

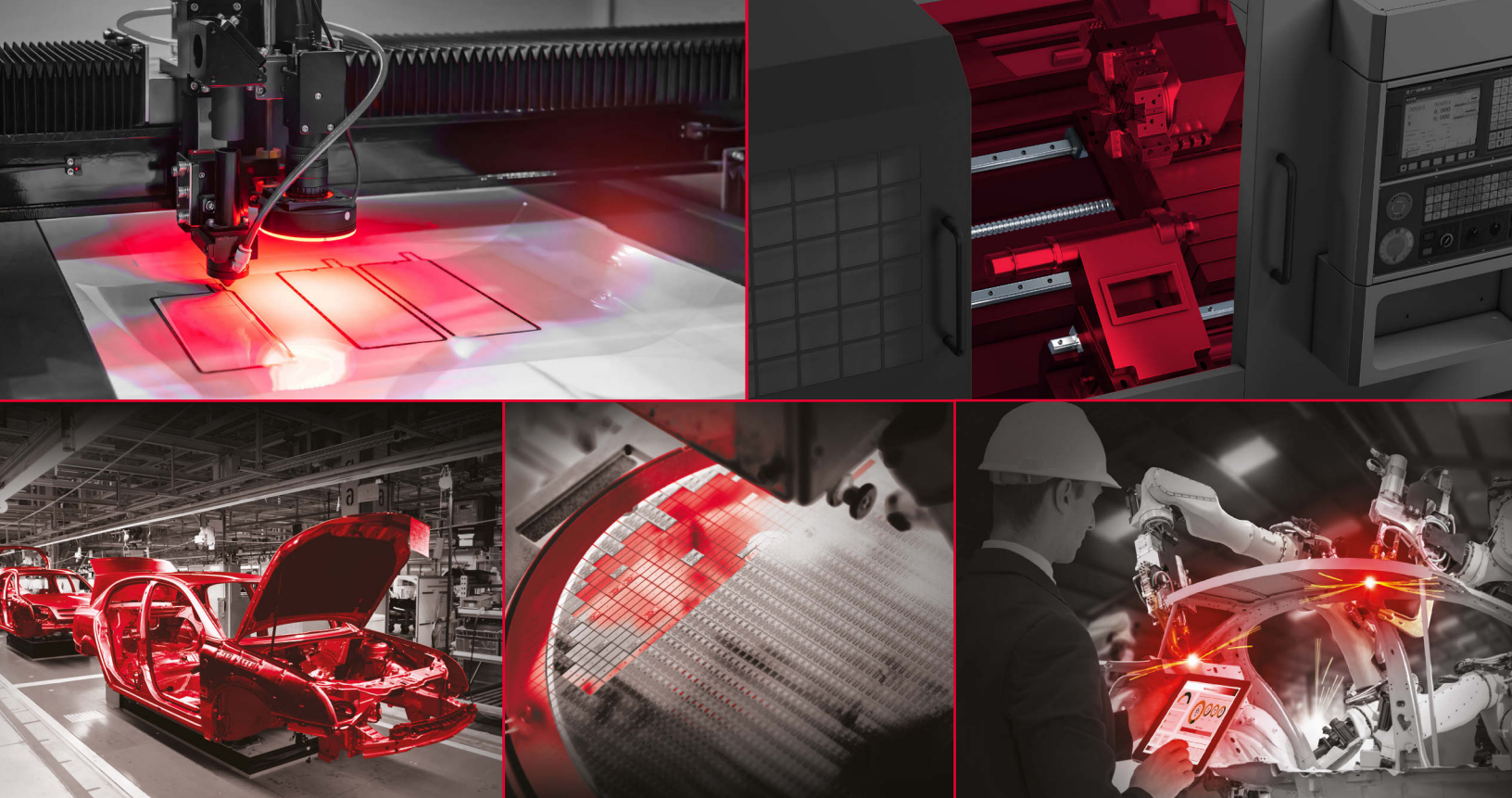


LONG-LIFE DH/DS SERIES LINEAR GUIDES

FEATURING TF HEAT TREATMENT TECHNOLOGY



ENABLING AUTOMATION IN MOTION & CONTROL



ENABLING AUTOMATION

NSK MECHATRONIC SYSTEM SOLUTIONS

For decades, NSK has specialized in developing electromechanical solutions – integrating our precision machine components with control technology – to deliver advanced, reliable and precise motion and control.

Robotic surgery. Medical imaging. Biomedicine. Semiconductor. 3D printing. Factory automation. Our customers are vast and diverse, united by precision-critical applications and NSK's ability to achieve coherent mechatronic solutions that offer:

- › Augmented machine function and accuracy
- › Optimized system performance, space and life
- › Reduced costs and complexity

From complex systems to single-axis solutions, NSK delivers innovative and ideal integrated motion solutions to enable automation and accuracy in machine function, for a competitive edge to our customers.

LONG-TERM CAPACITY AND RELIABILITY

As the shift to smart factories accelerates, process machinery is required to maximize productivity by improving takt times, operate without interruption, consume less energy and have a compact form factor. To keep pace with these demands for higher reliability and longer life, NSK has applied its proprietary TF "Tough" heat treatment technology to achieve even greater machine capacity with the newly developed long-life DH/DS series linear guides.

PROVEN ADVANTAGES

- › 25% higher load rating is achieved with TF heat treatment technology
- › Twice the running distance / operating life of NSK's NH/NS series
- › Greater resistance to wear and contamination-initiated flaking damage
- › Higher capacity enables downsizing to achieve reduced system weight, friction and energy consumption

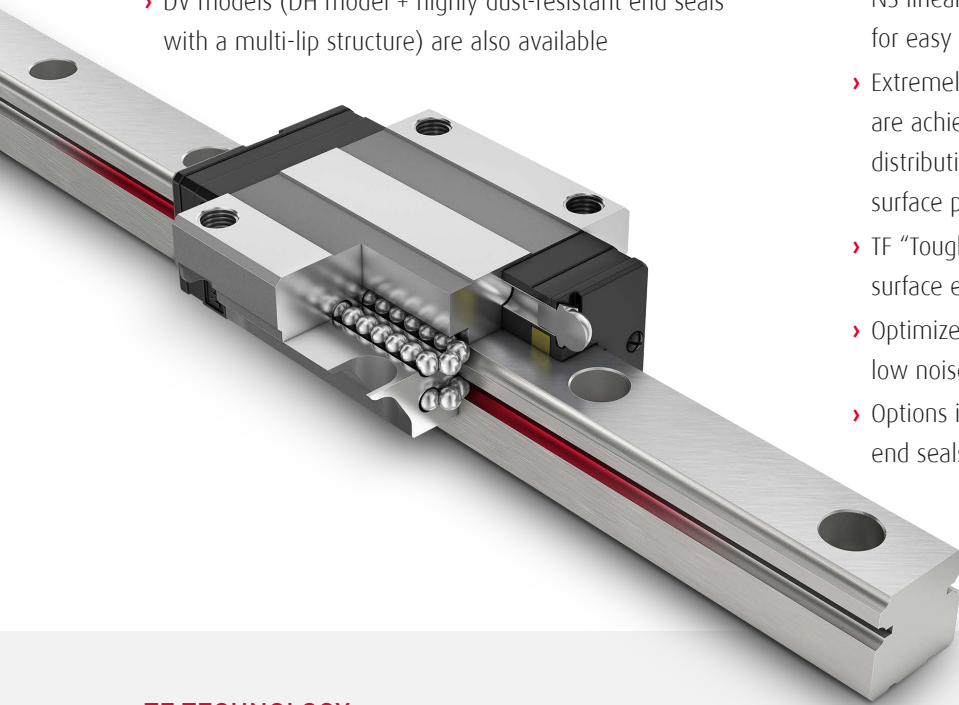


DESIGN AND OPERATING ADVANTAGES

NSK DH/DS series linear guides deliver outstanding precision accuracy, extremely high load ratings and substantially longer life under high loads and challenging environments. Optimized ball groove geometry and ball circulating path deliver extremely high load ratings with smooth and quiet circulation well suited to high-speed applications.

DESIGN FEATURES

- › DH models feature large ball diameters and higher load ratings; DS models offer a compact, low-profile shape
- › DV models (DH model + highly dust-resistant end seals with a multi-lip structure) are also available



- › Dimensionally interchangeable with NH/NS linear guides, allowing for easy replacement
- › Extremely high load ratings are achieved with optimized distribution of contact surface pressures
- › TF “Tough” heat treatment technology increases steel surface endurance under high load conditions
- › Optimized ball circulation geometry enables high speed / low noise performance
- › Options include K1-L lubrication units, highly dust-resistant end seals, double seals, protectors and surface treatments

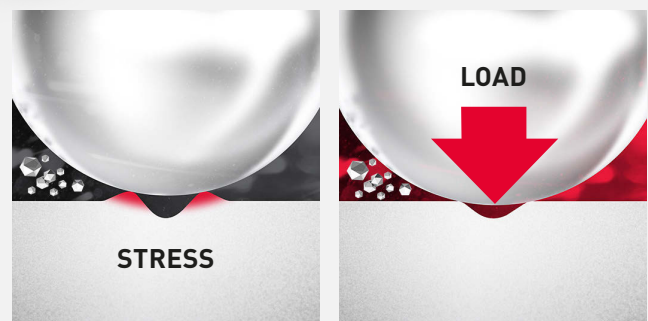


TF TECHNOLOGY

TF technology is an exclusive heat treatment technology developed to optimize the amount of retained austenite in steel, which in turn softens the contours of dents formed when a slide ball presses particle contaminants into the raceway surface of the linear guide rail. This reduces areas where stress might focus, suppressing the onset of raceway surface flaking and extending the linear guide running distance / operating life as much as two-fold.

Illustrated at right:

TF technology controls the magnitude of deformations and damage caused by contamination, reliably supporting high loads for a longer operating life.



Conventional Steel

TF Technology

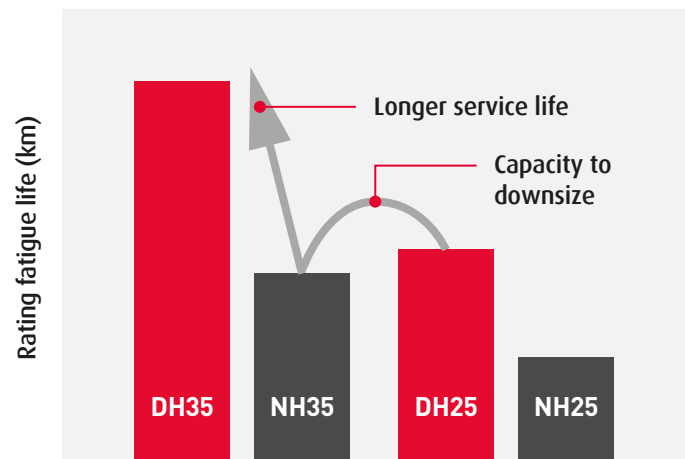
RANGE OF AVAILABILITY - DH/DS LINEAR GUIDES								
BALL SLIDE LOAD	HIGH LOAD (STANDARD)			SUPER-HIGH LOAD (LONG)			MEDIUM LOAD (SHORT)	
BALL SLIDE SHAPE	SQUARE	LOW PROFILE SQUARE	FLANGE	SQUARE	LOW PROFILE SQUARE	FLANGE	LOW PROFILE SQUARE	FLANGE
SERIES / MODEL / SIZE	AN	AL	EM	BN	BL	GM	CL	JM
STANDARD - DH TYPE	DH15	●		●	●	●		
	DH20	●		●	●	●		
	DH25	●	●	●	●	●		
	DH30	●	●	●	●	●		
	DH35	●	●	●	●	●		
	DH45	●	●	●	●	●		
	DH55	●	●	●	●	●		
	DH65							
COMPACT - DS TYPE	DS15							
	DS20							
	DS25							
	DS30							
	DS35							

● Above: available as DV model with highly dust-resistant end seals

LONG LIFE RELIABILITY

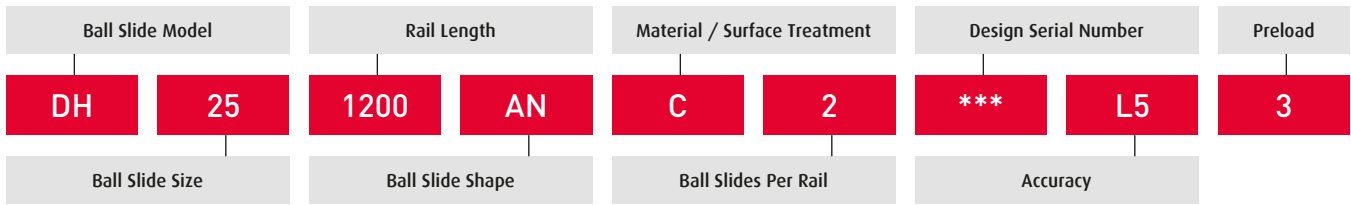
With TF heat treatment, load ratings of DH/DS series linear guides are 1.25 times higher than NH/NS models, with running distance doubled. As a result DH/DS linear guides offer significantly improved service life at the same size, and allow for equipment downsizing without compromising capacity.

For technical specifications including basic load ratings, mounting specifications, assembled linear guide height and width, etc., refer to catalog **Long-Life Series: DH/DS Models E3336** for details.

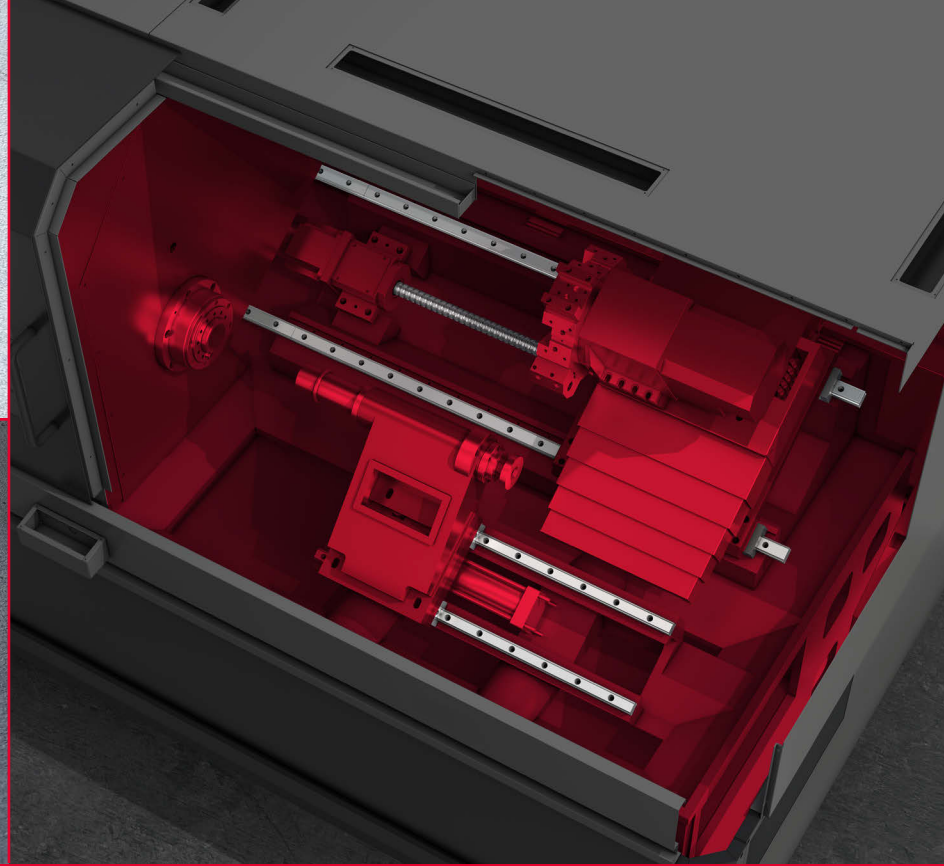
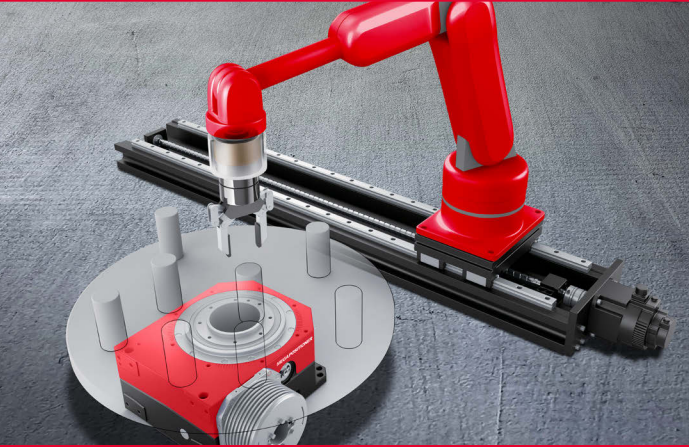
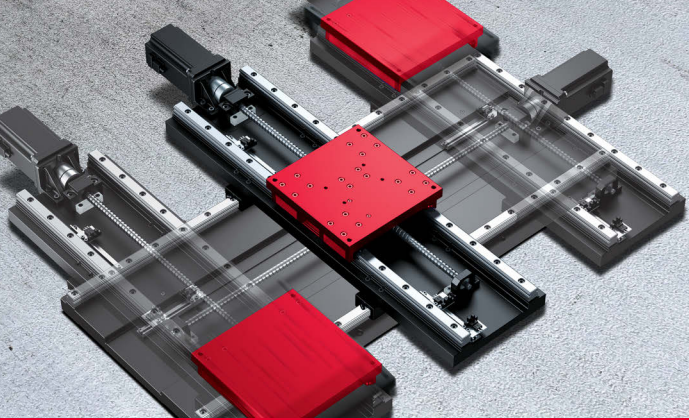


DESIGNATION SYSTEM

PRELOADED DH/DS LINEAR GUIDE ASSEMBLY



DESIGNATION		ATTRIBUTE	DESIGNATION		ATTRIBUTE
Ball Slide Model	DH	standard model	Material / Surface Treatment	C	special high-carbon steel with TF heat treatment
	DS	compact model		D	special high-carbon steel with TF heat treatment + surface treatment
	DV	standard model with dust-resistant end seals	Ball Slides Per Rail	quantity required for application as defined by customer	
Ball Slide Size	DH: 15 to 65 DS: 15 to 35 DV: 15 to 55	Design Serial Number		defined by NSK	
Rail Length	expressed in millimeters		Accuracy	P3	ultra precision
Ball Slide Shape	AN	high-load / standard length / square type - for DH and DV models		L3	ultra precision (P3) with K1-L units
	BN	super-high load / long / square type - for DH and DV models		P4	super precision
	AL	high-load / standard length / low-profile square type - for DH, DS and DV models		L4	super precision (P4) with K1-L units
	BL	super-high load / long / low-profile square type - for DH and DV models		P5	high precision
	CL	medium load / short / low-profile square type - for DS models only		L5	high precision (P5) with K1-L units
	EM	high-load / standard length / flange type - for DH, DS and DV models		P6	precision grade
	GM	super-high load / long / flange type - for DH and DV models		L6	precision grade (P6) with K1-L units
	JM	medium load / short / flange type for DS models only		PN	normal grade
			LN	normal grade (PN) with K1-L units	
Preload	0	fine clearance Z0	Preload	1	slight preload Z1
	1	slight preload Z1		3	medium preload Z3
	3	medium preload Z3			



ACCUMULATED EXPERTISE, OPTIMAL SUPPORT

For your precision machine component and integrated system requirements, you can rely on the optimum interaction of NSK design solutions, comprehensive engineering support, domestic manufacturing capabilities and access to our global technology network. Our local automation experts will collaborate closely with you through all aspects of design, provide intensive project management and extend comprehensive technical support. We aim to deliver to our customers the ideal motion and control solution and experience.

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