For New Technology Network

NTN®

NTNcorporation

ECO series

Tapered Roller Bearings ECO-Top

CAT. No. 3026/E

NTN's ECO-Top bearing adapts to the needs of the 21st century.

ECO-Top series features improved specifications for seizure resistance, lower torque and longer life for special applications in order to be more environment-friendly.

1 Performance

1) 10 times longer life under contaminated lubricant.
2) Doubles life with clean lubricant.
3) Minimum of 10 percent lower torque in practical speed range.
4) 25% more seizure resistance.
5) Cuts preload loss by half.
6) 50% reduction in the number of rotations until bearing stand height stabilizes.

2 ECO-Top Bearings

NTN answers the need for longer lasting, more compact, more fuel-efficient and higher speed bearings that offer more efficient assembly with the ECO-Top bearing, a bearing with special specifications based upon our standard bearing, the 4 Top tapered roller bearing.
Incorporating all these specifications by means of our new production system, the **ECO-Top tapered roller bearing**, our next-generation standard tapered roller bearing, can be used in a wide range of applications.

(1) Longer Life
1.Enhances rolling fatigue life by improved cleanliness of materials.
2.Standard specifications include specially treated long-life steel which effectively resists surface damage caused by foreign matter.
3.Equipped with crowning specially designed to provide optimal surface load distribution under conditions varying from light to heavy.
Thus the ECO-Top bearing offers 10 times longer life than the 4 Top tapered bearing when used under contaminated lubricant, and doubles the life when used with clean lubricant.

(2) Optimal Oil Film Formation Design
The roller to rib area of a tapered roller bearing slides. Therefore the ability of this part to form an oil film greatly affects the performance of the bearing.
ECO-Top tapered roller bearings offer the best shape for the part where the rib and rollers make contact with each other, offering optimal precision and texture to enhance the ability of the rib to form an oil film, thus reducing rotational torque, improving seizure resistance and resistance to preload loss.

(3) Early Stabilization of Bearing Stand Height
When using a tapered roller bearings under preload, the bearing must provide sufficient stabilization at the assembly process.
The smaller the number of rotations until stabilization occurs, the more reliably the preload can be set, thus speeding up the assembly process.
Optimal internal design enables **ECO-Top tapered roller bearings** to realize early stabilization of bearing stand height.
This in turn enables reliable preload setting and speeds up the assembly process. If, for example, you apply gear oil for early stabilization, and then stop and use rust preventative oil instead, the rollers stabilize at the same number of revolutions as before.

3 Test data

(1) Life

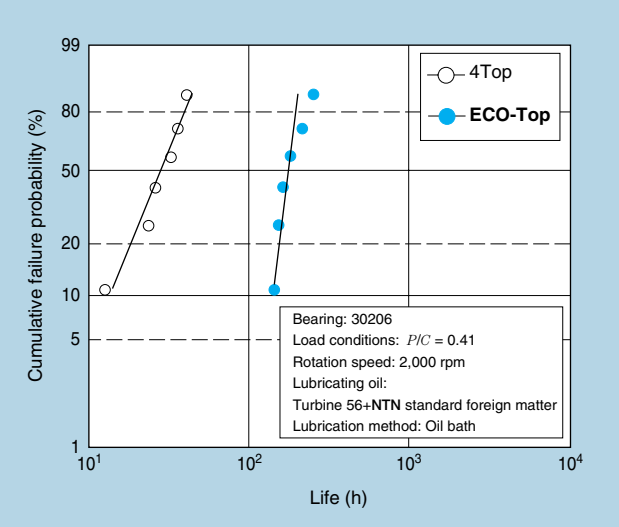

Fig. 1: Results of life test with contaminated oil

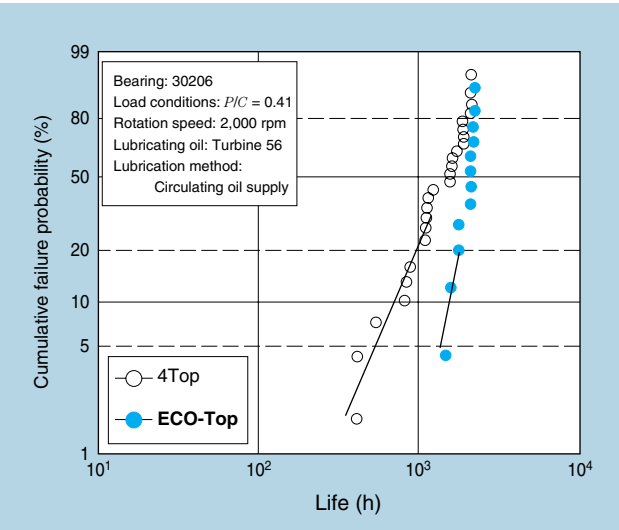

Fig. 2: Results of life test with clean oil

(2) Rotational torque

Test conditions

Bearing : 30206
Axial load : 4kN
Lubricating oil : Gear oil 70W90 (GL-4)

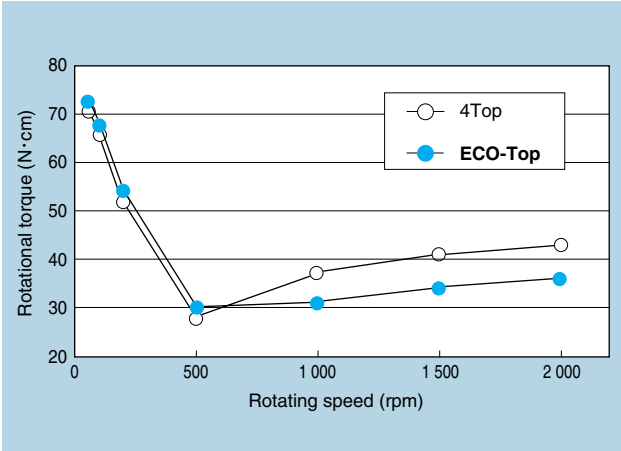

Fig. 3: Rotational torque measurement results

(3) Seizure resistance

Test conditions

Bearing : 30206
Load : P/C = 0.45
Lubricating oil : Turbine oil 56
Supply volume : 40 m ℓ /min
Supply temperature : 40±3˚C

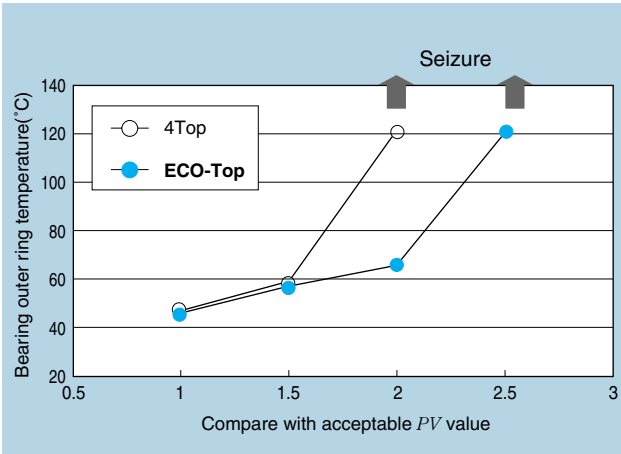

Fig. 4: Seizure resistance confirmation test results

Note ; PV pressure-velocity

(4) Preload loss vs time

Test condtions

Bearing : 30206
Preload load : 4.9 kN
Lubricating oil : Turbine oil 56
Supply volume : 60 m ℓ /min
Supply temperature : 40±3˚C

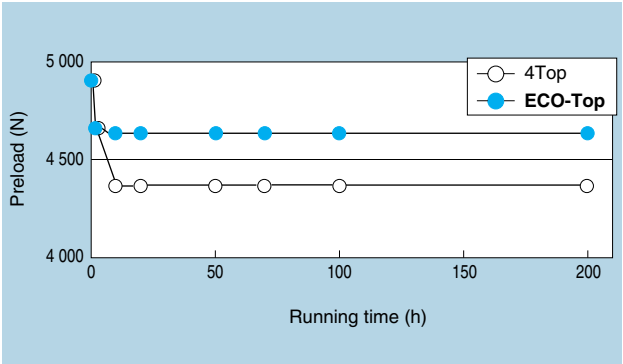

Fig. 5: Preload loss vs time test results

(5) Early stabilization of bearing stand height

Test conditions

With the bearing positioned as shown in Fig.6, an axial load (weight A) is applied, the inner ring is rotated, and the bearing stand height is measured for each revolution.The number of revolutions required for the bearing to stabilize is determined.

Bearing : 30206
Load : 29.4N

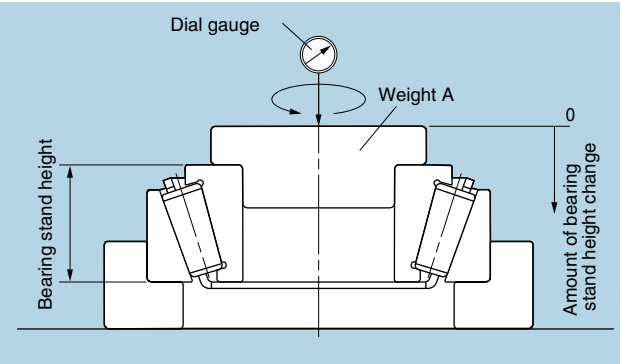

Fig. 6: Method of measuring number of revolutions until the bearing stand height stabilizes

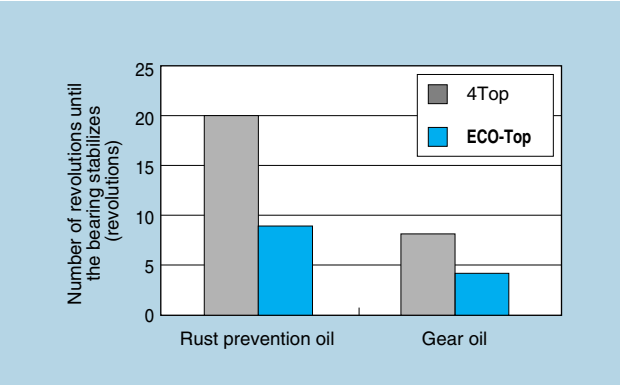

Fig. 7: Results of measuring number of revolutions until the bearing stabilizes

4 Applicable bearing sizes

Small to medium-size tapered roller bearings are applicable. For details, contact **NTN**.