

Maintenance Free

IKO C-Sleeve Linear Way

ML
ME
MH
MUL



*C-Sleeve Linear Way
Maintenance free for 20,000 km or 5 years.
Interchangeable spec. is newly added.*

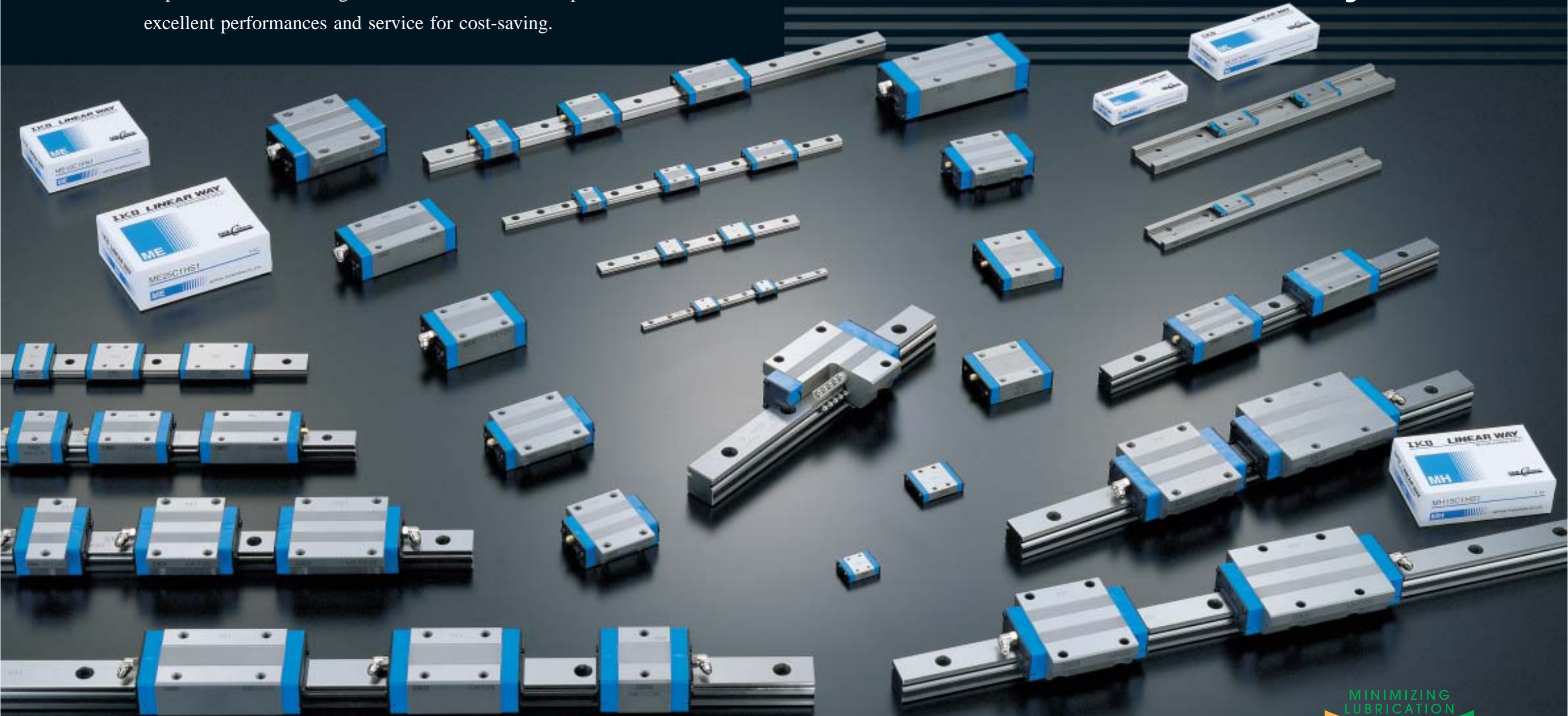
CAT-57139



We aim to be a Technology-Developing company taking customer-need as primary source for the development. With our original technologies and creativities, our function and performance differ us from the others. We develop and implement new and high technical skills, which pursue excellent performances and service for cost-saving.



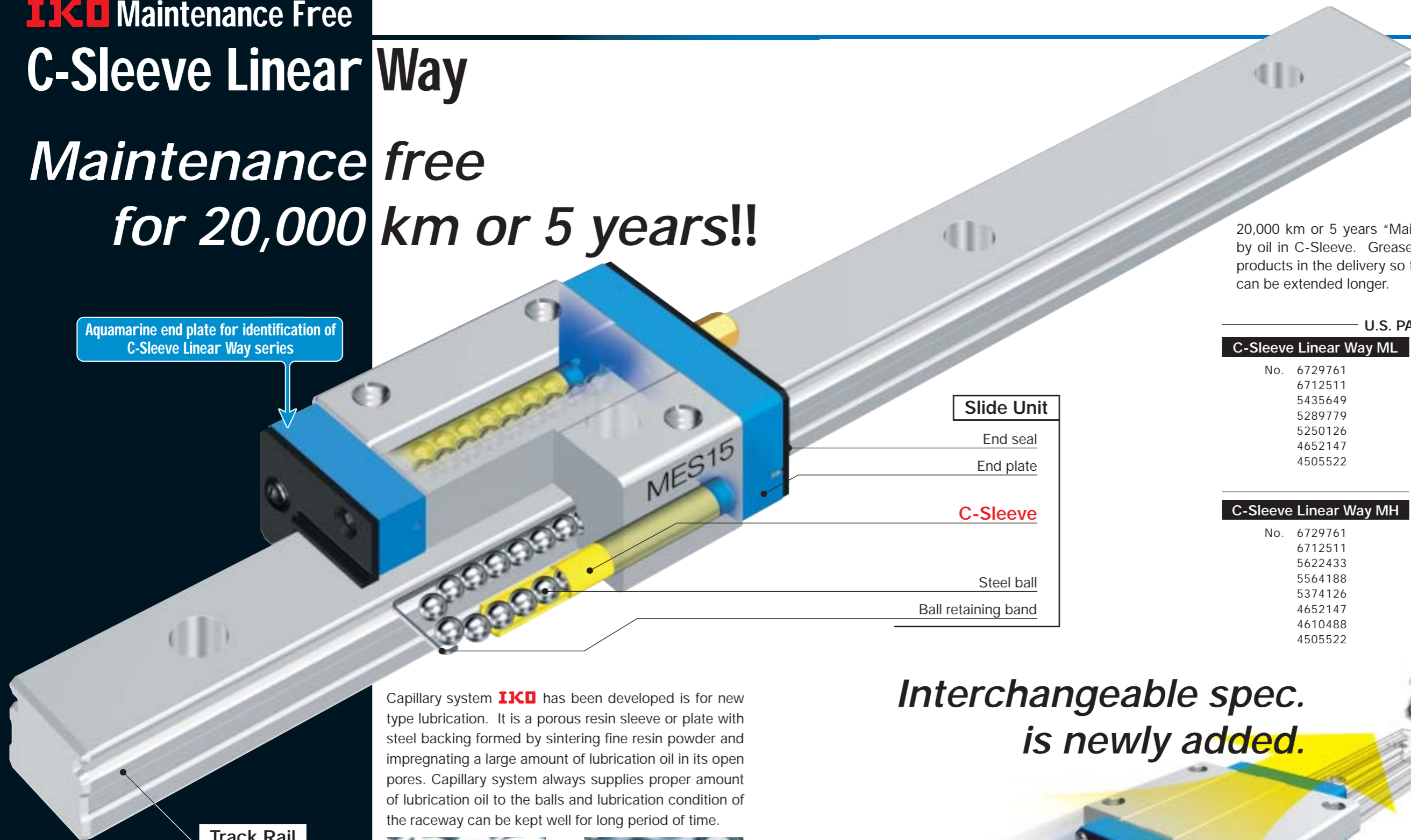
Maintenance Free & Interchangeable C-Sleeve Linear Way



IKO Maintenance Free C-Sleeve Linear Way

Maintenance free for 20,000 km or 5 years!!

Aquamarine end plate for identification of C-Sleeve Linear Way series



20,000 km or 5 years "Maintenance free" can be realized by oil in C-Sleeve. Grease is pre-packed in the standard products in the delivery so that actual maintenance interval can be extended longer.

U.S. PATENTED

C-Sleeve Linear Way ML		C-Sleeve Linear Way ME	
No.	6729761	No.	6729761
	6712511		6712511
	5435649		5564188
	5289779		5374126
	5250126		5356223
	4652147		5324116
	4505522		4652147
			4505522

C-Sleeve Linear Way MH		C-Sleeve Linear Way MUL	
No.	6729761	No.	6729761
	6712511		6712511
	5622433		6309107
	5564188		5435649
	5374126		5289779
	4652147		5250126
	4610488		4652147
	4505522		4505522

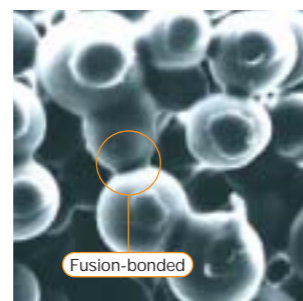
Interchangeable spec. is newly added.



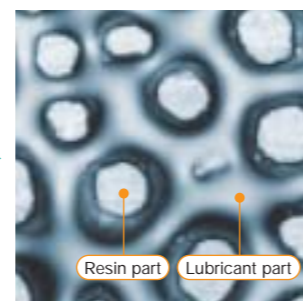
Interchangeable is newly available;

C-sleeve slide units can be supplied separately, and can be matched, replaced and added freely to the interchangeable track rail. This series will be useful in machine design, facilitating standardization of product specification and a quick change of specification.

Capillary system **IKO** has been developed is for new type lubrication. It is a porous resin sleeve or plate with steel backing formed by sintering fine resin powder and impregnating a large amount of lubrication oil in its open pores. Capillary system always supplies proper amount of lubrication oil to the balls and lubrication condition of the raceway can be kept well for long period of time.



Before impregnating oil
Resin particles are strongly fusion-bonded.



After impregnating oil
(Capillary lubrication structure)
Lubricant is retained in cavities amongst resin particles.

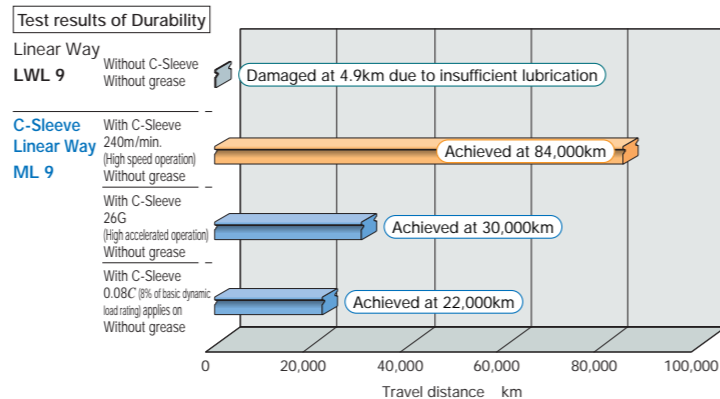


Features of C-sleeve Linear Way 1 ~ Four technical advantages ~

Maintenance free for saving-resources

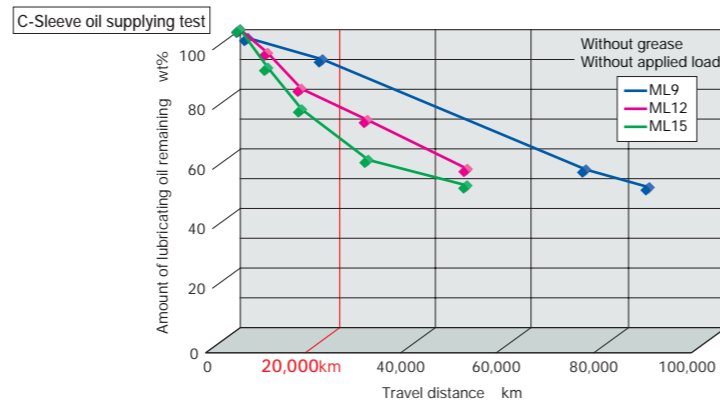
Maintenance free has the ability to maintain lubrication for a long time, reducing the amount of labor required for troublesome lubrication maintenance. The capillary lubrication body continuously supply lubricant for long period of time even after original grease inside is completely exhausted.

This durability test has been simulated for general machine purpose. Re-lubrication is necessary if operating condition is extremely severe.



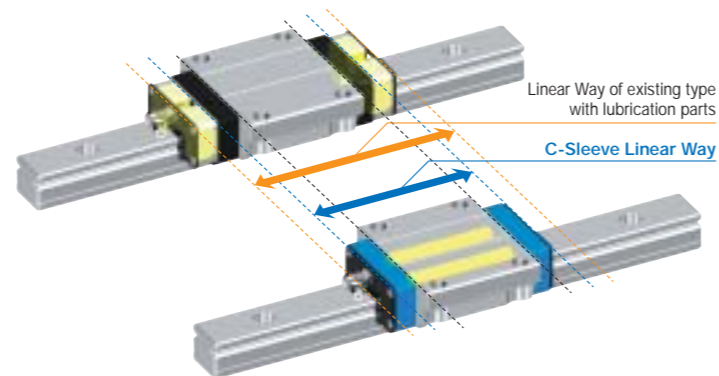
Ecology contributes to the global environment by conserving oil

To accomplish this, C-Sleeve applies only the minimal amount of lubricant required to properly lubricate the rolling parts. Since the oil consumption is small, C-Sleeve is able to maintain proper lubrication even in long-term operation.



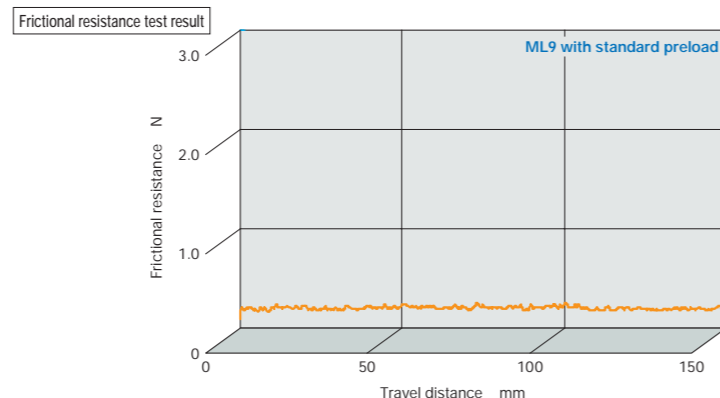
Compact design for miniaturization

Incorporating C-Sleeve in the Linear Way provides a lightweight and compact size. C-Sleeve Linear Way having no external parts can be replaced from standard Linear Way without changing the external dimensions and it does not sacrifice the allowable stroke length.



Smooth and light operation

C-Sleeve is not in contact with the track rail. This permits smooth and light unit motion without increasing the rolling resistance. The power loss of a driving device can be minimized. Compatibility of quick response is superior and it contributes accuracy improvement and saving drive energy.

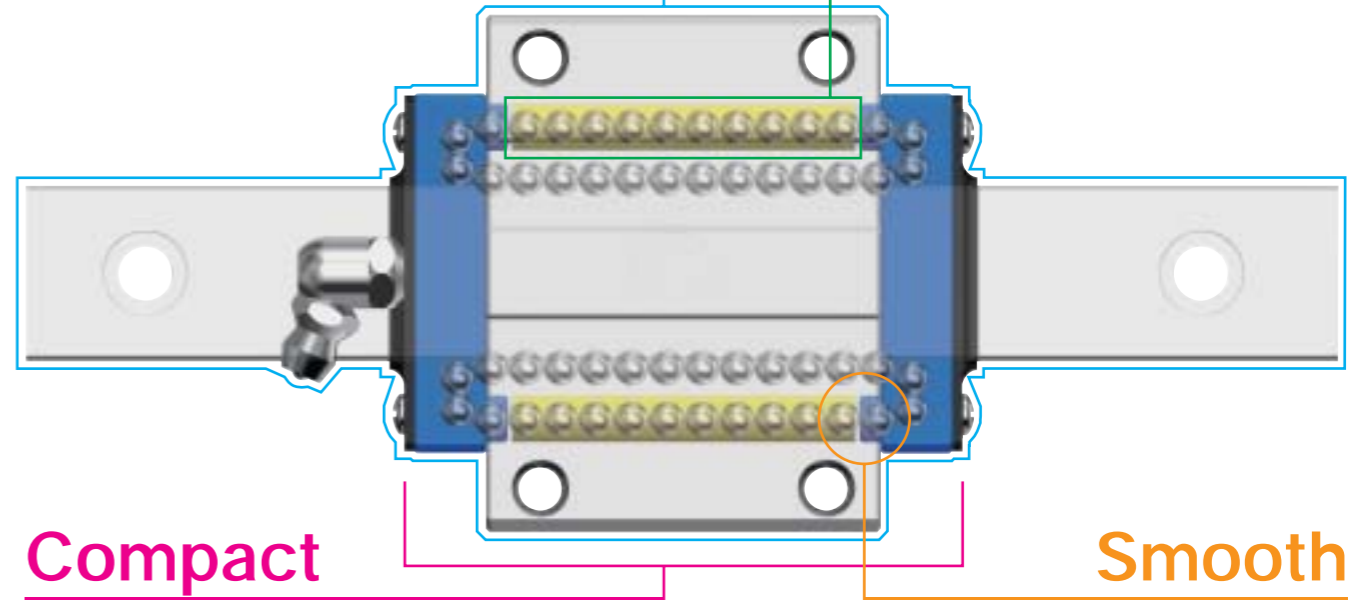


Maintenance Free

Ability of lubrication is maintained for long term, the cost of lubrication management and systems can be reduced.

Ecology

C-Sleeve contributes to global environment protection because the amount of lubricant can be minimized.



Compact

No increase in carriage length unlike a bolt-on external lubrication parts.
No loss of available stroke length when replacing standard units.

Smooth

Light and smooth running is achieved by the improvement of design. It is designed not to have direct contact to track rail and this has brought a very smooth friction.

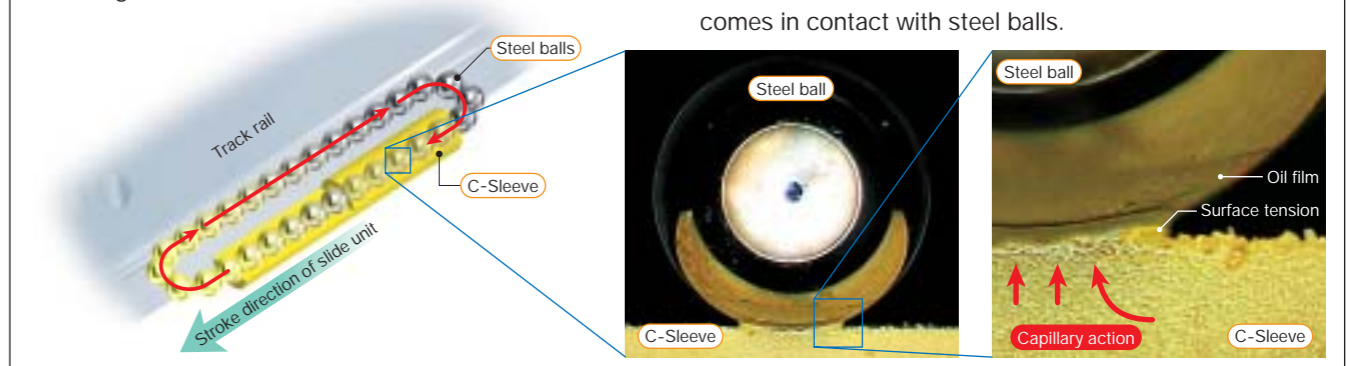
Lubricant supply mechanism of C-sleeve system

The circulation of the steel balls distributes lubricant.

Lubricant is supplied directly to the steel balls. As the steel balls circulate, the lubricant is distributed to the loading area along the track rail. This results in adequate lubrication being properly maintained in the loading area for a long time.

Lubricant is deposited directly to the surface of the steel balls.

The surface of C-Sleeve is always covered with the lubricant. Lubricant is continuously supplied to the surface of steel ball by surface tension in the contact of C-Sleeve surface and steel balls. New oil permeates automatically from the core of C-Sleeve to the internal surface that comes in contact with steel balls.



Features of C-sleeve Linear Way ② ~ Interchangeable ~

Interchangeable specification is newly available.

- 1 The slide unit and track rail can be ordered separately and can be assembled to make a set as required.
- 2 High level of flexibility as combination of any kinds of shape of the unit, accuracy classes and preload classes can be realized.
- 3 Slide units and track rails can be selected separately and it promises short delivery time when required.



The interchangeable specification is produced by **IKO** original precision manufacturing technology and the dimensional accuracy of both slide unit and track rail is strictly controlled to achieve the interchangeability of higher standard.

Requirements of ;

- Extending machine life and increase rigidity
- Improving machine accuracy
- Replace only the slide unit
- Increase number of slide unit
- Replace the track rail
- Extend length of the track rail
- Stock slide unit only as spare

Help

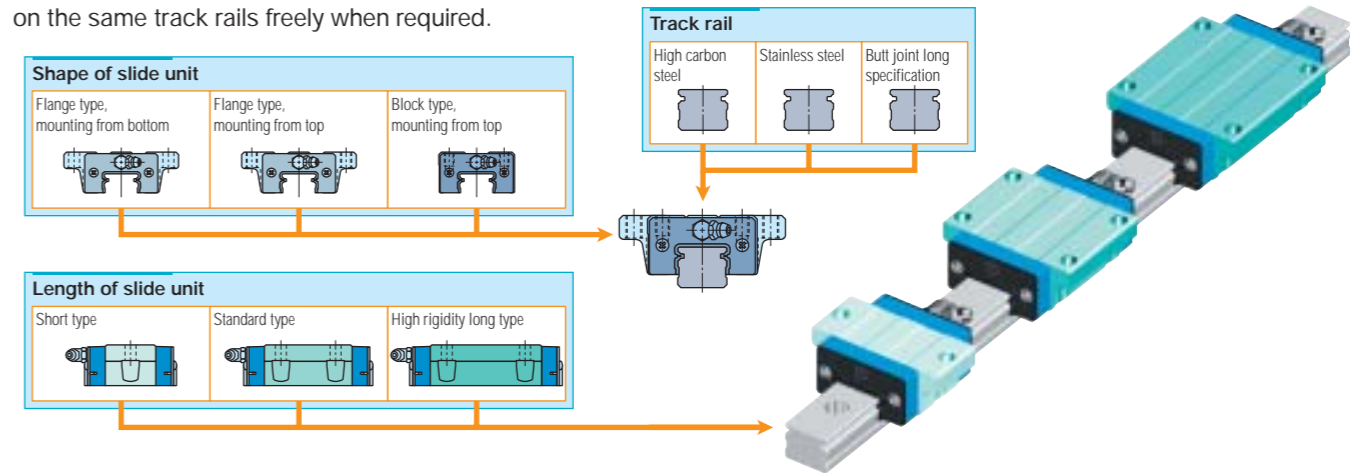
Interchangeable specification realizes ;

- Quick design change is possible.
- Giving higher accuracy and changing preload class are possible.
- Slide unit and track rail can be assembled to other mechanical part individually.
- Any shape, accuracy and preload class of slide unit and track rail can be assembled.
- Slide unit and track rail can be stocked separately and it contributes minimum storage space.

O.K.

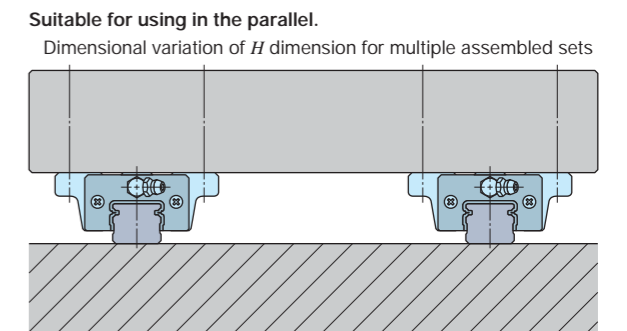
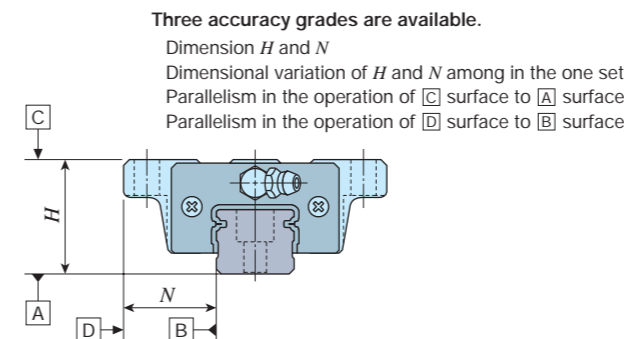
Interchangeability among types of slide unit

Various types of slide units with different sectional shapes and length are prepared. These entire slide units can be mounted on the same track rails freely when required.



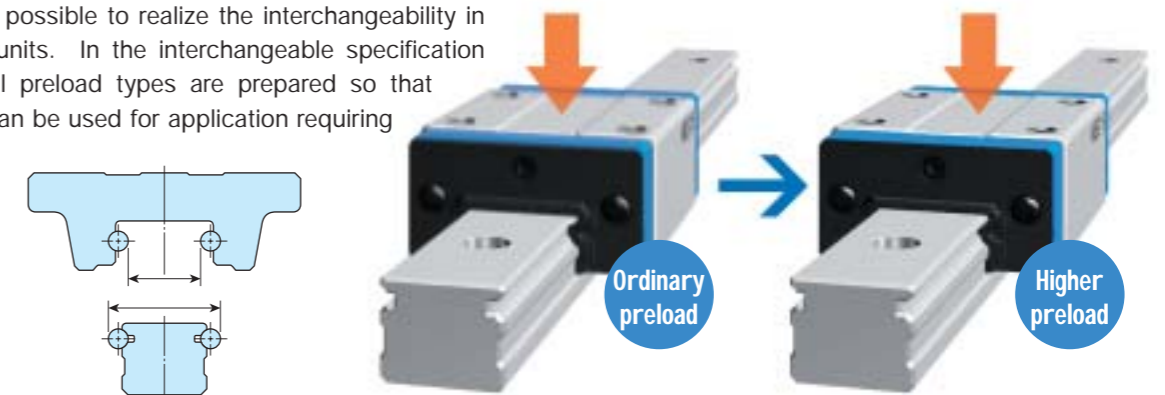
Interchangeability in accuracy class

Two accuracy classes, High and Precision class are prepared and they can be used for application requiring high running accuracy. Furthermore, height variation among multiple sets is also controlled as well with high level of accuracy, ensuring that these products can be used for parallel track rail arrangement requires the degree of level strictly.



Interchangeability in preload classes

High accuracy dimensional control owing to a simple structure has made it possible to realize the interchangeability in preloaded slide units. In the interchangeable specification products, several preload types are prepared so that these products can be used for application requiring increase rigidity.



Features of C-sleeve Linear Way ③ ~ Wide variation ~

C-Sleeve Linear Way

ML

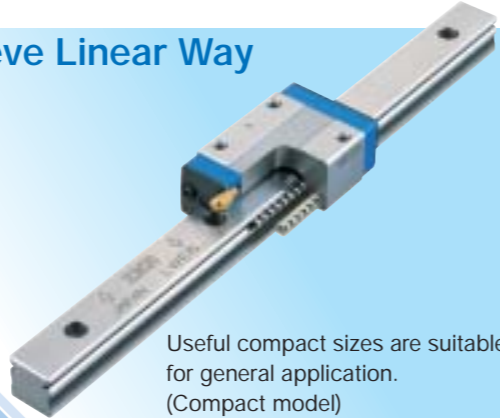
Miniature type Linear Way from the smallest 5mm of track rail width. (Miniature size)



C-Sleeve Linear Way

ME

Useful compact sizes are suitable for general application. (Compact model)

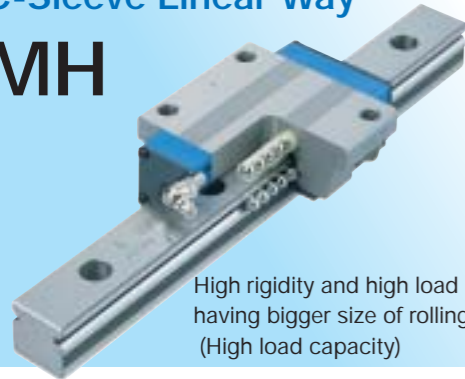


Wide variation of IKO C-Sleeve Linear Way series

C-Sleeve Linear Way

MH

High rigidity and high load capacity model having bigger size of rolling element. (High load capacity)



C-Sleeve Linear Way

MUL

High rigidity U-shaped track rail can be used as structural member of the machine. (High rigidity track rail)



Variation of IKO C-Sleeve Linear Way

Series	Shape of slide unit	Length of slide unit	Model code	Size
C-Sleeve Linear Way ML	Standard type	Short	MLC	5 7 9 12 15 20 25
		Standard	ML	5 7 9 12 15 20 25
		High rigidity long	MLG	- 7 9 12 15 20 25
	Wide type	Short	MLFC	10 14 18 24 30 42
		Standard	MLF	10 14 18 24 30 42
		High rigidity long	MLFG	- 14 18 24 30 42
C-Sleeve Linear Way ME	Flange type, mounting from bottom	Short	MEC	15 20 25
		Standard	ME	15 20 25
		High rigidity long	MEG	15 20 25
	Flange type, mounting from top	Short	METC	15 20 25
		Standard	MET	15 20 25
		High rigidity long	METG	15 20 25
	Block type, mounting from top	Short	MESC	15 20 25
		Standard	MES	15 20 25
		High rigidity long	MESG	15 20 25
C-Sleeve Linear Way MH	Flange type, mounting from bottom	Standard	MH	15 20 25
		High rigidity long	MHG	- 20 25
	Flange type, mounting from top	Standard	MHT	15 20 25
		High rigidity long	MHTG	- 20 25
	Block type, mounting from top	Standard	MHD	15 - 25
		High rigidity long	MHDG	- - 25
	Compact block type, mounting from top	Standard	MHS	15 20 25
		High rigidity long	MHSG	- 20 25
C-Sleeve Linear Way MUL		Standard	MUL	25 30

Identification number

The specification of C-Sleeve Linear Way is identified by the identification number, which consists of a model code, a size, a part code, a preload symbol, a classification symbol, interchangeable code and special supplemental codes.

Example of identification number

Interchangeable specification

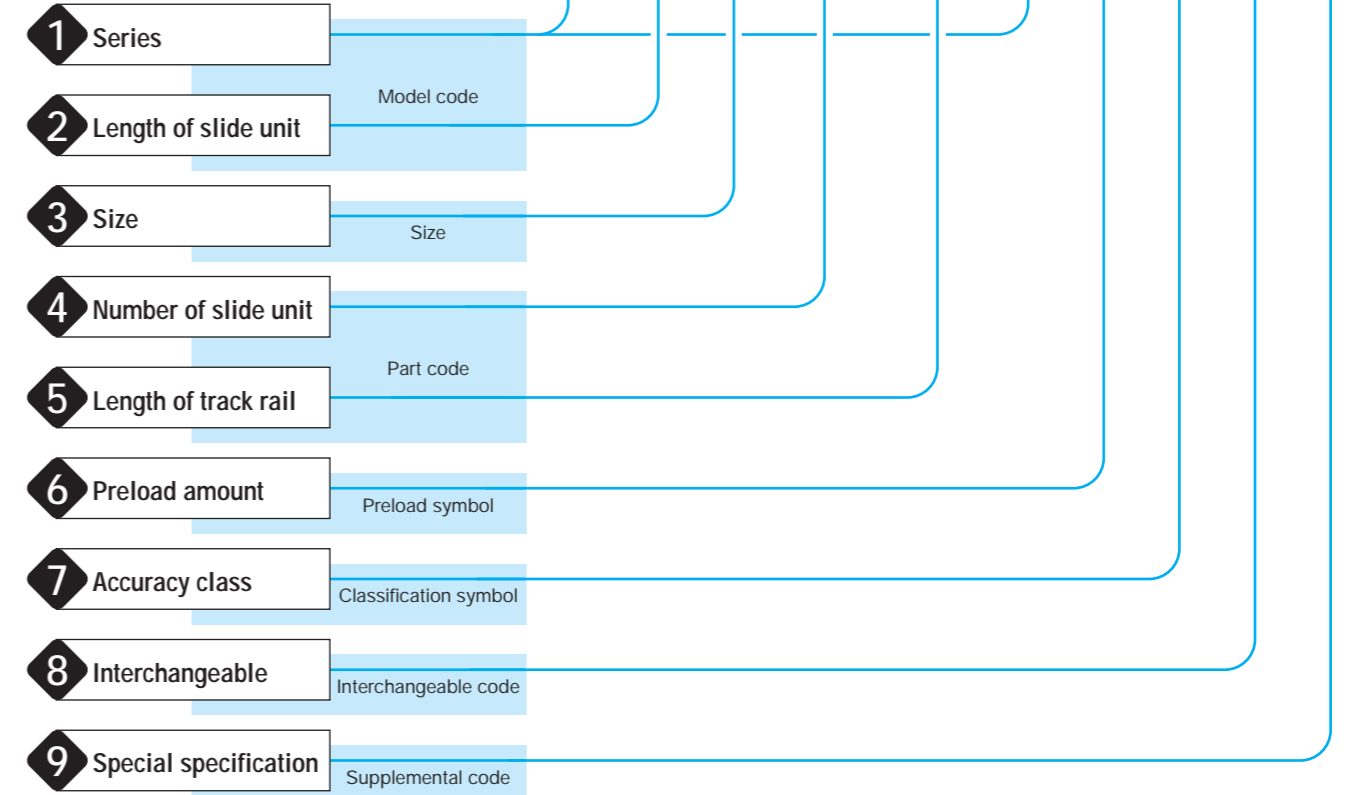
Slide unit only ML C 12 C1 T₁ P S2 /U

Track rail only ⁽¹⁾ LWL 12 R200 B P S2

Set product ML C 12 C2 R200 T₁ P S2 /U

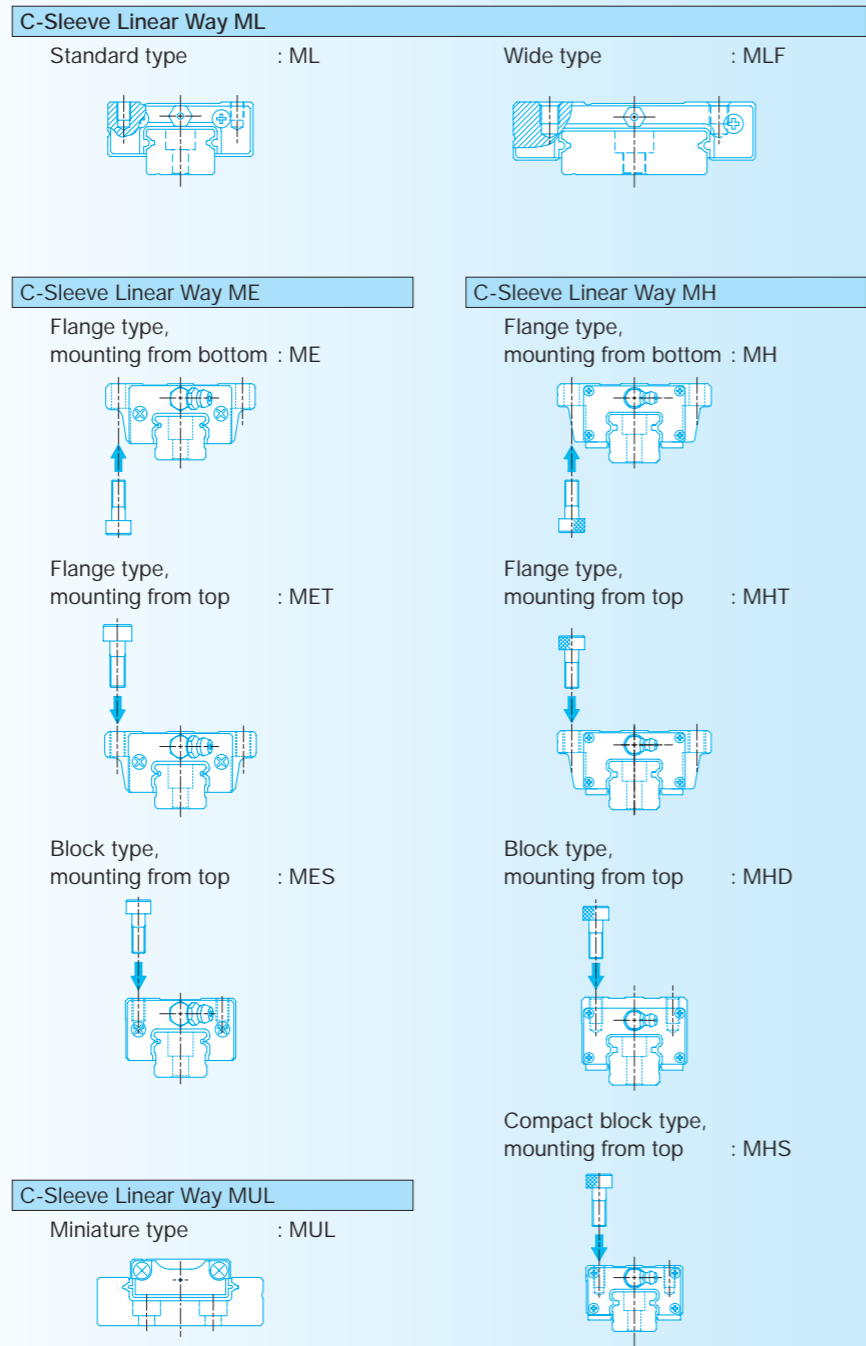
Non-interchangeable specification

Set product ML C 12 C2 R200 T₁ P /U



Note ⁽¹⁾: In case ordering track rail only, model code is changed as shown below.
 Track rail of interchangeable ML → Model code LWL-B (Ex: LWL9R160BPS2)
 Track rail of interchangeable MLF → Model code LWLF-B (Ex: LWLF42R320BPS2)
 Track rail of interchangeable ME → Model code LWE (Ex: LWE20R820PS2)
 Track rail of interchangeable MH → Model code LWH (Ex: LWH25R480BPS2)

1 Series



Applicable types and size are shown in Table 1.1 to 1.4 on the next page.

2 Length of slide unit

Short : C (Ex: MLC15C1S2)
 Standard : No symbol
 High rigidity long : G (Ex: MHG25C2R840H)

3 Size

Applicable types and size are shown in Table 1.1 to 1.4 on the next page.

Table 1.1 Type and size of C-Sleeve Linear Way ML

Body material	Shape of the slide unit	Length of the slide unit	Mode code	Size						
				5	7	9	12	15	20	25
Stainless steel	Standard type	Short	MLC							
		Standard	ML							
		High rigidity long	MLG	-						
	Wide type	Short	MLFC							
		Standard	MLF							
		High rigidity long	MLFG	-						

Table 1.2 Type and size of C-Sleeve Linear Way ME

Body material	Shape of the slide unit	Length of the slide unit	Mode code	15	20	25
Carbon steel	Flange type, mounting from bottom	Short	MEC			
		Standard	ME			
		High rigidity long	MEG			
	Flange type, mounting from top	Short	METC			
		Standard	MET			
		High rigidity long	METG			
	Block type, mounting from top	Short	MESC			
		Standard	MES			
		High rigidity long	MESG			

Table 1.3 Type and size of C-Sleeve Linear Way MH

Body material	Shape of the slide unit	Length of the slide unit	Mode code	15	20	25
Carbon steel	Flange type, mounting from bottom	Standard	MH			
		High rigidity long	MHG	-		
	Flange type, mounting from top	Standard	MHT			
		High rigidity long	MHTG	-		
	Block type, mounting from top	Standard	MHD		-	
		High rigidity long	MHDG	-	-	
	Compact block type, mounting from top	Standard	MHS			
		High rigidity long	MHSG	-		

Table 1.4 Type and size of C-Sleeve Linear Way MUL

Body material	Shape of the slide unit	Length of the slide unit	Mode code	25	30
Stainless steel	Miniature type	Standard	MUL		

Interchangeable model is not available in MUL series.

Identification number

4 Number of slide unit	Set product (with track rail) : C Slide unit only (Interchangeable series) : C1 Track rail only : No symbol	(Ex : ME15C2R220) (Ex : ME15C1S2)	For an assembled set, indicate the number of slide units assembled on one track rail. For an interchangeable slide unit only, "C1" can be indicated.
5 Length of track rail	Set product (with slide unit) : R Slide unit only : No symbol Track rail only (Interchangeable series) : R	(Ex:ME15C2R220) (Ex:LWE15R220S2)	Indicate the length of track rail in mm. For standard and maximum lengths, see "Track rail length" in Table 26.1 to 26.5 on page 30 to 32.
6 Preload amount	Clearance for ML : T ₀ Clearance for ME : T _c Standard : No symbol Light preload : T ₁ Medium preload : T ₂ Heavy preload : T ₃		Specify this items for an assembled set or an interchangeable single slide unit. Applicable preload and size are shown in Table 2. For details of preload amount, see table 12 on page 19.
7 Accuracy class	Ordinary class : No symbol High class : H Precision class : P Super precision class : SP		For applicable accuracy, see Table 3. In the interchangeable specification, please combine same accuracy codes on both slide unit and track rail. For details of accuracy, see table 11.1 to 11.3 on page 18 to 19.

Table 2 Preload of C-Sleeve Linear Way

Series	Preload class and symbol					
	Clearance for ME (T _c)	Clearance for ML (T ₀)	Standard (No symbol)	Light preload (T ₁)	Medium preload (T ₂)	Heavy preload (T ₃)
C-Sleeve Linear Way ML	-	-	-	(¹)	-	-
C-Sleeve Linear Way ME (²)	-	-	-	-	-	-
C-Sleeve Linear Way MH	-	-	-	-	-	-
C-Sleeve Linear Way MUL	-	-	-	-	-	-

Note (¹): Not applicable to size 5 and 10.
Note (²): In ME series, applicable combination of the preload and accuracy is limited and shown in Table 4.

Remark : marks are also applicable for interchangeable series.

Table 3 Accuracy of C-Sleeve Linear Way

Series	Accuracy class and symbol			
	Ordinary class (No symbol)	High class (H)	Precision class (P)	Super precision class (SP)
C-Sleeve Linear Way ML	-	-	-	-
C-Sleeve Linear Way ME (¹)	-	-	-	-
C-Sleeve Linear Way MH	-	-	-	-
C-Sleeve Linear Way MUL	-	-	-	-

Note (¹): In ME series, applicable combination of the preload and accuracy is limited and shown in Table 4.

Remark : marks are also applicable for interchangeable series.

Table 4 C-Sleeve Linear Way ME Combination of accuracy and preload

Preload class and symbol	Accuracy class and symbol	Ordinary class	High class	Precision class	Super precision class
		(No symbol)	(H)	(P)	(SP)
Clearance for ME (T _c)		-	-	-	-
Standard (No symbol)		-	-	-	-
Light preload (T ₁)		-	-	-	-
Middle preload (T ₂)		-	-	-	-

Remark : marks are also applicable for interchangeable series.

8 Interchangeable	Select group 1 : S1 Select group 2 : S2		Specify this item for the interchangeable specification products. Assemble track rails and slide units with the same interchangeable code. Performance and accuracy of both groups are the same.
--------------------------	--	--	--

9 Special specification		Applicable special specifications are shown in Table 5.1 to 5.4. When a combination of several special specifications (Table 6.1 to 6.4) is required, arrange their supplemental codes in alphabetical order. For detail of special specifications, see page 20 to 25.
--------------------------------	--	--

Table 5.1 C-Sleeve Linear Way ML Applicable special specifications

Specifications	Supplemental code	Interchangeable specification			Non-interchangeable specification
		Slide unit only	Track rail only	Set product	
Butt jointing track rail	/A	-	-	-	
Opposite reference surfaces arrangement	/D	-	-	-	
Specified rail mounting hole positions	/E	-	-	-	
Appending inspection sheet	/I	-	-	-	
Black chrome surface treatment	/LR	-	-	-	(¹)
Without track rail mounting bolts	/MN	-	-	-	
No rubber end seals	/N	-	-	-	
Track rail with stopper pins	/S	-	-	-	
Under seals	/U	(²)	-	(²)	(²)
Matched sets to be used as an assembled group	/W	-	-	-	

Note (¹): Not applicable to size 5 and 10.
Note (²): Not applicable to size 5, 7, 10 and 14.

Table 5.2 C-Sleeve Linear Way ME Applicable special specifications

Specifications	Supplemental code	Interchangeable specification			Non-interchangeable specification
		Slide unit only	Track rail only	Set product	
Butt jointing track rail	/A	-	-	-	
Opposite reference surfaces arrangement	/D	-	-	-	
Specified rail mounting hole positions	/E	-	-	-	
Caps for rail mounting holes	/F	-	-	-	
Append an inspection sheet	/I	-	-	-	
Female threads for bellows	/J	-	-	-	
Black chrome surface treatment	/L	-	-	-	
Fluoric black chrome surface treatment	/LF	-	-	-	
With track rail mounting bolts	/MA	-	-	-	
Change of mounting hole size	/M4	-	(¹)	(¹)	(¹)
No rubber end seals	/N	-	-	-	
Butt jointing interchangeable track rail	/T	-	-	-	-
Under seals	/U	-	-	-	
Double end seals	/V	-	-	-	
Matched sets to be used as an assembled group	/W	-	-	-	
Scrapers	/Z	-	-	-	

Note (¹): Applicable to size 15.

Table 5.3 C-Sleeve Linear Way MH Applicable special specifications

Specifications	Supplemental code	Interchangeable specification			Non-interchangeable specification
		Slide unit only	Track rail only	Set product	
Butt jointing track rail	/A	-	-	-	
Opposite reference surfaces arrangement	/D	-	-	-	
Specified rail mounting hole positions	/E	-	-	-	
Caps for rail mounting holes	/F	-	-	-	
Append an inspection sheet	/I	-	-	-	
Female threads for bellows	/J	-	-	-	
Black chrome surface treatment	/L	-	-	-	
Fluoric black chrome surface treatment	/LF	-	-	-	
With track rail mounting bolts (Applicable to set order)	/MA	-	-	-	
Without track rail mounting bolts (Applicable to track rail order)	/MN	-	-	-	
No rubber end seals	/N	-	-	-	
Rail cover plate	/PS	-	-	-	(¹)
Butt jointing interchangeable track rail	/T	-	-	-	-
Double end seals	/V	-	-	-	
Matched sets to be used as an assembled group	/W	-	-	-	
Scrapers	/Z	-	-	-	

Note (¹): Applicable to size 25.

Load factor

Actual loads applied to the linear motion rolling guide sometimes exceed the theoretically calculated load due to vibration and shocks caused by machine operation. The actual life is calculated from the following formula while considering the load factor.

Table 8 Load factor

Conditions	f_w
Smooth operation free from vibration and/or shocks	1 ~ 1.2
Normal operation	1.2 ~ 1.5
Operation with shock loads	1.5 ~ 3

Dynamic equivalent load

When there is any load in the direction other than basic dynamic load rating or combined load, dynamic equivalent load is obtained for life calculation.

From each directional load, converted load equal to downward or lateral is given by following formulae.

$$F_{re} = k_r |F_r| + \frac{C_0}{T_0} |M_0| + \frac{C_0}{T_X} |M_X| \dots \dots \dots (4)$$

$$F_{ae} = k_a |F_a| + \frac{C_0}{T_Y} |M_Y| \dots \dots \dots (5)$$

where, F_{re} : Converted downward load, N

F_{ae} : Converted lateral load, N

F_r : Downward load, N

F_a : Lateral load, N

M_0 : T_0 moment, N·m

M_X : T_X moment, N·m

M_Y : T_Y moment, N·m

k_r, k_a : Conversion factor by load direction (See Table 9)

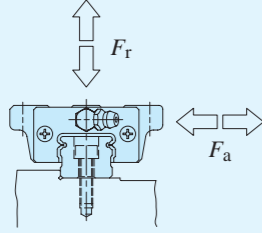
C_0 : Basic static load rating, N

T_0 : T_0 static moment, N·m

T_X : T_X static moment, N·m

T_Y : T_Y static moment, N·m

Table 9 Conversion factor by load direction



Series	Conversion factor		
	k_r		k_a
	$F_r \geq 0$	$F_r < 0$	
C-Sleeve Linear Way ML	1	1	1.19
C-Sleeve Linear Way ME	1	1	1
C-Sleeve Linear Way MH	1	1	1
C-Sleeve Linear Way MUL	1	1	1.19

From the converted downward and lateral load, mean equivalent dynamic load must be corrected by the following formula.

$$P = XF_{re} + YF_{ae} \dots \dots \dots (6)$$

where, P : Mean equivalent dynamic load, N

X, Y : Mean equivalent dynamic load factor (See Table 10)

F_{re} : Converted downward load, N

F_{ae} : Converted lateral load, N

Table 10 Mean equivalent dynamic load factor

Condition	X	Y
$ F_{re} \geq F_{ae} $	1	0.6
$ F_{re} < F_{ae} $	0.6	1

Static equivalent load

When there is any load in the direction other than basic dynamic load rating or combined load, mean equivalent static load is obtained for static safety factor calculation.

From each directional load, converted load equal to downward or lateral is given by following formula.

$$P_0 = k_r |F_r| + k_a |F_a| + \frac{C_0}{T_0} |M_0| + \frac{C_0}{T_X} |M_X| + \frac{C_0}{T_Y} |M_Y| \dots \dots \dots (7)$$

where, P_0 : Static equivalent load, N

F_r : Downward load, N

F_a : Lateral load, N

M_0 : T_0 moment, N·m

M_X : T_X moment, N·m

M_Y : T_Y moment, N·m

k_r, k_a : Conversion factor by load direction (See Table 9)

C_0 : Basic static load rating, N

T_0 : T_0 static moment, N·m

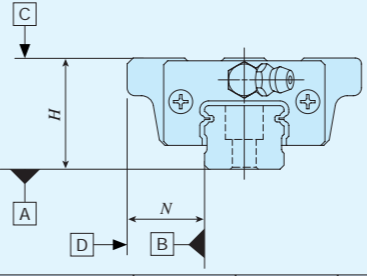
T_X : T_X static moment, N·m

T_Y : T_Y static moment, N·m

Accuracy

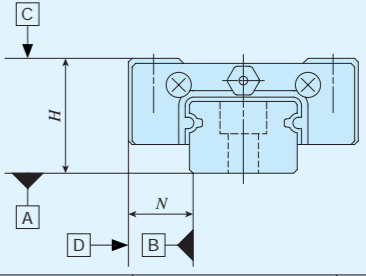
Accuracy for the assembled set of C-Sleeve Linear Way are shown in Table 11.1 to 11.3.

Table 11.1 Accuracy of C-Sleeve Linear Way ME and MH



Item	Classification (Symbol)	Ordinary	High	Precision	Super precision
		(No symbol)	(H)	(P)	(SP)
Dim. H Tolerance		± 0.080	± 0.040	± 0.020	± 0.010
Dim. N Tolerance		± 0.100	± 0.050	± 0.025	± 0.015
Dim. variation of $H^{(1)}$		0.025	0.015	0.007	0.005
Dim. variation of $N^{(1)}$		0.030	0.020	0.010	0.007
Dim. variation of $H^{(2)}$ for multiple sets		0.045	0.035	0.025	—
Parallelism in operation of C to A		Refer to Fig. 3.1			
Parallelism in operation of D to B		Refer to Fig. 3.1			

Table 11.2 Accuracy of C-Sleeve Linear Way ML



Item	Classification (Symbol)	High	Precision
		(H)	(P)
Dim. H Tolerance		± 0.020	± 0.010
Dim. N Tolerance		± 0.025	± 0.015
Dim. variation of $H^{(1)}$		0.015	0.007
Dim. variation of $N^{(1)}$		0.020	0.010
Dim. variation of $H^{(2)}$ for multiple sets		0.030	0.020
Parallelism in operation of C to A		Refer to Fig. 3.2	
Parallelism in operation of D to B		Refer to Fig. 3.2	

Note (1): Dimensional variation of dimension means the size variation between the slide units mounted on the same track rail when the dimension H is measured at the same measuring position of track rail.

(2) Applicable to interchangeable specification.

Remark 1: These values also apply to C-Sleeve Linear Way Interchangeable series that has opposite reference surface arrangements.

2: Dimensional variation of dimension H for multiple sets means the variation of dimension H among multiple sets of arbitrarily chosen slide unit and track rail of C-Sleeve Linear Way Interchangeable series.

3: All of above figures are applicable when the dimensions are measured at the center of each slide unit assembled with a track rail fixed onto a flat base.

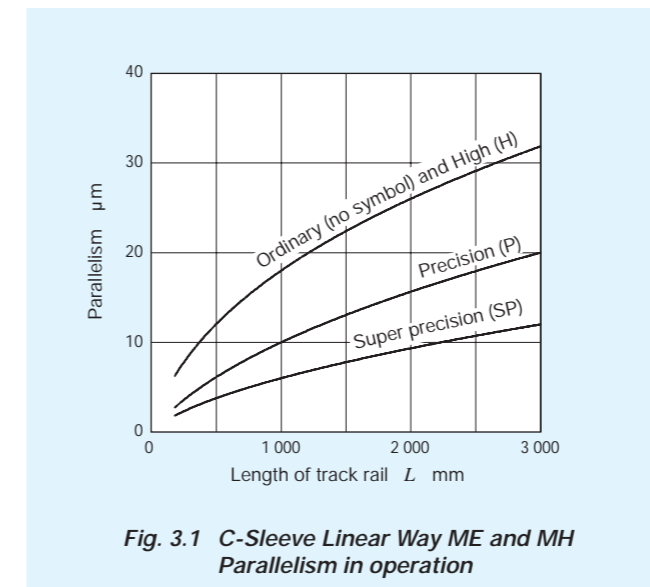


Fig. 3.1 C-Sleeve Linear Way ME and MH Parallelism in operation

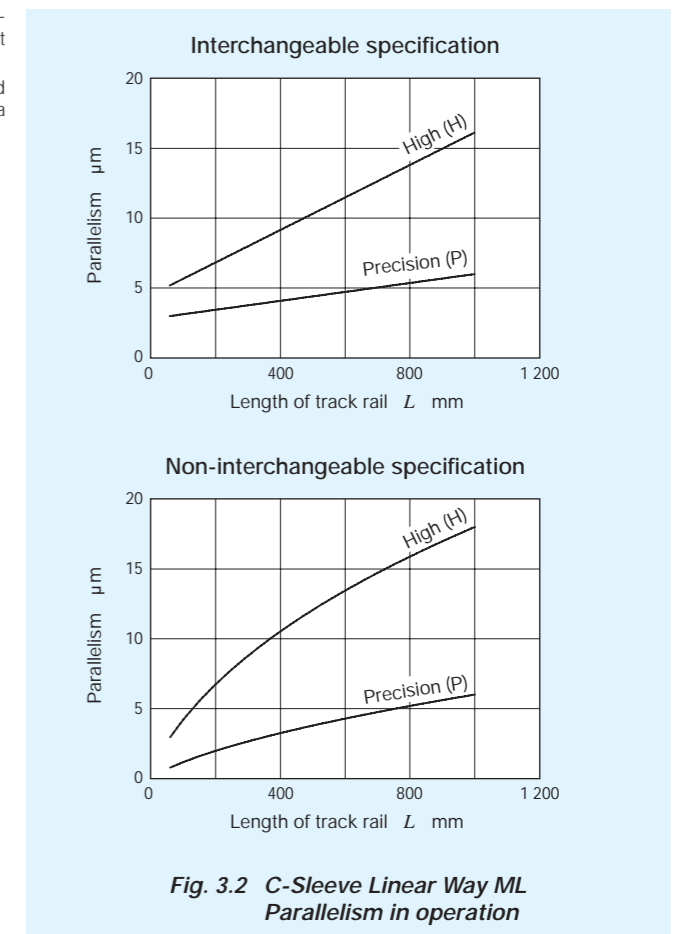
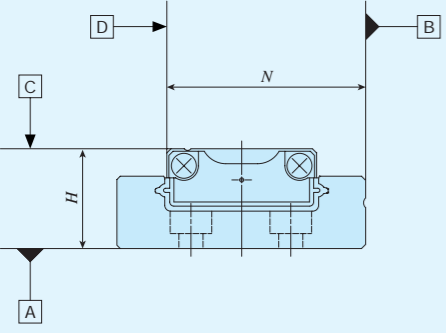


Fig. 3.2 C-Sleeve Linear Way ML Parallelism in operation

Table 11.3 Accuracy of C-Sleeve Linear Way MUL



Classification (Symbol)	Ordinary (No symbol)	High (H)
Dim. <i>H</i> Tolerance	±0.100	±0.050
Dim. <i>N</i> Tolerance	±0.100	±0.050
Dim. variation of <i>H</i> ⁽¹⁾	0.050	0.040
Dim. variation of <i>N</i> ⁽¹⁾	0.050	0.040
Parallelism in operation of <i>C</i> to <i>A</i>	Refer to Fig. 3.3	
Parallelism in operation of <i>D</i> to <i>B</i>	Refer to Fig. 3.3	

Note (1): Dimensional variation of dimension means the size variation between the slide units mounted on the same track rail when the dimension *H* is measured at the same measuring position of track rail.

Remark: All of above figures are applicable when the dimensions are measured at the center of each slide unit assembled with a track rail fixed onto a flat base.

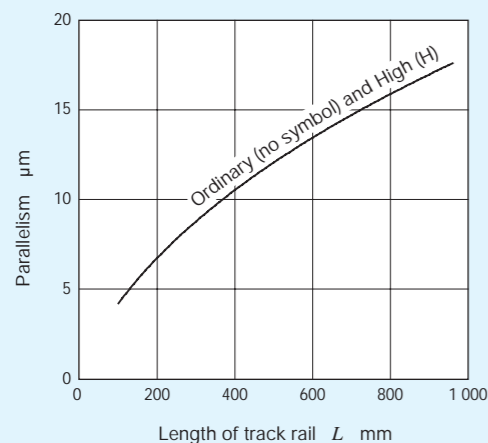


Fig. 3.3 C-Sleeve Linear Way MUL Parallelism in operation

Preload

Average amount of preload for C-Sleeve Linear Way series is shown in Table 12. In case, high rigidity and/or damping are needed, the preload amount is recommended to be 1/3 of the external force. However, excessive preload will cause short product life.

Table 12 Preload amount

Preload class	Item Symbol	Preload amount N	Typical application
Clearance	T _c	0 ⁽¹⁾	• Smooth motion • To absorb slight misalignment
	T ₀	0 ⁽²⁾	• Smooth motion
Standard preload	(No symbol)	0 ⁽³⁾	• Smooth and precise motion
Light preload	T ₁	0.02 C ₀	• Minimum vibration • Load is equally balanced. • Smooth and precise motion
Medium preload	T ₂	0.05 C ₀	• Medium vibration • Medium overhung load
Heavy preload	T ₃	0.08 C ₀	• Vibration and/or shocks • Large overhung load • Heavy cutting

Note (1): Approx. 10µm clearance

(2): Zero or minimal amount of clearance

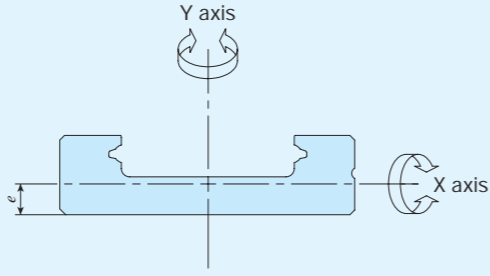
(3): Zero or minimal amount of preload

Remark: C₀ means basic static load rating.

Geometrical moment of inertia

High rigidity design of C-Sleeve Linear Way MUL is achieved by adopting a U-shaped track rail. Table 13 shows the moment of inertia of sectional area of track rails.

Table 13 C-Sleeve Linear Way MUL Moment of inertia of sectional area of track rails



Model number	Moment of inertia of sectional area mm ⁴		Center of gravity <i>e</i> mm
	<i>I_X</i>	<i>I_Y</i>	
MUL 25	3.7 × 10 ²	7.5 × 10 ³	2.6
MUL 30	9.3 × 10 ²	1.7 × 10 ⁴	3.3

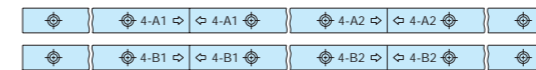
Optional special specification for use under special environment


C-Sleeve Linear Way series with the special specifications shown in Table 5.1 to 5.4 are optionally available for various applications. When ordering, add any supplemental codes onto the identification number.

If a combination of special specifications is required, indicate the supplemental codes in alphabetical order. These optional items can be combined to achieve further improvements in performance.

Butt jointing track rails

/A

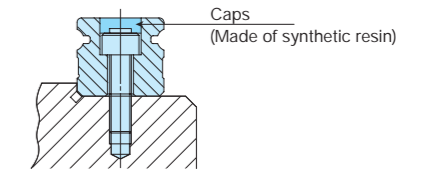



When the required length of non-interchangeable track rail exceeds the maximum length shown in page 30 to 32, two or more track rails can be used by butt jointing them in the direction of linear motion. For the length and the number of butt jointing track rails, please consult .

With caps for rail mounting holes

(for ML, ME and MH series)

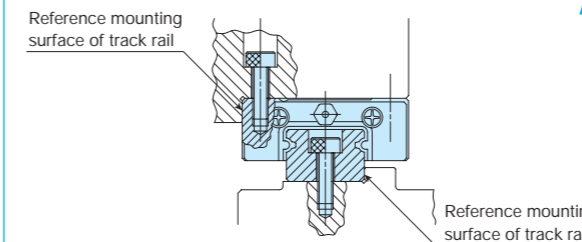
/F



Specify prepared caps for track rail mounting holes are appended. These caps cover the track rail mounting holes to improve the sealing performance in the linear motion direction. Aluminum caps are also available. Consult  for further information.

Opposite reference surfaces arrangement

/D



The reference mounting surface of track rail is made opposite to the standard side. The accuracy of dimension *N* including parallelism in operation is the same with that of standard specification.

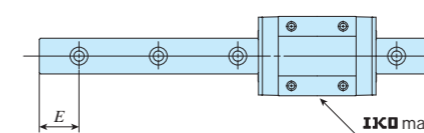
With inspection sheet


/I


The inspection sheet recording dimensions *H* and *N* (See Accuracy), dimensional variations of *H* and *N*, and parallelism in operation of the slide unit is attached to each set.

Specified track rail mounting hole positions

/E

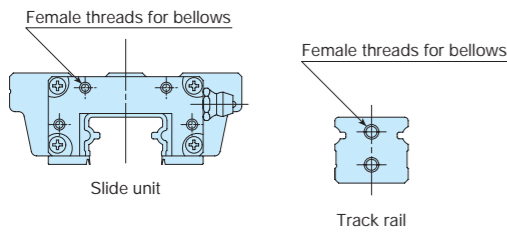


The mounting hole positions of track rail can be specified by specifying dimension *E* at the left end, which is the distance from the mounting hole nearest to the left end of the track rail to the left end face of the track rail in sight of  mark on the slide unit.

When ordering, add the dimension (in mm) after "/E". Dimension *E* can be specified in a limited range. Consult  for further information.

Optional special specification for use under special environment

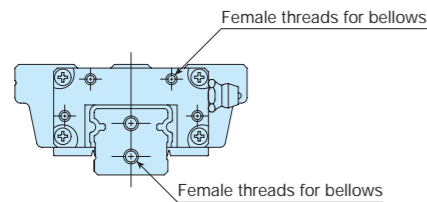
With female threads for bellows
(for ME and MH Interchangeable series) **/J /JR /JL**



Female threads for mounting bellows are provided on the interchangeable slide unit or the interchangeable track rail of C-Sleeve Linear Way ME and MH series. For details of related dimensions, see Table 14.

- ① /J Female threads are provided at both ends of the slide unit or the track rail.
- ② /JR Female threads are provided at the right end of the slide unit in sight of mark.
- ③ /JL Female threads are provided at the left end of the slide unit in sight of mark.

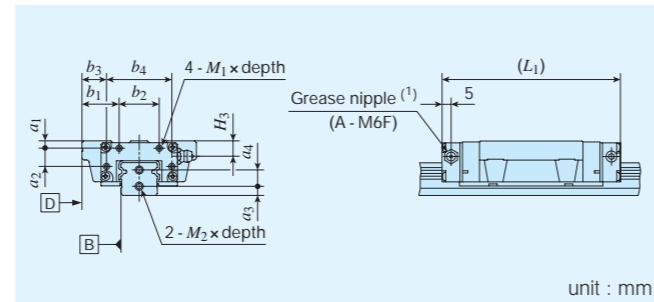
With female threads for bellows
(for assembled set of ME and MH series) **/J /JJ /JR /JS /JJS**



For an assembled set of interchangeable or non-interchangeable specification, female threads for mounting bellows are provided on the slide unit and the track rail. For details of related dimensions, see Table 14.

- ① /J Female threads are provided at both ends of the track rail, and at the slide unit ends which are the closest to the track rail ends. (In case only one slide unit is assembled, female threads are provided at both ends.)
- ② /JJ Female threads are provided at both ends of the track rail, and at all ends of all slide units. (Applicable, when the number of slide units is two or more. In case only one slide unit is assembled, indicate "/J".)
- ③ /JR Female threads are provided at both ends of the track rail.
- ④ /JS Female threads are provided at the slide unit ends which are the closest to the track rail ends. (In case only one slide unit is assembled, female threads are provided at both ends.)
- ⑤ /JJS Female threads are provided at all ends of all slide units. (Applicable, when the number of slide units is two or more. In case only one slide unit is assembled, indicate "/JS".)

Table 14 Dimension of female threads for bellows



Model number	Slide unit							Track rail				
	a_1	a_2	b_1	b_2	b_3	b_4	$M_1 \times$ depth	$L_1^{(2)}$	H_3	a_3	a_4	$M_2 \times$ depth
ME(T)C 15 ⁽¹⁾								58				
ME(T) 15 ⁽¹⁾			18		12			74				
ME(T)G 15 ⁽¹⁾	3	12		16		28	M3 × 6	87	5.7	4	7	M3 × 6
MESC 15 ⁽¹⁾			9		3			58				
MES 15 ⁽¹⁾								74				
MESG 15 ⁽¹⁾								87				
ME(T)C 20								64				
ME(T) 20			19.5		12.5			83				
ME(T)G 20	3	15		20		34	M3 × 6	99	6	4	8	M3 × 6
MESC 20			11		4			64				
MES 20								83				
MESG 20								99				
ME(T)C 25								76				
ME(T) 25			23.5		16.5			100				
ME(T)G 25	3.5	17		26		40	M3 × 6	119	7	5	9	M4 × 8
MESC 25			11		4			76				
MES 25								100				
MESG 25								119				
MH(T) 15 ⁽¹⁾	3		15.5	16	9.5			99	6.5			
MHD 15 ⁽¹⁾	7	7	9	16	3	28	M3 × 6	83	10.5	4	8	M3 × 6
MHS 15 ⁽¹⁾	3							6.5				
MH(T) 20			20.5	22	13.5			128				
MH(T)G 20	4	10				36	M3 × 6	99	8.5	5	9	M4 × 8
MHS 20			11	22	4			128				
MHSG 20								128				
MH(T) 25	4		22	26	15			110	8.5			
MH(T)G 25								133				
MHD 25	8	13				40	M3 × 6	110	12.5	5	12	M4 × 8
MHDG 25			11	26	4			133				
MHS 25								110	8.5			
MHSG 25	4							133				

Note ⁽¹⁾: The specification and mounting position of grease nipple are different from those of the standard specification product. Size 15 models are provided with a special specification grease nipple (NPB2 type). For details of dimension, consult for further information.

⁽²⁾: The values are for the slide unit with female threads for bellows at both ends.

Black chrome surface treatment
/LC /LR /LCR

A black permeable chrome film is formed to improve corrosion resistance.

- ① /LC Treatment is applied to the casing.
 - ② /LR Treatment is applied to the track rail.
 - ③ /LCR Treatment is applied to the casing and the track rail.
- For detail of applicability, see Table 5.1 to 5.4 on page 14 to 15.

Fluorine black chrome surface treatment
(for ME and MH series) **/LFC /LFR /LFCR**

After forming a black permeable chrome film, the surface is coated with fluorine resin for further improvement in corrosion resistance. This treatment is also effective in preventing the adhesion of foreign substances on the surface.

- ① /LFC Treatment is applied to the body of slide unit.
 - ② /LFR Treatment is applied to the track rail.
 - ③ /LFCR Treatment is applied to the body of slide unit and the track rail.
- For detail of applicability, see Table 5.1 to 5.4 on page 14 to 15.

With track rail mounting bolts
(for ME, MUL and set order of MH) **/MA**

Track rail mounting bolts are appended according to the number of mounting holes.

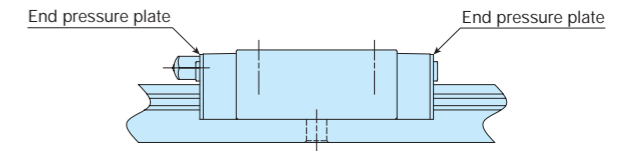
Without track rail mounting bolts
(for ML and interchangeable track rail order of MH) **/MN**

Track rail mounting bolts are not appended.

Change of mounting hole size and female threads size
(for ME15) **/M4**

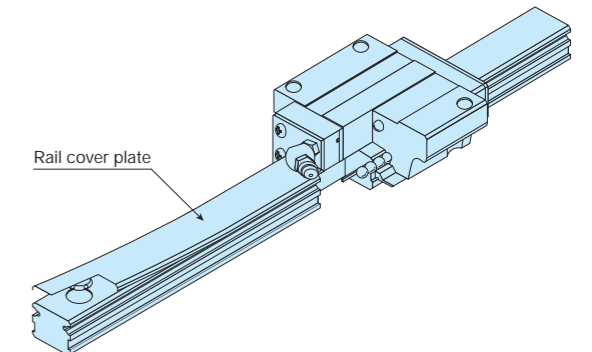
The track rail mounting holes for M3 of ME15 is changed to M4. For dimensions, see the dimension table of each series.

No end seal
(for ML, ME and MH series) **/N**



End rubber seals at both ends of slide unit are replaced by steel end pressure plates (not in contact with the track rail) to reduce frictional resistance. The under seals are not assembled. This specification is not effective for dust protection.

Rail cover plate for track rail
(for non-interchangeable MH series) **/PS**

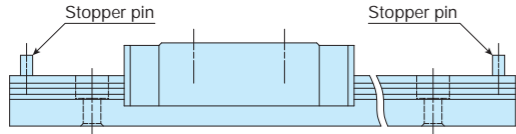


After mounting the track rail, the top surface of track rail is covered with a U-shaped thin stainless steel plate for further improvement in sealing performance. The rail cover plate is delivered as assembled on the track rail. Standard end seals must be replaced with the special end seals. When mounting the cover plate, refer to the attached instruction manual for rail cover plate.

Optional special specification for use under special environment

Track rail with stopper pins
(for non-interchangeable ML series)

/S



To prevent the slide unit of C-Sleeve Linear Way ML from slipping off, a stopper pin is provided at both ends of the track rail. For related dimensions, see Table 15 below.

Table 15 C-Sleeve Linear Way ML Track rail with stopper pins (Supplemental code /S)

unit : mm							
Model number	a	b	c	Model number	a	b	c
ML 5	2	2	1.6	MLF 10	2.5	2	1.6
ML 7	2.5	2.5	2	MLF 14		3	2
ML 9		3		MLF 18			
ML 12		4		MLF 24			
ML 15		5		MLF 30			
ML 20		3.5		5			
ML 25							

Remark: The table shows representative model numbers but is applicable to all models of the same size of ML and MLF series.

Butt-jointing interchangeable track rail
(for interchangeable specification of ME and MH series)

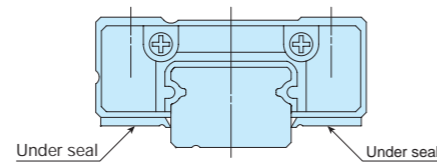
/T

A special interchangeable track rail of which both ends are finished for butt jointing in the direction of linear motion is provided. Use the track rails having the same interchangeable code for butt jointing. For the butt jointing for non-interchangeable specification, indicate butt-jointing track rail "/A".

With under seals
(for ML and ME series)

/U

Under seals are attached to MH series as standard specification.



To prevent foreign substances intruding from the lower side of Linear Way, rubber seals are provided on the bottom faces of slide unit. For size H_1 , see Table 16.

Table 16 H_1 dimension of slide unit with under seals (Supplemental code /U)

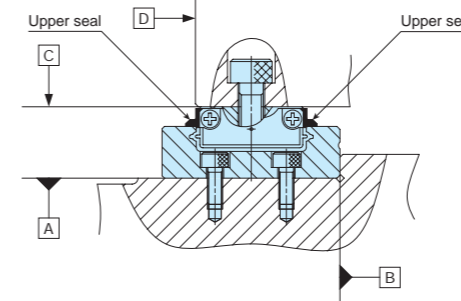
unit : mm	
Model number	H_1
ML 9	1
ML 12	2
ML 15	3
ML 20	4
ML 25	5 ⁽¹⁾
MLF 18	2
MLF 24	
MLF 30	
MLF 42	3
ME 15	5
ME 20	
ME 25	

Note (1): H_1 dimension of size 25 models is the same as the dimension without under seals.

Remark: The table shows representative model numbers but is applicable to all models of the same size of ML, MLF and ME series.

With upper seals
(for MUL series)

/U



Rubber seals are attached to the upper side face of the slide unit to prevent foreign materials from entering from the upper side, so that the mounting reference surface \square cannot be used. Table 17 shows sizes of the slide unit when upper seals are attached.

Table 17 Dimension of the slide unit with upper seals (Supplemental code /U)

unit : mm		
Model number	N	W_2
MUL 25	21.4	18
MUL 30	25.9	22

With double end seals

(for interchangeable single slide unit of ME and MH series)

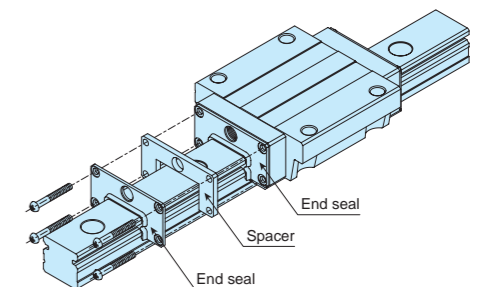
/V /VR /VL

Double rubber end seals are provided on the interchangeable slide unit for more effective dust protection. For the total length of the slide unit with double end seals, see the Table 18.

- ① /V Double end seals are provided at both ends of the slide unit.
- ② /VR Double end seals are provided at the right end of the slide unit in sight of mark.
- ③ /VL Double end seals are provided at the left end of the slide unit in sight of mark.

With double end seals
(for assembled set of ME and MH series)

/V /VV



Double end seals are provided on the slide unit of assembled set of interchangeable specification or non-interchangeable specification for more effective dust protection. For the total length of the slide unit with double end seals, see the Table 18.

- ① /V Double end seals are provided at the ends of slide units which are the closest to the ends of the track rail. (In case only one slide unit is assembled, double end seals are provided at both ends.)
- ② /VV Double end seals are provided at all ends of all slide units. (Applicable when the number of slide units is two or more. In case only one slide unit is assembled, indicate "/V".)

Table 18 Dimension of the slide unit with double end seals (Supplemental code /VV)

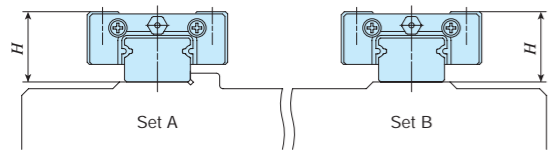
unit : mm		
Model number	L_1 (1)	L_4 (1)
MEC 15	48	50
ME 15	64	66
MEG 15	76	78
MEC 20	54	68
ME 20	73	87
MEG 20	89	103
MEC 25	67	80
ME 25	91	104
MEG 25	110	123
MH 15	72	77
MH 20	91	104
MHG 20	119	133
MH 25	104	116
MHG 25	127	139

Note (1): The values are the slide unit with double end seals at both ends. Remark: The table shows representative model numbers but is applicable to all models of the same size of ME and MH series.

Optional special specification for use under special environment

Matched sets to be used as an assembled group
(Applicable to non-interchangeable spec.)

/W



For two or more sets of C-Sleeve Linear Way used on the same plane, the dimensional variation of *H* of C-Sleeve Linear Way is kept within the specified range. The dimensional variation of dimension *H* in matched sets is the same as that of a single set. Indicate the number of sets after "/W". (Ex: ML9C2R160H/W2)

With scrapers
(for interchangeable single slide unit of ME and MH series)

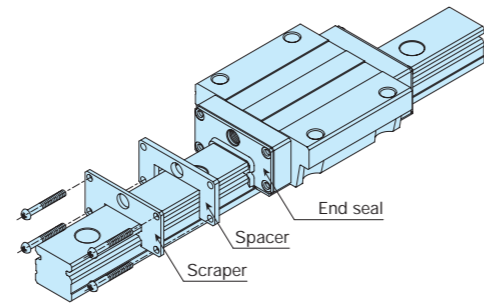
/Z /ZR /ZL

Metal scrapers are provided on the slide unit of interchangeable specification. The scraper (non-contact type) is used to effectively remove large particles of dust or foreign matter adhering to the track rail. For the total length of the slide unit with scrapers, see the description of each series.

- ① /Z Scrapers are provided at both ends of the slide unit.
- ② /ZR A scraper is provided at the right end of the slide unit in sight of mark.
- ③ /ZL A scraper is provided at the left end of the slide unit in sight of mark.

With scrapers
(for assembled set of ME and MH series)

/Z /ZZ



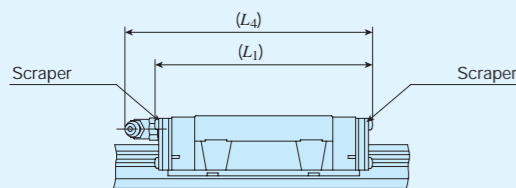
Metal scrapers are provided on the slide units of assembled set of interchangeable specification or non-interchangeable specification.

The scraper (non-contact type) is used to effectively remove large particles of dust or foreign matter adhering to the track rail. For the total length of the slide unit with scrapers, see the description of each series.

- ① /Z Scrapers are provided at the ends of slide units which are the closest to the ends of the track rail. (In case only one slide unit is assembled, scrapers are provided at both ends.)
- ② /ZZ Scrapers are provided at all ends of all slide units. (Applicable when the number of slide units is two or more. In case only one slide unit is assembled, indicate "/Z".)

Table 19 Dimension of the slide unit with scrapers (Supplemental code /Z /ZZ)

unit : mm



Model number	$L_1^{(1)}$	$L_4^{(1)}$
MEC 15	48	50
ME 15	64	66
MEG 15	77	79
MEC 20	55	69
ME 20	75	88
MEG 20	90	104
MEC 25	69	81
ME 25	93	105
MEG 25	112	124
MH 15	73	75
MH 20	91	104
MHG 20	119	133
MH 25	104	116
MHG 25	126	139

Note ⁽¹⁾: The values are the slide unit lengths with scrapers at both ends.
Remark: The table shows representative model numbers but is applicable to all models of the same size of ME and MH series.

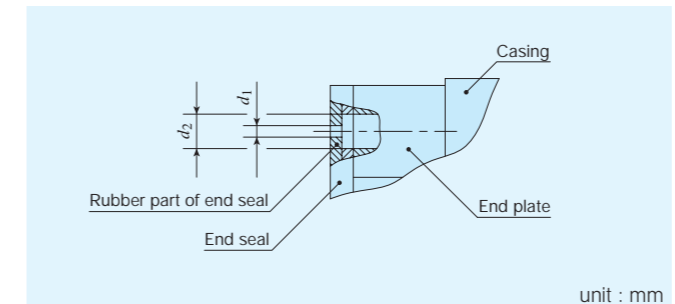
Lubrication and Dust protection

Lithium-soap base grease (MULTEMP PS No.2 : KYODO YUSHI) is pre-packed in C-Sleeve Linear Way ML and lithium-soap base grease containing extreme pressure additive (ALVANIA grease EP 2: SHELL) is pre-packed C-Sleeve Linear Way ME, MH and MUL. Additionally, C-Sleeve (Capillary sleeve) a component part is placed in the ball recirculation path, thereby extending the re-lubrication (greasing) interval time and maintenance work for a long period.

C-Sleeve Linear Way is provided with an oil hole and with grease nipple shown in Table 20 and 21. Supply nozzles matching the size of grease nipple are available. For these parts for lubrication, consult for further information.

C-Sleeve Linear Way is dust protected with special rubber seals. But, if large amount of fine contaminants are present, or if large particles of foreign matter such as dust or chips may fall on the track rail, it is recommended to provide protective covers such as bellows for the entire linear motion mechanism. Bellows to match the dimensions of C-Sleeve Linear Way are optionally available. They are easy to mount and highly effective for dust protection. If required, consult .

Table 20 Oil hole



unit : mm

Model number	Dimension of oil hole	
	d_1	d_2
ML 5	0.5	1.1
ML 7		1.2
ML 9		1.5
ML 12		2
MLF 10		1.1
MLF 14		1.2
MLF 18		1.5
MLF 24		2
MUL 25		1.2
MUL 30		1.5

Remark: The above table shows representative model numbers but is applicable to all models of the same size.

Table 21 Grease nipple

unit : mm

Model number	Type	Grease nipple
		Shape and dimension
ML 15 ML 20 MLF 30 MLF 42	A-M3	
ML 25	B-M4	
ME 15 MH 15	A-M4	
ME 20 ME 25 MH 20 MH 25	B-M6	

Remark: The above table shows representative model numbers but is applicable to all models of the same size.

Precautions for use

1 Mounting surface, reference mounting surface, and general mounting structure

To mount C-Sleeve linear way, correctly fit the reference mounting surfaces B and D of the slide unit and track rail to the reference mounting surfaces of the table and the bed, and then fix them tightly. (See Fig.4.1 and 4.2)

The reference mounting surfaces B and D and the mounting surfaces A and C of C-Sleeve Linear Way are accurately finished by grinding. Stable and high accuracy liner motion can be obtained by finishing the mating mounting surfaces of machines or equipment with high accuracy and correctly mounting the guide on these surfaces.

The slide unit reference mounting surface is always the side surface opposite to the IKO mark. The track rail reference mounting surface is identified by locating the IKO mark on the top surface of the track rail. The track rail reference mounting surface is the side surface above the IKO mark (in the direction of the arrow). (See Fig.5.1 and 5.2)

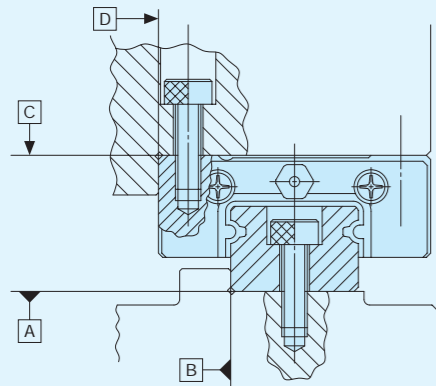


Fig. 4.1 C-Sleeve Linear Way ML, ME and MH Reference mounting surfaces and general mounting structure

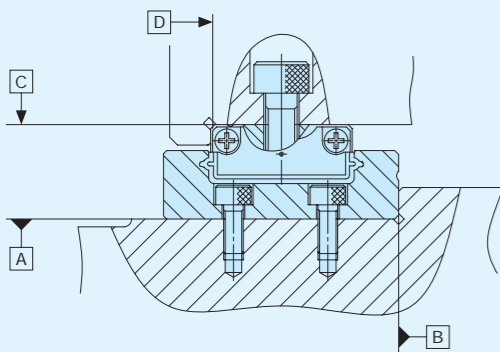


Fig. 4.2 C-Sleeve Linear Way MUL Reference mounting surfaces and general mounting structure

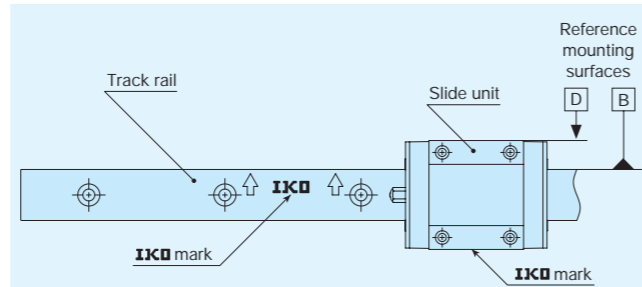


Fig. 5.1 C-Sleeve Linear Way ML, ME and MH Reference mounting surfaces

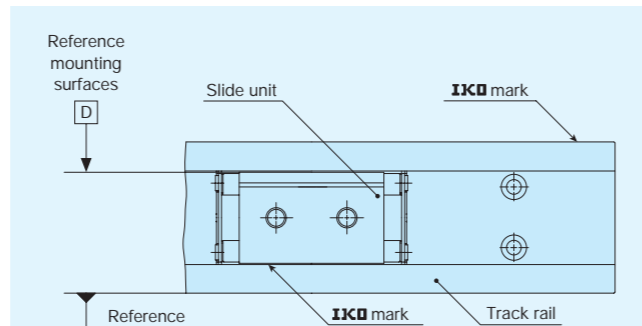


Fig. 5.2 C-Sleeve Linear Way MUL Reference mounting surfaces

2 Corner radius and shoulder height of reference mounting surfaces

It is recommended to make a relieved fillet at the corner of the mating reference mounting surfaces as shown in Fig.6. Otherwise, corner radius R_1 and R_2 are recommended shown in Table 22. Table 22 shows recommended shoulder heights and radius of the reference mounting surfaces.

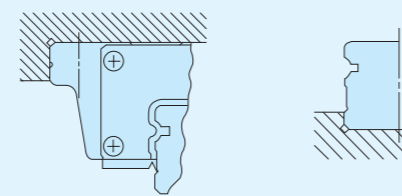


Fig. 6 Relieved radius shape of reference mounting surface

Table 22 Shoulder height and radius of the reference mounting surfaces

Model number	Slide unit		Track rail	
	Shoulder height h_1	Relieved radius R_1 (max.)	Shoulder height h_2	Relieved radius R_2 (max.)
ML 5	2	0.3	0.8	0.2
ML 7	2.5	0.2	1.2	0.2
ML 9	3	0.2	1.5 (1)	0.2
ML 12	4	0.2	2.5 (2)	0.2
ML 15	4.5	0.2	3 (2)	0.2
ML 20	5	0.2	4 (2)	0.2
ML 25	6.5	0.7	4 (2)	0.7
MLF 10	2	0.3	1.2	0.2
MLF 14	2.5	0.2	1.2	0.2
MLF 18	3	0.2	2.5 (2)	0.2
MLF 24	4	0.2	2.5 (2)	0.2
MLF 30	4.5	0.2	2.5 (2)	0.2
MLF 42	5	0.2	3 (2)	0.2
ME 15	4	1	3	0.5
MET 15		0.5		
MES 15		0.5		
ME 20	5	1	3	0.5
MET 20		0.5		
MES 20		0.5		
ME 25	6	1	4	1
MET 25		0.5		
MES 25		0.5		
MH 15	4	0.5	3	0.5
MH 20	5	0.5	3	0.5
MH 25	6	1	4	1
MUL 25	1.5	0.2	2.5	-
MUL 30	2.5	0.2	3	-

Note (1): For "with under seals" of the size 9 models, 0.8mm is recommended.

(2): For "with under seals" (supplemental code "/U"), it is recommended to use a value obtained by subtracting 1mm from the value h_2 shown in the table.

Remark: The above table shows representative model numbers but is applicable to all models of the same size.

3 Multiple slide units mounted in close distance

When using multiple slide units in close distance to each other, actual load may be greater than the calculated load depending on the mounting accuracy of the slide units on the mounting surfaces and the reference mounting surfaces of the machine. It is suggested in such cases to assume a greater load than the calculated load.

4 Operating temperature

The C-Sleeve Linear Way must be used under 80°C (maximum).

5 Cleaning

Do not wash C-Sleeve Linear Way with organic solvent and/or white kerosene, which have the ability of removing fat, nor leave them in contact with the above agents.

Mounting

1 When assembling two or more sets of C-Sleeve Linear Way

• Interchangeable specification

In the case of an interchangeable specification product, assemble a slide unit and a track rail with the same interchangeable code. ("S2" slide unit + "S2" track rail)

• Non-interchangeable specification

Use an assembly of slide unit and track rail as delivered without changing the combination.

• Matched sets to be used as an assembled group

Special specification products of matched sets (by supplemental code "/W") are delivered as a group in which dimensional variations are specially controlled. Mount them without mixing with the sets of another group.

2 Assembling a slide unit and a track rail

When assembling C-Sleeve Linear Way, correctly fit the slide unit mounted on a steel ball holder to the groove of the track rail, and then move the slide unit gently from the steel ball holder to the track rail in parallel direction.

Steel balls are retained in C-Sleeve Linear Way, so the slide unit can be separated freely from the track rail. However, the slide unit can be assembled on the track rail much easier by using the steel ball holder.

Steel ball holder is appended as an accessory to the interchangeable slide unit of C-Sleeve Linear Way ML as shown in Table 23. The steel ball holder for another models is also available. If required, consult IKO for further information.

Table 23 C-Sleeve Linear Way ML Models to which a steel ball holder is appended

Standard type		Wide rail type	
MLC 5		MLFC 10	
ML 5		MLF 10	
MLC 7		MLFC 14	
ML 7		MLF 14	
MLG 7		MLFG 14	
MLC 9		MLFC 18	
ML 9		MLF 18	
MLG 9		MLFG 18	
MLG 12		MLFG 24	
MLG 15		MLFG 30	
MLG 20		MLFG 42	
MLG 25		-	

Mounting

3 Working precision of mounting surfaces

Inadequate mounting accuracy of C-Sleeve Linear Way will affect the operating accuracy and life adversely, so mounting must be carried out with care. When multiple sets are mounted, the parallelism between the two mounting surfaces of machines must be prepared, in general, as shown in Table 24. If mounting parallelism is poor, frictional resistance will steeply increase giving a warning signal, which can be used to perform high accuracy mounting.

Table 24 Parallelism between two mounting surfaces

Class	unit : μm		
	Ordinary (No symbol)	High (H)	Precision (P)
Parallelism	30		20
			10

4 Cleaning the mounting surfaces

When mounting C-Sleeve Linear Way, first clean all mounting and reference mounting surfaces. (See Fig.7) Remove burrs and blemishes from the reference mounting surfaces and mounting surfaces of the machine using an oil-stone, etc., and then wipe the surfaces with clean cloth. Remove rust preventive oil and dirt from the reference mounting surfaces and mounting surfaces with clean cloth.

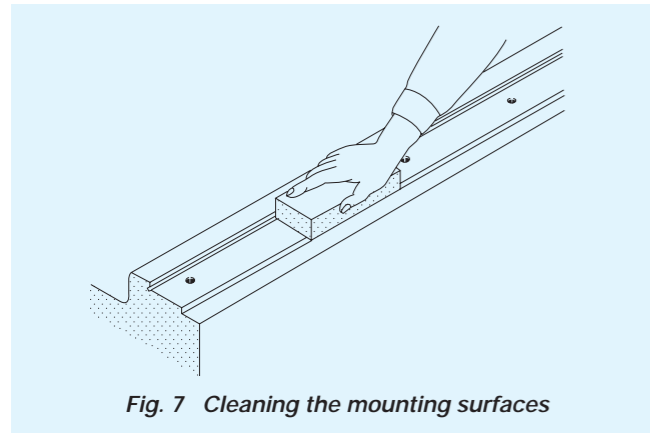


Fig. 7 Cleaning the mounting surfaces

5 Plugging-in of caps for rail mounting holes

When plugging the caps for rail mounting holes (supplemental code "/F") into the mounting holes of track rail, tap in the cap gently by applying a flat plate on the top face of the cap until the top face of the cap becomes level with the top face of the track rail.

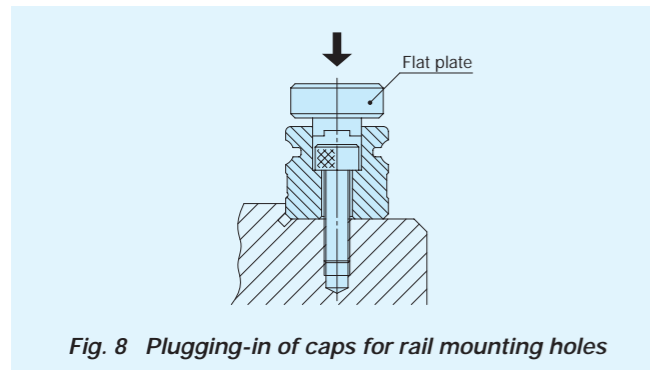


Fig. 8 Plugging-in of caps for rail mounting holes

6 Tightening torque of mounting bolts

The standard torque values for C-Sleeve Linear Way mounting bolts are shown in Table 25.1 and 25.2. When machines or equipment are subjected to serve vibration, shock, large fluctuating load, or moment load, the bolts should be tightened with a torque 1.2 to 1.5 times higher than the standard torque values shown. When the mating member material is cast iron or aluminum, tightening torque should be lowered in accordance with strength characteristics of the material.

Table 25.1 C-Sleeve Linear Way ME and MH Tightening torque of mounting bolts

Bolt size	Tightening torque N·m Carbon steel bolt (Strength division 12.9)
M3 x 0.5	1.7
M4 x 0.7	4.0
M5 x 0.8	7.9
M6 x 1	13.3
M8 x 1.25	32.0

Table 25.2 C-Sleeve Linear Way ML and MUL Tightening torque of mounting bolts

Bolt size	Tightening torque N·m Stainless steel bolt (Property division A2-70)
M2 x 0.4	0.31
M2.5 x 0.45	0.62
M3 x 0.5	1.1
M4 x 0.7	2.5
M5 x 0.8	5.0
M6 x 1.0	8.5

Track rail lengths

Standard and maximum lengths of track rails are shown in Table 26.1 to 26.5.

Track rail in any length are also available. Simply indicate the necessary length of track rail in millimeter (mm) in the identification number. For the tolerance of E dimension and Track rail length, consult for further information.

- In non-interchangeable specification, for track rail longer than the maximum length shown in Table 26.1 to 26.5, butt-jointing track rails are available upon request. In this case, indicate supplemental code "/A" in the identification number.
- E dimensions at both ends are the same unless otherwise specified. To change these dimensions, specify the specified rail mounting hole positions (supplemental code "/E") of special specification.

Table 26.1 C-Sleeve Linear Way ML (standard type) Standard and maximum lengths of track rails

Item	Model number	ML 5	ML 7	ML 9	ML 12	ML 15	ML 20	ML 25
	Standard length $L(n)$		60(4) 90(6) 105(7) 120(8) 150(10)	60(4) 90(6) 120(8) 150(10) 180(12) 240(16)	60(3) 80(4) 120(6) 160(8) 220(11) 280(14)	100(4) 150(6) 200(8) 275(11) 350(14) 475(19)	160(4) 240(6) 320(8) 440(11) 560(14) 680(17)	180(3) 240(4) 360(6) 480(8) 660(11) 840(14)
Mounting hole pitch F		15	15	20	25	40	60	60
E		7.5	7.5	10	12.5	20	30	30
Reference dimension $E^{(1)}$	Over (Incl.)	4	4.5	4.5	5	5.5	8	9
	Under	11.5	12	14.5	17.5	25.5	38	39
Maximum length $^{(2)}$		210 (510)	300 (990)	860 (1 200)	1 000 (1 450)	1 000 (1 480)	960 (1 800)	960 (1 800)
Maximum number of track rails for butt jointing		5	7	2	2	2	2	2
Maximum length of butt jointing track rails		915	1 905	1 660	1 925	1 880	1 740	1 740

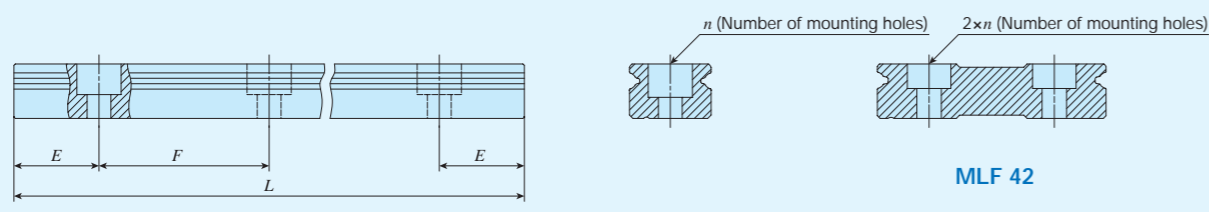
Note ⁽¹⁾: Not applied to optional specification "track rail stopper pins" (supplemental code "/S").

⁽²⁾: The track rails can be manufactured up to the maximum length shown in parentheses. If required, please consult .

Remark: The above table shows representative model numbers but is applicable to all models of the same size.

Track rail lengths


Table 26.2 C-Sleeve Linear Way MLF (wide type)
Standard and maximum lengths of track rails



Model number		MLF 10	MLF 14	MLF 18	MLF 24	MLF 30	MLF 42
Standard length $L(n)$		60(3)	90(3)	90(3)	120(3)	160(4)	160(4)
		80(4)	120(4)	120(4)	160(4)	240(6)	240(6)
		120(6)	150(5)	150(5)	240(6)	320(8)	320(8)
		160(8)	180(6)	180(6)	320(8)	440(11)	440(11)
		220(11)	240(8)	240(8)	400(10)	560(14)	560(14)
		280(14)	300(10)	300(10)	480(12)	680(17)	680(17)
Mounting hole pitch F		20	30	30	40	40	40
E		10	15	15	20	20	20
	Reference dimension $E^{(1)}$						
	Over (Incl.)	4.5	5.5	5.5	6.5	6.5	6.5
	Under	14.5	20.5	20.5	26.5	26.5	26.5
Maximum length $^{(2)}$		300 (500)	300 (990)	690 (1 860)	680 (1 960)	680 (2 000)	680 (2 000)
Maximum number of track rails for butt jointing		7	8	3	3	3	3
Maximum length of butt jointing track rails		1 840	1 950	1 920	1 840	1 840	1 840

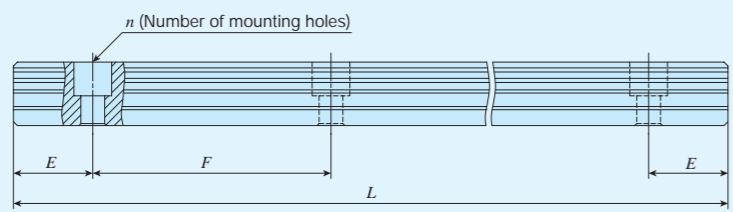
unit : mm

Note ⁽¹⁾: Not applied to optional specification "track rail stopper pins" (supplemental code "/S").

⁽²⁾: The track rails can be manufactured up to the maximum length shown in parentheses. If required, please consult  for further information.

Remark: The above table shows representative model numbers but is applicable to all models of the same size.

Table 26.3 C-Sleeve Linear Way ME
Standard and maximum lengths of track rails



Model number		ME 15	ME 20	ME 25
Standard length $L(n)$		160(3)	220(4)	220(4)
		220(4)	280(5)	280(5)
		280(5)	340(6)	340(6)
		340(6)	460(8)	460(8)
		460(8)	640(11)	640(11)
		640(11)	820(14)	820(14)
		820(14)	1 000(17)	1 000(17)
			1 240(21)	1 240(21)
Mounting hole pitch F		60	60	60
E		20	20	20
	Reference dimension $E^{(2)}$			
	Over (Incl.)	6	8	9
	Under	36	38	39
Maximum length $^{(3)}$		1 600 (2 980)	2 200 (2 980)	2 980 (4 000)

unit : mm

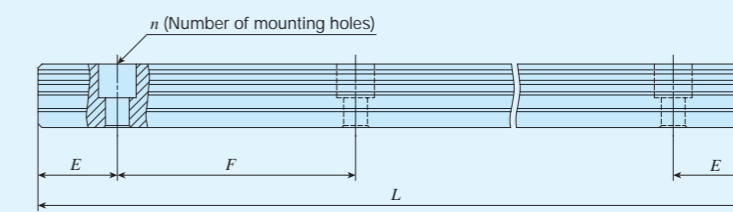
Note ⁽¹⁾: When specifying a butt-jointing interchangeable track rail (supplemental code "/T"), pay attention to the E dimension at the butt-jointing part.

⁽²⁾: Not applicable to the track rail with female threads for bellows (Supplemental code "/J").

⁽³⁾: The track rails can be manufactured up to the maximum length shown in parentheses. If required, please consult  for further information.

Remark: The above table shows representative model numbers but is applicable to all models of the same size.

Table 26.4 C-Sleeve Linear Way MH
Standard and maximum lengths of track rails



Model number		MH 15	MH 20	MH 25
Standard length $L(n)$		180(3)	240(4)	240(4)
		240(4)	480(8)	480(8)
		360(6)	660(11)	660(11)
		480(8)	840(14)	840(14)
		660(11)	1 020(17)	1 020(17)
		900(15)	1 200(20)	1 200(20)
		1 200(20)	1 500(25)	1 500(25)
Mounting hole pitch F		60	60	60
E		30	30	30
	Reference dimension $E^{(1)}$			
	Over (Incl.)	7	8	9
	Under	37	38	39
Maximum length $^{(2)}$		1 500 (3 000)	1 980 (3 000)	3 000 (3 960)

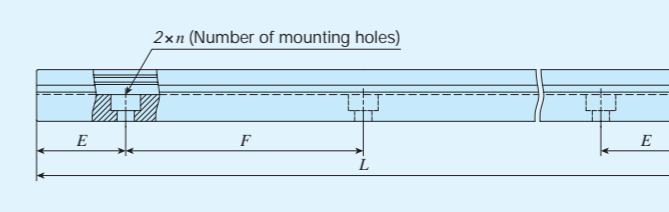
unit : mm

Note ⁽¹⁾: Not applicable to the track rail with female threads for bellows (Supplemental code "/J").

⁽²⁾: The track rails can be manufactured up to the maximum length shown in parentheses. If required, please consult  for further information.


Remark: The above table shows representative model numbers but is applicable to all models of the same size.

Table 26.5 C-Sleeve Linear Way MUL
Standard and maximum lengths of track rails



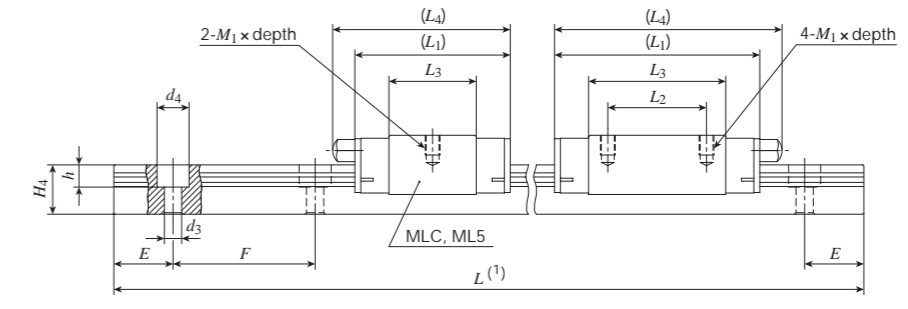
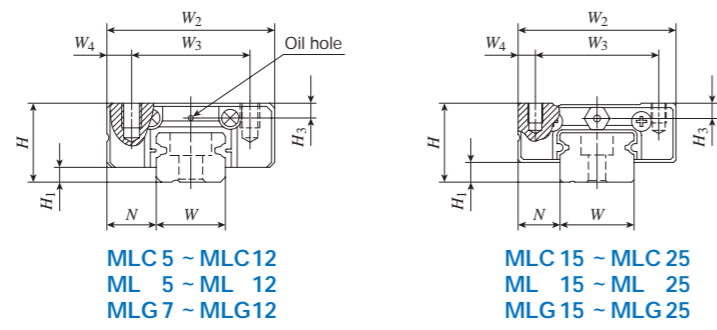
Model number		MUL 25	MUL 30
Standard length $L(n)$		105(3)	120(3)
		140(4)	160(4)
		175(5)	200(5)
		210(6)	240(6)
		245(7)	280(7)
		280(8)	320(8)
	Mounting hole pitch F		35
E		17.5	20
	Reference dimension E		
	Over (Incl.)	4.5	4.5
	Under	22	24.5
Maximum length $^{(1)}$		420 (840)	480 (960)

unit : mm

Note ⁽¹⁾: The track rails can be manufactured up to the maximum length shown in parentheses. If required, please consult  for further information.

IKO C-Sleeve Linear Way ML Standard type

MLC · ML · MLG

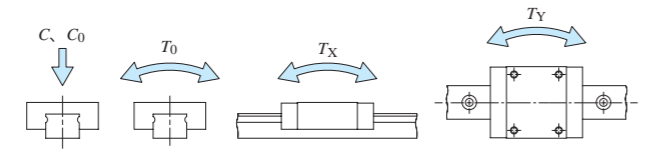


Model number	Mass (Reference)		Dimension of assembly			Dimension of slide unit							Dimension of track rail						Appended mounting bolt for track rail	Basic dynamic load rating ⁽²⁾	Basic static load rating ⁽²⁾	Static moment rating ⁽²⁾			Model number			
	Slide unit	Track rail (per 100mm)	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ × depth	H ₃	W	H ₄	d ₃	d ₄				h	E	F		Bolt size × length	C	C ₀
MLC 5	3.4	12	6	1	3.5	12	8	2	16	-	9.6	-	M2 × 1.5	1.2	5	3.7	2.4	3.6	0.8	7.5	15	Cross-recessed head screw for precision equipment M2 × 6	562	841	2.2	1.4	1.2	MLC 5
ML 5	4.3								19		12.6												8.5	7.2	ML 5			
MLC 7	6.7	22	8	1.5	5	17	12	2.5	19	-	9.6	-	M2 × 2.5	1.5	7	5	2.4	4.2	2.3	7.5	15	Hexagon socket head bolt M2 × 6	937	1 140	4.1	1.8	1.5	MLC 7
ML 7	9.1								23.5		8												14.3	14.9	12.5	ML 7		
MLG 7	13								31		12												21.6	28.2	23.6	MLG 7		
MLC 9	11	35	10	2	5.5	20	15	2.5	21.5	-	11.9	-	M3 × 3	2.2	9	6	3.5	6	3.5	10	20	Hexagon socket head bolt M3 × 8	1 180	1 480	6.9	2.9	2.4	MLC 9
ML 9	18								30		10												20.8	21.4	18.0	ML 9		
MLG 9	26								40.5		15												30.9	51.1	42.9	MLG 9		
MLC 12	22	65	13	3	7.5	27	20	3.5	25	-	13	-	M3 × 3.5	2.7	12	8	3.5	6.5	4.5	12.5	25	Hexagon socket head bolt M3 × 8	2 210	2 380	14.8	5.3	4.5	MLC 12
ML 12	34								34		15												21.6	41.7	35.0	ML 12		
MLG 12	48								44		20												32	98.3	82.5	MLG 12		
MLC 15	43	107	16	4	8.5	32	25	3.5	32	-	17.8	36	M3 × 4	3.1	15	10	3.5	6.5	4.5	20	40	Hexagon socket head bolt M3 × 10	3 490	3 890	30.0	11.7	9.8	MLC 15
ML 15	63								42		20	27.9											29.7	24.9	ML 15			
MLG 15	93								57		25	42.8											172	144	MLG 15			
MLC 20	89	156	20	5	10	40	30	5	38	-	22.3	42	M4 × 6	4.2	20	11	6	9.5	5.5	30	60	Hexagon socket head bolt M5 × 14	4 580	5 300	54.0	19.4	16.3	MLC 20
ML 20	130								50		25	34.6											52.7	44.2	ML 20			
MLG 20	189								68		30	52.3											102	85.7	MLG 20			
MLC 25	189	243	25	5	12.5	48	35	6.5	55	-	31.9	65	M6 × 7	5	23	15	7	11.0	9.0	30	60	Hexagon socket head bolt M6 × 16	9 120	10 600	128	57.4	48.1	MLC 25
ML 25	305								78		35	55.7											163	137	ML 25			
MLG 25	405								98		40	75.5											293	246	MLG 25			

Note (1): Track rail lengths L are shown in Table 26.1.

(2): The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_X and T_Y) are shown in the sketches below. The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.

Remark 1: The appended bolts for mounting track rails are hexagon socket head bolts of JIS B 1176 or equivalent, or cross-recessed head cap screws for precision equipment.
 2: Oil hole is provided for ML5 to ML12 models.



Example of identification number for assembled set

ML G 9 C2 R160 T1 P S2 /U

Model code	Size	Part code	Preload symbol	Class symbol	Interchangeable code	Supplemental code
ML	G	9	T1	P	S2	/U

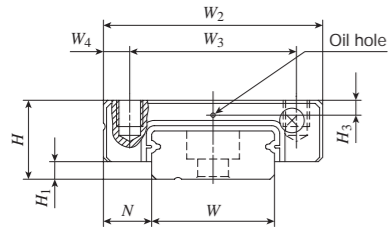
Series	ML
Length of slide unit	C: Short, No symbol: Standard, G: High rigidity long
Size	5, 7, 9, 12, 15, 20, 25
Number of slide unit (two slide units)	
Length of track rail (160mm)	

Interchangeable code	S1: S1 interchangeable specification, S2: S2 interchangeable specification, No symbol: Non interchangeable specification
Special specification	A, D, E, I, LR, MN, N, S, U, W
Preload amount	To: Clearance, No symbol: Standard, T1: Light preload
Accuracy class	H: High, P: Precision

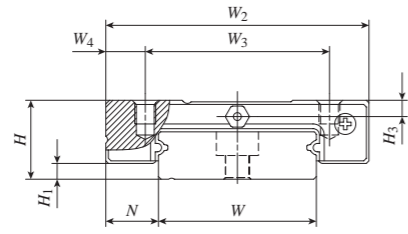
In case ordering track rail only, model code is changed as shown below.
 Track rail of interchangeable ML → Model code LWL-B (Ex: LWL9R160BPS2)

IKO C-Sleeve Linear Way MLF Wide type

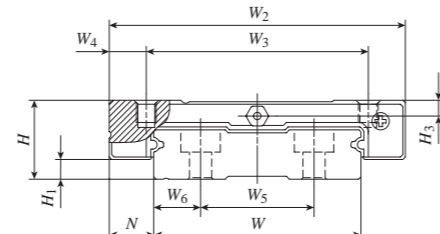
MLFC · MLF · MLFG



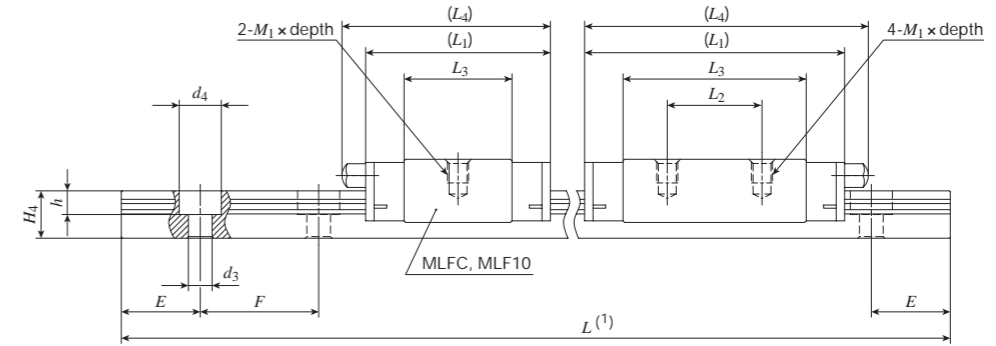
MLFC10 ~ MLFC24
MLF 10 ~ MLF 24
MLFG14 ~ MLFG24



MLFC30
MLF 30
MLFG30



MLFC42
MLF 42
MLFG42



Model number	Mass (Reference) g		Dimension of assembly mm			Dimension of slide unit mm										Dimension of track rail mm								Appended mounting bolt for track rail mm Bolt size x length	Basic dynamic load rating ⁽²⁾ C N	Basic static load rating ⁽²⁾ C ₀ N	Static moment rating ⁽²⁾ N·m			Model number
	Slide unit	Track rail (per 100mm)	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ x depth	H ₃	W	H ₄	W ₅	W ₆	d ₃	d ₄	h	E	F				T ₀	T _X	T _Y	
MLFC 10	6.1	28	6.5	1.5	3.5	17	13	2	20.5	-	13.6	-	M2.5 x 1.5	1.3	10	4	-	-	2.9	4.8	1.6	10	20	Cross-recessed head screw for precision equipment M2.5 x 7	712	1 180	6.1	2.6	2.2	MLFC 10
MLF 10	7.6								24.5		17.6														3.5	18.8	7.8	4.2	3.5	
MLFC 14	13	54	9	2	5.5	25	19	3	22.5	10	13	-	M3 x 3	1.7	14	5.5	-	-	3.5	6	3.2	15	30	Hexagon socket head bolt M3 x 8	1 240	1 700	12.2	3.8	3.2	MLFC 14
MLF 14	20								31.5		22														8.4	45.9	20.3	10.1	8.4	
MLFG 14	29								42		32.5														17.6	20.7	29.8	21.0	17.6	
MLFC 18	26	90	12	3	6	30	21	4.5	26.5	12	16.6	-	M3 x 3	2.5	18	7	-	-	3.5	6.5	4.5	15	30	Hexagon socket head bolt M3 x 8	1 510	2 120	19.4	5.5	4.7	MLFC 18
MLF 18	42								39		28.6														30.1	34.9	16.9	14.2		
MLFG 18	59								50.5		24														40.4	48.5	31.9	26.7		
MLFC 24	46	139	14	3	8	40	28	6	30.5	15	17.7	-	M3 x 3.5	3.2	24	8	-	-	4.5	8	4.5	20	40	Hexagon socket head bolt M4 x 10	2 800	3 340	40.7	9.7	8.2	MLFC 24
MLF 24	74								44		31														141	75.6	30.6	25.7		
MLFG 24	108								59		28														46.3	111	63.3	53.1		
MLFC 30	70	198	15	3	10	50	35	7.5	35.5	18	20.5	40	M4 x 4.5	3.1	30	9	-	-	4.5	8	4.5	20	40	Hexagon socket head bolt M4 x 12	3 890	4 540	69.1	15.4	13.0	MLFC 30
MLF 30	111								50		34.8														54	128	48.7	40.8		
MLFG 30	167								68.5		35														53.8	187	100	84.3		
MLFC 42	95	294	16	4	9	60	45	7.5	41.5	20	25.7	46	M4 x 4.5	3.2	42	10	23	9.5	4.5	8	4.5	20	40	Hexagon socket head bolt M4 x 12	5 440	6 810	144	30.8	25.8	MLFC 42
MLF 42	138								55		39.4														60	209	61.3	51.4		
MLFG 42	200								74.5		35														58.7	321	140	117		

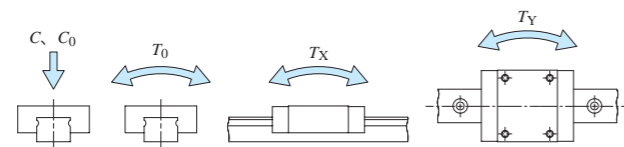
Note (1): Track rail lengths L are shown in Table 26.2.

1N 0.102kgf

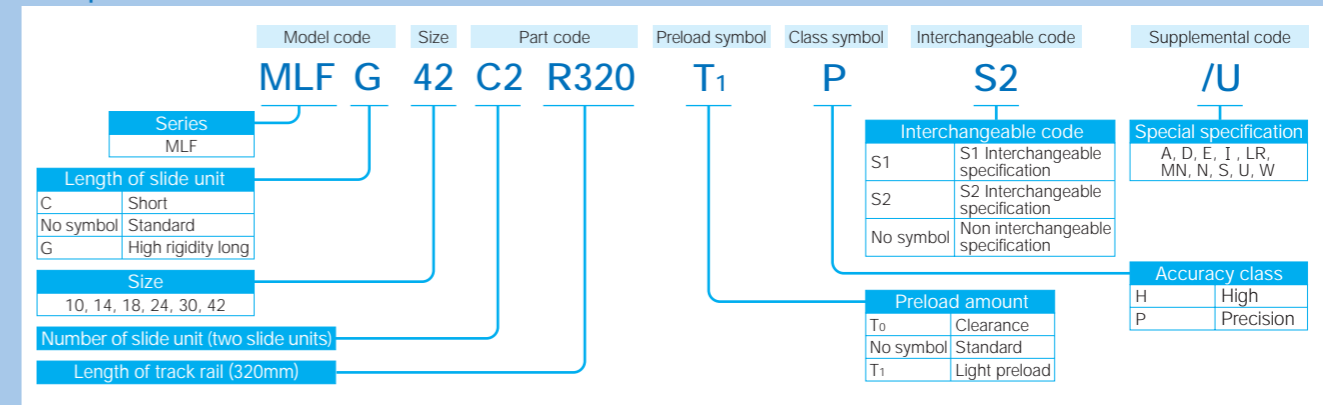
(2): The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_X and T_Y) are shown in the sketches below. The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.

Remark 1: The appended bolts for mounting track rails are hexagon socket head bolts of JIS B 1176 or equivalent, or cross-recessed head cap screws for precision equipment.

2: Oil hole is provided for MLF10 to MLF24 models.



Example of identification number for assembled set



In case ordering track rail only, model code is changed as shown below.

Track rail of interchangeable MLF → Model code LWLF-B (Ex: LWLF42R320BPS2)

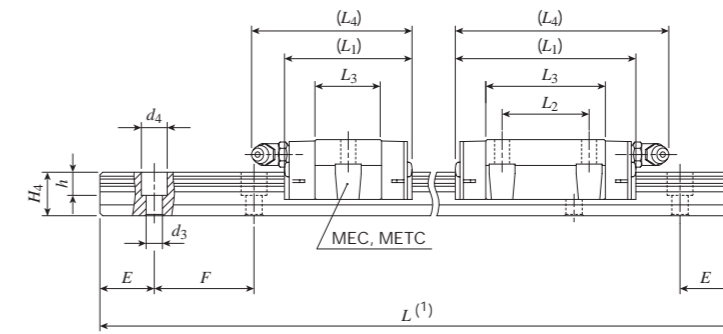
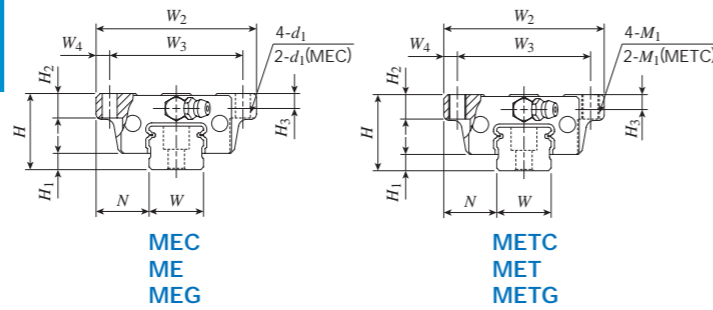
IKO C-Sleeve Linear Way ME

Flange type, mounting from bottom

Flange type, mounting from top

Short : MEC
Standard : ME
High rigidity long : MEG

Short : METC
Standard : MET
High rigidity long : METG



Model number	Mass (Reference) g		Dimension of assembly mm			Dimension of slide unit mm											Dimension of track rail mm						Recommended mounting bolt for track rail mm Bolt size x length	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N	Static moment rating ⁽³⁾			Model number	
	Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	d ₁	M ₁	H ₂	H ₃	W	H ₄	d ₃	d ₄	h	E				F	T ₀ N·m	T _X N·m		T _Y N·m
MEC 15	0.11	1.57	24	5.8	18.5	52	41	5.5	41	-	22.4	45	4.5	-	7	4.5	15	14.5	3.6 (4.5)	6.5 (8)	4.5 (6)	20	60	M3 x 16 (M4 x 16)	5 240	5 480	43.8	21.3 149	21.3 149	MEC 15
METC 15									-	M5	-	METC 15																		
ME 15	0.18	1.57	24	5.8	18.5	52	41	5.5	57	26	38.4	61	4.5	-	7	4.5	15	14.5	3.6 (4.5)	6.5 (8)	4.5 (6)	20	60	M3 x 16 (M4 x 16)	7 640	9 390	75.1	57.6 333	57.6 333	ME 15
MET 15									-	M5	-	MET 15																		
MEG 15	0.24	1.57	24	5.8	18.5	52	41	5.5	70	36	51.1	74	4.5	-	7	4.5	15	14.5	3.6 (4.5)	6.5 (8)	4.5 (6)	20	60	M3 x 16 (M4 x 16)	9 340	12 500	100	99.5 533	99.5 533	MEG 15
METG 15									-	M5	-	METG 15																		
MEC 20	0.18	2.28	28	6	19.5	59	49	5	47	-	24.7	59	5.5	-	9	5.5	20	16	6	9.5	8.5	20	60	M5 x 16	7 580	7 340	78.9	31.5 235	31.5 235	MEC 20
METC 20									-	M6	-	METC 20																		
ME 20	0.30	2.28	28	6	19.5	59	49	5	66.5	32	44.2	79	5.5	-	9	5.5	20	16	6	9.5	8.5	20	60	M5 x 16	11 600	13 400	145	95.6 561	95.6 561	ME 20
MET 20									-	M6	-	MET 20																		
MEG 20	0.39	2.28	28	6	19.5	59	49	5	82	45	60.1	95	5.5	-	9	5.5	20	16	6	9.5	8.5	20	60	M5 x 16	14 400	18 300	197	172 918	172 918	MEG 20
METG 20									-	M6	-	METG 20																		
MEC 25	0.33	3.09	33	7	25	73	60	6.5	59	-	32	71	7	-	10	6.5	23	19	7	11	9	20	60	M6 x 20	12 400	12 300	153	71.8 480	71.8 480	MEC 25
METC 25									-	M8	-	METC 25																		
ME 25	0.54	3.09	33	7	25	73	60	6.5	83	35	56	95	7	-	10	6.5	23	19	7	11	9	20	60	M6 x 20	18 100	21 100	262	195 1 090	195 1 090	ME 25
MET 25									-	M8	-	MET 25																		
MEG 25	0.72	3.09	33	7	25	73	60	6.5	102	50	75	114	7	-	10	6.5	23	19	7	11	9	20	60	M6 x 20	22 200	28 200	349	336 1 740	336 1 740	MEG 25
METG 25									-	M8	-	METG 25																		

Note (1): Track rail lengths L are shown in Table 26.3.

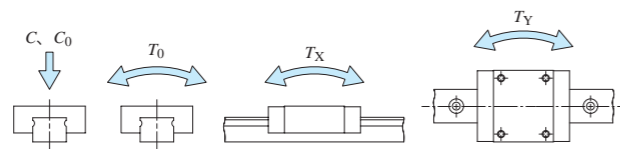
1N 0.102kgf

(2): Track rail mounting bolts are not appended. Hexagon socket bolts of JIS B 1176 strength division 12.9 or equivalent are recommended.

(3): The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_X and T_Y) are shown in the sketches below.

The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.

Remark: Values in parentheses are applicable to the supplemental code "/M4" of special specification.



Example of identification number for assembled set

Model code	Size	Part code	Preload symbol	Class symbol	Interchangeable code	Supplemental code
ME	G	20	C2	R820	T1	P S2 /U

Series

- ME Flange type, mounting from bottom
- MET Flange type, mounting from top

Length of slide unit

- C Short
- No symbol Standard
- G High rigidity long

Size

- 15, 20, 25

Number of slide unit (two slide units)

- 2

Length of track rail (820mm)

- 820

Interchangeable code

- S1 Interchangeable specification
- S2 Interchangeable specification
- No symbol Non interchangeable specification

Special specification

- A, D, E, F, I, J, L, LF, MA, M4, N, T, U, V, W, Z

Preload amount

- Tc Clearance
- No symbol Standard
- T1 Light preload
- T2 Medium preload

Accuracy class

- No symbol Ordinary
- H High
- P Precision
- SP Super precision

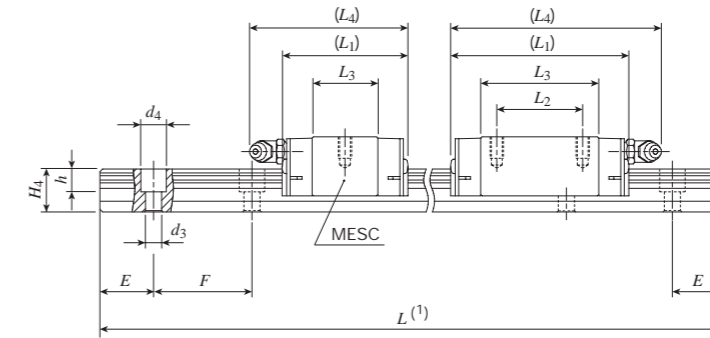
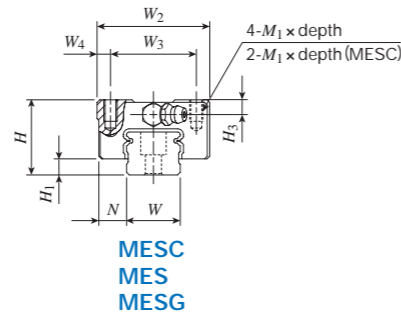
In case ordering track rail only, model code is changed as shown below.

Track rail of interchangeable ME → Model code LWE (Ex: LWE20R820PS2)

IKO C-Sleeve Linear Way ME

Block type,
mounting from top

Short : MESC
Standard : MES
High rigidity long : MESG



Model number	Mass (Reference) g		Dimension of assembly mm			Dimension of slide unit mm								Dimension of track rail mm							Recommended mounting bolt for track rail mm Bolt size x length	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N	Static moment rating ⁽³⁾			Model number	
	Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ x depth	H ₃	W	H ₄	d ₃	d ₄	h	E				F	T ₀ N·m	T _X N·m		T _Y N·m
MESC 15	0.09	1.57	24	5.8	9.5	34	26	4	41	-	22.4	45	M4 x 7	4.5	15	14.5	3.6 (4.5)	6.5 (8)	4.5 (6)	20	60	M3 x 16 (M4 x 16)	5 240	5 480	43.8	21.3 149	21.3 149	MESC 15
MES 15	0.14								57	26	38.4	61											7 640	9 390	75.1	57.6 333	57.6 333	MES 15
MESG 15	0.18								70	36	51.1	74											9 340	12 500	100	99.5 533	99.5 533	MESG 15
MESC 20	0.15	2.28	28	6	11	42	32	5	47	-	24.7	59	M5 x 8	5.5	20	16	6	9.5	8.5	20	60	M5 x 16	7 580	7 340	78.9	31.5 235	31.5 235	MESC 20
MES 20	0.25								66.5	32	44.2	79											11 600	13 400	145	95.6 561	95.6 561	MES 20
MESG 20	0.32								82	45	60.1	95											14 400	18 300	197	172 918	172 918	MESG 20
MESC 25	0.26	3.09	33	7	12.5	48	35	6.5	59	-	32	71	M6 x 9	6.5	23	19	7	11	9	20	60	M6 x 20	12 400	12 300	153	71.8 480	71.8 480	MESC 25
MES 25	0.41								83	35	56	95											18 100	21 100	262	195 1 090	195 1 090	MES 25
MESG 25	0.54								102	50	75	114											22 200	28 200	349	336 1 740	336 1 740	MESG 25

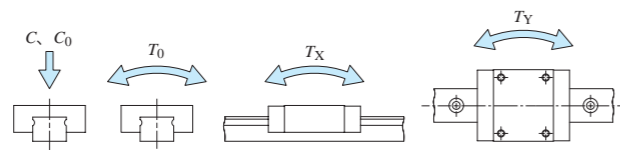
Note (1): Track rail lengths L are shown in Table 26.3.

1N 0.102kgf

(2): Track rail mounting bolts are not appended. Hexagon socket bolts of JIS B 1176 strength division 12.9 or equivalent are recommended.

(3): The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_X and T_Y) are shown in the sketches below. The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.

Remark: Values in parentheses are applicable to the supplemental code "/M4" of special specification.



Example of identification number for assembled set

Model code	Size	Part code	Preload symbol	Class symbol	Interchangeable code	Supplemental code
MES	G	20	C2	R820	T1	P S2 /U

Series
MES | Block type, mounting from top

Length of slide unit
C | Short
No symbol | Standard
G | High rigidity long

Size
15, 20, 25

Number of slide unit (two slide units)

Length of track rail (820mm)

Interchangeable code
S1 | S1 interchangeable specification
S2 | S2 interchangeable specification
No symbol | Non interchangeable specification

Special specification
A, D, E, F, I, J, L, LF, MA, M4, N, T, U, V, W, Z

Accuracy class
No symbol | Ordinary
H | High
P | Precision
SP | Super precision

Preload amount
Tc | Clearance
No symbol | Standard
T1 | Light preload
T2 | Medium preload

In case ordering track rail only, model code is changed as shown below.
Track rail of interchangeable ME → Model code LWE (Ex: LWE20R820PS2)

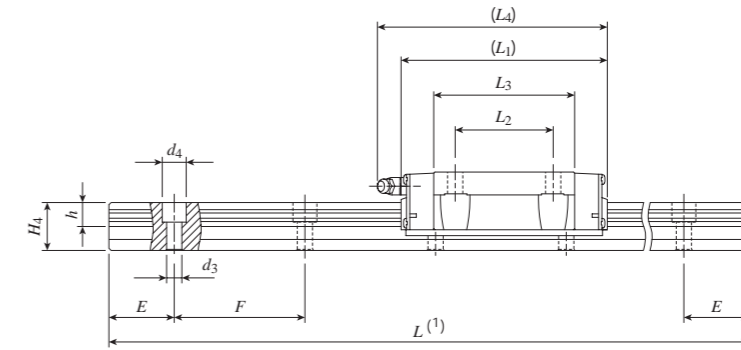
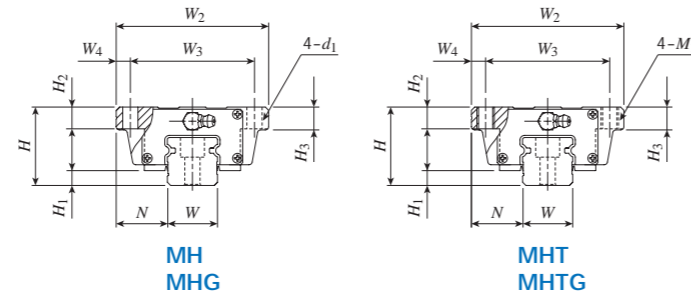
IKO C-Sleeve Linear Way MH

Flange type, mounting from bottom

Flange type, mounting from top

Standard : MH
High rigidity long : MHG

Standard : MHT
High rigidity long : MHTG



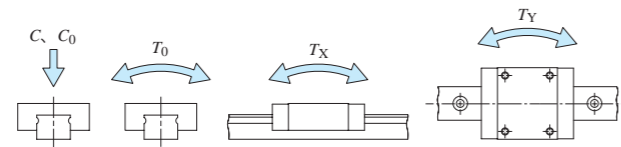
Model number	Mass (Reference) g		Dimension of assembly mm			Dimension of slide unit mm										Dimension of track rail mm							Recommended mounting bolt for track rail mm Bolt size x length	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N	Static moment rating ⁽³⁾			Model number	
	Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	d ₁	M ₁	H ₂	H ₃	W	H ₄	d ₃	d ₄	h	E				F	T ₀	T _X		T _Y
MH 15	0.22	1.47	24	4.5	16	47	38	4.5	66	30	44.2	69	4.5	-	7	4.5	15	15	4.5	8	6	30	60	M4 x 16	11 600	13 400	112	95.6 556	95.6 556	MH 15
MHT 15									112	40	56	95	-	M5	10	5.5														MHT 15
MH 20	0.47	2.56	30	5	21.5	63	53	5	83	40	56	95	6	-	10	5.5	20	18	6	9.5	8.5	30	60	M5 x 18	18 100	21 100	232	195 1 090	195 1 090	MH 20
MHT 20									112				40	56																95
MHG 20	0.69	2.56	30	5	21.5	63	53	5	112	40	84.8	124	6	-	10	5.5	20	18	6	9.5	8.5	30	60	M5 x 18	24 100	31 700	349	421 2 140	421 2 140	MHG 20
MHTG 20									112				40	84.8																124
MH 25	0.69	3.50	36	6.5	23.5	70	57	6.5	95	45	63.9	106	7	-	10	6.5	23	22	7	11	9	30	60	M6 x 22	25 200	28 800	362	309 1 690	309 1 690	MH 25
MHT 25									118				45	63.9																106
MHG 25	0.91	3.50	36	6.5	23.5	70	57	6.5	118	45	86.6	129	7	-	10	6.5	23	22	7	11	9	30	60	M6 x 22	30 800	38 300	483	533 2 740	533 2 740	MHG 25
MHTG 25									118				45	86.6																129

Note (1) : Track rail lengths L are shown in Table 26.4.

1N 0.102kgf

(2) : Track rail mounting bolts are not appended. Hexagon socket bolts of JIS B 1176 strength division 12.9 or equivalent are recommended. In case set order and mounting bolts are required, please indicate "/MA" onto the identification number.

(3) : The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_X and T_Y) are shown in the sketches below. The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.



Example of identification number for assembled set

Model code	Size	Part code	Preload symbol	Class symbol	Interchangeable code	Supplemental code
MH	G	20	C2	R480	T ₁	P S2 /D

Series

MH Flange type, mounting from bottom
MHT Flange type, mounting from top

Length of slide unit

No symbol Standard
G High rigidity long

Size

15, 20, 25

Number of slide unit (two slide units)

20

Length of track rail (480mm)

R480

Interchangeable code

S1 S1 Interchangeable specification
S2 S2 Interchangeable specification
No symbol Non interchangeable specification

Special specification

A, D, E, F, I, J, L, LF, MA, N, PS, T, V, W, Z

Accuracy class

H High
P Precision
SP Super precision

Preload amount

No symbol Standard
T₁ Light preload
T₂ Medium preload
T₃ Heavy preload

In case ordering track rail only, model code is changed as shown below.

Track rail of interchangeable MH → Model code LWH (Ex: LWH25R480BPS2)

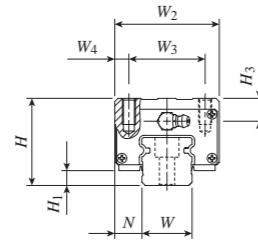
IKO C-Sleeve Linear Way MH

Block type,
mounting from top

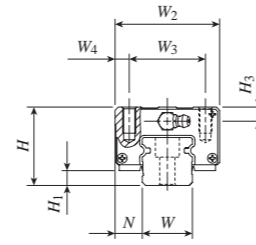
Compact block type,
mounting from top

Standard : MHD
High rigidity long : MHDG

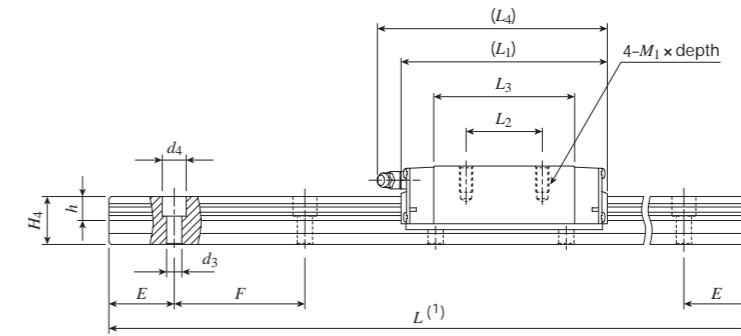
Standard : MHS
High rigidity long : MHSG



MHD
MHDG



MHS
MHSG



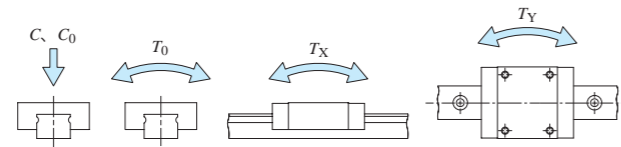
Model number	Mass (Reference) g		Dimension of assembly mm			Dimension of slide unit mm								Dimension of track rail mm							Recommended mounting bolt for track rail mm Bolt size x length	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N	Static moment rating ⁽³⁾			Model number	
	Slide unit kg	Track rail kg/m	H	H ₁	N	W ₂	W ₃	W ₄	L ₁	L ₂	L ₃	L ₄	M ₁ x depth	H ₃	W	H ₄	d ₃	d ₄	h	E				F	T ₀ N·m	T _X N·m		T _Y N·m
MHD 15	0.23	1.47	28	4.5	9.5	34	26	4	66	26	44.2	69	M4 x 10	8.5	15	15	4.5	8	6	30	60	M4 x 16	11 600	13 400	112	95.6	95.6	MHD 15
MHS 15	0.18		24						83	36	56	95													M4 x 8	4.5	195	
MHS 20	0.35	2.56	30	5	12	44	32	6	112	50	84.8	124	M5 x 10	5.5	20	18	6	9.5	8.5	30	60	M5 x 18	18 100	21 100	232	195	195	MHS 20
MHSG 20	0.52		95						35	63.9	106	421													421			
MHD 25	0.64	3.50	40	6.5	12.5	48	35	6.5	95	35	63.9	106	M6 x 12	10.5	23	22	7	11	9	30	60	M6 x 22	25 200	28 800	362	309	309	MHD 25
MHS 25	0.54		36						118	50	86.6	129													421	421		
MHDG 25	0.78		40						10.5	533	533																	
MHSG 25	0.66		36						6.5	2 740	2 740																	

Note (1): Track rail lengths L are shown in Table 26.4.

1N 0.102kgf

(2): Track rail mounting bolts are not appended. Hexagon socket bolts of JIS B 1176 strength division 12.9 or equivalent are recommended. In case set order and mounting bolts are required, please indicate "/MA" onto the identification number.

(3): The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_X and T_Y) are shown in the sketches below.
The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.



Example of identification number for assembled set

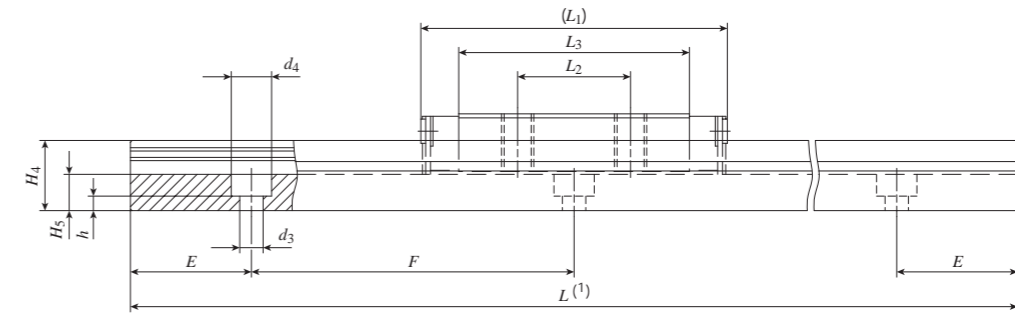
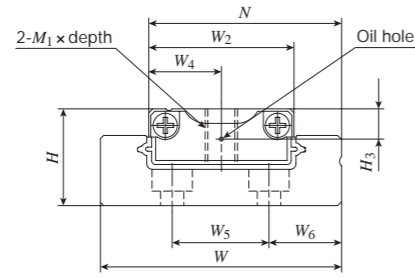
Model code	Size	Part code	Preload symbol	Class symbol	Interchangeable code	Supplemental code
MHD	G	20	C2	R480	T1	P S2 /D
Series						
MHD	Block type, mounting from top					
MHS	Compact block type, mounting from top					
Length of slide unit						
No symbol	Standard					
G	High rigidity long					
Size						
15, 20, 25						
Number of slide unit (two slide units)						
Length of track rail (480mm)						
Interchangeable code						
S1	S1 Interchangeable specification					
S2	S2 Interchangeable specification					
No symbol	Non interchangeable specification					
Special specification						
/D	A, D, E, F, I, J, L, LF, MA, N, PS, T, V, W, Z					
Accuracy class						
H	High					
P	Precision					
SP	Super precision					
Preload amount						
No symbol	Standard					
T1	Light preload					
T2	Medium preload					
T3	Heavy preload					

In case ordering track rail only, model code is changed as shown below.

Track rail of interchangeable MH → Model code LWH (Ex: LWH25R480BPS2)

IKO C-Sleeve Linear Way MUL Miniature type

MUL



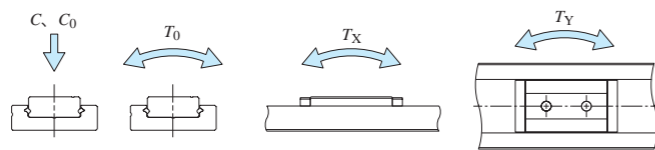
Model number	Mass (Reference) g		Dimension of assembly mm		Dimension of slide unit mm								Dimension of track rail mm						Recommended mounting bolt for track rail mm Bolt size x length	Basic dynamic load rating ⁽³⁾ C N	Basic static load rating ⁽³⁾ C ₀ N	Static moment rating ⁽³⁾			Model number			
	Slide unit	Track rail (per 100mm)	H	N	W ₂	W ₄	L ₁	L ₂	L ₃	M ₁ x depth	H ₃	W	H ₄	H ₅	W ₅	W ₆	d ₃	d ₄				h	E	F		T ₀ N·m	T _X N·m	T _Y N·m
MUL 25	13	87	9	19.4	14	7	31	12	22	M3 x 5	2.9	24.9	6.7	3.2	9	8	2.9	4.8	1.6	17.5	35	Cross-recessed head screw for precision equipment M2.5 x 6	1 770	2 840	20.3	10.1 53.7	8.4 45.0	MUL 25
MUL 30	28	139	12	23.9	18	9	38	14	28.6	M4 x 7	3.75	29.9	8.7	4.5	12	9	2.9	5	2.7	20	40	Hexagon socket head bolt M2.5 x 6	2 280	3 810	34.9	16.9 87.5	14.2 73.4	MUL 30

Note (1): Track rail lengths L are shown in Table 26.5.

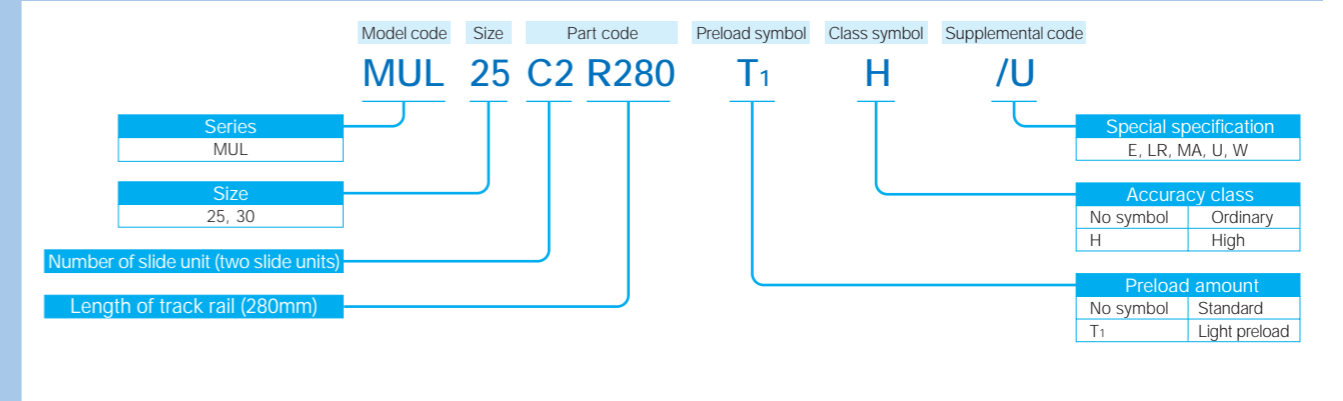
1N 0.102kgf

(2): Track rail mounting bolts are not appended. In case recommended bolts are required, please indicate "/MA" onto the identification number.

(3): The directions of basic dynamic load rating (C), basic static load rating (C₀) and static moment rating (T₀, T_X and T_Y) are shown in the sketches below.
The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.



Example of identification number for assembled set



NIPPON THOMPSON CO., LTD.

Head office : 19-19 Takanawa 2-chome
Minato-ku, Tokyo 108-8586, Japan
Phone : +81 (0)3-3448-5850
Fax : +81 (0)3-3447-7637
E-mail : ntt@ikonet.co.jp
URL : <http://www.ikont.co.jp/eg/>
Plant : Gifu, Kamakura

Nippon Thompson Co., Ltd.

- ASEAN REPRESENTATIVE OFFICE
586 Luang Road, Pomprab
Pomprab Satrupai, Bangkok
Thailand 10100
Phone: +66 (0)-2623-3699
Fax: +66 (0)-2623-0716
E-mail: iko@anet.net.th
- CHINA REPRESENTATIVE OFFICE
Shanghai Apollo Business Center 619
1440 Yan An C. Road, Shanghai 200040
People's Republic of China
Phone: +86 (0)21-6248-1120
Fax: +86 (0)21-6249-6835

IKO International, Inc.

- 91 Walsh Drive
Parsippany, NJ 07054
U.S.A.
Phone: +1 973-402-0254
Toll Free: 1-800-922-0337
Fax: +1 973-402-0441
E-mail: eco@ikonet.co.jp
- 500 East Thorndale Avenue
Wood Dale, IL 60191
U.S.A.
Phone: +1 630-766-6464
Toll Free: 1-800-323-6694
Fax: +1 630-766-6869
E-mail: mwo@ikonet.co.jp
- 20170 South Western Avenue
Torrance, CA 90501
U.S.A.
Phone: +1 310-609-3988
Toll Free: 1-800-252-3665
Fax: +1 310-609-3916
E-mail: wco@ikonet.co.jp
- 2150 Boggs Road, Suite 100
Duluth, GA 30096
U.S.A.
Phone: +1 770-418-1904
Toll Free: 1-800-874-6445
Fax: +1 770-418-9403
E-mail: seo@ikonet.co.jp
- 8105 N. Beltline Road
Suite 130, Irving, TX 75063
U.S.A.
Phone: +1 972-929-1515
Toll Free: 1-800-295-7886
Fax: +1 972-915-0060
E-mail: sw0@ikonet.co.jp

Nippon Thompson Europe B.V.

- Sheffieldstraat 35-39
3047 AN Rotterdam
The Netherlands
Phone: +31 (0)10-4626868
Fax: +31 (0)10-4626099
E-mail: nte@ikonet.co.jp
- Mündelheimer Weg 56
40472 Düsseldorf
Germany
Phone: +49 (0)211-414061
Fax: +49 (0)211-427693
E-mail: ntd@ikonet.co.jp

Donaustauer Str. 200
93059 Regensburg
Germany
Phone: +49 (0)941-447737
Fax: +49 (0)941-447747

Gruben Str.95c
66540 Neunkirchen
Germany
Phone: +49 (0)6821-742535
Fax: +49 (0)6821-742536
- 2 Vincent Avenue, Crownhill
Milton Keynes Bucks MK8 OAB
United Kingdom
Phone: +44 (0)1908-566144
Fax: +44 (0)1908-565458
E-mail: sales@iko.co.uk
- Autovia Madrid-Barcelona, Km. 43,700
Polig. Ind. AIDA, A-8, Ofic. 2, 1ª
19200-Azuqueca de Henares
Guadalajara, Spain
Phone: +34 949-263390
Fax: +34 949-263113
E-mail: nts@ikonet.co.jp
- Roissypole Le Dôme
2 rue de La Haye
BP 10950 Tremblay en France
95733 Roissy C. D. G. Cedex
France
Phone: +33 (0)1-48165739
Fax: +33 (0)1-48165746
E-mail: ntf@ikonet.co.jp

Although all data in this catalog has been carefully compiled to make the information as complete as possible, NIPPON THOMPSON CO., LTD. shall not be liable for any damages whatsoever, direct or indirect, based upon any information in this catalog. NIPPON THOMPSON CO., LTD. makes no warranty, either express or implied, including the implied warranty of merchantability or fitness for a particular purpose.