

B-3-1.11 Equipped with "NSK K1™" Lubrication Unit

This product is patented by NSK Ltd.

1. Features

"NSK K1™" is a new, efficient lubrication unit. Equipped with "NSK K1™", the ball screws demonstrate a superb performance as shown below.

- Long-term, maintenance-free usage
In mechanical environments where lubrication is difficult to apply, long-term running efficiency is maintained by using the "NSK K1™" in combination with grease.
- [ex.] For automotive component processing lines, etc.
- Does not pollute the environment
A very small volume of grease combined with NSK K1 Seal can provide sufficient lubrication in the environment where grease is undesirable as well as in the environment where high cleanliness is required.
- [ex.] Food processing/medical equipment, liquid crystal display/semiconductor manufacturing equipment, etc.
- Good for environments where lubricant is washed away
When used with grease, life of the machine is prolonged even when the machine is washed entirely by water, or in an environment where the machine is exposed to rain or wind.
- [ex.] Food processing equipment, housing/construction machines, etc.
- Maintains efficiency in dusty environment
In environment where oil- and grease-absorbing dust is produced, long-term efficiency in lubrication and prevention from foreign inclusions are maintained by using the "NSK K1™" in combination with grease.
- [ex.] Woodworking machines, etc.
- Comparative duration test of samples with and without NSK K1
Sample, testing conditions and test result are shown in Table 1 and Fig. 1.

Without lubricant, operation became impossible after running 8.6 km. With NSK K1 alone, it was possible to continue running exceeding 10000 km.

NSK conducts various tests under different conditions. Please consult NSK.

Table 1 Sample and testing conditions

Ball screw	Shaft dia. 20 mm, lead 20 mm
Lubrication	Comparison with only NSK K1 against no lubrication
Speed	4 000 min ⁻¹ (80 m/min)
Stroke	600 mm

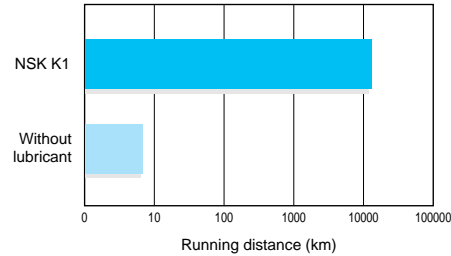


Fig. 1 Duration test results on ball screws without lubricant

2. Specifications

(1) Structure

The structure makes it possible to have a stable contact between the NSK K1 and outside of a ball screw with moderate force by a garter spring which fits onto outside of the NSK K1. NSK K1 is installed between the ball screw nut and the labyrinth seal. The overall nut length is slightly longer than Standard ball screw. Combination of NSK standard grease (factory-packed in the nut) and NSK K1 are standard specifications.



Fig. 2 NSK K1

(2) Accuracy grade and axial play

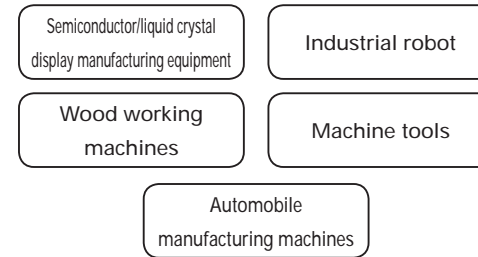
Accuracy grade, clearance and preload specifications remain unchanged. There is a slight increase in torque due to the equipped NSK K1.

(3) Overall nut length after equipped with NSK K1™

The nut length become longer than standard ball screw after equipped with NSK K1. The nut length after equipped K1 shown in page B211 to 214 for each recirculation. "NSK K1" can be installed on other types not listed in the dimension table, please consult with NSK.

(4) Application examples

Ball screws equipped with NSK K1 are maintenance-free for a long period of time. Its application is expanding in various industries.



◇Reference number for ball screw equipped with NSK K1

W1401 - P K1 - C3 Z10**

NSK K1 equipped type ball screw code

3. Precautions for use

Temperature range for use: Maximum temperature for use: 50°C

Momentary maximum temperature in use: 80°C

Chemicals that should not come to contact with K1:

Do not leave K1 Seal in organic solvent, white kerosene such as hexane, thinner which removes oil, and rust preventive oil which contains white kerosene.

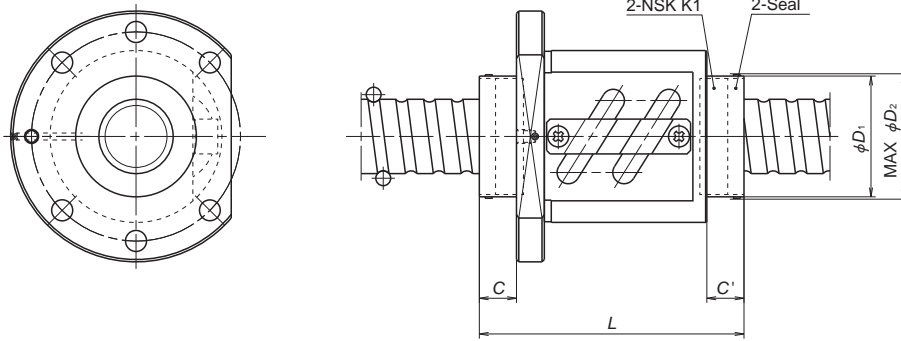
Note: Water-type cutting oil, oil-type cutting oil, grease such as mineral-type AS2 and ester-type PS2 do not damage K1 Seal.

4. Example of reference number

A structure of "Reference number for ball screw" is as follows.

Note: "K1" is added at the end of "nut model code" and "Specifications number".

(1) Tube type



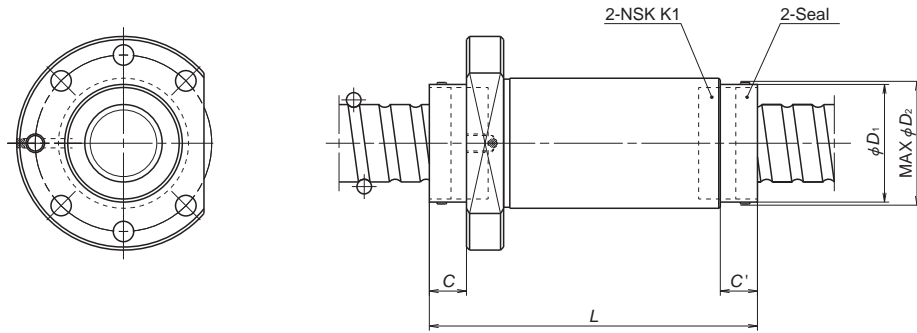
Tube type

Model No.	Screw shaft dia. <i>d</i>	Lead <i>I</i>	K1 installing dimension		Overall length when equipped K1 <i>L</i>	K1 cap dimension	
			<i>C</i>	<i>C'</i>		Cup dia. ϕD_1	Protruding dimension ϕD_2
PFT1004-2.5	10	4	14	15	61.5	$\phi 22$	MAX $\phi 24$
PFT1205-2.5	12	5	14	15	66	$\phi 26.5$	MAX $\phi 29$
LPFT1210-2.5	12	10	14	17	79	$\phi 26.5$	MAX $\phi 29$
PFT1405-2.5	14	5	14	15	65	$\phi 30$	MAX $\phi 32$
LPFT1510-2.5	15	10	14	15	76	$\phi 30$	MAX $\phi 32$
PFT1605-2.5	16	5	14	15	67	$\phi 32$	MAX $\phi 34$
PFT2005-5	20	5	14	14	81	$\phi 38$	MAX $\phi 40$
LPFT2010-2.5	20	10	14	14	78	$\phi 38$	MAX $\phi 40$
LPFT2020-1.5	20	20	14	14	84	$\phi 38$	MAX $\phi 40$
ZFT2505-10	25	5	16	17	115	$\phi 44$	MAX $\phi 46$
PFT2506-5	25	6	16	17	93	$\phi 44$	MAX $\phi 46$
PFT2510-2.5	25	10	16	17	89	$\phi 44$	MAX $\phi 46$
ZFT2510-3	25	10	16	17	103	$\phi 44$	MAX $\phi 46$
LPFT2520-2.5	25	20	12	12	109	$\phi 38$	MAX $\phi 40$
LPFT2525-1.5	25	25	12	12	98	$\phi 38$	MAX $\phi 40$
DFT2805-5	28	5	16	17	137	$\phi 48$	MAX $\phi 50$
PFT2810-2.5	28	10	16	17	90	$\phi 48$	MAX $\phi 50$
DFT2810-3	28	10	16	17	174	$\phi 48$	MAX $\phi 50$
PFT3206-5	32	6	16	17	93	$\phi 52$	MAX $\phi 54$
ZFT3206-10	32	6	16	17	129	$\phi 52$	MAX $\phi 54$
PFT3210-5	32	10	16	17	122	$\phi 52$	MAX $\phi 54$
ZFT3210-5	32	10	16	17	122	$\phi 52$	MAX $\phi 54$
DFT3210-5	32	10	16	16	212	$\phi 52$	MAX $\phi 54$
PFT3212-3	32	12	16	17	114	$\phi 52$	MAX $\phi 54$
DFT3212-3	32	12	16	16	198	$\phi 52$	MAX $\phi 54$
LPFT3225-2.5	32	25	12	12	122	$\phi 46$	MAX $\phi 48$
LPFT3232-1.5	32	32	12	12	109	$\phi 46$	MAX $\phi 48$

Model No.	Screw shaft dia. <i>d</i>	Lead <i>I</i>	K1 installing dimension		Overall length when equipped k1 <i>L</i>	K1 cap dimension	
			<i>C</i>	<i>C'</i>		Cup dia. ϕD_1	Protruding dimension ϕD_2
PFT3610-5	36	10	19	20	131	$\phi 56$	MAX $\phi 58$
DFT3610-5	36	10	19	19	221	$\phi 56$	MAX $\phi 58$
HZF3616-5	36	16	19	19	163	$\phi 56$	MAX $\phi 58$
HZF3620-3.5	36	20	19	19	146	$\phi 56$	MAX $\phi 58$
PFT4008-5	40	8	19	20	117	$\phi 62$	MAX $\phi 64$
ZFT4008-10	40	8	19	20	165	$\phi 62$	MAX $\phi 64$
ZFT4010-7	40	10	19	20	152	$\phi 62$	MAX $\phi 64$
DFT4010-5	40	10	19	19	222	$\phi 61$	MAX $\phi 64$
PFT4012-5	40	12	19	20	144	$\phi 62$	MAX $\phi 64$
DFT4012-5	40	12	19	19	252	$\phi 61$	MAX $\phi 64$
HZF4016-5	40	16	19	19	164	$\phi 61$	MAX $\phi 64$
HZF4020-5	40	20	19	19	189	$\phi 61$	MAX $\phi 64$
LPFT4032-2.5	40	32	14	14	151	$\phi 54$	MAX $\phi 56$
LPFT4040-1.5	40	40	14	14	133	$\phi 54$	MAX $\phi 56$
DFT4510-5	45	10	19	19	222	$\phi 72$	MAX $\phi 75$
DFT4512-5	45	12	19	19	254	$\phi 72$	MAX $\phi 75$
HZF4520-5	45	20	19	19	190	$\phi 72$	MAX $\phi 75$
ZFT5010-10	50	10	19	20	194	$\phi 73$	MAX $\phi 76$
DFT5012-5	50	12	19	19	256	$\phi 73$	MAX $\phi 76$
ZFT5016-5	50	16	19	20	172	$\phi 73$	MAX $\phi 76$
DFT5016-5	50	16	19	19	300	$\phi 73$	MAX $\phi 76$
HZF5020-5	50	20	19	19	192	$\phi 73$	MAX $\phi 76$
HZF5025-5	50	25	19	19	221	$\phi 73$	MAX $\phi 76$
DFT5516-5	55	16	22	22	178	$\phi 81$	MAX $\phi 87$
HZF5520-5	55	20	22	22	198	$\phi 81$	MAX $\phi 81$
HZF5525-5	55	25	22	22	227	$\phi 81$	MAX $\phi 81$
DFT6316-5	63	16	22	22	322	$\phi 89$	MAX $\phi 95$
DFT6320-5	63	20	22	22	362	$\phi 89$	MAX $\phi 95$

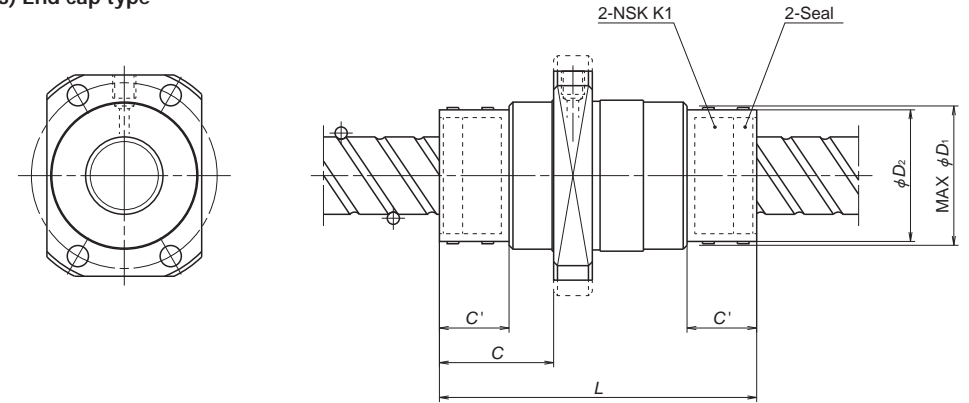
Remarks 1. "NSK K1" can be installed on other types not listed in the table. Please consult NSK.
2. C, C' and L are the dimensions when one NSK K1 is equipped to both ends of the nut.

(2) Deflector type



Deflector type

(3) End cap type



End cap type

Model No.	Screw shaft dia. <i>d</i>	Lead <i>l</i>	K1 installing dimension		Overall length when equipped K1 <i>L</i>	K1 cap dimension	
			<i>C</i>	<i>C'</i>		Cup dia. ϕD_1	Protruding dimension ϕD_2
ZFD2005-6	20	5	9	9	87	$\phi 32$	MAX $\phi 34$
ZFD2506-6	25	6	12	—	102	$\phi 38$	MAX $\phi 40$
ZFD2510-4	25	10	12	12	106	$\phi 38$	MAX $\phi 40$
ZFD3208-8	32	8	12	12	136	$\phi 46$	MAX $\phi 48$
ZFD3210-6	32	10	12	12	138	$\phi 46$	MAX $\phi 48$
ZFD3212-6	32	12	12	12	153	$\phi 46$	MAX $\phi 48$
ZFD4010-8	40	10	14	14	167	$\phi 54$	MAX $\phi 57$
ZFD4012-8	40	12	14	14	189	$\phi 54$	MAX $\phi 57$
ZFD5010-8	50	10	14	14	169	$\phi 64$	MAX $\phi 67$
ZFD5012-6	50	12	14	14	167	$\phi 64$	MAX $\phi 67$

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Model No.	Screw shaft dia. <i>d</i>	Lead <i>l</i>	K1 installing dimension		Overall length when equipped K1 <i>L</i>	K1 cap dimension	
			<i>C</i>	<i>C'</i>		Cup dia. ϕD_1	Protruding dimension ϕD_2
UPFC1520-1.5	15	20	29	18	81	$\phi 30$	MAX $\phi 32$
LPFC1616-3	16	16	28	18	74	$\phi 28$	MAX $\phi 30$
LPFC2020-3	20	20	29.5	18	82	$\phi 34$	MAX $\phi 36$
UPFC2040-1	20	40	29	18	77	$\phi 32$	MAX $\phi 34$
LPFC2525-3	25	25	34	21	97	$\phi 44$	MAX $\phi 46$
UPFC2550-1	25	50	34	21	92	$\phi 44$	MAX $\phi 46$
LPFC3232-3	32	32	37	21	112	$\phi 52$	MAX $\phi 54$
UPFC3264-1	32	64	36.5	21	104	$\phi 52$	MAX $\phi 54$
LPFC4040-3	40	40	43.5	24	133	$\phi 62$	MAX $\phi 65$
LPFC5050-3	50	50	45.5	24	155	$\phi 74$	MAX $\phi 77$

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2. C, C' and L are the dimensions when one NSK K1 is equipped to both ends of the nut.