

# Block type Linear Ball Spline

## LSB

**IKD** Block type Linear Ball Spline is a linear motion rolling guide, featuring a slide unit which performs endless linear motion along a spline shaft. Two rows of steel balls are arranged in four point contact with the raceways. This design ensures stable high accuracy and rigidity in operations even under fluctuating loads with changing direction and magnitude or complex loads.

### Interchangeable

All models in this series are interchangeable specification products. The dimensions of slide units and spline shafts are individually controlled, so that the spline shafts and slide units can be combined, added or exchanged freely.

### Stainless steel type

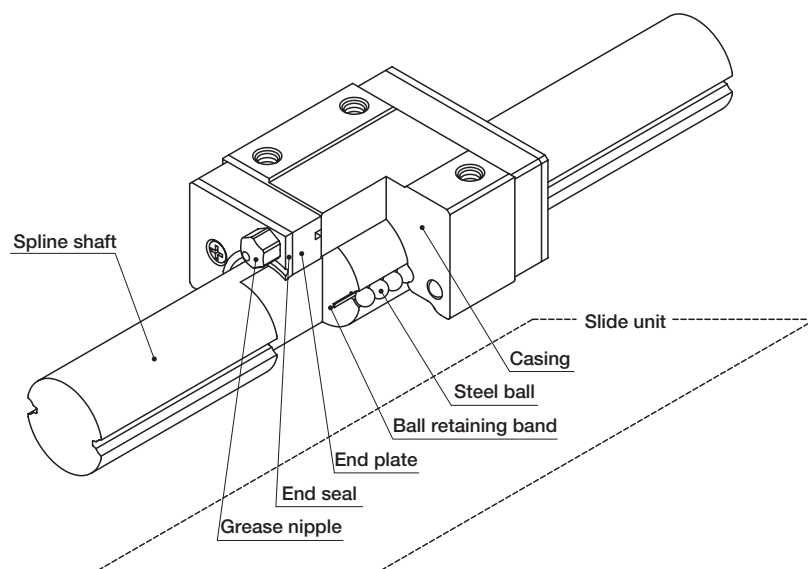
The stainless steel type has excellent corrosion resistance and is most suitable for machines and equipment used in clean environments, for example, medical equipment, measuring instruments, and semiconductor manufacturing equipment.

### Easy mounting

The slide unit is provided with threaded mounting holes for easy mounting on machines or equipment with bolts.

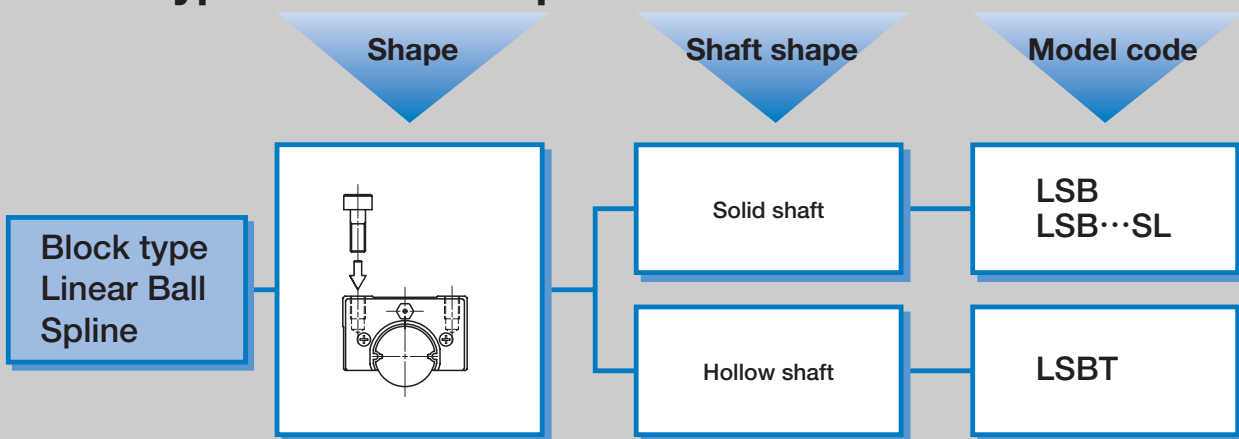
### Hollow shaft

In high carbon steel type, hollow shafts are also available in addition to solid shafts. The hollow shafts are suitable for applications in which piping, wiring or ventilation is needed.



Structure of Block type Linear Ball Spline

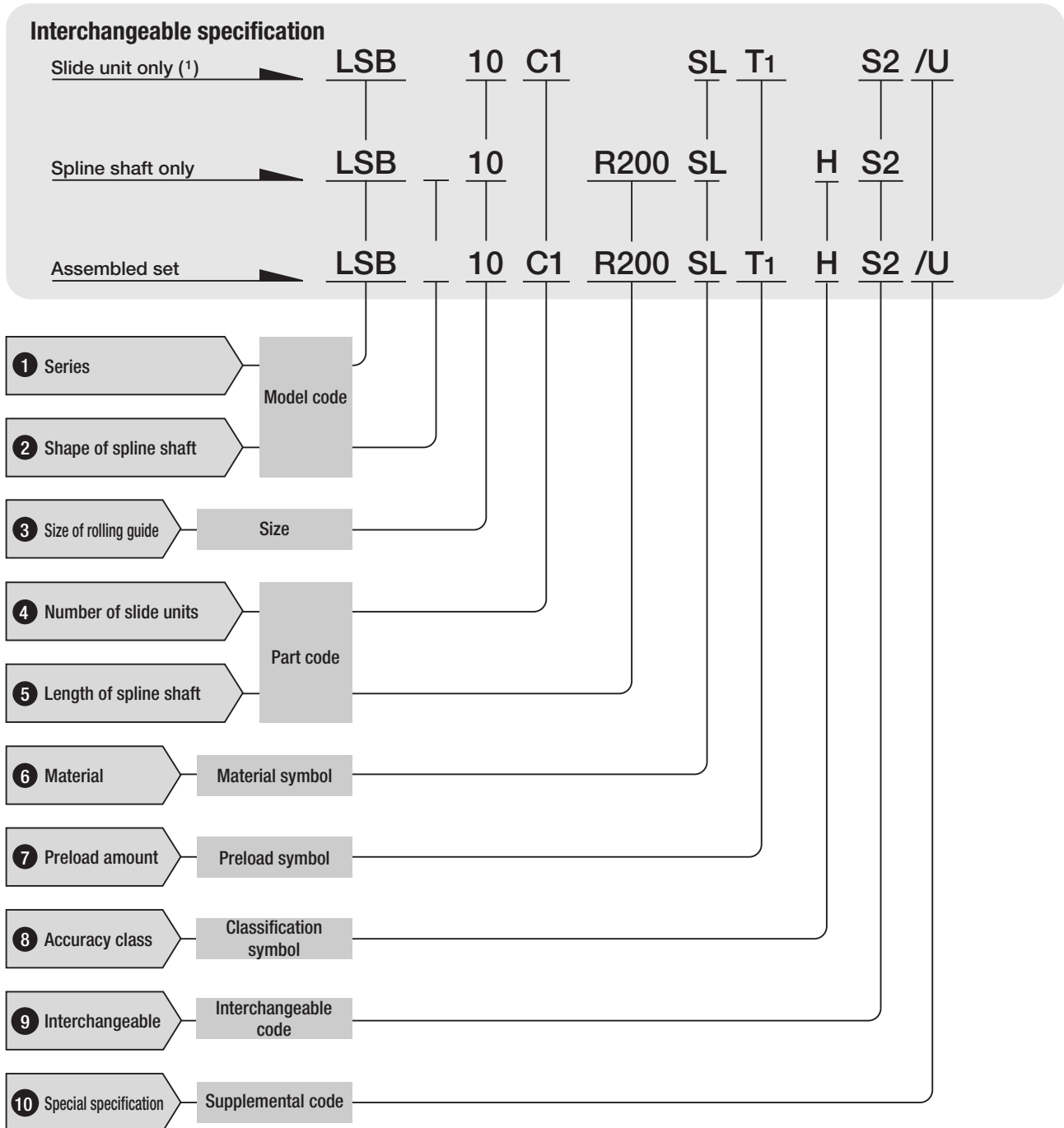
# Block type Linear Ball Spline series



Remark : Models with "SL" are stainless steel type.

## ● Identification number and specification

The specification of Block type Linear Ball Spline is indicated by the identification number, consisting of a model code, a size, a part code, a material symbol, a preload symbol, a classification symbol, an interchangeable code and any supplemental codes. For details of each specification, see page D-6.



Note(1) : For the model code of a single slide unit, indicate "LSB" regardless of the spline shaft type to be combined.

**1 Series**

LSB

**2 Shape of spline shaft**

Solid shaft : No symbol  
Hollow shaft : T

For available slide unit models, materials and sizes, see Table 1.1. For available spline shaft models, materials and sizes, see Table 1.2.

**3 Size of rolling guide**

**4 Number of slide units**

Assembled set : C○  
Slide unit : C1

For an assembled set, indicate the number of slide units assembled on one spline shaft. For a slide unit, only "C1" can be indicated.

**5 Length of spline shaft**

Assembled set : R○  
Spline shaft : R○

Indicate the length of spline shaft in mm. For standard and maximum lengths of spline shafts, see the table of dimensions.

**6 Material**

High carbon steel made : No symbol  
Stainless steel made : SL

For available material types, see Tables 1.1 and 1.2.



LSB

Table 1.1 Models and sizes of slide unit of Block type Linear Ball Spline

Size \ Model	High carbon steel made	Stainless steel made
	LSB···C1···S1 LSB···C1···S2	LSB···C1 SL···S1 LSB···C1 SL···S2
6	—	☆
8	—	☆
10	—	☆
13	☆	—
16	☆	—
20	☆	—
25	☆	—

Remark : For the slide units of size 6, 8, and 10 models, only the stainless steel type is available. If high carbon steel type is specified in the identification number of assembled set, only the spline shaft will be high carbon steel type.

Table 1.2 Models and sizes of spline shaft of Block type Linear Ball Spline

Size \ Model	High carbon steel made		Stainless steel made
	Solid shaft LSB···R···S1 LSB···R···S2	Hollow shaft LSBT···R···S1 LSBT···R···S2	Solid shaft LSB···R SL···S1 LSB···R SL···S2
6	☆	☆	☆
8	☆	☆	☆
10	☆	☆	☆
13	☆	☆	—
16	☆	☆	—
20	☆	☆	—
25	☆	☆	—

**7** Preload amount

Standard : No symbol      Specify this item for an assemble set or a single slide unit. For applicable preload types, see Table 2. For details of preload amount, see page D-15.  
 Light preload : T1

Table 2 Applicable preload types

Size	Standard (No symbol)	Light preload (T <sub>1</sub> )
6	☆	—
8	☆	☆
10	☆	☆
13	☆	☆
16	☆	☆
20	☆	☆
25	☆	☆

**8 Accuracy class**

Ordinary : No symbol Specify this item for an assemble set or a single spline shaft. For details of accuracy, see page D-11.  
 High : H

**9 Interchangeable code**

Select group 1 : S1 Assemble slide units and spline shafts with the same interchangeable code.  
 Select group 2 : S2 Performance and accuracy of "S1" group and "S2" group are the same.

**10 Special specification**

For applicable special specifications, see Table 3.  
 For details of special specifications, see page D-16.

**Table 3 Special specifications of Block type Linear Ball Spline**

Special specification	Supplemental code
No end seal	N
With under seals	U

Remark 1 : Applicable to a single slide unit and an assembled set.  
 2 : "No end seal" and "With under seals" cannot be combined.

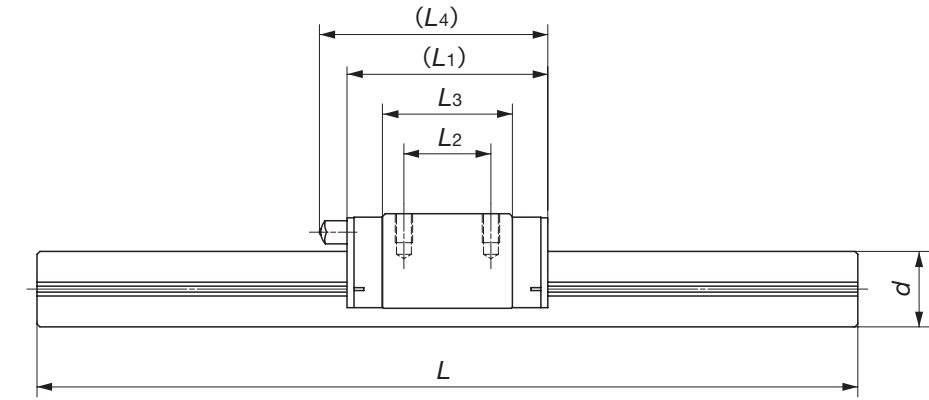
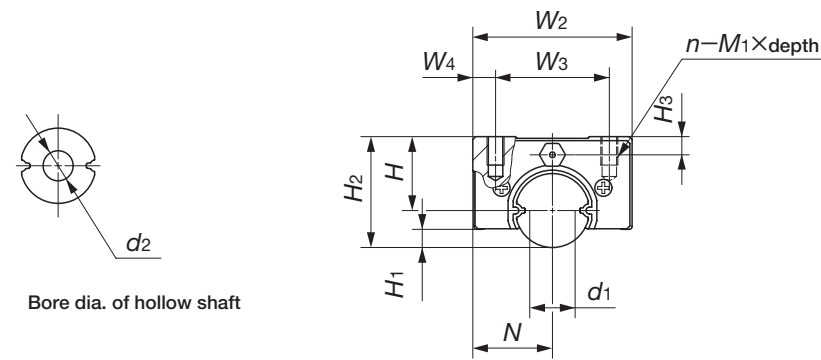
**● Moment of inertia of sectional area and section modulus of spline shaft**

Moment of inertia of sectional area and section modulus of the spline shaft are shown in Table 4.

**Table 4 Moment of inertia of sectional area and section modulus of spline shaft**

Size	Moment of inertia of sectional area mm <sup>4</sup>		Section modulus mm <sup>3</sup>	
	Solid shaft	Hollow shaft	Solid shaft	Hollow shaft
6	55	54	19	19
8	170	170	44	43
10	440	420	90	87
13	1 220	1 160	190	180
16	2 830	2 630	360	340
20	7 110	6 620	730	680
25	17 600	15 100	1 440	1 230

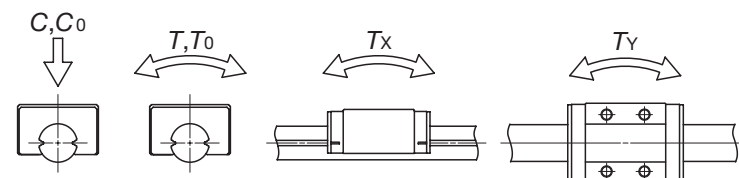
## LSB • LSBT



Model number	Interchangeable	Mass (Ref.) g		Dimensions of assembly mm				Dimensions of slide unit mm								
		Slide unit	Spline shaft (per 100 mm)	H	H <sub>1</sub>	H <sub>2</sub>	N	W <sub>2</sub>	W <sub>3</sub>	W <sub>4</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	n-M <sub>1</sub> ×depth	H <sub>3</sub>
LSB 6	☆	7.6	21.2	6	1.1	9	6.5	13	8	2.5	19	—	12.5	—	2-M2×3	1.5
LSBT 6	☆		18.8													
LSB 6...SL	☆		21.2													
LSB 8	☆	18	37.6	8	1.3	12	9	18	12	3	25	8	15.6	—	4-M3×3	1.5
LSBT 8	☆		32.1													
LSB 8...SL	☆		37.6													
LSB 10	☆	34	59.7	10	1.9	15	10.5	21	15	3	31	10	21.2	—	4-M3×4	2.5
LSBT 10	☆		49.8													
LSB 10...SL	☆		59.7													
LSB 13	☆	62	100	13	3.2	19.5	14	28	20	4	35	15	22.4	40	4-M3×5	3.2
LSBT 13	☆		77.9													
LSB 16	☆	112	152	16	4.2	24	16.5	33	25	4	43	20	28.8	48	4-M4×6	4
LSBT 16	☆		113													
LSB 20	☆	215	240	20	5.8	30	20	40	30	5	53	25	37.3	58	4-M5×10	5
LSBT 20	☆		178													
LSB 25	☆	403	376	25	6	37.5	26	52	40	6	67	30	41.8	70	4-M6×12	6
LSBT 25	☆		237													

Dimensions and tolerance of spline shaft mm						Basic dynamic load rating <sup>(4)</sup> C N	Basic static load rating <sup>(4)</sup> C <sub>0</sub> N	Dynamic torque rating <sup>(4)</sup> T N·m	Static torque rating <sup>(4)</sup> T <sub>0</sub> N·m	Static moment rating <sup>(4)</sup>	
d	Tolerance <sup>(1)</sup>	d <sub>1</sub> <sup>(2)</sup>	d <sub>2</sub>	L <sup>(3)</sup>	Maximum length					T <sub>x</sub> N·m	T <sub>y</sub> N·m
6	0 -0.012	3.7	2	150 200	300	612	1 130	1.8	3.4	2.4 13.3	2.0 11.2
						489	907	1.5	2.7	1.9 10.7	1.6 8.9
8	0 -0.015	5	3	150 200 250	500	1 200	1 960	4.8	7.8	4.9 31.4	4.1 26.3
					400	963	1 570	3.9	6.3	3.9 25.1	3.3 21.1
					500	1 610	2 860	8.1	14.3	9.4 55.0	7.9 46.2
10	0 -0.015	6.9	4	200 300	600	1 290	2 290	6.5	11.4	7.5 44.0	6.3 36.9
						1 610	2 860	8.1	14.3	9.4 55.0	7.9 46.2
13	0 -0.018	9	6	200 300 400	800	2 960	4 450	19.2	28.9	16.0 99.9	13.4 83.8
						4 390	6 730	35.1	53.9	30.8 183	25.9 153
16	0 -0.018	11.4	8	200 300 400	1 000	5 830	9 420	58.3	94.2	54.6 310	45.8 260
						9 360	13 900	122	181	99.2 587	99.2 587
20	0 -0.021	15	10	300 400 500 600	1 000	9 360	13 900	122	181	99.2 587	99.2 587
						13 900	19 300	19.3	30.8 183	25.9 153	
25	0 -0.021	19.3	15	300 400 500 600 800	1 200	19 300	28 900	122	181	99.2 587	99.2 587
						28 900	43 800	19.3	30.8 183	25.9 153	

Note<sup>(1)</sup>: Not applicable to the hollow shaft (LSBT).  
<sup>(2)</sup>: Dimension d<sub>1</sub> indicates the maximum diameter when machining is done at the shaft ends.  
<sup>(3)</sup>: This length is the standard length. Spline shafts in other length are also available. Simply indicate the necessary length of spline shaft in mm in the identification number.  
<sup>(4)</sup>: The directions of basic dynamic load rating (C), basic static load rating (C<sub>0</sub>), dynamic torque rating (T) and static torque/moment rating (T<sub>0</sub>, T<sub>x</sub>, T<sub>y</sub>) are shown in the sketches below.  
 The upper values in the T<sub>x</sub> and T<sub>y</sub> columns apply to one slide unit, and the lower values apply to two slide units in close contact.  
 Remark 1: All Block type Linear Ball Splines are interchangeable specification products.  
 2: Models LSB6, LSBT6, LSB6...SL, LSB8, LSBT8, LSB8...SL, LSB10, LSBT10 and LSB10...SL are provided with an oil hole.  
 For grease nipple and oil hole specifications, see page D-19.



Example of identification number of assembled set (For details, see "Identification number and specification".)

