

# BALL SCREW SUPPORT BEARINGS

## BSBD SERIES



---

As one of the world's leading manufacturers of rolling bearings, linear technology components and steering systems, we can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



### The NSK company

---

NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context, we develop technologies in the fields of rolling bearings, linear systems, components for the automotive industry and mechatronic systems. Our research and production facilities in Europe, Americas and Asia are linked together in a global technology

network. Here we concentrate not only on the development of new technologies, but also on the continuous optimisation of quality – at every process stage.

Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

## Partnership based on trust – and trust based on quality

Total Quality by NSK: The synergies of our global network of NSK Technology Centres. Just one example of how we meet our requirements for high quality.

NSK is one of the leading companies with a long tradition in patent applications for machine parts. In our worldwide research centres, we not only concentrate on the development of new technologies, but also on the continual

improvement of quality based on the integrated technology platform of tribology, material technology, analysis and mechatronics.

**More about NSK at [www.nskeurope.com](http://www.nskeurope.com) or call us on +44 (0) 1636 605123**



# Ball Screw Support Bearings

## BSBD Series

Modern machine tools require ball screws that can accurately position a work piece or machine component, quickly and efficiently. The BSN / BSF range of bearings are support bearings designed to specifically meet these demanding requirements.

The double row configuration, with a 60° contact angle, enables the bearings to support large axial forces in both directions, while providing the accuracy and stiffness required by modern high precision machinery. The bearings are supplied sealed, greased for life and ready for installation.

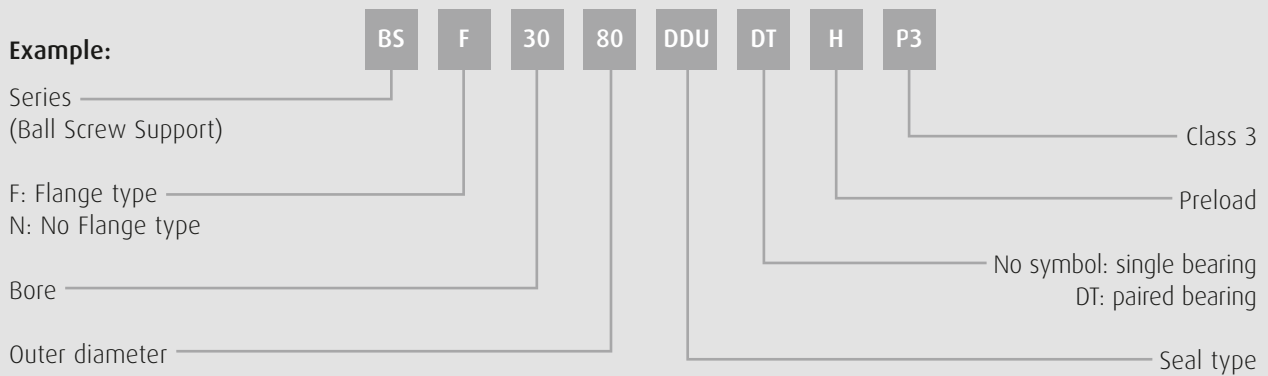
The bearings can be supplied as pairs (DT) for higher loads. In this case, the individual bearings are matched together.





## Nomenclature

### Example:



Feature	Benefit
60° contact angle	Enables bearings to support large axial forces
Double row	Supports axial load in two directions
Contact lip seal (seal runs in inner ring groove)	Provides excellent sealing characteristics, with low friction and heat generation
Greased	Greased for life (under normal operating conditions)
Relubrication facilities	Enables relubrication of bearing during operation if required
Mounting holes (BSF only)	Easy mounting of bearing, directly onto machinery
Extraction groove (BSF only)	To help with removal of bearing from machine
Set screws (BSF only)	Plugs relubrication holes to prevent contamination



CAD-Data: [nsk.solidcomponents.com](http://nsk.solidcomponents.com)

# BSN Series

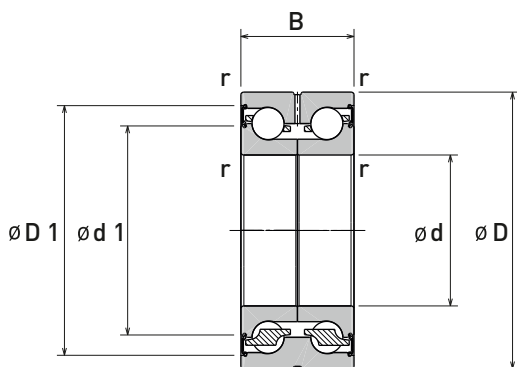


## BSN series

The BSN series of ball screw support bearings are double row, angular contact thrust ball bearings, with a 60° contact angle. They are equivalent to two single row bearings in a back-to-back arrangement, with a single outer ring. Bearings are supplied ready to be mounted. They come greased with long life lithium soap grease, with synthetic hydrocarbon base oil.

Under normal operating conditions, the bearings are greased for life. A relubrication groove located on the outside surface of the outer ring allows the bearings to be relubricated during operation if required. The bearings are sealed on both sides. The low friction contact lip seal runs in a groove in the inner ring. This gives excellent sealing characteristics, while minimising torque and heat generation.

Preload is set during manufacture so that the correct loading is achieved when the lock nut is tightened to the recommended torque.



Bearing Numbers	Boundary Dimensions (mm)				Reference Dimensions (mm)		Basic Dynamic Load Rating (kN)	Basic Static Load Rating (kN)	Limiting Axial Load (kN)	Axial Rigidity (N/μm)	Mass (kg)	Limiting Speed (rpm)	Tightening Torque (Nm)
	d	D	B	r (min)	d <sub>1</sub>	D <sub>1</sub>							
BSN1747	17	47	25	0.6	28.1	37.7	19.3	29.7	21.2	450	0.23	6,700	19
BSN2052	20	52	28	0.6	32.6	43.0	25.1	41.0	29.3	650	0.31	5,800	25
BSN2557	25	57	28	0.6	37.6	48.0	27.0	48.0	34.0	750	0.36	5,100	35
BSN3062	30	62	28	0.6	42.6	53.0	28.6	55.5	38.5	850	0.40	4,500	45
BSN3072	30	72	38	0.6	49.1	64.4	57.5	94.0	66.5	950	0.74	3,900	80
BSN3572	35	72	34	0.6	53.1	62.2	40.0	77.5	52.0	900	0.66	3,800	50
BSN4075	40	75	34	0.6	56.2	68.1	42.0	88.0	58.5	1,000	0.65	3,500	65
BSN4090	40	90	46	0.6	63.2	80.0	75.0	135.0	91.0	1,200	1.38	3,100	155
BSN5090	50	90	34	0.6	70.2	82.1	45.5	110.0	71.5	1,250	0.93	2,800	110
BSN50110	50	110	54	0.6	78.2	97.4	110.0	219.0	149.0	1,400	2.46	2,500	200
BSN60110	60	110	45	0.6	83.2	99.2	82.5	187.0	126.0	1,300	1.82	2,400	155

\* Limiting axial load: see p.10.

# BSF Series

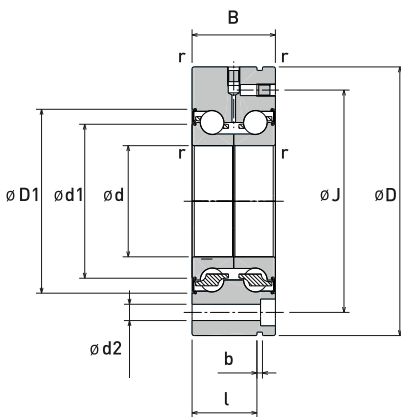
## BSF series

The BSF series of bearings is equivalent to the BSN range of bearings, with an extended outer ring, with bolt holes for easy direct mounting.

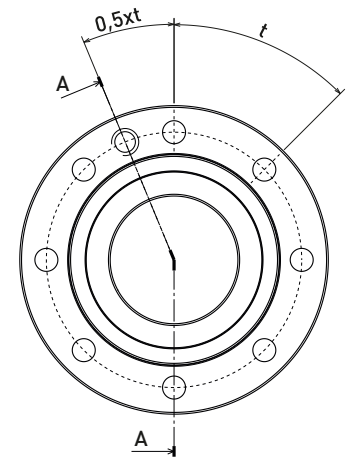
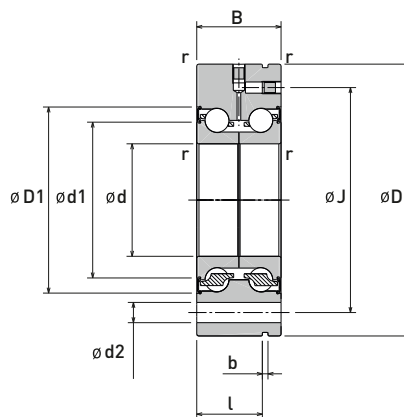
Relubrication holes in outside surface and face of the outer ring allow for relubrication during operation if required. The holes are closed off with set screws. An extraction groove on the outer surface of the outer ring aids removal of the bearing.



Design for  $d = 60 \text{ mm}$



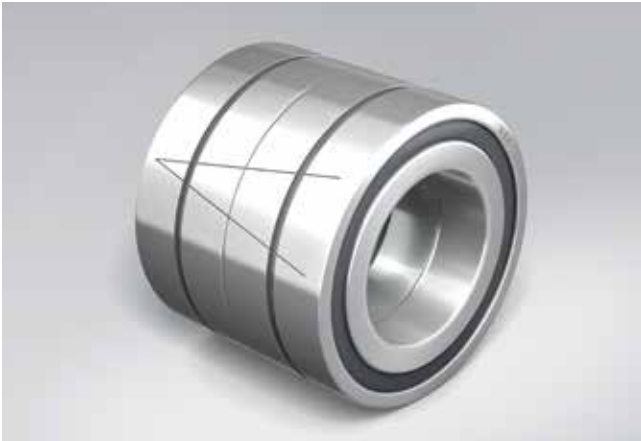
Design for  $d \leq 50 \text{ mm}$



Bearing Numbers	Boundary Dimensions (mm)			Reference Dimensions (mm)								Fixing Screws		Basic Dynamic Load Rating (kN)	Basic Static Load Rating (kN)	Limiting Axial Load (kN)	Axial Rigidity (N/ $\mu\text{m}$ )	Mass (kg)	Limiting Speed (rpm)	Tightening Torque (Nm)
	d	D	B	$r$ (min)	$d_1$	$D_1$	J	$d_2$	l	b	t	Size	Quantity							
BSF1762	17	62	25	0.6	28.1	37.7	48	6.8	17	3	3 x 120°	M6	3	19.3	29.7	21.2	450	0.46	6,700	19
BSF2068	20	68	28	0.6	32.6	43.0	53	6.8	19	3	4 x 90°	M6	4	25.1	41.0	29.3	650	0.61	5,800	25
BSF2575	25	75	28	0.6	37.6	48.0	58	6.8	19	3	4 x 90°	M6	4	27.0	48.0	34.0	750	0.73	5,100	35
BSF3080	30	80	28	0.6	42.6	53.0	63	6.8	19	3	6 x 60°	M6	6	28.6	55.5	38.5	850	0.79	4,500	45
BSF30100	30	100	38	0.6	49.1	64.4	80	8.8	30	3	8 x 45°	M8	8	57.5	94.0	66.5	950	1.71	3,900	80
BSF3590	35	90	34	0.6	53.1	62.2	75	8.8	25	3	4 x 90°	M8	4	40.0	77.5	52.0	900	1.20	3,800	50
BSF40100	40	100	34	0.6	56.2	68.1	80	8.8	25	3	4 x 90°	M8	4	42.0	88.0	58.5	1,000	1.49	3,500	65
BSF40115	40	115	46	0.6	63.2	80.0	94	8.8	36	3	12 x 30°	M8	12	75.0	135.0	91.0	1,200	2.56	3,100	155
BSF50115	50	115	34	0.6	70.2	82.1	94	8.8	25	3	6 x 60°	M8	6	45.5	110.0	71.5	1,250	1.89	2,800	110
BSF50140	50	140	54	0.6	78.2	97.4	113	11.0	45	3	12 x 30°	M10	12	110.0	219.0	149.0	1,400	4.46	2,500	200
BSF60145	60	145	45	0.6	83.2	99.2	120	8.8	35	3	8 x 45°	M8	8	82.5	187.0	126.0	1,300	4.06	2,400	155

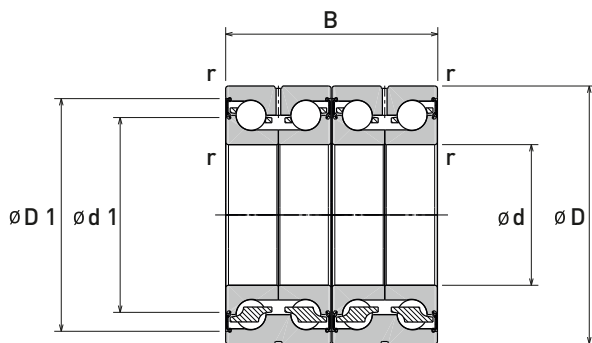
\* Limiting axial load: see p.10.

# BSN-DT Series



## BSN-DT series

The matched DT pairs are essentially the same as the individual bearings. The two individual bearings have simply been matched together in the paired version. Both bearings have a V-shaped mark on the outer diameter to ensure that they are arranged correctly.



Bearing Numbers	Boundary Dimensions (mm)				Reference Dimensions (mm)		Basic Dynamic Load Rating (kN)	Basic Static Load Rating (kN)	Limiting Axial Load (kN)	Axial Rigidity (N/μm)	Mass (kg)	Limiting Speed (rpm)	Tightening Torque (Nm)
	d	D	B	r (min)	d <sub>1</sub>	D <sub>1</sub>							
BSN1747-DT	17	47	50	0.6	28.1	37.7	31.5	59.5	42.5	790	0.46	6,700	19
BSN2052-DT	20	52	56	0.6	32.6	43.0	41.0	82.0	58.5	1,180	0.62	5,800	25
BSN2557-DT	25	57	56	0.6	37.6	48.0	44.0	96.0	68.0	1,370	0.71	5,100	35
BSN3062-DT	30	62	56	0.6	42.6	53.0	46.5	111.0	77.0	1,580	0.80	4,500	45
BSN3072-DT	30	72	76	0.6	49.1	64.4	93.5	188.0	133.0	1,800	1.47	3,900	80
BSN3572-DT	35	72	68	0.6	53.1	62.2	64.5	155.0	104.0	1,630	1.32	3,800	50
BSN4075-DT	40	75	68	0.6	56.2	68.1	68.5	176.0	117.0	1,850	1.30	3,500	65
BSN4090-DT	40	90	92	0.6	63.2	80.0	122.0	269.0	182.0	2,300	2.76	3,100	155
BSN5090-DT	50	90	68	0.6	70.2	82.1	74.0	220.0	143.0	2,330	1.86	2,800	110
BSN50110-DT	50	110	108	0.6	78.2	97.4	179.0	440.0	299.0	2,690	4.92	2,500	200

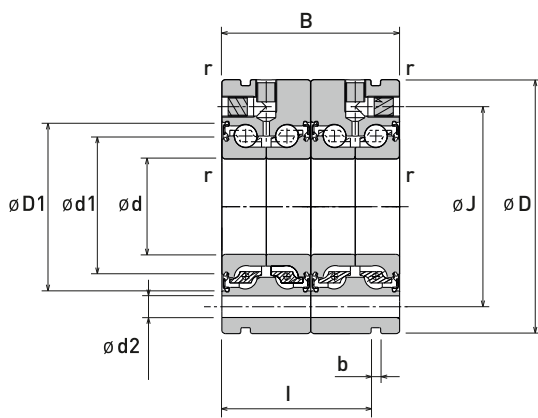
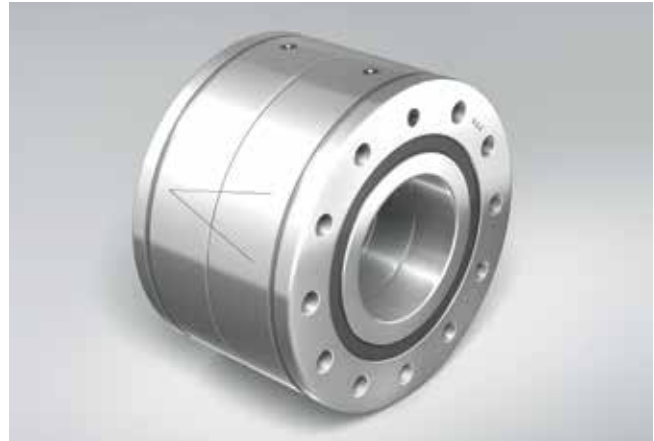
\* Limiting axial load: see p.10.



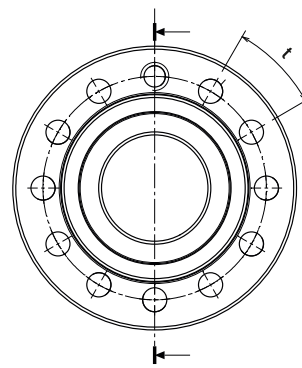
# BSF-DT Series

## BSF-DT series

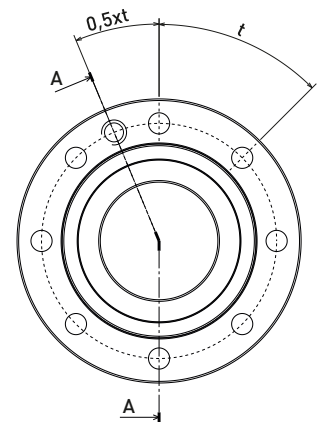
The matched DT pairs are essentially the same as the individual bearings. The two individual bearings have simply been matched together in the paired version. Some sizes also have additional fixing holes in the outer diameter. Both bearings have a V-shaped mark on the outer diameter to ensure that they are arranged correctly.



Design I



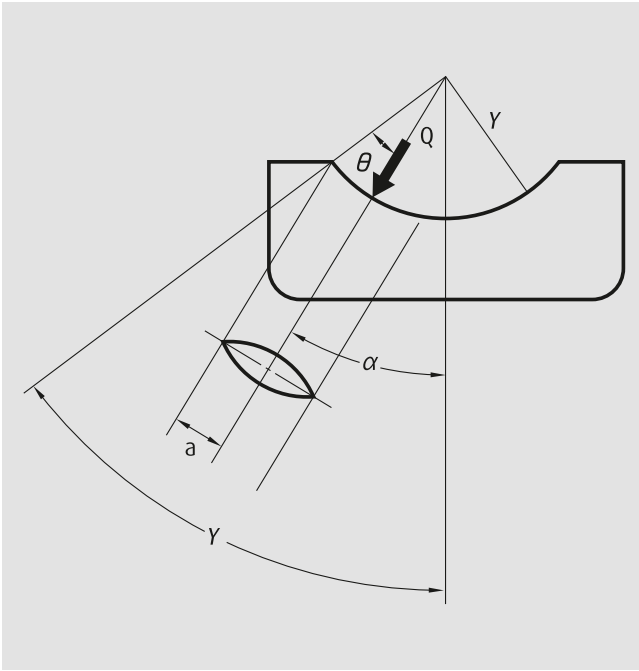
Design II



Bearing Numbers	Boundary Dimensions (mm)			Reference Dimensions (mm)								Fixing Screws		Basic Dynamic Load Rating (kN)	Basic Static Load Rating (kN)	Limiting Axial Load (kN)	Axial Rigidity (N/μm)	Mass (kg)	Limiting Speed (rpm)	Tightening Torque (Nm)	Design
	d	D	B	r (min)	d <sub>1</sub>	D <sub>1</sub>	J	d <sub>2</sub>	l	b	t	Size	Quantity								
BSF1762-DT	17	62	50	0.6	28.1	37.7	48	6.8	42	3	6 x 60°	M6	5	31.5	59.5	42.5	790	0.89	6,700	19	I
BSF2068-DT	20	68	56	0.6	32.6	43.0	53	6.8	47	3	8 x 45°	M6	7	41.0	82.0	58.5	1,180	1.17	5,800	25	I
BSF2575-DT	25	75	56	0.6	37.6	48.0	58	6.8	47	3	8 x 45°	M6	7	44.0	96.0	68.0	1,370	1.46	5,100	35	I
BSF3080-DT	30	80	56	0.6	42.6	53.0	63	6.8	47	3	12 x 30°	M6	11	46.5	111.0	77.0	1,580	1.58	4,500	45	I
BSF30100-DT	30	100	76	0.6	49.1	64.4	80	8.8	68	3	8 x 45°	M8	8	93.5	188.0	133.0	1,800	3.41	3,900	80	II
BSF3590-DT	35	90	68	0.6	53.1	62.2	75	8.8	59	3	8 x 45°	M8	7	64.5	155.0	104.0	1,630	2.30	3,800	50	I
BSF40100-DT	40	100	68	0.6	56.2	68.1	80	8.8	59	3	8 x 45°	M8	7	68.5	176.0	117.0	1,850	2.88	3,500	65	I
BSF40115-DT	40	115	92	0.6	63.2	80.0	94	8.8	82	3	12 x 30°	M8	12	122.0	269.0	182.0	2,300	5.12	3,100	155	II
BSF50115-DT	50	115	68	0.6	70.2	82.1	94	8.8	59	3	12 x 30°	M8	11	74.0	220.0	143.0	2,330	3.78	2,800	110	I
BSF50140-DT	50	140	108	0.6	78.2	97.4	113	11.0	99	3	12 x 30°	M10	12	179.0	440.0	299.0	2,690	8.92	2,500	200	II

\* Limiting axial load: see p.10.

# Limiting Axial Load



**NSK has calculated the limiting axial load using two different assumptions for optimum bearing use:**

1. The limit load which would cause the contact ellipse between the ball and the raceway to go over the shoulder of the raceway under the given axial load with the associated change in contact angle.
2. The equivalent static load  $P_0$ , which is calculated using the bearing's static capacity  $C_0$  and the axial factor  $Y_0$ .

The permissible axial load is equivalent to the lower of the two figures mentioned above. This has proved accurate in practice. Please refer to the bearing tables for details of the permissible axial loads.

Fig.: Contact Ellipse and limiting axial load

# Notes



---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

## NSK Sales Offices – Europe, Middle East and Africa

### UK

NSK UK Ltd.  
Northern Road, Newark  
Nottinghamshire NG24 2JF  
Tel. +44 (0) 1636 605123  
Fax +44 (0) 1636 643276  
info-uk@nsk.com

### France

NSK France S.A.S.  
Quartier de l'Europe  
2, rue Georges Guynemer  
78283 Guyancourt Cedex  
Tel. +33 (0) 1 30573939  
Fax +33 (0) 1 30570001  
info-fr@nsk.com

### Germany, Austria, Switzerland, Benelux, Nordic

NSK Deutschland GmbH  
Harkortstraße 15  
40880 Ratingen  
Tel. +49 (0) 2102 4810  
Fax +49 (0) 2102 4812290  
info-de@nsk.com

### Italy

NSK Italia S.p.A.  
Via Garibaldi, 215  
20024 Garbagnate  
Milanese (MI)  
Tel. +39 02 995 191  
Fax +39 02 990 25 778  
info-it@nsk.com

### Middle East

NSK Bearings Gulf Trading Co.  
JAFZA View 19, Floor 24 Office 2/3  
Jebel Ali Downtown,  
PO Box 262163  
Dubai, UAE  
Tel. +971 (0) 4 804 8202  
Fax +971 (0) 4 884 7227  
info-me@nsk.com

### Poland & CEE

NSK Polska Sp. z o.o.  
Warsaw Branch  
Ul. Migdałowa 4/73  
02-796 Warszawa  
Tel. +48 22 645 15 25  
Fax +48 22 645 15 29  
info-pl@nsk.com

### Russia

NSK Polska Sp. z o.o.  
Russian Branch  
Office I 703, Bldg 29,  
18<sup>th</sup> Line of Vasilievskiy Ostrov,  
Saint-Petersburg, 199178  
Tel. +7 812 3325071  
Fax +7 812 3325072  
info-ru@nsk.com

### South Africa

NSK South Africa (Pty) Ltd.  
27 Galaxy Avenue  
Linbro Business Park  
Sandton 2146  
Tel. +27 (011) 458 3600  
Fax +27 (011) 458 3608  
nsk-sa@nsk.com

### Spain

NSK Spain, S.A.  
C/ Tarragona, 161 Cuerpo Bajo  
2<sup>a</sup> Planta, 08014 Barcelona  
Tel. +34 93 2892763  
Fax +34 93 4335776  
info-es@nsk.com

### Turkey

NSK Rulmanları Orta Doğu Tic. Ltd. Şti  
19 Mayıs Mah. Atatürk Cad.  
Ulya Engin İş Merkezi No: 68/3 Kat. 6  
P.K.: 34736 - Kozyatağı - İstanbul  
Tel. +90 216 4777111  
Fax +90 216 4777174  
turkey@nsk.com

Please also visit our website: [www.nskeurope.com](http://www.nskeurope.com)  
Global NSK: [www.nsk.com](http://www.nsk.com)

