

MRC double-row angular contact ball bearings are manufactured in two main types: C-type (Conrad construction) and M-type (maximum capacity with filling notches). Each of the two rows has a 30° contact angle.

C-type

Conrad construction, or C-type, double-row ball bearings have contact angles that converge outside the bearing, thereby increasing resistance to misalignment. This type does not have filling notches. These bearings are recommended for applications where single-row ball bearings are inadequate, but radial loads are not so great as to suggest a filling-notch bearing. They will take heavy radial loads and axial loads equally in either direction. The C-type design fully meets the requirements of American Petroleum Institute (API) Specification 610.

Both the inner and the outer rings have closure grooves. These bearings are available with seals, shields, and snap-rings.

M-type

Maximum capacity double-row ball bearings have filling notches on one side to permit assembling the maximum number of balls into the bearing. Contact angles converge outside the bearing. All inner and outer rings have closure grooves. These bearings may be equipped with seals, shields, and snap-rings. The M-type bearing has very heavy radial capacity. It also has thrust capacity in one direction, with the ability to accommodate light thrust load in the reversing direction.

Part numbers on M-type double-row bearings are normally located on either the side face or the O.D. surface of the bearing. The side face marking is always on the side opposite the filling notch and the O.D. marking is offset from the center away from the filling notch. Therefore, double sealed or shielded bearings with the filling notch covered from view can be oriented correctly.

Ball Cages and Types

The cage supplied with C-type and M-type bearings is a one-piece crown-type of heat-treated pressed steel. It is snapped into place after the full quota of balls has been introduced between the inner and outer ring.

| Size | Series | Page |
|---|---|------------|
| 5200C | Light, Conrad (Non-Filling Notch) | 93 |
| 5200C1 | Light, Extra Width, Conrad (Non-Filling Notch) | 93 |
| 5300C | Medium, Conrad (Non-Filling Notch) | 94 |
| 5300C1 | Medium, Extra Width, Conrad (Non-Filling Notch) | 94 |
| 5400C | Heavy, Conrad (Non-Filling Notch) | 95 |
| 5200M | Light, Filling Notch | 96 |
| 5200M1 | Light, Extra Width, Filling Notch | 96 |
| 5300M | Medium, Filling Notch | 97 |
| 5300M1 | Medium, Extra Width, Filling Notch | 97 |
| 5300UPG | MRC Pump Bearing | 98 |
| Width Summary and Interchange from Old Series to C & M Series | | 85 |
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| Thrust Rating | | 90 |
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The older MRC 5000 series double-row ball bearings were made in three series — 5200 Light, 5300 Medium, and 5400 Heavy — each with progressively larger cross sections. These old-style 5000 type double-rows were available in the SB Conrad and maximum capacity configurations. The SB Conrad version had contact angles which diverged inwardly, thereby increasing resistance to misalignment. The maximum capacity version had contact angles which converged inwardly, giving it the capability of handling small amounts of misalignment. It also had filling notches on both sides, for the introduction of a maximum complement of balls.

Our double-row ball bearings are available in the C-type (Conrad construction) and M-type (with filling notches on one side only). Both types feature inwardly diverging contact angles, which provide

greater rigidity than found in the previous double-row filling-notch type bearings. A unique manufacturing system utilizing “common parts” is employed in the manufacture of these bearings. Using a minimum number of components, the system provides greater flexibility for producing either Conrad or maximum capacity types as open bearings or with a variety of closures. Twenty-four variations of a single bearing size can be manufactured to solve your application problems.

The chart on pages 85-86 outlines the suffixes and widths of MRC 5000 series bearings. The data on the chart do not represent actual availability of double-row products. These data are intended to be used as references for interchanging. Current style double-rows appear next to their old-style counterparts that are the same width.

MRC Double-Row Suffix Identification Summary

| Suffix | Description | Suffix | Description |
|-----------|---|--------------|--|
| B | Rigid construction, maximum capacity. | M1 | 1/8" additional width from standard. |
| BK | Rigid construction, maximum capacity, standard width. | | 5205M1 & 5212M1 are 1/16" wider than standard. |
| C | Conrad, rigid construction, standard width. | Plain | Maximum capacity, nonrigid construction. Narrow width in 5200 series, extra width is required with closures. |
| C1 | 1/8" additional width from standard. 5205C1 & 5212C1 are 1/16" wider than standard. | S | Conrad construction (Note: always combined with additional suffix letters) |
| F | One shield | SB | Conrad, rigid construction, narrow width. Extra width is required with closures. |
| FF | Two shields | SBK | Conrad, rigid construction, standard width. |
| G | Snap-ring | Z | One seal |
| K | Standard width | ZZ | Two seals |
| M | Maximum capacity, rigid construction, standard width. | | |

| Basic Bearing Number | Old— Style Suffix | New— Style Suffix | Width (inches) | Basic Bearing Number | Old— Style Suffix | New— Style Suffix | Width (inches) | Basic Bearing Number | Old— Style Suffix | New— Style Suffix | Width (inches) |
|----------------------|-------------------|-------------------|----------------------------------|----------------------|-------------------|-------------------|--------------------------------|----------------------|-------------------|-------------------|--------------------------------|
| 5200 Series | | | | 5206 | F | MF1 | 1 ¹ / ₁₆ | | — | C | 1 ³ / ₁₆ |
| 5106 | SBZZ | | 29 ³² / ₃₂ | | K | M | 1 ⁵ / ₁₆ | | | | |
| 5200 | SB | | 9 ¹ / ₁₆ | | KF | MF | 1 ⁵ / ₁₆ | | | | |
| | SBKF | | 9 ¹ / ₁₆ | | KFF | MFF | 1 ⁵ / ₁₆ | | | | |
| | SBKFF | | 9 ¹ / ₁₆ | | KG | MG | 1 ⁵ / ₁₆ | | | | |
| | SBKZ | | 9 ¹ / ₁₆ | | Plain | | 3 ⁴ / ₄ | | | | |
| | SBKZZ | | 9 ¹ / ₁₆ | | SBF | CF1 | 1 ¹ / ₁₆ | | | | |
| 5201 | SB | | 5 ⁸ / ₈ | | SBK | C | 1 ⁵ / ₁₆ | | | | |
| | SBFG | | 5 ⁸ / ₈ | | SBKF | CF | 1 ⁵ / ₁₆ | | | | |
| | SBKF | | 5 ⁸ / ₈ | | SBKFF | CFF | 1 ⁵ / ₁₆ | | | | |
| | SBKFF | | 5 ⁸ / ₈ | | SBKFFG | CFFG | 1 ⁵ / ₁₆ | | | | |
| | SBKFFG | | 5 ⁸ / ₈ | | SBKFG | CFG | 1 ⁵ / ₁₆ | | | | |
| | SBKFG | | 5 ⁸ / ₈ | | SBKG | CG | 1 ⁵ / ₁₆ | | | | |
| | SBKZ | | 5 ⁸ / ₈ | | SBZZ | CZZ1 | 1 ¹ / ₁₆ | | | | |
| | SBKZZ | | 5 ⁸ / ₈ | | SBKZZG | CZZG1 | 1 ¹ / ₁₆ | | | | |
| 5202 | Plain | | 5 ⁸ / ₈ | 5207 | — | C1, M1 | 1 ¹ / ₁₆ | | | | |
| | SB | | 5 ⁸ / ₈ | | F | MF1 | 1 ³ / ₁₆ | | | | |
| | SBFG | | 1 ¹ / ₁₆ | | K | M | 1 ¹ / ₁₆ | | | | |
| | SBKF | | 5 ⁸ / ₈ | | KF | MF | 1 ¹ / ₁₆ | | | | |
| | SBKFF | | 5 ⁸ / ₈ | | KFF | MFF | 1 ¹ / ₁₆ | | | | |
| | SBKFG | | 5 ⁸ / ₈ | | KFG | MFG | 1 ¹ / ₁₆ | | | | |
| | SBKZZ | | 5 ⁸ / ₈ | | KG | MG | 1 ¹ / ₁₆ | | | | |
| 5203 | SB | | 1 ¹ / ₁₆ | | Plain | | 7 ⁸ / ₈ | | | | |
| | SBKF | | 1 ¹ / ₁₆ | | SBK | C | 1 ¹ / ₁₆ | | | | |
| | SBKFF | | 1 ¹ / ₁₆ | | SBKF | CF | 1 ¹ / ₁₆ | | | | |
| | SBKFFG | | 1 ¹ / ₁₆ | | SBKFF | CFF | 1 ¹ / ₁₆ | | | | |
| | SBKFG | | 1 ¹ / ₁₆ | | SBKFG | CFG | 1 ¹ / ₁₆ | | | | |
| | SBKZ | | 1 ¹ / ₁₆ | | SBKFG | CFG | 1 ¹ / ₁₆ | | | | |
| | SBKZZ | | 1 ¹ / ₁₆ | | SBKGG | CG | 1 ¹ / ₁₆ | | | | |
| 5204 | Plain | | 3 ⁴ / ₄ | 5208 | — | C1, M1 | 1 ³ / ₁₆ | | | | |
| | K | M | 1 ³ / ₁₆ | | BKF | MF | 1 ³ / ₁₆ | | | | |
| | KF | MF | 1 ³ / ₁₆ | | BKFF | MFF | 1 ³ / ₁₆ | | | | |
| | SB | | 3 ⁴ / ₄ | | K | M | 1 ³ / ₁₆ | | | | |
| | SBK | C | 1 ³ / ₁₆ | | KF | MF | 1 ³ / ₁₆ | | | | |
| | SBKF | CF | 1 ³ / ₁₆ | | KFF | MFF | 1 ³ / ₁₆ | | | | |
| | SBKFF | CFF | 1 ³ / ₁₆ | | KFG | MFG | 1 ³ / ₁₆ | | | | |
| | SBKFFG | CFFG | 1 ³ / ₁₆ | | KG | MG | 1 ³ / ₁₆ | | | | |
| | SBKFG | CFG | 1 ³ / ₁₆ | | Plain | | 1 | | | | |
| | SBKG | CG | 1 ³ / ₁₆ | | SBK | C | 1 ³ / ₁₆ | | | | |
| | SBKZ | CZ | 1 ³ / ₁₆ | | SBKF | CF | 1 ³ / ₁₆ | | | | |
| 5205 | F | MF1 | 7 ⁸ / ₈ | | SBKFF | CFF | 1 ³ / ₁₆ | | | | |
| | K | M | 1 ³ / ₁₆ | | SBKFG | CFG | 1 ³ / ₁₆ | | | | |
| | KG | MG | 1 ³ / ₁₆ | | SBKG | CG | 1 ³ / ₁₆ | | | | |
| | Plain | | 3 ⁴ / ₄ | 5209 | K | M | 1 ³ / ₁₆ | | | | |
| | SB | | 3 ⁴ / ₄ | | KF | MF | 1 ³ / ₁₆ | | | | |
| | SBF | CF1 | 7 ⁸ / ₈ | | KG | MG | 1 ³ / ₁₆ | | | | |
| | SBK | C | 1 ³ / ₁₆ | | Plain | | 1 | | | | |
| | SBKF | CF | 1 ³ / ₁₆ | | SBK | C | 1 ³ / ₁₆ | | | | |
| | SBKFF | CFF | 1 ³ / ₁₆ | | SBKF | CF | 1 ³ / ₁₆ | | | | |
| | SBKFFG | CFFG | 1 ³ / ₁₆ | | SBKFF | CFF | 1 ³ / ₁₆ | | | | |
| | SBKFG | CFG | 1 ³ / ₁₆ | | | | | | | | |
| | SBKG | CG | 1 ³ / ₁₆ | | | | | | | | |
| | — | C1, M1 | 7 ⁸ / ₈ | 5210 | K | M | 1 ³ / ₁₆ | | | | |
| | | | | | KF | MF | 1 ³ / ₁₆ | | | | |
| | | | | | KFF | MFF | 1 ³ / ₁₆ | | | | |
| | | | | | KG | MG | 1 ³ / ₁₆ | | | | |
| | | | | | Plain | | 1 | | | | |

5000 Series Bearings Suffix and Width Summary

MRC Bearing Services

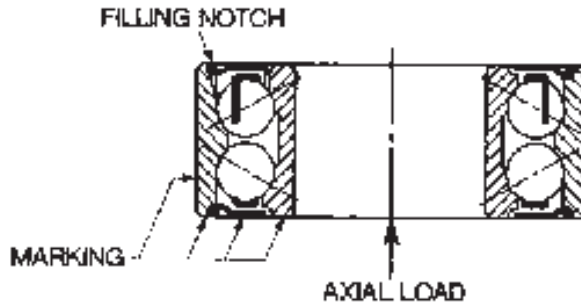
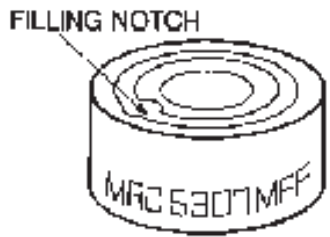
| Basic Bearing Number | Old— Style Suffix | New— Style Suffix | Width (inches) | Basic Bearing Number | Old— Style Suffix | New— Style Suffix | Width (inches) | Basic Bearing Number | Old— Style Suffix | New— Style Suffix | Width (inches) |
|----------------------|-------------------|-------------------|--------------------------------|----------------------|-------------------|-------------------|---------------------------------|----------------------|-------------------|-------------------|---------------------------------|
| 5300 Series | | | | 5307 | BKFF | MFF | 1 ³ / ₈ | 5315 | F | MF1 | 2 ¹³ / ₁₆ |
| 5300 | SB | | 3 ⁴ / ₄ | | F | MF1 | 1 ¹ / ₂ | | G | MG | 2 ¹¹ / ₁₆ |
| 5301 | SB | | 3 ⁴ / ₄ | | FG | MFG1 | 1 ¹ / ₂ | | Plain | M | 2 ¹¹ / ₁₆ |
| 5302 | Plain | | 3 ⁴ / ₄ | | G | MG | 1 ³ / ₈ | | — | C | 2 ¹¹ / ₁₆ |
| | SB | | 3 ⁴ / ₄ | | KF | MF | 1 ³ / ₈ | | — | C1, M1 | 2 ¹³ / ₁₆ |
| 5303 | G | | 7 ⁸ / ₈ | | KFG | MFG | 1 ³ / ₈ | 5316 | G | MG | 2 ¹¹ / ₁₆ |
| | KF | | 7 ⁸ / ₈ | | Plain | M | 1 ³ / ₈ | | Plain | M | 2 ¹¹ / ₁₆ |
| | KFG | | 7 ⁸ / ₈ | | — | C1, M1 | 1 ¹ / ₂ | | — | C | 2 ¹¹ / ₁₆ |
| | SB | | 7 ⁸ / ₈ | | — | C | 1 ³ / ₈ | 5317 | Plain | | 2 ⁷ / ₈ |
| | SBG | | 7 ⁸ / ₈ | 5308 | BG | MG | 1 ⁷ / ₁₆ | | — | C | 2 ⁷ / ₈ |
| | SBKF | | 7 ⁸ / ₈ | | F | MF1 | 1 ⁹ / ₁₆ | 5318 | Plain | | 2 ⁷ / ₈ |
| | SBKFF | | 7 ⁸ / ₈ | | FG | MFG1 | 1 ⁹ / ₁₆ | | — | C | 2 ⁷ / ₈ |
| | SBKFFG | | 7 ⁸ / ₈ | | G | MG | 1 ⁷ / ₁₆ | 5319 | Plain | | 3 ¹ / ₁₆ |
| | — | | 7 ⁸ / ₈ | | Plain | M | 1 ⁷ / ₁₆ | | — | C | 3 ¹ / ₁₆ |
| 5304 | F | MF1 | 1 | | — | C | 1 ⁷ / ₁₆ | 5320 | Plain | | 3 ¹ / ₄ |
| | Plain | M | 7 ⁸ / ₈ | | — | C1, M1 | 1 ⁹ / ₁₆ | 5321 | Plain | | 3 ⁷ / ₁₆ |
| | SB | C | 7 ⁸ / ₈ | 5309 | B | M | 1 ⁹ / ₁₆ | 5322 | Plain | | 3 ⁵ / ₈ |
| | SBF | CF1 | 1 | | F | MF1 | 1 ¹¹ / ₁₆ | 5400 Series | | | |
| | SBG | CG | 7 ⁸ / ₈ | | FG | MFG1 | 1 ¹¹ / ₁₆ | 5403 | Plain | | 1 ³ / ₁₆ |
| | SBKF | CF | 7 ⁸ / ₈ | | G | MG | 1 ⁹ / ₁₆ | 5404 | Plain | | 1 ³ / ₈ |
| | SBKFF | CFF | 7 ⁸ / ₈ | | Plain | M | 1 ⁹ / ₁₆ | 5405 | Plain | | 1 ³ / ₈ |
| | SBKFFG | CFFG | 7 ⁸ / ₈ | | — | C | 1 ⁹ / ₁₆ | 5406 | Plain | | 1 ⁹ / ₁₆ |
| | SBKFG | CFG | 7 ⁸ / ₈ | | — | C1, M1 | 1 ¹¹ / ₁₆ | | — | C | 1 ⁹ / ₁₆ |
| | — | C1, M1 | 1 | 5310 | F | MF1 | 1 ⁷ / ₈ | 5407 | G | | 1 ³ / ₄ |
| 5305 | F | | 1 ¹ / ₈ | | FG | MFG1 | 1 ⁷ / ₈ | | Plain | | 1 ³ / ₄ |
| | FG | | 1 ¹ / ₈ | | G | MG | 1 ³ / ₄ | 5408 | — | C | 1 ¹⁵ / ₁₆ |
| | G | MG | 1 | | KF | MF | 1 ³ / ₄ | | — | C | 1 ³ / ₄ |
| | KFF | MFF | 1 | | KFG | MFG | 1 ³ / ₄ | 5409 | Plain | | 1 ³ / ₄ |
| | Plain | M | 1 | | Plain | M | 1 ³ / ₄ | | — | C | 1 ¹⁵ / ₁₆ |
| | SB | C | 1 | | — | C | 1 ³ / ₄ | 5410 | Plain | | 1 ¹⁵ / ₁₆ |
| | SBF | | 1 ¹ / ₈ | | — | C1, M1 | 1 ⁷ / ₈ | | G | | 2 ¹ / ₈ |
| | SBFG | | 1 ¹ / ₈ | 5311 | F | MF1 | 2 ¹ / ₁₆ | | Plain | | 2 ¹ / ₈ |
| | SBG | CG | 1 | | FG | MFG1 | 2 ¹ / ₁₆ | 5411 | — | C | 2 ¹ / ₈ |
| | SBKF | CF | 1 | | G | MG | 1 ¹⁵ / ₁₆ | | — | C | 2 ¹ / ₈ |
| | SBKFF | CFF | 1 | | Plain | M | 1 ¹⁵ / ₁₆ | 5412 | F | | 2 ⁷ / ₁₆ |
| | SBKFG | CFG | 1 | | — | C | 1 ¹⁵ / ₁₆ | | Plain | | 2 ⁹ / ₁₆ |
| 5306 | B | M | 1 ³ / ₁₆ | | — | C1, M1 | 2 ¹ / ₁₆ | 5413 | — | C | 2 ⁹ / ₁₆ |
| | BKFF | MFF | 1 ³ / ₁₆ | 5312 | F | MF1 | 2 ¹ / ₄ | | F | | 2 ⁵ / ₈ |
| | F | MF1 | 1 ³ / ₁₆ | | FG | MFG1 | 2 ¹ / ₄ | | G | | 2 ¹ / ₂ |
| | FG | MFG1 | 1 ⁵ / ₁₆ | | G | MG | 2 ¹ / ₈ | 5414 | Plain | | 2 ¹ / ₂ |
| | G | MG | 1 ³ / ₁₆ | | Plain | M | 2 ¹ / ₈ | | — | C | 2 ¹ / ₂ |
| | KF | MF | 1 ³ / ₁₆ | | — | C | 2 ¹ / ₈ | 5415 | Plain | | 2 ⁵ / ₈ |
| | KFF | MFF | 1 ³ / ₁₆ | | — | C1, M1 | 2 ¹ / ₄ | | — | C | 2 ⁵ / ₈ |
| | KFG | MFG | 1 ³ / ₁₆ | 5313 | F | MF1 | 2 ⁷ / ₁₆ | 5416 | Plain | | 2 ¹³ / ₁₆ |
| | Plain | M | 1 ³ / ₁₆ | | FG | MFG1 | 2 ⁷ / ₁₆ | | — | C | 2 ¹³ / ₁₆ |
| | — | C1, M1 | 1 ³ / ₁₆ | | G | MG | 2 ⁹ / ₁₆ | 5417 | Plain | | 3 ¹ / ₈ |
| | — | C | 1 ³ / ₁₆ | | Plain | M | 2 ⁹ / ₁₆ | | — | C | 3 ¹ / ₈ |
| | | | | | — | C | 2 ⁹ / ₁₆ | 5418 | Plain | | 3 ¹ / ₈ |
| | | | | | — | C1, M1 | 2 ⁷ / ₁₆ | | — | C | 3 ¹ / ₄ |
| | | | | 5314 | F | MF1 | 2 ⁵ / ₈ | 5419 | Plain | | 4 ³ / ₁₆ |
| | | | | | G | MG | 2 ¹ / ₂ | | | | |
| | | | | | KF | MF | 2 ¹ / ₂ | | | | |
| | | | | | KFG | MFG | 2 ¹ / ₂ | | | | |
| | | | | | Plain | M | 2 ¹ / ₂ | | | | |
| | | | | | — | C | 2 ¹ / ₂ | | | | |
| | | | | | — | C1, M1 | 2 ⁵ / ₈ | | | | |

Bearing numbers of MRC double-row ball bearings produced before 1983 differ from the C- and M-types listed in this catalog. Shown below is the interchange of pre-1983 bearing numbers with the C- and M-types.

5000 Series double-row bearings not listed here maintain the original bearing number and must be specified by that number when ordering.

| MRC Bearing Numbers | | MRC Bearing Numbers | | MRC Bearing Numbers | |
|---------------------|---------------|---------------------|---------------|---------------------|---------------|
| Prior to 1983 | Superseded by | Prior to 1983 | Superseded by | Prior to 1983 | Superseded by |
| 5200SB | 5200C* | 5211K | 5211M | 5306 | 5306M |
| 5200SBKF | 5200CF* | 5211KF | 5211MF | 5306F | 5306MF1 |
| 5200SBKFF | 5200CFF* | 5211KFG | 5211MFG | 5306FG | 5306MFG1 |
| 5200SBKZ | 5200CZ* | 5211KG | 5211MG | 5306G | 5306MG |
| 5200SBKZZ | 5200CZZ* | 5212F | 5212MF1 | 5306KF | 5306MF |
| 5201SB | 5201C* | 5212FG | 5212MFG1 | 5306KFF | 5306MFF |
| 5201SBKF | 5201CF* | 5212K | 5212M | 5306KFG | 5306MFG |
| 5201SBKFF | 5201CFF* | 5212KF | 5212MF | 5307 | 5307M |
| 5201SBKZ | 5201CZ* | 5212KFG | 5212MFG | 5307F | 5307MF1 |
| 5201SBKZZ | 5201CZZ* | 5212KG | 5212MG | 5307FG | 5307MFG1 |
| 5202SB | 5202C* | 5213K | 5213M | 5307G | 5307MG |
| 5202SBKFF | 5202CFF* | 5213KF | 5213MF | 5307KF | 5307MF |
| 5202SBFG | 5202CFG1* | 5213KFG | 5213MFG | 5307KFG | 5307MFG |
| 5202SBKFG | 5202CFG* | 5213KG | 5213MG | 5308 | 5308M |
| 5202SBKZ | 5202CZ* | 5214K | 5214M | 5308F | 5308MF1 |
| 5202SBKZZ | 5202CZZ* | 5214KF | 5214MF | 5308FG | 5308MFG1 |
| 5203SB | 5203C* | 5214KG | 5214MG | 5308G | 5308MG |
| 5203SBKF | 5203CF* | 5215K | 5215M | 5309 | 5309M |
| 5203SBKFF | 5203CFF* | 5215KF | 5215MF | 5309B | 5309M |
| 5203SBKFG | 5203CFG* | 5215KFF | 5215MFF | 5309F | 5309MF1 |
| 5203SBKZ | 5203CZ* | 5215KFG | 5215MFG | 5309FG | 5309MFG1 |
| 5203SBKZZ | 5203CZZ* | 5215KG | 5215MG | 5309G | 5309MG |
| 5204SBK | 5204C | 5216K | 5216M | 5310 | 5310M |
| 5204SBKF | 5204CF | 5216KF | 5216MF | 5310F | 5310MF1 |
| 5204SBKFF | 5204CFF | 5216KFG | 5216MFG | 5310FG | 5310MFG1 |
| 5204SBKFG | 5204CFG | 5216KG | 5216MG | 5310G | 5310MG |
| 5204SBKFFG | 5204CFFG | 5217K | 5217M | 5310KF | 5310MF |
| 5204SBKG | 5204CG | 5217KF | 5217MF | 5310KFG | 5310MFG |
| 5204SBKZ | 5204CZ | 5217KG | 5217MG | 5311 | 5311M |
| 5205SBK | 5205C | 5218K | 5218M | 5311F | 5311MF1 |
| 5205SBF | 5205CF1 | 5218KF | 5218MF | 5311FG | 5311MFG1 |
| 5205SBKF | 5205CF | 5218KFG | 5218MG | 5311G | 5311MG |
| 5205SBKFF | 5205CFF | 5219 | 5219M | 5312 | 5312M |
| 5205SBKG | 5205CG | 5219G | 5219MG | 5312F | 5312MF1 |
| 5206SBK | 5206C | 5220 | 5220M | 5312FG | 5312MFG1 |
| 5206SBF | 5206CF1 | 5220G | 5220MG | 5312G | 5312MG |
| 5206SBKF | 5206CF | 5221 | 5221M | 5313 | 5313M |
| 5206SBKFF | 5206CFF | 5221G | 5221MG | 5313F | 5313MF1 |
| 5206SBKFG | 5206CFG | 5222 | 5222M | 5313FG | 5313MFG1 |
| 5206SBKG | 5206CG | 5222KF | 5222MG | 5313G | 5313MG |
| 5206SBZZ | 5206CZZ1 | 5300SB | 5300C* | 5314 | 5314M |
| 5207F | 5207MF1 | 5301SB | 5301C* | 5314F | 5314MF1 |
| 5207SBK | 5207C | 5302SB | 5302C* | 5314G | 5314MG |
| 5207SBKF | 5207CF | 5303SB | 5303C* | 5314KF | 5314MF |
| 5207SBKFF | 5207CFF | 5303SBG | 5303CG* | 5315 | 5315M |
| 5207SBKFG | 5207CFG | 5303SBKF | 5303CF* | 5315F | 5315MF1 |
| 5207SBKG | 5207CG | 5303SBKFF | 5303CFF* | 5315G | 5315MG |
| 5208SBK | 5208C | 5303SBKFG | 5303CFG* | 5316 | 5316M |
| 5208SBKF | 5208CF | 5304SB | 5304C | 5316G | 5316MG |
| 5208SBKFF | 5208CFF | 5304SBF | 5304CF1 | 5317 | 5317M |
| 5208SBKFG | 5208CFG | 5304SBKF | 5304CF | 5318 | 5318M |
| 5208SBKG | 5208CG | 5304SBKFF | 5304CFF | 5319 | 5319M |
| 5209K | 5209M | 5305SB | 5305C | 5320 | 5320M |
| 5209KF | 5209MF | 5305SBG | 5305CG | 5321 | 5321M |
| 5209SBFF | 5209CFF | 5305SBKF | 5305CF | 5322 | 5322M |
| 5209KG | 5209MG | 5305SBKFF | 5305CFF | | |
| 5210K | 5210M | 5305SBKFG | 5305CFG | | |
| 5210KF | 5210MF | | | | |
| 5210KFF | 5210MFF | | | | |
| 5210KG | 5210MG | | | | |

*Listed for information only. Not currently in production. Use SB types.



Since the filling notch row is not visible on 5000MFF and 5000MZZ bearings, it is necessary to identify which row of balls has the notch in those cases where the bearing will be subjected to axial load. Axial load should be carried on the non-filling notch row. A moderate reversing axial load is permissible on the filling notch row.

A typical application of a 5000MFF or 5000MZZ bearing is shown above in which it is subjected to an axial load in an upward direction. The bearing should be mounted with the filling notch up so that the axial load is taken by the bottom, non-filling notch row.

The filling notch is oriented in relation to the identification marking on the bearing, which will be found in one of the following locations:

- Side face of the outer ring
- Side face of the inner ring
- OD surface of the outer ring
- Face of the closure

In each case the marking will occur on the side of the bearing opposite the filling notch as illustrated above.

5200 and 5300 Series

| Bore Diameter d | | | | Axial Internal Clearance | | | | | | | | | | | | | | | |
|-----------------|--------|-----------|--------|--------------------------|-----|----------|-----|-----------|-----|----------|-----|---------|-----|----------|-----|---------|-----|----------|-----|
| Over | | Including | | C2 | | | | Normal C0 | | | | C3 | | | | C4 | | | |
| mm | in | mm | in | .001 mm | | .0001 in | | .001 mm | | .0001 in | | .001 mm | | .0001 in | | .001 mm | | .0001 in | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| 10 | .3937 | 10 | .3937 | 1 | 11 | 0 | 4 | 5 | 21 | 2 | 8 | 12 | 28 | 5 | 11 | 25 | 45 | 10 | 18 |
| 18 | .7087 | 18 | .7087 | 1 | 12 | 0 | 5 | 6 | 23 | 2 | 9 | 13 | 31 | 5 | 12 | 27 | 47 | 11 | 19 |
| | | 24 | .9449 | 2 | 14 | 1 | 6 | 7 | 25 | 3 | 10 | 16 | 34 | 6 | 13 | 28 | 48 | 11 | 19 |
| 24 | .9449 | 30 | 1.1811 | 2 | 15 | 1 | 6 | 8 | 27 | 3 | 11 | 18 | 37 | 7 | 15 | 30 | 50 | 12 | 20 |
| 30 | 1.1811 | 40 | 1.5748 | 2 | 16 | 1 | 6 | 9 | 29 | 4 | 11 | 21 | 40 | 8 | 16 | 33 | 54 | 13 | 21 |
| 40 | 1.5748 | 50 | 1.9685 | 2 | 18 | 1 | 7 | 11 | 33 | 4 | 13 | 23 | 44 | 9 | 17 | 36 | 58 | 14 | 23 |
| 50 | 1.9685 | 65 | 2.5591 | 3 | 22 | 1 | 9 | 13 | 36 | 5 | 14 | 26 | 48 | 10 | 19 | 40 | 63 | 16 | 25 |
| 65 | 2.5591 | 80 | 3.1496 | 3 | 24 | 1 | 9 | 15 | 40 | 6 | 16 | 30 | 54 | 12 | 21 | 46 | 71 | 18 | 28 |
| 80 | 3.1496 | 100 | 3.9370 | 3 | 26 | 1 | 10 | 18 | 46 | 7 | 18 | 35 | 63 | 14 | 25 | 55 | 83 | 22 | 33 |
| 100 | 3.9370 | 110 | 4.3307 | 4 | 30 | 2 | 12 | 22 | 53 | 9 | 21 | 42 | 73 | 17 | 29 | 65 | 96 | 26 | 38 |

| Bore Diameter d | | | | Radial Internal Clearance | | | | | | | | | | | | | | | |
|-----------------|--------|-----------|--------|---------------------------|-----|----------|-----|-----------|-----|----------|-----|---------|-----|----------|-----|---------|-----|----------|-----|
| Over | | Including | | C2 | | | | Normal C0 | | | | C3 | | | | C4 | | | |
| mm | in | mm | in | .001 mm | | .0001 in | | .001 mm | | .0001 in | | .001 mm | | .0001 in | | .001 mm | | .0001 in | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| 10 | .3937 | 10 | .3937 | 0.6 | 7 | 0 | 2.4 | 3 | 13 | 1.2 | 5 | 8 | 18 | 3 | 7 | 15 | 27 | 6 | 11 |
| 18 | .7087 | 18 | .7087 | 0.6 | 7 | 0 | 3 | 3.6 | 14 | 1.2 | 5 | 8 | 18 | 3 | 7 | 18 | 27 | 7 | 11 |
| | | 24 | .9449 | 1.2 | 8 | 0.6 | 3.6 | 4 | 15 | 1.8 | 6 | 11 | 21 | 4 | 8 | 18 | 27 | 7 | 11 |
| 24 | .9449 | 30 | 1.1811 | 1.2 | 9 | 0.6 | 3.6 | 5 | 16 | 1.8 | 7 | 11 | 23 | 4 | 9 | 18 | 31 | 7 | 12 |
| 30 | 1.1811 | 40 | 1.5748 | 1.2 | 10 | 0.6 | 3.6 | 5 | 17 | 2.4 | 7 | 12 | 25 | 5 | 10 | 21 | 33 | 8 | 13 |
| 40 | 1.5748 | 50 | 1.9685 | 1.2 | 11 | 0.6 | 4 | 7 | 20 | 2.4 | 8 | 12 | 25 | 5 | 10 | 21 | 36 | 8 | 14 |
| 50 | 1.9685 | 65 | 2.5591 | 1.8 | 13 | 0.6 | 5 | 8 | 22 | 3 | 8 | 15 | 27 | 6 | 11 | 25 | 38 | 10 | 15 |
| 65 | 2.5591 | 80 | 3.1496 | 1.8 | 14 | 0.6 | 5 | 9 | 24 | 3.6 | 10 | 18 | 33 | 7 | 13 | 27 | 44 | 11 | 17 |
| 80 | 3.1496 | 100 | 3.9370 | 1.8 | 16 | 0.6 | 6 | 11 | 28 | 4 | 11 | 21 | 38 | 8 | 15 | 33 | 50 | 13 | 20 |
| 100 | 3.9370 | 110 | 4.3307 | 2.4 | 18 | 1.2 | 7 | 13 | 32 | 5 | 13 | 25 | 44 | 10 | 17 | 40 | 58 | 16 | 23 |

5400 Series

| Bore Diameter d | | | | Radial Internal Clearance | | | | | | | | | | | | | | | |
|-----------------|--------|-----------|--------|---------------------------|-----|----------|-----|-----------|-----|----------|-----|---------|-----|----------|-----|---------|-----|----------|-----|
| Over | | Including | | C2 | | | | Normal C0 | | | | C3 | | | | C4 | | | |
| mm | in | mm | in | .001 mm | | .0001 in | | .001 mm | | .0001 in | | .001 mm | | .0001 in | | .001 mm | | .0001 in | |
| | | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| 30 | 1.1811 | 30 | 1.1811 | 1 | 8 | 0.4 | 3 | 2 | 13 | 1 | 5 | 13 | 23 | 5 | 9 | 20 | 38 | 8 | 15 |
| 40 | 1.5748 | 40 | 1.5748 | 1 | 8 | 0.5 | 3 | 6 | 13 | 2 | 5 | 15 | 23 | 6 | 9 | 23 | 41 | 9 | 16 |
| | | 50 | 1.9685 | 1 | 8 | 0.5 | 3 | 6 | 15 | 2 | 6 | 15 | 25 | 6 | 10 | 23 | 44 | 9 | 17 |
| 50 | 1.9685 | 65 | 2.5591 | 1 | 11 | 0.5 | 4 | 6 | 15 | 2 | 6 | 15 | 28 | 6 | 11 | 25 | 45 | 10 | 18 |
| 65 | 2.5591 | 70 | 2.7559 | 1 | 11 | 0.5 | 4 | 6 | 18 | 2 | 7 | 18 | 31 | 7 | 12 | 28 | 48 | 11 | 19 |
| 70 | 2.7559 | 80 | 3.1496 | 0 | 6 | 0 | 2 | 6 | 18 | 2 | 7 | 18 | 33 | 7 | 13 | 33 | 48 | 13 | 19 |
| 80 | 3.1496 | 90 | 3.5433 | 0 | 7 | 0 | 3 | 7 | 23 | 3 | 9 | 23 | 44 | 9 | 17 | 44 | 65 | 17 | 26 |

**Thrust Rating of 5000 Series
Double-Row Angular Contact Ball Bearings**

Dynamic Rating

To obtain dynamic thrust rating multiply dynamic radial rating C by the factor shown below.

| Size | Factor |
|---|--------|
| 5200SB-5203SB 5300SB-5303SB 5403C-5414C | 0.71 |
| 5204C&M-5218C&M 5304C&M-5319C&M | 0.81 |

Example:

Bearing size: 5307C
 Basic dynamic radial load rating (C) = 11100 lbf
 Thrust rating factor = 0.81
 Thrust rating = $0.81 \times 11100 = 8991$ lbf

Sizes 5415C-5419C have 0° contact angles and are not included in the above tables. When thrust load is present, the equivalent radial load should be used to determine life.

Static Rating

To obtain static thrust rating multiply static radial rating C₀ by the factor shown below.

| Size | Factor |
|--|--------|
| 5200SB-5203SB 5300SB-5303SB 5204C&M-5206C&M 5403C-5414C | 0.57 |
| 5207C&M-5218C&M 5304C&M-5319C&M | 0.66 |

Example:

Bearing size: 5214M
 Basic static radial load rating (C₀) = 28100 lbf
 Thrust rating factor = 0.66
 Thrust rating = $0.66 \times 28100 = 18546$ lbf

Double-row angular contact ball bearings with non-standard extra wide width are currently available as a retrofit kit. These replacement units consist of a standard width double-row angular contact ball bearing and two specially designed spacers packaged together in a single carton.

Spacers

The Extra Width Double-Row Angular Contact Ball Bearing Retrofit Kit is simple to use. When used with bearings without snap rings, place both spacers on the same side, as shown in Figure 1.

With snap ring bearings, the inner ring spacer must be installed on the side opposite the snap ring, as shown in Figure 2. The outer spacer is not needed in applications where the bearing's snap ring controls the axial location of the outer ring in the housing.

The spacers accommodate slight variations in the shaft and housing seat width. The inner ring and spacer can be secured to the shaft with a retaining ring or threaded

locknut. If a locknut is used, the amount of clamping force can be regulated to make slight adjustments in the shaft's axial location. The spacer rings yield slightly when an axial clamping force is applied. The spacer rings also exert a reaction force, which helps maintain the initial clamping force and helps prevent the inner ring from becoming loose on the shaft. The same circumstances apply to the outer ring spacers when an end cap is used to clamp the bearing's outer ring against a housing shoulder.

Because the spacer rings are designed to yield slightly when axial clamping forces are applied, the spacer rings should always be replaced with new spacer rings anytime the bearing is removed, replaced or reinstalled.

Materials for Rings, Balls and Spacers

High-carbon chromium vacuum-processed steel (SAE 52100) is used for all balls and rings. Machined and roll formed spacer rings are fabricated from 1018 carbon steel and 304 stainless steel.

Mounting Instructions

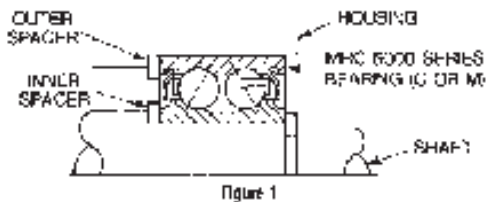


Figure 1

Without Snap Ring

1. Install inner and outer ring spacers onto the shaft and into the housing bore respectively.
2. Install bearing in accordance with normal mounting instructions.
3. If any locking devices such as snap rings or locknuts are normally used to secure the bearing on the shaft or in the housing be sure they are properly installed.
4. These inner and outer ring spacers are adjusted to proper width prior to installation. During bearing installation their width may be slightly altered to accommodate variations in shaft and housing shoulder distances. As a consequence, when a new extra width retrofit bearing kit is installed the new spacer rings supplied with the kit should always be used and the old spacers discarded.

Mounting Instructions

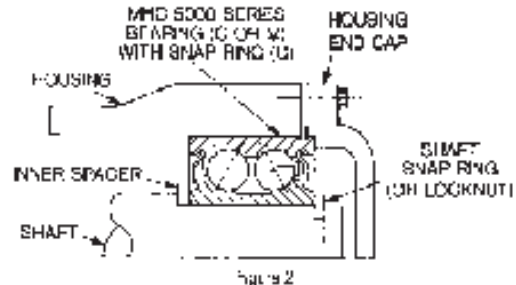


Figure 2

With Snap Ring

1. Install the inner ring spacer onto the shaft. The outer ring spacer is not used with a snap ring bearing and may be discarded.
2. Install bearing in accordance with normal mounting instructions.
3. If any locking devices such as snap rings, locknuts or end caps are normally used to secure the bearing on the shaft or in the housing be sure they are properly installed.
4. These inner and outer ring spacers are adjusted to proper width prior to installation. During bearing installation their width may be slightly altered to accommodate variations in shaft and housing shoulder distances. As a consequence, when a new extra width retrofit bearing kit is installed the new spacer rings supplied with the kit should always be used and the old spacers discarded.

Extra Wide 5000 Series

Part Numbers

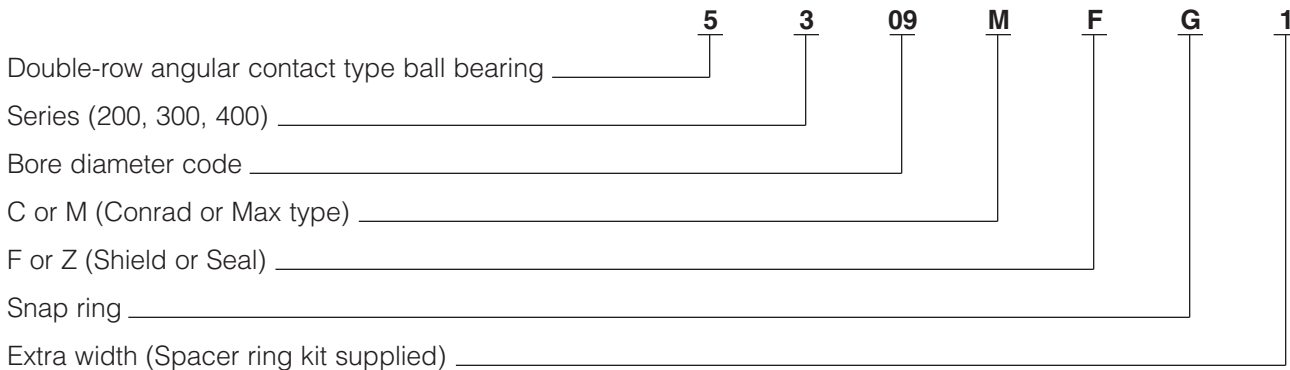
MRC Bearing Services

A listing of available part numbers appears below. This listing may change with sizes being added or deleted based on demand.

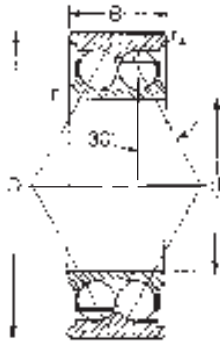
| MRC Part Number | Width including Spacers | | |
|------------------|-------------------------|--------|-------|
| | Inches | mm | |
| 5205CF1 | 7/8 | .8750 | 22.23 |
| 5205MF1 | 7/8 | .8750 | 22.23 |
| 5206CF1 | 1 1/16 | 1.0625 | 26.99 |
| 5206MF1 | 1 1/16 | 1.0625 | 26.99 |
| 5206SBZZ* | 1 1/16 | 1.0625 | 26.99 |
| 5212MF1 | 1 1/2 | 1.5000 | 38.10 |
| 5304CF1 | 1 | 1.0000 | 25.40 |
| 5304MF1 | 1 | 1.0000 | 25.40 |
| 5305CF1 | 1 1/8 | 1.1250 | 28.58 |
| 5305MFG1 | 1 1/8 | 1.1250 | 28.58 |
| 5306MFG1 | 1 5/16 | 1.3125 | 33.34 |
| 5306MF1 | 1 5/16 | 1.3125 | 33.34 |
| 5307MF1 | 1 1/2 | 1.5000 | 38.10 |
| 5307MFG1 | 1 1/2 | 1.5000 | 38.10 |
| 5308MFG1 | 1 9/16 | 1.5625 | 39.69 |
| 5308MF1 | 1 9/16 | 1.5625 | 39.69 |
| 5309MFG1 | 1 11/16 | 1.6875 | 42.86 |
| 5309MF1 | 1 11/16 | 1.6875 | 42.86 |
| 5310MFG1 | 1 7/8 | 1.8750 | 47.63 |
| 5310MF1 | 1 7/8 | 1.8750 | 47.63 |
| 5311MFG1 | 2 1/16 | 2.0625 | 52.39 |
| 5311MF1 | 2 1/16 | 2.0625 | 52.39 |
| 5312MFG1 | 2 1/4 | 2.2500 | 57.15 |
| 5312MF1 | 2 1/4 | 2.2500 | 57.15 |
| 5313MFG1 | 2 7/16 | 2.4375 | 61.91 |
| 5313MF1 | 2 7/16 | 2.4375 | 61.91 |
| 5315MF1 | 2 13/16 | 2.8125 | 71.44 |

*Currently stocked. No spacer needed.

Nomenclature



5200-C bearings are used with moderate to heavy radial loads, two-directional thrust loads, or a combination of both.



CP/SBK1
One Shield



CZ/SBKZ
One Seal



CP/SBKFP
Two Shields



CZZ/SBKZZ
Two Seals



CP/SBK1Z
Shield & Seal



CG/SBK1G
Snap Ring



CP/SBK1FG
One Shield & Snap-Ring



CZG
One Seal & Snap-Ring



CPFG/SBK1FG
Two Shields & Snap Ring



CZZG
Two Seals & Snap Ring



CPZG
Shield, Seal & Snap Ring

| MRC Bearing Number | Bore | | Outside Diameter D | | Width B | | Fillet Radius ¹⁾ r _s | | Basic Radial Load Rating | | | | Speed Rating ²⁾ | | |
|--------------------|------|--------|--------------------|--------|---------|--------|--|------|--------------------------|--------|-----------------------|--------|----------------------------|--------|---------------------------------|
| | d | in | mm | in | mm | in | mm | in | Dynamic C ³⁾ | | Static C ₀ | | Open and Shielded Oil | | Single and Double Sealed Grease |
| | | | | | | | | | N | lbf | N | lbf | RPM | RPM | RPM |
| 5200-SB | 10 | .3937 | 30 | 1.1811 | 14.29 | .5625 | .64 | .025 | 7 610 | 1 710 | 4 300 | 967 | 16 000 | 22 000 | 16 000 |
| 5201-SB | 12 | .4724 | 32 | 1.2598 | 15.88 | .6250 | .64 | .025 | 10 400 | 2 340 | 5 600 | 1 260 | 15 000 | 20 000 | 15 000 |
| 5202-SB | 15 | .5906 | 35 | 1.3780 | 15.88 | .6250 | .64 | .025 | 11 400 | 2 560 | 6 800 | 1 530 | 12 000 | 17 000 | 12 000 |
| 5203-SB | 17 | .6693 | 40 | 1.5748 | 17.47 | .6876 | .64 | .025 | 14 300 | 3 210 | 8 800 | 1 980 | 10 000 | 15 000 | 10 000 |
| 5204-C | 20 | .7874 | 47 | 1.8504 | 20.64 | .8125 | 1.0 | .04 | 19 000 | 4 270 | 12 000 | 2 700 | 9 000 | 13 000 | 9 000 |
| 5205-C | 25 | .9843 | 52 | 2.0472 | 20.64 | .8125 | 1.0 | .04 | 20 800 | 4 680 | 14 000 | 3 150 | 8 000 | 11 000 | 8 000 |
| 5205-C1 | 25 | .9843 | 52 | 2.0472 | 22.23 | .8750 | 1.0 | .04 | 20 800 | 4 680 | 14 000 | 3 150 | 8 000 | 11 000 | 8 000 |
| 5206-C | 30 | 1.1811 | 62 | 2.4409 | 23.81 | .9375 | 1.0 | .04 | 28 600 | 6 430 | 20 400 | 4 590 | 7 000 | 9 500 | 7 000 |
| 5206-C1 | 30 | 1.1811 | 62 | 2.4409 | 26.99 | 1.0625 | 1.0 | .04 | 28 600 | 6 430 | 20 400 | 4 590 | 7 000 | 9 500 | 7 000 |
| 5207-C | 35 | 1.3780 | 72 | 2.8346 | 26.99 | 1.0625 | 1.0 | .04 | 37 700 | 8 480 | 27 500 | 6 180 | 6 000 | 8 000 | 6 000 |
| 5207-C1 | 35 | 1.3780 | 72 | 2.8346 | 30.16 | 1.1875 | 1.0 | .04 | 37 700 | 8 480 | 27 500 | 6 180 | 6 000 | 8 000 | 6 000 |
| 5208-C | 40 | 1.5748 | 80 | 3.1496 | 30.16 | 1.1875 | 1.0 | .04 | 44 900 | 10 100 | 34 000 | 7 640 | 5 600 | 7 500 | 5 600 |
| 5209-C | 45 | 1.7717 | 85 | 3.3465 | 30.16 | 1.1875 | 1.0 | .04 | 48 800 | 11 000 | 39 000 | 8 770 | 5 000 | 6 700 | 5 000 |
| 5210-C | 50 | 1.9685 | 90 | 3.5433 | 30.16 | 1.1875 | 1.0 | .04 | 48 800 | 11 000 | 39 000 | 8 770 | 4 800 | 6 300 | 4 800 |
| 5211-C | 55 | 2.1654 | 100 | 3.9370 | 33.34 | 1.3125 | 1.5 | .06 | 57 200 | 12 900 | 47 500 | 10 700 | 4 300 | 5 600 | 4 300 |
| 5212-C | 60 | 2.3622 | 110 | 4.3307 | 36.51 | 1.4375 | 1.5 | .06 | 70 200 | 15 800 | 58 500 | 13 200 | 3 800 | 5 000 | 3 800 |
| 5212-C1 | 60 | 2.3622 | 110 | 4.3307 | 38.10 | 1.5000 | 1.5 | .06 | 70 200 | 15 800 | 58 500 | 13 200 | 3 800 | 5 000 | 3 800 |
| 5213-C | 65 | 2.5591 | 120 | 4.7244 | 38.10 | 1.5000 | 1.5 | .06 | 80 600 | 18 100 | 73 500 | 16 500 | 3 600 | 4 800 | 3 600 |
| 5214-C | 70 | 2.7559 | 125 | 4.9213 | 39.69 | 1.5625 | 1.5 | .06 | 88 400 | 19 900 | 80 000 | 18 000 | 3 200 | 4 300 | 3 200 |
| 5215-C | 75 | 2.9528 | 130 | 5.1181 | 41.28 | 1.6250 | 1.5 | .06 | 95 600 | 21 500 | 88 000 | 19 800 | 3 200 | 4 300 | 3 200 |
| 5216-C | 80 | 3.1496 | 140 | 5.5118 | 44.45 | 1.7500 | 2.0 | .08 | 106 000 | 23 900 | 95 000 | 21 400 | 2 800 | 3 800 | 2 800 |
| 5217-C | 85 | 3.3465 | 150 | 5.9055 | 49.21 | 1.9375 | 2.0 | .08 | 124 000 | 27 900 | 110 000 | 24 700 | 2 600 | 3 600 | 2 600 |
| 5218-C | 90 | 3.5433 | 160 | 6.2992 | 52.39 | 2.0625 | 2.0 | .08 | 130 000 | 29 300 | 120 000 | 27 000 | 2 400 | 3 400 | 2 400 |
| 5219-C | 95 | 3.7402 | 170 | 6.6929 | 55.56 | 2.1875 | 2.0 | .08 | 159 000 | 35 700 | 146 000 | 32 800 | 2 200 | 3 200 | 2 200 |
| 5220-C | 100 | 3.9370 | 180 | 7.0866 | 60.33 | 2.3750 | 2.0 | .08 | 178 000 | 40 000 | 166 000 | 37 300 | 2 000 | 3 000 | 2 000 |
| 5221-C | 105 | 4.1339 | 190 | 7.4803 | 65.09 | 2.5625 | 2.0 | .08 | 186 000 | 41 800 | 180 000 | 40 500 | 1 800 | 2 800 | 1 800 |
| 5222-C | 110 | 4.3307 | 200 | 7.8740 | 69.85 | 2.7500 | 2.0 | .08 | 203 000 | 45 600 | 200 000 | 45 000 | 1 600 | 2 600 | 1 600 |

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

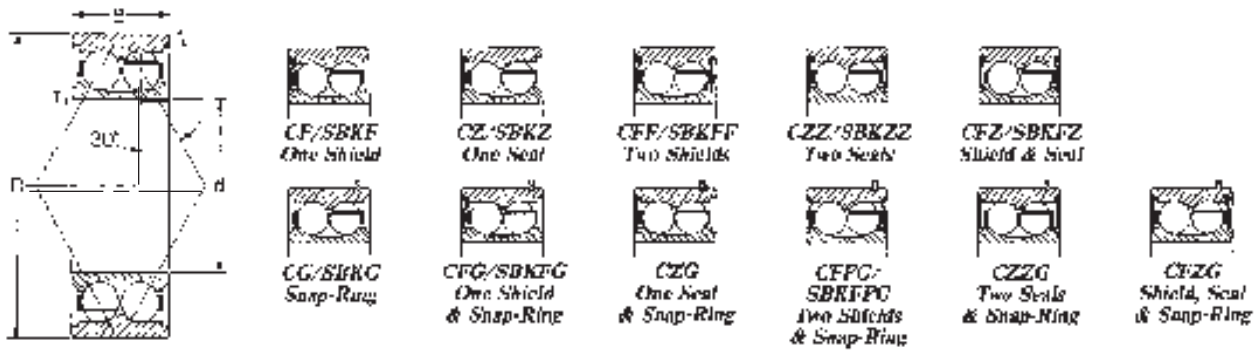
²⁾ Listed values are for pressed steel cage, ABEC-1.

The values have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

Note: Extra width bearings identified by the suffix C1 are supplied with a retrofit kit described on pages 91, 92.

5300-C bearings are used with heavy radial loads, two-directional thrust loads, or a combination of both.



| MRC Bearing Number | Bore | | Outside Diameter D | | Width B | | Fillet Radius ¹⁾ r _s | | Basic Radial Load Rating | | | Speed Rating ²⁾ | | | |
|--------------------|---------|--------|--------------------|--------|---------|--------|--|------|--------------------------|--------|-----------------------|----------------------------|--------------------------|--------|---------------------------------|
| | d mm | in | mm | in | mm | in | mm | in | Dynamic C ³⁾ | | Static C ₀ | | Open and Shielded Grease | | Single and Double Sealed Grease |
| | | | | | | | | | N | lbf | N | lbf | RPM | RPM | RPM |
| 5300-SB | 10 | .3937 | 35 | 1.3780 | 19.05 | .7500 | .64 | .025 | 10 600 | 2 380 | 6 100 | 1 370 | 15 000 | 20 000 | 15 000 |
| 5301-SB | 12 | .4724 | 37 | 1.4567 | 19.05 | .7500 | 1.0 | .04 | 11 700 | 2 630 | 6 800 | 1 530 | 14 000 | 18 000 | 14 000 |
| 5302-SB | 15 | .5906 | 42 | 1.6535 | 19.05 | .7500 | 1.0 | .04 | 15 100 | 3 390 | 9 300 | 2 090 | 11 000 | 15 000 | 11 000 |
| 5303-SB | 17 | .6693 | 47 | 1.8504 | 22.23 | .8750 | 1.0 | .04 | 21 600 | 4 860 | 12 700 | 2 860 | 11 000 | 14 000 | 11 000 |
| 5304-C | 20 | .7874 | 52 | 2.0472 | 22.23 | .8750 | 1.0 | .04 | 22 500 | 5 060 | 14 600 | 3 280 | 8 500 | 12 000 | 8 500 |
| 5304-C1 | 20 | .7874 | 52 | 2.0472 | 25.40 | 1.0000 | 1.0 | .04 | 22 500 | 5 060 | 14 600 | 3 280 | 8 500 | 12 000 | 8 500 |
| 5305-C | 25 | .9843 | 62 | 2.4409 | 25.40 | 1.0000 | 1.0 | .04 | 30 700 | 6 910 | 20 400 | 4 590 | 7 500 | 10 000 | 7 500 |
| 5306-C | 30 | 1.1811 | 72 | 2.8346 | 30.16 | 1.1875 | 1.0 | .04 | 41 600 | 9 360 | 29 000 | 6 520 | 6 300 | 8 500 | 6 300 |
| 5306-C1 | 30 | 1.1811 | 72 | 2.8346 | 33.34 | 1.3125 | 1.0 | .04 | 41 600 | 9 360 | 29 000 | 6 520 | 6 300 | 8 500 | 6 300 |
| 5307-C | 35 | 1.3780 | 80 | 3.1496 | 34.93 | 1.3750 | 1.5 | .06 | 49 400 | 11 100 | 34 500 | 7 760 | 5 600 | 7 500 | 5 600 |
| 5307-C1 | 35 | 1.3780 | 80 | 3.1496 | 38.10 | 1.5000 | 1.5 | .06 | 49 400 | 11 100 | 34 500 | 7 760 | 5 600 | 7 500 | 5 600 |
| 5308-C | 40 | 1.5748 | 90 | 3.5433 | 36.51 | 1.4375 | 1.5 | .06 | 60 500 | 13 600 | 43 000 | 9 760 | 5 000 | 6 700 | 5 000 |
| 5308-C1 | 40 | 1.5748 | 90 | 3.5433 | 39.69 | 1.5625 | 1.5 | .06 | 60 500 | 13 600 | 43 000 | 9 760 | 5 000 | 6 700 | 5 000 |
| 5309-C | 45 | 1.7717 | 100 | 3.9370 | 39.69 | 1.5625 | 1.5 | .06 | 72 800 | 16 400 | 53 000 | 11 900 | 4 500 | 6 000 | 4 500 |
| 5309-C1 | 45 | 1.7717 | 100 | 3.9370 | 42.86 | 1.6875 | 1.5 | .06 | 72 800 | 16 400 | 53 000 | 11 900 | 4 500 | 6 000 | 4 500 |
| 5310-C | 50 | 1.9685 | 110 | 4.3307 | 44.45 | 1.7500 | 2.0 | .08 | 85 200 | 19 200 | 64 000 | 14 400 | 4 000 | 5 300 | 4 000 |
| 5310-C1 | 50 | 1.9685 | 110 | 4.3307 | 47.63 | 1.8750 | 2.0 | .08 | 85 200 | 19 200 | 64 000 | 14 400 | 4 000 | 5 300 | 4 000 |
| 5311-C | 55 | 2.1654 | 120 | 4.7244 | 49.21 | 1.9375 | 2.0 | .08 | 106 000 | 23 900 | 81 500 | 18 300 | 3 800 | 5 000 | 3 800 |
| 5311-C1 | 55 | 2.1654 | 120 | 4.7244 | 52.39 | 2.0625 | 2.0 | .08 | 106 000 | 23 900 | 81 500 | 18 300 | 3 800 | 5 000 | 3 800 |
| 5312-C | 60 | 2.3622 | 130 | 5.1181 | 53.98 | 2.1250 | 2.0 | .08 | 121 000 | 27 200 | 95 000 | 21 400 | 3 400 | 4 500 | 3 400 |
| 5312-C1 | 60 | 2.3622 | 130 | 5.1181 | 57.15 | 2.2500 | 2.0 | .08 | 121 000 | 27 200 | 95 000 | 21 400 | 3 400 | 4 500 | 3 400 |
| 5313-C | 65 | 2.5591 | 140 | 5.5118 | 58.74 | 2.3125 | 2.0 | .08 | 138 000 | 31 100 | 108 000 | 24 300 | 3 200 | 4 300 | 3 200 |
| 5313-C1 | 65 | 2.5591 | 140 | 5.5118 | 61.91 | 2.4375 | 2.0 | .08 | 138 000 | 31 100 | 108 000 | 24 300 | 3 200 | 4 300 | 3 200 |
| 5314-C | 70 | 2.7559 | 150 | 5.9055 | 63.50 | 2.5000 | 2.0 | .08 | 153 000 | 34 400 | 125 000 | 28 100 | 2 800 | 3 800 | 2 800 |
| 5314-C1 | 70 | 2.7559 | 150 | 5.9055 | 66.68 | 2.6250 | 2.0 | .08 | 153 000 | 34 400 | 125 000 | 28 100 | 2 800 | 3 800 | 2 800 |
| 5315-C | 75 | 2.9528 | 160 | 6.2992 | 68.26 | 2.6875 | 2.0 | .08 | 168 000 | 37 800 | 140 000 | 31 500 | 2 600 | 3 600 | 2 600 |
| 5315-C1 | 75 | 2.9528 | 160 | 6.2992 | 71.44 | 2.8125 | 2.0 | .08 | 168 000 | 37 800 | 140 000 | 31 500 | 2 600 | 3 600 | 2 600 |
| 5316-C | 80 | 3.1496 | 170 | 6.6929 | 68.26 | 2.6875 | 2.0 | .08 | 182 000 | 41 000 | 156 000 | 35 100 | 2 400 | 3 400 | 2 400 |
| 5317-C | 85 | 3.3465 | 180 | 7.0866 | 73.03 | 2.8750 | 2.5 | .10 | 195 000 | 43 900 | 176 000 | 39 600 | 2 200 | 3 200 | 2 200 |
| 5318-C | 90 | 3.5433 | 190 | 7.4803 | 73.03 | 2.8750 | 2.5 | .10 | 212 000 | 47 700 | 196 000 | 44 100 | 2 000 | 3 000 | 2 000 |
| 5319-C | 95 | 3.7402 | 200 | 7.8740 | 77.79 | 3.0625 | 2.5 | .10 | 234 000 | 52 700 | 224 000 | 50 400 | 1 900 | 2 800 | 1 900 |
| 5320-C | 100 | 3.9370 | 215 | 8.4646 | 82.55 | 3.2500 | 2.5 | .10 | 255 000 | 57 300 | 255 000 | 57 300 | 1 800 | 2 600 | 1 800 |
| 5322-C | 110 | 4.3307 | 240 | 9.4488 | 92.08 | 3.6250 | 2.5 | .10 | 291 000 | 65 400 | 305 000 | 68 600 | 1 700 | 2 400 | 1 700 |

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel cage, ABEC-1.

The values have been determined through historical application and practice. For a more complete explanation, see page 274.

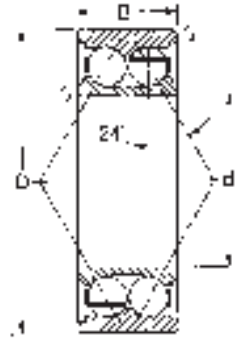
³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

Note: Extra width bearings identified by the suffix C1 are supplied with a retrofit kit described on pages 91, 92.

5400 Series bearings are used with extremely heavy radial loads, two-directional thrust loads, or a combination of both.

5406-5414 have a 24° contact angle per row.

5415-5418 have a 0° contact angle.



| MRC Bearing Number | Bore | | Outside Diameter D | | Width B | | Fillet Radius ¹⁾ r _a | | Basic Radial Load Rating | | | | Speed Rating ²⁾ | |
|--------------------|---------|---------------|--------------------|---------------|---------|---------------|--|------------|--------------------------|---------------|-----------------------|---------------|----------------------------|---------|
| | d mm | in | mm | in | mm | in | mm | in | Dynamic C ³⁾ | | Static C ₀ | | Grease RPM | Oil RPM |
| | | | | | | | | | N | lbf | N | lbf | | |
| 5406C | 30 | 1.1811 | 90 | 3.5433 | 39.69 | 1.5625 | 1.5 | .06 | 67 600 | 15 200 | 45 000 | 10 100 | 5 300 | 7 000 |
| 5407C | 35 | 1.3780 | 100 | 3.9370 | 44.45 | 1.7500 | 1.5 | .06 | 76 100 | 17 000 | 49 000 | 11 000 | 4 800 | 6 300 |
| 5408C | 40 | 1.5748 | 110 | 4.3307 | 49.21 | 1.9375 | 2.0 | .08 | 88 400 | 19 900 | 57 000 | 12 800 | 4 300 | 5 600 |
| 5409C | 45 | 1.7717 | 120 | 4.7244 | 53.98 | 2.1250 | 2.0 | .08 | 112 000 | 25 200 | 78 000 | 17 600 | 4 000 | 5 300 |
| 5410C | 50 | 1.9685 | 130 | 5.1181 | 58.74 | 2.3125 | 2.0 | .08 | 143 000 | 32 200 | 102 000 | 23 000 | 3 600 | 4 800 |
| 5411C | 55 | 2.1654 | 140 | 5.5118 | 63.50 | 2.5000 | 2.0 | .08 | 146 000 | 32 900 | 102 000 | 23 000 | 3 200 | 4 300 |
| 5412C | 60 | 2.3622 | 150 | 5.9055 | 66.68 | 2.6250 | 2.0 | .08 | 159 000 | 35 800 | 114 000 | 25 700 | 3 000 | 4 000 |
| 5413C | 65 | 2.5591 | 160 | 6.2992 | 71.44 | 2.8125 | 2.0 | .08 | 195 000 | 43 900 | 156 000 | 35 100 | 2 800 | 3 800 |
| 5414C | 70 | 2.7559 | 180 | 7.0866 | 79.38 | 3.1250 | 2.5 | .10 | 199 000 | 44 800 | 156 000 | 35 100 | 2 400 | 3 400 |
| 5415C | 75 | 2.9528 | 190 | 7.4803 | 82.55 | 3.2500 | 2.5 | .10 | 212 000 | 47 700 | 200 000 | 45 000 | 2 200 | 3 200 |
| 5416C | 80 | 3.1496 | 200 | 7.8740 | 87.31 | 3.4375 | 2.5 | .10 | 229 000 | 51 500 | 216 000 | 48 600 | 2 000 | 3 000 |
| 5417C | 85 | 3.3465 | 210 | 8.2677 | 92.08 | 3.6250 | 3.0 | .12 | 255 000 | 57 300 | 255 000 | 57 300 | 1 900 | 2 800 |
| 5418C | 90 | 3.5433 | 225 | 8.8583 | 98.43 | 3.8750 | 3.0 | .12 | 281 000 | 63 200 | 300 000 | 67 400 | 1 800 | 2 600 |

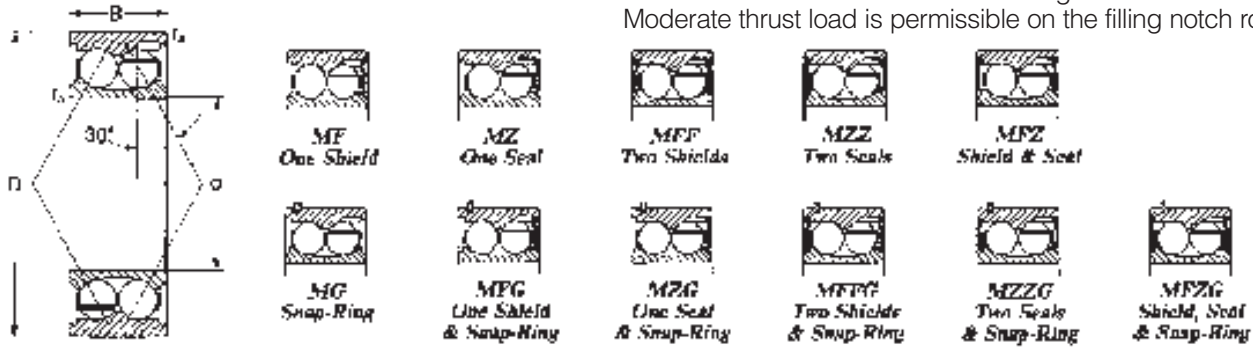
¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel cage, ABEC-1.

The values have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

5200M bearings are used with heavy radial loads, two-directional thrust loads, or a combination of both. Thrust load should be carried on the non-filling notch row. Moderate thrust load is permissible on the filling notch row.



| MRC Bearing Number | Bore | | Outside Diameter D | | Width B | | Fillet Radius ¹⁾ r _s | | Basic Radial Load Rating | | | | Speed Rating ²⁾ | | |
|--------------------|---------|--------|--------------------|--------|---------|--------|--|-----|--------------------------|--------|-----------------------|--------|----------------------------|--------|---------------------------------|
| | d mm | in | mm | in | mm | in | mm | in | Dynamic C ³⁾ | | Static C ₀ | | Open and Shielded Grease | | Single and Double Sealed Grease |
| | | | | | | | | | N | lbf | N | lbf | RPM | RPM | RPM |
| 5204-M | 20 | .7874 | 47 | 1.8504 | 20.64 | .8125 | 1.0 | .04 | 20 500 | 4 610 | 17 000 | 3 820 | 9 000 | 13 000 | 9 000 |
| 5205-M | 25 | .9843 | 52 | 2.0472 | 20.64 | .8125 | 1.0 | .04 | 22 900 | 5 150 | 21 200 | 4 770 | 8 000 | 11 000 | 8 000 |
| 5205-M1 | 25 | .9843 | 52 | 2.0472 | 22.23 | .8750 | 1.0 | .04 | 22 900 | 5 150 | 21 200 | 4 770 | 8 000 | 11 000 | 8 000 |
| 5206-M | 30 | 1.1811 | 62 | 2.4409 | 23.81 | .9375 | 1.0 | .04 | 30 300 | 6 820 | 28 000 | 6 290 | 7 000 | 9 500 | 7 000 |
| 5206-M1 | 30 | 1.1811 | 62 | 2.4409 | 26.99 | 1.0625 | 1.0 | .04 | 30 300 | 6 820 | 28 000 | 6 290 | 7 000 | 9 500 | 7 000 |
| 5207-M | 35 | 1.3780 | 72 | 2.8346 | 26.99 | 1.0625 | 1.0 | .04 | 39 100 | 8 800 | 36 500 | 8 210 | 6 000 | 8 000 | 6 000 |
| 5207-M1 | 35 | 1.3780 | 72 | 2.8346 | 30.16 | 1.1875 | 1.0 | .04 | 39 100 | 8 800 | 36 500 | 8 210 | 6 000 | 8 000 | 6 000 |
| 5208-M | 40 | 1.5748 | 80 | 3.1496 | 30.16 | 1.1875 | 1.0 | .04 | 49 500 | 11 100 | 49 000 | 11 000 | 5 600 | 7 500 | 5 600 |
| 5209-M | 45 | 1.7717 | 85 | 3.3465 | 30.16 | 1.1875 | 1.0 | .04 | 51 200 | 11 500 | 54 000 | 12 100 | 5 000 | 6 700 | 5 000 |
| 5210-M | 50 | 1.9685 | 90 | 3.5433 | 30.16 | 1.1875 | 1.0 | .04 | 53 900 | 12 100 | 58 500 | 13 200 | 4 800 | 6 300 | 4 800 |
| 5211-M | 55 | 2.1654 | 100 | 3.9370 | 33.34 | 1.3125 | 1.5 | .06 | 66 000 | 14 900 | 76 500 | 17 200 | 4 300 | 5 600 | 4 300 |
| 5212-M | 60 | 2.3622 | 110 | 4.3307 | 36.51 | 1.4375 | 1.5 | .06 | 78 100 | 17 600 | 88 000 | 19 800 | 3 800 | 5 000 | 3 800 |
| 5212-M1 | 60 | 2.3622 | 110 | 4.3307 | 38.10 | 1.5000 | 1.5 | .06 | 78 100 | 17 600 | 88 000 | 19 800 | 3 800 | 5 000 | 3 800 |
| 5213-M | 65 | 2.5591 | 120 | 4.7244 | 38.10 | 1.5000 | 1.5 | .06 | 88 000 | 19 800 | 106 000 | 23 800 | 3 600 | 4 800 | 3 600 |
| 5214-M | 70 | 2.7559 | 125 | 4.9213 | 39.69 | 1.5625 | 1.5 | .06 | 101 000 | 22 700 | 125 000 | 28 100 | 3 200 | 4 300 | 3 200 |
| 5215-M | 75 | 2.9528 | 130 | 5.1181 | 41.28 | 1.6250 | 1.5 | .06 | 108 000 | 24 300 | 137 000 | 30 800 | 3 200 | 4 300 | 3 200 |
| 5216-M | 80 | 3.1496 | 140 | 5.5118 | 44.45 | 1.7500 | 2.0 | .08 | 128 000 | 28 800 | 160 000 | 36 000 | 2 800 | 3 800 | 2 800 |
| 5217-M | 85 | 3.3465 | 150 | 5.9055 | 49.21 | 1.9375 | 2.0 | .08 | 142 000 | 32 000 | 176 000 | 39 600 | 2 600 | 3 600 | 2 600 |
| 5218-M | 90 | 3.5433 | 160 | 6.2992 | 52.39 | 2.0625 | 2.0 | .08 | 151 000 | 34 000 | 193 000 | 43 400 | 2 400 | 3 400 | 2 400 |

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

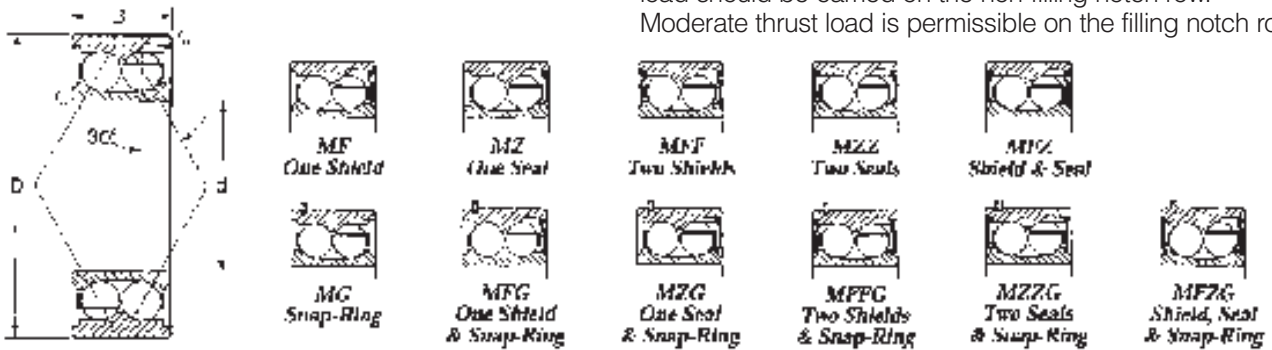
²⁾ Listed values are for pressed steel cage, ABEC-1.

The values have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

Note: Extra width bearings identified by the suffix M1 are supplied with a retrofit kit described on pages 91, 92.

5300M bearings are used with heavy radial loads, two-directional thrust loads, or a combination of both. Thrust load should be carried on the non-filling notch row. Moderate thrust load is permissible on the filling notch row.



| MRC Bearing Number | Bore | | Outside Diameter | | Width | | Fillet Radius ¹⁾ | | Basic Radial Load Rating | | | | Speed Rating ²⁾ | | |
|--------------------|---------|--------|------------------|--------|---------|--------|-----------------------------|-----|--------------------------|--------|-----------------------|--------|------------------------------|--------|---------------------------------|
| | d mm | in | D mm | in | B mm | in | r _a mm | in | Dynamic C ³⁾ | | Static C ₀ | | Open and Shielded Oil Grease | | Single and Double Sealed Grease |
| | | | | | | | | | N | lbf | N | lbf | RPM | RPM | RPM |
| 5304-M | 20 | .7874 | 52 | 2.0472 | 22.23 | .8750 | 1.0 | .04 | 23 800 | 5 360 | 20 000 | 4 500 | 8 500 | 12 000 | 8 500 |
| 5304-M1 | 20 | .7874 | 52 | 2.0472 | 25.40 | 1.0000 | 1.0 | .04 | 23 800 | 5 360 | 20 000 | 4 500 | 8 500 | 12 000 | 8 500 |
| 5305-M | 25 | .9843 | 62 | 2.4409 | 25.40 | 1.0000 | 1.0 | .04 | 34 100 | 7 670 | 30 500 | 6 860 | 7 500 | 10 000 | 7 500 |
| 5306-M | 30 | 1.1811 | 72 | 2.8346 | 30.16 | 1.1875 | 1.0 | .04 | 46 800 | 10 500 | 43 000 | 9 670 | 6 300 | 8 500 | 6 300 |
| 5306-M1 | 30 | 1.1811 | 72 | 2.8346 | 33.34 | 1.3125 | 1.0 | .04 | 46 800 | 10 500 | 43 000 | 9 670 | 6 300 | 8 500 | 6 300 |
| 5307-M | 35 | 1.3780 | 80 | 3.1496 | 34.93 | 1.3750 | 1.5 | .06 | 52 300 | 11 800 | 48 000 | 10 800 | 5 600 | 7 500 | 5 600 |
| 5307-M1 | 35 | 1.3780 | 80 | 3.1496 | 38.10 | 1.5000 | 1.5 | .06 | 52 300 | 11 800 | 48 000 | 10 800 | 5 600 | 7 500 | 5 600 |
| 5308-M | 40 | 1.5748 | 90 | 3.5433 | 36.51 | 1.4375 | 1.5 | .06 | 67 100 | 15 100 | 65 500 | 14 700 | 5 000 | 6 700 | 5 000 |
| 5308-M1 | 40 | 1.5748 | 90 | 3.5433 | 39.69 | 1.5625 | 1.5 | .06 | 67 100 | 15 100 | 65 500 | 14 700 | 5 000 | 6 700 | 5 000 |
| 5309-M | 45 | 1.7717 | 100 | 3.9370 | 39.69 | 1.5625 | 1.5 | .06 | 80 900 | 18 200 | 80 000 | 18 000 | 4 500 | 6 000 | 4 500 |
| 5309-M1 | 45 | 1.7717 | 100 | 3.9370 | 42.86 | 1.6875 | 1.5 | .06 | 80 900 | 18 200 | 80 000 | 18 000 | 4 500 | 6 000 | 4 500 |
| 5310-M | 50 | 1.9685 | 110 | 4.3307 | 44.45 | 1.7500 | 2.0 | .08 | 95 200 | 21 400 | 95 000 | 21 400 | 4 000 | 5 300 | 4 000 |
| 5310-M1 | 50 | 1.9685 | 110 | 4.3307 | 47.63 | 1.8750 | 2.0 | .08 | 95 200 | 21 400 | 95 000 | 21 400 | 4 000 | 5 300 | 4 000 |
| 5311-M | 55 | 2.1654 | 120 | 4.7244 | 49.21 | 1.9375 | 2.0 | .08 | 119 000 | 26 800 | 122 000 | 27 400 | 3 800 | 5 000 | 3 800 |
| 5311-M1 | 55 | 2.1654 | 120 | 4.7244 | 52.39 | 2.0625 | 2.0 | .08 | 119 000 | 26 800 | 122 000 | 27 400 | 3 800 | 5 000 | 3 800 |
| 5312-M | 60 | 2.3622 | 130 | 5.1181 | 53.98 | 2.1250 | 2.0 | .08 | 134 000 | 30 200 | 143 000 | 32 100 | 3 400 | 4 500 | 3 400 |
| 5312-M1 | 60 | 2.3622 | 130 | 5.1181 | 57.15 | 2.2500 | 2.0 | .08 | 134 000 | 30 200 | 143 000 | 32 100 | 3 400 | 4 500 | 3 400 |
| 5313-M | 65 | 2.5591 | 140 | 5.5118 | 58.74 | 2.3125 | 2.0 | .08 | 154 000 | 34 700 | 163 000 | 36 600 | 3 200 | 4 300 | 3 200 |
| 5313-M1 | 65 | 2.5591 | 140 | 5.5118 | 61.91 | 2.4375 | 2.0 | .08 | 154 000 | 34 700 | 163 000 | 36 600 | 3 200 | 4 300 | 3 200 |
| 5314-M | 70 | 2.7559 | 150 | 5.9055 | 63.50 | 2.5000 | 2.0 | .08 | 172 000 | 38 700 | 186 000 | 41 800 | 2 800 | 3 800 | 2 800 |
| 5314-M1 | 70 | 2.7559 | 150 | 5.9055 | 66.68 | 2.6250 | 2.0 | .08 | 172 000 | 38 700 | 186 000 | 41 800 | 2 800 | 3 800 | 2 800 |
| 5315-M | 75 | 2.9528 | 160 | 6.2992 | 68.26 | 2.6875 | 2.0 | .08 | 187 000 | 42 000 | 208 000 | 46 800 | 2 600 | 3 600 | 2 600 |
| 5315-M1 | 75 | 2.9528 | 160 | 6.2992 | 71.44 | 2.8125 | 2.0 | .08 | 187 000 | 42 000 | 208 000 | 46 800 | 2 600 | 3 600 | 2 600 |
| 5316-M | 80 | 3.1496 | 170 | 6.6929 | 68.26 | 2.6875 | 2.0 | .08 | 201 000 | 45 200 | 236 000 | 53 100 | 2 400 | 3 400 | 2 400 |
| 5317 | 85 | 3.3465 | 180 | 7.0866 | 73.03 | 2.8750 | 2.5 | .10 | 198 000 | 44 500 | 245 000 | 55 100 | 2 200 | 3 200 | 2 200 |
| 5318 | 90 | 3.5433 | 190 | 7.4803 | 73.03 | 2.8750 | 2.5 | .10 | 224 000 | 50 400 | 290 000 | 65 200 | 2 000 | 3 000 | 2 000 |
| 5319 | 95 | 3.7402 | 200 | 7.8740 | 77.79 | 3.0625 | 2.5 | .10 | 242 000 | 54 400 | 315 000 | 70 800 | 1 900 | 2 800 | 1 900 |

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel cage, ABEC-1.

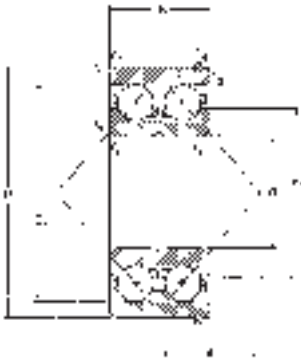
The values have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

Note: Extra width bearings identified by the suffix M1 are supplied with a retrofit kit described on pages 91, 92.

5300-UPG Series Double-Row Angular Contact Ball Bearings

MRC Bearing Services



5300 UPG series bearings are a specialized double-row angular contact design developed specifically for pump applications. The bearings are capable of carrying axial loads in either direction, radial loads, or a combination of both. Machined brass cages, ABEC 3 tolerances, 40° contact angle and reduced (“CB”) end play are standard features selected to improve performance for these bearings.

The MRC 5300 UPG Series is “The Pump Bearing”

| MRC Bearing Number | Bore | | Outside Diameter D | | Width B | | Fillet Radius ¹⁾ r _a | | Basic Radial Load Rating | | | | Speed Rating | |
|--------------------|------|--------|--------------------|--------|---------|--------|--|------|--------------------------|--------|-----------------------|--------|--------------|-------|
| | d | | | | | | | | Dynamic C ²⁾ | | Static C ₀ | | Grease | Oil |
| | mm | in | mm | in | mm | in | mm | in | N | lbf | N | lbf | RPM | RPM |
| 5308UPG | 40 | 1.5748 | 90 | 3.5433 | 36.51 | 1.4375 | 1.5 | 0.06 | 49 400 | 11 110 | 41 500 | 9 330 | 5 000 | 6 700 |
| 5309UPG | 45 | 1.7717 | 100 | 3.9370 | 39.69 | 1.5625 | 1.5 | 0.06 | 61 800 | 13 890 | 52 000 | 11 690 | 4 500 | 6 000 |
| 5310UPG | 50 | 1.9685 | 110 | 4.3307 | 44.45 | 1.7500 | 2.0 | 0.08 | 81 900 | 18 410 | 69 500 | 15 620 | 4 000 | 5 300 |
| 5311UPG | 55 | 2.1654 | 120 | 4.7244 | 49.21 | 1.9375 | 2.0 | 0.08 | 95 600 | 21 490 | 83 000 | 18 660 | 3 800 | 5 000 |
| 5313UPG | 65 | 2.5591 | 140 | 5.5118 | 58.74 | 2.3125 | 2.1 | 0.08 | 138 000 | 31 000 | 122 000 | 27 400 | 3 200 | 4 300 |

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Rating for one million revolutions or 500 hours at 33¹/₃ RPM.

Dynamic and static equivalent radial load and life rating

Dynamic equivalent radial load

$P = XF_R + YF_A$ P = Dynamic equivalent radial load
 F_R = Radial load
 F_A = Thrust load
 X = Radial load factor
 Y = Thrust load factor
 C_0 = Basic static radial load rating
 e = Limiting factor for F_A/F_R

| Size | e | $F_A/F_R \leq e$ | | $F_A/F_R > e$ | |
|--|------|------------------|------|---------------|------|
| | | X | Y | X | Y |
| 5200SB-5206C&M 5300SB-5303SB 5403C-5414C | 0.66 | 1.0 | 0.92 | 0.67 | 1.41 |
| 5207C&M-5218C&M 5304C&M-5319C&M | 0.80 | 1.0 | 0.78 | 0.63 | 1.24 |
| 5308UPG-5313UPG | 1.14 | 1.0 | 0 | 0.35 | 0.57 |

| Size | F_A/C_0 | Normal Clearance (ST Fit) | | | C3 Clearance (LO Fit) | | |
|-------------|-----------|---------------------------|------|-----|-----------------------|------|------|
| | | e | X | Y | e | X | Y |
| 5415C-5419C | 0.025 | 0.22 | 0.56 | 2.0 | 0.25 | 0.52 | 1.8 |
| | 0.040 | 0.24 | 0.56 | 1.8 | 0.28 | 0.52 | 1.65 |
| | 0.070 | 0.27 | 0.56 | 1.6 | 0.30 | 0.52 | 1.5 |
| | 0.13 | 0.31 | 0.56 | 1.4 | 0.34 | 0.52 | 1.33 |
| | 0.25 | 0.37 | 0.56 | 1.2 | 0.40 | 0.52 | 1.17 |
| | 0.50 | 0.44 | 0.56 | 1.0 | 0.48 | 0.52 | 1.0 |

Values of Y and e for loads not shown are obtained by linear interpolation.

Life Rating

$$L_{10} = \left(\frac{C}{P}\right)^3 \text{ (Millions of revolutions)}$$

or

$$L_{10h} = \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 \text{ (Hours)}$$

C = Basic dynamic load rating
 P = Dynamic equivalent radial load
 n = Speed in RPM

Static equivalent radial load

$P_0 = X_0F_R + Y_0F_A$ P_0 = Static equivalent radial load
 F_R = Radial load
 F_A = Thrust load
 X_0 = Radial load factor
 Y_0 = Thrust load factor

| Size | X_0 | Y_0 |
|--|-------|-------|
| 5200SB-5206C&M 5300SB-5303SB 5403C-5414C | 1.0 | 0.76 |
| 5207C&M-5218C&M 5304C&M-5319C&M | 1.0 | 0.66 |
| 5308-5313UPG | 0.50 | 0.26 |
| 5415C-5419C | 0.60 | 0.50 |

P_0 is always $\geq F_R$

Minimum Radial Load

To insure satisfactory operation of double row, angular contact ball bearings, they must be subjected to a minimum radial load, which is especially true at high speeds where inertia forces of the balls and cage, and the friction in the lubricant, can cause skidding to occur between the balls and raceway.

The required minimum radial load can be estimated from:

$$F_{r,m} = K_r \left(\frac{\gamma n}{1000}\right)^{2/3} \left(\frac{d_m}{100}\right)^2$$

$F_{r,m}$ = Minimum radial load (N)

K_r = Minimum load factor

| Series | K_r |
|----------|-------|
| 5200SB&C | 60 |
| 5200M | 90 |
| 5300SB&C | 70 |
| 5300M | 110 |
| 5400C | 70 |

γ = Oil viscosity at operating temperature (cSt)

n = Speed in RPM

$$d_m = \text{Mean bearing diameter} = \left(\frac{D+d}{2}\right), (\text{mm})$$

D = Bearing outside diameter (mm)

d = Bearing inside diameter (mm)

**Dynamic equivalent radial load
and life calculation examples**

Bearing size: 5210 M
Speed: 2000 RPM
Basic dynamic radial load rating (C) = 12100

Bearing size: 5203 SB
Speed: 2000 RPM
Basic dynamic radial load rating (C) = 3210

Case 1

Radial load (F_R) = 1750
 $F_A/F_R = 0/1750 = 0$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R < e$, equivalent load
(P) = $1.0 F_R + 0.78 F_A = 1.0 \times 1750 = 1750$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{12100}{1750}\right)^3 = 331 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{12100}{1750}\right)^3$
= 2755 Hrs

Case 1

Radial load (F_R) = 500
 $F_A/F_R = 0/500 = 0$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R < e$, equivalent load
(P) = $1.0 F_R + 0.92 F_A = 1.0 \times 500 = 500$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{3210}{500}\right)^3 = 265 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{3210}{500}\right)^3$
= 2205 Hrs

Case 2

Radial load (F_R) = 1750
Thrust load (F_A) = 1300
 $F_A/F_R = 1300/1750 = 0.74$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R < e$, equivalent load
(P) = $1.0 F_R + 0.78 F_A = 1.0 \times 1750 + 0.78 \times 1300 = 2764$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{12100}{2764}\right)^3 = 83.9 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{12100}{2764}\right)^3$
= 699 Hrs

Case 2

Radial load (F_R) = 500
Thrust load (F_A) = 325
 $F_A/F_R = 325/500 = 0.65$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R < e$, equivalent load
(P) = $1.0 F_R + 0.92 F_A = 1.0 \times 500 + 0.92 \times 325 = 799$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{3210}{799}\right)^3 = 64.8 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{3210}{799}\right)^3$
= 540 Hrs

Case 3

Radial load (F_R) = 1750
Thrust load (F_A) = 1500
 $F_A/F_R = 1500/1750 = 0.86$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R > e$, equivalent load
(P) = $0.63 F_R + 1.24 F_A$
= $0.63 \times 1750 + 1.24 \times 1500 = 2963$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{12100}{2963}\right)^3 = 68.1 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{12100}{2963}\right)^3$
= 568 Hrs

Case 3

Radial load (F_R) = 500
Thrust load (F_A) = 375
 $F_A/F_R = 375/500 = 0.75$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R > e$, equivalent load
(P) = $0.67 F_R + 1.41 F_A$
= $0.67 \times 500 + 1.41 \times 375 = 864$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{3210}{864}\right)^3 = 51.3 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{3210}{864}\right)^3$
= 427 Hrs

Case 4

Thrust load (F_A) = 1500
 $F_A/F_R = 1500/0 = \infty$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R > e$, equivalent load
(P) = $0.63 F_R + 1.24 F_A = 1.24 \times 1500 = 1860$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{12100}{1860}\right)^3 = 275 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{12100}{1860}\right)^3$
= 2294 Hrs

Case 4

Thrust load (F_A) = 375
 $F_A/F_R = 375/0 = \infty$
Equivalent load (P) = $X F_R + Y F_A$
Since $F_A/F_R > e$, equivalent load
(P) = $0.67 F_R + 1.41 F_A = 1.41 \times 375 = 529$
Life (L10) = $\left(\frac{C}{P}\right)^3 = \left(\frac{3210}{529}\right)^3 = 223 \times 10^6$ Rev.
or
Life (L10h) = $\frac{10^6(C)^3}{60n(P)^3} = \frac{10^6}{60 \times 2000} \left(\frac{3210}{529}\right)^3$
= 1862 Hrs