C-Lube Linear Roller Way Super MX

MASTER GRADE

Introducing the low fluctuation specification product, for superb high-precision feed!

The C-Lube Linear Roller Way Super MX low fluctuation specification MX Master Grade has special precision processing on the roller raceway surface, significantly reducing fluctuation compared to the standard extra long unit and thus making it the ideal product for ultra-precision working machine shaft guides, which require high-precision, high-quality machining.

Features

1. Special raceway processing suppresses miniscule running deflection and significantly reduces pulsation compared to standard extra long units.

Fluctuation comparison data

Pulsation: Refers to the running deflection related to movement of the rolling elements within the Linear Roller Way.

Measuring method

Measures the vertical runout when the table is moved.

Super low fluctuation is achieved!

About 50% less fluctuation compared with the standard extra long unit!

2. Low fluctuation makes it ideal for ultra-precision working machine shaft guides, which require high-precision, high-quality machining.

Fluctuation data

The running deflection value is within 0.0090μm (9.0nm) in actual measurement!

Improve machining quality with the use of MX Master Grade!

3. The extra long unit contributes to improved load capacity and rigidity in mechanical equipment.

Applicable products

<table>
<thead>
<tr>
<th>Series</th>
<th>C-Lube Linear Roller Way Super MX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported model</td>
<td>MXL, MXDL, MXSL, MXNL, MXNSL</td>
</tr>
<tr>
<td>Size</td>
<td>30-35-45-55</td>
</tr>
</tbody>
</table>

MX Master Grade (low fluctuation specifications) is a special order product; if needed please contact IKO.
IKO's unique ideas and experiences in special environment applications are utilized to explore new world for

IKO Linear Way and Linear Roller Way are available for various special environment by using different materials and grease, surface treatment and dust protection measures, etc. Typical application fields and major countermeasures are described below.

**Clean Environment**
When the Linear Way or Linear Roller Way is used in a clean environment such as a clean room, it is required that the environment is not polluted by dust-generation by the Linear Way or Linear Roller Way and it must have excellent rust prevention property as rust prevention oil cannot be used.

**Vacuum Environment**
When the Linear Way or Linear Roller Way is used in vacuum environment, it is required that the gas discharged from the Linear Way or Linear Roller Way does not pollute the environment or reduce the degree of vacuum, and it must have excellent rust prevention property as rust prevention oil cannot be used.

**Heat Resistance Measures**
When the Linear Way is used in an environment where temperature is higher than usual, heat resistance of synthetic resin components and metal parts will be an issue.

**Dust Protection**
If dust such as metal or wooden chips get into the way of the Linear Way or Linear Roller Way, reduction of life and accuracy may be caused. Therefore, measures to prevent foreign substances from entering into the way are necessary.

**Spatter Protection**
Spatter of welding, etc. is so hot that it adheres to components. Foreign substances adhering to the track rail firmly cannot be fully removed by normal dust protection measures, so measures to avoid adherence and enhanced foreign substances removal measures are necessary.
Hybrid C-Lube Linear Way ML

While maintenance free performance of C-Lube Linear Way ML is maintained, the silicon nitride ceramics ball improves high-speed performance and reduces noise level. Ceramics has more resistance to deformation and more rigidity than bearing steel and stainless steel.

Features

1. Superior high-speed performance • More than three times durability
2. Noise reduction • Noise reduction by about 4.5 dB
3. High rigidity • Displacement volume reduced by about 10%
4. Superior abrasion resistance • Preload reduction volume is about one fourth

+ Maintenance free
Eco-friendly
Compact
Smooth

Noise reduction by about 4.5 dB

More than three times durability

Performance

High-speed performance

Small deformation of rolling elements and excellent rigidity

Low preload reduction volume and accuracy maintained after operation

Basic performance of C-Lube Linear Way

Achieved long term maintenance free

Achieved light and smooth sliding

Maintenance free

Sliding characteristic

1std: 0.102kgf/cm, 2nd: 0.224kgf/cm

100,000km

10,000km

0 50,000km

0 20,000km

0 10,000km

0 5,000km

0 2,500km

0 1,000km

0 500km

0 250km

0 100km

0 50km

0 25km

0 10km

0 5km

0 2.5km

0 1.0km

0 0.5km

0 0.25km

0 0.125km

0 0.0625km

Load 

Displacement, μm

ML-8: 1/4

Test conditions: Model: ML12, Preload: Standard, Preload direction: Downward
Non-magnetic stainless
Linear Roller Way Super X

The non-magnetic stainless Linear Roller Way Super X is the world’s first non-magnetic stainless steel endless motion roller type linear motion rolling guide to attain relative magnetic permeability of 1.01 or less. This is accomplished through the dedicated development of silicon nitride ceramic cylindrical rollers and non-magnetic stainless steel casings and track rails. Despite being non-magnetic material it still maintains the superior vibration characteristics, excellent running accuracy, and friction characteristics provided by the Linear Roller Way Super X. This allows for accurate and rapid positioning in environments affected by minimal magnetism.

Features

World first for roller types
The first non-magnetic specifications ever realized in the world for endless motion roller type linear motion rolling guides

Relative magnetic permeability 1.01 or less
Allows for accurate and rapid positioning in environments affected by minimal magnetism

High corrosion resistance
Optimal for use in clean environment thanks to non-magnetic stainless steel

High running accuracy
The superb vibration characteristics of roller type linear motion rolling guides allow superior running accuracy

Non-magnetic stainless steel characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Non-magnetic stainless steel</th>
<th>Silicon nitride ceramics</th>
<th>Non-magnetic hard alloy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative magnetic permeability</td>
<td>1.01 or less (1.005)</td>
<td>1 (0.999991)</td>
<td>1 (1.0002)</td>
</tr>
<tr>
<td>Electric conductivity</td>
<td>○</td>
<td>×</td>
<td>○</td>
</tr>
<tr>
<td>Hardness (HV)</td>
<td>380~450</td>
<td>1400~1600</td>
<td>1200~1450</td>
</tr>
<tr>
<td>Linear expansion coefficient (&lt;10⁻⁶/°C)</td>
<td>19.0 (20~400°C)</td>
<td>3.2 (20~400°C)</td>
<td>5.1 (20~400°C)</td>
</tr>
<tr>
<td>Specific gravity (g/cm³)</td>
<td>7.9</td>
<td>3.2</td>
<td>14.5</td>
</tr>
<tr>
<td>Main ingredients</td>
<td>Fe, Mn, Cr</td>
<td>SiN₄</td>
<td>Ni, WC</td>
</tr>
<tr>
<td>Cost</td>
<td>○</td>
<td>△</td>
<td>△</td>
</tr>
</tbody>
</table>

Remarks
Good corrosion resistance, Sintered alloy

Selection of lubricant

By setting appropriate lubricants such as vacuum grease and low dust-generating grease, any operating environment can be supported.

Main components

- **Series**: Linear Roller Way Super X
- **Main model**: LRX15, LRXD15, LRXS15
- **Main component materials**:
  - Casing: Non-magnetic stainless steel
  - Track rail: Non-magnetic stainless steel
  - Cylindrical roller: Silicon nitride ceramics
  - End plate: Engineering plastic
**Stainless Linear Way and Linear Roller Way**

A variety of stainless steel series

IKO Linear Way and Linear Roller Way lineup include products with stainless steel made parts instead of steel parts. As stainless steel is resistant to rust relative to high carbon steel made products, they are optimal for use in applications where oil and rust prevention oil are not preferred. It is also suitable for use in cleanroom environment, so use IKO clean grease that inhibits dust-generation amount together.

**Series name**

**Linear Way**
- Ball Type Miniature Series
  - C-Lube Linear Way ML
  - C-Lube Linear Way MLV
- Linear Way L
- Micro Linear Way L

**Ball Type Compact Series**
- C-Lube Linear Way ME
- Linear Way E

**Ball Type High Rigidity Series**
- C-Lube Linear Way MH
- Linear Way H

**Ball Type Wide Type Series**
- Linear Way F

**Ball Type U-Shaped Track Rail Series**
- C-Lube Linear Way MUL

**Linear Roller Way**
- Roller Type
  - C-Lube Linear Roller Way Super MX
  - Linear Roller Way Super X

Combination with special specification corresponds to use in special environment!

**Rust prevention**

**Black chrome surface treatment /L**
Black chrome surface treatment on the track rail and slide unit improves rust prevention capacity.

**Fluorine black chrome surface treatment /LF**
Coating of fluorinated resin is applied over the black chrome surface treatment to prevent foreign substances from sticking and improve the rust prevention capacity.

**Features**
- Thin film
- Uniform film
- Strong adhesion
- Excellent rust prevention capability
- Low temperature processing to prevent distortion
- No peeling and no effects on life and cleanroom environment
Special specification for special environment

IKO Linear Way and Linear Roller Way lineup include following special specifications to correspond to various special environments.

C-Wiper /RC

Mounted to the outside of end seal, it may be used for long time even under environment where metal chips are spattering. End seal, inner seal (UR) and scraper (Z) may be equipped as standard when you specify special specification /RC with C-Wiper.

If you need inner seal only, specify /UR.

Applicable C-Wiper size

<table>
<thead>
<tr>
<th>Model</th>
<th>Length of side unit</th>
<th>Model code</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 15 20 25 30 35 45 55 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flange type mounting from top/bottom</td>
<td>Short</td>
<td>MXC</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>MX</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>MGX</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Extra long</td>
<td>MXL</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Block type mounting from top</td>
<td>Short</td>
<td>MXGC</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>MXD</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>MGXG</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Extra long</td>
<td>MXDL</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Compact block type mounting from top</td>
<td>Short</td>
<td>MXGC</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>MXD</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>MGXG</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Extra long</td>
<td>MXDL</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Low profile flange type mounting from top</td>
<td>Short</td>
<td>MXS</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>MXNG</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>MXNS</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td></td>
<td>Extra long</td>
<td>MXNSL</td>
<td>○ ○ ○ ○ ○ ○ ○ ○ ○</td>
</tr>
</tbody>
</table>

Note (*) Also applicable to models mounting from bottom (MXHC20, MXH20, MXH20, MXHL20).
Features of Special Environment Linear Way and Linear Roller Way

Special specification for special environment

**Dust protection**

**Rail cover sheet**
Rail cover sheet that consists of steel plate and adhesive tape and fastened to the dedicated track rail with groove on the track rail prevents foreign substances from entering into the slide unit.

**Caps for rail mounting holes /F**
Caps for rail mounting holes close the track rail mounting holes to prevent foreign substances from entering into the slide unit. Contact IKO for aluminum alloy caps for rail mounting holes.

**Double end seals /V**
Double end seals improve the dust protection property further.

**Scraper /Z**
Mounted to the outside of end seal, it may remove large foreign substances adhering to the track rail.

**Rail cover plate /PS**
Rail cover plate totally covers the upper surface of the track rail to prevent foreign substances from entering into the track rail.

**Track rail mounting from bottom**
This is the specification that track rail is fixed from the mounting surface side. As there are no mounting holes on the track rail upper surface, adherence with the seal is superior and better dust protection effect is achieved.

**Female threads for bellows /J**
Female threads for bellows are prepared on the slide unit and track rail ends.

**Specific bellows**
Dust protection cover over the exposed part of the track rail.
### Features of Special Environment Linear Way and Linear Roller Way

**Special specification for special environment**

<table>
<thead>
<tr>
<th>Lubrication</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>With C-Lube plate /Q</strong></td>
<td><strong>Stainless steel end plate /BS</strong></td>
</tr>
<tr>
<td>Lubrication parts to substantially reduce the need for lubrication</td>
<td>End plate is changed to stainless steel.</td>
</tr>
<tr>
<td>management, i.e. grease job.</td>
<td></td>
</tr>
<tr>
<td><strong>Low Dust-Generation Grease for Clean Environment CGL /YCL</strong></td>
<td><strong>Special environment seal /RE</strong></td>
</tr>
<tr>
<td>For this grease, mixed soap is used as thickener and synthetic oil and</td>
<td>The end and under seals are replaced with end seals for special</td>
</tr>
<tr>
<td>low pour point mineral oil are mixed with base oil, so it has excellent</td>
<td>environment that can be used at high temperatures. When it is used in</td>
</tr>
<tr>
<td>low dust generating performance, rolling resistance, lubrication, and</td>
<td>high temperature environment, stainless steel end plate /BS and high</td>
</tr>
<tr>
<td>rust prevention property.</td>
<td>temperature grease should be combined.</td>
</tr>
<tr>
<td>Bellows cartridge (80 g)</td>
<td></td>
</tr>
<tr>
<td>JG40 /CGL</td>
<td></td>
</tr>
<tr>
<td>With miniature greaser (2.5 ml)</td>
<td></td>
</tr>
<tr>
<td>M32.5 /CGL</td>
<td></td>
</tr>
<tr>
<td><strong>Low Dust-Generation Grease for Clean Environment CG2 /YCG</strong></td>
<td></td>
</tr>
<tr>
<td>For this grease, urea is used as thickener and synthetic oil is used as</td>
<td></td>
</tr>
<tr>
<td>base oil, so it has excellent low dust generating performance, operating</td>
<td></td>
</tr>
<tr>
<td>temperature range, lubrication property, rust prevention property and</td>
<td></td>
</tr>
<tr>
<td>oxidation stability.</td>
<td></td>
</tr>
<tr>
<td>Bellows cartridge (80 g)</td>
<td></td>
</tr>
<tr>
<td>JG30 /CG2</td>
<td></td>
</tr>
<tr>
<td>With miniature greaser (2.5 ml)</td>
<td></td>
</tr>
<tr>
<td>M32.5 /CG2</td>
<td></td>
</tr>
<tr>
<td><strong>Anti-Fretting Corrosion Grease AF2 /YAF</strong></td>
<td></td>
</tr>
<tr>
<td>Grease with excellent fretting-proof corrosion property.</td>
<td></td>
</tr>
<tr>
<td>Bellows cartridge (80 g)</td>
<td></td>
</tr>
<tr>
<td>JG40 /AF2</td>
<td></td>
</tr>
<tr>
<td>With miniature greaser (2.5 ml)</td>
<td></td>
</tr>
<tr>
<td>M32.5 /AF2</td>
<td></td>
</tr>
</tbody>
</table>

**Other special grease**

For special grease for vacuum or high temperature, please contact IKO.

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**IKO can offer products for special environment!**

If needed, please contact IKO.