

What is a Static Load Rating? by Mike Mortensen - Director of Engineering RBI-USA

As radial load is applied to a bearing, elastic deformation occurs between the rolling element and raceway. As radial load is increased, the stress on the rolling element and raceway increase. As stress level increases, non-elastic or permanent deformation to the rolling element and raceway will occur. Non-elastic deformation increases in area and depth as the load increases, and when the load exceeds a certain limit, the smooth running of the bearing is affected.

The basic static radial load rating is defined in accordance with ISO and ABMA standards as the static radial load which corresponds to a calculated contact stress at the center of the most heavily loaded rolling element/raceway contact. For the following bearing types, the listed contact stress level will cause a total permanent deformation of approximately 0.0001 of the rolling element diameter.

For self-aligning ball bearings: 4,600 MPa (approximately 667,000 psi)

For other ball bearings: 4,200 MPa (approximately 609,000 psi)

For roller bearings: 4,000 MPa (approximately 580,000 psi)

(MPa or MegaPascal or 10 6 Pascal is a unit of stress. 1 Pa or Pascal equals 1 N/m 2. 1 N or Newton is a unit of force)

This small amount of non-elastic (or plastic) deformation for standard wide-purpose bearings will not have any substantial influence on the bearing performances (vibration, noise, stiffness, friction moment, etc.)

For stainless steel bearings, static load ratings are approximately 75% of the load ratings for chrome steel bearings.

www.rbibearing.com			
CHICAGO IL	MONROVIA CA	TORONTO ON	CALGARY AB
(800) 708-2128	(800) 358-7652	(800) 724-2426	(800) 724-2426
(630) 295-5490 Fax	(626) 357-7426 Fax	(905) 670-2062 Fax	(403) 256-9140 Fax