



**Overview:** PS Bearings' Axial Needle Roller Bearings are components of small diameter needle rollers arranged in a spoke-like configuration. Needle rollers are equally spaced by means of a cage whose web section separates the rollers and provides guidance to keep them tracking in an orbital path. The purpose of these assemblies is to transmit a thrust load between two relatively rotating objects while greatly reducing friction. Thrust needle roller bearings can also be unitized with lipped washers which service as raceway for needle rollers. Bearing washers can be supplied separately or can be mechanically unitized to needle roller bearings for ease of handling.

**Application:** Automotive automatic and manual transmissions, automotive accessories (compressors, steering gears etc.), agricultural and construction equipment.

**Inspection:**

If an inspection of the bore diameter is desired, it should be checked with "go" and "no go" plug gages. The "go" plug gage size is the minimum bore diameter. The "no go" plug gage size is the maximum bore diameter. The bearing or washer, under its own weight, must fall freely from the "go" plug gage. The "no go" plug gage must not enter the bore. Where the "no go" plug gage can be forced through the bore, the bearing or washer must not fall from the gage under its own weight.

**Tolerance for Axial Needle Bearings and Thrust Washers:**

Tolerance for Outside Diameters and Bore Diameter of Series AXK and AX; Inside Diameter of AXW:

| Bore Diameter(mm) |     | Deviation(um) |      | Outside Diameter(mm) |     | Deviation(um) |      |
|-------------------|-----|---------------|------|----------------------|-----|---------------|------|
| >                 | ≤   | Min.          | Max. | >                    | ≤   | Min.          | Max. |
| 3                 | 6   | +20           | +140 | 10                   | 18  | -365          | -95  |
| 6                 | 10  | +25           | +175 | 18                   | 30  | -440          | -110 |
| 10                | 18  | +32           | +212 | 30                   | 40  | -510          | -120 |
| 18                | 30  | +40           | +250 | 40                   | 50  | -520          | -130 |
| 30                | 50  | +50           | +300 | 50                   | 65  | -600          | -140 |
| 50                | 80  | +60           | +360 | 65                   | 80  | -610          | -150 |
| 80                | 120 | +72           | +422 | 80                   | 100 | -710          | -170 |
| 120               | 180 | +85           | +485 | 100                  | 120 | -720          | -180 |
|                   |     |               |      | 120                  | 140 | -830          | -200 |
|                   |     |               |      | 140                  | 160 | -840          | -210 |
|                   |     |               |      | 160                  | 180 | -860          | -230 |
|                   |     |               |      | 180                  | 200 | -960          | -240 |

**Tolerance for Outside Diameters and Bore Diameter of Series AS:**

| Bore Diameter(mm) |     | Deviation(um) |      | Outside Diameter(mm) |     | Deviation(um) |      |
|-------------------|-----|---------------|------|----------------------|-----|---------------|------|
| >                 | ≤   | Min.          | Max. | >                    | ≤   | Min.          | Max. |
| 3                 | 6   | +20           | +200 | 18                   | 30  | -370          | -40  |
| 6                 | 10  | +25           | +245 | 30                   | 50  | -440          | -50  |
| 10                | 18  | +32           | +302 | 50                   | 80  | -520          | -60  |
| 18                | 30  | +40           | +370 | 80                   | 120 | -612          | -72  |
| 30                | 50  | +50           | +440 | 120                  | 180 | -715          | -85  |
| 50                | 80  | +60           | +520 | 180                  | 250 | -820          | -100 |
| 80                | 120 | +72           | +612 |                      |     |               |      |
| 120               | 180 | +85           | +715 |                      |     |               |      |

**Tolerance for Thickness of Series AS:**

| Thickness (mm) | Deviation(mm) |       |
|----------------|---------------|-------|
|                | Min.          | Max.  |
| All            | -0.05         | +0.05 |

**Tolerance for Outside Diameters and Bore Diameter of Series NTA:**

| Needle Roller Diameter (mm) | Deviation(mm) |       |                  |       |
|-----------------------------|---------------|-------|------------------|-------|
|                             | Bore Diameter |       | Outside Diameter |       |
|                             | Min.          | Max.  | Min.             | Max.  |
| 1.984                       | +0.05         | +0.18 | -0.5             | -0.25 |
| 3.175                       | +0.05         | +0.25 | -0.63            | -0.25 |

**Tolerance for Outside Diameters and Bore Diameter of Series TRA~TRE:**

| Bore Diameter(mm) |       | Deviation(mm) |       | Outside Diameter(mm) |       | Deviation(mm) |       |
|-------------------|-------|---------------|-------|----------------------|-------|---------------|-------|
| >                 | ≤     | Min.          | Max.  | >                    | ≤     | Min.          | Max.  |
| 6                 | 57.2  | +0.05         | +0.30 | 6                    | 133.4 | -0.76         | -0.25 |
| 57.2              | 133.4 | +0.05         | +0.43 |                      |       |               |       |

**Tolerance for Thickness of Series TRA~TRE:**

| Series | Deviation (mm) |       |
|--------|----------------|-------|
|        | Min.           | Max.  |
| TRA    | -0.04          | +0.01 |
| TRB    | -0.08          | 0     |
| TRC    | -0.07          | +0.01 |
| TRD    | -0.08          | 0     |
| TRE    | -0.09          | -0.01 |

**Tolerance for Thickness of Series AXK and NTA:**

| Thickness (mm) | Deviation(um) |      |
|----------------|---------------|------|
|                | Min.          | Max. |
| All            | -0.01         | 0    |

**Tolerance for Outside Diameters and Bore Diameter of Series LS**

| Bore Diameter(mm) |     | Deviation(um) |      | Outside Diameter(mm) |     | Deviation(um) |      |
|-------------------|-----|---------------|------|----------------------|-----|---------------|------|
| >                 | ≤   | Min.          | Max. | >                    | ≤   | Min.          | Max. |
| 3                 | 6   | +20           | +140 | 18                   | 30  | -510          | -300 |
| 6                 | 10  | +25           | +175 | 30                   | 40  | -560          | -310 |
| 10                | 18  | +32           | +212 | 40                   | 50  | -570          | -320 |
| 18                | 30  | +40           | +250 | 50                   | 65  | -640          | -340 |
| 30                | 50  | +50           | +300 | 65                   | 80  | -660          | -360 |
| 50                | 80  | +60           | +360 | 80                   | 100 | -730          | -380 |
| 80                | 120 | +72           | +422 | 100                  | 120 | -760          | -410 |
| 120               | 180 | +85           | +485 | 120                  | 140 | -860          | -460 |
|                   |     |               |      | 140                  | 160 | -920          | -520 |
|                   |     |               |      | 160                  | 180 | -980          | -580 |
|                   |     |               |      | 180                  | 200 | -1120         | -660 |

**Thickness Tolerance of Series LS:**

| Bore Diameter(mm) |    | Deviation(um) |      |
|-------------------|----|---------------|------|
| >                 | ≤  | Min.          | Max. |
| 3                 | 6  | -75           | 0    |
| 6                 | 10 | -90           | 0    |

**Thrust Needle Roller Bearings and Thrust Washer Design and Description:**

Metric Axial Needle Bearings:

|     |  |
|-----|--|
| AXK | Needle Roller and Cage Thrust Assembly |
| AXW | Piloted Thrust Race                    |
| AX  | Unitized Thrust Bearings               |
| AXZ | Needle Roller Thrust Bearings          |

Metric Bearing Washer:

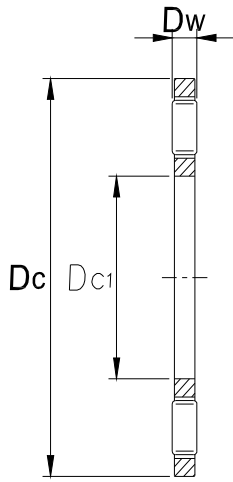
|    |                     |
|----|---------------------|
| AS | Thin Thrust Washer  |
| LS | Heavy Thrust Washer |
| CP | Lipped washers      |

Inch Needle Roller Thrust Bearings:

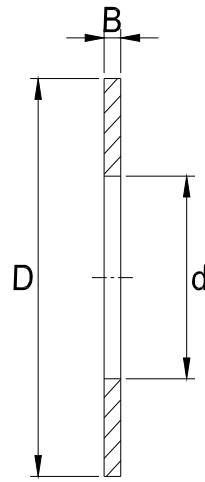
|     |                               |
|-----|-------------------------------|
| NTA | Thrust Needle Roller Bearings |
|-----|-------------------------------|

Inch Thrust Washers

|                 |                |
|-----------------|----------------|
| TRA,TRB,TRC,TRD | Thrust Washers |
|-----------------|----------------|



NTA



TRA, TRB, TRC, TRD

| Part Number | Dimension(mm) |        |       | Load Rating(KN) |        | Limiting Speed(RPM) | Weight (g) |
|-------------|---------------|--------|-------|-----------------|--------|---------------------|------------|
|             | Dc1           | Dc     | Dw    | Co              | Cor    |                     |            |
| NTA411      | 6.35          | 17.45  | 1.984 | 5.12            | 10.76  | 26000               | 1          |
| NTA512      | 7.92          | 19.05  | 1.984 | 5.83            | 13.17  | 24000               | 2          |
| NTA613      | 9.53          | 20.625 | 1.984 | 6.05            | 14.32  | 22000               | 2          |
| NTA815      | 12.7          | 23.8   | 1.984 | 7.16            | 19.13  | 19000               | 2          |
| NTA916      | 14.275        | 25.4   | 1.984 | 7.7             | 21.53  | 18000               | 3          |
| NTA1018     | 15.88         | 28.575 | 1.984 | 9.79            | 30.38  | 15000               | 3          |
| NTA1220     | 19.05         | 31.75  | 1.984 | 10.9            | 36.48  | 14000               | 4          |
| NTA1423     | 22.23         | 36.5   | 1.984 | 13.43           | 49.82  | 12000               | 5          |
| NTA1427     | 22.23         | 42.85  | 1.984 | 18.46           | 78.29  | 9800                | 8          |
| NTA1625     | 25.4          | 39.675 | 1.984 | 13.83           | 53.82  | 11000               | 6          |
| NTA1828     | 28.58         | 44.45  | 1.984 | 16.68           | 71.17  | 9600                | 9          |
| NTA2031     | 31.75         | 49.2   | 1.984 | 20.15           | 93.41  | 8600                | 10         |
| NTA2233     | 34.93         | 52.375 | 1.984 | 21.35           | 103.2  | 8000                | 10         |
| NTA2435     | 38.1          | 55.55  | 1.984 | 23.22           | 117.88 | 7600                | 11         |
| NTA2840     | 44.45         | 63.5   | 1.984 | 25.31           | 137.45 | 6800                | 14         |
| NTA3244     | 50.8          | 69.85  | 1.984 | 24.02           | 132.56 | 6100                | 15         |
| NTA3446     | 53.98         | 73.025 | 1.984 | 24.42           | 137.45 | 5800                | 16         |
| NTA3648     | 57.15         | 76.2   | 1.984 | 24.78           | 142.34 | 5600                | 17         |
| NTA3650     | 57.15         | 79.375 | 3.175 | 37.68           | 177.04 | 5300                | 29         |
| NTA4052     | 63.5          | 82.55  | 1.984 | 25.53           | 152.13 | 5100                | 19         |
| NTA4458     | 69.85         | 92.075 | 3.175 | 47.6            | 255.8  | 4600                | 37         |
| NTA4860     | 76.2          | 95.25  | 1.984 | 26.96           | 172.1  | 4400                | 22         |
| NTA5266     | 82.55         | 104.78 | 3.175 | 51.6            | 294.9  | 4000                | 42         |
| NTA6074     | 95.25         | 117.48 | 3.175 | 56.05           | 344.3  | 3500                | 50         |
| NTA6681     | 104.78        | 128.57 | 3.175 | 63.61           | 414.6  | 3200                | 62         |

**Remark: Other types like TC, NTC and BT are also workable.**

*Axial Needle Roller Bearings (Thrust Needle Roller Bearings, Needle Thrust Bearings, Unitized Thrust Bearings)*

| Part Number | Dimension(mm) |        |     |
|-------------|---------------|--------|-----|
|             | d             | D      | B   |
| TRA411      | 6.35          | 17.45  | 0.8 |
| TRA512      | 7.92          | 19.05  | 0.8 |
| TRA613      | 9.53          | 20.62  | 0.8 |
| TRA815      | 12.7          | 23.8   | 0.8 |
| TRA916      | 14.27         | 25.4   | 0.8 |
| TRA1018     | 15.88         | 28.58  | 0.8 |
| TRA1220     | 19.05         | 31.75  | 0.8 |
| TRA1423     | 22.23         | 36.5   | 0.8 |
| TRA1625     | 25.4          | 39.67  | 0.8 |
| TRA1828     | 28.58         | 44.45  | 0.8 |
| TRA2233     | 34.93         | 52.37  | 0.8 |
| TRA2435     | 38.1          | 55.55  | 0.8 |
| TRA2840     | 44.45         | 63.5   | 0.8 |
| TRA3244     | 50.8          | 69.85  | 0.8 |
| TRA3446     | 53.98         | 73.03  | 0.8 |
| TRA3648     | 57.15         | 76.2   | 0.8 |
| TRA4052     | 63.5          | 82.55  | 0.8 |
| TRA4458     | 69.85         | 92.08  | 0.8 |
| TRA4860     | 76.2          | 95.25  | 0.8 |
| TRA5266     | 82.55         | 104.78 | 0.8 |
| TRA6074     | 95.25         | 117.48 | 0.8 |
| TRA6681     | 104.78        | 128.57 | 0.8 |

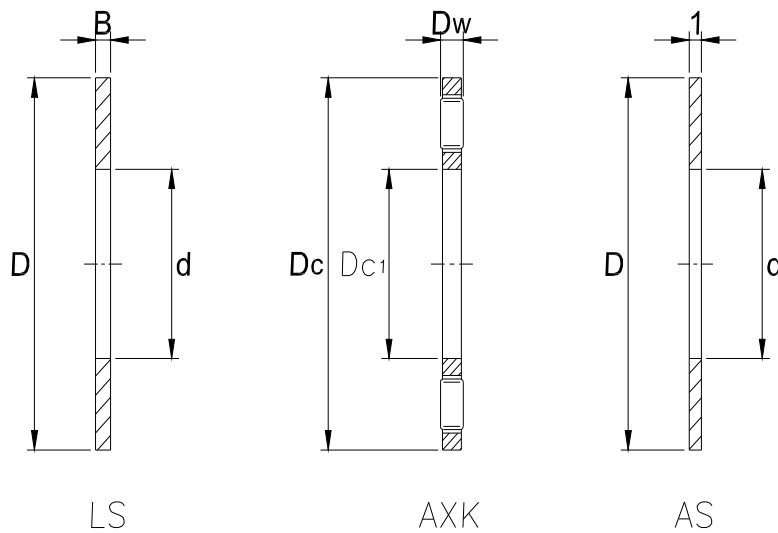
| Part Number | Dimension(mm) |        |     |
|-------------|---------------|--------|-----|
|             | d             | D      | B   |
| TRB411      | 6.35          | 17.45  | 1.6 |
| TRB512      | 7.92          | 19.05  | 1.6 |
| TRB613      | 9.53          | 20.62  | 1.6 |
| TRB815      | 12.7          | 23.8   | 1.6 |
| TRB916      | 14.27         | 25.4   | 1.6 |
| TRB1018     | 15.88         | 28.58  | 1.6 |
| TRB1220     | 19.05         | 31.75  | 1.6 |
| TRB1423     | 22.23         | 36.5   | 1.6 |
| TRB1427     | 22.23         | 42.85  | 1.6 |
| TRB1625     | 25.4          | 39.67  | 1.6 |
| TRB1828     | 28.58         | 44.45  | 1.6 |
| TRB2031     | 31.75         | 49.2   | 1.6 |
| TRB2233     | 34.93         | 52.37  | 1.6 |
| TRB2435     | 38.1          | 55.55  | 1.6 |
| TRB2840     | 44.45         | 63.5   | 1.6 |
| TRB3244     | 50.8          | 69.85  | 1.6 |
| TRB3446     | 53.98         | 73.03  | 1.6 |
| TRB3648     | 57.15         | 76.2   | 1.6 |
| TRB4052     | 63.5          | 82.55  | 1.6 |
| TRB4458     | 69.85         | 92.08  | 1.6 |
| TRB4860     | 76.2          | 95.25  | 1.6 |
| TRB6074     | 95.25         | 117.48 | 1.6 |

| Part Number | Dimension(mm) |        |     |
|-------------|---------------|--------|-----|
|             | d             | D      | B   |
| TRC411      | 6.35          | 17.45  | 2.4 |
| TRC613      | 9.53          | 20.62  | 2.4 |
| TRC815      | 12.7          | 23.8   | 2.4 |
| TRC916      | 14.27         | 25.4   | 2.4 |
| TRC1018     | 15.88         | 28.58  | 2.4 |
| TRC1220     | 19.05         | 31.75  | 2.4 |
| TRC1423     | 22.23         | 36.5   | 2.4 |
| TRC1427     | 22.23         | 42.85  | 2.4 |
| TRC1828     | 28.58         | 44.45  | 2.4 |
| TRC2031     | 31.75         | 49.2   | 2.4 |
| TRC2233     | 34.93         | 52.37  | 2.4 |
| TRC2435     | 38.1          | 55.55  | 2.4 |
| TRC2840     | 44.45         | 63.5   | 2.4 |
| TRC3244     | 50.8          | 69.85  | 2.4 |
| TRC3446     | 53.98         | 73.03  | 2.4 |
| TRC3648     | 57.15         | 76.2   | 2.4 |
| TRC4052     | 63.5          | 82.55  | 2.4 |
| TRC4458     | 69.85         | 92.08  | 2.4 |
| TRC6074     | 95.25         | 117.48 | 2.4 |
| TRC6681     | 104.78        | 128.57 | 2.4 |

| Part Number | Dimension(mm) |        |     |
|-------------|---------------|--------|-----|
|             | d             | D      | B   |
| TRD1018     | 15.88         | 28.58  | 3.2 |
| TRD1220     | 19.05         | 31.75  | 3.2 |
| TRD1423     | 22.23         | 36.5   | 3.2 |
| TRD1427     | 22.23         | 42.85  | 3.2 |
| TRD1625     | 25.4          | 39.67  | 3.2 |
| TRD1828     | 28.58         | 44.45  | 3.2 |
| TRD2031     | 31.75         | 49.2   | 3.2 |
| TRD2233     | 34.93         | 52.37  | 3.2 |
| TRD2435     | 38.1          | 55.55  | 3.2 |
| TRD2840     | 44.45         | 63.5   | 3.2 |
| TRD3244     | 50.8          | 69.85  | 3.2 |
| TRD3446     | 53.98         | 73.03  | 3.2 |
| TRD3648     | 57.15         | 76.2   | 3.2 |
| TRD4052     | 63.5          | 82.55  | 3.2 |
| TRD4458     | 69.85         | 92.08  | 3.2 |
| TRD4860     | 76.2          | 95.25  | 3.2 |
| TRD5266     | 82.55         | 104.78 | 3.2 |
| TRD6074     | 95.25         | 117.48 | 3.2 |
| TRD6681     | 104.78        | 128.57 | 3.2 |

Remark: Other types like TWA, TWB, TWC, TWD, NWA, NWB, NWC, NWD and TW are also workable.

*Axial Needle Roller Bearings (Thrust Needle Roller Bearings, Needle Thrust Bearings, Unitized Thrust Bearings)*

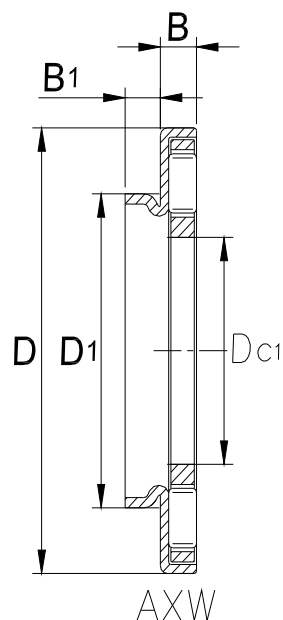


| Part Number | Thrust Washer |          | Dimention(mm) |      |    |      | Load Rating (N) |         |
|-------------|---------------|----------|---------------|------|----|------|-----------------|---------|
|             | AS            | LS       | Dc1/d         | Dc/D | Dw | B    | Co              | Cor     |
| AXK0414TN   | AS0414        |          | 4             | 14   | 2  |      | 4400            | 8000    |
| AXK0515TN   | AS0515        |          | 5             | 15   | 2  |      | 4750            | 9200    |
| AXK0619TN   | AS0619        | LS0619   | 6             | 19   | 2  | 2.75 | 6800            | 15500   |
| AXK0821TN   | AS0821        | LS0821   | 8             | 21   | 2  | 2.75 | 7800            | 19400   |
| AXK1024     | AS1024        | LS1024   | 10            | 24   | 2  | 2.75 | 9200            | 25500   |
| AXK1226     | AS1226        | LS1226   | 12            | 26   | 2  | 2.75 | 9900            | 29000   |
| AXK1528     | AS1528        | LS1528   | 15            | 28   | 2  | 2.75 | 11300           | 36000   |
| AXK1730     | AS1730        | LS1730   | 17            | 30   | 2  | 2.75 | 11900           | 39500   |
| AXK2035     | AS2035        | LS2035   | 20            | 35   | 2  | 2.75 | 13100           | 46500   |
| AXK2542     | AS2542        | LS2542   | 25            | 42   | 2  | 3    | 14700           | 58000   |
| AXK3047     | AS3047        | LS3047   | 30            | 47   | 2  | 3    | 16300           | 70000   |
| AXK3552     | AS3552        | LS3552   | 35            | 52   | 2  | 3.5  | 17800           | 81000   |
| AXK4060     | AS4060        | LS4060   | 40            | 60   | 3  | 3.5  | 28000           | 114000  |
| AXK4565     | AS4565        | LS4565   | 45            | 65   | 3  | 4    | 30000           | 128000  |
| AXK5070     | AS5070        | LS5070   | 50            | 70   | 3  | 4    | 32000           | 143000  |
| AXK5578     | AS5578        | LS5578   | 55            | 78   | 3  | 5    | 38000           | 186000  |
| AXK6085     | AS6085        | LS6085   | 60            | 85   | 3  | 4.75 | 44500           | 234000  |
| AXK6590     | AS6590        | LS6590   | 65            | 90   | 3  | 5.25 | 46500           | 255000  |
| AXK7095     | AS7095        | LS7095   | 70            | 95   | 4  | 5.25 | 54000           | 255000  |
| AXK75100    | AS75100       | LS75100  | 75            | 100  | 4  | 5.75 | 55000           | 265000  |
| AXK80105    | AS80105       | LS80105  | 80            | 105  | 4  | 5.75 | 56000           | 280000  |
| AXK85110    | AS85110       | LS85110  | 85            | 110  | 4  | 5.75 | 58000           | 290000  |
| AXK90120    | AS90120       | LS90120  | 90            | 120  | 4  | 6.5  | 73000           | 405000  |
| AXK100135   | AS10013       | LS100135 | 100           | 135  | 4  | 7    | 91000           | 560000  |
| AXK110145   | AS11014       | LS110145 | 110           | 145  | 4  | 7    | 97000           | 620000  |
| AXK120155   | AS12015       | LS120155 | 120           | 155  | 4  | 7    | 102000          | 680000  |
| AXK130170   | AS13017       | LS130170 | 130           | 170  | 5  | 9    | 133000          | 840000  |
| AXK140180   | AS14018       | LS140180 | 140           | 180  | 5  | 9.5  | 138000          | 900000  |
| AXK150190   | AS15019       | LS150190 | 150           | 190  | 5  | 9.5  | 143000          | 960000  |
| AXK160200   | AS16020       | LS160200 | 160           | 200  | 5  | 9.5  | 148000          | 1020000 |

Remark: Other types like FNT, FNTA, TP and TPK are also workable.

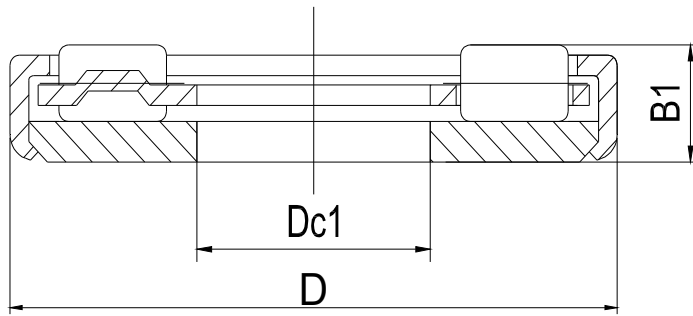
*Axial Needle Roller Bearings (Thrust Needle Roller Bearings, Needle Thrust Bearings, Unitized Thrust Bearings)*

| Part Number | Thrust Washer |          | Limiting Speed(RPM) | Weight(g) |    |     |
|-------------|---------------|----------|---------------------|-----------|----|-----|
|             | AS            | LS       |                     | AXK       | AS | LS  |
| AXK0414TN   | AS0414        |          | 21500               | 0.7       | 1  |     |
| AXK0515TN   | AS0515        |          | 20600               | 0.8       | 1  |     |
| AXK0619TN   | AS0619        | LS0619   | 18900               | 1         | 2  | 4   |
| AXK0821TN   | AS0821        | LS0821   | 17800               | 2         | 2  | 4   |
| AXK1024     | AS1024        | LS1024   | 16900               | 3         | 3  | 7   |
| AXK1226     | AS1226        | LS1226   | 15200               | 3         | 3  | 8   |
| AXK1528     | AS1528        | LS1528   | 13200               | 4         | 3  | 9   |
| AXK1730     | AS1730        | LS1730   | 12100               | 4         | 4  | 9   |
| AXK2035     | AS2035        | LS2035   | 10500               | 5         | 5  | 13  |
| AXK2542     | AS2542        | LS2542   | 8400                | 7         | 7  | 19  |
| AXK3047     | AS3047        | LS3047   | 7300                | 8         | 8  | 22  |
| AXK3552     | AS3552        | LS3552   | 6500                | 10        | 9  | 29  |
| AXK4060     | AS4060        | LS4060   | 5600                | 16        | 12 | 40  |
| AXK4565     | AS4565        | LS4565   | 5100                | 18        | 13 | 50  |
| AXK5070     | AS5070        | LS5070   | 4700                | 20        | 14 | 55  |
| AXK5578     | AS5578        | LS5578   | 4250                | 28        | 18 | 88  |
| AXK6085     | AS6085        | LS6085   | 3900                | 33        | 22 | 97  |
| AXK6590     | AS6590        | LS6590   | 3650                | 35        | 24 | 115 |
| AXK7095     | AS7095        | LS7095   | 3450                | 60        | 25 | 125 |
| AXK75100    | AS75100       | LS75100  | 3250                | 61        | 27 | 140 |
| AXK80105    | AS80105       | LS80105  | 3100                | 63        | 28 | 150 |
| AXK85110    | AS85110       | LS85110  | 2950                | 67        | 29 | 160 |
| AXK90120    | AS90120       | LS90120  | 2700                | 86        | 39 | 235 |
| AXK100135   | AS10013       | LS100135 | 2420                | 104       | 50 | 350 |
| AXK110145   | AS11014       | LS110145 | 2230                | 122       | 55 | 385 |
| AXK120155   | AS12015       | LS120155 | 2070                | 131       | 59 | 415 |
| AXK130170   | AS13017       | LS130170 | 1900                | 205       | 65 | 665 |
| AXK140180   | AS14018       | LS140180 | 1780                | 219       | 79 | 750 |
| AXK150190   | AS15019       | LS150190 | 1680                | 232       | 84 | 795 |
| AXK160200   | AS16020       | LS160200 | 1590                | 246       | 89 | 840 |



| Part Number | Dimension (mm) |                |    |     |     | Load Rating(N) |        | Limiting Speed(RPM) |
|-------------|----------------|----------------|----|-----|-----|----------------|--------|---------------------|
|             | Dc1            | D <sub>1</sub> | D  | B   | B1  | Co             | Cor    |                     |
| AXW10       | 10             | 14             | 27 | 3.2 | 3   | 9200           | 25500  | 16900               |
| AXW12       | 12             | 16             | 29 | 3.2 | 3   | 9900           | 29000  | 15200               |
| AXW15       | 15             | 21             | 31 | 3.2 | 3.5 | 11300          | 36000  | 13200               |
| AXW17       | 17             | 23             | 33 | 3.2 | 3.5 | 11900          | 39500  | 12100               |
| AXW20       | 20             | 26             | 38 | 3.2 | 3.5 | 13100          | 46500  | 10500               |
| AXW25       | 25             | 32             | 45 | 3.2 | 4   | 14700          | 58000  | 8400                |
| AXW30       | 30             | 37             | 50 | 3.2 | 4   | 16300          | 70000  | 7300                |
| AXW35       | 35             | 42             | 55 | 3.2 | 4   | 17800          | 81000  | 6500                |
| AXW40       | 40             | 47             | 63 | 4.2 | 4   | 28000          | 114000 | 5600                |
| AXW45       | 45             | 52             | 68 | 4.2 | 4   | 30000          | 128000 | 5100                |
| AXW50       | 50             | 58             | 73 | 4.2 | 4.5 | 32000          | 143000 | 4700                |

*Axial Needle Roller Bearings (Thrust Needle Roller Bearings, Needle Thrust Bearings, Unitized Thrust Bearings)*

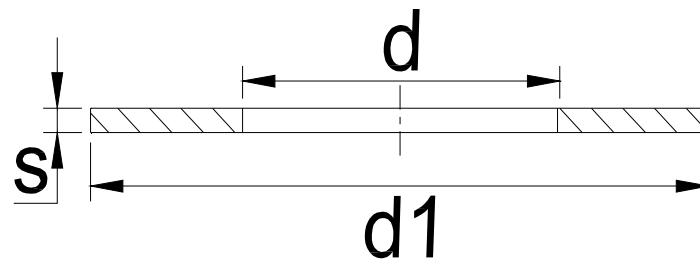


| Part Number | Dimension (mm) |    |     | Load Rating(KN) |        | Limiting Speed(RPM) | Weight(g) |
|-------------|----------------|----|-----|-----------------|--------|---------------------|-----------|
|             | Dc1            | D  | B1  | Dynamic         | Static |                     |           |
| AX513       | 5              | 13 | 2.3 | 3               | 5.7    | 25000               | 1.3       |
| AX3.5 513   | 5              | 13 | 3.5 | 3               | 5.7    | 25000               | 2.3       |
| AX614       | 6              | 14 | 2.3 | 3.15            | 6.35   | 22000               | 1.4       |
| AX3.5 614   | 6              | 14 | 3.5 | 3.15            | 6.35   | 22000               | 2.4       |
| AX715       | 7              | 15 | 2.3 | 3.55            | 7.6    | 22000               | 1.7       |
| AX3.5 715   | 7              | 15 | 3.5 | 3.55            | 7.6    | 22000               | 2.9       |
| AX816       | 8              | 16 | 2.3 | 3.7             | 8.3    | 22000               | 1.7       |
| AX3.5 816   | 8              | 16 | 3.5 | 3.7             | 8.3    | 22000               | 3         |
| AX917       | 9              | 17 | 2.3 | 4.05            | 9.5    | 19000               | 2.1       |
| AX3.5 917   | 9              | 17 | 3.5 | 4.05            | 9.5    | 19000               | 3.6       |
| AX4 1022    | 10             | 22 | 4   | 5               | 10.9   | 15500               | 6.6       |
| AX1226      | 12             | 26 | 2.8 | 6.9             | 17.7   | 13000               | 6         |
| AX4 1226    | 12             | 26 | 4   | 6.9             | 17.7   | 13000               | 10        |
| AX1326      | 13             | 26 | 2.8 | 6.9             | 17.7   | 13000               | 6         |
| AX4 1326    | 13             | 26 | 4   | 6.9             | 17.7   | 13000               | 9.8       |
| AX1528      | 15             | 28 | 2.8 | 7.4             | 20     | 11500               | 6.9       |
| AX4 1528    | 15             | 28 | 4   | 7.4             | 20     | 11500               | 9         |
| AX1730      | 17             | 30 | 2.8 | 7.8             | 22     | 10500               | 7.6       |
| AX4 1730    | 17             | 30 | 4   | 7.8             | 22     | 10500               | 10        |
| AX1932      | 19             | 32 | 2.8 | 8               | 23.3   | 10000               | 8.6       |
| AX4 1932    | 19             | 32 | 4   | 8               | 23.3   | 10000               | 13        |
| AX5 2035    | 20             | 35 | 5   | 11.8            | 39     | 9000                | 18        |
| AX2542      | 25             | 42 | 2.8 | 13.3            | 49     | 7500                | 11.5      |
| AX5 2542    | 25             | 42 | 5   | 13.3            | 49     | 7500                | 25        |
| AX2744      | 27             | 44 | 2.8 | 13.7            | 52     | 7200                | 12.1      |
| AX3047      | 30             | 47 | 2.8 | 14.5            | 57     | 6500                | 13.7      |
| AX5 3047    | 30             | 47 | 5   | 14.5            | 57     | 6500                | 29        |
| AX3552      | 35             | 52 | 2.8 | 18.9            | 84     | 5500                | 18.5      |
| AX5 3552    | 35             | 52 | 5   | 18.9            | 84     | 5500                | 35        |
| AX3553      | 35             | 53 | 2.8 | 18.9            | 84     | 5500                | 19.3      |
| AX5 3553    | 35             | 53 | 5   | 18.9            | 84     | 5500                | 36        |
| AX4060      | 40             | 60 | 2.8 | 20.4            | 96     | 5000                | 23.9      |
| AX5 4060    | 40             | 60 | 5   | 20.4            | 96     | 5000                | 46        |
| AX4565      | 45             | 65 | 2.8 | 21.8            | 109    | 4500                | 24.7      |
| AX5 4565    | 45             | 65 | 5   | 21.8            | 109    | 4500                | 50        |
| AX5070      | 50             | 70 | 2.8 | 22.5            | 118    | 4000                | 25.5      |
| AX5 5070    | 50             | 70 | 5   | 22.5            | 118    | 4000                | 55        |
| AX5578      | 55             | 78 | 2.8 | 28.5            | 164    | 3800                | 34        |
| AX6 5578    | 55             | 78 | 6   | 28.5            | 164    | 3800                | 89        |
| AX6 6085    | 60             | 85 | 6   | 31.5            | 193    | 3500                | 106       |
| AX3.5 6590  | 65             | 90 | 3.5 | 33.5            | 210    | 3200                | 59        |
| AX6 6590    | 65             | 90 | 6   | 33.5            | 210    | 3200                | 114       |



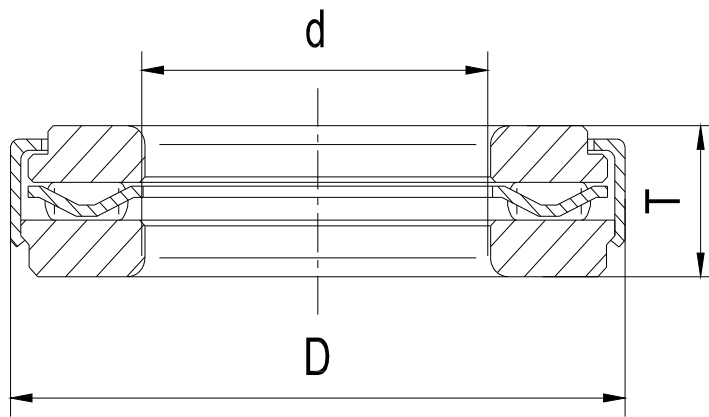
*Axial Needle Roller Bearings (Thrust Needle Roller Bearings, Needle Thrust Bearings, Unitized Thrust Bearings)*

|              |     |     |      |      |      |      |      |
|--------------|-----|-----|------|------|------|------|------|
| AX3.5 7095   | 70  | 95  | 3.5  | 34.5 | 223  | 3000 | 61   |
| AX6 7095     | 70  | 95  | 6    | 34.5 | 223  | 3000 | 120  |
| AX3.5 75100  | 75  | 100 | 3.5  | 36   | 240  | 2900 | 65   |
| AX6 75100    | 75  | 100 | 6    | 36   | 240  | 2900 | 127  |
| AX3.5 80105  | 80  | 105 | 3.5  | 36.5 | 253  | 2700 | 69   |
| AX6 80105    | 80  | 105 | 6    | 36.5 | 253  | 2700 | 134  |
| AX3.5 85110  | 85  | 110 | 3.5  | 38   | 270  | 2600 | 78   |
| AX6 85110    | 85  | 110 | 6    | 38   | 270  | 2600 | 142  |
| AX4.5 90120  | 90  | 120 | 4.5  | 59   | 360  | 2400 | 117  |
| AX8 90120    | 90  | 120 | 8    | 59   | 360  | 2400 | 238  |
| AX9 100135   | 100 | 135 | 9    | 73   | 490  | 2100 | 364  |
| AX4.5 110145 | 110 | 145 | 4.5  | 77   | 550  | 2000 | 168  |
| AX9 110145   | 110 | 145 | 9    | 77   | 550  | 2000 | 393  |
| AX4.5 120155 | 120 | 155 | 4.5  | 80   | 590  | 1800 | 182  |
| AX9 120155   | 120 | 155 | 9    | 80   | 590  | 1800 | 424  |
| AX11 130170  | 130 | 170 | 11   | 106  | 710  | 1700 | 660  |
| AX11 140180  | 140 | 180 | 9    | 111  | 770  | 1600 | 670  |
| AX11 150190  | 150 | 190 | 9    | 115  | 830  | 1500 | 710  |
| AX11 160200  | 160 | 200 | 9    | 118  | 870  | 1400 | 760  |
| AX12 170215  | 170 | 215 | 12   | 165  | 1160 | 1300 | 1000 |
| AX12 180225  | 180 | 225 | 12   | 173  | 1250 | 1200 | 1050 |
| AX14 190240  | 190 | 240 | 13.9 | 230  | 1650 | 1200 | 1400 |
| AX14 200250  | 200 | 250 | 13.9 | 239  | 1730 | 1100 | 1500 |
| AX14 220270  | 220 | 270 | 13.9 | 248  | 1850 | 1000 | 1600 |
| AX15 240300  | 240 | 300 | 14.9 | 280  | 2240 | 9900 | 2300 |

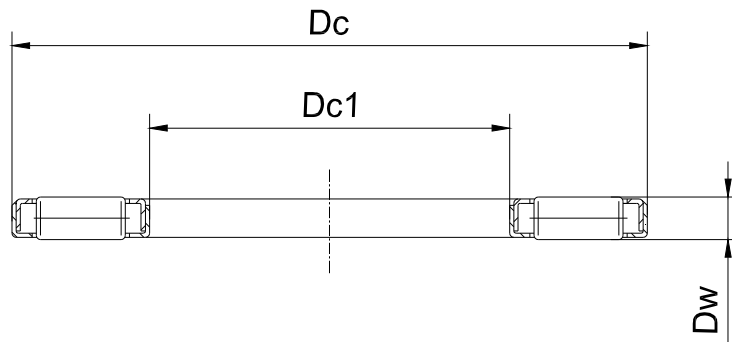


| Part Number | Dimension (mm) |      |     |
|-------------|----------------|------|-----|
|             | d              | d1   | s   |
| CP513       | 5              | 12.4 | 0.8 |
| CP2 513     | 5              | 12.4 | 2   |
| CP614       | 6              | 13.4 | 0.8 |
| CP2 614     | 6              | 13.4 | 2   |
| CP715       | 7              | 14.4 | 0.8 |
| CP2 715     | 7              | 14.4 | 2   |
| CP816       | 8              | 15.4 | 0.8 |
| CP2 816     | 8              | 15.4 | 2   |
| CP917       | 9              | 16.4 | 0.8 |
| CP2 917     | 9              | 16.4 | 2   |
| CP2 1022    | 10             | 21.2 | 2   |
| CP1226      | 12             | 25.5 | 0.8 |
| CP2 1226    | 12             | 25.5 | 2   |
| CP1326      | 13             | 25.5 | 0.8 |
| CP2 1326    | 13             | 25.5 | 2   |
| CP1528      | 15             | 27.5 | 0.8 |
| CP2 1528    | 15             | 27.5 | 2   |
| CP1730      | 17             | 29.5 | 0.8 |
| CP2 1730    | 17             | 29.5 | 2   |
| CP1932      | 19             | 31.5 | 0.8 |
| CP2 1932    | 19             | 31.5 | 2   |
| CP3 2035    | 20             | 34.5 | 3   |
| CP2542      | 25             | 41.5 | 0.8 |
| CP3 2542    | 25             | 41.5 | 3   |
| CP2744      | 27             | 43.7 | 0.8 |
| CP3047      | 30             | 46.5 | 0.8 |
| CP3 3047    | 30             | 46.5 | 3   |
| CP3552      | 35             | 51.5 | 0.8 |
| CP3 3552    | 35             | 51.5 | 3   |
| CP3553      | 35             | 52.5 | 0.8 |
| CP3 3553    | 35             | 52.5 | 3   |
| CP4060      | 40             | 59.5 | 0.8 |
| CP3 4060    | 40             | 59.5 | 3   |

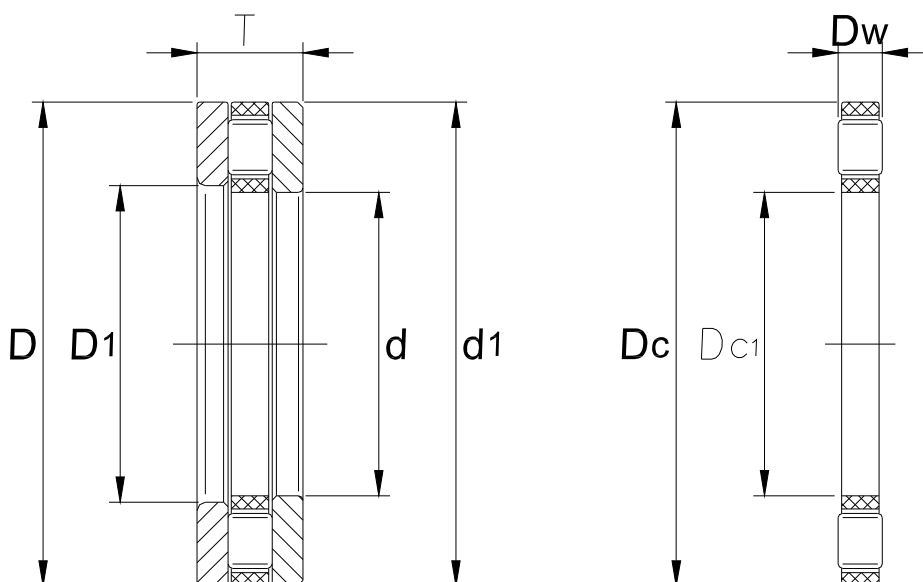
| Part Number  | Dimension (mm) |       |     |
|--------------|----------------|-------|-----|
|              | d              | d1    | s   |
| CP4565       | 45             | 64.3  | 0.8 |
| CP3 4565     | 45             | 64.3  | 3   |
| CP5070       | 50             | 69.4  | 0.8 |
| CP3 5070     | 50             | 69.4  | 3   |
| CP5578       | 55             | 77.4  | 0.8 |
| CP4 5578     | 55             | 77.4  | 4   |
| CP4 6085     | 60             | 84.3  | 4   |
| CP1.5 6590   | 65             | 89.3  | 1.5 |
| CP4 6590     | 65             | 89.3  | 4   |
| CP1.5 7095   | 70             | 94.3  | 1.5 |
| CP4 7095     | 70             | 94.3  | 4   |
| CP1.5 75100  | 75             | 99    | 1.5 |
| CP4 75100    | 75             | 99    | 4   |
| CP1.5 80105  | 80             | 104   | 1.5 |
| CP4 80105    | 80             | 104   | 4   |
| CP1.5 85110  | 85             | 109   | 1.5 |
| CP4 85110    | 85             | 109   | 4   |
| CP1.5 90120  | 90             | 119   | 1.5 |
| CP5 90120    | 90             | 119   | 5   |
| CP6 100135   | 100            | 133.8 | 6   |
| CP1.5 110145 | 110            | 143.8 | 1.5 |
| CP6 110145   | 110            | 143.8 | 6   |
| CP1.5 120155 | 120            | 153.8 | 1.5 |
| CP6 120155   | 120            | 153.8 | 6   |
| CP7 130170   | 130            | 168.7 | 7   |
| CP7 140180   | 140            | 178.7 | 7   |
| CP7 150190   | 150            | 188.7 | 7   |
| CP7 160200   | 160            | 198.7 | 7   |
| CP7 170215   | 170            | 213.5 | 7   |
| CP7 180225   | 180            | 223.5 | 7   |
| CP8 190240   | 190            | 238.3 | 8   |
| CP8 200250   | 200            | 248.3 | 8   |
| CP8 220270   | 220            | 268.3 | 8   |
| CP9 240300   | 240            | 298.5 | 9   |



| Part Number  | Dimensions(mm) |      |     | Load Rating(KN) |      | Limiting Speed(Oil ) | Weight(Kg) |
|--------------|----------------|------|-----|-----------------|------|----------------------|------------|
|              | d              | D    | T   | Co              | Cor  |                      |            |
| AXZ5.5 5 13  | 5              | 13   | 5.5 | 3               | 5.7  | 25000                | 0.004      |
| AXZ5.5 6 14  | 6              | 14   | 5.5 | 3.15            | 6.35 | 22000                | 0.004      |
| AXZ5.5 7 15  | 7              | 15   | 5.5 | 3.55            | 7.6  | 22000                | 0.005      |
| AXZ5.5 8 16  | 8              | 16   | 5.5 | 3.7             | 8.3  | 22000                | 0.005      |
| AXZ5.5 9 17  | 9              | 17   | 5.5 | 4.05            | 9.5  | 19000                | 0.005      |
| AXZ6 10 22.4 | 10             | 22.4 | 6   | 5               | 10.9 | 15500                | 0.011      |
| AXZ6 12 26.4 | 12             | 26.4 | 6   | 6.9             | 17.7 | 13000                | 0.017      |
| ARZ7 12 26.4 | 12             | 26.4 | 7   | 12.7            | 29.5 | 13000                | 0.017      |
| AXZ6 15 28.4 | 15             | 28.4 | 6   | 7.4             | 20   | 11500                | 0.016      |
| AXZ6 17 30.4 | 17             | 30   | 6   | 7.8             | 22   | 10500                | 0.018      |
| AXZ8 20 35.4 | 20             | 35   | 8   | 11.8            | 39   | 9000                 | 0.033      |
| AXZ8 25 43   | 25             | 43   | 8   | 13.3            | 49   | 7500                 | 0.047      |
| AXZ8 30 48   | 30             | 48   | 8   | 14.5            | 57   | 6500                 | 0.054      |
| AXZ8 35 54   | 35             | 54   | 8   | 18.9            | 84   | 5500                 | 0.066      |
| AXZ8 40 61   | 40             | 61   | 8   | 20.4            | 96   | 5000                 | 0.084      |
| AXZ8 45 66   | 45             | 66   | 8   | 21.8            | 109  | 4500                 | 0.092      |
| AXZ8 50 71   | 50             | 71   | 8   | 22.5            | 118  | 4000                 | 0.1        |
| AXZ10 60 86  | 60             | 86   | 10  | 31.5            | 193  | 3500                 | 0.194      |
| AXZ10 70 96  | 70             | 96   | 10  | 34.5            | 223  | 3000                 | 0.22       |
| AXZ10 80 106 | 80             | 106  | 10  | 36.5            | 253  | 2700                 | 0.256      |



| Part Number | Dimension |     |    | Load Rating (N) |        | Limiting Speed(Oil)<br>RPM | Weight<br>NTB<br>g |
|-------------|-----------|-----|----|-----------------|--------|----------------------------|--------------------|
|             | Dc1       | Dc  | Dw | Co              | Cor    |                            |                    |
|             | mm        |     |    |                 |        |                            |                    |
| NTB1024     | 10        | 24  | 2  | 7820            | 23900  | 15000                      | 3.3                |
| NTB1226     | 12        | 26  | 2  | 8340            | 26900  | 13000                      | 3.8                |
| NTB1528     | 15        | 28  | 2  | 8830            | 29900  | 12000                      | 4.1                |
| NTB1629     | 16        | 29  | 2  | 9070            | 31400  | 11000                      | 4.3                |
| NTB1730     | 17        | 30  | 2  | 9320            | 32900  | 11000                      | 4.5                |
| NTB1831     | 18        | 31  | 2  | 9550            | 34400  | 10000                      | 4.7                |
| NTB2035     | 20        | 35  | 2  | 11700           | 46500  | 9000                       | 6.1                |
| NTB2542     | 25        | 42  | 2  | 14400           | 64700  | 7500                       | 8.2                |
| NTB3047     | 30        | 47  | 2  | 15400           | 73300  | 6500                       | 9.4                |
| NTB3552     | 35        | 52  | 2  | 16300           | 81900  | 5500                       | 10.6               |
| NTB4060     | 40        | 60  | 3  | 24200           | 108000 | 5000                       | 22                 |
| NTB4565     | 45        | 65  | 3  | 25900           | 121000 | 4500                       | 24.5               |
| NTB5070     | 50        | 70  | 3  | 27600           | 135000 | 4000                       | 26.5               |
| NTB5578     | 55        | 78  | 3  | 32400           | 171000 | 4000                       | 33.5               |
| NTB6085     | 60        | 85  | 3  | 38200           | 219000 | 3500                       | 38.5               |
| NTB6590     | 65        | 90  | 3  | 40100           | 237000 | 3000                       | 41.5               |
| NTB7095     | 70        | 95  | 4  | 47400           | 244000 | 3000                       | 61                 |
| NTB75100    | 75        | 100 | 4  | 48400           | 256000 | 3000                       | 65                 |
| NTB80105    | 80        | 105 | 4  | 49500           | 267000 | 2500                       | 68.5               |
| NTB85110    | 85        | 110 | 4  | 50300           | 279000 | 2500                       | 72                 |
| NTB90120    | 90        | 120 | 4  | 64500           | 394000 | 2500                       | 92                 |
| NTB100135   | 100       | 135 | 4  | 80300           | 541000 | 2000                       | 119                |
| NTB110145   | 110       | 145 | 4  | 83200           | 578000 | 2000                       | 129                |
| NTB120155   | 120       | 155 | 4  | 87900           | 634000 | 1800                       | 139                |
| NTB130170   | 130       | 170 | 5  | 120000          | 839000 | 1700                       | 225                |



| Part Number                       |                |              | Dimension |     |         |    |     | Load Rating(KN) |
|-----------------------------------|----------------|--------------|-----------|-----|---------|----|-----|-----------------|
| Thrust Cylindrical Roller Bearing | Housing Washer | Shaft Washer | Dc1/d     | D1  | Dc/D/d1 | T  | Dw  | Co/Cor          |
|                                   |                |              | mm        |     |         |    |     |                 |
| K81102TN                          | GS81102        | WS81102      | 15        | 16  | 28      | 9  | 3.5 | 12.8/ 28.6      |
| K81103TN                          | GS81103        | WS81103      | 17        | 18  | 30      | 9  | 3.5 | 14.2/ 33.4      |
| K81104TN                          | GS81104        | WS81104      | 20        | 21  | 35      | 10 | 4.5 | 23.6/ 56.8      |
| K81105TN                          | GS81105        | WS81105      | 25        | 26  | 42      | 11 | 5   | 31.2/ 81        |
| K81106TN                          | GS81106        | WS81106      | 30        | 32  | 47      | 11 | 5   | 33/ 91.1        |
| K81206TN                          | GS81206        | WS81206      | 30        | 32  | 52      | 16 | 7.5 | 56.9/ 141       |
| K81107TN                          | GS81107        | WS81107      | 35        | 37  | 52      | 12 | 5   | 34.8/ 101       |
| K81207TN                          | GS81207        | WS81207      | 35        | 37  | 62      | 18 | 7.5 | 61.6/ 164       |
| K81108TN                          | GS81108        | WS81108      | 40        | 42  | 60      | 13 | 6   | 49.8/ 148       |
| K81208TN                          | GS81208        | WS81208      | 40        | 42  | 68      | 19 | 9   | 86.8/ 233       |
| K81109TN                          | GS81109        | WS81109      | 45        | 47  | 65      | 14 | 6   | 52.3/ 163       |
| K81209TN                          | GS81209        | WS81209      | 45        | 47  | 73      | 20 | 9   | 94.2/ 266       |
| K81110TN                          | GS81110        | WS81110      | 50        | 52  | 70      | 14 | 6   | 54.8/ 177       |
| K81210TN                          | GS81210        | WS81210      | 50        | 52  | 78      | 22 | 9   | 101/ 299        |
| K81111TN                          | GS81111        | WS81111      | 55        | 57  | 78      | 16 | 6   | 60.3/ 207       |
| K81211TN                          | GS81211        | WS81211      | 55        | 57  | 90      | 25 | 11  | 138/ 403        |
| K81112TN                          | GS81112        | WS81112      | 60        | 62  | 85      | 17 | 7.5 | 84.4/ 281       |
| K81212TN                          | GS81212        | WS81212      | 60        | 62  | 95      | 26 | 11  | 129/ 378        |
| K81113TN                          | GS81113        | WS81113      | 65        | 67  | 90      | 18 | 7.5 | 88.3/ 305       |
| K81213TN                          | GS81213        | WS81213      | 65        | 67  | 100     | 27 | 11  | 134/ 403        |
| K81114TN                          | GS81114        | WS81114      | 70        | 72  | 95      | 18 | 7.5 | 92.1/ 328       |
| K81214TN                          | GS81214        | WS81214      | 70        | 72  | 105     | 27 | 11  | 138/ 428        |
| K81115TN                          | GS81115        | WS81115      | 75        | 77  | 100     | 19 | 7.5 | 86.1/ 305       |
| K81215TN                          | GS81215        | WS81215      | 75        | 77  | 110     | 27 | 11  | 143/ 453        |
| K81116TN                          | GS81116        | WS81116      | 80        | 82  | 105     | 19 | 7.5 | 87.5/ 316       |
| K81216TN                          | GS81216        | WS81216      | 80        | 82  | 115     | 28 | 11  | 147/ 478        |
| K81117TN                          | GS81117        | WS81117      | 85        | 87  | 110     | 19 | 7.5 | 88.9/ 328       |
| K81217TN                          | GS81217        | WS81217      | 85        | 88  | 125     | 31 | 12  | 174/ 572        |
| K81118TN                          | GS81118        | WS81118      | 90        | 92  | 120     | 22 | 9   | 119/ 432        |
| K81218TN                          | GS81218        | WS81218      | 90        | 93  | 135     | 35 | 14  | 215/ 691        |
| K81120TN                          | GS81120        | WS81120      | 100       | 102 | 135     | 25 | 11  | 199/ 650        |
| K81220TN                          | GS81220        | WS81220      | 100       | 103 | 150     | 38 | 15  | 340/ 1080       |