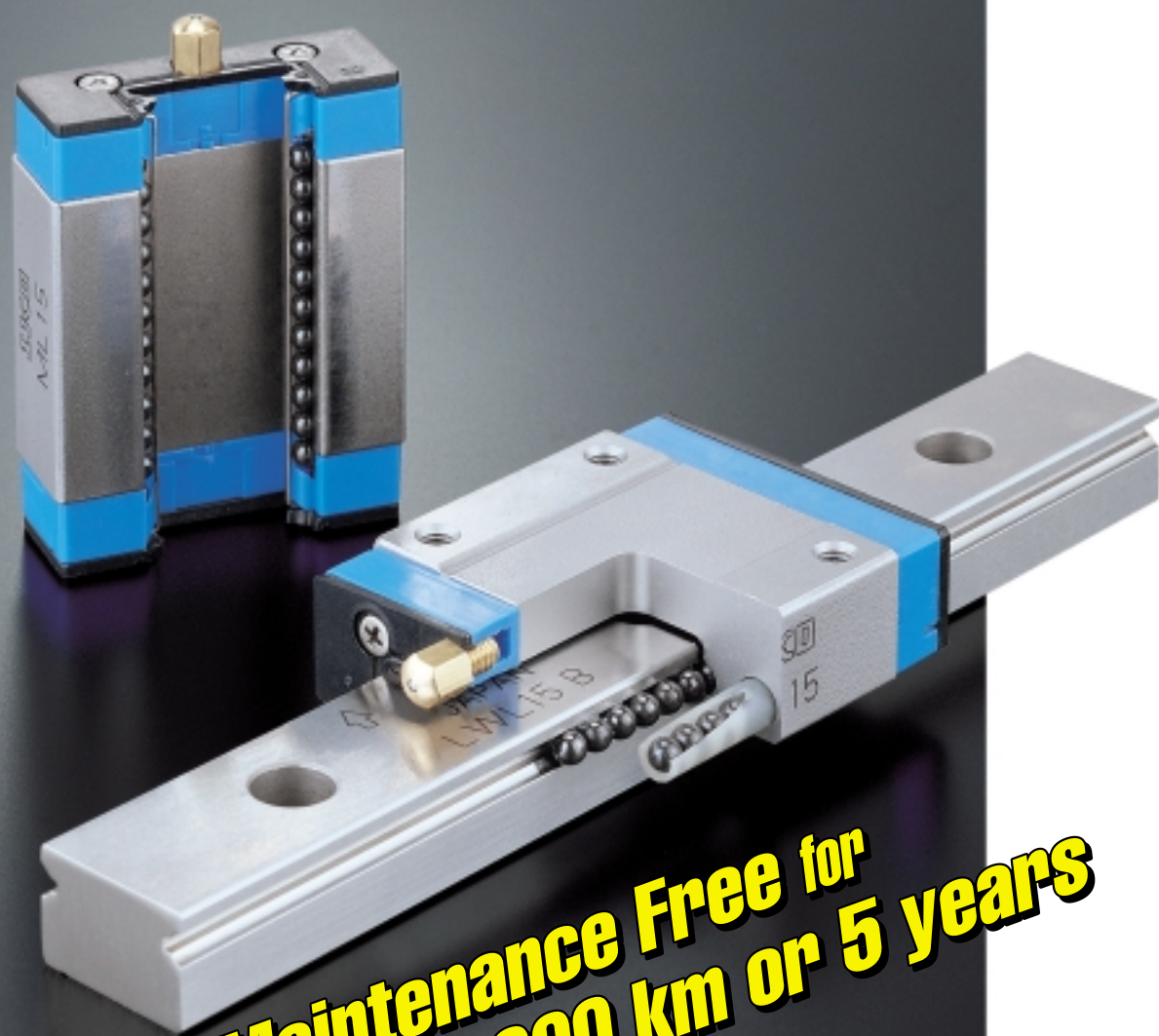


IKO

C-Sleeve Linear Way ML

Ceramic Ball Specification



**Maintenance Free for
 20,000 km or 5 years**

CAT-5946



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IKO C-Sleeve Linear Way

Maintenance Free

Ability of lubrication is maintained for long term and allows cost reduction in lubrication management and systems.

Compact

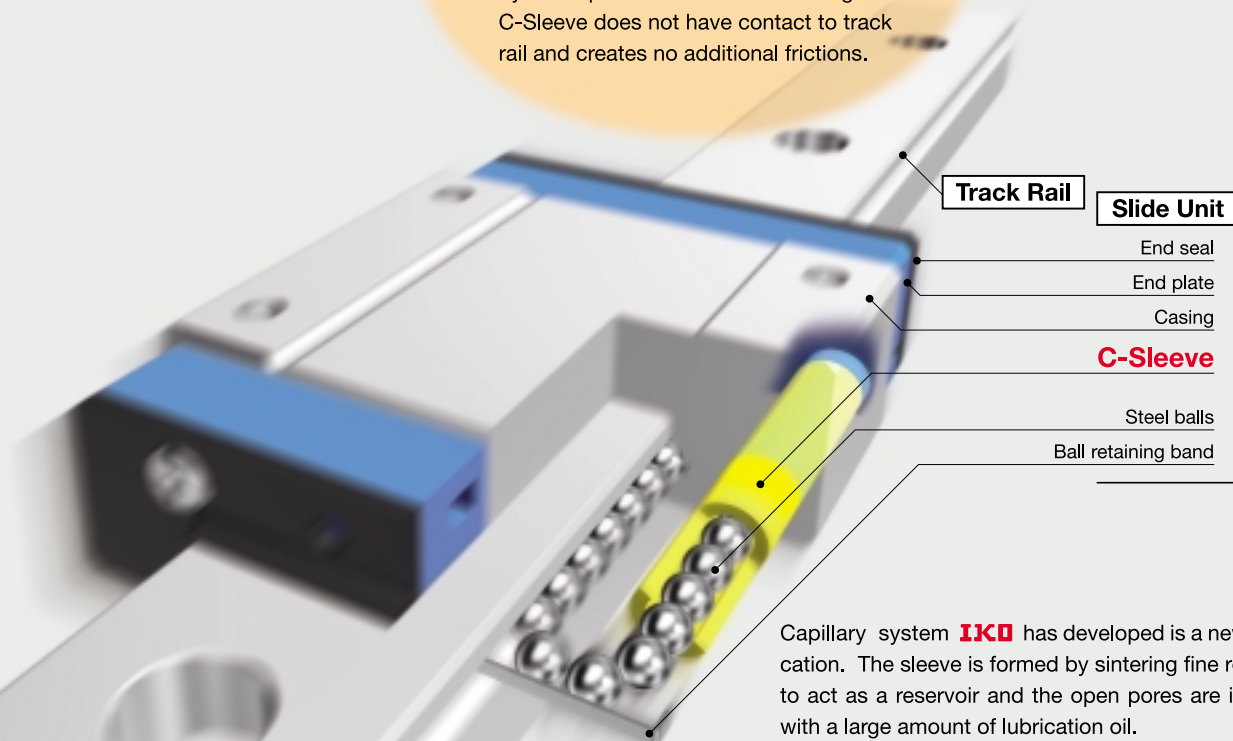
No increase in carriage length unlike a bolt-on external lubrication components. No loss of available stroke length when replacing standard units.

Ecology

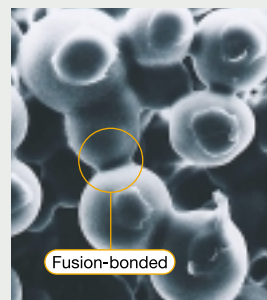
C-Sleeve contributes to global environment protection as the amount of lubricant can be minimized.

Smooth

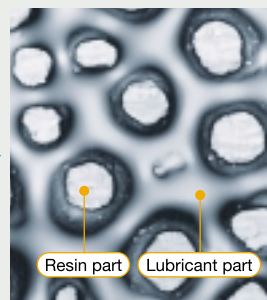
Light and smooth running is achieved by the improvement of internal design. C-Sleeve does not have contact to track rail and creates no additional frictions.



Capillary system **IKO** has developed is a new type lubrication. The sleeve is formed by sintering fine resin powder to act as a reservoir and the open pores are impregnated with a large amount of lubrication oil. The capillary action will then deposit the appropriate amount of lubrication on to the rolling elements to protect raceway surfaces.



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

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 keeps supplying lubricant for long period of time even after original grease inside of the slide unit is completely exhausted.

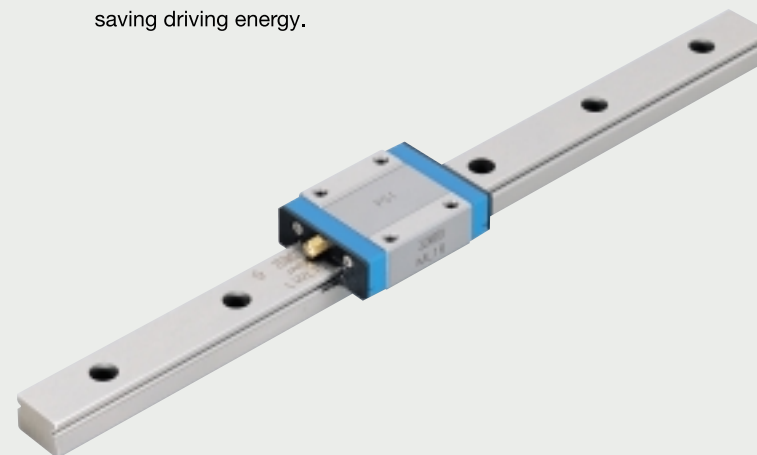
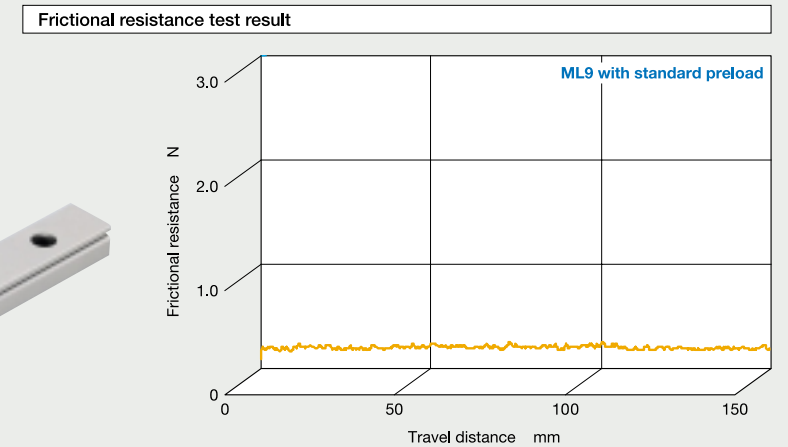
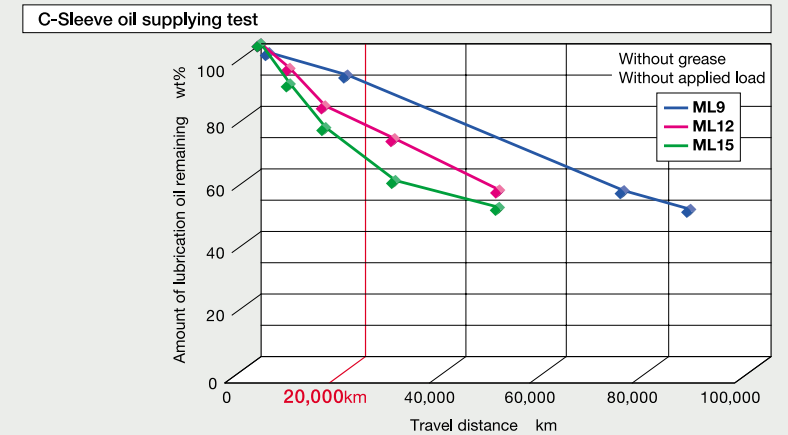
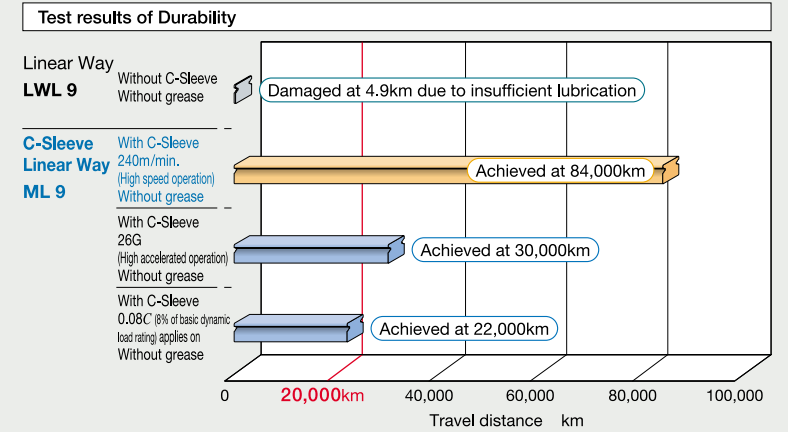
※ This durability test has been simulated for general use.
Re-lubrication may necessary if operating condition is extremely severe.

Ecological contribution to the global environment by conserving oil

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

Smooth and light operation

C-Sleeve has no contact with the track rail. This permits smooth and light sliding 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 driving energy.



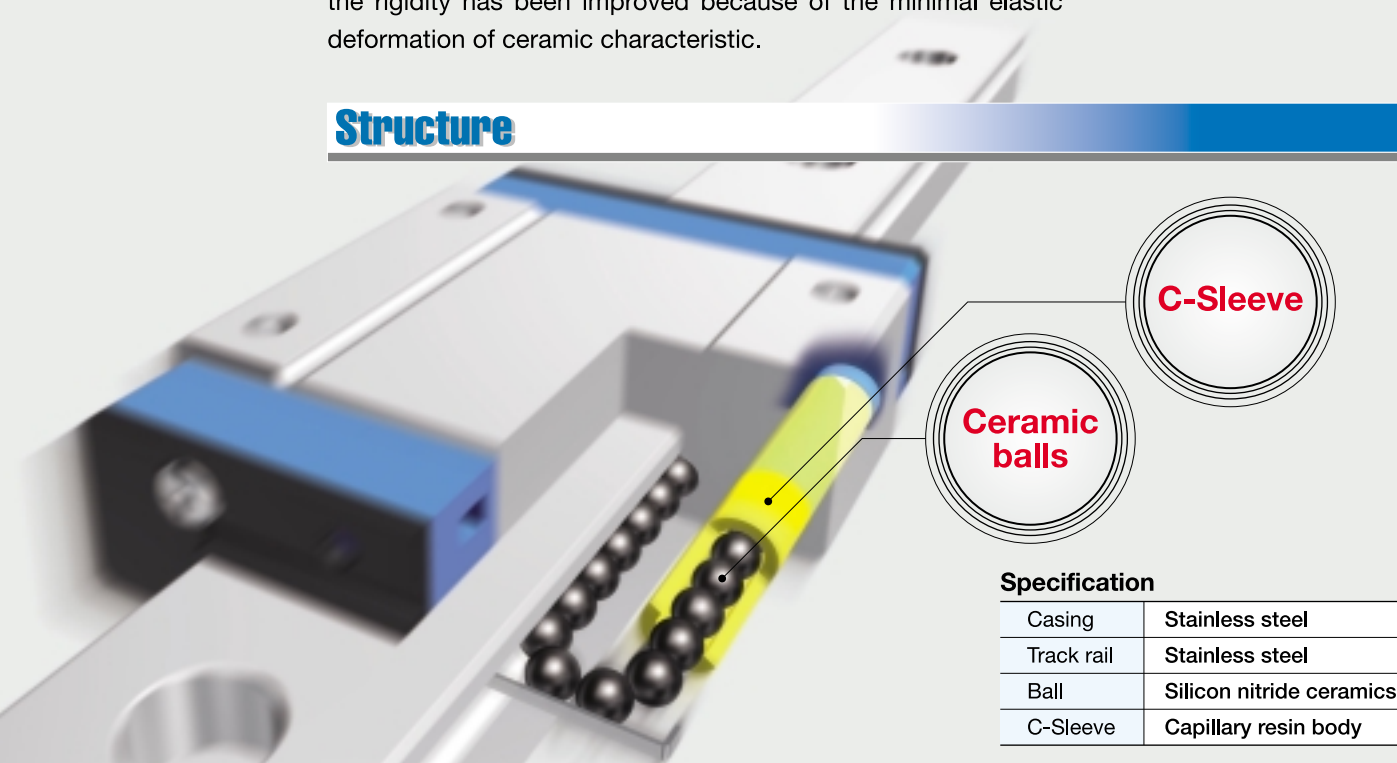
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO C-Sleeve Linear Way ML with Ceramic Ball Specification

ML.../HB

Silicon nitride ceramics balls are incorporated in the slide unit to realize high-speed operation and low running noise. In addition, the rigidity has been improved because of the minimal elastic deformation of ceramic characteristic.

Structure

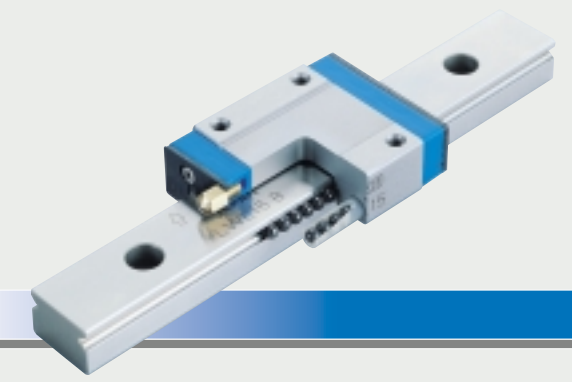


| Specification | |
|---------------|--------------------------|
| Casing | Stainless steel |
| Track rail | Stainless steel |
| Ball | Silicon nitride ceramics |
| C-Sleeve | Capillary resin body |

Features

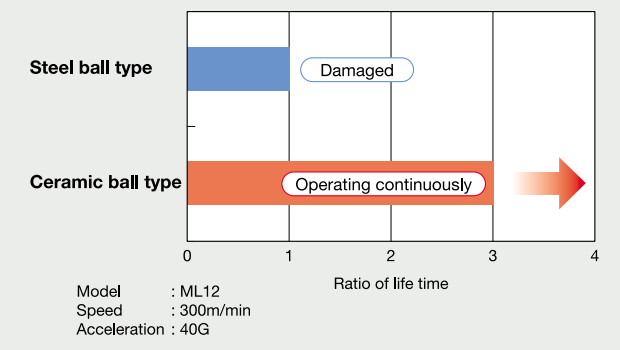
- 1 High Speed Operation**
Three times of durability
- 2 Low Running Noise**
Approximately 4.5dB
- 3 High Rigidity**
Deformation reduced by 10%
- 4 High Wear Resistance**
Wear resistance improved by four times

| | |
|--|--|
| <p>Maintenance Free</p> <p>Ability of lubrication is maintained for 5 years or 20,000 km. Cost of lubrication management and system can be reduced.</p> | <p>Ecology</p> <p>For the global environment protection</p> |
| <p>Compact</p> <p>No increase in length of slide unit No loss of available stroke length</p> | <p>Smooth</p> <p>Very light running motion</p> |

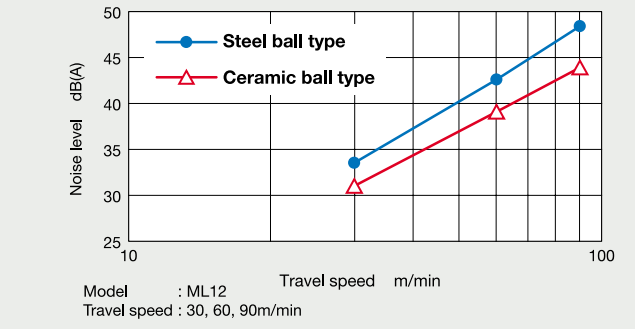


Performance

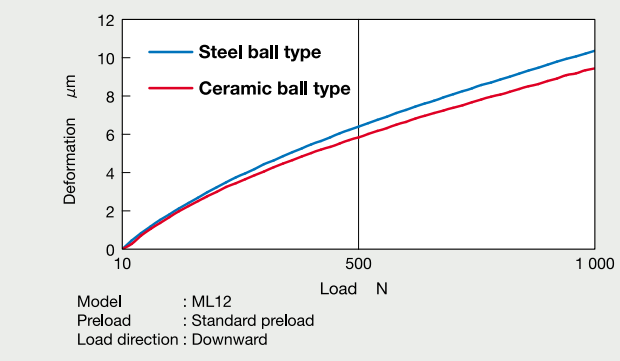
High-Speed Operation



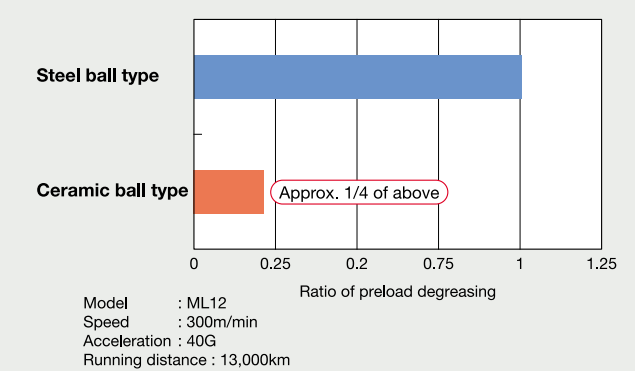
Low Noise in Operation



High Rigidity



Wear Resistance



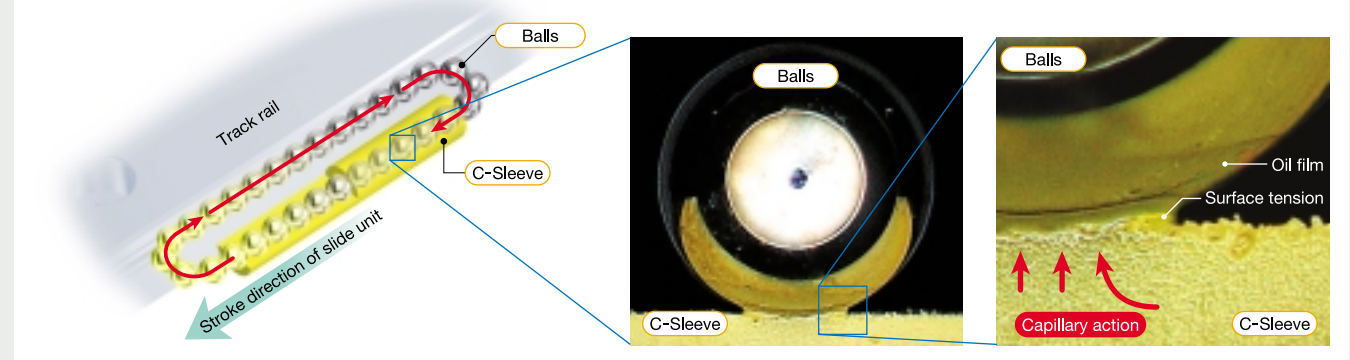
Lubricant supply mechanism of C-Sleeve system

The circulation of the balls distributes lubricant.

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

Lubricant is deposited directly to the surface of the balls.

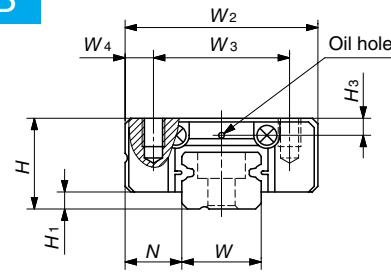
The surface of C-Sleeve is always covered with the lubricant. Lubricant is continuously supplied to the surface of ball by surface tension in the contact of C-Sleeve surface and balls. New oil permeates automatically from the core of C-Sleeve to the internal surface that comes in contact with balls.



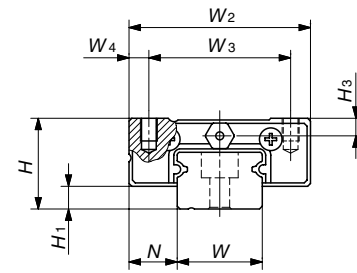
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

IKO C-Sleeve Linear Way ML Ceramic ball specification

MLC·ML·MLG···/HB



MLC7~MLC 12···/HB
ML 7~ML 12···/HB
MLG7~MLG 12···/HB



MLC15···/HB
ML 15···/HB
MLG15···/HB

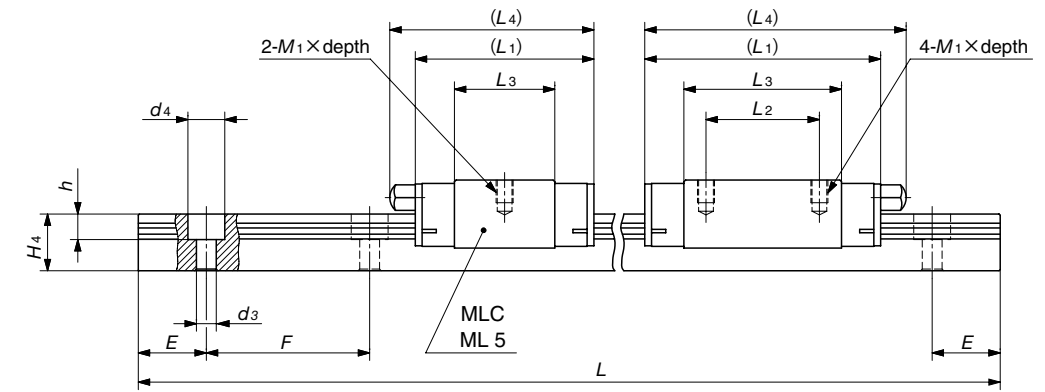
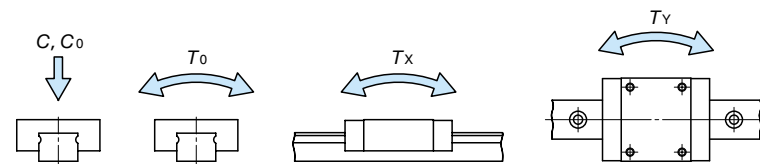
| Model number | Mass (Reference) g | | Dimension of assembly mm | | | Dimension of slide unit mm | | | | | | | | | |
|---------------------|--------------------|------------------------|--------------------------|----------------|-----|----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------|----------------|----|
| | 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 |
| MLC 7···/HB | 6.1 | 22 | 8 | 1.5 | 5 | 17 | 12 | 2.5 | 19 | — | 9.6 | — | M2×2.5 | 1.5 | 7 |
| ML 7···/HB | 8.4 | | | | | | | | 23.5 | 8 | 14.3 | | | | |
| MLG 7···/HB | 12 | | | | | | | | 31 | 12 | 21.6 | | | | |
| MLC 9···/HB | 11 | 35 | 10 | 2 | 5.5 | 20 | 15 | 2.5 | 21.5 | — | 11.9 | — | M3×3 | 2.2 | 9 |
| ML 9···/HB | 17 | | | | | | | | 30 | 10 | 20.8 | | | | |
| MLG 9···/HB | 25 | | | | | | | | 40.5 | 15 | 30.9 | | | | |
| MLC 12···/HB | 20 | 65 | 13 | 3 | 7.5 | 27 | 20 | 3.5 | 25 | — | 13 | — | M3×3.5 | 2.7 | 12 |
| ML 12···/HB | 31 | | | | | | | | 34 | 15 | 21.6 | | | | |
| MLG 12···/HB | 44 | | | | | | | | 44 | 20 | 32 | | | | |
| MLC 15···/HB | 40 | 107 | 16 | 4 | 8.5 | 32 | 25 | 3.5 | 32 | — | 17.8 | 36 | M3×4 | 3.1 | 15 |
| ML 15···/HB | 58 | | | | | | | | 42 | 20 | 27.9 | 47 | | | |
| MLG 15···/HB | 86 | | | | | | | | 57 | 25 | 42.8 | 62 | | | |

Note (1) : 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.

Remarks 1 : The appended bolts for mounting track rails are hexagon socket head bolts of JIS B1176 or equivalent, or cross-recessed head cap screws for precision equipment.

2 : Oil hole is provided for ML7 to ML12 models.



| Dimension of track rail mm | | | | | | Included mounting bolt for track rail mm Bolt size x length | Basic dynamic load rating (1) C N | Basic static load rating (1) C ₀ N | Static moment rating (1) | | | Model number |
|----------------------------|----------------|----------------|-----|------|----|--|---|---|--------------------------|-----------------------|-----------------------|---------------------|
| H ₄ | d ₃ | d ₄ | h | E | F | | | | T ₀ N·m | T _x N·m | T _y N·m | |
| 5 | 2.4 | 4.2 | 2.3 | 7.5 | 15 | Hexagon socket head bolt M2×6 | 937 | 965 | 3.5 | 1.6 | 1.3 | MLC 7···/HB |
| | | | | | | | 1 330 | 1 610 | 5.9 | 4.0 | 3.3 | ML 7···/HB |
| | | | | | | | 1 690 | 2 250 | 8.2 | 7.5 | 6.3 | MLG 7···/HB |
| 6 | 3.5 | 6 | 3.5 | 10 | 20 | Hexagon socket head bolt M3×8 | 1 180 | 1 260 | 5.9 | 2.4 | 2.1 | MLC 9···/HB |
| | | | | | | | 1 810 | 2 340 | 10.9 | 7.7 | 6.5 | ML 9···/HB |
| | | | | | | | 2 370 | 3 420 | 15.9 | 15.9 | 13.4 | MLG 9···/HB |
| 8 | 3.5 | 6.5 | 4.5 | 12.5 | 25 | Hexagon socket head bolt M3×8 | 2 210 | 2 030 | 12.6 | 4.5 | 3.8 | MLC 12···/HB |
| | | | | | | | 3 330 | 3 650 | 22.6 | 13.1 | 11.0 | ML 12···/HB |
| | | | | | | | 4 310 | 5 270 | 32.7 | 26.0 | 21.9 | MLG 12···/HB |
| 10 | 3.5 | 6.5 | 4.5 | 20 | 40 | Hexagon socket head bolt M3×10 | 3 490 | 3 310 | 25.5 | 9.9 | 8.3 | MLC 15···/HB |
| | | | | | | | 4 980 | 5 520 | 42.5 | 25.3 | 21.2 | ML 15···/HB |
| | | | | | | | 6 620 | 8 280 | 63.7 | 54.3 | 45.5 | MLG 15···/HB |

Example of identification number of assembled set

