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Bearing Solutions

Frequently Asked Questions (FAQs)

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Are your tapers the same as Timken? Are they interchangeable with Timken?

NTN tapers with the prefix 4T- or ET- and all NTN-Bower tapers are Timken interchangeable.

What is the Designation for Sets (pairs) on your angular contact bearings?

Paired arrangements for angular contact bearings are designated as D2 (universal flush ground pair), DB (matched back-to-back pair), DF (Matched face-to-face pair) and DT (matched tandem pair).

What is the nomenclature for Precision Bearings (P4, P5, Tolerances)?

NTN follows the ISO precision tolerance classes of P0, P6, P5, P4 and P2 which are equivalent to ABMA classes ABEC 1, ABEC 3, ABEC 5, ABEC 7 and ABEC 9.

What is the difference between T & D1 or what is the designation for an oil hole?

D1 always denotes a relube feature (any bearing). T is old nomenclature for inch dimensioned bearing units housings with a relube feature.

What is/are the standard greases?

2AS (Shell Alvania 2S), 5K (Kyodo Multemp SRL) and 3AS (Shell Alvania 3S) are considered NTN standard greases: L627 (Polyrex EM) is the current standard grease for most aftermarket inventory. 5K (Kyodo Multemp SRL) is the standard for micro bearings. 3AS (Shell Alvania 3S) is the standard in bearing units.

What is good high temperature grease?

NTN has close to 700 greases listed. To pick one for a specific application requires more application information.

What is the designation for a bronze cage on cylindricals?

Usually a G1 suffix is used to indicate a bronze cage in a cylindrical roller bearing. In rare applications an L1 type cage has been used as well.

What is the designation for a tapered bore on sphericals?

A tapered bore on any NTN bearing (except tapered roller bearings) is a K (1 to 12 ratio) or K30 (1 to 30 ratio) suffix.

What does CE or C0 fit mean?

NTN does not use "CE" or "C0". These are competitor terms for electric motor and normal internal clearances. Clearance does not indicate any type of fit.

What does V1 mean at the end of the deep groove ball bearing nomenclature?

For NTN "V1" stands for the first variation on this basic part number. This suffix lettering does not indicate any specific features. A print will have to be reviewed to see what is not standard.

What does U3A mean at the end of the deep groove ball bearing nomenclature?

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In a part number like 6313ZZC3/2AU3A the "U3A" can be a packaging code or specific customer identification code. This does not affect the bearing features.

What does LD1NR mean?

LD1NR is the current suffix used on cylindrical outer ring bearing unit inserts. The "L" indicates it meets the new Japanese Industrial Specifications. The "D1" indicates it has a relube feature. The "NR" means it has a snap ring groove and snap ring on the outer diameter. This new suffix (LD1NR) will replace the older suffix D1NR on all future stock orders on this type of bearing.

Are tapered bearings case carburized?

All Bower tapers and NTN tapers with the prefix: 4T-, ET- or E- are case carburized. ISO tapers with a "U" suffix and NTN tapers not having a previously mentioned prefix will be through hardened.

Does internal clearance effect the bearing precision (C3 vs P3)?

C3 is an internal clearance, or the amount of internal free space between the rolling elements and the raceways of a bearing. P3 does not exist. P6 is an ISO tolerance class equivalent to ABEC 3, or the accuracy the bearing is manufactured to. Clearance does not affect tolerance and tolerance does not affect clearance.

Does NTN make tapered roller assemblies?

Both NTN and NTN-Bower make 2 and 4 row assemblies, some of which can be found in the NTN-Bower catalog and the NTN Large Bearing catalog (2250/E).

Does NTN make extra precision tapered roller bearings?

NTN does make some select sizes of tapers in high precision classes (ie. -3, -0, -00 etc.).

What is the recommended end play for tapered roller bearings?

End play is application specific, or preset in the case of NA type taper assemblies. The machine manufacturers recommendations should be followed. For new designs please contact NTN engineering.

Which grease is best suited for most general bearing?

The current NTN standard grease for unknown aftermarket applications is L627 (Exxon-Mobil Polyrex EM). In most cases a good general purpose lithium or polyurea based grease will work.

Load ratings seem to vary from manufacturer to manufacturer, is there a single method that can be used to compare like styles of bearings?

Load ratings don't really vary from among manufacturers, the methods used to calculate load ratings is different. Some manufacturers use the ABMA standard, some use the US Industry standard, some use equivalent dynamic load calculations. In general if the internal design is the same the load ratings will be equivalent.

What factors should be considered when choosing a bearing?

All application data (loads, speeds, orientation, etc.), intended use, and environment.

How much grease is too much?

For general applications a grease fill of 30% of the free space in the bearing seems to be accepted as standard by most manufacturers. Slow speed applications in harsh environments (such as agricultural machinery) can sometimes require a larger fill. High speed applications (ie. hand tools) can require a lesser fill. Check with NTN engineering for any special requirements.

Where is the nearest distributor or field sales person?

Contact your regional sales office listed on the back of any NTN catalog (or [here](#) on this Web site) and they can put you in touch with the area sales representative or local distributor.

Explain the difference between C3 and normal clearance?

Clearance classes are established by the ABMA. C3 is a clearance specification one class larger than "C Normal" sometimes referred to as "CO" in deep groove radial ball bearings.

What does the term "electric motor quality" mean?

The term "electric motor quality" is freely used in describing bearings that meet a perceived "higher" level of quality than the standard ABEC1 bearing. Contact NTN marketing for an Electric Motor Quality brochure.

Where are specific bearing types manufactured, plant by plant?

Due to the size of NTN, the answers to this are too numerous to list. Contact NTN engineering for specific bearing inquiries.

Does NTN have field engineering support? How does a visit get scheduled?

NTN does provide engineering field support to its customers. Contact your local NTN sales representative to arrange a visit.

Is the Ultra Class mounted unit going to be available in metric sizes?

Contact the NTN Marketing department.

Can a metric insert fit into the Ultra Class housing?

Any metric 200 series bearing insert with an "A-" prefix can be installed in the appropriate sized Ultra Class housing.

What bearing types does NTN consider their strong points?

Contact the NTN Marketing department.

Does NTN have any OEM programs similar to Timken?

Contact the NTN Sales department.

Are BCA parts/drawings going to be available?

Contact the NTN Marketing department. A new BCA dimensional catalog is under construction. Individual prints can be requested through NTN engineering.

Is there a chart that shows radial clearance ranges in both metric & inches?

NTN does not currently publish inch dimensioned clearance tables.

What is preload?

Preload is an initial load or "negative clearance" given to a bearing before or during operation. This results in the rolling element and raceway surfaces being under constant elastic compressive forces at their contact points. This has the effect of making the bearing extremely rigid so that even when load is applied to the bearing , radial or axial shaft displacement is minimized.

What is the difference between LLB & LLU seals?

The "LB" seal is a non-contact seal for reduced torque or higher speed requirements. The "LU" seal is contact seal for better grease contamination control, but the contact friction increases torque and lowers the limiting speed.

What is the 4T prefix used for?

The 4T- prefix designates a taper bearing that is made of a special grade of case hardened steel and is interchangeable with other manufacturers taper with the same part number.

What is the difference between B type sphericals and E type?

The type "B" spherical has asymmetric rollers guided by an inner ring center rib for better skewing control. The "E" type spherical employs larger symmetric rollers (for increased load capacity) guided by a molded resin cage.

Does NTN make sealed sphericals?

NTN makes several series of sealed spherical bearings, the WA22200 series, the MX-W22200 and various specials.

Does NTN make split sphericals?

NTN has made split spherical as special orders. These bearings start with a 2PE ----. Please consult your NTN sales representative for your applications.

Does NTN make angular contact bearings?

NTN makes a full line of standard and high speed angular contact bearings.

Does NTN make angular contact bearings with steel cages?

NTN makes a selection of cage options, including steel for its angular contact bearings.

Why does NTN use asymmetric rollers in their sphericals...is there an advantage?

NTN's standard spherical roller bearing is a B-type design. This type of bearing has asymmetric rollers that have the advantage of reduced roller skewing. This allows the bearing to run cooler at higher speeds than other spherical designs.

Is it safe to use a C3 fit in place of a standard fit?

C3 is not a fit, it is an internal clearance. Fit is how tight or loose the shaft and housing hold the bearing in place. In most electric motor rebuild applications a C3 clearance can be used in place of a normal clearance. Contact NTN engineering for other applications.

What grease can be used when performing maintenance on mounted units?

Standard bearing unit inserts are prelubed with a lithium based (Shell Alvania 3S) grease. Relube should be a grease with the same base (lithium).

What does each grease code identify?

The grease code on a bearing number tells us the manufacturer, type and quantity.

What is the difference between ABEC 3 and C3? Does the fit get better going up to C4 or down to C2?

ABEC 3 is an AMBA tolerance class. C3 is an internal clearance specification. Fit is the relationship between the bearing bore and outside diameters to the housing bore and shaft outside diameter. Tolerance, clearance and fit are independent dimensions, although in some cases choosing a larger internal clearance can allow you to use a tighter interference fit. Please contact NTN engineering for details.

What is back-to-back and face-to-face in angular contact bearings?

Back-to-back (DB) or face-to-face (DF) are duplex arrangements of angular contact bearings (can also refer to taper bearings). Radial loads and axial loads in either direction can be accommodated by these arrangements. DB should be selected when shaft mounting rigidity is the primary factor. Select DF when shaft misalignment is a concern. The DB arrangement requires the inner rings to be clamped whereas the DF arrangement requires the outer rings to be clamped.

What is the difference between angular contact bearings and deep groove ball bearings?

Deep groove ball bearings are a non-separable type bearing with the line connecting contact points of the steel ball and inner ring and the steel ball and outer ring of 0° in the radial direction. They are designed to take mainly radial loads but can handle some axial load in either direction. Angular contact bearings are a non-separable type. The line connecting contact points of the steel ball and inner ring and the steel ball and outer ring create an angle with the line drawn in the radial direction called the contact angle. In addition to radial loads, relatively heavy axial loads in one direction can be accommodated by an angular contact bearing. The larger the contact angle, the larger the axial loading capacity becomes.