

Extra-Capacity Sealed-Clean™ Roll Neck Bearings

- Increased load capacity
- Easier handling
- Greater durability in severe lubrication conditions



NSK, the first in the world with sealed roll neck bearings, delivers again with Extra-Capacity Sealed-Clean™ Bearings for roll necks.

Negative pressure and water infiltration were reduced to less than **1/3**

The new bore seal prevents negative pressure that causes water infiltration and better facilitates mounting and dismounting. (Patents pending)

Life

2.7 times

Estimated life extension (maximum)

Super-TF steel gives longer life in severe lubrication conditions. (Patented in Japan and overseas)

The new seal and its holder make handling easier and minimize seal damage. (Patents pending)

Basic load rating **35% increase** (maximum)

Load capacity is increased because the new cage and thinner seal create space for more and larger rollers. (Patents pending)

Long life and easy handling

Increased load capacity with more and larger rollers

Conventional KVE type
343KVE4557E
 $C_r = 2\,200\text{ kN}$

New Extra-Capacity
KVS type STF343KVS4551E
 $C_r = 2\,830\text{ kN}$

Bearing No.	Bearing Size (mm)	Basic Dynamic Load Rating, kN	
		New Extra-Capacity Series	Conventional
STF254KVS3552Eg	$\phi 254 \times \phi 358.775 \times 269.875$	2 420 (+11%)	2 180
STF276KVS3952Eg	$\phi 276.225 \times \phi 393.7 \times 269.875$	2 720 (+19%)	2 290
STF343KVS4551Eg	$\phi 343.052 \times \phi 457.098 \times 254$	2 830 (+29%)	2 200
STF482KVS6151Eg	$\phi 482.6 \times \phi 615.95 \times 330.2$	4 900 (+34%)	3 650

Longer life in severe lubrication conditions with Super-TF Steel

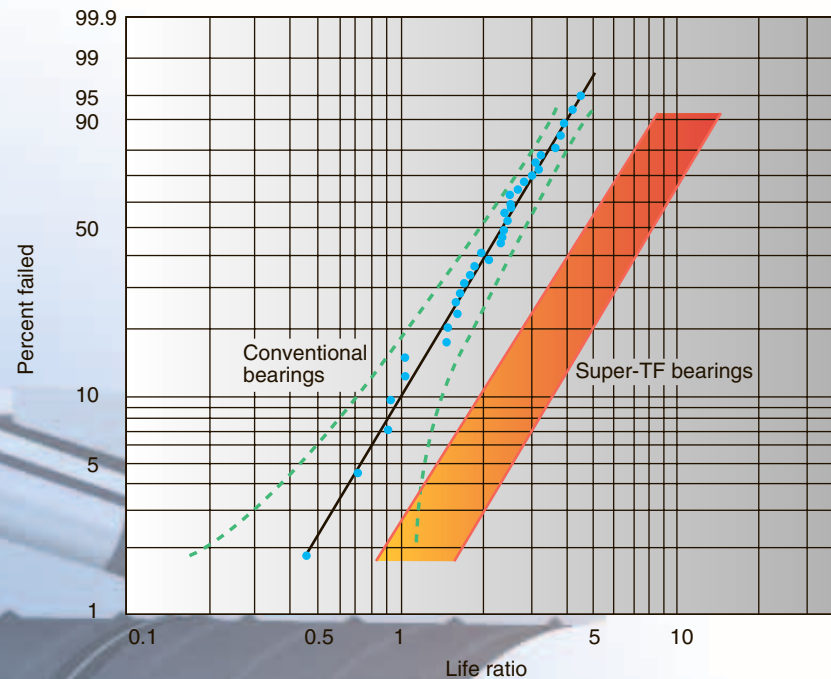


Fig. 1 Field data on Super-TF bearings

New bore seal

- Prevention of negative pressure that causes water infiltration
- Easier mounting and dismounting

Negative pressure develops inside sealed roll neck bearings because of internal temperature changes brought about by changing rotating speeds. This negative pressure causes water to more readily enter the bearing, leading to lubricant deterioration and reduced bearing life. In response, NSK has developed a new bore seal. Located in a position relatively free from coolant water, the new seal allows the bearing to “breathe” and thus eliminates the build-up of negative pressure.

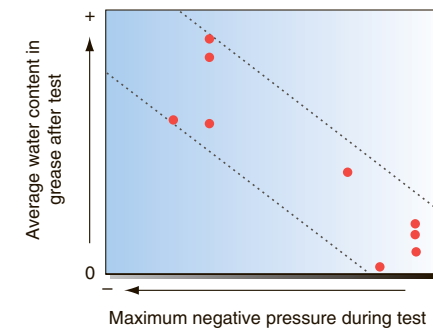


Fig. 2 Maximum negative pressure and water entry

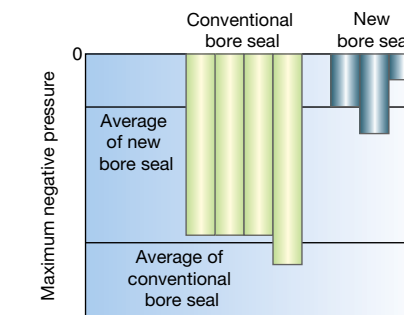


Fig. 3 Seal and maximum negative pressure

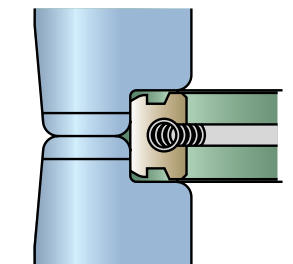


Fig. 5 New bore seal

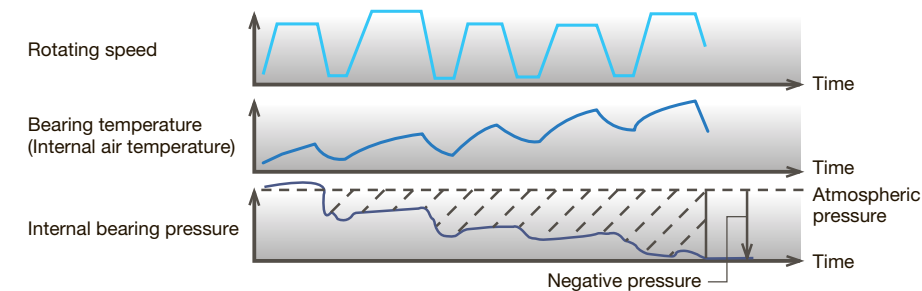


Fig. 4 Representation of internal negative pressure during sealed-clean roll neck bearing operation



The new seal is easily installed and removed.

New main seal and holder

NSK has developed a new main seal and holder that are easily installed and removed. With the size of the bore of the seal holder reduced, more space is provided for the lifting jig.

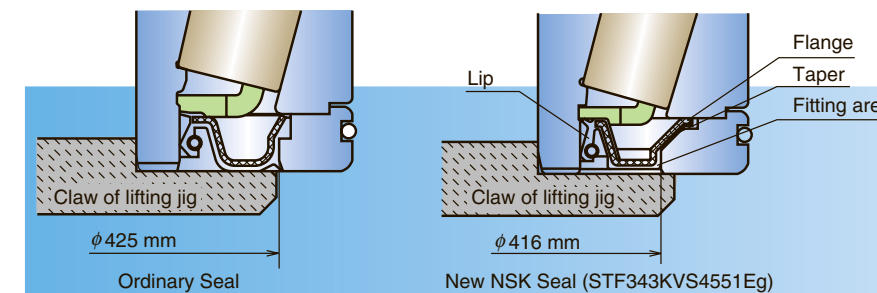


Fig. 6 Seal Comparison (Typical cold mill roll neck bearing)

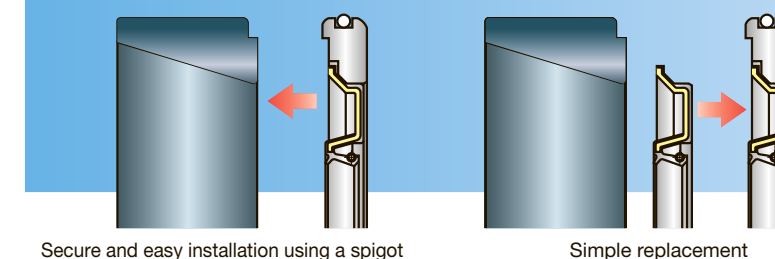
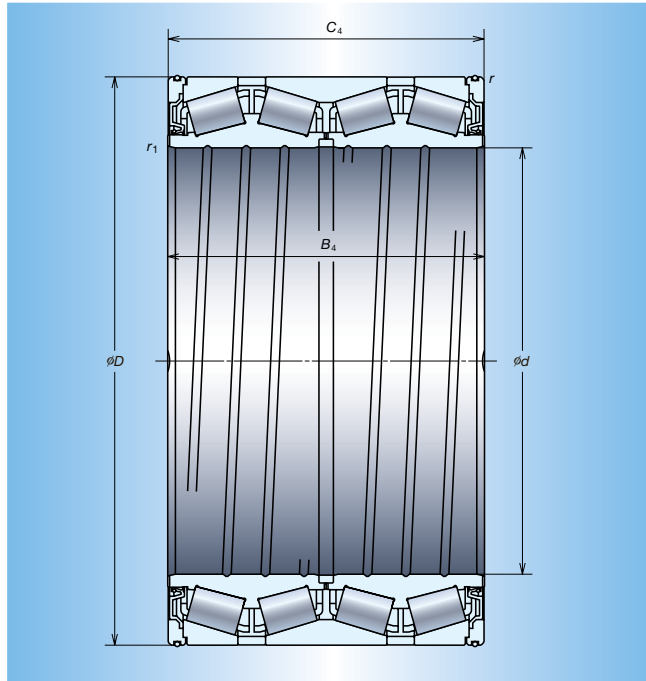


Fig. 7 New main seal and seal holder





Dynamic Equivalent Load

$$P = XF_r + YF_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$$P_0 = F_r + Y_0 F_a$$

Where $Y_0 = Y_3$

The values of e , Y_2 , and Y_3 are given in the table.



Bearing Numbers ⁽¹⁾	Boundary Dimensions (mm/inch)						Basic Load Ratings (kN)		Constant	Axial Load Factors		
	d	D	B ₄	C ₄	r (min)	r ₁ (min)	C _r	C _{0r}		e	Y ₂	Y ₃
STF170KVS2401Eg	170	240	175	175	2.5	2.5	1 020	2 010	0.32	3.2	2.1	
*STF215KVS2851Eg	215.900 (8.5000)	288.925 (11.3750)	177.800 (7.0000)	177.800 (7.0000)	3.3	0.8	1 070	2 350	0.49	2.1	1.4	
*STF216KVS3351Eg	216.103 (8.5080)	330.2 (13.0000)	263.525 (10.3750)	269.875 (10.6250)	3.3	1.5	2 290	4 550	0.46	2.2	1.5	
STF220KVS3301Eg	220	330	260	260	3	4	2 330	4 800	0.40	2.5	1.7	
*STF234KVS3251Eg	234.950 (9.2500)	327.025 (12.8750)	196.850 (7.7500)	196.850 (7.7500)	3.3	1.5	1 550	3 200	0.46	2.2	1.5	
*STF244KVS3251Eg	244.475 (9.6250)	327.025 (12.8750)	193.680 (7.6250)	193.680 (7.6250)	3	1.5	1 370	3 050	0.40	2.5	1.7	
STF245KVS3402Eg	245	345	310	310	3	2	2 700	6 650	0.40	2.5	1.7	
*STF254KVS3552Eg	254.000 (10.0000)	358.775 (14.1250)	269.875 (10.6250)	269.875 (10.6250)	3.3	1.5	2 420	5 500	0.40	2.5	1.7	
STF260KVS3601Eg	260	365	340	340	4	2.7	2 960	7 350	0.40	2.5	1.7	
STF260KVS3651Eg	260	365	340	340	4	2.5	2 960	7 350	0.40	2.5	1.7	
*STF260KVS4251Eg	260.350 (10.2500)	422.275 (16.6250)	314.325 (12.3750)	317.500 (12.5000)	3.3	6.4	3 600	7 050	0.33	3.0	2.0	
*STF266KVS3551Eg	266.700 (10.5000)	355.600 (14.0000)	230.188 (9.0625)	228.600 (9.0000)	3.3	1.5	1 960	4 600	0.35	2.9	1.9	
*STF276KVS3952Eg	276.225 (10.8750)	393.700 (15.5000)	269.875 (10.6251)	269.875 (10.6251)	3.3	1.5	2 720	6 100	0.45	2.2	1.5	
*STF279KVS3952Eg	279.400 (11.0000)	393.700 (15.5000)	269.875 (10.6250)	269.875 (10.6250)	6.4	1.5	2 720	6 100	0.45	2.2	1.5	

Note ⁽¹⁾ Bearings marked * are inch designs.

Bearing Numbers ⁽¹⁾	Boundary Dimensions (mm/inch)						Basic Load Ratings (kN)		Constant	Axial Load Factors		
	d	D	B ₄	C ₄	r (min)	r ₁ (min)	C _r	C _{0r}		e	Y ₂	Y ₃
STF279KVS3954Eg	279.4	393.7	320	320	6.4	1.5	3 100	7 350	0.40	2.5	1.7	
STF290KVS4001Eg	290	400	346	346	4	3	3 250	8 400	0.40	2.5	1.7	
*STF304KVS4351Eg	304.648 (11.9940)	438.048 (17.2460)	280.990 (11.6260)	279.400 (11.0000)	3.3	3.3	3 100	6 750	0.45	2.2	1.5	
*STF304KVS4155Eg	304.800 (12.0000)	419.100 (16.5000)	269.875 (10.6250)	269.875 (10.6250)	6.4	1.5	2 850	6 550	0.33	3.0	2.0	
*STF304KVS4152Eg	304.902 (12.0040)	412.648 (16.2460)	266.700 (10.5000)	266.700 (10.5000)	3.3	1.5	2 760	6 500	0.33	3.0	2.0	
STF310KVS4301Eg	310	430	310	310	3	3	3 350	8 200	0.46	2.2	1.5	
STF310KVS4302Eg	310	430	350	350	3	2.7	3 700	9 550	0.46	2.2	1.5	
*STF317KVS4251Eg	317.500 (12.5000)	422.275 (16.6250)	269.875 (10.6250)	269.875 (10.6250)	3.3	1.5	2 740	6 750	0.34	3.0	2.0	
*STF343KVS4551Eg	343.052 (13.5060)	457.098 (17.9960)	254.000 (10.0000)	254.000 (10.0000)	3.3	1.5	2 830	6 700	0.45	2.2	1.5	
*STF355KVS4551Eg	355.600 (14.0000)	457.200 (18.0000)	252.412 (9.9375)	252.412 (9.9375)	3.3	1.5	2 650	6 750	0.32	3.2	2.1	
*STF406KVS5451Eg	406.400 (16.0000)	546.100 (21.5000)	288.925 (11.3750)	288.925 (11.3750)	6.4	1.5	3 950	9 450	0.48	2.1	1.4	
STF450KVS5901Eg	450	595	368	368	5	4	5 550	15 000	0.33	3.0	2.0	
*STF457KVS5951Eg	457.200 (18.0000)	596.900 (23.5000)	276.225 (10.8750)	279.400 (11.0000)	3.3	1.5	4 000	9 850	0.47	2.2	1.4	
*STF482KVS6151Eg	482.600 (19.0000)	615.950 (24.2500)	330.200 (13.0000)	330.200 (13.0000)	6.4	4.3	4 900	13 500	0.33	3.1	2.1	

Remarks 1. Extra-capacity sealed-clean four-row tapered roller bearings are made of the Super TF material as the standard specification.

2. Other bearings are available. Please contact NSK for additional information.