

Tilting Shoe Thrust Bearings

Catalog NE



 ***Kingsbury, Inc.***[®]

Introduction

To better serve the needs of our overseas customers, Kingsbury is introducing style "NE" bearings, designed to conform with European fluid-film thrust bearing standards. These bearings are designed to the close tolerances necessary for bearings not incorporating a self-aligning device. The bearings feature interchangeable parts: one shoe size can be used with several different base ring diameters. Parts will be carried in stock outside the North American continent to facilitate delivery.

Style "NE" thrust bearings are manufactured to the same exacting quality standards for which Kingsbury has gained worldwide recognition. Our Engineering staff will assist in the application of these bearings and, on request, will provide friction power loss and lubricating oil-flow data. Consultation with regard to housing design and lubrication systems is also available.

General Description

A typical style "NE" bearing is shown on the front cover; note the shoe retention washers and shoe (pad) contours.

The bearing parts are assembled on a base ring, available as a one-piece ring or split in halves. The base ring can be slotted to accommodate the lubricating oil-flow paths required for your application (see Figure 1). Antirotation pins are installed in either a radial or axial orientation depending on your requirements.

The centrally pivoted shoes are evenly spaced and loosely retained in the base ring by shoulder washers. The washers engage slots in the sides of the shoes providing positive shoe positioning during operation and retention during assembly. Fasteners are threaded to ISO metric standards.

The steel shoe bodies have a contoured profile and are lined with babbitt (white metal) which conforms with standards ASTM B23GR2, DIN1703 L.g. SN89 and BS3332/2. The shoes are manufactured to meet Kingsbury's ultrasonic and edge-bond

standards. Filler plates and shims are available for setting bearing clearance (end float).

Bearing Selection

Preliminary bearing selection is made using the maximum load ratings given in the dimension tables. Thrust load and shaft size are the parameters used for making a bearing selection. The load capacities shown are maximum values. Specific load capacity will vary depending on shaft speed, oil viscosity and the nature of the thrust load. Condition of the machine with regard to alignment, vibration, lubrication contamination and ambient temperature can also affect bearing thrust capacity.

The maximum recommended shaft size provides space for oil flow into the thrust face and clearance for the fillet/undercut between the integral thrust collar and the shaft. If a separate collar is used, a larger shaft size can be used.

Preliminary thrust bearing selection can be confirmed by contacting our Engineering Department.

Reference Number

Examples of the reference number system:

The reference number system in this catalog will assist you in identifying the bearing size you have selected along with the base ring modifications and accessories desired.

The reference number consists of two parts separated by a diagonal line. Numbers to the left of the diagonal identify bearing style and size; the numbers to right of the diagonal indicate configuration and accessories.

The three numbers immediately to the left of the diagonal line identify the shoe size and are approximately the shoe's radial width in hundredths of an inch. The fourth and fifth numbers left of the diagonal line indicate the number of shoes in a single bearing ring. The letters "NE" are the style designation.

The numbers and letters to the right of the

diagonal line identify the type of base ring and the combination of filler plate and shims required (see Figure 1).

If a base ring with less than a full complement of shoes is desired, use a bracketed fraction with the number of shoes in a full complement in the denominator (see Example 3).

Loaded and slack side bearings of equal size are designated by using the appropriate reference number for the loaded side bearing followed by a dash. The numbers and letters to the left of the diagonal describe the slack side bearing (see Example 4).

For unequal size loaded and slack side bearings, use the appropriate reference number for each separated by a dash (see Example 5).

Examples of the reference number system:

1. NE6103/2

Style NE, 6 thrust shoes, size 103; outer diameter 92 mm, inner diameter 38 mm; two piece base ring with radial and axial slots.

2. NE8159/OK

Style NE, 8 thrust shoes; size 159; outer diameter 176 mm, inner diameter 93.5 mm; one piece base ring with radial slots.

3. NE8159/OK (4/8)

Same as Example 2 except 4 thrust shoes are fitted.

4. NE14225/2P-2P

Style NE, 14 thrust shoes; size 225, outer diameter 394 mm, inner diameter 279 mm; two piece base ring, filler plate with allowance left on thickness for finishing, identical slack side bearing.

**5. NE8320/20KSF—
NE14190/20KSF**

Style NE, 8 thrust shoes, size 320; outer diameter 354 mm, inner diameter 191 mm; two piece base ring, shims and filler plate finished to thickness. Slack side, style NE, 14 thrust shoes; size 190; outer diameter 332 mm, inner diameter 235 mm; two piece base ring, shims and filler plate finished to thickness.

Filler Plates and Shim Packs

Filler plates and shim packs are normally used with fluid-film thrust bearings to provide the desired clearance or end float. Standard filler plate thickness is 4.8 mm. The standard shim pack thickness is 2.3 mm. Filler plates are attached to the back of the base ring with screws. The desired end float

is obtained by peeling off shims. Alternately, a filler plate with extra stock (2.5 mm depending on bearing size) can be ground to the thickness determined by comparing the bearing stacked height plus clearance to the bearing housing axial length.

| BASIC CODE | ONE-PIECE RING 0 | RING IN HALVES (2 halves) 2 | HALF RING 1 |
|--|---------------------|-----------------------------------|----------------|
|  PLAIN RING | 0 | 2 | 1 |
|  PLAIN RING WITHOUT SLOTS Add N | 0N | 2N | 1N |
|  PLAIN RING RADIAL SLOTS ONLY Add K | 0K | 2K | 1K |
|  WITH FILLER PLATE Allowance left for finishing to thickness Add P Supplied finished to thickness Add PF | 0KP | 2KP | 1KP |
| | 0KPF | 2KPF | 1KPF |
|  WITH FILLER PLATE & SHIMS Allowance left for finishing to thickness Add S Supplied finished to thickness Add SF | 0KS | 2KS | 1KS |
| | 0KSF | 2KSF | 1KSF |

Fig. 1

Lubrication

Kingsbury recommends separate orificed oil inlets to both the loaded and the slack side thrust bearings and a tangential oil outlet sized to maintain a partially flooded housing (see Figure 2). This oil flow arrangement has been used in thousands of thrust bearing applications with excellent reliability. Friction power loss in a partially flooded housing is much less than the loss which would occur in a comparable flooded

housing. A flooded oil arrangement with an open oil inlet and orificed oil outlet is recommended only for slower speed applications because of the high friction power loss (see Figure 3). Radial orientation of the oil discharge outlet is recommended only for lower speed applications because the radial outlet has a higher power loss than the tangential oil outlet.

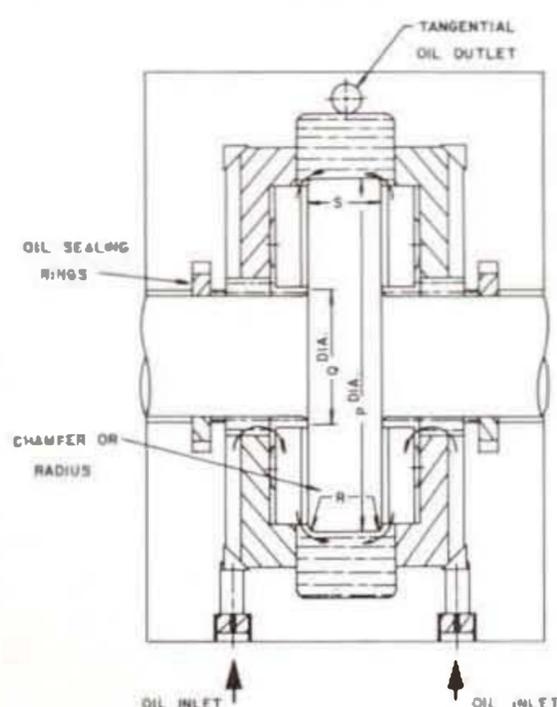


Fig. 2

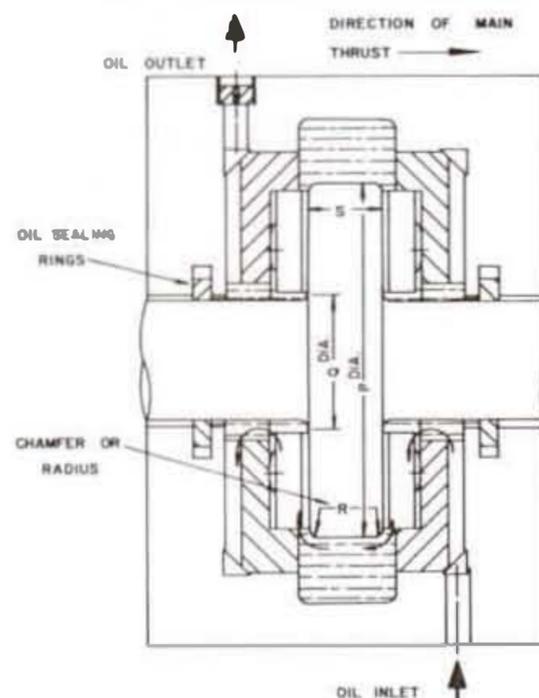


Fig. 3

STYLE "NE" DIMENSION TABLE

| SIZE | THRUST SHOE | | BASE RING | | ANTI ROTATION PINS | | | | | SHIM PLATE | | | COLLAR SIZE | | | | THRUST SURFACE MM ² | MEAN OIA. d | MAX. LOAD NEWTON | TOTAL AXIAL CLEAR. | MAX. SHAFT DIA. | | |
|--------|--------------|--------------|--------------|--------------|--------------------|----|------|------|-----|------------|-------|-----|-------------|-----|-----|-----|--------------------------------|-------------|------------------|--------------------|-----------------|------|----|
| | OUTER DIA. A | INNER DIA. B | THICK-NESS C | OUTER DIA. D | E | F | G | H | I | J | K | L | M | N | P | O | | | | | | R | S |
| NE6103 | 92 | 38 | 20.64 | 10795 | 15 | 6 | 4.8 | 5.8 | 5 | 11 | 33.3 | 83 | 51 | 4.8 | 95 | 36 | 0.4 | 17 | 4210 | 65.8 | 13,530 | 0.30 | 31 |
| NE6123 | 110 | 44.5 | 23.81 | 12700 | 17 | 6 | 5.6 | 6.5 | 6 | 12 | 39.7 | 98 | 60 | 4.8 | 113 | 43 | 0.8 | 21 | 6011 | 78.2 | 20,010 | 0.30 | 36 |
| NE6134 | 119 | 49 | 25.40 | 139.70 | 19 | 6 | 6.4 | 7.5 | 7 | 13 | 42.9 | 105 | 67 | 4.8 | 122 | 46 | 0.8 | 22 | 7219 | 85.1 | 24,150 | 0.35 | 40 |
| NE6159 | 143 | 58.5 | 28.58 | 165.10 | 21 | 7 | 7.9 | 9 | 8 | 14 | 50.8 | 124 | 79 | 4.8 | 146 | 56 | 0.8 | 27 | 9950 | 102 | 35,280 | 0.35 | 48 |
| NE6190 | 168 | 70 | 34.93 | 193.68 | 25 | 8 | 9.5 | 10.5 | 8 | 16 | 60.3 | 146 | 95 | 6.4 | 171 | 67 | 0.8 | 32 | 14023 | 120.4 | 51,430 | 0.40 | 57 |
| NE6225 | 200 | 82.5 | 41.28 | 22860 | 30 | 10 | 11.1 | 12.5 | 8 | 19 | 71.4 | 175 | 111 | 6.4 | 203 | 79 | 0.8 | 38 | 20585 | 143 | 73,875 | 0.50 | 67 |
| NE6246 | 219 | 91 | 44.45 | 24765 | 32 | 11 | 12.7 | 14 | 10 | 22 | 79.4 | 194 | 124 | 6.4 | 224 | 87 | 0.8 | 43 | 24539 | 157 | 89,300 | 0.50 | 74 |
| NE6320 | 286 | 117 | 57.15 | 317.50 | 40 | 13 | 15.9 | 17.5 | 5.6 | 26 | 103.2 | 251 | 162 | 6.4 | 289 | 116 | 0.8 | 56 | 40897 | 205 | 152,845 | 0.60 | 96 |

| SIZE | THRUST SHOE | | BASE RING | | ANTI ROTATION PINS | | | | | SHIM PLATE | | | COLLAR SIZE | | | | THRUST SURFACE MM ² | MEAN OIA. d | MAX. LOAD NEWTON | TOTAL AXIAL CLEAR. | MAX. SHAFT DIA. | | |
|--------|--------------|--------------|--------------|--------------|--------------------|----|------|------|-----|------------|-------|-----|-------------|-----|-----|-----|--------------------------------|-------------|------------------|--------------------|-----------------|------|-----|
| | OUTER DIA. A | INNER DIA. B | THICK-NESS C | OUTER DIA. D | E | F | G | H | I | J | K | L | M | N | P | O | | | | | | R | S |
| NE8103 | 114 | 62 | 20.64 | 130.18 | 16 | 6 | 6.4 | 7.5 | 7 | 10 | 44.5 | 105 | 73 | 4.8 | 117 | 59 | 0.8 | 17 | 5614 | 89.2 | 18,150 | 0.30 | 54 |
| NE8123 | 137 | 73 | 23.81 | 15240 | 17 | 6 | 6.4 | 7.5 | 7 | 11 | 53.2 | 125 | 87 | 4.8 | 140 | 70 | 0.8 | 21 | 8015 | 106 | 26,737 | 0.30 | 64 |
| NE8134 | 149 | 79.5 | 25.40 | 168.28 | 19 | 6 | 7.9 | 9 | 8 | 13 | 57.9 | 135 | 97 | 4.8 | 152 | 76 | 0.8 | 22 | 9625 | 116 | 32,375 | 0.35 | 70 |
| NE8159 | 176 | 93.5 | 28.58 | 196.85 | 21 | 6 | 7.9 | 9 | 8 | 13 | 69.9 | 162 | 117 | 4.8 | 179 | 92 | 0.8 | 27 | 13266 | 137 | 47,160 | 0.35 | 83 |
| NE8190 | 210 | 113 | 34.92 | 234.95 | 25 | 8 | 9.5 | 10.5 | 8 | 17 | 82.6 | 191 | 140 | 6.4 | 213 | 110 | 0.8 | 32 | 18698 | 163 | 68,820 | 0.40 | 99 |
| NE8225 | 251 | 135 | 41.28 | 27940 | 30 | 10 | 12.7 | 14 | 10 | 19 | 98.4 | 229 | 165 | 6.4 | 254 | 132 | 0.8 | 38 | 27446 | 196 | 98,625 | 0.50 | 119 |
| NE8246 | 273 | 145 | 44.45 | 301.63 | 32 | 11 | 12.7 | 14 | 5.6 | 21 | 106.4 | 244 | 181 | 6.4 | 276 | 141 | 0.8 | 43 | 32718 | 213 | 118,940 | 0.50 | 129 |
| NE8320 | 354 | 191 | 57.15 | 384.18 | 40 | 13 | 15.9 | 17.5 | 5.6 | 26 | 138.1 | 321 | 232 | 9.5 | 357 | 187 | 0.8 | 56 | 54530 | 276 | 203,665 | 0.60 | 167 |

| SIZE | THRUST SHOE | | BASE RING | | ANTI ROTATION PINS | | | | | SHIM PLATE | | | COLLAR SIZE | | | | THRUST SURFACE MM ² | MEAN OIA. d | MAX. LOAD NEWTON | TOTAL AXIAL CLEAR. | MAX. SHAFT DIA. | | |
|---------|--------------|--------------|--------------|--------------|--------------------|----|------|------|-----|------------|-----|-----|-------------|-----|-----|-----|--------------------------------|-------------|------------------|--------------------|-----------------|------|-----|
| | OUTER DIA. A | INNER DIA. B | THICK-NESS C | OUTER DIA. D | E | F | G | H | I | J | K | L | M | N | P | O | | | | | | R | S |
| NE11103 | 148 | 95.5 | 22.23 | 168.28 | 17 | 6 | 6.4 | 7.5 | 7 | 11 | 81 | 138 | 106 | 4.8 | 151 | 92 | 0.8 | 17 | 7719 | 123 | 24,915 | 0.30 | 87 |
| NE11123 | 175 | 113 | 25.40 | 196.85 | 19 | 6 | 7.9 | 9 | 8 | 13 | 72 | 164 | 125 | 4.8 | 178 | 110 | 0.8 | 21 | 11021 | 145 | 36,040 | 0.30 | 103 |
| NE11134 | 191 | 122 | 26.99 | 212.73 | 21 | 7 | 7.9 | 9 | 8 | 13 | 79 | 178 | 140 | 4.8 | 194 | 119 | 0.8 | 22 | 13235 | 158 | 44,450 | 0.35 | 112 |
| NE11159 | 229 | 148 | 30.16 | 254.00 | 22 | 7 | 9.5 | 10.5 | 8 | 14 | 95 | 216 | 165 | 6.4 | 232 | 144 | 0.8 | 27 | 18241 | 191 | 64,440 | 0.35 | 136 |
| NE11190 | 271 | 175 | 34.93 | 301.63 | 25 | 8 | 11.1 | 12.5 | 8 | 17 | 113 | 254 | 197 | 6.4 | 275 | 171 | 0.8 | 32 | 25709 | 226 | 94,350 | 0.40 | 161 |
| NE11225 | 324 | 210 | 41.28 | 355.60 | 29 | 10 | 15.9 | 17.5 | 5.6 | 18 | 135 | 308 | 232 | 9.5 | 327 | 206 | 0.8 | 38 | 37739 | 270 | 135,375 | 0.50 | 193 |
| NE11246 | 352 | 227 | 44.45 | 384.18 | 32 | 10 | 15.9 | 17.5 | 5.6 | 20 | 146 | 330 | 254 | 9.5 | 356 | 224 | 0.8 | 43 | 44988 | 292 | 163,400 | 0.50 | 209 |
| NE11320 | 457 | 295 | 57.15 | 495.30 | 40 | 13 | 19.1 | 21 | 6.4 | 26 | 191 | 425 | 337 | 9.5 | 464 | 289 | 1.5 | 56 | 74978 | 381 | 280,665 | 0.60 | 270 |

| SIZE | THRUST SHOE | | BASE RING | | ANTI ROTATION PINS | | | | | SHIM PLATE | | | COLLAR SIZE | | | | THRUST SURFACE MM ² | MEAN OIA. d | MAX. LOAD NEWTON | TOTAL AXIAL CLEAR. | MAX. SHAFT DIA. | | |
|---------|--------------|--------------|--------------|--------------|--------------------|----|------|------|-----|------------|-------|-----|-------------|-----|-----|-----|--------------------------------|-------------|------------------|--------------------|-----------------|------|-----|
| | OUTER DIA. A | INNER DIA. B | THICK-NESS C | OUTER DIA. D | E | F | G | H | I | J | K | L | M | N | P | O | | | | | | R | S |
| NE14103 | 181 | 129 | 22.23 | 200.03 | 17 | 5 | 7.9 | 9 | 8 | 10 | 77.8 | 175 | 137 | 4.8 | 184 | 125 | 0.8 | 17 | 9824 | 156 | 31,515 | 0.30 | 119 |
| NE14123 | 214 | 152 | 25.40 | 238.13 | 19 | 6 | 9.5 | 10.5 | 8 | 13 | 93.7 | 210 | 165 | 4.8 | 217 | 149 | 0.8 | 21 | 14027 | 185 | 46,575 | 0.30 | 141 |
| NE14134 | 235 | 165 | 26.99 | 260.35 | 21 | 6 | 9.5 | 10.5 | 8 | 13 | 101.6 | 225 | 181 | 6.4 | 238 | 164 | 0.8 | 22 | 16844 | 203 | 56,350 | 0.35 | 154 |
| NE14159 | 279 | 197 | 31.75 | 307.98 | 24 | 6 | 11.1 | 12.5 | 6 | 15 | 120.7 | 267 | 216 | 6.4 | 283 | 195 | 0.8 | 27 | 23216 | 241 | 82,440 | 0.35 | 185 |
| NE14190 | 332 | 235 | 38.10 | 361.95 | 29 | 10 | 12.7 | 14 | 5.6 | 19 | 142.9 | 318 | 254 | 6.4 | 335 | 232 | 0.8 | 32 | 32721 | 286 | 120,250 | 0.40 | 220 |
| NE14225 | 394 | 279 | 44.45 | 425.45 | 33 | 11 | 15.9 | 17.5 | 6.4 | 21 | 169.9 | 378 | 302 | 9.5 | 400 | 273 | 1.5 | 38 | 48031 | 340 | 172,550 | 0.50 | 260 |
| NE14246 | 432 | 305 | 47.63 | 463.55 | 35 | 13 | 19.1 | 21 | 6.4 | 22 | 185.7 | 416 | 327 | 9.5 | 438 | 302 | 1.5 | 43 | 57257 | 373 | 208,240 | 0.50 | 285 |
| NE14320 | 558 | 396 | 60.33 | 596.90 | 43 | 14 | 22.2 | 24 | 8.0 | 28 | 241.3 | 533 | 432 | 9.5 | 565 | 391 | 1.5 | 54 | 95427 | 483 | 355,355 | 0.60 | 370 |

| SIZE | THRUST SHOE | | BASE RING | | ANTI ROTATION PINS | | | | | SHIM PLATE | | | COLLAR SIZE | | | | THRUST SURFACE MM ² | MEAN OIA. d | MAX. LOAD NEWTON | TOTAL AXIAL CLEAR. | MAX. SHAFT DIA. | | |
|---------|--------------|--------------|--------------|--------------|--------------------|----|------|------|-----|------------|-------|-----|-------------|-----|-----|-----|--------------------------------|-------------|------------------|--------------------|-----------------|------|-----|
| | OUTER DIA. A | INNER DIA. B | THICK-NESS C | OUTER DIA. D | E | F | G | H | I | J | K | L | M | N | P | O | | | | | | R | S |
| NE18103 | 224 | 171 | 23.81 | 244.48 | 19 | 6 | 7.9 | 9 | 8 | 13 | 100.1 | 219 | 181 | 4.8 | 227 | 168 | 0.8 | 17 | 12631 | 200 | 40,590 | 0.30 | 158 |
| NE18123 | 267 | 205 | 28.58 | 288.93 | 22 | 7 | 9.5 | 10.5 | 8 | 15 | 119.1 | 260 | 216 | 6.4 | 270 | 202 | 0.8 | 21 | 18034 | 237 | 60,030 | 0.30 | 191 |
| NE18134 | 292 | 224 | 30.16 | 317.50 | 24 | 7 | 11.1 | 12.5 | 8 | 15 | 130.2 | 286 | 235 | 6.4 | 295 | 221 | 0.8 | 22 | 21657 | 260 | 72,800 | 0.35 | 209 |
| NE18159 | 346 | 265 | 34.93 | 374.65 | 27 | 10 | 12.7 | 14 | 5.6 | 17 | 154.0 | 337 | 279 | 6.4 | 349 | 262 | 0.8 | 27 | 29849 | 307 | 105,840 | 0.35 | 248 |
| NE18190 | 413 | 316 | 41.28 | 444.50 | 32 | 11 | 15.9 | 17.5 | 5.6 | 21 | 184.2 | 406 | 330 | 9.5 | 419 | 311 | 0.8 | 32 | 42069 | 367 | 154,290 | 0.40 | 297 |
| NE18225 | 492 | 378 | 47.63 | 527.05 | 35 | 13 | 19.1 | 21 | 6.4 | 22 | 219.1 | 483 | 394 | 9.5 | 498 | 371 | 0.8 | 38 | 61755 | 438 | 221,250 | 0.50 | 355 |
| NE18246 | 536 | 413 | 50.80 | 571.50 | 38 | 13 | 19.1 | 21 | 8.0 | 25 | 238.1 | 521 | 432 | 9.5 | 543 | 406 | 1.5 | 43 | 73617 | 478 | 267,140 | 0.50 | 388 |

