

Bearing Tolerance Help Guide



Understanding Bearing Tolerance

Tolerances control the dimensional accuracy of a roller or ball bearing. They are standardized by classifying them into one of six precision level categories as defined by standards organizations or individual bearing manufacturers. Each classification defines tolerances on dimensions such as bore, outside diameter, width, and runout.

In addition, bearings are produced in both inch and metric systems with the boundary dimension tolerances being different between the two systems. See the [Timken Engineering Manual](#) for more details.

Standard vs. Precision Bearing Class

The following table summarizes the different specifications and classes for ball, tapered roller, cylindrical roller, and spherical roller bearings.

System	Specifications	Bearing Type	Standard Bearing Class		Precision Bearing Class			
Metric	Timken	Tapered Roller Bearings	K	N	C	B	A	AA
	ISO/DIN	All Bearing Types	PO	P6	P5	P4	P2	-
	ABMA	Cylindrical, Spherical Roller Bearings	RBEC 1	RBEC 3	RBEC 5	RBEC 7	RBEC 9	-
		Ball Bearings	ABEC 1	ABEC 3	ABEC 5	ABEC 7	ABEC 9	-
Inch	Timken	Tapered Roller Bearings	4	2	3	0	00	000
		Tapered Roller Bearings	4	2	3	0	00	-
	ABMA	Ball Bearings	ABEC 1	ABEC 3	ABEC 5	ABEC 7	ABEC 9	-

How to Use the Bearing Tolerance Tool

Follow these simple steps to get quick and accurate tolerance data to help you design Timken® bearings into your project.

1. Go to engineering.timken.com.
2. Select **Bearing Tolerances** from the home page.
3. Enter in a Timken **Bearing Part Number**. Don't know the part number? Use our bearing search tool to select one from our online product catalog.
4. Select **Bearing Class**. Refer to chart above for different classifications.
5. Select **Display Units**.
6. Click the **Calculate** button.

Output and Interpretations

You can take these results and

- Enter them into your design software.
- Use to ensure proper fitting of the bearing in your application. You can enter results into the [Timken Bearing Fitting Practice tool](#).
- Enter them into Timken's Syber™ Bearing System Designer software.
- If you need to download a CAD file, go to cad.timken.com.

Still Need Help?

- Contact your Timken sales office. Locate your local office by visiting locations.timken.com.
- Email us at TimkenEngineeringHelp@timken.com.

IMPORTANT NOTE: The accuracy of the technical information supplied through this engineering tool is dependent upon the accuracy and completeness of information supplied to Timken. Actual product performance is affected by many factors beyond the control of Timken, and which cannot be modeled through this engineering tool. Therefore, you must validate the suitability and feasibility of all designs and product selection. The technical information is presented solely to provide you, a customer of Timken or its affiliates, with data to assist you in your design. No warranty, expressed or implied, including any warranty of fitness for a particular purpose, is made by Timken through the provision of this information.

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets bearings, gear drives, automated lubrication systems, belts, brakes, clutches, chain, couplings, linear motion products and related industrial motion rebuild and repair services.