The result of pursuing the minimum oil amount; in IKO original lubrication part "C-lube"
ML series is a linear motion rolling guide of the super-small size invented by an original small sizing technology. Stabilized accuracy and rigidity can be obtained even under the usage in which load that of the direction and the size change and compound load even though it is extremely small because of the structure of the arrangement of the steel ball with four point contacts in two row raceways.

**Features**

1. **Upgrading of load capacity and rigidity on your machine!**

   - Comparison of basic static load ratings
     - 32% higher than high rigidity long unit (MLL)
     - Comparison of elastic deformation under downward load
     - 85% of deflection against high rigidity long unit
   - Comparison of slide unit length
   - Comparison of basic static load ratings

2. **Contributing to downsizing of guide mechanism!**

   - Enable downsizing of the machines and devices in same height.
   - Extra high rigidity long unit is debut!

3. **Achieving of precision transferring mechanism!**

   - Enable to achieve ultra-high precision transferring mechanism due to about a half of running accuracy comparing with High rigidity long unit.

---

**Variation of C-Lube Linear Way ML**

<table>
<thead>
<tr>
<th>Shape</th>
<th>Length of slide unit</th>
<th>Model</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard type</td>
<td>Short</td>
<td>MLC</td>
<td>5, 7, 9, 12, 15, 20, 25</td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>ML</td>
<td>5, 7, 9, 12, 15, 20, 25</td>
</tr>
<tr>
<td></td>
<td>High rigidity long</td>
<td>MLG</td>
<td>—, —, 5, 7, 9, 12, 15, 20</td>
</tr>
<tr>
<td></td>
<td>Extra high rigidity long</td>
<td>MLL</td>
<td>—, —, 5, 7, 9, 12, 15, 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shape</th>
<th>Length of slide unit</th>
<th>Model</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide type</td>
<td>Short</td>
<td>MLFC</td>
<td>10, 14, 18, 24, 30, 42</td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>MLF</td>
<td>10, 14, 18, 24, 30, 42</td>
</tr>
<tr>
<td></td>
<td>High rigidity long</td>
<td>MLFG</td>
<td>—, —, 10, 14, 18, 24, 30</td>
</tr>
</tbody>
</table>

**Remarks:**

- Interchangeable specification which enables combination of slide unit and track rail freely is available.
MH series is a high rigidity linear motion rolling guide with the greatest load capacity by assembling of large diameter balls in. Stabilized accuracy and rigidity can be obtained even under the usage in which load that of the direction and the size change and compound load.

Expanding size of high rigidity long unit! Upgrading of load capacity and rigidity!

Variation of C-Lube Linear Way MH

<table>
<thead>
<tr>
<th>Shape</th>
<th>Length of slide unit</th>
<th>Model</th>
<th>Size</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flanged type mounting from bottom</td>
<td>Standard</td>
<td>MH</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>High rigidity long</td>
<td>MHG</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Flanged type mounting from top</td>
<td>Standard</td>
<td>MHT</td>
<td>-</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>High rigidity long</td>
<td>MHTG</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Block type mounting from top</td>
<td>Standard</td>
<td>MHD</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td></td>
<td>High rigidity long</td>
<td>MHDG</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Compact block type mounting from top</td>
<td>Standard</td>
<td>MHS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>High rigidity long</td>
<td>MHSG</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
</tbody>
</table>

Remarks: 1. Stainless steel type is also lined up in the model marked on.

MAG series is a linear motion rolling guide which achieves endless linear motion of an external cylinder along a spline shaft. As steel balls make rolling contact with the spline grooves, radial loads as well as rotating torque can be received. This product is most suitable for mechanisms that perform linear motion while transmitting rotating torque.

The smallest size among the series is debut! High rigidity long external cylinder is lined up!

Variation of C-Lube Linear Ball Spline MAG

<table>
<thead>
<tr>
<th>Shape</th>
<th>Length of external cylinder</th>
<th>Model</th>
<th>Size</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard solid shaft</td>
<td>Standard</td>
<td>MAG</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>High rigidity long</td>
<td>MAGL</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Standard hollow shaft</td>
<td>Standard</td>
<td>MAGT</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>High rigidity long</td>
<td>MAGLT</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Flanged type solid shaft</td>
<td>Standard</td>
<td>MAGF</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Flanged type hollow shaft</td>
<td>MAGFT</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Remarks: Interchangeable specification which enables combination of external cylinder and spline shaft freely is available.
CRWG...H series is a linear motion rolling guide structures that cylinder rollers are built between two ways with V-shaped raceway grooves, which are two planes. Due to rack and pinion gear mechanism, cage-creep cannot be occurred. Also, extremely highly accurate and smooth linear motion can be performed while receiving all directions load. Moreover, great load ratings have been achieved by thoroughly reviewing of specification of the contacting area in raceways comparing with the former type.

**Structure of CRWG...H**

- Cage-creeping issue has been eliminated by rack and pinion gear mechanism!
- Pinion gear
- Rack gear
- Way
- End screw
- Rack gear
- Cylindrical roller
- [ Roller cage ]
- Cage

**Features**

1. **Upgrading of load capacity and rigidity on your machine!**
   - Great load ratings have been achieved by thoroughly reviewing of specification of the contacting area in raceways against the former type.
   - **Comparison of basic dynamic load ratings**
     - 43 to 79% higher than former type!
   - **Comparison of basic static load ratings**
     - 60 to 113% higher than former type!

2. **Cage-creeping issue terminated perfectly!**
   - Original structure of built-in rack and pinion gear mechanism has terminated cage-creeping issue.
   - **Freedom in mounting**
     - Usable safety even for applications such as a vertical axis that a former type was hard to be adopted.
   - **High-speed and high-tact operation**
     - Cage creeping issue cannot be occurred even in increasing operating speed.
   - **Operation saving energy**
     - Any corrective operation for cage creep is not necessary even for a long time operation.

3. **Interchangeable in dimensions!**
   - The same external dimensions as on former type make easier to be replaced without any modification.

4. **Smooth and accurate operation!**
   - Combination of precisely finished raceways and non-recirculating cages with super high precision rollers provides superbly smooth motion with very high accuracy.
   - **Improved running accuracy**
     - Extremely high-running accuracy can be achieved without run-out by recirculating of rolling element.
   - **Suitable for step positioning**
     - Improvement of precision positioning accuracy and superior corresponding feature to step positioning command can be expected because of the linear motion without stick-slip by extremely small frictional resistance.
New Vacuum Environment Linear Roller Way Super X is a series of roller-type linear motion rolling guides that combine a corrosion-resistant stainless-steel casing with resin parts, such as a super-engineering plastic (PEEK resin) end plate, to solve this problem, thereby achieving excellent low out-gassing characteristics. It consistently exhibits the superb characteristics of a roller-type linear motion rolling guides, such as high load-carrying capacity, high rigidity and smooth and low-friction running performance, in a vacuum environment.

**Features**

1. **Usable from low to high-vacuum regions!** (vacuum $10^{-3}$[Pa])

2. **Excellent low outgassing characteristics!**

3. **Baking temperatures up to 200°C!**

   - Temperature in a static state.
   - At baking temperatures above 150 degree C, multiply the basic load rating by a temperature coefficient.

4. **Superb corrosion resistance!**

   - Corrosion-resistant stainless steel is used on all steel parts.

**Lubricant selection**

Fluorine-based grease is recommended. Please pay attention to the relation also between vapor pressure and temperature of fluorine-based as shown in the following graph when selection of grease. For detail information, please refer to catalog of grease manufacture.

**Typical brands of fluorine greases**

- BARRIERETA SUPER IS/V
- DEMNUM™ GREASE L-200
- FLUITRIBO VAC
- FOMBLIN® VAC3
- KRYTOX® LVP

Remarks:
1. FOMBLIN® is a registered trademark of Solvay Solexis.
2. KRYTOX® is a registered trademark of DuPont.

**Structure of Vacuum Environment Linear Roller Way Super X**

- Track rail
- Slide unit
- Casing
- Cylindrical roller
- Retaining plate
- Retaining band for pressure plate
- End plate
- Grease nipple
- End pressure plate

**Specifications**

<table>
<thead>
<tr>
<th>Series</th>
<th>Linear Roller Way Super X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable type</td>
<td>LRXD20...SL</td>
</tr>
</tbody>
</table>

**Material of main component**

- Casing: Martensitic stainless steel
- Track rail: Martensitic stainless steel
- Cylindrical roller: Martensitic stainless steel
- End plate: Super-engineering plastic (PEEK resin)
**Precision Positioning Table TE TE50**

Precision Positioning Table TE is a light-weight, compact positioning table featuring that its main components are made of high-strength aluminum alloy and the slide table is placed inside a U-shaped bed. Its driving mechanism adopts a precision-ground ball screw to assure high reliability and high-precision positioning. A C-Lube lubrication part built-in the linear motion rolling guide and the ball screw enables long-term maintenance-free operation. This can reduce your time-consuming for lubrication.

**Features**

1. **Light-weight, Low-cross section, and Compact!**
   - Light-weight and compact positioning table using high-strength aluminum alloy for its main components.
   - Low cross-section (26 mm high for TE50, 33 mm high for TE60 and 46 mm high for TE86) due to optimum designing of linear guides and ball screws.
   - No sensor rail for mounting sensors, which contributes to space saving.

2. **High positioning accuracy!**
   - Higher precision positioning by one rank due to a combination of unique linear rolling guide technology and precision-ground ball screws.

3. **Maintenance free!**
   - Long-term maintenance-free operation due to unique C-Lube lubrication part built-in the linear motion rolling guide and the ball screw. This can reduce labor time for lubrication and increase the reliability of the equipment.

4. **Amazing low prices!**
   - Excellent cost performance thanks to adoption of less components and improvement in parts shapes.

**Comparison with IKO Precision Positioning Table TU**

<table>
<thead>
<tr>
<th>Sectional height</th>
<th>TE50</th>
<th>TU50</th>
<th>TE60</th>
<th>TU60</th>
<th>TE86</th>
<th>TU86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke length mm</td>
<td>60</td>
<td>60</td>
<td>100</td>
<td>100</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Overall length mm</td>
<td>218</td>
<td>226</td>
<td>269</td>
<td>298</td>
<td>498</td>
<td>498</td>
</tr>
<tr>
<td>Mass (kg)</td>
<td>0.52</td>
<td>1.8</td>
<td>1.0</td>
<td>3.3</td>
<td>10.9</td>
<td>2.19</td>
</tr>
<tr>
<td>Mass/100mm kg</td>
<td>0.24</td>
<td>0.80</td>
<td>0.37</td>
<td>1.11</td>
<td>2.19</td>
<td></td>
</tr>
</tbody>
</table>

Note: The mass of whole table with single slide table is shown. The mass of motor is not included.

**Structure of TE**

- Motor
- Motor attachment
- Motor bracket
- End bracket
- Groove for sensors
- C-Lube ball screw
- Slide table
- Bed
Super Precision Positioning Table TX
TX...M, CTX...M

High Precision Positioning Table TX has realized almost as high positioning performance as the air stage by incorporated the ultimate rolling guide C-Lube Linear Roller Way Super X. In Precision Positioning Table LH which is well-known for high accuracy and high rigidity as the base.

Structure of TX...M and CTX...M

- Slide table
- C-Lube ball screw
- C-Lube Linear Roller Way Super MX
- Motor
- Head
- Scale
- Bed

Features

1. Long-term maintenance free!

Long-term maintenance-free feature is achieved by lubricating part, C-Lube built-in linear motion rolling guide and ball screw. Not only reduction of the cost of lubrication management and system, reliability of machine is improved.

- Lubricant is supplied directly to the surface of the steel balls.
- Lubricant is distributed by the circulation of the steel balls.
- Lubrication being properly maintained in the loading area for a long time.

2. Ultimate positioning performance!

High positioning accuracy and resolution due to super-high accuracy linear encoder

By directly feeding back positional information from the super-high accuracy linear encoder of a resolution of 0.016 μm, a full-closed-loop control system is established. This control system assures high positioning accuracy in the whole stroke length.

Ultimate running accuracy by adopting Linear Roller Way Super X

Rolling guide type of ultimate running accuracy thanks to good combination of components that are machined and assembled very accurately and C-Lube Linear Roller Way Super X that demonstrates the best running accuracy.

3. Selectable control method to fit for use!

Suitable control method can be selected because AC servomotor and stepper motor are prepared with optional linear encoder.
Cleanroom Precision Positioning Table TC...E is light-weight, low-cross section, and compact precision positioning table, which is TE table with light-sealing structure with stainless sheet and side covers that prevent dust generating from the table to the surrounding environment to correspond to cleanliness ISO Class 3 (Federal Standard 209D class 1). C-Lube lubrication parts are built-in the linear motion rolling guide integrated in the slide table and the ball screw, achieve long-term maintenance-free feature.

**Features**

1. **Cleanliness level equivalent to ISO class 3!** (Federal Standard 209D class 1)
   - The driving part and slide table guide part inside of table are sealed tightly with stainless sheet and side covers, which are excellent for corrosion resistance.

   - **Cleanliness measurement**
     - **Measuring condition**
       - **Item** | **Condition**
         - Measuring device | Particle counter
         - Air velocity in measuring zone | 2.5 m/s
         - Measuring air amount | 28.3 L (1cf)
         - Measuring time | 48 hours (10 min./time, 1 time/hour)

   - **Schematic diagram of the test equipment**
     - Clean bench in clean room (Clean air withdrawing in acrylic cover)

   - **Example of measurement data (cleanliness evaluation result with upper limit density of cleanliness)**
     - **Measuring device**
       - **Measuring condition**
         - Measuring device: Particle counter
         - Measuring zone: Air velocity 2.5 m/s
         - Measuring air amount: 28.3 L (1cf)
         - Measuring time: 48 hours (10 min./time, 1 time/hour)

2. **Light-weight, Low-cross section, and Compact!**
   - Light-weight and compact positioning table using high-strength aluminum alloy for its main components. Low cross-section (54 mm high for TC60E and 67 mm high for TC86E) due to optimum designing of linear guides and ball screws.

3. **High positioning accuracy!**
   - Higher precision positioning by one rank due to a combination of IKO’s unique linear motion rolling guide technology and precision-ground ball screws.

4. **High corrosion resistance!**
   - The main composition parts, which are made from high strength aluminum alloy coated with alumite treatment and stainless sheet, are excellent in corrosion resistance.

5. **Long-term maintenance free!**
   - Long-term maintenance free operation due to IKO’s original C-Lube lubrication part built in the linear motion rolling guide and the ball screw. This can reduce labor time for lubrication and increase the reliability of the equipment.
Environment-friendly IKO C-Lube Bearings
Minimizing Lubricant Requirement

What is your trouble?
1. Hard access to lubricating?
2. Machines and work places are dirty with lubricant?
3. Lubricating tools and instruments occupy the working places?
4. Having problems keeping up with lubrication maintenance schedule?

Find solutions with IKO

"C-Lube bearings" are IKO’s unique maintenance free bearing products with thermocasting solid lubricant (CapLube) pre-packed in the bearing space. As the bearing rotates, the lubricating oil spreads out onto needle rollers and raceways in proper quantity keeping the lubrication performance for a long period of time.

For shaft support
For cam mechanisms and follower bearings

Maintenance work can be reduced greatly
Requires no periodical lubrication and increases the productivity.

Minimizes the amount of lubricant and contributes to the earth environment
Contributes to the earth environment and reduces the running cost.

Suppresses machine designing and device costs
Working spaces can be utilized.