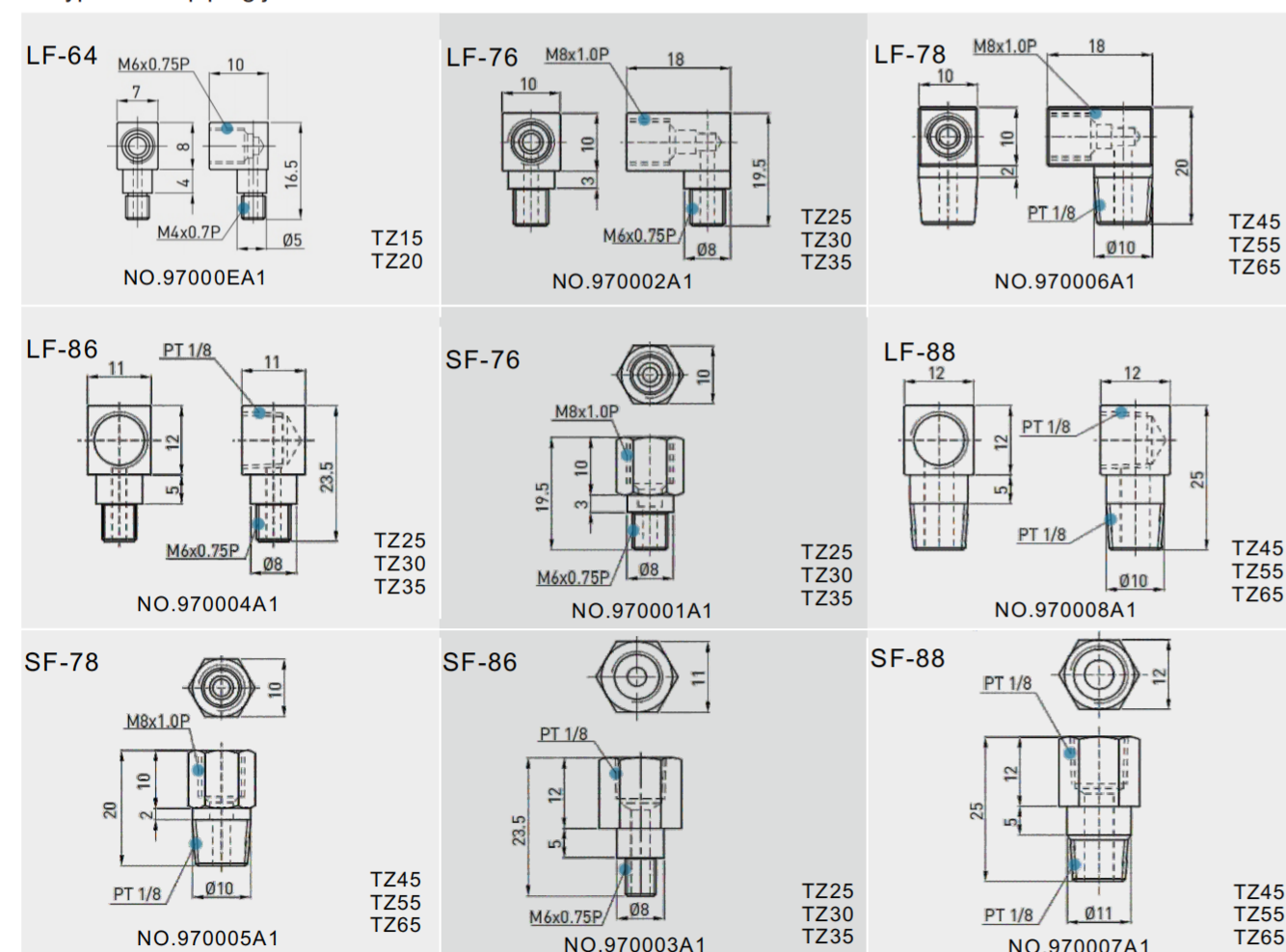
## ○ Lubrication frequency

Check grease every 100km, or every 3 to 6 months.

## (2) Lubricating oil

It is recommended to use lubricating oil with an oil viscosity of about 30~150cSt to lubricate linear guides. Customers can inform their requirements for lubricating oil. The linear guides shipped will not be sealed with lubricating grease.

## ○ Types of oil piping joint



## ○ Oil supply rate

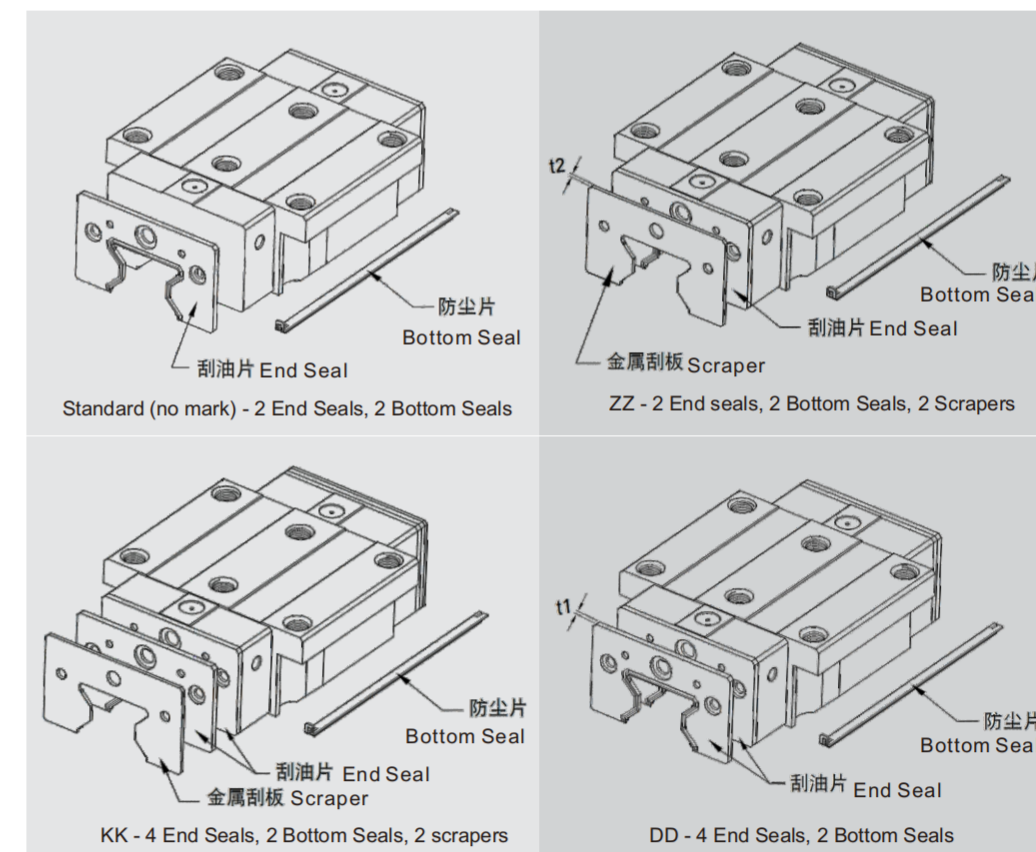
Table 2.83 oil supply rate

| Specification | Supply rate (cm <sup>3</sup> /hr) | Specification | Supply rate (cm <sup>3</sup> /hr) |
|---------------|-----------------------------------|---------------|-----------------------------------|
| TZ15          | 0.14                              | TZ35          | 0.23                              |
| TZ20          | 0.14                              | TZ45          | 0.3                               |
| TZ25          | 0.167                             | TZ55          | 0.367                             |
| TZ30          | 0.2                               | TZ65          | 0.433                             |

## 4. 8 Dust-proof equipment

### (1) Dust-proof equipment code

If the following dust-proof accessories are required, please add the code after the product model.



### (2) Oil scraper and bottom dust-proof sheet

Prevent machining iron filings or dust particles from entering the slide block and destroying the surface of the bead channel and reducing the life of the linear guide.

### (3) Double oil scraper

Double the effect of scraping, even in the environment of heavy cutting, foreign matter is completely excluded from the slider.

Table 2.84 Thickness of oil scraper

| Specification | Thickness(t <sub>1</sub> )(mm) | Specification | Thickness(t <sub>1</sub> )(mm) |
|---------------|--------------------------------|---------------|--------------------------------|
| TZ15 ES       | 2.2                            | TZ35 ES       | 2.5                            |
| TZ20 ES       | 2.2                            | TZ45 ES       | 3.6                            |
| TZ25 ES       | 2.2                            | TZ55 ES       | 3.6                            |
| TZ30 ES       | 2.4                            | TZ65 ES       | 4.4                            |

#### (4)Metal scraper

It can isolate high-temperature iron filings or machining sparks, and remove large-volume impurities.

Table2. 85 Thickness of metal scraper

| Specification | Thickness(t <sub>1</sub> )(mm) | Specification | Thickness(t <sub>1</sub> )(mm) |
|---------------|--------------------------------|---------------|--------------------------------|
| TZ15 SC       | 1.0                            | TZ35 SC       | 1.5                            |
| TZ20 SC       | 1.0                            | TZ45 SC       | 1.5                            |
| TZ25 SC       | 1.0                            | TZ55 SC       | 1.5                            |
| TZ30 SC       | 1.5                            | TZ65 SC       | 1.5                            |

#### (5)Bolt cover

In order to prevent cutting powder or foreign matter from entering the block through the bolt hole and affecting the accuracy, the customer must drive the bolt cover into the bolt hole when installing the rail. Each rail is equipped with a bolt cover when it leaves the factory.

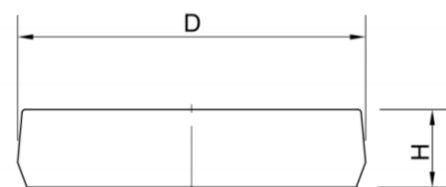


Table 2.86 Bolt cover of the rail

| Rail specification | Bolt Size | Diameter (D) (mm) | Thickness (H) (mm) |
|--------------------|-----------|-------------------|--------------------|
| TZR 15             | M4        | 7.65              | 1.1                |
| TZR 20             | M5        | 9.65              | 2.2                |
| TZR 25             | M6        | 11.15             | 2.5                |
| TZR 30             | M8        | 14.20             | 3.3                |
| TZR 35             | M8        | 14.20             | 3.3                |
| TZR 45             | M12       | 20.25             | 4.6                |
| TZR 55             | M14       | 23.50             | 5.5                |
| TZR 65             | M16       | 26.60             | 5.5                |

#### (6) The total length of the slider of the dust-proof code

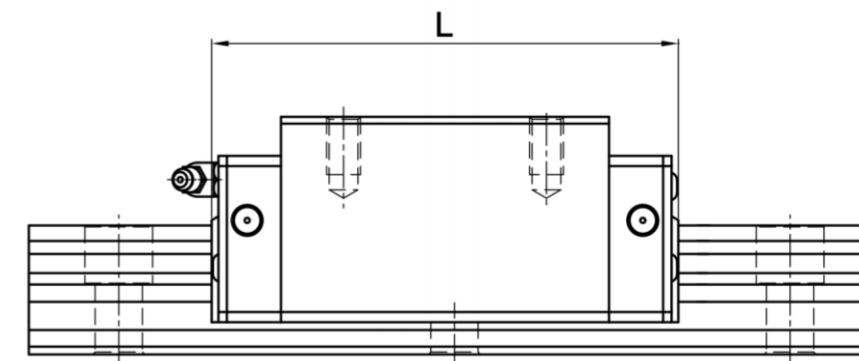


Table 2.87 The total length

Unit: mm

| Specification | The total length (L) |              |              | Specification | The total length (L) |              |              |
|---------------|----------------------|--------------|--------------|---------------|----------------------|--------------|--------------|
|               | SS                   | DD           | DD+CS        |               | SS                   | DD           | DD+CS        |
| TZ15C         | 68.0(70.4)           | 70.0(74.4)   | 72.4(74.8)   | TZ35C         | 124.0(129.4)         | 127.0(135.0) | 129.0(134.4) |
| TZ20C         | 86.0(88.4)           | 88.0(92.4)   | 90.4(92.8)   | TZ45C         | 153.2(156.4)         | 156.2(164.2) | 160.4(163.6) |
| TZ25C         | 97.9(101.5)          | 99.9(105.9)  | 102.3(105.9) | TZ55C         | 183.7(186.9)         | 186.7(194.7) | 190.9(194.1) |
| TZ30C         | 109.8(113.4)         | 112.8(118.8) | 114.6(118.2) | TZ65C         | 232.0(236.0)         | 235.0(245.0) | 240.8(244.8) |

## 4. 9 Friction

The maximum value of resistance per end seal are as shown in the table.

Table 2.88 TZ Series seal resistance

| Specification | Resistance N (kgf) | Specification | Resistance N (kgf) |
|---------------|--------------------|---------------|--------------------|
| TZ15          | 1.92(0.2)          | TZ35          | 3.53(0.36)         |
| TZ20          | 2.45(0.25)         | TZ45          | 4.21(0.43)         |
| TZ25          | 2.74(0.28)         | TZ55          | 5.09(0.52)         |
| TZ30          | 3.31(0.31)         | TZ65          | 6.66(0.68)         |

Note:1 kgf = 9.81N

## 4.10 The Accuracy Tolerance of Mounting Surface

TZ series linear guides greatly increase the rigidity of the linear guides by the linear contact between the roller-type rolling elements and the sliding rails and the sliders. Therefore, when the installation plane accuracy error is too large, it will affect the installation quality of the linear guides, not only increasing Frictional resistance will further reduce its service life. If the customer can install the linear guide according to the following requirements of the installation plane accuracy, it will be able to show the characteristics of high rigidity, high precision and long service life of the TZ series linear guide.

- Bearing surface parallelism error (P)

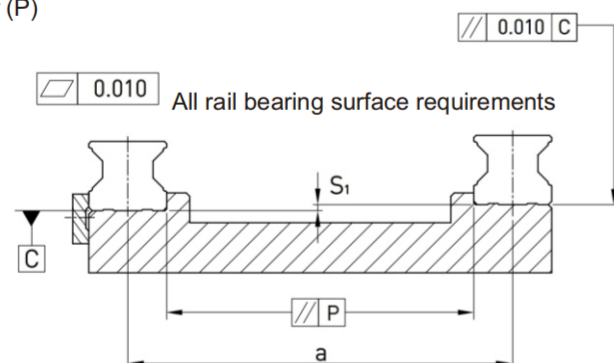


Table 2.89 Maximum allowable parallelism error (P)

Unit:  $\mu\text{m}$

| Specification | Preload |    |    |
|---------------|---------|----|----|
|               | Z0      | ZA | ZB |
| TZ 15         | 5       | 3  | 3  |
| TZ 20         | 8       | 6  | 4  |
| TZ 25         | 9       | 7  | 5  |
| TZ 30         | 11      | 8  | 6  |
| TZ 35         | 14      | 10 | 7  |
| TZ 45         | 17      | 13 | 9  |
| TZ 55         | 21      | 14 | 11 |
| TZ 65         | 27      | 18 | 14 |

- Bearing surface parallelism error ( $S_1$ )

$$S_1 = a \times K$$

$S_1$  : Maximum allowable error in height

$a$  : Paired rails spacing

$K$  : height error coefficient

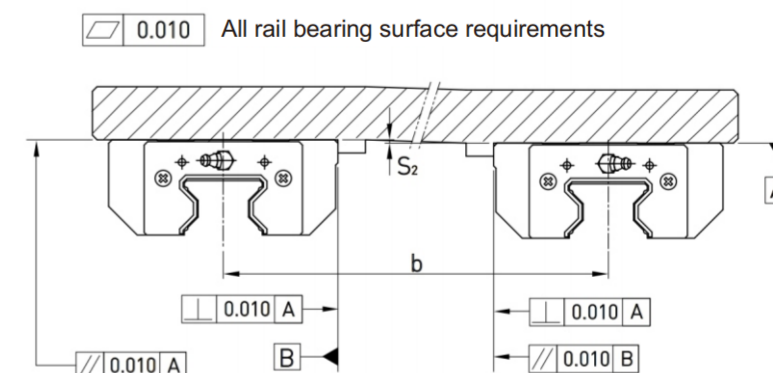
Table 2.90 Height error coefficient ( $S_1$ )

Unit:  $\mu\text{m}$

| Specification | Preload              |                      |                      |
|---------------|----------------------|----------------------|----------------------|
|               | Z0                   | ZA                   | ZB                   |
| K             | $2.2 \times 10^{-4}$ | $1.7 \times 10^{-4}$ | $1.2 \times 10^{-4}$ |

- Block installation plane accuracy

- Height error of paired bearing surfaces of different rails and sliders ( $S_2$ )

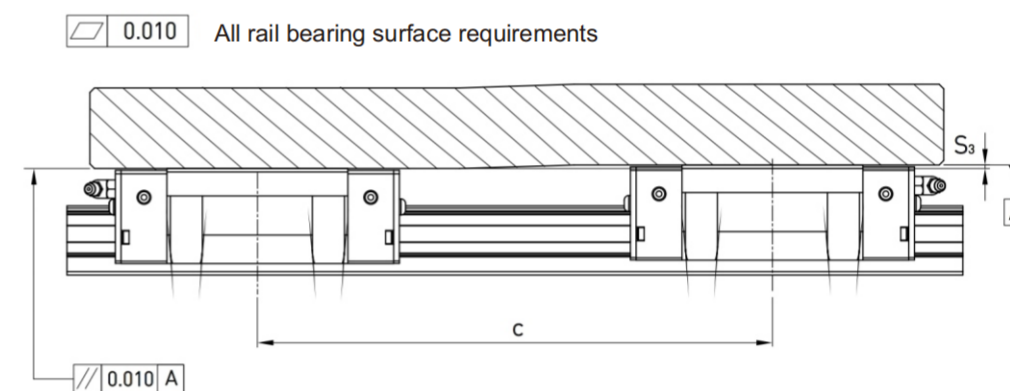


$$S_2 = b \times 4.2 \times 10^{-5}$$

$S_2$  : Maximum allowable error in height

$b$  : Paired slider spacing

- Height error of paired bearing surface of the same rail and slider ( $S_3$ )



$$S_3 = c \times 4.2 \times 10^{-5}$$

$S_3$  : Maximum allowable error in height

$c$  : Paired slider spacing

## 4.11 Installation Precautions

### (1) Mounting Surface Shoulder Height and fillet

Improper shoulder heights and fillets of mounting surfaces will cause a deviation in accuracy and the interference with the filleted part of the rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

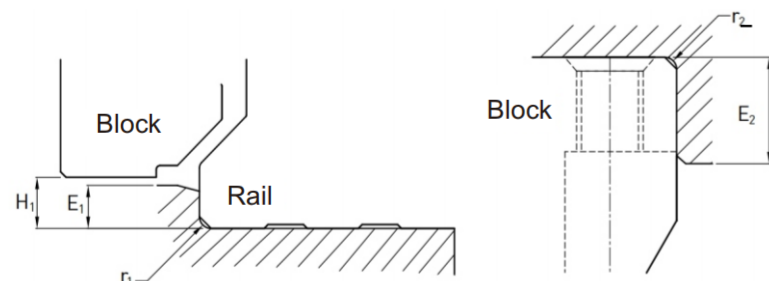


Table 2.91 Shoulder Heights and fillets

| Spec. | Ril End Maximum Fillet Radiu<br>$r_1$ (mm) | Ril End Maximum Fillet Radiu<br>$r_2$ (mm) | Rail end shoulder height<br>$E_1$ (mm) | Block end shoulder height<br>$E_2$ (mm) | The Running high<br>of S block<br>$H_1$ (mm) |
|-------|--------------------------------------------|--------------------------------------------|----------------------------------------|-----------------------------------------|----------------------------------------------|
| TZ 15 | 0.5                                        | 0.5                                        | 3                                      | 4                                       | 4                                            |
| TZ 20 | 0.5                                        | 0.5                                        | 3.5                                    | 5                                       | 5                                            |
| TZ 25 | 1.0                                        | 1.0                                        | 5                                      | 5                                       | 5.5                                          |
| TZ 30 | 1.0                                        | 1.0                                        | 5                                      | 5                                       | 6                                            |
| TZ 35 | 1.0                                        | 1.0                                        | 6                                      | 6                                       | 6.5                                          |
| TZ 45 | 1.0                                        | 1.0                                        | 7                                      | 8                                       | 8                                            |
| TZ 55 | 1.5                                        | 1.5                                        | 9                                      | 10                                      | 10                                           |
| TZ 65 | 1.5                                        | 1.5                                        | 10                                     | 10                                      | 12                                           |

### (2) Torque value of rail assembly screws

Whether the rail is locked tightly to the flat reference surface when installing greatly affects the accuracy of the linear guide. Therefore, in order to achieve the purpose of locking each screw, it is recommended to use the following torque values to lock the assembly screws.

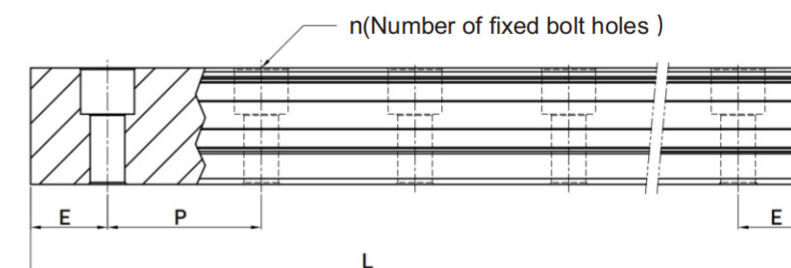
Table 2.92 Torque value

| Spec. | Bolt Size   | Toque Value<br>N-cm(kgf-cm) | Spec. | Bolt Size     | Toque Value<br>N-cm(kgf-cm) |
|-------|-------------|-----------------------------|-------|---------------|-----------------------------|
| TZ 15 | M4X0.7PX16L | 392(40)                     | TZ 35 | M8X1.25PX25L  | 3041(310)                   |
| TZ 20 | M5X0.8PX20L | 883(90)                     | TZ 45 | M8X1.25PX25L  | 11772(1200)                 |
| TZ 25 | M6X1PX20L   | 1373(140)                   | TZ 55 | M12X1.75PX35L | 15696(1600)                 |
| TZ 30 | M6X1PX20L   | 3041(310)                   | TZ 65 | M12X1.75PX35L | 19620(2000)                 |

Note: 1kgf=9.81N

## 4.12 Standard and maximum lengths of Rail

IMTEK has stocks of standard lengths of rails to meet customer needs. If the customer orders non-standard length rails, the dimension of the end face distance E should not be greater than 1/2P to prevent the instability of the rear end of the rail assembly due to the excessive size of E, and reduce the accuracy of the linear guide.



$$L=(n-1) \times P+2 E$$

L: Total length of slide rail (mm)

n: Number of bolt holes

P: Distance between bolt holes (mm)

E: Distance from bolt hole to end face (mm)

Table 2.93 Rail length

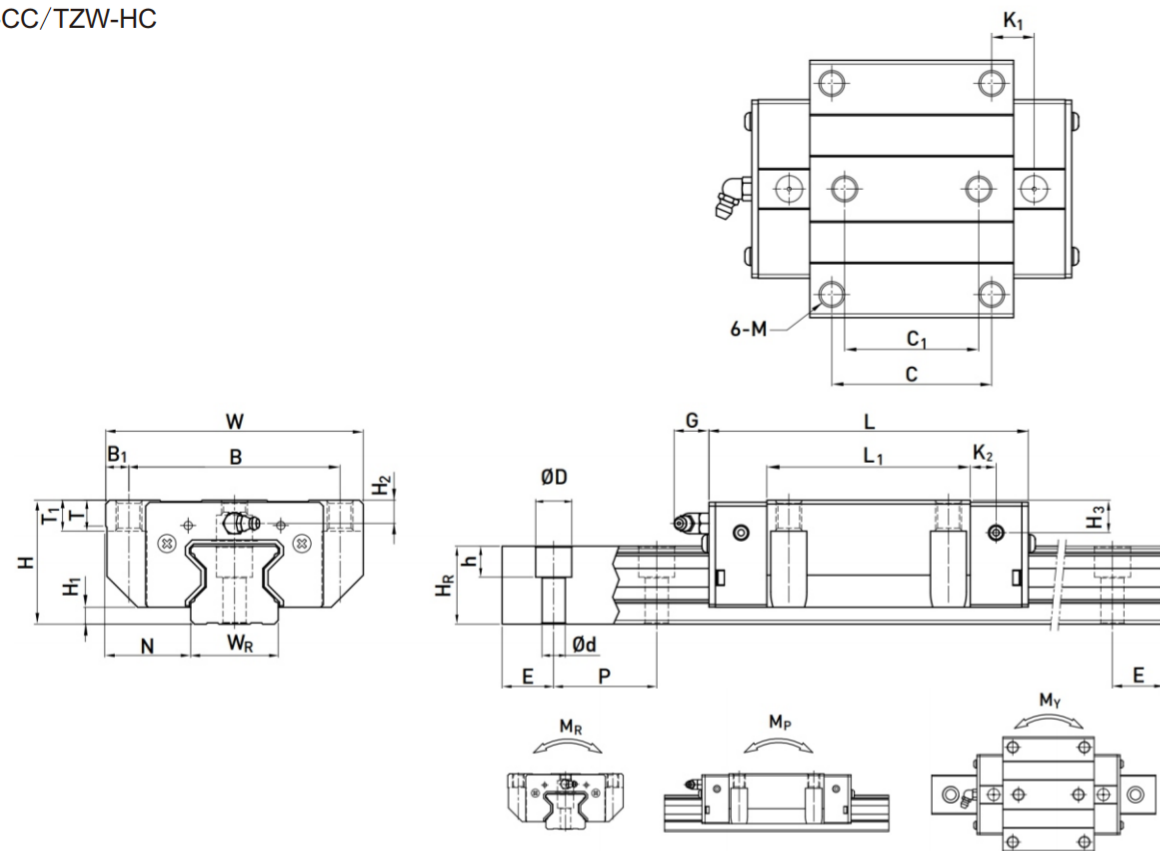
| Item                                 | TZ15      | TZ20      | TZ25      | TZ30      | TZ35      | TZ45       | TZ55     | TZ65     |
|--------------------------------------|-----------|-----------|-----------|-----------|-----------|------------|----------|----------|
| Standard length(n)                   | 160(5)    | 220(7)    | 220(7)    | 280(7)    | 280(7)    | 570(11)    | 780(13)  | 1270(17) |
|                                      | 220(7)    | 280(9)    | 280(9)    | 440(11)   | 440(11)   | 885(17)    | 1020(17) | 1570(21) |
|                                      | 340(11)   | 340(11)   | 340(11)   | 600(15)   | 600(15)   | 1200(23)   | 1260(21) | 2020(27) |
|                                      | 460(15)   | 460(15)   | 460(15)   | 760(19)   | 760(19)   | 1620(31)   | 1500(25) | 2620(35) |
|                                      | 580(19)   | 640(21)   | 640(21)   | 1000(25)  | 1000(25)  | 2040(39)   | 1980(33) | -        |
|                                      | 700(23)   | 820(27)   | 820(27)   | 1640(41)  | 1640(41)  | 2460(47)   | 2580(43) | -        |
|                                      | 940(31)   | 1000(33)  | 1000(33)  | 2040(51)  | 2040(51)  | 2985(57)   | 2940(49) | -        |
|                                      | 1120(37)  | 1180(39)  | 1240(41)  | 2520(63)  | 2520(63)  | 3090(59)   | 3060(51) | -        |
|                                      | 1360(45)  | 1360(45)  | 1600(53)  | 3000(75)  | 3000(75)  | -          | -        | -        |
| Spacing (P)                          | 30        | 30        | 30        | 40        | 40        | 52.5       | 60       | 75       |
| Standard end distance (E)            | 20        | 20        | 20        | 20        | 20        | 22.5       | 30       | 35       |
| Standard end distance maximum length | 4000(133) | 4000(133) | 4000(133) | 4000(100) | 4000(100) | 3982.5(76) | 3960(66) | 3970(53) |
| maximum length                       | 4000      | 4000      | 4000      | 4000      | 4000      | 4000       | 4000     | 4000     |

Note:

- In general, the dimension tolerance of E is 0.5~0.5 mm, and the dimension error tolerance of the end distance E of the rail connection piece is 0~0.3 mm.
- The maximum length of the standard end distance refers to the maximum length of the rail where the left and right end distances are both standard end distances.
- If customers need different E size, please contact us.
- Unit: mm



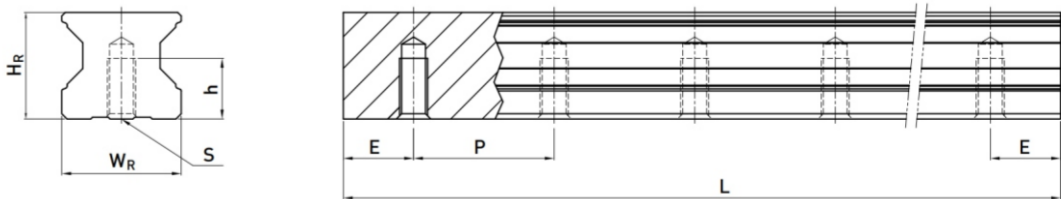
(3) TZW-CC/TZW-HC



| Spec.    | Dimension of Assembly (mm) |     |      | Dimension of Block (mm) |     |                |     |                |                |       |                |                |      |     |     |                |                |                |                | Dimension of Rail (mm) |     |     |     |      |      |        |       |                     |                     | Mounting Bolt for rail | Basic Dynamic Load Rating | Basic Static Load Rating | Static Rated Moment |  |  | Weight |  |
|----------|----------------------------|-----|------|-------------------------|-----|----------------|-----|----------------|----------------|-------|----------------|----------------|------|-----|-----|----------------|----------------|----------------|----------------|------------------------|-----|-----|-----|------|------|--------|-------|---------------------|---------------------|------------------------|---------------------------|--------------------------|---------------------|--|--|--------|--|
|          |                            |     |      | W                       | B   | B <sub>1</sub> | C   | C <sub>1</sub> | L <sub>1</sub> | L     | K <sub>1</sub> | K <sub>2</sub> | G    | M   | T   | T <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub>         | D   | h   | d   | p    | E    | (mm)   | C(KN) | C <sub>0</sub> (KN) | M <sub>R</sub> kN-m |                        |                           |                          |                     |  |  |        |  |
| TZW 15CA | 24                         | 4   | 16   | 47                      | 38  | 4.5            | 30  | 26             | 45             | 68    | 11.4           | 4.7            | 5.3  | M5  | 6   | 6.95           | 3.6            | 6.1            | 15             | 16.5                   | 7.5 | 5.7 | 4.5 | 30   | 20   | M4x16  | 11.3  | 24                  | 0.311               | 0.173                  | 0.173                     | 0.22                     | 1.8                 |  |  |        |  |
| TZW 20CA | 30                         | 5   | 21.5 | 63                      | 53  | 5              | 40  | 35             | 57.5           | 86    | 13.8           | 6              | 5.3  | M6  | 8   | 10             | 4.3            | 4.3            | 20             | 21                     | 9.5 | 8.5 | 6   | 30   | 20   | M5x20  | 21.3  | 46.7                | 0.647               | 0.46                   | 0.46                      | 0.47                     | 2.76                |  |  |        |  |
| TZW 20HA |                            |     |      |                         |     |                |     |                | 77.5           | 106   | 23.8           |                |      |     |     |                |                |                |                |                        |     |     |     |      |      |        | 26.9  | 63                  | 0.872               | 0.837                  | 0.837                     | 0.63                     |                     |  |  |        |  |
| TZW 25CA | 36                         | 5.5 | 23.5 | 70                      | 57  | 6.5            | 45  | 40             | 64.5           | 97.9  | 15.75          | 7.25           | 12   | M8  | 9.5 | 10             | 6.2            | 6              | 23             | 23.6                   | 11  | 9   | 7   | 30   | 20   | M6x20  | 27.7  | 57.1                | 0.758               | 0.605                  | 0.605                     | 0.72                     | 3.08                |  |  |        |  |
| TZW 25HA |                            |     |      |                         |     |                |     |                | 81             | 114.4 | 24             |                |      |     |     |                |                |                |                |                        |     |     |     |      |      |        | 33.9  | 73.4                | 0.975               | 0.991                  | 0.991                     | 0.91                     |                     |  |  |        |  |
| TZW 30CA | 42                         | 6   | 31   | 90                      | 72  | 9              | 52  | 44             | 71             | 109.8 | 17.5           | 8              | 12   | M10 | 9.5 | 10             | 6.5            | 7.3            | 28             | 28                     | 14  | 12  | 9   | 40   | 20   | M8x25  | 39.1  | 82.1                | 1.445               | 1.06                   | 1.06                      | 1.16                     | 4.41                |  |  |        |  |
| TZW 30HA |                            |     |      |                         |     |                |     |                | 93             | 131.8 | 28.5           |                |      |     |     |                |                |                |                |                        |     |     |     |      |      |        | 48.1  | 105                 | 1.846               | 1.712                  | 1.712                     | 1.52                     |                     |  |  |        |  |
| TZW 35CA | 48                         | 6.5 | 33   | 100                     | 82  | 9              | 62  | 52             | 79             | 124   | 16.5           | 10             | 12   | M10 | 12  | 13             | 9              | 12.6           | 34             | 30.2                   | 14  | 12  | 9   | 40   | 20   | M8x25  | 57.9  | 105.2               | 2.17                | 1.44                   | 1.44                      | 1.75                     | 6.06                |  |  |        |  |
| TZW 35HA |                            |     |      |                         |     |                |     |                | 106.5          | 151.5 | 30.25          |                |      |     |     |                |                |                |                |                        |     |     |     |      |      |        | 73.1  | 142                 | 2.93                | 2.6                    | 2.6                       | 2.40                     |                     |  |  |        |  |
| TZW 45CA | 60                         | 8   | 37.5 | 120                     | 100 | 10             | 80  | 62             | 106            | 153.2 | 21             | 10             | 12.9 | M12 | 14  | 15             | 10             | 14             | 45             | 38                     | 20  | 17  | 14  | 52.5 | 22.5 | M12x35 | 92.6  | 178.8               | 4.52                | 3.05                   | 3.05                      | 3.43                     | 9.97                |  |  |        |  |
| TZW 45HA |                            |     |      |                         |     |                |     |                | 139.8          | 187   | 37.9           |                |      |     |     |                |                |                |                |                        |     |     |     |      |      |        | 116   | 230.9               | 6.33                | 5.47                   | 5.47                      | 4.57                     |                     |  |  |        |  |
| TZW 55CA | 70                         | 10  | 43.5 | 140                     | 116 | 12             | 95  | 70             | 125.5          | 183.7 | 27.75          | 12.5           | 12.9 | M14 | 16  | 17             | 12             | 17.5           | 53             | 44                     | 23  | 20  | 16  | 60   | 30   | M14x45 | 130.5 | 252                 | 8.01                | 5.4                    | 5.4                       | 5.43                     | 13.98               |  |  |        |  |
| TZW 55HA |                            |     |      |                         |     |                |     |                | 173.8          | 232   | 51.9           |                |      |     |     |                |                |                |                |                        |     |     |     |      |      |        | 167.8 | 348                 | 11.15               | 10.25                  | 10.25                     | 7.61                     |                     |  |  |        |  |
| TZW 65CA | 90                         | 12  | 53.5 | 170                     | 142 | 14             | 110 | 82             | 160            | 232   | 40.8           | 15.8           | 12.9 | M16 | 22  | 23             | 15             | 15             | 63             | 53                     | 26  | 22  | 18  | 75   | 35   | M16x50 | 213   | 411.6               | 16.20               | 11.59                  | 11.59                     | 11.63                    | 20.22               |  |  |        |  |
| TZW 65HA |                            |     |      |                         |     |                |     |                | 223            | 295   | 72.3           |                |      |     |     |                |                |                |                |                        |     |     |     |      |      |        | 275.3 | 572.7               | 22.55               | 22.17                  | 22.17                     | 16.58                    |                     |  |  |        |  |

Note: 1kgf=9.81N

(4) Dimension for TZR-T



| Spec.  | Dimension of Rail (mm) |                |           |    |      |      | Weight (kg/m) |
|--------|------------------------|----------------|-----------|----|------|------|---------------|
|        | W <sub>R</sub>         | H <sub>R</sub> | S         | h  | P    | E    |               |
| TZR15T | 15                     | 16.5           | M5×0.8P   | 8  | 30   | 20   | 1.86          |
| TZR20T | 20                     | 21             | M6×1P     | 10 | 30   | 20   | 2.76          |
| TZR25T | 23                     | 23.6           | M6×1P     | 12 | 30   | 20   | 3.36          |
| TZR30T | 28                     | 28             | M8×1.25P  | 15 | 40   | 20   | 4.82          |
| TZR35T | 34                     | 30.2           | M8×1.25P  | 17 | 40   | 20   | 6.48          |
| TZR45T | 45                     | 38             | M12×1.75P | 24 | 52.5 | 22.5 | 10.83         |
| TZR55T | 53                     | 44             | M14×2P    | 24 | 60   | 30   | 15.15         |
| TZR65T | 63                     | 53             | M20×2.5P  | 30 | 75   | 35   | 21.24         |