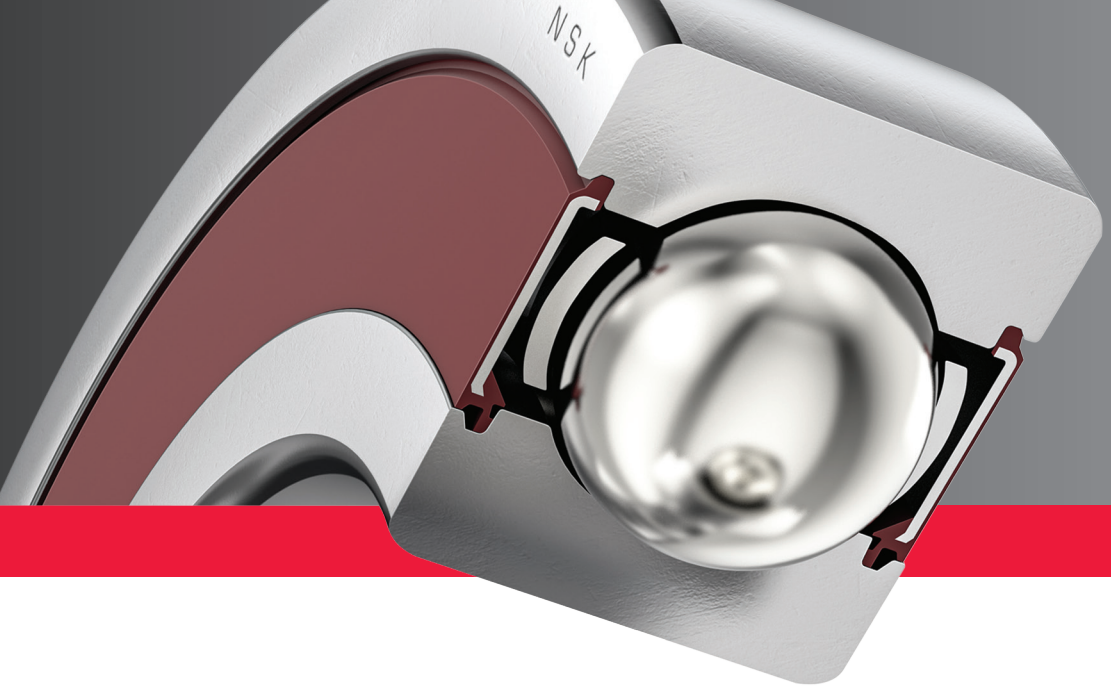


NSK

NSK TECHNICAL INSIGHT

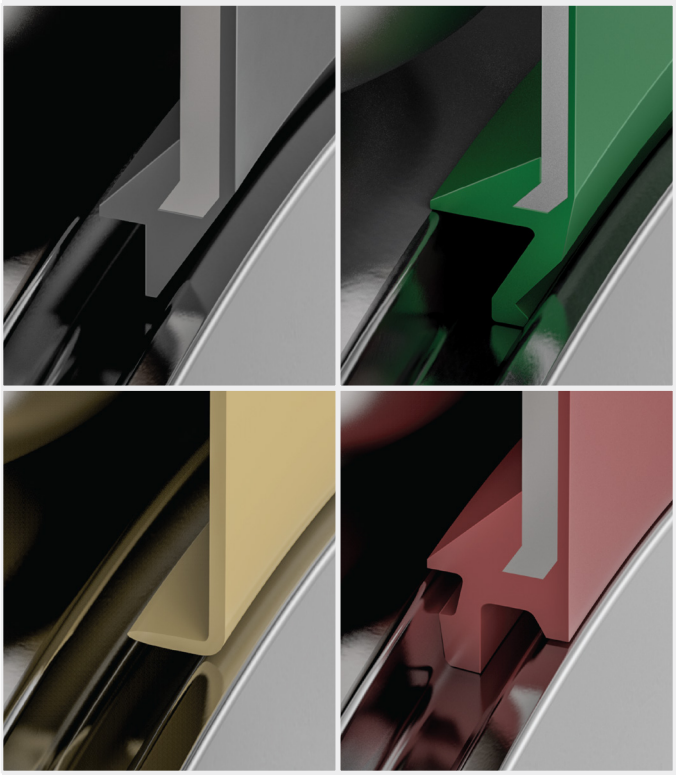
LONG-LIFE RELIABILITY

SEALS AND SHIELDS FOR SINGLE ROW DEEP GROOVE BALL BEARINGS

Deep groove ball bearings equipped with seals or shields can deliver years of trouble-free operation, retaining clean grease free from external contaminants. Selection of appropriate sealing is based not only by the severity of the application environment, but also with consideration of operating speeds, seal torque and temperatures.

NSK offers standard sealing solutions ranging from non-contact to full contact, designed to achieve optimal sealing while mitigating power loss in a wide variety of application conditions. Special seal designs and seal materials for special environments such as corrosive, dust-laden and high temperatures, as well as low seal drag requirements, are also available.

Refer to **Tables 1 and 2** for additional information and recommendations regarding seal selection and seal materials.



Clockwise from top left: non-contact seal (V), light-contact seal (DW), contact seal (DU), non-contact shield (Z)

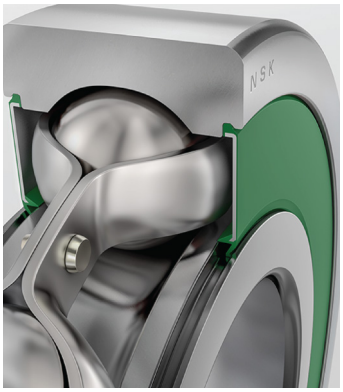
CONTACT NSK

NON-CONTACT V SEALS

High Performance without Friction

NSK's V seal is designed for the higher speed and higher temperature requirements in applications such as electric motors. It provides excellent sealing performance without friction for increased bearing life and reduced load on the tmotor. The labyrinth design delivers better sealing capability than a shield while enabling comparable speeds. The non-contact lip produces lower drag than a contact seal, particularly important where power loss is critical as in small electric motors.





LIGHT-CONTACT DW SEALS

Contaminant Protection with Low Friction

The light-contact DW seal is designed to deliver a high degree of contamination protection when torque levels are a consideration. It performs with 1/3 lower friction levels than a full contact seal but is nonetheless designed for use in high contaminant environments.

CONTACT DU SEALS

Maximum Protection from Contamination

NSK's DU seal is a full-contact seal designed to deliver maximum protection against ingress of all forms of contaminants - small particle, dust and water. With due consideration of speed and temperature limits, the DU seal is recommended for use when maximum sealing is critical.





NON-CONTACT Z SHIELDS

Moderate Protection for High Speeds

Anti-corrosion zinc coated metal Z shields are recommended for diverse applications where low torque and low temperature rise are required and contamination levels are moderate. Shields deliver superb performance through a wide temperature range and protect bearings from large contaminants but are not effective in preventing the ingress of water or small particles.

CONTACT NSK

NSK

Table 1: Comparison of seal / shield performance

OPERATING CHARACTERISTICS	CLOSURE TYPE AND RELATIVE PERFORMANCE			
	VV	DDW	DDU	ZZ
Resistant to dust	good	excellent	excellent	normal
Resistant to water intrusion	not suitable	normal	excellent	not suitable
Effective against grease leakage	good	excellent	excellent	normal
Torque	very low	low	normal	very low
Speed capability	high	good	normal	high

Table 2: Seal materials and temperature range

NSK SEAL MATERIALS		NSK DESIGNATION	TEMPERATURE RANGE	
			Non-Contact Seal	Contact Seal
Standard seals	Nitrile Rubber	VV, DDW, DDU	-50° C to 130° C	-30° C to 110° C
Seals for special conditions	Polyacrylic Rubber (ACM)	VV8, DDU8	-30° C to 170° C	-15° C to 150° C
	Silicone	VV9, DDU9	-100° C to 250° C	-70° C to 200° C
	Fluoroelastomer (FKM)	VV7, DDU7	-50° C to 220° C	-30° C to 200° C

Learn more about NSK bearing products and services for optimizing machine performance.

Follow us at:

www.nskamericas.com

CONTACT NSK