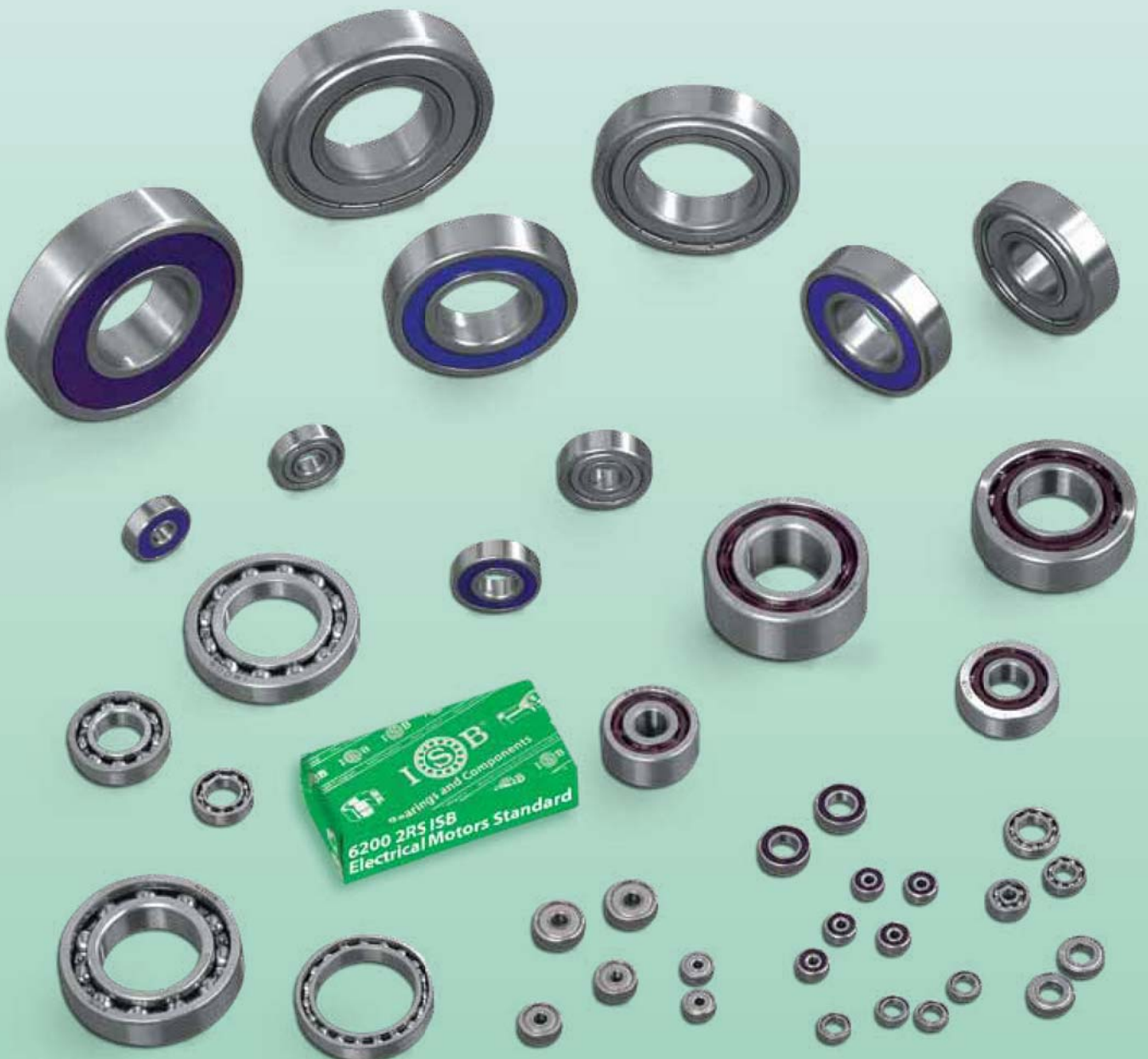




ELECTRICAL MOTORS STANDARD

Rodamientos para aplicaciones "baja rumorosidad"

Bearings for "low noise" applications



ISB[®], RODAMIENTOS BAJA RUMOROSIDAD...

Los rodamientos ISB[®] ELECTRICAL MOTORS STANDARD han sido especialmente estudiados, fabricados y seleccionados uno por uno, para aplicaciones donde se requiere la máxima silenciosidad y las mínimas vibraciones.

Un pool de empresas, con Sistema de Calidad certificado UNI EN ISO 9001:2008, gracias a su elevado know-how técnico y a la disponibilidad de máquinas de avanzada tecnología, controla atentamente la producción, garantizando por lo tanto un producto de elevada calidad.

Para rodamientos con particulares características técnicas y constructivas, las mismas empresas cuentan con oficinas técnicas capaces de resolver eventuales problemas inherentes al diseño y a la aplicación.

ISB[®], LOW NOISE BALL BEARINGS...

ISB[®] ELECTRICAL MOTORS STANDARD bearings have been carefully manufactured and individually selected for assembly on Electric Motors and other applications where low noise and vibration is of paramount importance.

The production of these bearings is constantly monitored and checked only by companies who have full certification with System Quality UNI EN ISO 9001:2008. This ensures that, thanks to their knowledge and their use of bearings for special applications.

The technical staff of these companies are able to solve any difficulties customers may have arising from the need of bearings for special applications.

MATERIALES

Los aros interiores y exteriores, las bolas y las jaulas están fabricadas con un tipo especial de acero de alta calidad, conforme con las normas ISO y SAE 52100. A continuación se exponen las especificaciones técnicas.

MATERIALS

Inner and outer rings, balls and cages are made from a special type of high quality chrome steel in full accordance with ISO and SAE 52100 requirements. See below the technical specifications.

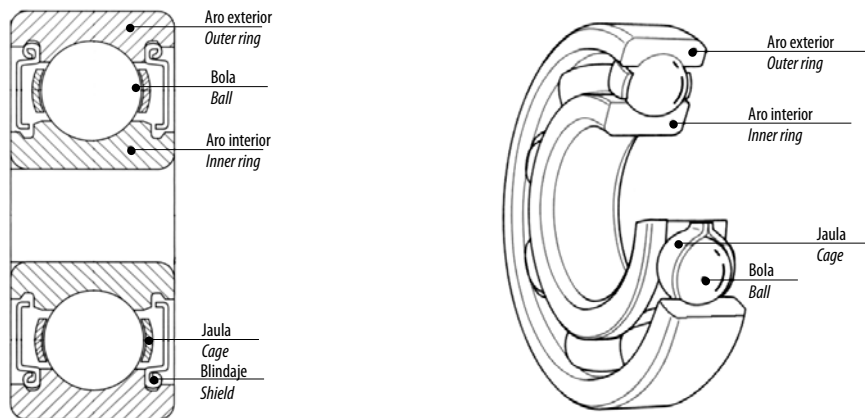
| Componentes - Components | Tipo de acero - Steel type | Dureza - Hardness |
|---------------------------|--|-----------------------|
| Aro interior - Inner ring | Acero al cromo - Chrome steel 100 Cr6 (GCr15) | 60 / 62,5 (± 0,5) HRC |
| Aro exterior - Outer ring | Acero al cromo - Chrome steel 100 Cr6 (GCr15) | 60 / 62,5 (± 0,5) HRC |
| Jaula - Cage | Acero - Steel C40 | — |
| Bolas - Balls* | Acero al cromo - Chrome steel 100 Cr6 (grado-grade G5) | 60 / 65 (± 0,5) HRC |

* Disponible bajo demanda con elevado grado de precisión - Available upon request with other precision grade

| % Composición química del acero para rodamientos - Chemical composition of bearing steel % | | | | | |
|--|--------------------------|------------------------------|----------------------------|------------------------|-------------------------|
| Carbono Carbon C | Silicio Silicon Si | Manganeso Manganese Mn | Fósforo Phosphorus P | Azufre Sulphur S | Cromo Chromium Cr |
| 0,98 ~ 1,10 | 0,15 ~ 0,30 | 0,25 ~ 0,45 | <0,025 | <0,025 | 1,30 ~ 1,60 |

ESTRUCTURA DEL RODAMIENTO

BEARING STRUCTURE



JAULA

CAGE



Jaula remachada
Rivet-type cage



Jaula con chavetero
Tongue-type cage



Jaula de poliamida reforzada con fibra de vidrio
Polyamide-type cage reinforced with glass fiber

LUBRIFICACIÓN

Los rodamientos para aplicaciones de "baja rumorosidad" están pre-lubricados con lubricantes especialmente estudiados para reducir el roce y el calor generado, contener la rumorosidad, proteger contra las contaminaciones y reducir los costes de mantenimiento para los usuarios finales.

Según las condiciones de aplicación, de la rotación del eje, de la temperatura de servicio, etc., es posible utilizar lubricantes diversos como se muestra en la tabla que sigue. En los rodamientos **ISB® ELECTRICAL MOTORS STANDARD** se emplean las siguientes grasas:

Kyodo Yushi Multitemp y Shell Alvania 2.

LUBRICATION

Ball bearings for "low noise" applications are pre-lubricated with special lubricants purposely designed to reduce friction and heat, to limit noise, to protect from contamination thus reducing maintenance costs for the end user.

It is possible to use different lubricants depending application conditions. Please see table below.

Greases used in **ISB® ELECTRICAL MOTORS STANDARD** bearings are as follows:

Kyodo Yushi Multitemp and Shell Alvania 2.

COMPARACIÓN ENTRE LUBRICACIÓN CON GRASA Y LUBRICACIÓN CON ACEITE

COMPARISON BETWEEN GREASE LUBRICATION AND OIL LUBRICATION

| Descripción <i>Specification</i> | Lubricación con grasa <i>Grease lubrication</i> | Lubricación con aceite <i>Oil lubrication</i> |
|--|--|---|
| Alojamientos y obturaciones <i>Housing and seals</i> | Simple <i>Simple</i> | Atención!!! Mantenimiento requerido <i>Careful!!! Maintenance required</i> |
| Velocidad <i>Speed</i> | Velocidad máxima entre 65% y 80% de la lubricación con aceite <i>Max speed between 65% and 80% of oil lubrication</i> | Límite de velocidad más alto <i>Higher limit speed</i> |
| Refrigeración <i>Cooling</i> | Escasa <i>Poor</i> | — |
| Fluidez <i>Fluidity</i> | Escasa <i>Poor</i> | Buena <i>Good</i> |
| Relubricación total <i>Total re-lubrication</i> | A veces difícil <i>Sometimes is difficult</i> | Simple <i>Easy</i> |
| Desmontaje piezas externas <i>Removal of external parts</i> | Desmontaje imposible <i>Impossible removal</i> | Simple <i>Easy</i> |
| Contaminación exterior debida a pérdidas <i>External contamination due to leakage</i> | Pocas contaminaciones por pérdidas <i>Rare contamination by leakage</i> | Si no se toman medidas existen muchas pérdidas. Desaconsejado en caso de contaminaciones exteriores. Evitar <i>Frequent leakage. No suitable if external contamination has to be avoided</i> |

CLASES DE PRECISIÓN

Los rodamientos **ISB® ELECTRICAL MOTORS STANDARD** se fabrican con tolerancias de elaboración conformes con las normas ISO. Normalmente se realizan con clase de precisión 6. Clases de precisión mayores se pueden suministrar bajo demanda del Cliente.

PRECISION CLASS

ISB® ELECTRICAL MOTORS STANDARD bearings are manufactured with precision class tolerances according to ISO standards. They are usually supplied with precision class 6. At Customer's request or for special applications, they can be supplied with a higher precision class.

| Estándar | Clase de tolerancia / Tolerance class | | | |
|----------|---------------------------------------|----------|----------|----------|
| ISO | 0 | 6 | 5 | 4 |
| DIN | P0 | P6 | P5 | P4 |
| ANSI | ABEC - 1 | ABEC - 3 | ABEC - 5 | ABEC - 7 |

Símbolos

Symbols

| | | |
|--|--|---|
| Diámetro nominal del orificio | d | Nominal bore diameter |
| Diámetro medio del orificio | d_{mp} | Mean bore diameter |
| Variación del diámetro del orificio | V_{dp} | Bore diameter variation |
| Variación del diámetro medio del orificio | V_{dmp} | Mean bore diameter variation |
| Diferencia del diámetro del orificio respecto al valor nominal ($\Delta_{dmp}=dmp-d$) | Δ_{dmp} | Deviation of the mean bore diameter ($\Delta_{dmp}=dmp-d$) |
| Diámetro nominal exterior | D | Nominal outer diameter |
| Diámetro exterior medio | D_{mp} | Mean outer diameter |
| Variación del diámetro exterior | V_{Dp} | Outer diameter variation |
| Variación del diámetro medio exterior | V_{Dmp} | Mean outer diameter variation |
| Diferencia del diámetro exterior medio ($\Delta_{Dmp}=Dmp-D$) | Δ_{Dmp} | Deviation of the mean outer diameter ($\Delta_{Dmp}=Dmp-D$) |
| Concentricidad de rotación del aro interior del rodamiento completo (precisión radial de rotación) | K_{ia} | Rotation concentricity of the bearing inner ring (run out radial precision) |
| Concentricidad de rotación del aro exterior del rodamiento completo (precisión radial de rotación) | K_{ea} | Concentricity radial run out of assembled bearing outer ring (run out radial precision) |
| Medida nominal de la altura del aro interior | B | Nominal height of the inner ring |
| Medida nominal de la altura del aro exterior | C | Nominal height of the outer ring |
| Medida individual de la altura del aro interior y del aro exterior | B_S - C_S | Single height of the inner and outer ring |
| Diferencia de una única medida de la altura del aro interior respecto a la dimensión nominal ($\Delta_{Bs}=Bs-B$) | Δ_{Bs} | Inner ring single width deviation ($\Delta_{Bs}=Bs-B$) |
| Diferencia de una única medida de la altura del aro exterior respecto a la dimensión nominal ($\Delta_{Cs}=Cs-C$) | Δ_{Cs} | Deviation of outer ring single width ($\Delta_{Cs}=Cs-C$) |
| Variación del ancho del aro (diferencia entre valores máximos y mínimos de las diferentes medidas del aro interior y exterior) | V_{Bs} - V_{Cs} | Inner and outer ring width variation |
| Defecto de cuadratura de las caras respecto al orificio del aro interior | S_d | Side face run out with reference to bore of the inner ring |
| Variación de la inclinación cilíndrica exterior respecto a la superficie lateral del aro exterior | S_D | Variation of the inclination of outside cylindrical surface to outer ring side face |
| Planaridad de rotación de la superficie lateral del aro interior respecto al camino de rodadura del rodamiento rígido completo (precisión axial de rotación) | S_{ia} | Side face run out of assembled inner ring with reference to raceway |
| Planaridad de rotación de la superficie lateral del aro exterior respecto al camino de rodadura del rodamiento rígido completo (precisión axial de rotación) | S_{ea} | Side face run out of assembled outer ring with reference to raceway |

CLASE DE PRECISIÓN P0 (ABEC-1)

PRECISION CLASS P0 (ABEC-1)

ARO INTERIOR / INNER RING

μm.

| d (mm) | | Δ _{dmp} | | V _{dp} | | | V _{dmp} | K _{ia} | Δ _{Bs} | | V _{Bs} | |
|----------------|----------------|------------------|-----|--------------------------------------|-----|-------|------------------|-----------------|-----------------|------|-----------------|-----|
| | | | | Serie diametrales Diameter series | | | | | máx | mín | | máx |
| | | | | 9 | 0,1 | 2,3,4 | | | | | | |
| más de over | hasta up to | máx | mín | máx | | | máx | máx | máx | mín | máx | |
| 0,6 | 2,5 | 0 | -8 | 10 | 8 | 6 | 6 | 10 | 0 | -40 | 12 | |
| 2,5 | 10 | 0 | -8 | 10 | 8 | 6 | 6 | 10 | 0 | -120 | 15 | |
| 10 | 18 | 0 | -8 | 10 | 8 | 6 | 6 | 10 | 0 | -120 | 20 | |
| 18 | 30 | 0 | -10 | 13 | 10 | 8 | 8 | 13 | 0 | -120 | 20 | |
| 30 | 50 | 0 | -12 | 15 | 12 | 9 | 9 | 15 | 0 | -120 | 20 | |
| 50 | 80 | 0 | -15 | 19 | 19 | 11 | 11 | 20 | 0 | -150 | 25 | |

ARO EXTERIOR / OUTER RING

μm.

| D (mm) | | Δ _{Dmp} | | V _{Dp} | | | | V _{Dmp} | K _{ea} | Δ _{Cs} | | V _{Cs} | | |
|----------------|----------------|------------------|-----|---------------------------------------|-----|---|-------|------------------|-----------------|--|-----|-----------------|-----|-----|
| | | | | Rodamientos abiertos Open bearings | | Rodamientos cerrados Closed bearings | | | | máx | máx | | máx | mín |
| | | | | Serie diametrales Diameter series | | | | | | | | | | |
| más de over | hasta up to | máx | mín | 9 | 0,1 | 2,3,4 | 2,3,4 | máx | máx | máx | mín | máx | | |
| 2,5 | 6 | 0 | -8 | 10 | 8 | 6 | 10 | 6 | 15 | Igual a Δ _{Bs} y V _{Bs} para aro interior del mismo rodamiento Identical to Δ _{Bs} and V _{Bs} of the inner ring of the relevant bearing | | | | |
| 6 | 18 | 0 | -8 | 10 | 8 | 6 | 10 | 6 | 15 | | | | | |
| 18 | 30 | 0 | -9 | 12 | 9 | 7 | 12 | 7 | 15 | | | | | |
| 30 | 50 | 0 | -11 | 14 | 11 | 8 | 16 | 8 | 20 | | | | | |
| 50 | 80 | 0 | -13 | 16 | 13 | 10 | 20 | 10 | 25 | | | | | |
| 80 | 120 | 0 | -15 | 19 | 19 | 11 | 26 | 11 | 35 | | | | | |
| 120 | 150 | 0 | -18 | 23 | 23 | 14 | 30 | 14 | 40 | | | | | |

CLASE DE PRECISI3N P6 (ABEC-3)

PRECISION CLASS P6 (ABEC-3)

ARO INTERIOR / INNER RING

μm.

| d (mm) | | Δ _{dmp} | | V _{dp} | | | V _{dmp} | K _{ia} | Δ _{Bs} | | V _{Bs} |
|-------------|-------------|------------------|-----|--------------------------------------|-----|-------|------------------|-----------------|-----------------|------|-----------------|
| | | | | Serie diametrales Diameter series | | | | | | | |
| | | | | 9 | 0,1 | 2,3,4 | | | | | |
| más de over | hasta up to | máx | mín | máx | | | máx | máx | máx | mín | máx |
| 0,6 | 2,5 | 0 | -7 | 9 | 7 | 5 | 5 | 5 | 0 | -40 | 12 |
| 2,5 | 10 | 0 | -7 | 9 | 7 | 5 | 5 | 6 | 0 | -120 | 15 |
| 10 | 18 | 0 | -7 | 9 | 7 | 5 | 5 | 7 | 0 | -120 | 20 |
| 18 | 30 | 0 | -8 | 10 | 8 | 6 | 6 | 8 | 0 | -120 | 20 |
| 30 | 50 | 0 | -10 | 13 | 10 | 8 | 8 | 10 | 0 | -120 | 20 |
| 50 | 80 | 0 | -12 | 15 | 15 | 9 | 9 | 10 | 0 | -150 | 25 |

ARO EXTERIOR / OUTER RING

μm.

| D (mm) | | Δ _{Dmp} | | V _{Dp} | | | | V _{Dmp} | K _{ea} | Δ _{Cs} | | V _{Cs} |
|-------------|-------------|------------------|-----|---------------------------------------|-----|-------|---|------------------|-----------------|--|-----|-----------------|
| | | | | Rodamientos abiertos Open bearings | | | Rodamientos cerrados Closed bearings | | | | | |
| | | | | Serie diametrales Diameter series | | | | | | | | |
| | | | | 9 | 0,1 | 2,3,4 | 2,3,4 | | | | | |
| más de over | hasta up to | máx | mín | máx | | | máx | máx | máx | mín | máx | |
| 2,5 | 6 | 0 | -7 | 9 | 7 | 5 | 9 | 5 | 8 | Igual a Δ _{Bs} y V _{Bs} para aro interior del mismo rodamiento Identical to Δ _{Bs} and V _{Bs} of the inner ring of the relevant bearing | | |
| 6 | 18 | 0 | -7 | 9 | 7 | 5 | 9 | 5 | 8 | | | |
| 18 | 30 | 0 | -8 | 10 | 8 | 6 | 10 | 6 | 9 | | | |
| 30 | 50 | 0 | -9 | 11 | 9 | 7 | 13 | 7 | 10 | | | |
| 50 | 80 | 0 | -11 | 14 | 11 | 8 | 16 | 8 | 13 | | | |
| 80 | 120 | 0 | -13 | 16 | 16 | 10 | 20 | 10 | 18 | | | |
| 120 | 150 | 0 | -15 | 19 | 19 | 11 | 25 | 11 | 20 | | | |

CLASE DE PRECISIÓN P5 (ABEC-5)
PRECISION CLASS P5 (ABEC-5)
ARO INTERIOR / INNER RING

μm.

| d (mm) | | Δ _{dmp} | | V _{dp} | | V _{dmp} | K _{ia} | S _d | S _{ia} | Δ _{Bs} | | V _{Bs} | |
|----------------|----------------|------------------|-----|--------------------------------------|-----------|------------------|-----------------|----------------|-----------------|-----------------|------|-----------------|-----|
| | | | | Serie diametrales Diameter series | | | | | | máx | mín | | máx |
| | | | | 9 | 0,1,2,3,4 | | | | | | | | |
| más de over | hasta up to | máx | mín | máx | | máx | máx | máx | máx | máx | mín | máx | |
| 0,6 | 2,5 | 0 | -5 | 5 | 4 | 3 | 4 | 7 | 7 | 0 | -40 | 5 | |
| 2,5 | 10 | 0 | -5 | 5 | 4 | 3 | 4 | 7 | 7 | 0 | -40 | 5 | |
| 10 | 18 | 0 | -5 | 5 | 4 | 3 | 4 | 7 | 7 | 0 | -80 | 5 | |
| 18 | 30 | 0 | -6 | 6 | 5 | 3 | 4 | 8 | 8 | 0 | -120 | 5 | |
| 30 | 50 | 0 | -8 | 8 | 6 | 4 | 5 | 8 | 8 | 0 | -120 | 5 | |
| 50 | 80 | 0 | -9 | 9 | 7 | 5 | 5 | 8 | 8 | 0 | -150 | 6 | |

ARO EXTERIOR / OUTER RING

μm.

| D (mm) | | Δ _{Dmp} | | V _{Dp} | | V _{Dmp} | K _{ea} | S _D | S _{ea} | Δ _{Cs} | | V _{Cs} | |
|----------------|----------------|------------------|-----|--------------------------------------|-----------|------------------|-----------------|----------------|-----------------|--|-----|-----------------|-----|
| | | | | Serie diametrales Diameter series | | | | | | máx | mín | | máx |
| | | | | 9 | 0,1,2,3,4 | | | | | | | | |
| más de over | hasta up to | máx | mín | máx | | máx | máx | máx | máx | máx | mín | máx | |
| 2,5 | 6 | 0 | -5 | 5 | 4 | 3 | 5 | 8 | 8 | Igual a Δ _{Bs} y V _{Bs} para aro interior del mismo rodamiento Identical to Δ _{Bs} and V _{Bs} of the inner ring of the relevant bearing | | | |
| 6 | 18 | 0 | -5 | 5 | 4 | 3 | 5 | 8 | 8 | | | | |
| 18 | 30 | 0 | -6 | 6 | 5 | 3 | 6 | 8 | 8 | | | | |
| 30 | 50 | 0 | -7 | 7 | 5 | 4 | 7 | 8 | 8 | | | | |
| 50 | 80 | 0 | -9 | 9 | 7 | 5 | 8 | 8 | 10 | | | | |
| 80 | 120 | 0 | -10 | 10 | 8 | 5 | 10 | 9 | 11 | | | | |
| 120 | 150 | 0 | -11 | 11 | 8 | 6 | 11 | 10 | 13 | | | | |

CLASE DE PRECISIÓN P4 (ABEC-7)

PRECISION CLASS P4 (ABEC-7)

ARO INTERIOR / INNER RING

µm.

| d (mm) | | Δ _{dmp} | | Δ _{ds} | | V _{dp} | | V _{dmp} | K _{ia} | S _d | S _{ia} | Δ _{Bs} | | V _{Bs} | | |
|----------------|----------------|------------------|-----|-----------------|-----|--------------------------------------|-----------|------------------|-----------------|----------------|-----------------|-----------------|------|-----------------|-----|-----|
| | | | | | | Serie diametrales Diameter series | | | | | | máx | mín | | máx | mín |
| | | | | | | 7,8,9 | 1,7,2,3,4 | | | | | | | | | |
| más de over | hasta up to | máx | mín | máx | mín | máx | | máx | máx | máx | máx | máx | mín | máx | | |
| 0,6 | 2,5 | 0 | -4 | 0 | -4 | 4 | 3 | 2 | 2,5 | 3 | 3 | 0 | -40 | 2,5 | | |
| 2,5 | 10 | 0 | -4 | 0 | -4 | 4 | 3 | 2 | 2,5 | 3 | 3 | 0 | -40 | 2,5 | | |
| 10 | 18 | 0 | -4 | 0 | -4 | 4 | 3 | 2 | 2,5 | 3 | 3 | 0 | -80 | 2,5 | | |
| 18 | 30 | 0 | -5 | 0 | -5 | 5 | 4 | 2,5 | 3 | 4 | 4 | 0 | -120 | 2,5 | | |
| 30 | 50 | 0 | -6 | 0 | -6 | 6 | 5 | 3 | 4 | 4 | 4 | 0 | -120 | 3 | | |
| 50 | 80 | 0 | -7 | 0 | -7 | 7 | 5 | 3,5 | 4 | 5 | 5 | 0 | -150 | 4 | | |

ARO EXTERIOR / OUTER RING

µm.

| D (mm) | | Δ _{Dmp} | | Δ _{Ds} | | V _{Dp} | | V _{Dmp} | K _{ea} | S _D | S _{ea} | Δ _{Cs} | | V _{Cs} | | |
|----------------|----------------|------------------|-----|-----------------|-----|--------------------------------------|-----------|------------------|-----------------|----------------|-----------------|--|-----|-----------------|-----|-----|
| | | | | | | Serie diametrales Diameter series | | | | | | máx | mín | | máx | mín |
| | | | | | | 7,8,9 | 1,7,2,3,4 | | | | | | | | | |
| más de over | hasta up to | máx | mín | máx | mín | máx | | máx | máx | máx | máx | máx | mín | máx | | |
| 2,5 | 6 | 0 | -4 | 0 | -4 | 4 | 3 | 2 | 3 | 4 | 5 | Igual a Δ _{Bs} y V _{Bs} para aro interior del mismo rodamiento Identical to Δ _{Bs} and V _{Bs} of the inner ring of the relevant bearing | | | | |
| 6 | 18 | 0 | -4 | 0 | -4 | 4 | 3 | 2 | 3 | 4 | 5 | | | | | |
| 18 | 30 | 0 | -5 | 0 | -5 | 5 | 4 | 2,5 | 4 | 4 | 5 | | | | | |
| 30 | 50 | 0 | -6 | 0 | -6 | 6 | 5 | 3 | 5 | 4 | 5 | | | | | |
| 50 | 80 | 0 | -7 | 0 | -7 | 7 | 5 | 3,5 | 5 | 4 | 5 | | | | | |
| 80 | 120 | 0 | -8 | 0 | -8 | 8 | 6 | 4 | 6 | 5 | 6 | | | | | |
| 120 | 150 | 0 | -9 | 0 | -9 | 9 | 7 | 5 | 7 | 5 | 7 | | | | | |

JUEGO RADIAL

El juego radial de los rodamientos está determinado por el desplazamiento en sentido radial (de una a otra parte) del aro interior respecto al aro exterior.

Los rodamientos **ISB® ELECTRICAL MOTORS STANDARD** se fabrican con juego radial "normal" y se utilizan para empleos comunes, garantizando parámetros satisfactorios de funcionamiento.

Si el juego radial es diferente al normal, se evidencia añadiendo un sufijo a la referencia del rodamiento (por ejemplo: 6005 C3). La tabla que sigue a continuación muestra los valores de los juegos radiales.

RADIAL CLEARANCE

The radial clearance of bearings is determined by the radial movement (from one side to the other between the inner ring and the outer track.

The **ISB® ELECTRICAL MOTORS STANDARD** bearings are constructed with "normal" radial clearance, in order to satisfy common applications.

If the radial play differs from the standard, it can be recognized with a suffix that identifies the type of bearing (example: 6005 C3). The following table shows the values for radial clearances.

TABLA JUEGO RADIAL DE LOS RODAMIENTOS DE BOLAS

TABLES OF RADIAL CLEARANCE FOR BALL BEARINGS

µm.

| Diámetro del orificio (mm) Bore diameter (mm) | | C2 | | Normal Normal | | C3 | | C4 | | C5 | |
|---|----------------|-----|-----|------------------|-----|-----|-----|-----|-----|-----|-----|
| Más de Over | Hasta Up to | Mín | Máx | Mín | Máx | Mín | Máx | Mín | Máx | Mín | Máx |
| 2,5 | 10 | 0 | 7 | 2 | 13 | 8 | 23 | 14 | 29 | 20 | 37 |
| 10 | 18 | 0 | 9 | 3 | 18 | 11 | 25 | 18 | 33 | 25 | 45 |
| 18 | 24 | 0 | 10 | 5 | 20 | 13 | 28 | 20 | 36 | 28 | 48 |
| 24 | 30 | 1 | 11 | 5 | 20 | 13 | 28 | 23 | 41 | 30 | 53 |
| 30 | 40 | 1 | 11 | 6 | 20 | 15 | 33 | 28 | 46 | 40 | 64 |
| 40 | 50 | 1 | 11 | 6 | 23 | 18 | 36 | 30 | 51 | 45 | 73 |
| 50 | 65 | 1 | 15 | 8 | 28 | 23 | 43 | 38 | 61 | 55 | 90 |

VIBRACIONES Y RUMOROSIDAD

Los rodamientos ISB® ELECTRICAL MOTORS STANDARD se fabrican siguiendo los valores de rumorosidad y vibración indicados en las tablas que siguen, en particular pueden ser fabricados en ejecución "Low Noise-Z₃ V₃" o bien en ejecución "Low Noise Plus - Z_p V_p".

VIBRATIONS AND NOISE

ISB® ELECTRICAL MOTORS STANDARD bearings have been manufactured in accordance with the values shown in the tables below. In particular they are available in Z₃-V₃ noiseless "Low Noise" or "Z_p - V_p Low Noise Plus" version.

TABLA TOLERANCIAS DE LAS VIBRACIONES

VIBRATIONS TOLERANCES TABLE

µm./s

| d mm | V | | | V ₁ | | | V ₂ | | | V ₃ | | | V ₄ | | | V _p | | |
|---------|----------|--------------|-----------|----------------|--------------|-----------|----------------|--------------|-----------|----------------|--------------|-----------|----------------|--------------|-----------|----------------|--------------|-----------|
| | Bajo Low | Medio Medium | Alto High | Bajo Low | Medio Medium | Alto High | Bajo Low | Medio Medium | Alto High | Bajo Low | Medio Medium | Alto High | Bajo Low | Medio Medium | Alto High | Bajo Low | Medio Medium | Alto High |
| 3,4 | 80 | 44 | 44 | 60 | 35 | 32 | 48 | 26 | 22 | 31 | 16 | 15 | 28 | 10 | 10 | 25 | 10 | 10 |
| 5,6 | 110 | 72 | 60 | 74 | 48 | 40 | 58 | 36 | 30 | 35 | 21 | 18 | 32 | 11 | 11 | 25 | 12 | 10 |
| 7,8 | 130 | 96 | 80 | 92 | 66 | 54 | 72 | 48 | 40 | 44 | 28 | 24 | 38 | 12 | 12 | 35 | 14 | 12 |
| 9 | 130 | 96 | 80 | 92 | 66 | 54 | 72 | 48 | 40 | 44 | 28 | 24 | 38 | 12 | 12 | 40 | 16 | 14 |
| 10 | 160 | 120 | 100 | 120 | 80 | 70 | 90 | 60 | 50 | 55 | 35 | 30 | 45 | 14 | 15 | 45 | 22 | 20 |
| 12 | 160 | 120 | 100 | 120 | 80 | 70 | 90 | 60 | 50 | 55 | 35 | 30 | 45 | 14 | 15 | 45 | 24 | 22 |
| 15 | 210 | 150 | 120 | 150 | 100 | 85 | 110 | 78 | 60 | 65 | 46 | 35 | 52 | 18 | 18 | 50 | 32 | 26 |
| 17 | 210 | 150 | 120 | 150 | 100 | 85 | 110 | 78 | 60 | 65 | 46 | 35 | 52 | 25 | 25 | 50 | 35 | 30 |
| 20 | 260 | 190 | 150 | 180 | 125 | 100 | 130 | 100 | 75 | 80 | 60 | 45 | 60 | 25 | 25 | 60 | 40 | 35 |
| 22,25 | 260 | 190 | 150 | 180 | 125 | 100 | 130 | 100 | 75 | 80 | 60 | 45 | 60 | 30 | 32 | 70 | 40 | 35 |
| 28 | 260 | 190 | 150 | 180 | 125 | 100 | 130 | 100 | 75 | 80 | 60 | 45 | 60 | 35 | 40 | 55 | 31 | 28 |
| 30,32 | 300 | 240 | 190 | 200 | 150 | 130 | 150 | 120 | 100 | 90 | 75 | 60 | 70 | 35 | 40 | 80 | 50 | 45 |
| 35 | 300 | 240 | 190 | 200 | 150 | 130 | 150 | 120 | 100 | 90 | 75 | 60 | 70 | 42 | 45 | 80 | 50 | 40 |
| 40 | 360 | 300 | 260 | 240 | 180 | 160 | 180 | 150 | 130 | 110 | 90 | 80 | 82 | 50 | 50 | 100 | 80 | 60 |
| 45 | 360 | 300 | 260 | 240 | 180 | 160 | 180 | 150 | 130 | 110 | 90 | 80 | 82 | 60 | 60 | 120 | 80 | 70 |
| 50 | 420 | 320 | 320 | 280 | 200 | 200 | 210 | 160 | 160 | 125 | 100 | 100 | 95 | 70 | 70 | 140 | 100 | 80 |

TABLA TOLERANCIAS DE LA RUMOROSIDAD

NOISE TOLERANCES TABLE

dB

| d mm | Serie diametrales (60...) Diameter series (60...) | | | | | Serie diametrales (62...) Diameter series (62...) | | | | | | Serie diametrales (63...) Diameter series (63...) | | | | | |
|---------|--|----------------|----------------|----------------|----------------|--|----------------|----------------|----------------|----------------|----------------|--|----------------|----------------|----------------|----------------|----------------|
| | Z | Z ₁ | Z ₂ | Z ₃ | Z _p | Z | Z ₁ | Z ₂ | Z ₃ | Z ₄ | Z _p | Z | Z ₁ | Z ₂ | Z ₃ | Z ₄ | Z _p |
| 3 | 35 | 34 | 32 | 28 | 26 | 36 | 35 | 32 | 30 | - | 26 | 37 | 36 | 33 | 31 | - | 26 |
| 4 | 35 | 34 | 32 | 28 | 26 | 36 | 35 | 32 | 30 | - | 26 | 37 | 36 | 33 | 31 | - | 26 |
| 5 | 37 | 36 | 34 | 30 | 26 | 38 | 37 | 34 | 32 | - | 26 | 39 | 37 | 35 | 33 | - | 26 |
| 6 | 37 | 36 | 34 | 30 | 22 | 38 | 37 | 34 | 32 | - | 23 | 39 | 37 | 35 | 33 | - | 24 |
| 7 | 39 | 38 | 35 | 31 | 22 | 40 | 38 | 36 | 34 | - | 23 | - | - | - | - | - | 24 |
| 8 | 39 | 38 | 35 | 31 | 23 | 40 | 38 | 36 | 34 | - | 24 | - | - | - | - | - | 25 |
| 9 | 41 | 40 | 36 | 32 | 24 | 42 | 40 | 37 | 35 | - | 25 | - | - | - | - | - | 26 |
| 10 | 43 | 42 | 38 | 33 | 24 | 44 | 42 | 39 | 35 | 30 | 25 | 46 | 44 | 40 | 37 | 32 | 26 |
| 12 | 44 | 43 | 39 | 34 | 26 | 45 | 43 | 39 | 35 | 30 | 27 | 47 | 45 | 40 | 37 | 32 | 28 |
| 15 | 45 | 44 | 40 | 35 | 28 | 46 | 44 | 41 | 36 | 31 | 29 | 48 | 46 | 42 | 38 | 33 | 30 |
| 17 | 46 | 44 | 40 | 35 | 31 | 47 | 45 | 41 | 36 | 31 | 32 | 49 | 47 | 42 | 38 | 33 | 33 |
| 20 | 47 | 45 | 41 | 36 | 34 | 48 | 46 | 42 | 38 | 33 | 35 | 50 | 48 | 43 | 39 | 34 | 36 |
| 22 | 47 | 45 | 41 | 36 | 35 | 48 | 46 | 42 | 38 | 33 | 36 | 50 | 48 | 43 | 39 | 34 | 35 |
| 25 | 48 | 46 | 42 | 38 | 35 | 49 | 47 | 43 | 40 | 36 | 36 | 51 | 49 | 44 | 41 | 37 | 39 |
| 28 | 49 | 47 | 43 | 39 | 36 | 50 | 48 | 44 | 41 | 37 | 37 | 52 | 50 | 45 | 42 | 38 | 37 |
| 30 | 49 | 47 | 43 | 39 | 37 | 50 | 48 | 44 | 41 | 37 | 38 | 52 | 50 | 45 | 42 | 38 | 40 |
| 32 | 50 | 48 | 44 | 40 | 38 | 51 | 49 | 45 | 42 | 38 | 39 | 53 | 51 | 46 | 43 | 39 | 39 |
| 35 | 51 | 49 | 45 | 41 | 40 | 52 | 50 | 46 | 43 | 39 | 40 | 54 | 52 | 47 | 44 | 40 | 42 |
| 40 | 53 | 51 | 46 | 42 | 42 | 54 | 52 | 47 | 44 | 40 | 42 | 56 | 54 | 49 | 45 | 41 | 43 |
| 45 | 55 | 53 | 48 | 45 | 43 | 56 | 54 | 49 | 46 | 43 | 43 | 58 | 56 | 51 | 47 | 44 | 42 |
| 50 | 57 | 54 | 50 | 47 | 44 | 58 | 55 | 51 | 48 | 45 | 44 | 60 | 57 | 53 | 49 | 46 | 43 |
| 55 | 59 | 56 | 52 | 49 | 45 | 60 | 57 | 53 | 50 | 47 | 45 | 62 | 59 | 54 | 51 | 48 | 47 |
| 60 | 61 | 58 | 54 | 51 | 47 | 62 | 59 | 54 | 51 | 48 | 47 | 64 | 61 | 56 | 53 | 50 | 48 |

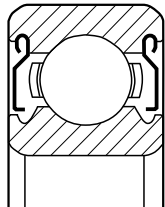
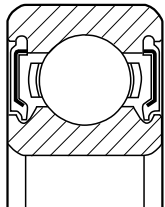
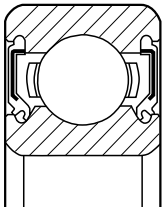
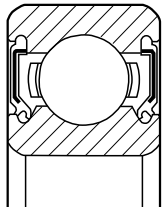
SUFIJOS DE LOS RODAMIENTOS

BEARINGS SUFFIXS

| | | |
|---|-----|--|
| Blindaje de metal no deslizante de un lado del rodamiento | Z | Metal shield at one side of the bearing |
| Blindaje de metal no deslizante de ambos lados del rodamiento | ZZ | Metal shield at both sides of the bearing |
| Obturación de goma deslizante de un lado del rodamiento | RS | Rubber seal at one side of the bearing |
| Obturación de goma deslizante de ambos lados del rodamiento | 2RS | Rubber seal at both sides of the bearing |
| Obturación de goma de baja fricción reforzada con una chapa de acero a un lado del rodamiento | RZ | Low friction rubber seal reinforced with steel, at one side of the bearing |
| Obturación de goma de baja fricción reforzada con una chapa de acero a ambos lados del rodamiento | 2RZ | Low friction rubber seal reinforced with steel, at both sides of the bearing |
| Obturación de goma con fricción media | 2RV | Medium friction rubber seals |

BLINDAJES Y OBTURACIONES

SHIELDS AND SEALS

| Marca y descripción Brand and specification | Blindado - Shielded | Con obturación - Sealed | | |
|--|---|---|--|---|
| | Sin contacto Non-contact type | Sin contacto Non-contact type | A contacto Contact type | Tipo "baja torsión" "Low torque" type |
| ISB | ZZ | 2RZ | 2RS | 2RV |
| NSK | ZZ | VV | DDU | DDW |
| NTN | ZZ | LLB | LLU | LLH |
| Estructura Structure |  |  |  |  |
| Torsión Torque | Bajo Low | Bajo Low | Bastante alto Rather high | Medio Medium |
| Resistente al polvo Dust proofing | Muy bueno Very good | Mejor que el ZZ Better than ZZ-type | Excelente Excellent | Mucho mejor que el 2RZ Much better than 2RZ-type |
| Resistencia al agua Water proofing | Escasa Poor | Escasa Poor | Muy bueno Very good | Muy bueno Very good |
| Capacidad de alta velocidad High speed capacity | Cómo el tipo abierto Same as open type | Cómo el tipo abierto Same as open type | Limitado por el aro de contacto Limited by contact seals | Mucho mejor que el 2RS Much better than 2RS-type |
| Temperatura permitida Allowable temperature range | Depende del lubricante Depends on lubricant | -25 °C ~ +120 °C | -25 °C ~ +110 °C | -25 °C ~ +120 °C |

DIMENSIÓN DE LOS RACORES (BISEL)

- r_1, r_3 = biseles en dirección central
- r_2, r_4 = biseles en dirección axial
- $r_s \text{ min}$ = símbolo limite máximo biseles r_1, r_2, r_3, r_4 ,
- $r_{1s} \text{ max}, r_{3s} \text{ max}$ = dimensión máxima en dirección radial
- $r_{2s} \text{ max}, r_{4s} \text{ max}$ = dimensión máxima en dirección axial

DIMENSIONES LIMITE RACORES PARA RODAMIENTOS RÍGIDOS Y AXIALES

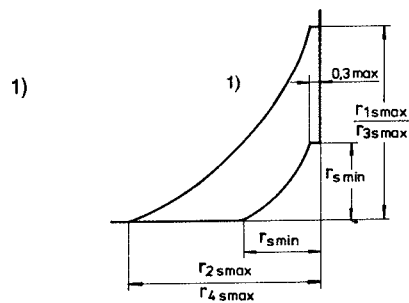
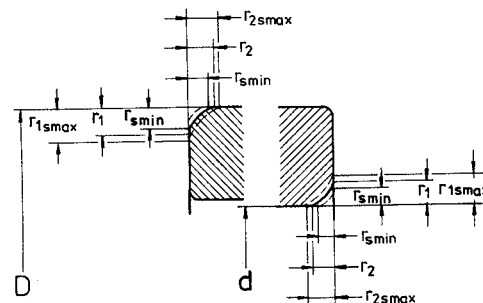
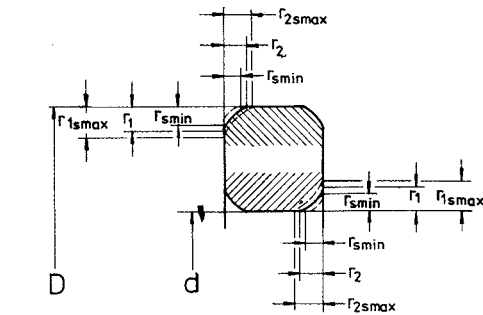
| Diámetro del orificio Bore diameter | | | Rodamientos rígidos Radial bearings | | Rodamientos axiales Thrust bearings |
|--|-------------|-------------|--|------------------------------|--|
| $r_s \text{ min}$ | d | | $r_{1s}, r_{3s} \text{ máx}$ | $r_{2s}, r_{4s} \text{ máx}$ | $r_{1s}, r_{2s} \text{ máx}$ |
| | más de over | hasta up to | | | |
| 0,1 | - | - | 0,2 | 0,4 | 0,2 |
| 0,15 | - | - | 0,3 | 0,6 | 0,3 |
| 0,2 | - | - | 0,5 | 0,8 | 0,5 |
| 0,3 | - | 40 | 0,6 | 1 | 0,8 |
| | 40 | - | 0,8 | 1 | 0,8 |
| 0,6 | - | 40 | 1 | 2 | 1,5 |
| | 40 | - | 1,3 | 2 | 1,5 |
| 1 | - | 50 | 1,5 | 3 | 2,2 |
| | 50 | - | 1,9 | 3 | 2,2 |
| 1,1 | - | 120 | 2 | 3,5 | 2,7 |
| | 120 | - | 2,5 | 4 | 2,7 |
| 1,5 | - | 120 | 2,3 | 4 | 3,5 |
| | 120 | - | 3 | 5 | 3,5 |
| 2 | - | 80 | 3 | 4,5 | 4 |
| | 220 | - | 3,8 | 6 | 4 |
| | 80 | 220 | 3,5 | 5 | 4 |
| 2,1 | - | 100 | 3,8 | 6 | 4,5 |
| | - | 280 | 4 | 6,5 | 4,5 |
| | 280 | - | 4,5 | 7 | 4,5 |
| 2,5 | 100 | 280 | 4,5 | 6 | - |
| | 280 | - | 5 | 7 | - |
| 3 | - | 280 | 5 | 8 | 5,5 |
| | 280 | - | 5,5 | 8 | 5,5 |
| 4 | - | - | 6,5 | 9 | 6,5 |
| 5 | - | - | 8 | 10 | 8 |
| 6 | - | - | 10 | 13 | 10 |
| 7,5 | - | - | 12,5 | 17 | 12,5 |
| 9,5 | - | - | 15 | 19 | 15 |
| 12 | - | - | 18 | 24 | 18 |
| 15 | - | - | 21 | 30 | 21 |
| 19 | - | - | 25 | 38 | 25 |

MOUNTING CHAMFER DIMENSIONS

TOLERANCES

- r_1, r_3 = chamfer dimension in radial direction
- r_2, r_4 = chamfer dimension in axial direction
- $r_s \text{ min}$ = general symbol for minimum limit r_1, r_2, r_3, r_4 ,
- $r_{1s} \text{ max}, r_{3s} \text{ max}$ = maximum dimension in radial direction
- $r_{2s} \text{ max}, r_{4s} \text{ max}$ = maximum dimension in axial direction

MOUNTING CHAMFER DIMENSION LIMITS FOR RADIAL AND THRUST BEARINGS



1) Solo para $d < 30 \text{ mm}$
1) Only for $d < 30 \text{ mm}$

MANTENIMIENTO

ANOMALÍAS EN EL FUNCIONAMIENTO DE UN RODAMIENTO: CAUSAS PROBABLES Y ACCIONES CORRECTIVAS

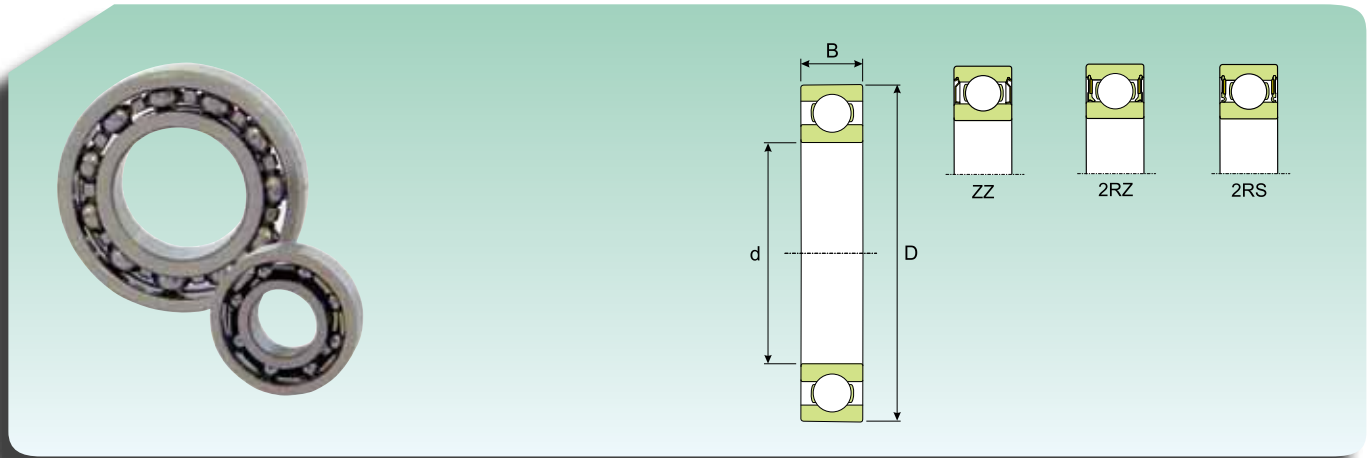
| ANOMALÍA | CAUSAS PROBABLES | ACCIONES CORRECTIVAS |
|---|---|---|
| Fuerte ruido metálico | Carga anómala | Seleccionar con mayor cuidado el acoplamiento, el juego interior, la pre-carga, la posición del apoyo lateral del alojamiento, etc. |
| | Montaje incorrecto | Mejorar la precisión de la elaboración, la alineación del eje y del alojamiento, el método de montaje |
| | Lubricante no adecuado y/o insuficiente | Seleccionar un lubricante más adecuado o agregar lubricante |
| | Juego excesivo | Seleccionar un rodamiento de clase más silenciosa o bien con juego reducido |
| | Contacto entre las partes rotativas | Modificar la obturación del laberinto, etc |
| Fuerte ruido regular | Resquebrajamientos, corrosión o abrasiones en los caminos de rodadura | Sustituir o lavar bien el rodamiento, mejorar el sistema de obturación y usar lubricantes limpios |
| | Efecto Brinell | Sustituir el rodamiento, manipularlo y montarlo con cuidado |
| | Soldadura en el camino de rodadura | Sustituir el rodamiento |
| Ruido irregular | Juego excesivo | Seleccionar con más cuidado el acoplamiento, el juego interno, la pre-carga |
| | Penetración de partículas extrañas | Sustituir o lavar bien el rodamiento, mejorar el sistema de obturación y usar lubricantes limpios |
| | Agrietamientos o soldaduras en los cuerpos rodantes | Sustituir el rodamiento |
| Aumento irregular de la temperatura | Excesiva cantidad de lubricante | Reducir la cantidad, seleccionar una grasa más consistente |
| | Lubricante no adecuado e insuficiente | Seleccionar un lubricante más adecuado o agregar lubricante |
| | Carga anómala | Seleccionar con mayor cuidado el acoplamiento, el juego interior, la pre-carga, la posición del apoyo lateral del alojamiento, etc. |
| | Montaje incorrecto | Mejorar la precisión de la elaboración, la alineación del eje y del alojamiento, el método de montaje |
| | Deslizamiento de las superficies acopladas, excesiva fricción por causa de las obturaciones | Modificar o sustituir las obturaciones, sustituir el rodamiento, seleccionar con más cuidado el acoplamiento y el método de montaje |
| Vibraciones (precisión axial de rotación) | Efecto Brinell | Sustituir el rodamiento, manipularlo y montarlo con cuidado |
| | Descamación | Sustituir el rodamiento |
| | Montaje incorrecto | Mejorar la ortogonalidad entre el eje y el apoyo lateral del alojamiento o el plano de apoyo del separador. |
| | Penetración de partículas extrañas | Sustituir o lavar bien el rodamiento, mejorar el sistema de obturación y usar lubricantes limpios |
| Pérdidas o alteraciones de color del lubricante | Excesiva lubricación | Reducir la cantidad, seleccionar una grasa más consistente |
| | | Sustituir el rodamiento o el lubricante Limpiar el alojamiento y las partes adyacentes |

MAINTENANCE

ANOMALIES IN THE WORKING OF A BEARING: POSSIBLE CAUSES AND CORRECTIVE ACTIONS

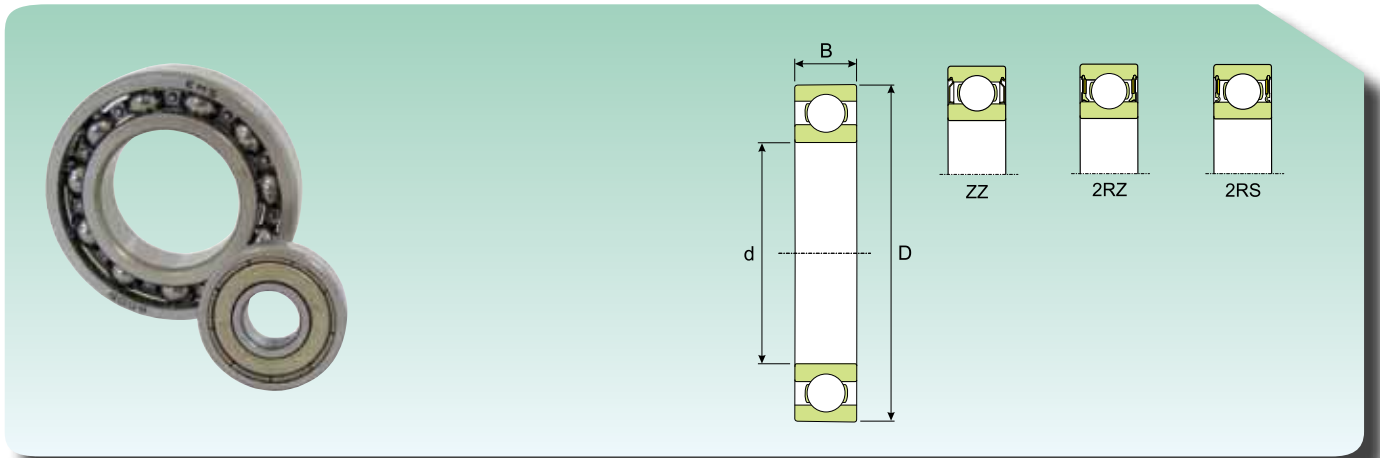
| ANOMALY | POSSIBLE CAUSES | CORRECTIVE ACTIONS |
|---|--|--|
| Strong clang | Anomalous load | To select more carefully the fit, the internal clearance, the preloading, the position of housing shoulder |
| | Incorrect assembling | To improve the precision of the manufacturing, the alignment of the shaft and of the housing, the assembling method |
| | Inadequate or insufficient lubricant | To select a better lubricant or to replenish the lubricant |
| | Excessive clearance | To select a bearing of a more silent class or with reduced clearance |
| | Contact between the rotating parts | To modify the labyrinth seal etc |
| Strong regular sound | Cracks, corrosion or abrasion on the raceways | To substitute or wash accurately the bearing, to improve the seal system and use clean lubricants |
| | Pitting | To substitute the bearing, handle and assemble it with care |
| | Welding on the raceways | To substitute the bearing |
| Irregular sound | Excessive clearance | To select more carefully the fit, the internal clearance, the preloading |
| | Penetration of extraneous particles | To substitute or wash accurately the bearing, to improve the seal system and use clean lubricant |
| | Cracks or wildings on the rolling elements | To substitute the bearing |
| Irregular increase of the temperature | Excessive quantity of lubricant | To reduce the quantity, to select a grease more consistency |
| | Inadequate or insufficient lubricant | To select a better lubricant or to replenish the lubricant |
| | Anomalous load | To select more carefully the fit, the internal clearance, the preloading, the position of housing shoulder |
| | Incorrect assembling | To improve the precision of the manufacturing, the alignment of the shaft and of the housing, the assembling method |
| | Relative sliding of connected surface, excessive friction of the seals | To modify or substitute the seals, to substitute the bearing, to select more carefully the fit and the assembling method |
| Vibrations (running axial accuracy) | Pitting | To substitute the bearing, handle and assemble it with care |
| | Flaking off | To substitute the bearing |
| | Incorrect assembling | To improve the orthogonality between the shaft and the housing shoulder or the support surface of the space collar |
| | Penetration of extraneous particles | To substitute or wash accurately the bearing, to improve the seal system and use clean lubricant |
| Losses or alteration of the colour of the lubricant | Lubricant in excess | To reduce the quantity, to select a crease more consistency |
| | | To substitute the bearing or the lubricant To clean the housing and the contiguous part |

MICRO RODAMIENTOS RÍGIDOS DE BOLAS MINIATURE RADIAL BALL BEARINGS



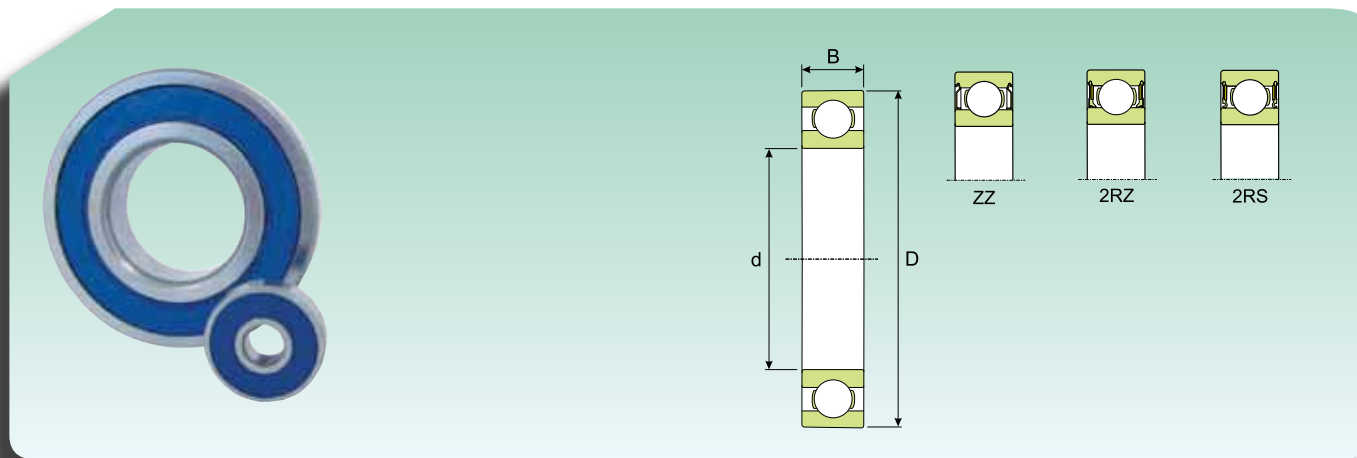
| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 3 | 10 | 4 | 0.488 |
| 4 | 13 | 5 | 1.310 | 0.490 | 42 000 | 50 000 | 0,0031 | 624 |
| 4 | 16 | 5 | 1.110 | 0.380 | 43 000 | 50 000 | 0,0054 | 634 |
| 5 | 16 | 5 | 1.760 | 0.680 | 37 000 | 44 000 | 0,0050 | 625 |
| 5 | 19 | 6 | 2.340 | 0.950 | 34 000 | 42 000 | 0,0090 | 635 |
| 6 | 19 | 6 | 2.340 | 0.950 | 34 000 | 41 000 | 0,0084 | 626 |
| 7 | 19 | 6 | 2.340 | 0.950 | 35 000 | 42 000 | 0,0075 | 607 |
| 7 | 22 | 7 | 3.450 | 1.400 | 32 000 | 37 000 | 0,0130 | 627 |
| 8 | 22 | 7 | 3.450 | 1.400 | 32 000 | 38 000 | 0,0120 | 608 |
| 9 | 24 | 7 | 3.900 | 1.660 | 31 000 | 37 000 | 0,0140 | 609 |
| 9 | 26 | 8 | 4.750 | 1.960 | 27 000 | 32 000 | 0,0200 | 629 |

RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS RADIAL DEEP GROOVE BALL BEARINGS SINGLE ROW



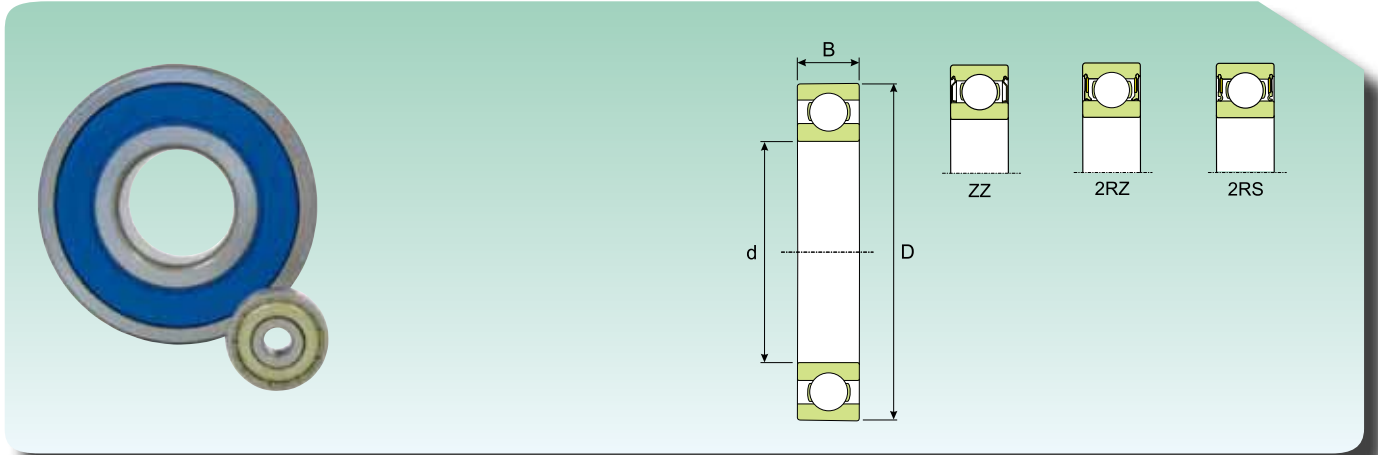
| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 10 | 26 | 8 | 4.750 |
| 12 | 28 | 8 | 5.400 | 2.360 | 29 000 | 33 000 | 0,022 | 6001 |
| 15 | 32 | 9 | 5.850 | 2.850 | 25 000 | 29 000 | 0,030 | 6002 |
| 17 | 35 | 10 | 6.800 | 3.350 | 23 000 | 26 000 | 0,039 | 6003 |
| 20 | 42 | 12 | 9.950 | 5.050 | 18 000 | 21 000 | 0,069 | 6004 |
| 25 | 47 | 12 | 11.900 | 6.550 | 16 000 | 19 000 | 0,080 | 6005 |
| 30 | 55 | 13 | 13.800 | 8.300 | 13 000 | 15 000 | 0,120 | 6006 |
| 35 | 62 | 14 | 16.800 | 10.300 | 12 000 | 14 000 | 0,160 | 6007 |
| 40 | 68 | 15 | 17.800 | 11.600 | 10 000 | 12 000 | 0,190 | 6008 |
| 45 | 75 | 16 | 22.100 | 15.100 | 9 200 | 11 000 | 0,250 | 6009 |
| 50 | 80 | 16 | 22.900 | 16.600 | 8 400 | 9 800 | 0,260 | 6010 |
| 55 | 90 | 18 | 29.600 | 21.200 | 7 700 | 9 000 | 0,390 | 6011 |
| 60 | 95 | 18 | 30.700 | 23.200 | 7 100 | 8 300 | 0,420 | 6012 |
| 65 | 100 | 18 | 31.900 | 25.000 | 6 700 | 8 000 | 0,440 | 6013 |
| 70 | 110 | 20 | 39.700 | 31.000 | 6 300 | 7 100 | 0,600 | 6014 |
| 75 | 115 | 20 | 41.600 | 33.500 | 5 800 | 7 000 | 0,640 | 6015 |
| 80 | 125 | 22 | 49.400 | 40.000 | 5 500 | 6 500 | 0,850 | 6016 |
| 85 | 130 | 22 | 52.000 | 43.000 | 5 300 | 6 300 | 0,890 | 6017 |
| 90 | 140 | 24 | 60.500 | 50.000 | 5 000 | 6 000 | 1,150 | 6018 |
| 95 | 145 | 24 | 63.700 | 54.000 | 4 700 | 5 500 | 1,200 | 6019 |
| 100 | 150 | 24 | 63.700 | 54.000 | 4 500 | 5 500 | 1,250 | 6020 |
| 105 | 160 | 26 | 76.100 | 65.500 | 4 200 | 5 000 | 1,600 | 6021 |
| 110 | 170 | 28 | 85.200 | 73.500 | 4 000 | 4 700 | 1,950 | 6022 |
| 120 | 180 | 28 | 88.400 | 80.000 | 3 800 | 4 500 | 2,050 | 6024 |

RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS RADIAL DEEP GROOVE BALL BEARINGS SINGLE ROW



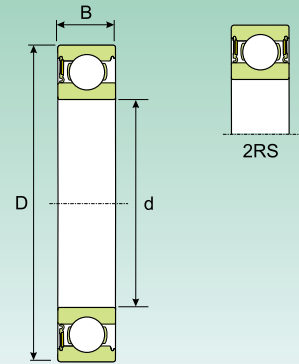
| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 10 | 30 | 9 | 5.400 |
| 12 | 32 | 10 | 7.280 | 3.100 | 23 000 | 28 000 | 0,037 | 6201 |
| 15 | 35 | 11 | 8.060 | 3.750 | 20 000 | 25 000 | 0,045 | 6202 |
| 17 | 40 | 12 | 9.950 | 4.750 | 18 000 | 22 000 | 0,065 | 6203 |
| 20 | 47 | 14 | 13.500 | 6.650 | 16 000 | 18 000 | 0,110 | 6204 |
| 25 | 52 | 15 | 14.800 | 7.850 | 13 000 | 16 000 | 0,130 | 6205 |
| 30 | 62 | 16 | 20.300 | 11.300 | 12 000 | 14 000 | 0,200 | 6206 |
| 35 | 72 | 17 | 27.000 | 15.300 | 10 000 | 12 000 | 0,290 | 6207 |
| 40 | 80 | 18 | 32.500 | 19.000 | 8 800 | 10 000 | 0,370 | 6208 |
| 45 | 85 | 19 | 35.100 | 21.600 | 7 800 | 9 200 | 0,410 | 6209 |
| 50 | 90 | 20 | 37.100 | 23.200 | 7 100 | 8 300 | 0,460 | 6210 |
| 55 | 100 | 21 | 46.200 | 29.200 | 6 400 | 7 600 | 0,610 | 6211 |
| 60 | 110 | 22 | 55.300 | 36.000 | 6 000 | 7 300 | 0,780 | 6212 |
| 65 | 120 | 23 | 58.500 | 40.500 | 5 500 | 7 000 | 0,990 | 6213 |
| 70 | 125 | 24 | 63.700 | 45.000 | 5 100 | 6 100 | 1,050 | 6214 |
| 75 | 130 | 25 | 68.900 | 49.000 | 4 800 | 5 600 | 1,200 | 6215 |
| 80 | 140 | 26 | 72.800 | 55.000 | 4 500 | 5 300 | 1,400 | 6216 |
| 85 | 150 | 28 | 87.100 | 64.000 | 4 300 | 5 000 | 1,800 | 6217 |
| 90 | 160 | 30 | 101.000 | 73.500 | 4 000 | 4 800 | 2,150 | 6218 |
| 95 | 170 | 32 | 114.000 | 82.00 | 3 800 | 4 500 | 2,600 | 6219 |
| 100 | 180 | 34 | 127.000 | 93.000 | 3 600 | 4 300 | 3,150 | 6220 |
| 105 | 190 | 36 | 146.000 | 105.000 | 3 400 | 4 000 | 3,700 | 6221 |
| 110 | 200 | 38 | 151.000 | 118.000 | 3 200 | 3 800 | 4,350 | 6222 |

RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS RADIAL DEEP GROOVE BALL BEARINGS SINGLE ROW



| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 10 | 35 | 11 | 8.520 |
| 12 | 37 | 12 | 10.100 | 4.200 | 21 000 | 25 000 | 0,060 | 6301 |
| 15 | 42 | 13 | 11.900 | 5.450 | 19 000 | 22 000 | 0,082 | 6302 |
| 17 | 47 | 14 | 14.300 | 6.550 | 16 000 | 19 000 | 0,120 | 6303 |
| 20 | 52 | 15 | 16.800 | 7.900 | 14 000 | 17 500 | 0,140 | 6304 |
| 25 | 62 | 17 | 23.400 | 11.600 | 12 000 | 14 000 | 0,230 | 6305 |
| 30 | 72 | 19 | 29.600 | 16.000 | 10 000 | 12 000 | 0,350 | 6306 |
| 35 | 80 | 21 | 35.100 | 19.100 | 8 800 | 10 000 | 0,460 | 6307 |
| 40 | 90 | 23 | 42.300 | 24.000 | 7 800 | 9 200 | 0,630 | 6308 |
| 45 | 100 | 25 | 55.300 | 32.000 | 7 000 | 8 200 | 0,830 | 6309 |
| 50 | 110 | 27 | 65.000 | 38.500 | 6 400 | 7 500 | 1,050 | 6310 |
| 55 | 120 | 29 | 74.100 | 45.000 | 5 800 | 6 800 | 1,350 | 6311 |
| 60 | 130 | 31 | 85.200 | 52.000 | 5 400 | 6 300 | 1,700 | 6312 |
| 65 | 140 | 33 | 97.500 | 60.000 | 5 000 | 6 000 | 2,100 | 6313 |
| 70 | 150 | 35 | 111.000 | 68.000 | 4 500 | 5 300 | 2,500 | 6314 |
| 75 | 160 | 37 | 119.000 | 76.500 | 4 300 | 5 000 | 3,000 | 6315 |
| 80 | 170 | 39 | 130.000 | 86.500 | 4 000 | 4 800 | 3,600 | 6316 |
| 85 | 180 | 41 | 133.000 | 97.000 | 3 800 | 4 500 | 4,250 | 6317 |
| 90 | 190 | 43 | 151.000 | 108.000 | 3 600 | 4 300 | 4,900 | 6318 |
| 95 | 200 | 45 | 159.000 | 119.000 | 3 300 | 3 900 | 5,650 | 6319 |
| 100 | 215 | 47 | 174.000 | 140.000 | 3 200 | 3 700 | 7,000 | 6320 |

RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS RADIAL BALL BEARINGS SINGLE ROW



| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 10 | 30 | 14 | 5.070 |
| 12 | 32 | 14 | 6.890 | 3.100 | 13 000 | 15 000 | 0,045 | 62201 |
| 15 | 35 | 14 | 7.800 | 3.750 | 11 000 | 13 000 | 0,054 | 62202 |
| 17 | 40 | 16 | 9.560 | 4.750 | 10 000 | 12 000 | 0,083 | 62203 |
| 20 | 47 | 18 | 12.700 | 6.550 | 9 000 | 10 000 | 0,130 | 62204 |
| 25 | 52 | 18 | 14.000 | 7.800 | 7 000 | 8 500 | 0,150 | 62205 |
| 30 | 62 | 20 | 19.500 | 11.200 | 6 000 | 7 500 | 0,240 | 62206 |
| 35 | 72 | 23 | 25.500 | 15.300 | 5 500 | 6 300 | 0,370 | 62207 |
| 40 | 80 | 23 | 30.700 | 19.000 | 4 500 | 5 600 | 0,440 | 62208 |
| 45 | 85 | 23 | 33.200 | 21.600 | 4 300 | 5 000 | 0,480 | 62209 |
| 50 | 90 | 23 | 35.100 | 23.200 | 4 000 | 4 800 | 0,520 | 62210 |

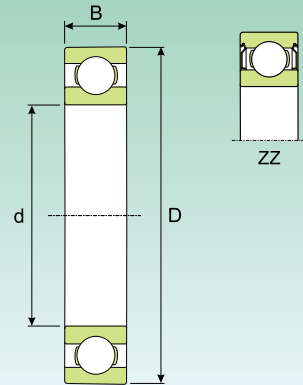
RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS

RADIAL BALL BEARINGS SINGLE ROW



| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|--|--------------------------------------|---|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | | | |
| 8 | 22 | 11 | 3.250 | 1.370 | 20 000 | 0,016 | 630/8 |
| 10 | 26 | 12 | 4.620 | 1.960 | 19 000 | 0,025 | 63000 |
| 12 | 28 | 12 | 5.070 | 2.360 | 17 000 | 0,029 | 63001 |
| 15 | 32 | 13 | 5.590 | 2.850 | 14 000 | 0,039 | 63002 |
| 17 | 35 | 14 | 6.050 | 3.250 | 13 000 | 0,052 | 63003 |
| 20 | 42 | 16 | 9.360 | 5.000 | 11 000 | 0,086 | 63004 |
| 25 | 47 | 16 | 11.200 | 6.550 | 9 500 | 0,100 | 63005 |
| 30 | 55 | 19 | 13.300 | 8.300 | 8 000 | 0,160 | 63006 |
| 35 | 62 | 20 | 15.900 | 10.200 | 7 000 | 0,210 | 63007 |
| 40 | 68 | 21 | 16.800 | 11.600 | 6 300 | 0,260 | 63008 |
| 45 | 75 | 23 | 20.800 | 14.600 | 5 600 | 0,340 | 63009 |
| 50 | 80 | 23 | 21.600 | 16.000 | 5 000 | 0,370 | 63010 |

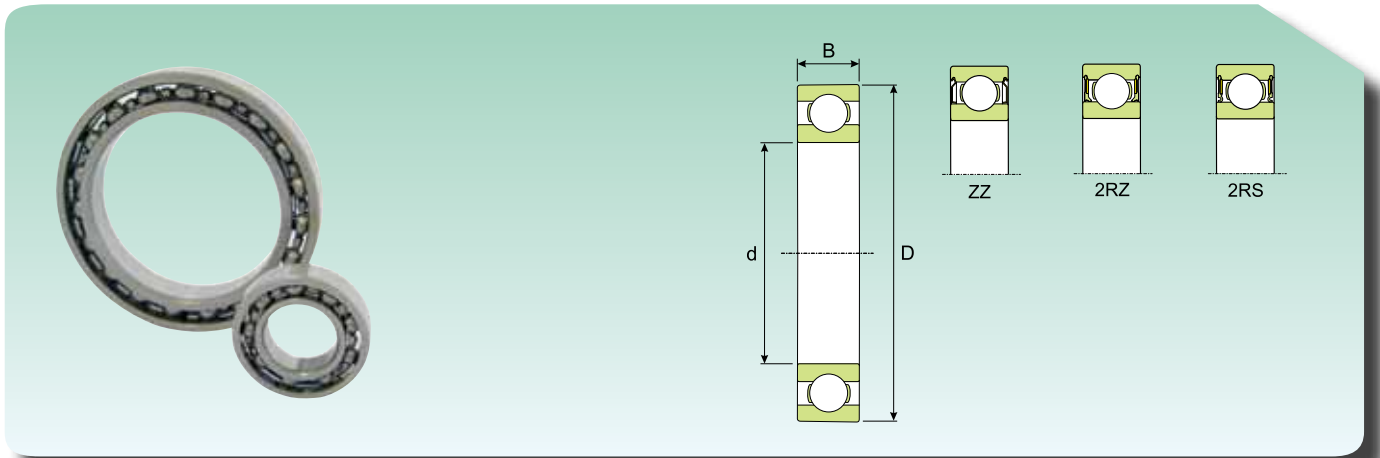
RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS RADIAL DEEP GROOVE BALL BEARINGS SINGLE ROW



| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|--|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 15 | 32 | 8 | 5.850 |
| 17 | 35 | 8 | 6.800 | 3.350 | 20 000 | 24 000 | 0,032 | 16003* |
| 20 | 42 | 8 | 7.900 | 4.500 | 18 000 | 21 000 | 0,050 | 16004 |
| 25 | 47 | 8 | 8.350 | 5.100 | 15 000 | 18 000 | 0,060 | 16005 |
| 30 | 55 | 9 | 11.900 | 7.400 | 13 000 | 15 000 | 0,085 | 16006 |
| 35 | 62 | 9 | 13.000 | 8.200 | 12 000 | 14 000 | 0,110 | 16007 |
| 40 | 68 | 9 | 13.800 | 9.650 | 10 00 | 12 000 | 0,130 | 16008 |
| 45 | 75 | 10 | 16.500 | 10.800 | 9 200 | 11 000 | 0,170 | 16009 |
| 50 | 80 | 10 | 16.800 | 11.400 | 8 500 | 10 000 | 0,180 | 16010 |
| 55 | 90 | 11 | 20.300 | 15.300 | 7 700 | 9 000 | 0,260 | 16011 |
| 60 | 95 | 11 | 20.800 | 17.500 | 7 100 | 8 500 | 0,280 | 16012 |
| 65 | 100 | 11 | 22.100 | 16.300 | 6 885 | 8 100 | 0,300 | 16013 |
| 70 | 110 | 13 | 28.600 | 24.500 | 6 120 | 7 200 | 0,430 | 16014 |
| 75 | 115 | 13 | 29.600 | 26.500 | 5 738 | 6 750 | 0,460 | 16015 |
| 80 | 125 | 14 | 34.400 | 30.900 | 5 355 | 6 300 | 0,600 | 16016 |
| 85 | 130 | 14 | 35.100 | 32.900 | 5 126 | 6 030 | 0,630 | 16017 |
| 90 | 140 | 16 | 42.800 | 38.300 | 4 820 | 5 670 | 0,850 | 16018 |
| 95 | 145 | 16 | 43.900 | 40.700 | 4 590 | 5 400 | 0,890 | 16019 |
| 100 | 150 | 16 | 45.300 | 43.200 | 4 284 | 5 040 | 0,910 | 16020 |
| 10 | 28 | 8 | 4.620 | 1.960 | 28 000 | 34 000 | 0,022 | 16100* |
| 12 | 30 | 8 | 5.070 | 2.360 | 26 000 | 32 000 | 0,023 | 16101 |

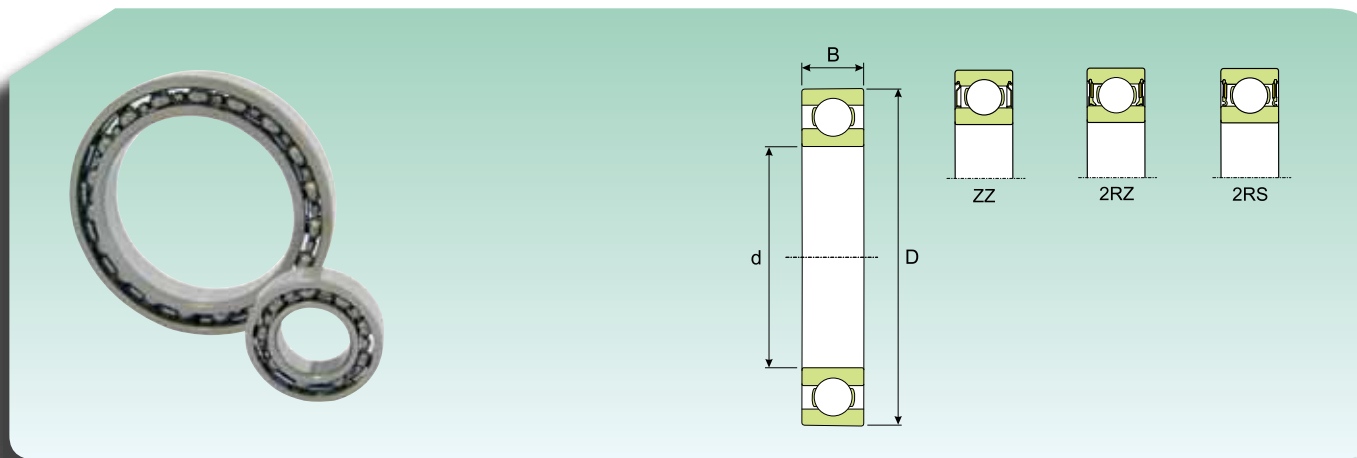
* Sólo en ejecución ZZ
ZZ type only

RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS
RADIAL DEEP GROOVE BALL BEARINGS SINGLE ROW



| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 10 | 19 | 5 | 1.380 |
| 12 | 21 | 5 | 1.430 | 0.670 | 32 000 | 38 000 | 0,0063 | 61801 |
| 15 | 24 | 5 | 1.560 | 0.800 | 28 000 | 34 000 | 0,0074 | 61802 |
| 17 | 26 | 5 | 1.680 | 0.930 | 24 000 | 30 000 | 0,0082 | 61803 |
| 20 | 32 | 7 | 2.700 | 1.500 | 19 000 | 24 000 | 0,0180 | 61804 |
| 25 | 37 | 7 | 4.360 | 2.600 | 17 000 | 20 000 | 0,0220 | 61805 |
| 30 | 42 | 7 | 4.490 | 2.900 | 15 000 | 18 000 | 0,0270 | 61806 |
| 35 | 47 | 7 | 4.750 | 3.200 | 13 000 | 16 000 | 0,0300 | 61807 |
| 40 | 52 | 7 | 4.940 | 3.450 | 11 000 | 14 000 | 0,0340 | 61808 |
| 45 | 58 | 7 | 6.500 | 6.000 | 10 710 | 12 600 | 0,040 | 61809 |
| 50 | 65 | 7 | 6.800 | 6.700 | 9 945 | 11 700 | 0,052 | 61810 |
| 55 | 72 | 9 | 8.860 | 8.700 | 9 180 | 10 800 | 0,083 | 61811 |
| 60 | 78 | 10 | 11.700 | 11.200 | 8 415 | 9 900 | 0,110 | 61812 |
| 65 | 85 | 10 | 12.200 | 12.500 | 7 650 | 9 000 | 0,130 | 61813 |
| 70 | 90 | 10 | 12.200 | 13.000 | 6 885 | 8 100 | 0,140 | 61814 |
| 75 | 95 | 10 | 12.500 | 14.100 | 6 503 | 7 650 | 0,150 | 61815 |
| 80 | 100 | 10 | 12.800 | 14 800 | 6 120 | 7 200 | 0,150 | 61816 |
| 85 | 110 | 13 | 19.200 | 20.400 | 5 738 | 6 750 | 0,270 | 61817 |
| 90 | 115 | 13 | 19.200 | 21.600 | 5 355 | 6 300 | 0,280 | 61818 |
| 95 | 120 | 13 | 19.600 | 22.400 | 5 126 | 6 030 | 0,300 | 61819 |
| 100 | 125 | 13 | 19.600 | 23.600 | 4 820 | 5 670 | 0,310 | 61820 |
| 105 | 130 | 13 | 20.400 | 19.300 | 4 820 | 5 670 | 0,320 | 61821 |
| 110 | 140 | 16 | 27.600 | 25.500 | 4 284 | 5 040 | 0,600 | 61822 |
| 120 | 150 | 16 | 28.600 | 27.600 | 4 055 | 4 770 | 0,650 | 61824 |
| 130 | 165 | 18 | 36.900 | 42.200 | 3 672 | 4 320 | 0,930 | 61826 |
| 140 | 175 | 18 | 38.300 | 45.600 | 3 443 | 4 050 | 0,990 | 61828 |
| 150 | 190 | 20 | 47.900 | 59.800 | 3 290 | 3 870 | 1,400 | 61830 |

RODAMIENTOS RÍGIDOS DE UNA HILERA DE BOLAS RADIAL DEEP GROOVE BALL BEARINGS SINGLE ROW



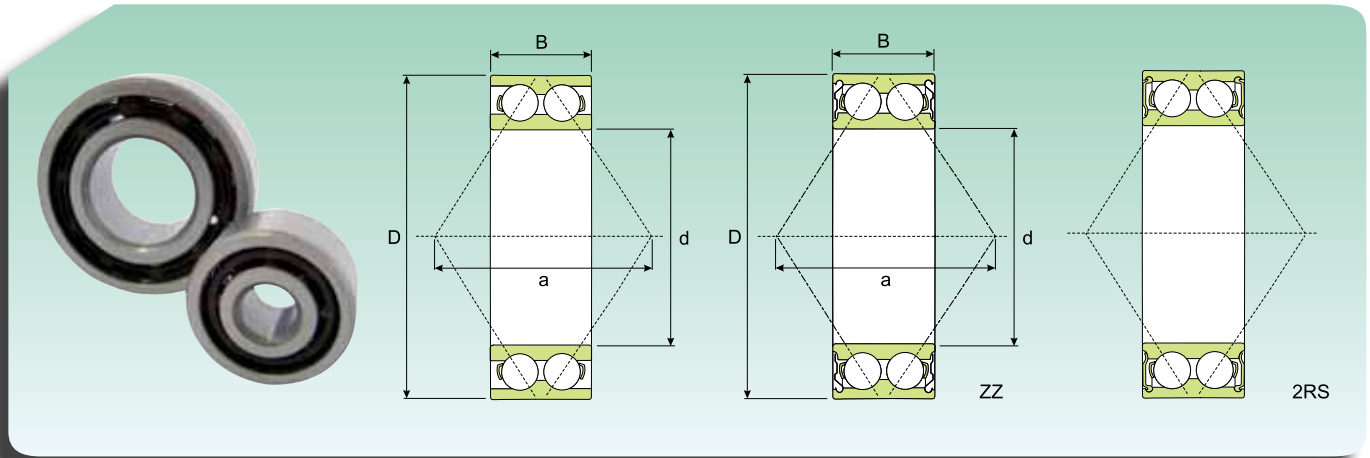
| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 10 | 22 | 6 | 1.950 |
| 12 | 24 | 6 | 2.250 | 0.980 | 30 000 | 36 000 | 0,011 | 61901 |
| 15 | 28 | 7 | 4.030 | 2.040 | 24 000 | 30 000 | 0,016 | 61902 |
| 17 | 30 | 7 | 4.360 | 2.320 | 22 000 | 28 000 | 0,018 | 61903 |
| 20 | 37 | 9 | 6.370 | 3.650 | 18 000 | 22 000 | 0,038 | 61904 |
| 25 | 42 | 9 | 6.630 | 4.000 | 16 000 | 19 000 | 0,045 | 61905 |
| 30 | 47 | 9 | 7.280 | 4.550 | 14 000 | 17 000 | 0,051 | 61906 |
| 35 | 55 | 10 | 9.560 | 6.200 | 11 000 | 14 000 | 0,080 | 61907 |
| 40 | 62 | 12 | 13.800 | 9.300 | 10 000 | 13 000 | 0,120 | 61908 |
| 45 | 68 | 12 | 13.800 | 10.600 | 9 945 | 11 700 | 0,140 | 61909 |
| 50 | 72 | 12 | 14.400 | 11.600 | 9 180 | 10 800 | 0,140 | 61910 |
| 55 | 80 | 13 | 16.200 | 13.800 | 8 415 | 9 900 | 0,190 | 61911 |
| 60 | 85 | 13 | 16.200 | 14.100 | 7 650 | 9 000 | 0,200 | 61912 |
| 65 | 90 | 13 | 17.100 | 15.700 | 7 268 | 8 550 | 0,220 | 61913 |
| 70 | 100 | 16 | 23.400 | 20.800 | 6 503 | 7 650 | 0,350 | 61914 |
| 75 | 105 | 16 | 23.800 | 19.000 | 6 120 | 7 200 | 0,370 | 61915 |
| 80 | 110 | 16 | 24.600 | 20.000 | 5 738 | 6 750 | 0,400 | 61916 |
| 85 | 120 | 18 | 31.300 | 29.500 | 5 355 | 6 300 | 0,550 | 61917 |
| 90 | 125 | 18 | 32.600 | 30.900 | 5 126 | 6 030 | 0,590 | 61918 |
| 95 | 130 | 18 | 33.200 | 32.900 | 4 820 | 5 670 | 0,610 | 61919 |
| 100 | 140 | 20 | 41.500 | 40.200 | 4 590 | 5 400 | 0,830 | 61920 |
| 105 | 145 | 20 | 43.400 | 43.200 | 4 284 | 5 040 | 0,870 | 61921 |
| 110 | 150 | 20 | 42.800 | 44.200 | 4 284 | 5 040 | 0,900 | 61922 |
| 120 | 165 | 22 | 54.200 | 55.900 | 3 825 | 4 500 | 1,200 | 61924 |
| 130 | 180 | 24 | 63.700 | 65.700 | 3 443 | 4 050 | 1,850 | 61926 |

RODAMIENTOS DE UNA HILERA DE BOLAS CON CONTACTO ANGULAR (JAULA DE POLIAMIDA)
ANGULAR CONTACT SINGLE-ROW BALL BEARINGS (POLYAMIDE CAGE)



| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|-----------|-----------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| | | | | | 10 | 30 | 9 | 7.020 |
| 12 | 32 | 10 | 7.610 | 3.800 | 18 000 | 26 000 | 0,036 | 7201 |
| 15 | 35 | 11 | 8.840 | 4.800 | 17 000 | 24 000 | 0,045 | 7202 |
| 17 | 40 | 12 | 11.100 | 6.100 | 15 000 | 20 000 | 0,065 | 7203 |
| 20 | 47 | 14 | 14.000 | 8.300 | 12 000 | 17 000 | 0,110 | 7204 |
| 25 | 52 | 15 | 15.600 | 10.200 | 10 000 | 15 000 | 0,130 | 7205 |
| 30 | 62 | 16 | 23.800 | 15.600 | 8 500 | 12 000 | 0,200 | 7206 |
| 35 | 72 | 17 | 30.700 | 20.800 | 8 000 | 11 000 | 0,280 | 7207 |
| 40 | 80 | 18 | 36.400 | 26.000 | 7 000 | 9 500 | 0,370 | 7208 |
| 45 | 85 | 19 | 37.700 | 28.000 | 6 700 | 9 000 | 0,420 | 7209 |
| 50 | 90 | 20 | 39.000 | 30.500 | 6 000 | 8 000 | 0,470 | 7210 |
| 55 | 100 | 21 | 48.800 | 38.000 | 5 600 | 7 500 | 0,620 | 7211 |
| 60 | 110 | 22 | 57.200 | 45.500 | 5 000 | 6 700 | 0,800 | 7212 |
| 12 | 37 | 12 | 10.600 | 5.000 | 17 000 | 24 000 | 0,060 | 7301 |
| 15 | 42 | 13 | 13.000 | 6.700 | 15 000 | 20 000 | 0,080 | 7302 |
| 17 | 47 | 14 | 15.900 | 8.300 | 13 000 | 18 000 | 0,110 | 7303 |
| 20 | 52 | 15 | 19.000 | 10.400 | 11 000 | 16 000 | 0,140 | 7304 |
| 25 | 62 | 17 | 26.000 | 15.600 | 9 000 | 13 000 | 0,230 | 7305 |
| 30 | 72 | 19 | 34.500 | 21.200 | 8 000 | 11 000 | 0,340 | 7306 |
| 35 | 80 | 21 | 39.000 | 24.500 | 7 500 | 10 000 | 0,450 | 7307 |
| 40 | 90 | 23 | 49.400 | 33.500 | 6 700 | 9 000 | 0,630 | 7308 |
| 45 | 100 | 25 | 60.500 | 41.500 | 6 000 | 8 000 | 0,850 | 7309 |
| 50 | 110 | 27 | 74.100 | 51.000 | 5 300 | 7 000 | 1,100 | 7310 |
| 55 | 120 | 29 | 85.200 | 60.000 | 4 800 | 6 300 | 1,400 | 7311 |
| 60 | 130 | 31 | 95.600 | 69.500 | 4 500 | 6 000 | 1,750 | 7312 |

Bajo demanda disponible con jaula de acero - Under request available with steel cage

RODAMIENTOS DE DOS HILERAS DE BOLAS CON CONTACTO ANGULAR (JAULA DE POLIAMIDA)
ANGULAR CONTACT BALL BEARINGS DOUBLE ROW (POLYAMIDE CAGE)


| Dimensiones (mm) Dimension (mm) | | | Coeficiente de carga (KN) Load rating (KN) | | Velocidad límite (rpm) Speed limit (Rpm) | | Peso (Kg) Weight (Kg) | Sigla Designation |
|------------------------------------|--------|--------|---|--------------------------------------|---|---------------|--------------------------|----------------------|
| d (mm) | D (mm) | B (mm) | Dinámico Dynamic C | Estático Static C ₀ | Grasa Grease | Aceite Oil | | |
| 10 | 30 | 14,0 | 7.410 | 4.300 | 16 000 | 22 000 | 0,051 | 3200 |
| 12 | 32 | 15,9 | 10.100 | 5.600 | 15 000 | 20 000 | 0,058 | 3201 |
| 15 | 35 | 15,9 | 11.200 | 6.800 | 12 000 | 17 000 | 0,066 | 3202 |
| 17 | 40 | 17,5 | 14.000 | 8.650 | 10 000 | 15 000 | 0,096 | 3203 |
| 20 | 47 | 20,6 | 18.600 | 12.000 | 9 000 | 13 000 | 0,160 | 3204 |
| 25 | 52 | 20,6 | 20.300 | 14.000 | 8 000 | 11 000 | 0,180 | 3205 |
| 30 | 62 | 23,8 | 28.100 | 20.000 | 7 000 | 9 500 | 0,290 | 3206 |
| 35 | 72 | 27,0 | 37.100 | 27.500 | 6 000 | 8 000 | 0,440 | 3207 |
| 40 | 80 | 30,2 | 44.900 | 33.500 | 5 600 | 7 500 | 0,580 | 3208 |
| 45 | 85 | 30,2 | 47.500 | 38.000 | 5 000 | 6 700 | 0,630 | 3209 |
| 50 | 90 | 30,2 | 47.500 | 39.000 | 4 800 | 6 300 | 0,660 | 3210 |
| 55 | 100 | 33,3 | 57.200 | 67.000 | 4 300 | 5 600 | 1,050 | 3211 |
| 60 | 110 | 36,5 | 72.100 | 85.000 | 3 800 | 5 000 | 1,400 | 3212 |
| 15 | 42 | 19,0 | 15.100 | 9.150 | 10 000 | 15 000 | 0,130 | 3302 |
| 17 | 47 | 22,2 | 21.200 | 12.500 | 9 500 | 14 000 | 0,180 | 3303 |
| 20 | 52 | 22,2 | 22.100 | 14.300 | 8 500 | 12 000 | 0,220 | 3304 |
| 25 | 62 | 25,4 | 31.200 | 20.800 | 7 500 | 10 000 | 0,350 | 3305 |
| 30 | 72 | 30,2 | 41.000 | 28.500 | 6 300 | 8 500 | 0,530 | 3306 |
| 35 | 80 | 34,9 | 48.800 | 34.000 | 5 600 | 7 500 | 0,730 | 3307 |
| 40 | 90 | 36,5 | 59.200 | 43.000 | 5 000 | 6 700 | 0,950 | 3308 |
| 45 | 100 | 39,7 | 72.100 | 73.500 | 4 500 | 6 000 | 1,400 | 3309 |
| 50 | 110 | 44,4 | 88.000 | 96.500 | 4 000 | 5 300 | 1,950 | 3310 |
| 55 | 120 | 49,2 | 95.200 | 108.000 | 3 800 | 5 000 | 2,550 | 3311 |
| 60 | 130 | 54,0 | 112.000 | 127.000 | 3 400 | 4 500 | 3,250 | 3312 |

Bajo demanda disponible con jaula de acero - Under request available with steel cage