

SPACEA™ Series for Special Environments Ball Screws and NSK Linear Guides for Vacuum Environments

# Ball Screws and NSK Linear Guides With E-DFO for Vacuum Environments

New!

Patent Pending

Ongoing evolution of DFO thin-film lubrication technology leads to significantly longer life and low outgassing in vacuum environments.



■ Features

**1. Long life**

Up to twenty times longer life than existing products.

**2. Low outgassing**

Outgassing is limited even in high vacuum environments.

**3. Low friction**

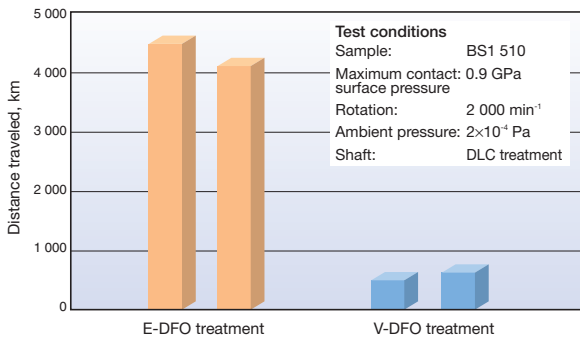
Friction is significantly reduced from existing products.

■ Operating environment

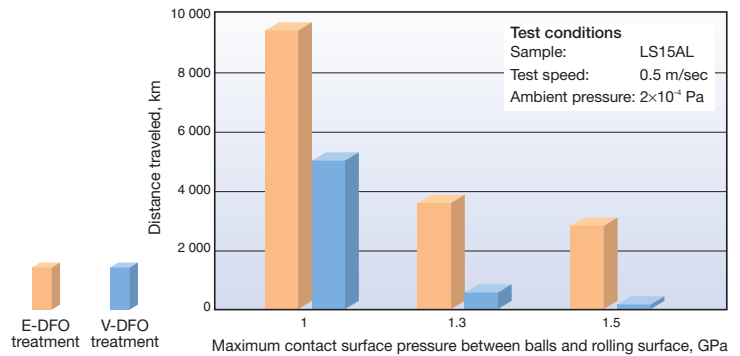
Maximum vacuum environment at room temperature	Recommended operating temperature range	Maximum instantaneous operating temperature (less than 10 hours)
10 <sup>-6</sup> Pa	-40—125°C	200°C

**Long life** Up to twenty times longer life than existing products means longer maintenance intervals.

Ball screw durability test result



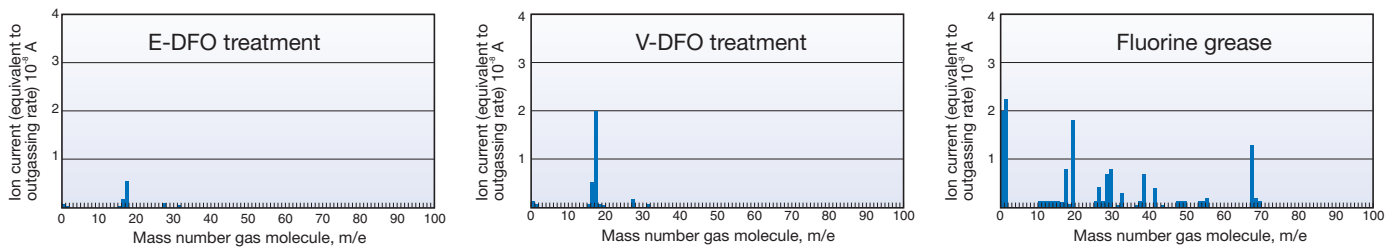
Linear guide durability test result



**Low outgassing** Outgassing is limited even in high vacuum environments.

Outgassing analysis result (quadruple mass spectrometer)

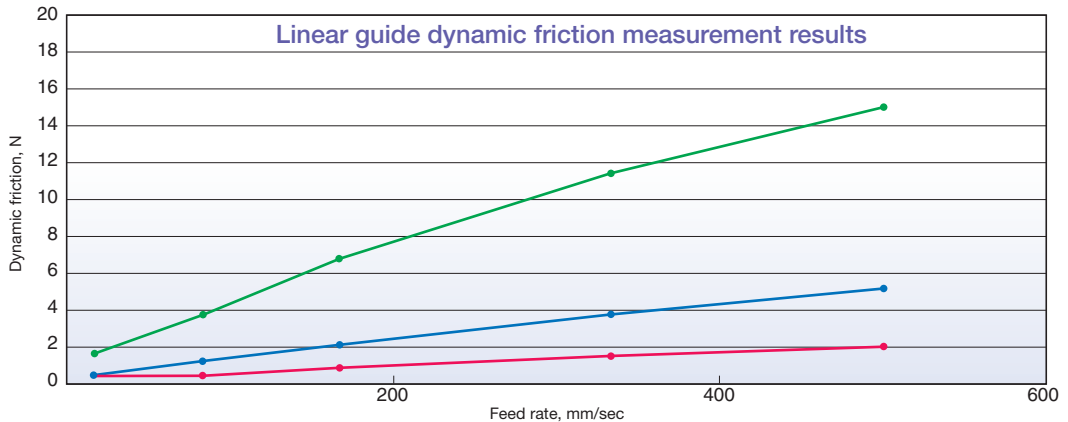
**Test conditions**  
 Measurement temperature: 100 °C  
 Ambient pressure: 10<sup>-5</sup> Pa or less



**Low friction** Friction is significantly reduced from existing products, thereby reducing motor loads and helping to produce efficient equipment.

Linear guide dynamic friction measurement results

**Test conditions**  
 Sample: LH15BN  
 Preload: Z1 (326N)  
 Stroke: 800 mm  
 Measurement temperature: 20°C  
 Ambient pressure: Atmospheric



**Applications**

Wafer inspection equipment, SED manufacturing equipment, ion implanter, IC stepper lighting systems, work handling component for optical measuring equipment, ion steppers, coating equipment, vacuum monochromator, lens inspection equipment, vacuum inspection equipment, etc.

\* All these products are manufactured to order. For details, please contact NSK.

For more information about NSK products, please contact: [www.nsk.com](http://www.nsk.com)



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