Dimensional stability

Standard bearing steel is suitable for operating temperatures up to 120 °C, and for short periods up to 150 °C. If these limits are exceeded, dimensional changes may occur due to internal lattice stresses and the transformation of retained austenite. This can negatively affect tolerances, bearing clearance and performance.

To prevent this, bearings intended for higher operating temperatures are dimensionally stabilised by tempering at elevated temperatures. This process relieves stresses and pre-emptively transforms the microstructure. Although it slightly reduces hardness and load carrying capacity, it ensures dimensional stability during operation.

Dimensionally stabilised bearings are identified by the suffix “S” followed by a number (e.g. S0, S1, S2), depending on the maximum permissible operating temperature.

Suffix	Permissible operating temperature	Load rating (reference value)	Typical application / note
SN	120° C	100%	Dimensionally stabilised for occasional temperature peaks above standard limit
S0	120 °C, short-term up to approx. 150 °C	90 - 100%	
S1	up to approx. 200 °C	75 - 90%	Suitable for continuously higher operating temperatures in industrial applications
S2	up to approx. 250 °C	60 - 75%	For sustained high temperatures, e.g. in dryers or electric motors
S3	up to approx. 300 °C	50 - 60%	For extreme temperature conditions, e.g. in high-temperature furnaces
S4	up to approx. 350° C	45 - 50%	

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