Ball screws

Linear movement - Linear bearings

Standard product line – microlinea

The MPS ball screws are entirely made out of stainless steel and all components are ground. They are fitted with a double nut to adjust the play. The manufacturing process guarantees a pitch variation of less than 5 µm over the full length.

Ball screw calculations – general formulas

The theoretical life expectancy is generally expressed by the total number of revolutions. The life expectancy can also be expressed in hours or in total travel distance. The fatigue life is calculated as follows:

\[
L_m = \frac{L_{hm}}{n_m}
\]

where:
- \(L_m\): Life expectancy in number of millions of revolutions [rev]
- \(L_{hm}\): Life expectancy in hours [h]
- \(n_m\): Equivalent rotating speed [min⁻¹]
- \(Cam\): Equivalent axial dynamic load rating [N]
- \(F_m\): Equivalent axial load [N], to ISO 3408-5

Example of part number definition

ED 513X/V501X double nut
EDD 513X/V501X two double nuts
ED 513X/V501X 4 x lead of nut thread
ED 513X/V501X outer diameter of nut
ED 513X/V501X nut in stainless steel
ED 513X/V501X ground precision screw
ED 513X/V501X 4 x lead of screw thread
ED 513X/V501X screw drawing number
ED 513X/V501X screw in stainless steel

Materials

Housing: stainless steel AISI 440C
Ball nuts ED/ES: stainless steel AISI 440C
Shields: stainless steel AISI 302 or AISI 303
Balls: stainless steel AISI 440C
Lubrication: standard Winner Lube L245X (rust protection; i.e. dipped in oil)

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Customized ball screws

MPS offers a comprehensive range of miniature high precision ball screws with a positioning accuracy < 5 µm.

The ball screw technology that was developed by MPS leads to outstanding performances such as high efficiencies, smoothness and long-life reliability.

Most applications require specific mechanical interfaces, or special characteristics.

Throughout a long-time experience with countless cases in various application fields MPS has acquired an exceptional level of expertise in the design and manufacture of customized ball screws, thus always gathering two essential features: precision and compactness.

MPS ball screws are primarily intended for demanding applications which require very accurate movements with positioning accuracies in the micron range.

To obtain an accurate adjustment, the dimensional and geometric tolerances of each component interfacing with the ball screw must be properly determined.

To optimize the function and achieve the longevity of the ball screws, it is strongly recommended to take utmost care of the cleanliness during their installation in the final application, for instance by wearing appropriate gloves, and avoid any shock or mechanical stress.

The MPS team of experts is at your disposal to answer all your questions and to support you in finding solutions as needed.

On request

- Lubricants: grease, oil, or dry lubrication
- Machined ends
- Higher static and dynamic load capacity
- Multiple nuts
- Left-hand thread
- Customized length and diameter
- Reduced axial play (down to zero backlash)
- Special surface treatments
- Customized nut outer sleeve with flange, pins, etc.

FROM STANDARD PRODUCTS TO CUSTOMIZED SOLUTIONS