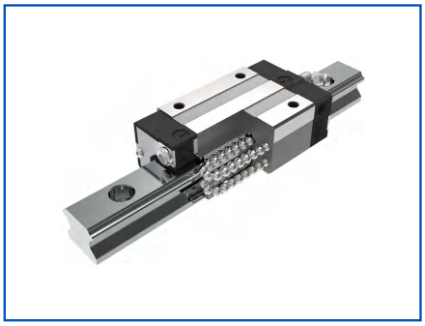
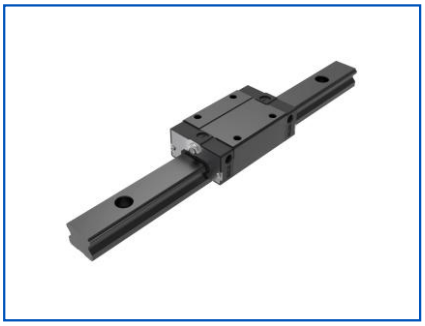
INNOVATIVE TECHNOLOGY

NI SENSORE®

BALL & ROLLER GUIDEWAYS



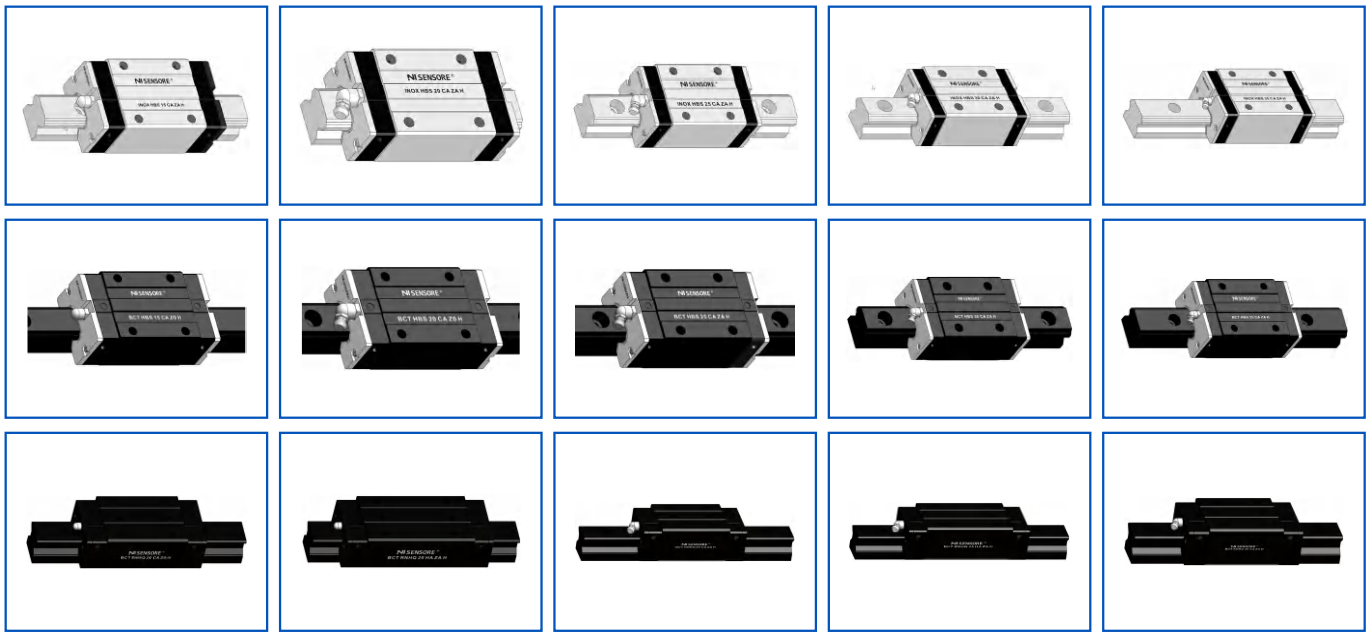
Stainless Steel (INOX)



Cold Electroplating (BCT - Ball Tpye)

Cold Electroplating (BCT - Roller Tpye)

Solution for anti-rusty linear Guideways



Company Profile

BINGGO Automation's technological foundation is rooted in its sister company, NIPPON KODO TECHNOLOGY AUTOMATION CO., LIMITED. (Est. 1997). For over 25 years, NIPPON KODO has been a cornerstone of the bearings and linear motion industry. Its flagship brand, NIKO, synonymous with "Precision Engineered to Last," supplies **high-qualities of linear guides, pinions/racks, shafts, ball screws and bearings** to clients worldwide in heavy machinery, automotive assembly, and industrial robotics.

In 2018, to address Industry 4.0 demands for agility and customization, the Group launched its **Dual-Brand Strategy:**

- NIPPON KODO (via NIKO) continues to refine standardized components, optimizing global supply chains for cost-efficiency and durability.
- **BINGGO Automation** (via NiSENSORE) focuses on high-tech customization, pushing boundaries with digital twin modeling and rapid prototyping.

United by 25+ years of engineering expertise, the two brands form a synergistic ecosystem: **NIKO powers industrial foundations, while NiSENSORE drives intelligent innovation**, delivering seamless solutions for both legacy industries and emerging technological challenges.

NI SENSORE

High-Tech Precision, Customized for Innovation
(BINGGO)

- Cutting-edge stainless steel linear guides & smart sensors
- Using digital platforms for facing worldwide customers
- Quick delivery for specialized industries (semiconductors, medical, aerospace and so on)

Quality Management
& Consultancy

NIKO® NIPPON KODO AUTOMATION TECHNOLOGY

UKAS ISO9001

日本高導オートメーションテクノロジー株式会社
会社法人等番号　１３０９ー０１ー００１３３２

Website: http://www.nipponkodobearings.com

Proven Motion Solutions, Built to Last
(NIPPON KODO)

- 27+ years in bearings & linear motion systems
- Standardized components for heavy-duty applications
- Global supply chain for cost-effective reliability

Certificate of Registration

NIPPON KODO TECHNOLOGY AUTOMATION CO., LTD.

USCI: 91331100MACKCTLH4C

Registered address:No. 795 South Ming Road, Workshop 3, Nanmingshan Subdistrict, Lishui City, Zhejiang Province

Production / Business address:Second floor、No. 126, Shangxu Road, Nanmingshan Subdistrict, Lishui City, Zhejiang Province

operates a

Quality Management System

which complies with the requirements of:

GB/T 19001-2016/ISO 9001:2015

The registration covers Sales of transmission components (linear block, linear guides, linear ball bearings, racks and pinions, linear shafts)

Original Certification: 2025-06-13
Issue/Revised Date: 2025-06-13
Registration No:LY505E5058Q
Expiry Date: 2028-06-12

The certified organization must regularly receive supervision and audit and passed the examination and approval.This certificate will continue to be valid. The qualified label attached to the certificate indicates that the audit has been approved.
Shanghai Liyang Certification Co., Ltd. (CNCA-R-2021-890,Address: Room 712, No. 216, Ningguo Road,Yangpu District, Shanghai) issued this certificate according to the rules of CNCA and the rules of certification of Shanghai Liyang Certification Co., Ltd.
The certificate can be verified on CNCA's web site at www.cnca.gov.cn.

signer:

Shanghai Liyang Certification Co., Ltd.
Room 712, No. 216, Ningguo Road,Yangpu District, Shanghai


NISENSORE

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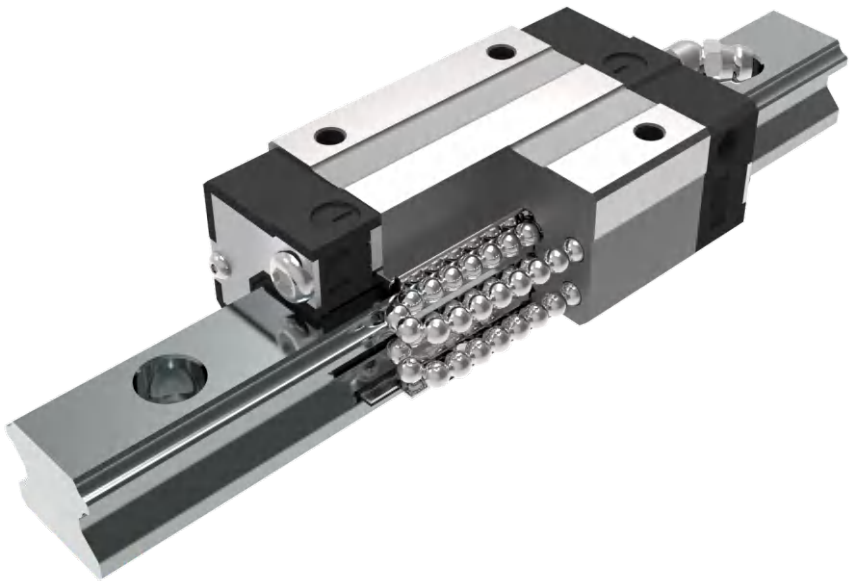
Stainless Steel (INOX)

Cold Electroplating (BCT - Ball Type)

Cold Electroplating (BCT - Roller Type)


NISENSORE

Stainless Steel Linear Guides



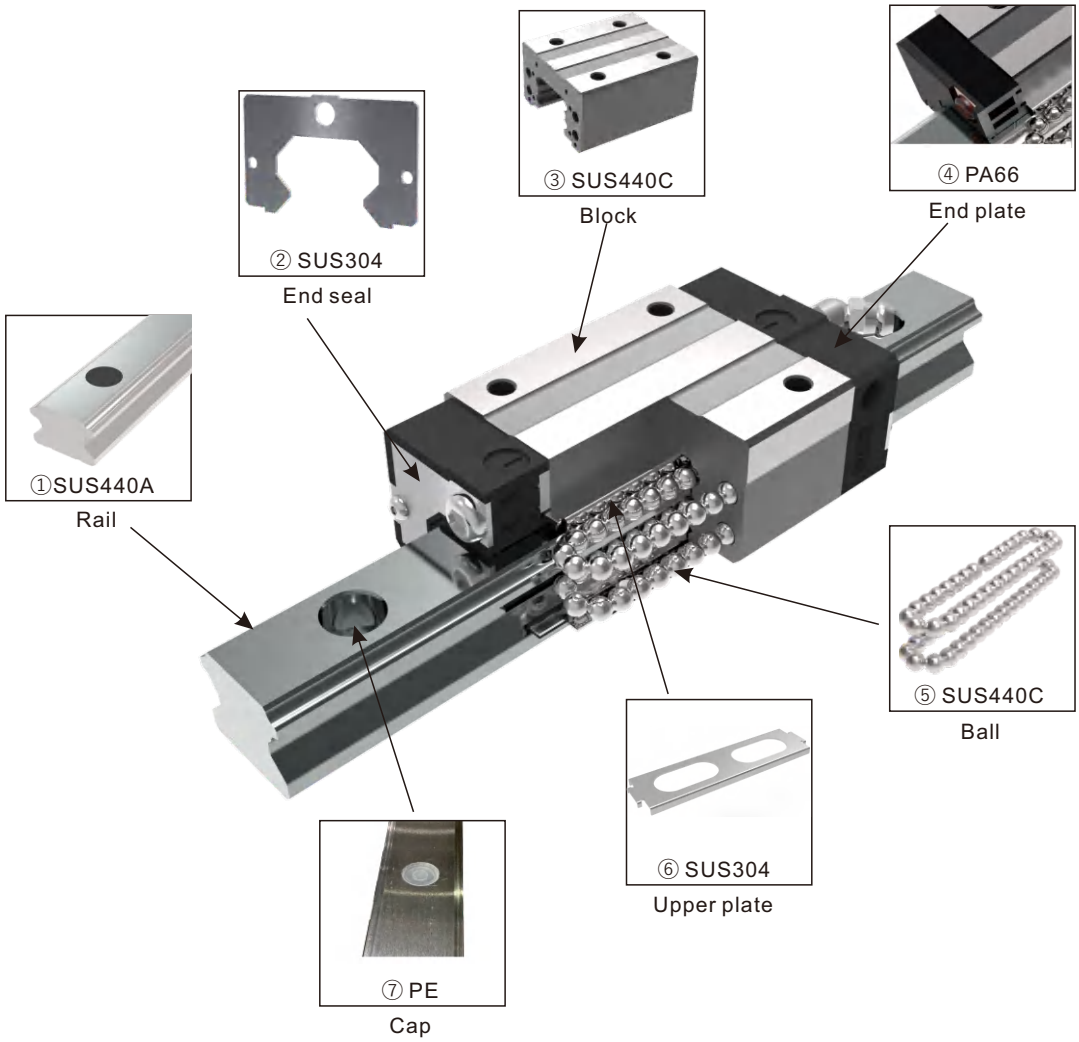
Typical Applications

High-precision machinery, semiconductor equipment,

aerospace systems, and other demanding environments.

INOX HB & INOX LB Series

Structure Designation



Material Composition Table

Material name.	Material composition table (%)							
X90CrMoV18	C	Si	Mn	P	S	Cr	V	Mo
	0.85 - 0.95	≤1.00	≤1.00	≤0.040	≤0.015	17.00 - 19.00	0.07 - 0.12	0.90 - 1.30

Material name.	Material composition table (%)						
SUS304	C	Si	Mn	P	S	Cr	Ni
	≤0.08	≤1	≤2	≤0.045	≤0.03	18.00-20.00	8.00-10.50

Material name.	Material composition table (%)		
PA66	AA	HMDA	H2O
	45.7	54.3	< 2.0

Material name.	Material composition table (%)	
PE	AA	HMDA
	45.7	54.3

1. Materials

1.1. Guide Rail Material

Stainless Steel Material: The guide rail is made of SUS440A stainless steel. SUS440A is a high-carbon martensitic stainless steel with the following characteristics:

- High Hardness: After heat treatment, the hardness can reach HRC 58-60, providing excellent wear resistance.
- Corrosion Resistance: It offers good corrosion resistance in general and humid environments.
- High Cleanliness: The smooth surface minimizes dust generation, making it suitable for cleanroom environments.

1.2 Ball Material

Stainless Steel Balls: The balls are made of SUS440C stainless steel.

-The balls and guide rail are made of the same material to prevent electrochemical corrosion caused by material differences in corrosive environments.
-The balls undergo precision machining and polishing to ensure smooth operation and low noise.

1.3 Retainer Material

Stainless Steel Retainer: The retainer is made of SUS304 austenitic stainless steel, which offers excellent corrosion resistance and toughness.

-The retainer fixes the balls in place, ensuring even distribution and reducing friction and wear.

1.4 Seal and End Cover Material

Special Rubber Seals: The seals are made of corrosion-resistant and high-temperature-resistant PA 66.
-The seals prevent dust, moisture, and corrosive substances from entering the guide rail while maintaining lubricant stability.

Stainless Steel End Covers: The end covers are made of SUS 316L stainless steel to ensure overall corrosion resistance.

1.5 Lubricant Recommendations

Food-Grade Lubricant: INOX HBS / INOX HBF series food-grade lubricants are available, suitable for food processing, pharmaceuticals, and other applications with high hygiene requirements.
High-Temperature Lubricant: For high-temperature environments, special high-temperature lubricants can be used to ensure stable operation of the guide rail.

1.6 Surface Treatment

Precision Polishing: The guide rail and balls undergo precision polishing to reduce the friction coefficient and improve operational accuracy.
Passivation Treatment: The stainless steel surface is passivated to further enhance its corrosion resistance.

Application:

The series made of stainless steel and featuring special designs, is highly suitable for the following applications:

-**Food Processing Equipment:** Such as filling machines, packaging machines, etc.
-**Pharmaceutical Equipment:** Such as pharmaceutical production lines, testing equipment, etc.
-**Semiconductor Equipment:** Such as wafer handling equipment, packaging equipment, etc.
-**Medical Equipment:** Such as surgical robots, testing instruments, etc.
-**Marine Engineering Equipment:** Such as ship equipment, underwater robots, etc.
-**Chemical Equipment:** Such as chemical reaction equipment, wastewater treatment equipment, etc.

2. Hardness

The NiSENOSRE Stainless Steel Series is a linear motion guide system OEM-produced by Zhejiang Jinshanmen Transmission Tchnology Co., Ltd (JSM). It is manufactured using stainless steel materials and is suitable for applications requiring corrosion resistance and hygienic conditions.

Below are the general hardness references for the INOX HBS and INOX HBF stainless steel series:

2.1. Guide Rail Hardness

Material: Typically made of stainless steel (e.g., SUS 440A).
Hardness: After heat treatment, the surface hardness of the guide rail can reach HRC 56-60.

2.2. Block Hardness

Rolling Elements (Balls or Rollers): Typically made of stainless steel (e.g., SUS 440C), with a hardness range of HRC 56-60.
Slider Body: Made of stainless steel and subjected to appropriate surface treatment, with a hardness generally in the range of HRC 50-55.

2.3. Other Components

End Covers, Seals, and Auxiliary Parts: These are typically made of stainless steel or other corrosion-resistant materials. Their hardness values may be lower, depending on the material and processing techniques used.

Note:
- The above hardness values are general references. The actual hardness of the products may vary due to differences in material batches, heat treatment processes, and manufacturing standards.
- For further assistance, please provide specific model numbers or application scenarios to obtain more precise information.

Quality Management
& Consultancy

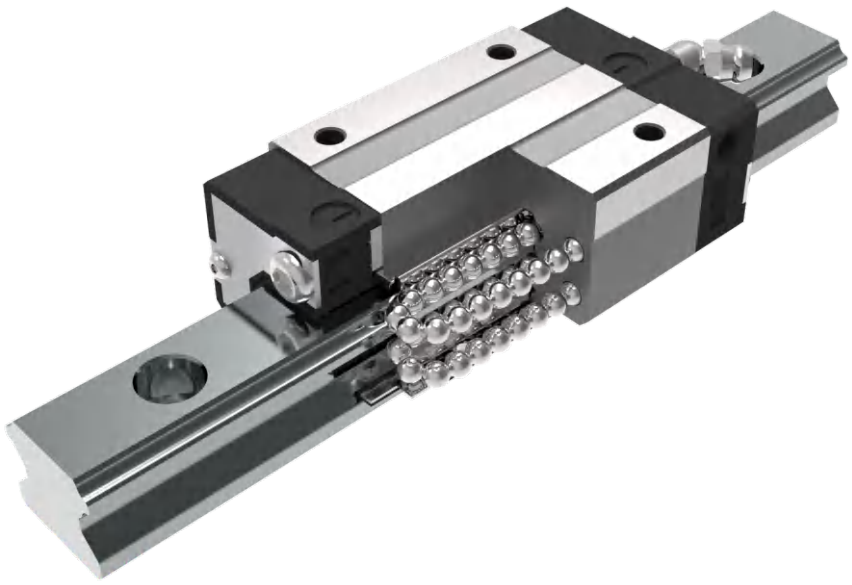
NIKO® NIPPON KODO AUTOMATION TECHNOLOGY

UKAS ISO9001

日本高導オートメーションテクノロジー株式会社
会社法人等番号　１３０９－０１－００１３３２

Website: http://www.nipponkodobearings.com

Stainless Steel Linear Guides



Designation

INOX Linear Guideways

(1) Interchangeable type

INOX HB	S	2 0	C	C		E	Z 0	H	Z Z / E 2
Series	Type	Model					Preload	Class	Accessories
①	②	③	④	⑤	⑧	⑨	⑩	⑪	⑬

INOX HB	R	2 0	R	2 0 0 0	E	Z 0	H	R C
Series	Type	Model		Rail Length (mm)		Preload	Class	Accessories
①	②	③	⑦	⑧	⑨	⑩	⑪	⑬

(2) Non-Interchangeable type

INOX LB	F	3 0	C	C	2	R	2 0 0 0	Z A	H	II	D D / E 2
Series	Type	Model					Rail Length (mm)	Preload	Class		Accessories
①	②	③	④	⑤	⑥	⑦	⑧	⑩	⑪	⑫	⑬

Remarks:

① Series
HB : High Block
LB : Low Block

② Types
S : Square Type
F : Flange Type

③ Model sizes
M5, M7, M9, M12, M15
15, 20, 25, 30, 35, 45

④ Load Types
C: Heavy Load
H: Super Heavy Load

⑤ Block Mounting Types
A: Mounting From Top
B: Bottom
C: Top or Bottom

⑥
No.of Blocks per Rail

⑦ Rail Mounting Types
R: Mounting Type
T: Bottom

⑧
Rail Length (mm)

⑨
E: Special Block
None: Standard Block

⑩ Preload
Z0,ZA

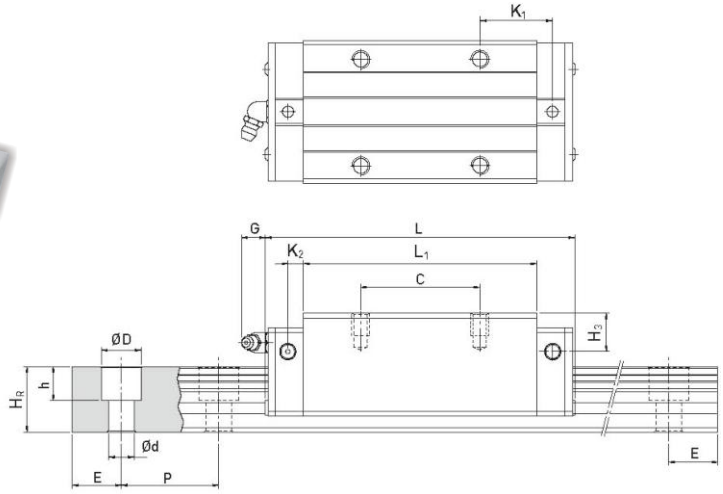
⑪ Precision	
C	H

⑫
Nos. of rails per axis

⑬ Accessories
DD: Dust Protection
E2: Self-Lubricant
SE: Metallic End Cap

Product Information

Heavy Load and Super Heavy Load
Ball Type Inox Linear Blocks (Square)
Series INOX HBS



Model No. (Precision C & H)	Unit Price US$	Dimensions of Aembly (mm)			Dimensions of Block (mm)												
		H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	H2	H3
INOX HBS M5 C	10.34	6	1	3.5	12	8	2	-	9.6	16.0	-	-	-	M2x1.5	-	1.2	-
INOX HBS M5 H	-	6	1	3.5	12	8	2	6	12.6	19.0	-	-	-	M2x1.5	-	1.2	-
INOX HBS M7 C	4.92	8	1.5	5	17	12	2.5	8	13.5	22.5	-	-	Ø1.2	M2x2.5	-	1.5	-
INOX HBS M7 H	5.80	8	1.5	5	17	12	2.5	13	21.8	30.8	-	-	Ø1.2	M2x2.5	-	1.5	-
INOX HBS M9 C	4.92	10	2	5.5	20	15	2.5	10	18.9	28.9	-	-	Ø1.4	M3x3	-	1.8	-
INOX HBS M9 H	5.80	10	2	5.5	20	15	2.5	16	29.9	39.9	-	-	Ø1.4	M3x3	-	1.8	-
INOX HBS M12 C	5.80	13	3	7.5	27	20	3.5	15	21.7	34.7	-	-	Ø2	M3x3.5	-	2.5	-
INOX HBS M12 H	6.36	13	3	7.5	27	20	3.5	20	32.4	45.4	-	-	Ø2	M3x3.5	-	2.5	-
INOX HBS M15 C	9.26	16	4	8.5	32	25	3.5	20	26.7	42.1	-	4.5	M3	M3x4	-	3	-
INOX HBS M15 H	10.34	16	4	8.5	32	25	3.5	25	43.4	58.8	-	4.5	M3	M3x4	-	3	-

Notes: ① Materials: SUS 440 C.

② The above prices apply to quantities of 1-50pcs. For quantities exceeding this, please contact sales for a quote.


INOX HBS M7C Z0 H


INOX HBS M7H Z0 H


INOX HBS M9C Z0 H


INOX HBS M9H Z0 H

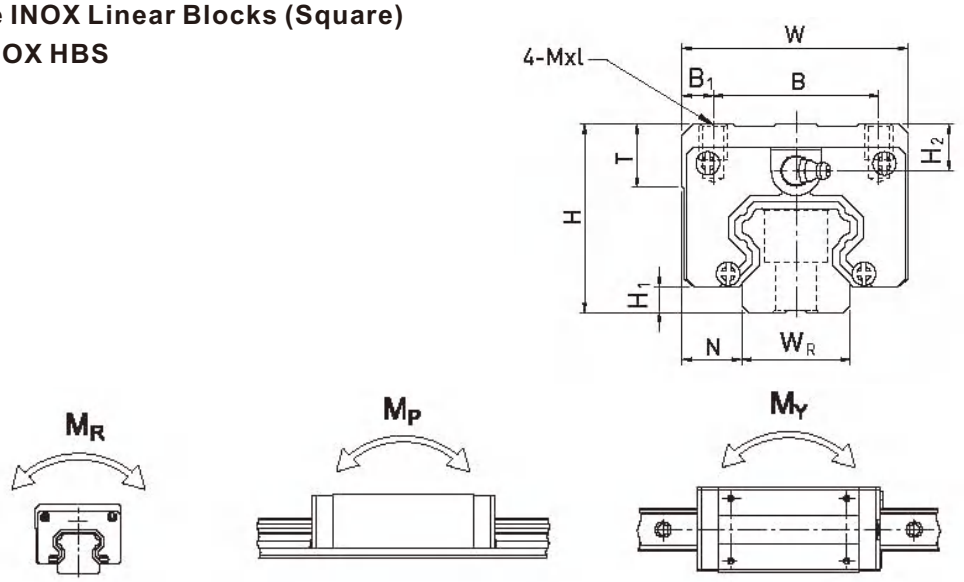

INOX HBS M12C Z0 H


INOX HBS M12H Z0 H


INOX HBS M15C Z0 H

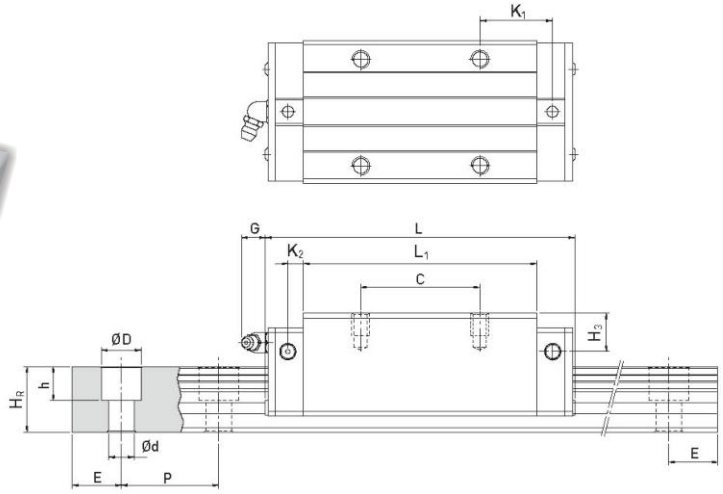

INOX HBS M15H Z0 H

Heavy Load and Super Heavy Load
Ball Type INOX Linear Blocks (Square)
Series INOX HBS



Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
										MR	MP	MY	Block	Rail
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
5	3.7	3.6	0.8	2.4	15	7.5	M2x6	0.56	0.81	2.20	1.40	1.20	0.003	0.12
5	3.7	3.6	0.8	2.4	15	7.5	M2x6	0.67	1.09	2.90	2.30	1.90	0.004	0.13
7	4.8	4.2	2.3	2.4	15	5	M2x6	0.98	1.24	4.70	2.84	2.84	0.010	0.22
7	4.8	4.2	2.3	2.4	15	5	M2x6	1.37	1.96	7.64	4.80	4.80	0.015	0.22
9	6.5	6	3.5	3.5	20	7.5	M3x8	1.86	2.55	11.76	7.35	7.35	0.016	0.38
9	6.5	6	3.5	3.5	20	7.5	M3x8	2.55	4.02	19.60	18.62	18.62	0.026	0.38
12	8	6	4.5	3.5	25	10	M3x8	2.84	3.92	25.48	13.72	13.72	0.034	0.65
12	8	6	4.5	3.5	25	10	M3x8	3.72	5.88	38.22	36.26	36.26	0.054	0.65
15	10	6	4.5	3.5	40	15	M3x10	4.61	5.59	45.08	21.56	21.56	0.059	1.06
15	10	6	4.5	3.5	40	15	M3x10	6.37	9.11	73.50	57.82	57.82	0.092	1.06

Heavy Load and Super Heavy Load
Ball Type Inox Linear Blocks (Square)
Series INOX HBS



Model No. (Precision C & H)	Unit Price	Dimensions of Aembly (mm)			Dimensions of Block (mm)												
	US$	H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	H2	H3
INOX HBS 15 CA	24.12	28	4.3	9.5	34	26	4	26	39.4	61.4	10	5.3	-	M4x5	6	7.95	7.7
INOX HBS 20 CA	32.52	30	4.6	12	44	32	6	36	50.5	77.5	12.25	12	-	M5x6	8	6	6
INOX HBS 20 HA	-	30	4.6	12	44	32	6	50	65.2	92.2	12.6	12	-	M5x6	8	6	6
INOX HBS 25 CA	50.34	40	5.5	12.5	48	35	6.5	35	58	84	15.7	12	-	M6x8	8	10	9
INOX HBS 25 HA	-	40	5.5	12.5	48	35	6.5	50	78.6	104.6	18.5	12	-	M6x8	8	10	9
INOX HBS 30 CA	84.34	45	6	16	60	40	10	40	70	97.4	20.25	12	-	M8x10	8.5	9.5	13.8
INOX HBS 30 HA	-	45	6	16	60	40	10	60	93	120.4	21.75	12	-	M8x10	8.5	9.5	13.8
INOX HBS 35 CA	115.8	55	7.5	18	70	50	10	50	80	112.4	20.6	12	-	M8x12	10.2	16	19.6
INOX HBS 35 HA	-	55	7.5	18	70	50	10	72	105.8	138.2	22.5	12	-	M8x12	10.2	16	19.6
INOX HBS 45 CA	-	70	9.5	20.5	86	60	13	60	97	139.4	23	12.9	-	M10x17	16	18.5	30.5
INOX HBS 45 HA	-	70	9.5	20.5	86	60	13	80	128.8	171.2	28.9	12.9	-	M10x17	16	18.5	30.5

Notes: ① Materials: SUS 440 C.

② The above prices apply to quantities of 1-50pcs. For quantities exceeding this, please contact sales for a quote.


INOX HBS 15 CA ZA H


INOX HBS 20 CA ZA H


INOX HBS 20 HA ZA H


INOX HBS 25 CA ZA H


INOX HBS 25 HA ZA H


INOX HBS 30 CA ZA H


INOX HBS 30 HA ZA H

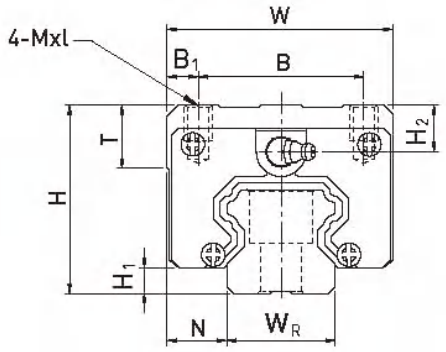

INOX HBS 35 CA ZA H

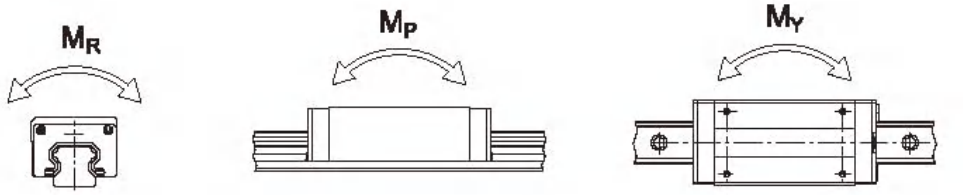

INOX HBS 35 HA ZA H


INOX HBS 45 CA ZA H


INOX HBS 45 HA ZA H

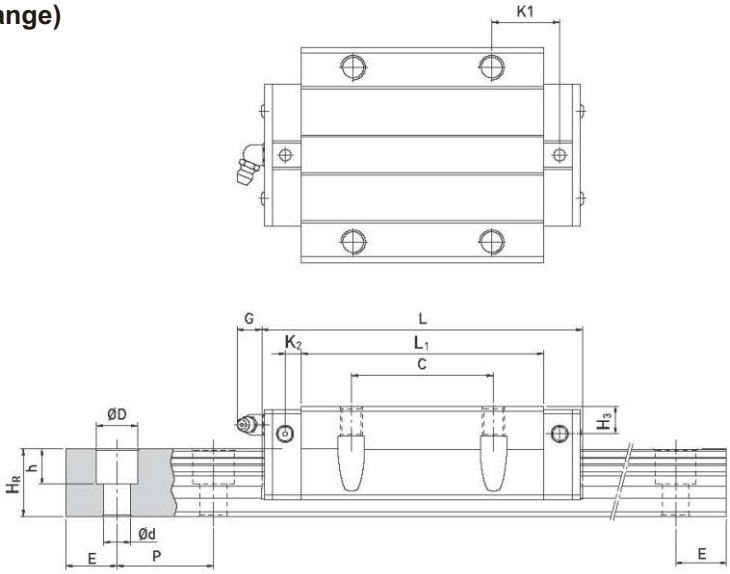
Heavy Load and Super Heavy Load
Ball Type Inox Linear Blocks (Square)
Series INOX HBS





Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
										MR	MP	MY	Block	Rail
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.18	1.45
20	17.5	9.5	8.5	6	60	20	M5x16	27.1	36.68	0.27	0.20	0.20	0.30	2.21
20	17.5	9.5	8.5	6	60	20	M5x16	32.7	47.96	0.35	0.35	0.35	0.39	2.21
23	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.51	3.21
23	22	11	9	7	60	20	M6x20	42.2	69.07	0.56	0.57	0.57	0.69	3.21
28	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	0.88	4.47
28	26	14	12	9	80	20	M8x25	58.6	93.99	0.88	0.92	0.92	1.16	4.47
34	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.45	6.30
34	29	14	12	9	80	20	M8x25	77.9	122.77	1.54	1.40	1.40	1.92	6.30
45	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.73	10.41
45	38	20	17	14	105	22.5	M12x35	125.3	191.85	2.63	2.68	2.68	3.61	10.41

Heavy Load and Super Heavy Load Ball Type High Linear Blocks (Flange) Series INOX HBF



Model No. (Precision C & H)	Unit Price	Dimensions of Aembly (mm)			Dimensions of Block (mm)													
	US$	H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	T1	H2	H3
INOX HBF M7 C	8.68	9	1.9	5.5	25	19	3	10	21	31.2	-	-	Ø1.2	M3x3	-	-	1.85	-
INOX HBF M7 H	9.26	9	1.9	5.5	25	19	3	19	30.8	41	-	-	Ø1.2	M3x3	-	-	1.85	-
INOX HBF M9 C	10.34	12	2.9	6	30	21	4.5	12	27.5	39.3	-	-	Ø1.2	M3x3	-	-	2.4	-
INOX HBF M9 H	11.58	12	2.9	6	30	23	3.5	24	38.5	50.7	-	-	Ø1.2	M3x3	-	-	2.4	-
INOX HBF M12 C	11.58	14	3.4	8	40	28	6	15	31.3	46.1	-	-	Ø1. 2	M3x3.6	-	-	2.8	-
INOX HBF M12 H	13.02	14	3.4	8	40	28	6	28	45.6	60.4	-	-	Ø1. 2	M3x3.6	-	-	2.8	-
INOX HBF M15 C	17.38	16	3.4	9	60	45	7.5	20	38	54.8	-	5.2	M3	M4x4.2	-	-	3.2	-
INOX HBF M15 H	19.02	16	3.4	9	60	45	7.5	35	57	73.8	-	5.2	M3	M4x4.2	-	-	3.2	-

Notes: ① Materials: SUS 440 C.

② The above prices apply to quantities of 1-50pcs. For quantities exceeding this, please contact sales for a quote.


INOX HBF M7C Z0 H


INOX HBF M7H Z0 H


INOX HBF M9C Z0 H


INOX HBF M9H Z0 H

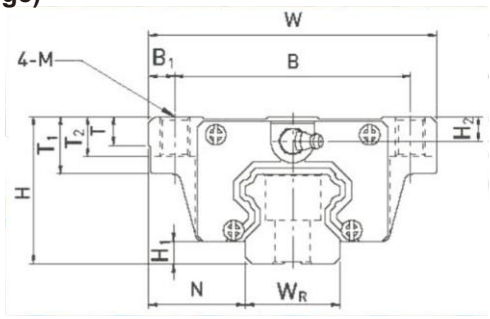

INOX HBF M12C Z0 H

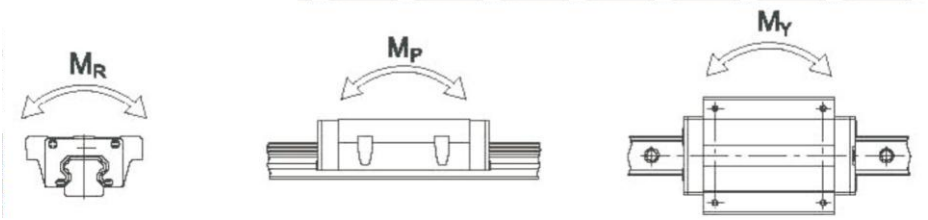

INOX HBF M12H Z0 H


INOX HBF M15C Z0 H


INOX HBF M15H Z0 H

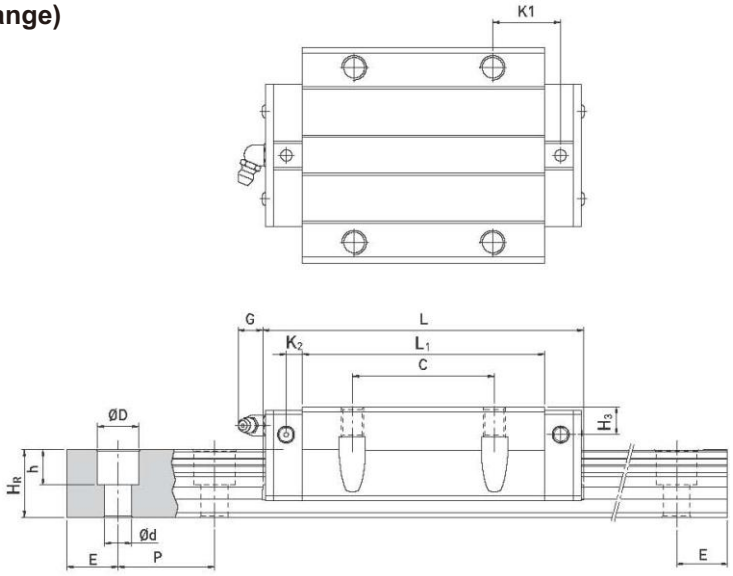
Heavy Load and Super Heavy Load
Ball Type High Linear Blocks (Flange)
Series INOX HBF





Dimensions of Rail (mm)								Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
											MR	MP	MY	Block	Rail
WR	WB	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
14	-	5.2	6	3.2	3.5	30	10	M3x6	1.37	2.06	15.70	7.14	7.14	0.020	0.51
14	-	5.2	6	3.2	3.5	30	10	M3x6	1.77	3.14	23.45	15.53	15.53	0.029	0.51
18	-	7	6	4.5	3.5	30	10	M3x8	2.75	4.12	40.12	18.96	18.96	0.040	0.91
18	-	7	6	4.5	3.5	30	10	M3x8	3.43	5.89	54.54	34.00	34.00	0.057	0.91
24	-	8.5	8	4.5	4.5	40	15	M4x8	3.92	5.59	70.34	27.80	27.80	0.071	1.49
24	-	8.5	8	4.5	4.5	40	15	M4x8	5.10	8.24	102.70	57.37	57.37	0.103	1.49
42	23	9.5	8	4.5	4.5	40	15	M4x10	6.77	9.22	199.34	56.66	56.66	0.143	2.86
42	23	9.5	8	4.5	4.5	40	15	M4x10	8.93	13.38	299.01	122.60	122.60	0.215	2.86

Heavy Load and Super Heavy Load
Ball Type High Linear Blocks (Flange)
Series INOX HBF



Model No. (Precision C & H)	Unit Price	Dimensions of Aembly (mm)			Dimensions of Block (mm)													
	US$	H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	T1	H2	H3
INOX HBF 15 CC	30.42	24	4.3	16	47	38	4.5	30	39.4	61.4	8	5.3	-	M5	6	8.9	3.95	3.7
INOX HBF 20 CC	44.06	30	4.6	21.5	63	53	5	40	50.5	77.5	10.25	12	-	M6	8	10	6	6
INOX HBF 20 HC	-	30	4.6	21.5	63	53	5	40	65.2	92.2	17.6	12	-	M6	8	10	6	6
INOX HBF 25 CC	66.08	36	5.5	23.5	70	57	6.5	45	58	84	10.7	12	-	M8	8	14	6	5
INOX HBF 25 HC	-	36	5.5	23.5	70	57	6.5	45	78.6	104.6	21	12	-	M8	8	14	6	5
INOX HBF 30 CC	105.32	42	6	31	90	72	9	52	70	97.4	14.25	12	-	M10	8.5	16	6.5	10.8
INOX HBF 30 HC	-	42	6	31	90	72	9	52	93	120.4	25.75	12	-	M10	8.5	16	6.5	10.8
INOX HBF 35 CC	140.56	48	7.5	33	100	82	9	62	80	112.4	14.6	12	-	M10	10.1	18	9	12.6
INOX HBF 35 HC	-	48	7.5	33	100	82	9	62	105.8	138.2	27.5	12	-	M10	10.1	18	9	12.6

Notes: ① Materials: SUS 440 C.

② The above prices apply to quantities of 1-50pcs. For quantities exceeding this, please contact sales for a quote.

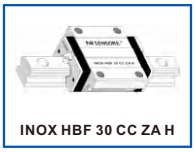

INOX HBF 15 CC Z0 H


INOX HBF 20 CC Z0 H

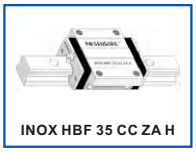

INOX HBF 20 HC Z0 H


INOX HBF 25 CC ZA H


INOX HBF 25 HC ZA H

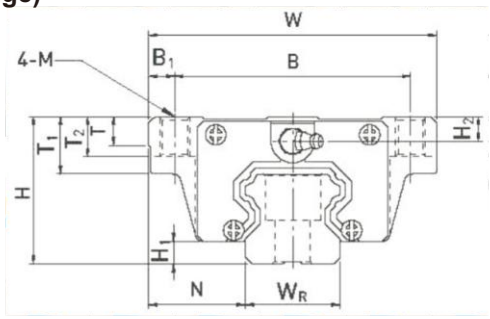

INOX HBF 30 CC ZA H

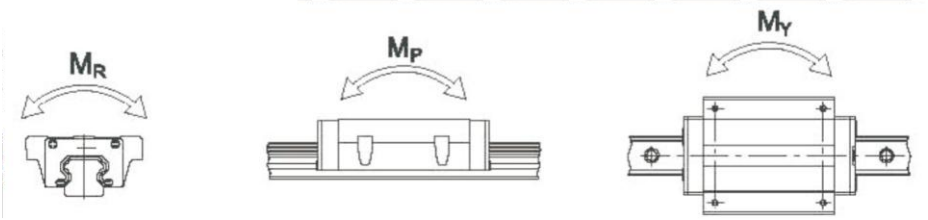

INOX HBF 30 HC ZA H


INOX HBF 35 CC ZA H


INOX HBF 35 HC ZA H

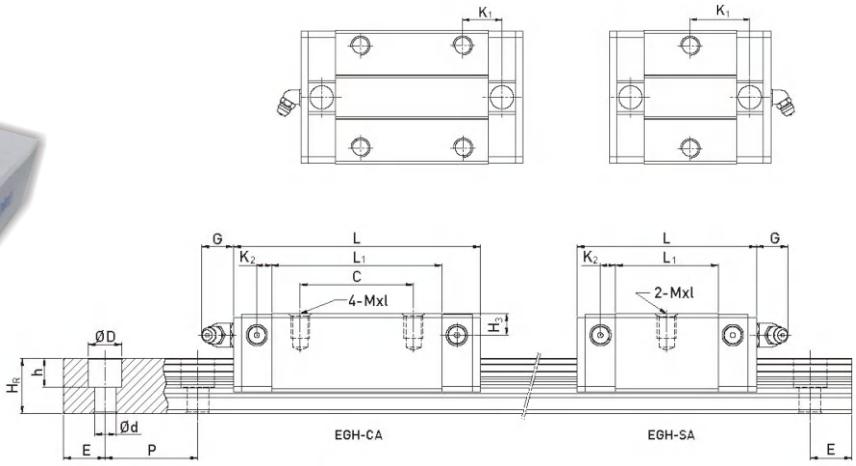
Heavy Load and Super Heavy Load
Ball Type High Linear Blocks (Flange)
Series INOX HBF





Dimensions of Rail (mm)								Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
											MR	MP	MY	Block	Rail
WR	WB	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	-	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.17	1.45
20	-	17.5	9.5	8.5	6	60	20	M5x16	27.1	36.68	0.27	0.20	0.20	0.40	2.21
20	-	17.5	9.5	8.5	6	60	20	M5x16	32.7	47.96	0.35	0.35	0.35	0.52	2.21
23	-	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.59	3.21
23	-	22	11	9	7	60	20	M6x20	42.2	69.07	0.56	0.57	0.57	0.80	3.21
28	-	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	1.09	4.47
28	-	26	14	12	9	80	20	M8x25	58.6	93.99	0.88	0.92	0.92	1.44	4.47
34	-	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.56	6.30
34	-	29	14	12	9	80	20	M8x25	77.9	122.77	1.54	1.40	1.40	2.06	6.30

Heavy Load and Super Heavy Load
Ball Type Inox Linear Blocks (Square)
Series INOX LBS



Model No. (Precision C & H)	Unit Price	Dimensions of Aembly (mm)			Dimensions of Block (mm)												
	US$	H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	H2	H3
INOX LBS 15 SA	-	24	4.5	9.5	34	26	4	-	23.1	40.1	14.8	5.7	-	M4x6	6	5.5	6
INOX LBS 15 CA	24.12	24	4.5	9.5	34	26	4	26	39.8	56.8	10.15	5.7	-	M4x6	6	5.5	6
INOX LBS 20 SA	-	28	6	11	42	32	5	-	29	50	18.75	12	-	M5x7	7.5	6	6
INOX LBS 20 CA	32.52	28	6	11	42	32	5	32	48.1	69.1	12.3	12	-	M5x7	7.5	6	6
INOX LBS 25 SA	-	33	7	12.5	48	35	6.5	-	35.5	59.1	21.9	12	-	M6x9	8	8	8
INOX LBS 25 CA	50.34	33	7	12.5	48	35	6.5	35	59	82.6	16.15	12	-	M6x9	8	8	8
INOX LBS 30 SA	-	42	10	16	60	40	10	-	41.5	69.5	26.75	12	-	M8x12	9	8	9
INOX LBS 30 CA	-	42	10	16	60	40	10	40	70.1	98.1	21.05	12	-	M8x12	9	8	9

Notes: ① Materials: SUS 440 C.
② The above prices apply to quantities of 1-50pcs. For quantities exceeding this, please contact sales for a quote.


INOX LBS 15 SA Z0 H


INOX LBS 15 CA Z0 H


INOX LBS 20 SA Z0 H


INOX LBS 20 CA Z0 H

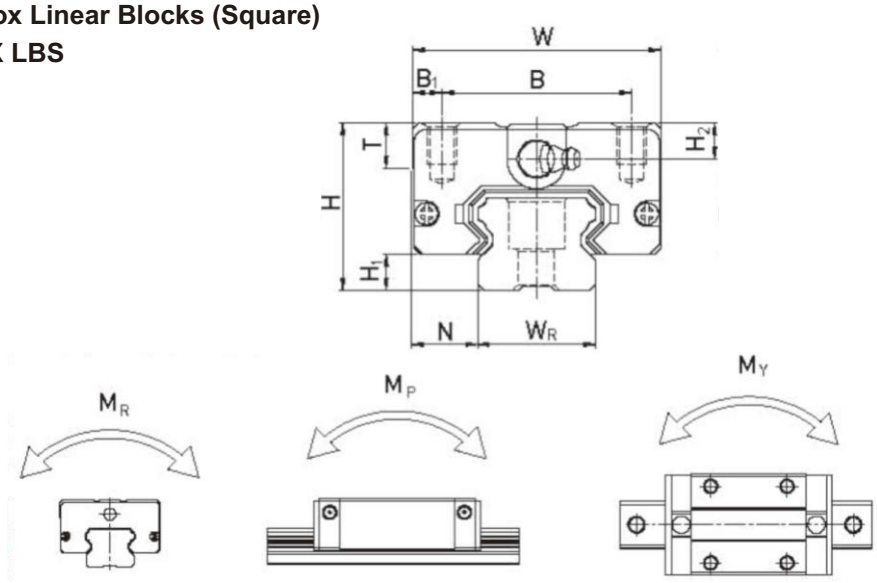

INOX LBS 25 SA ZA H


INOX LBS 25 CA ZA H


INOX LBS 30 SA ZA H

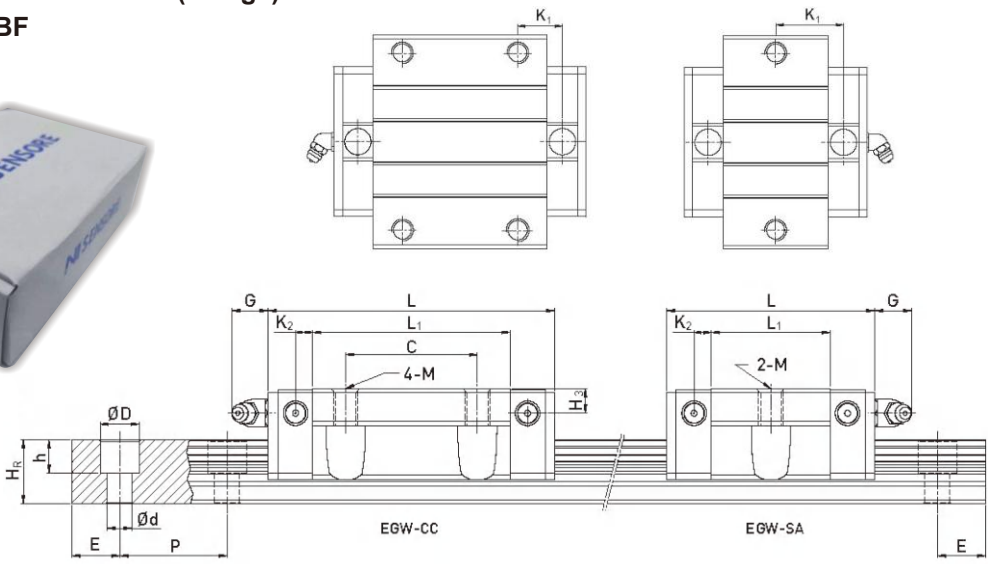

INOX LBS 30 CA ZA H

Heavy Load and Super Heavy Load
Ball Type Inox Linear Blocks (Square)
Series INOX LBS



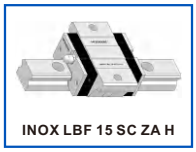
Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
										MR	MP	MY	Block	Rail
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	12.5	6	4.5	3.5	60	20	M3x16	5.35	9.40	0.08	0.04	0.04	0.09	1.25
15	12.5	6	4.5	3.5	60	20	M3x16	7.83	16.19	0.13	0.10	0.10	0.15	1.25
20	15.5	9.5	8.5	6	60	20	M5x16	7.23	12.74	0.13	0.06	0.06	0.15	2.08
20	15.5	9.5	8.5	6	60	20	M5x16	10.31	21.13	0.22	0.16	0.16	0.24	2.08
23	18	11	9	7	60	20	M6x20	11.40	19.50	0.23	0.12	0.12	0.25	2.67
23	18	11	9	7	60	20	M6x20	16.27	32.40	0.38	0.32	0.32	0.41	2.67
28	23	11	9	7	80	20	M6x25	16.42	28.10	0.40	0.21	0.21	0.45	4.35
28	23	11	9	7	80	20	M6x25	23.70	47.46	0.68	0.55	0.55	0.76	4.35

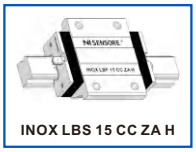
Heavy Load and Medium Load
Ball Type Low Linear Blocks (Flange)
Series INOX LBF

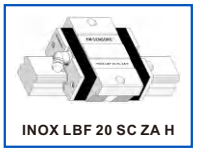


Model No. (Precision C & H)	Unit Price	Dimensions of Aembly (mm)			Dimensions of Block (mm)												
	US$	H	H1	N	W	B	B1	C	L1	L	K1	G	M	T	T1	H2	H3
INOX LBF 15 SC	-	24	4.5	18.5	52	41	5.5	-	23.1	40.1	14.8	5.7	M5	5	7	5.5	6
INOX LBF 15 CC	30.42	24	4.5	18.5	52	41	5.5	26	39.8	56.8	10.15	5.7	M5	5	7	5.5	6
INOX LBF 20 SC	-	28	6	19.5	59	49	5	-	29	50	18.75	12	M6	7	9	6	6
INOX LBF 20 CC	44.06	28	6	19.5	59	49	5	32	48.1	69.1	12.3	12	M6	7	9	6	6
INOX LBF 25 SC	-	33	7	25	73	60	6.5	-	35.5	59.1	21.9	12	M8	7.5	10	8	8
INOX LBF 25 CC	66.08	33	7	25	73	60	6.5	35	59	82.6	16.15	12	M8	7.5	10	8	8
INOX LBF 30 SC	-	42	10	31	90	72	9	-	41.5	69.5	26.75	12	M10	7	10	8	9
INOX LBF 30 CC	-	42	10	31	90	72	9	40	70.1	98.1	21.05	12	M10	7	10	8	9

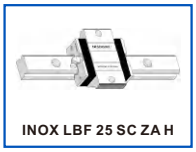
Notes: ① Materials: SUS 440 C.
② The above prices apply to quantities of 1-50pcs. For quantities exceeding this, please contact sales for a quote.

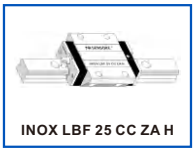

INOX LBF 15 SC ZA H


INOX LBS 15 CC ZA H

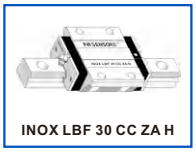

INOX LBF 20 SC ZA H


INOX LBF 20 CC ZA H

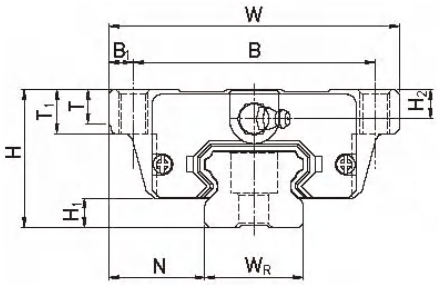

INOX LBF 25 SC ZA H

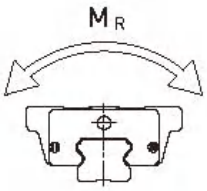

INOX LBF 25 CC ZA H

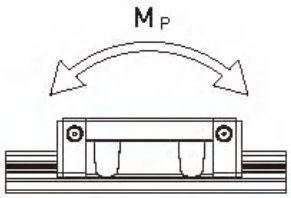

INOX LBF 30 SC ZA H

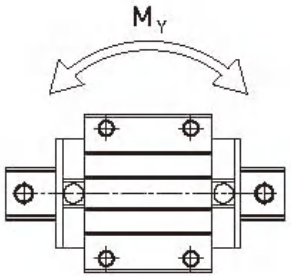

INOX LBF 30 CC ZA H

Heavy Load and Medium Load
Ball Type Low Linear Blocks (Flange)
Series INOX LBF









Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
										MR	MP	MY	Block	Rail
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	12.5	6	4.5	3.5	60	20	M3x16	5.35	9.40	0.08	0.04	0.04	0.12	1.25
15	12.5	6	4.5	3.5	60	20	M3x16	7.83	16.19	0.13	0.10	0.10	0.21	1.25
20	15.5	9.5	8.5	6	60	20	M5x16	7.23	12.74	0.13	0.06	0.06	0.19	2.08
20	15.5	9.5	8.5	6	60	20	M5x16	10.31	21.13	0.22	0.16	0.16	0.32	2.08
23	18	11	9	7	60	20	M6x20	11.40	19.50	0.23	0.12	0.12	0.35	2.67
23	18	11	9	7	60	20	M6x20	16.27	32.40	0.38	0.32	0.32	0.59	2.67
28	23	11	9	7	80	20	M6x25	16.42	28.10	0.40	0.21	0.21	0.62	4.35
28	23	11	9	7	80	20	M6x25	23.70	47.46	0.68	0.55	0.55	1.04	4.35

Quality Management
& Consultancy

NIKO® NIPPON KODO AUTOMATION TECHNOLOGY

UKAS ISO9001

日本高導オートメーションテクノロジー株式会社
会社法人等番号　１３０９－０１－００１３３２

Website: http://www.nipponkodobearings.com

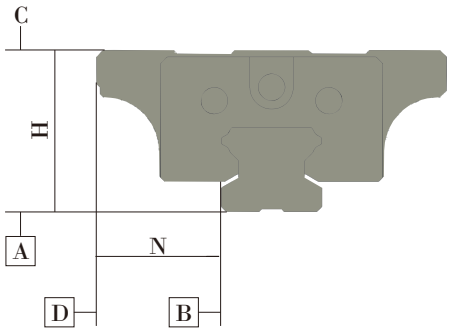
Technical Information

NiSENSORE Inox Linear Guideways – Precision

Accuracy Classes

The accurcy of INOX HB series

Precision C & H.



(1) Accuracy Standard

Unit: mm

Items / Accuracy Classes	INOX HB - M5, 7, 9, 12, 15		INOX HB - 15, 20		INOX HB - 25, 30, 35		INOX HB - 45	
	Normal (C)	High (H)	Normal (C)	High (H)	Normal (C)	High (H)	Normal (C)	High (H)
Dimensional tolerance of height H	±0.04	±0.02	±0.1	±0.03	±0.1	±0.04	±0.1	±0.05
Dimensional tolerance of Width N	±0.04	±0.025	±0.1	±0.03	±0.1	±0.04	±0.1	±0.05
Variation of height H	0.03	0.015	0.02	0.01	0.02	0.015	0.03	0.015
Variation of width N	0.03	0.02	0.02	0.01	0.03	0.015	0.03	0.02
Running parallelism of block surface C to Surface A	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table
Running parallelism of block surface D to Surface B	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table

(2) Accuracy of running parallelism - INOX Miniature Linear Guideways

Unit: mm

Rail Length (mm)	Accuracy (μm)		Rail Length (mm)	Accuracy (μm)	
	Normal (C)	High (H)		Normal (C)	High (H)
~ 50	12	6	1300 ~ 1400	26	19
50 ~ 80	13	7	1400 ~ 1500	27	19
80 ~ 125	14	8	1500 ~ 1600	28	20
125 ~ 200	15	9	1600 ~ 1700	29	20
200 ~ 250	16	10	1700 ~ 1800	30	21
250 ~ 315	17	11	1800 ~ 1900	30	21
315 ~ 400	18	11	1900 ~ 2000	31	22
400 ~ 500	19	12			
500 ~ 630	20	13			
630 ~ 800	22	14			
800 ~ 1000	23	16			
1000 ~ 1200	25	18			
1200 ~ 1300	25	18			

(3) Accuracy of running parallelism - INOX Linear Guideways

Unit: mm

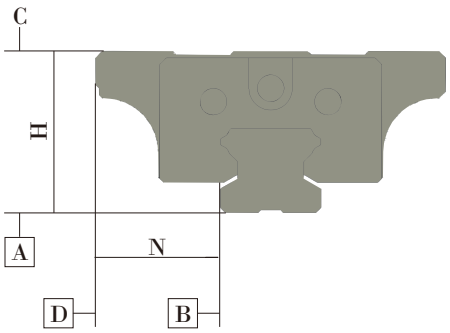
Rail Length (mm)	Accuracy (μm)	
	Normal (C)	High (H)
0 ~ 100	12	7
100 ~ 200	14	9
200 ~ 300	15	10
300 ~ 500	17	12
500 ~ 700	20	13
700 ~ 900	22	15
900 ~ 1100	24	16
1100 ~ 1500	26	18
1500 ~ 1900	28	20
1900 ~ 2500	31	22
2500 ~ 3100	33	25
3100 ~ 3600	36	27
3600 ~ 4000	37	28

NiSENSORE INOX Linear Guideways – Precision

Accuracy Classes

The accurcy of INOX LB series

Precision C & H.



(1) Accuracy Standard

Unit: mm

Items / Accuracy Classes	INOX LB - 15, 20		INOX LB - 25, 30	
	Normal (C)	High (H)	Normal (C)	High (H)
Dimensional tolerance of height H	±0.1	±0.03	±0.1	±0.04
Dimensional tolerance of Width N	±0.1	±0.03	±0.1	±0.04
Variation of height H	0.02	0.01	0.02	0.015
Variation of width N	0.02	0.01	0.03	0.015
Running parallelism of block surface C to Surface A	See Table	See Table	See Table	See Table
Running parallelism of block surface D to Surface B	See Table	See Table	See Table	See Table

(2) Accuracy of running parallelism

Unit: mm

Rail Length (mm)	Accuracy (μm)	
	Normal (C)	High (H)
0 ~ 100	12	7
100 ~ 200	14	9
200 ~ 300	15	10
300 ~ 500	17	12
500 ~ 700	20	13
700 ~ 900	22	15
900 ~ 1100	24	16
1100 ~ 1500	26	18
1500 ~ 1900	28	20
1900 ~ 2500	31	22
2500 ~ 3100	33	25
3100 ~ 3600	36	27
3600 ~ 4000	37	28

3. Preload

The preload control standards for the INOXHB / INOXLB Stainless Steel Series are critical parameters to ensure the stable performance of linear guide systems in high-precision and high-rigidity applications. Preload refers to adjusting the contact state between rolling elements (such as balls or rollers) and the guide rail to generate internal stress under no-load conditions, thereby improving rigidity, reducing vibration, and extending service life.

Below are the general preload control standards for the INOXHB / INOXLB Stainless Steel Series:

3.1. Preload Levels

Preload is typically divided into the following levels:

Preload Level	Application	Description	Characteristics
No Preload (Z0)	Light loads, low rigidity requirements.	No preload contact between rolling elements and guide rails.	Low friction, low rigidity.
Light Preload (Z1)	Medium loads, moderate rigidity needs.	Slight preload between rolling elements and guide rails.	Moderate rigidity, slightly higher friction.
Medium Preload (Z2)	High loads, high rigidity requirements.	Medium preload between rolling elements and guide rails.	High rigidity, further increased friction.
Heavy Preload (Z3)	Extreme loads, maximum rigidity needs.	High preload between rolling elements and guide rails.	Maximum rigidity, highest friction.

3.2. Preload Adjustment Methods:

The preload for the INOXHB/INOXLB Stainless Steel Series is typically achieved through the following methods:

-Ball Diameter Adjustment: Preload is adjusted by selecting balls of different diameters.
-Block Clearance Adjustment: Preload is controlled by adjusting the clearance between the slider and the guide rail.

3.3. Preload Selection Recommendations:

-Light Preload (Z1): Suitable for general industrial equipment and automation systems.
-Medium Preload (Z2): Suitable for high-precision machine tools and semiconductor equipment.
-Heavy Preload (Z3): Suitable for heavy-duty machine tools and special equipment with high rigidity requirements.

Important Notes

-The selection of preload level should be based on actual load, speed, precision, and rigidity requirements.
-Excessive preload can increase friction and wear, shortening the service life.
-Preload adjustment should be performed by professional technicians to ensure optimal system performance.

4. Rigidity

The rigidity of the INOX stainless steel series is a crucial performance indicator for linear guide systems, typically determined through calculation or experimentation. Rigidity refers to the system's ability to resist deformation under external forces, usually expressed as a stiffness value (N/μm). Rigidity calculation tables or formulas are often provided to help users estimate rigidity values based on specific models and application conditions.

Below is the general method and reference data for calculating rigidity in the stainless steel series:

4.1. Basic Formula for Rigidity Calculation

Rigidity(K) can be calculated using the following formula:

$$K = \frac{F}{\delta}$$

where:
K = Rigidity (N/μm)
F = Applied load (N)
δ = Deformation (μm)

4.2. Factors Affecting Rigidity

4.2.1. Preload Level:

-Higher preload results in higher rigidity.
-Preload levels are categorized as no preload (Z0), light preload (Z1), medium preload (Z2), and heavy -preload (Z3).

4.2.2. Guide Length and Span:

-Longer guide lengths reduce rigidity.
-Larger spans between sliders increase rigidity.

4.2.3. Load Direction:

Rigidity varies depending on the load direction (radial, reverse radial, or lateral).

4.2.4. Number of Blocks:

Using multiple sliders can enhance the overall system rigidity.

4.3. Basic Formula for Rigidity Calculation

Rigidity calculation tables or charts are provided. Below is an example:

Preload Level	Radial Rigidity (N/μm)	Reverse Radial Rigidity (N/μm)	Lateral Rigidity (N/μm)
No Preload (Z0)	50	45	40
Light Preload (Z1)	80	70	60
Medium Preload (Z2)	120	100	90
Heavy Preload (Z3)	150	130	110

4.4. Example of Rigidity Calculation

Assumptiaons:
-Preload level: Z2 (Medium Preload)
-Load direction: Radial
-Guide length: 1000 mm
-Number of blocks: 2

Step-by-Step Calculation:
-Determine the rigidity of a single block:
From the table, the radial rigidity of a single slider with Z2 preload is **120 N/μm**.
-Calculate the system rigidity with two blocks:
When two blocks are used, the overall system rigidity can be approximated by summing the rigidity of each blocks:

$$K_{\text{system}} = 2 \times 120 = 240\,\text{N}/\mu\text{m}$$

Result:
The overall system rigidity is **240 N/μm.**

Notes:
-This calculation assumes that the sliders are evenly loaded and that the system is properly aligned.
-For more precise calculations, factors such as guide length, load distribution, and mounting conditions should be considered. Refer to official documentation for detailed guidance.

5. Life Calculation

5.1. Life Calculation for INOXHB / INOXLB Stainless Steel Series

The life calculation of linear guide systems is a critical step in design and selection. It is typ ically based on rolling fatigue life theory, which predicts the lifespan of the guide rail and slider due to material fatigue under rolling contact. Below is the detailed method for calculating the life of the **INOXHB / INOXLB Stainless Steel Series.**

Life Calculation Formula
The life of a linear guide is calculated using the following formula:

$$L = \left(\frac{C}{P}\right)^3 \times 50$$

Where:
L:Rated life (in km)
C:Basic dynamic load rating (in N)
F:Equivalent load (in N)

5.2. Equivalent Load Calculation

The equivalent load (P) is a combined load calculated based on the actual load direction and magnitude. The formula is:

$$P = X \cdot F_r + Y \cdot F_a$$

Where:

Fr: Radial load (in N)

Fa : Axial load (in N)

X and Y: Load factors (refer to the product manual for specific values).

5.3. Life Calculation Steps

5.3.1.Determine the Basic Dynamic Load Rating (*C*)

-The basic dynamic load rating is provided in the product manual.

-Example: For the INOX HB series, C might be 10,000 N (refer to the specific model for exact values).

5.3.2.Calculate the Equivalent Load (P)

-Calculate **P** based on the actual load direction and magnitude.

5.3.3.Calculate the Rated Life (L)

-Use the life formula to calculate the rated life in kilometers.

5.3.4.Convert to Time-Based Life

-Convert the life from kilometers to hours based on the stroke length and operating speed.

5.4. Life Calculation Example

Assume the following parameters:

Basic dynamic load rating (*C*): 10,000 N

Equivalent load (*P*): 2,000 N

Stroke length: 0.5 m

Operating speed: 1 m/s

5.5. Life Calculation for INOXHB / INOXLB Stainless Steel Series

5.5.1. Calculate Rated Life (L)

$$L = \left(\frac{10,000}{2,000}\right)^3 \times 50 = 125 \times 50 = 6,250\,\text{km}$$

5.5.2. Convert to Time-Based Life

$$\text{Operating Time} = \frac{L}{\text{Stroke Length} \times \text{Operating Speed}} = \frac{6,250 \times 1,000}{0.5 \times 1} = 12,500,000\,\text{seconds} \approx 3,472\,\text{hours}$$

5.6. Life Correction Factors

In practical applications, the lifespan may be affected by the following factors, requiring correction coefficients:

Load Factor (fw)

-Depends on load type (smooth, impact, etc.), typically ranging from 1.0 to 1.5.

Temperature Factor (ft)

Considered when the operating temperature exceeds 100°C, as it affects material performance.

Lubrication Factor (fl)

Good lubrication conditions can extend the lifespan.

The corrected lifespan formula is:

$$L_{\text{corrected}} = L \times f_w \times f_t \times f_l$$

5.6. INOXHB / INOXLB Stainless Steel Series Life Calculation Table

Below is a simplified example of a life calculation table:

5.3.4.Convert to Time-Based Life

-Convert the life from kilometers to hours based on the stroke length and operating speed.

Equivalent Load (N)	Rated Life (km)
1,000	50,000
2,000	6,250
3,000	1,852
4,000	781
5,000	400

Important Notes

-The above calculations are theoretical values. Actual lifespan may vary due to installation conditions, environmental factors, etc.

-Regular maintenance and lubrication are recommended to extend lifespan.

NiSENSORE INOX Linear Guideways

Preload Class & Rigidity Stiffness

Rigidity stiffness for INOX H series

Rigidity depends on preload, below formula can be used to determine deformation depending on rigidity.

$$\delta = \frac{p}{k}$$

δ Deformation (μm)
p Operating load (N)
k Rigidity (N/μm)

(1) Raidial stifness for INOX Miniature Linear Guideways

Load Class	Series/size	Stiffness (N/μm) Z0	Z1	Series/size	Stiffness (N/μm) Z0	Z1
Standard	INOX HBS M7 C	36	73	INOX HBF M7 C	44	112
	INOX HBS M9 C	38	102	INOX HBF M9 C	62	140
	INOX HBS M12 C	44	105	INOX HBF M12 C	72	148
	INOX HBS M15 C	58	126	INOX HBF M15 C	85	154
Long	INOX HBS M7 H	42	122	INOX HBF M7 H	64	168
	INOX HBS M9 H	56	153	INOX HBF M9 H	81	190
	INOX HBS M12 H	70	175	INOX HBF M12 H	102	217
	INOX HBS M15 H	89	202	INOX HBF M15 H	122	235

(2) Raidial stifness for INOX Linear Guideways

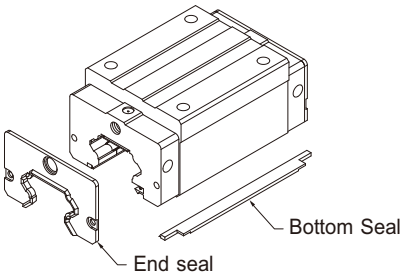
Load Class	Series/size	Rigidity depending on preload Z0	ZA	ZB
Heavy load	INOX HB 15 C	196	365	483
	INOX HB 20 C	232	460	678
	INOX HB 25 C	292	539	705
	INOX HB 30 C	354	618	823
	INOX HB 35 C	395	642	865
	INOX HB 45 C	505	738	980
Super heavy load	INOX HB 20 H	300	611	824
	INOX HB 25 H	378	715	935
	INOX HB 30 H	453	820	1093
	INOX HB 35 H	509	855	1150
	INOX HB 45 H	649	970	1298

NiSENSORE Inox Linear Guideways

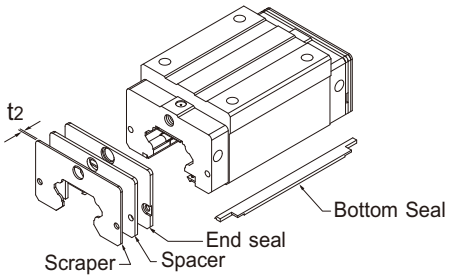
Dust Proof Accessories

1. INOX HB Codes of standard dust proof accessories

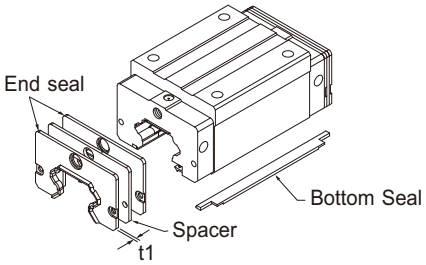
If the following accessories are needed, please add the code followed by the model number.



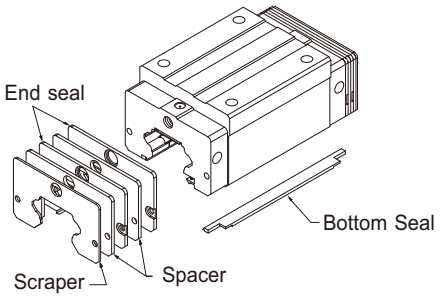
No symbol: Standard Protection
(End seal + Bottom Seal)



ZZ (End seal + Bottom Seal + Scraper)



DD(Double seals + Bottom Seal)
Note: HN_20/25/65 are without spacer.



KK (Double seals + Bottom Seal + Scraper)

2. Rigidity stiffness for INOX LB series

Stiffness depends on preload. The following table shows stiffness value of each size.

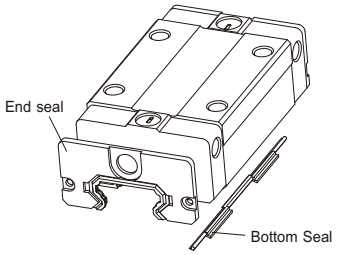
(2) Raidial stifness for INOX LB Series

Load Class	Series/size	Rigidity depending on preload		
		Z0	ZA	ZB
Medium load	INOX LB 15 S	200	260	290
	INOX LB 20 S	250	320	360
	INOX LB 25 S	300	390	440
	INOX LB 30 S	370	480	550
Heavy load	INOX LB 15 C	200	260	290
	INOX LB 20 C	310	400	460
	INOX LB 25 C	390	510	580
	INOX LB 30 C	480	620	710

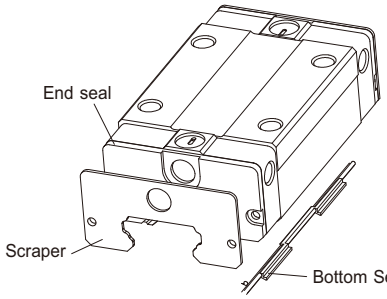
NiSENSORE INOX Linear Guideways

3. LB Codes of equipment

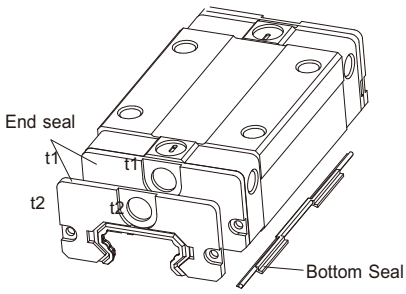
If the following equipment is needed, please indicate the code followed by the model number.



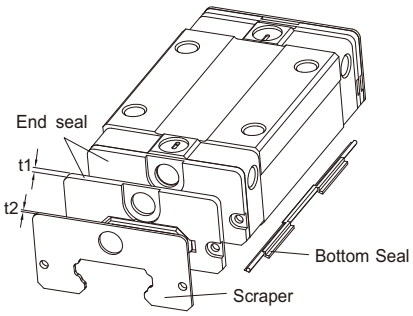
No symbol: Standard Protection
(End seal + Bottom seal)



ZZ (End seal + Bottom seal + Scraper)



DD (Double seals + Bottom Seal)

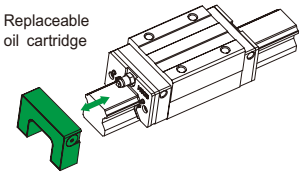


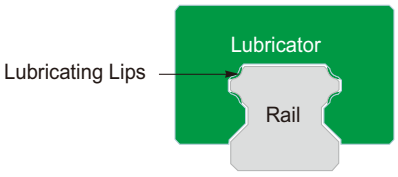
KK (Double seals + Bottom Seal + Scraper)

4. Construction of E2 Type

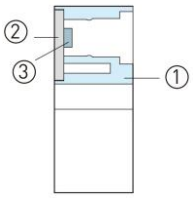
E2 self-lubricating linear guideway contains a lubricator between the end cap and end seal.
Outside of the block is equipped with a replaceable oil cartridge, the configuration of which is listed below.

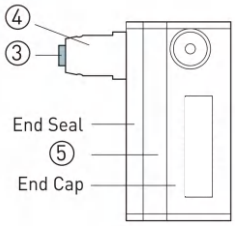
Lubrication oil flows from the replaceable oil cartridge to the lubricator and then lubricates grooves of rails.
The Oil cartridge comprises a oil conductor with 3D structure that enables the lubricator to contact oil despite that blocks are placed at a random position , and thus the lubrication oil inside the oil cartridge can be used up via capillary action.





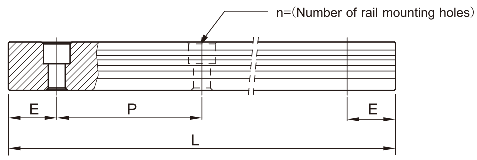
Configuration of the self-lubricant acessory
1. Oil cartridge
2. Cartridge cover
3. Oil conductor
4. Connector
5. Lubricator





Standard and Maximum Lengths of Rail

NiSENSORE offers standard rail lengths for customer needs. For non-standard E-values, the recommended dimension should no greater than 1/2 of the pitch (P) dimension. This will prevent an unstable rail end.



L=(n-1)xP+2xE - Eq. 5

L: Total length of rail (mm)

n: Number of mounting holes

P: Distance between any two holes (mm)

E: Distance from the center of the last hole to the edge (mm)

(1) Rail Standard Length and Max. Length for INOX Miniature Linear Guideways

unit: mm

Item	S M7	S M9	S M12	S M15	F M7	F M9	F M12	F M15
Standard Length L(n)	40(3)	55(3)	70(3)	70(2)	80(3)	80(3)	110(3)	110(3)
	55(4)	75(4)	95(4)	110(3)	110(4)	110(4)	150(4)	150(4)
	70(5)	95(5)	120(5)	150(4)	140(5)	140(5)	190(5)	190(5)
	85(6)	115(6)	145(6)	190(5)	170(6)	170(6)	230(6)	230(6)
	100(7)	135(7)	170(7)	230(6)	200(7)	200(7)	270(7)	270(7)
	130(9)	155(8)	195(8)	270(7)	260(9)	230(8)	310(8)	310(8)
		175(9)	220(9)	310(8)		260(9)	350(9)	350(9)
		195(10)	245(10)	350(9)		290(10)	390(10)	390(10)
		275(14)	270(11)	390(10)		350(14)	430(11)	430(11)
		375(19)	320(13)	430(11)		500(19)	510(13)	510(13)
			370(15)	470(12)		710(24)	590(15)	590(15)
			470(19)	550(14)		860(29)	750(19)	750(19)
			570(23)	670(17)			910(23)	910(23)
			695(28)	870(22)			1070(27)	1070(27)
Pitch (P)	15	20	25	40	30	30	40	40
Distance to End (E)	5	7.5	10	15	10	10	15	15
Max. Standard Length	595(40)	1195(60)	1995(80)	1990(50)	590(20)	1970(66)	1990(50)	1990(50)
Max. Length	600	1200	2000	2000	600	2000	2000	2000

(2) Rail Standard Length and Max. Length for INOX Linear Guideways

unit: mm

Item	15	20	25	30	35	45
Standard Length L(n)	160(3)	220(4)	220(4)	280(4)	280(4)	570(6)
	220(4)	280(5)	280(5)	440(6)	440(6)	885(9)
	280(5)	340(6)	340(6)	600(8)	600(8)	1200(12)
	340(6)	460(8)	460(8)	760(10)	760(10)	1620(16)
	460(8)	640(11)	640(11)	1000(13)	1000(13)	2040(20)
	640(11)	820(14)	820(14)	1640(21)	1640(21)	2460(24)
	820(14)	1000(17)	1000(17)	2040(26)	2040(26)	2985(29)
		1240(21)	1240(21)	2520(32)	2520(32)	
			1600(27)	3000(38)	3000(38)	
Pitch (P)	60	60	60	80	80	105
Distance to End (E)	20	20	20	20	20	22.5
Max. Standard Length	4000(67)	4000(67)	4000(67)	3960(50)	3960(50)	3930(38)
Max. Length	4000	4000	4000	4000	4000	4000

Note: 1. Tolerance of E value for standard rail is 0.5~-0.5mm. Tolerance of E value for jointed rail is 0~-0.3mm.

2. Maximum standard length means the max. rail length with standard E value on both sides.

3. If different E value is needed, please contact NiSENSORE.

Quality Management
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NIKO® NIPPON KODO AUTOMATION TECHNOLOGY

UKAS ISO9001

日本高導オートメーションテクノロジー株式会社
会社法人等番号　１３０９－０１－００１３３２

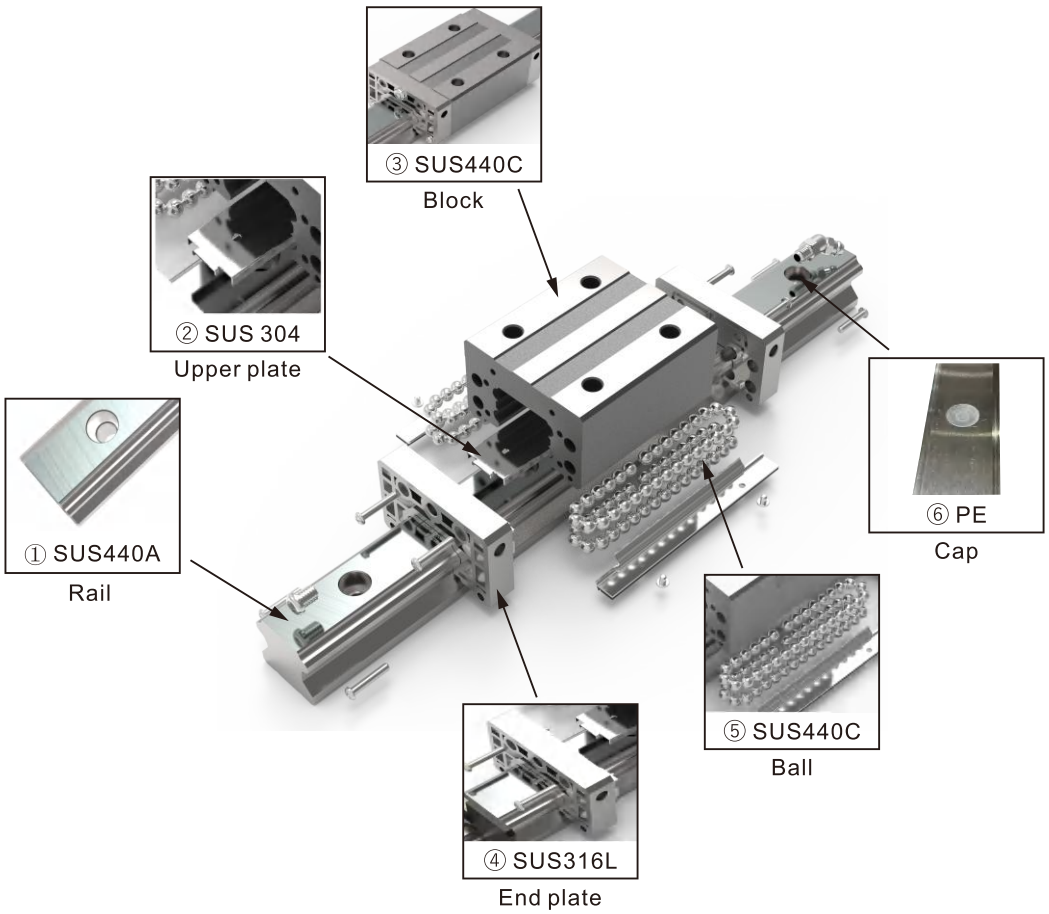
Website: http://www.nipponkodobearings.com

Optional

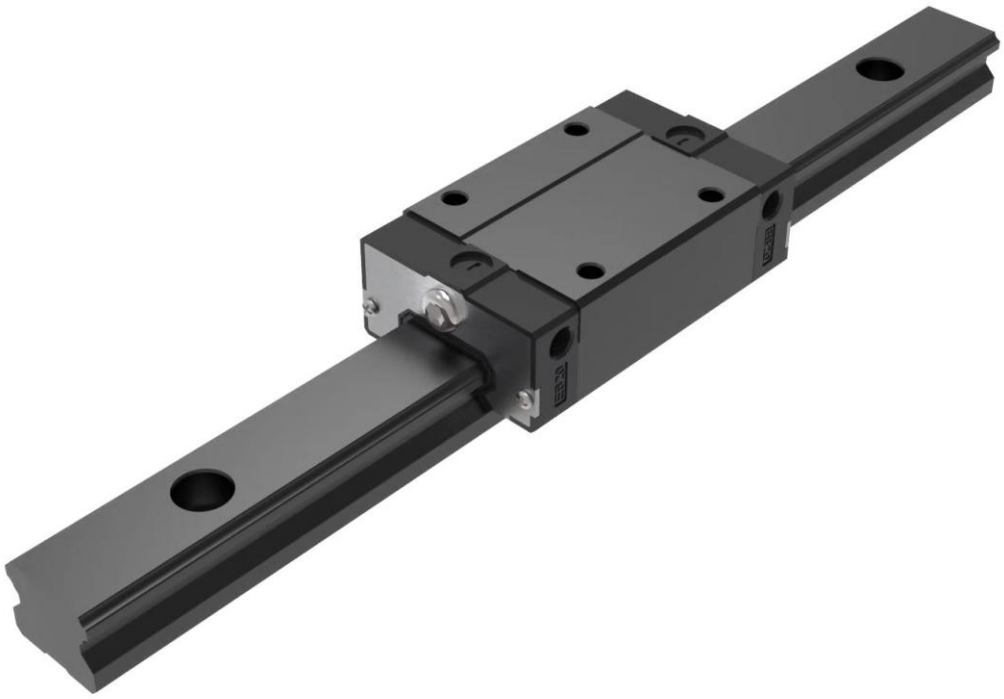
Stainless Steel Linear Guide - Full Metal

High-Temperature Resistance

Structure Designation



Black Cold Electroplated Linear Guides



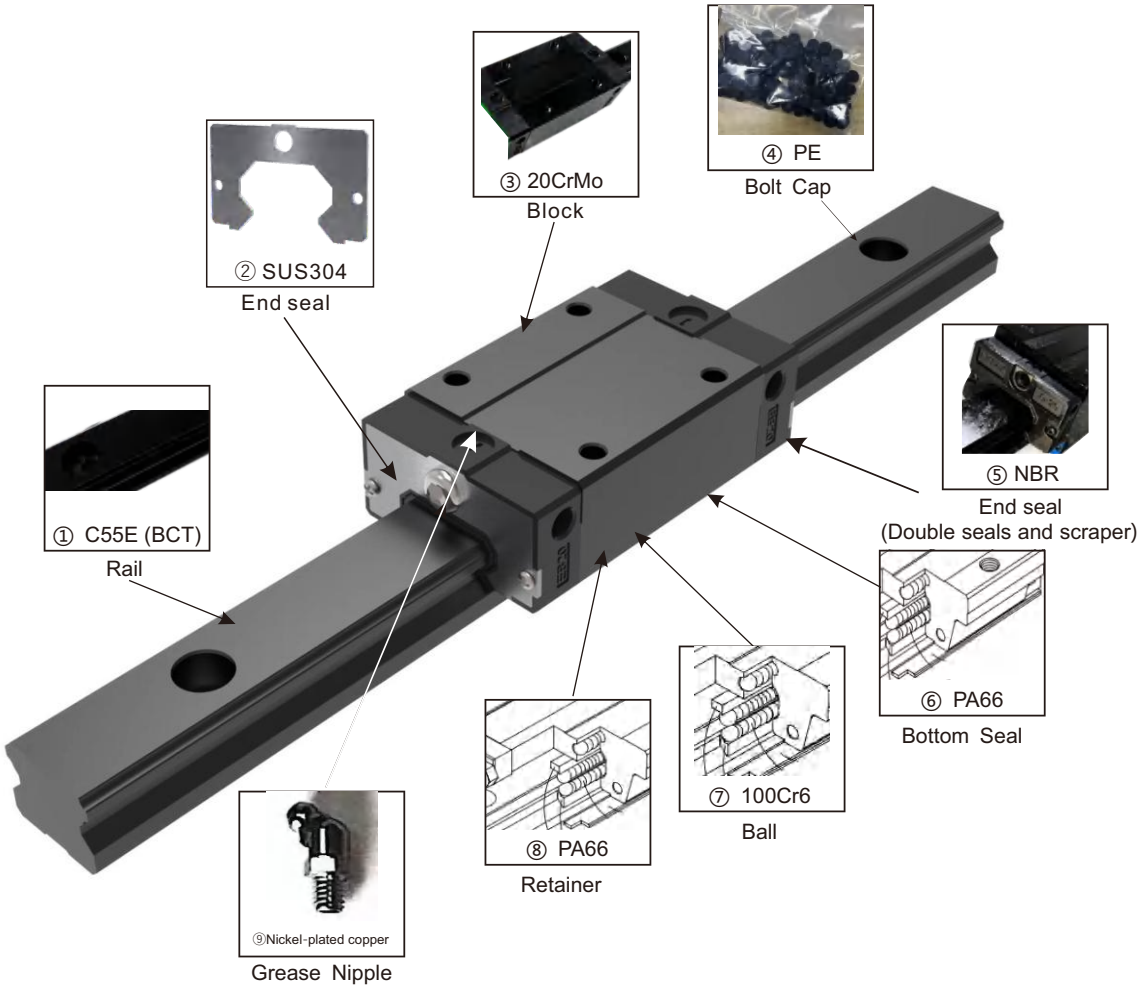
Typical Applications

High-precision machinery, semiconductor equipment,

aerospace systems, and other demanding environments.

BCT HB.. & BCT LB.. Series

Structure Designation



Material

1. Block and Rail Body:
1.1 20CrMo
1.2 C55E

2. Balls:
2.1 100Cr6

3. Parts:
3.1 Scraper: NBR
3.2 Deflector: PA66
3.3 Bottom Dust Cover: PA66
3.4 Rail Clamp: PA66
3.5 Rail Bolt Cap: PE
3.6 Ball Retainer: PA66

Material Composition Table

Material name.	Material composition table (%)						
20CrMo	C	Si	Mn	P	S	Cr	Mo
	0.17 - 0.24	0.17 - 0.37	0.40 - 0.70	≤0.035	≤0.035	0.80 - 1.10	0.05 - 0.25

Material name.	Material composition table (%)							
C55E	C	Si	Mn	P	S	Ni	Cr	Mo
	0.52 - 0.60	0.15 - 0.35	0.60 - 0.90	≤0.035	≤0.035	≤0.4	≤0.4	≤0.1

Material name.	Material composition table (%)					
100Cr6	C	Si	Mn	P	S	Cr
	0.93 - 1.05	0.15 - 0.35	0.25 - 0.45	0.025	0.025	1.30 - 1.65

Material name.	Material composition table (%)		
PA66	AA	HMDA	H2O
	45.7	54.3	< 2.0

Material name.	Material composition table (%)	
PE	AA	HMDA
	45.7	54.3

Quality Management
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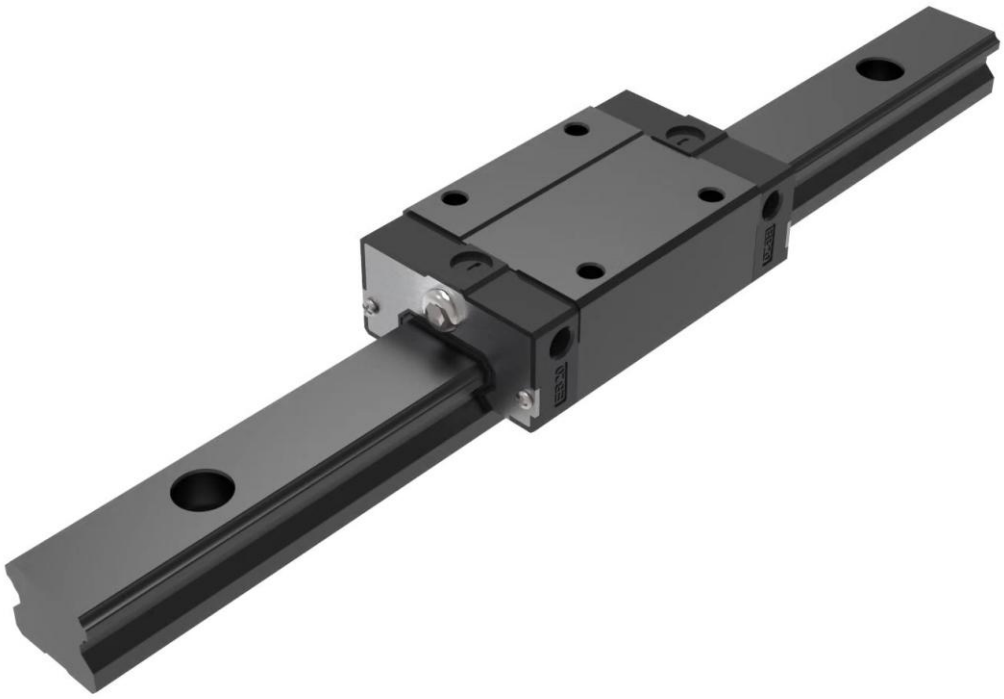
NIKO® NIPPON KODO AUTOMATION TECHNOLOGY

UKAS ISO9001

日本高導オートメーションテクノロジー株式会社
会社法人等番号　１３０９－０１－００１３３２

Website: http://www.nipponkodobearings.com

Black Cold Electroplated Linear Guides



Designation

BCT Linear Guideways

(1) Interchangeable type

BCT HB	S	2 0	C	C		E	Z 0	H	Z Z / E 2
Series	Type	Model					Preload	Class	Accessories
①	②	③	④	⑤	⑧	⑨	⑩	⑪	⑬

BCT HB	R	2 0	R	2 0 0 0	E	Z 0	H	R C
Series	Type	Model		Rail Length (mm)		Preload	Class	Accessories
①	②	③	⑦	⑧	⑨	⑩	⑪	⑬

(2) Non-Interchangeable type

BCT LB	F	3 0	C	C	2	R	2 0 0 0	Z A	H	II	D D / E 2
Series	Type	Model					Rail Length (mm)	Preload	Class		Accessories
①	②	③	④	⑤	⑥	⑦	⑧	⑩	⑪	⑫	⑬

Remarks:

① Series
HB : High Block
LB : Low Block

② Types
S : Square Type
F : Flange Type

③ Model sizes
15, 20, 25, 30, 35, 45

④ Load Types
C: Heavy Load
H: Super Heavy Load

⑤ Block Mounting Types
A: Mounting From Top
B: Bottom
C: Top or Bottom

⑥
No.of Blocks per Rail

⑦ Rail Mounting Types
R: Mounting Type
T: Bottom

⑧
Rail Length (mm)

⑨
E: Special Block
None: Standard Block

⑩ Preload
Z0,ZA

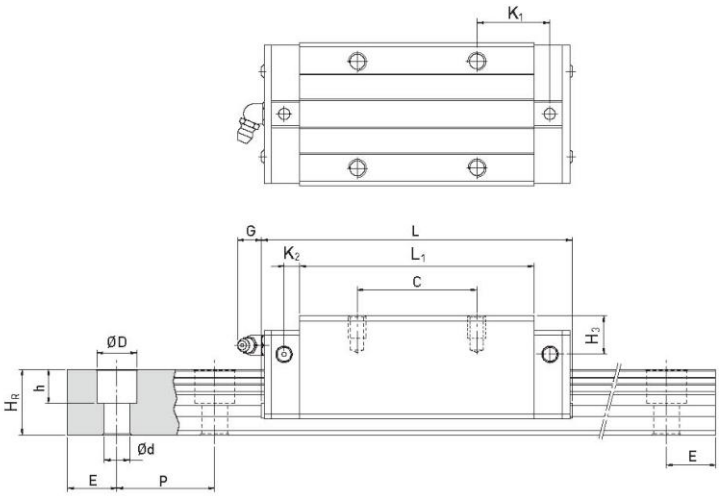
⑪ Precision	
H	P

⑫
Nos. of rails per axis

⑬ Accessories
DD: Dust Protection
E2: Self-Lubricant
SE: Metallic End Cap

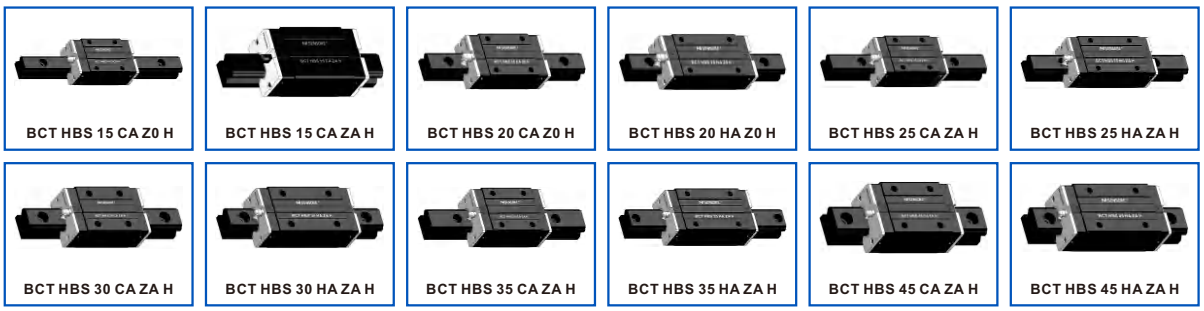
Product Information

Heavy Load and Super Heavy Load
Ball Type Cold Electroplated High Linear Blocks (Square)
Series BCT HBS

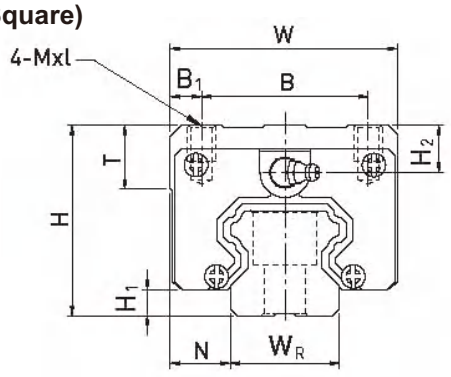


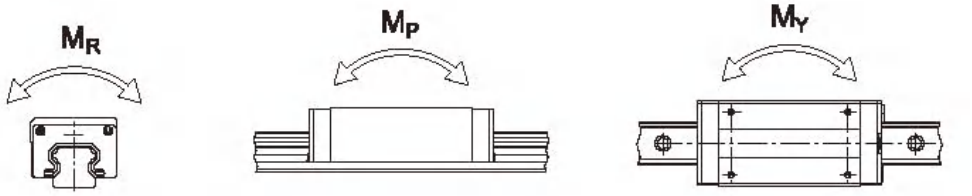
Model No. (Precision H & P)	Unit Price US$	Dimensions of Aembly (mm)			Dimensions of Block (mm)												
		H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	H2	H3
BCT HBS 15 CA	7.00	28	4. 3	9. 5	34	26	4	26	39. 4	61. 4	10	5. 3	–	M4x5	6	7. 95	7. 7
BCT HBS 20 CA	8.40	30	4. 6	12	44	32	6	36	50. 5	77. 5	12. 25	12	–	M5x6	8	6	6
BCT HBS 20 HA	11.18	30	4. 6	12	44	32	6	50	65. 2	92. 2	12. 6	12	–	M5x6	8	6	6
BCT HBS 25 CA	12.58	40	5. 5	12. 5	48	35	6. 5	35	58	84	15. 7	12	–	M6x8	8	10	9
BCT HBS 25 HA	14.54	40	5. 5	12. 5	48	35	6. 5	50	78. 6	104. 6	18. 5	12	–	M6x8	8	10	9
BCT HBS 30 CA	16.50	45	6	16	60	40	10	40	70	97. 4	20. 25	12	–	M8x10	8. 5	9. 5	13. 8
BCT HBS 30 HA	19.30	45	6	16	60	40	10	60	93	120. 4	21. 75	12	–	M8x10	8. 5	9. 5	13. 8
BCT HBS 35 CA	23.50	55	7. 5	18	70	50	10	50	80	112. 4	20. 6	12	–	M8x12	10. 2	16	19. 6
BCT HBS 35 HA	25.74	55	7. 5	18	70	50	10	72	105. 8	138. 2	22. 5	12	–	M8x12	10. 2	16	19. 6
BCT HBS 45 CA	36.36	70	9. 5	20. 5	86	60	13	60	97	139. 4	23	12. 9	–	M10x17	16	18. 5	30. 5
BCT HBS 45 HA	43.64	70	9. 5	20. 5	86	60	13	80	128. 8	171. 2	28. 9	12. 9	–	M10x17	16	18. 5	30. 5

Notes: The above prices apply to quantities of 1-50pcs.
For quantities exceeding this, please contact sales for a quote.



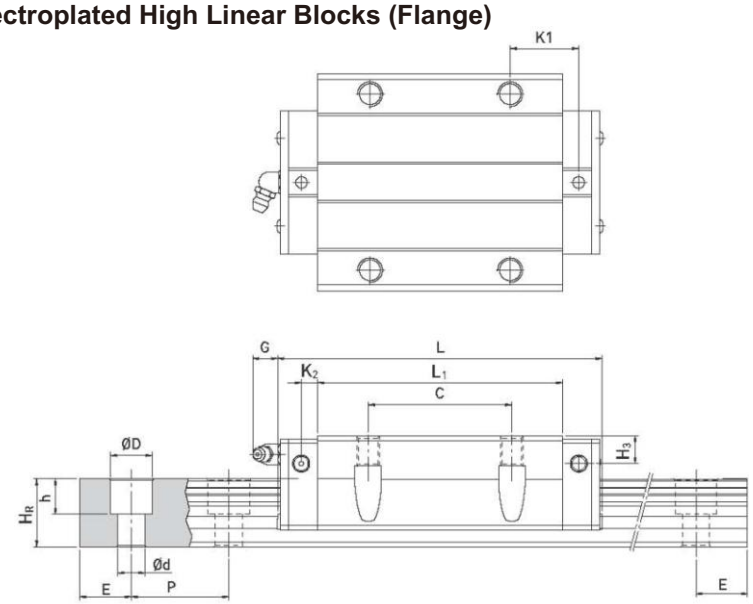
Heavy Load and Super Heavy Load
Ball Type Cold Electroplated High Linear Blocks (Square)
Series BCT HBS





Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
										MR	MP	MY	Block	Rail
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.18	1.45
20	17.5	9.5	8.5	6	60	20	M5x16	27.1	36.68	0.27	0.20	0.20	0.30	2.21
20	17.5	9.5	8.5	6	60	20	M5x16	32.7	47.96	0.35	0.35	0.35	0.39	2.21
23	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.51	3.21
23	22	11	9	7	60	20	M6x20	42.2	69.07	0.56	0.57	0.57	0.69	3.21
28	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	0.88	4.47
28	26	14	12	9	80	20	M8x25	58.6	93.99	0.88	0.92	0.92	1.16	4.47
34	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.45	6.30
34	29	14	12	9	80	20	M8x25	77.9	122.77	1.54	1.40	1.40	1.92	6.30
45	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.73	10.41
45	38	20	17	14	105	22.5	M12x35	125.3	191.85	2.63	2.68	2.68	3.61	10.41

Heavy Load and Super Heavy Load
Ball Type Cold Electroplated High Linear Blocks (Flange)
Series BCT HBF



Model No. (Precision H & P)	Unit Price US$	Dimensions of Aembly (mm)			Dimensions of Block (mm)													
		H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	T1	H2	H3
BCT HBF 15 CC	7.56	24	4.3	16	47	38	4. 5	30	39. 4	61. 4	8	5. 3	–	M5	6	8. 9	3.95	3.7
BCT HBF 20 CC	8.96	30	4.6	21.5	63	53	5	40	50. 5	77. 5	10. 25	12	–	M6	8	10	6	6
BCT HBF 20 HC	12.02	30	4.6	21.5	63	53	5	40	65. 2	92. 2	17. 6	12	–	M6	8	10	6	6
BCT HBF 25 CC	13.42	36	5.5	23.5	70	57	6. 5	45	58	84	10. 7	12	–	M8	8	14	6	5
BCT HBF 25 HC	15.38	36	5.5	23.5	70	57	6. 5	45	78. 6	104. 6	21	12	–	M8	8	14	6	5
BCT HBF 30 CC	17.34	42	6	31	90	72	9	52	70	97. 4	14. 25	12	–	M10	8. 5	16	6.5	10.8
BCT HBF 30 HC	20.42	42	6	31	90	72	9	52	93	120. 4	25. 75	12	–	M10	8. 5	16	6.5	10.8
BCT HBF 35 CC	24.62	48	7.5	33	100	82	9	62	80	112. 4	14. 6	12	–	M10	10.1	18	9	12.6
BCT HBF 35 HC	26.86	48	7.5	33	100	82	9	62	105. 8	138. 2	27. 5	12	–	M10	10.1	18	9	12.6
BCT HBF 45 CC	37.76	60	9.5	37.5	120	100	10	80	97	139.4	13	12.9	–	M12	15.1	22	8.5	20.5
BCT HBF 45 HC	45.32	60	9.5	37.5	120	100	10	80	128.8	171.2	28.9	12.9	–	M12	15.1	22	8.5	20.5

Notes: The above prices apply to quantities of 1-50pcs.
For quantities exceeding this, please contact sales for a quote.


BCT HBF 15 CC Z0 H


BCT HBF 20 CC Z0 H

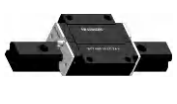

BCT HBF 20 HA Z0 H


BCT HBF 25 CC ZA H


BCT HBF 25 HC ZA H


BCT HBF 30 CC ZA H


BCT HBF 30 HC ZA H

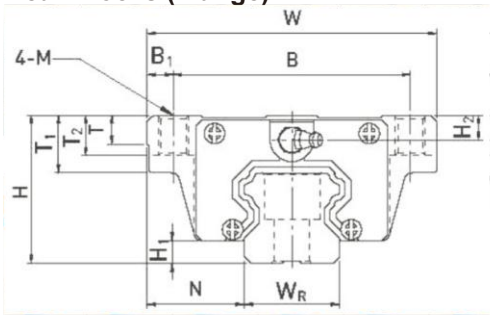

BCT HBF 35 CC ZA H

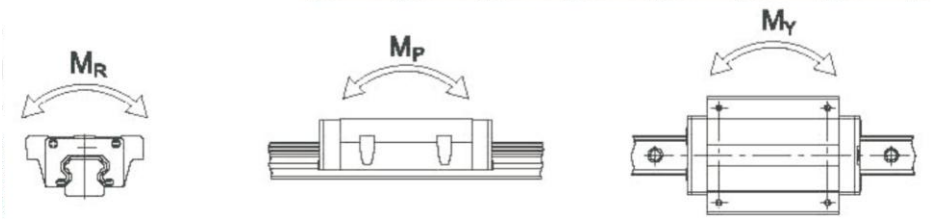

BCT HBF 35 HC ZA H


BCT HBF 45 CC ZA H


BCT HBF 45 HC ZA H

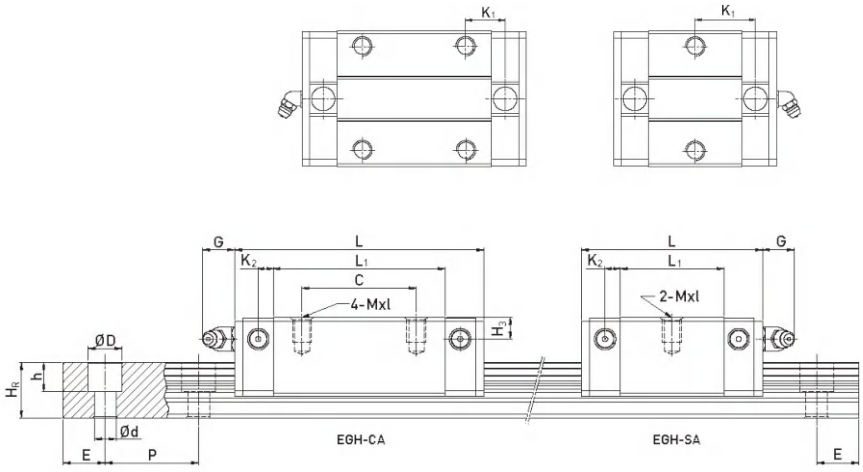
Heavy Load and Super Heavy Load
Ball Type Cold Electroplated High Linear Blocks (Flange)
Series BCT HBF





Dimensions of Rail (mm)								Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
											MR	MP	MY	Block	Rail
WR	WB	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	-	15	7.5	5.3	4.5	60	20	M4x16	14.7	23.47	0.12	0.10	0.10	0.17	1.45
20	-	17.5	9.5	8.5	6	60	20	M5x16	27.1	36.68	0.27	0.20	0.20	0.40	2.21
20	-	17.5	9.5	8.5	6	60	20	M5x16	32.7	47.96	0.35	0.35	0.35	0.52	2.21
23	-	22	11	9	7	60	20	M6x20	34.9	52.82	0.42	0.33	0.33	0.59	3.21
23	-	22	11	9	7	60	20	M6x20	42.2	69.07	0.56	0.57	0.57	0.80	3.21
28	-	26	14	12	9	80	20	M8x25	48.5	71.87	0.66	0.53	0.53	1.09	4.47
28	-	26	14	12	9	80	20	M8x25	58.6	93.99	0.88	0.92	0.92	1.44	4.47
34	-	29	14	12	9	80	20	M8x25	64.6	93.88	1.16	0.81	0.81	1.56	6.30
34	-	29	14	12	9	80	20	M8x25	77.9	122.77	1.54	1.40	1.40	2.06	6.30
45	-	38	20	17	14	105	22.5	M12x35	103.8	146.71	1.98	1.55	1.55	2.79	10.41
45	-	38	20	17	14	105	22.5	M12x35	125.3	191.85	2.63	2.68	2.68	3.69	10.41

Heavy Load and Super Heavy Load
Ball Type Cold Electroplated Low Linear Blocks (Square)
Series BCT LBS



Model No. (Precision H & P)	Unit Price US$	Dimensions of Aembly (mm)			Dimensions of Block (mm)												
		H	H1	N	W	B	B1	C	L1	L	K1	G	Gn	MxL	T	H2	H3
BCT LBS 15 SA	6.72	24	4. 5	9. 5	34	26	4	–	23. 1	40. 1	14. 8	5. 7	–	M4x6	6	5. 5	6
BCT LBS 15 CA	6.16	24	4. 5	9. 5	34	26	4	26	39. 8	56. 8	10. 15	5. 7	–	M4x6	6	5. 5	6
BCT LBS 20 SA	8.12	28	6	11	42	32	5	–	29	50	18. 75	12	–	M5x7	7. 5	6	6
BCT LBS 20 CA	7.56	28	6	11	42	32	5	32	48. 1	69. 1	12. 3	12	–	M5x7	7. 5	6	6
BCT LBS 25 SA	12.30	33	7	12. 5	48	35	6. 5	–	35. 5	59. 1	21. 9	12	–	M6x9	8	8	8
BCT LBS 25 CA	11.74	33	7	12. 5	48	35	6. 5	35	59	82. 6	16. 15	12	–	M6x9	8	8	8
BCT LBS 30 SA	15.94	42	10	16	60	40	10	–	41. 5	69. 5	26. 75	12	–	M8x12	9	8	9
BCT LBS 30 CA	15.38	42	10	16	60	40	10	40	70. 1	98. 1	21. 05	12	–	M8x12	9	8	9

Notes: The above prices apply to quantities of 1-50pcs.
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BCT LBS 15 SA Z0 H


BCT LBS 15 CA Z0 H


BCT LBS 20 SA Z0 H


BCT LBS 20 CA Z0 H

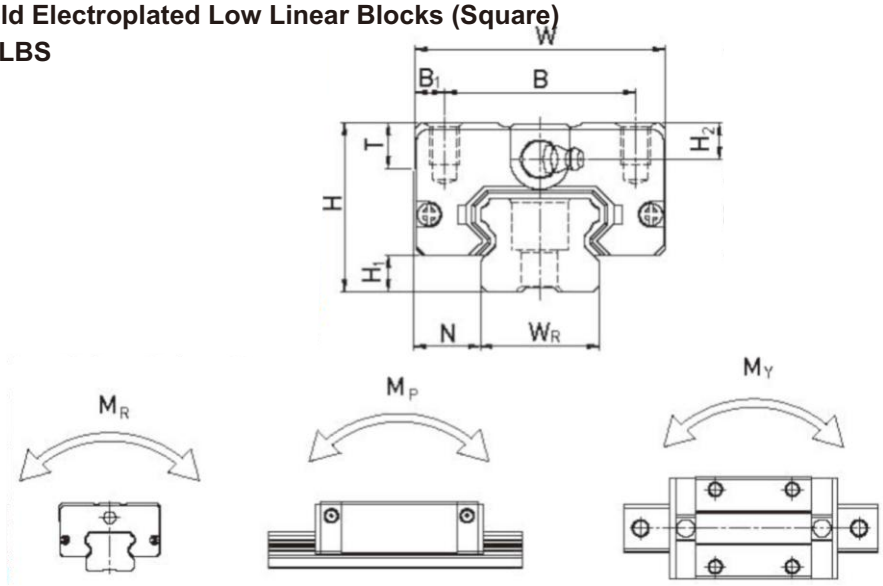

BCT LBS 25 SA ZA H


BCT LBS 25 CA ZA H


BCT LBS 30 SA ZA H

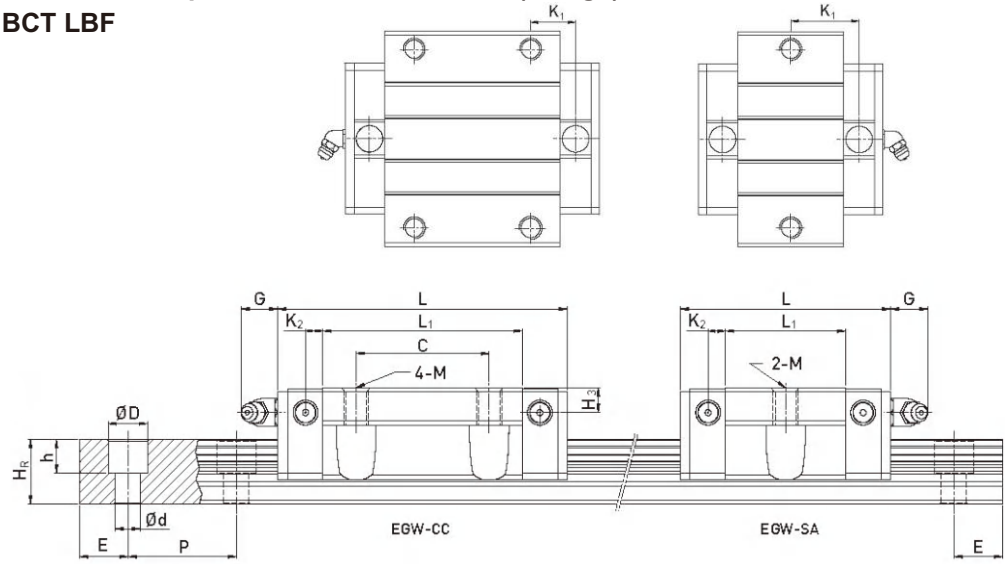

BCT LBS 30 CA ZA H

Heavy Load and Super Heavy Load
Ball Type Cold Electroplated Low Linear Blocks (Square)
Series BCT LBS



Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
										MR	MP	MY	Block	Rail
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	12.5	6	4.5	3.5	60	20	M3x16	5.35	9.40	0.08	0.04	0.04	0.09	1.25
15	12.5	6	4.5	3.5	60	20	M3x16	7.83	16.19	0.13	0.10	0.10	0.15	1.25
20	15.5	9.5	8.5	6	60	20	M5x16	7.23	12.74	0.13	0.06	0.06	0.15	2.08
20	15.5	9.5	8.5	6	60	20	M5x16	10.31	21.13	0.22	0.16	0.16	0.24	2.08
23	18	11	9	7	60	20	M6x20	11.40	19.50	0.23	0.12	0.12	0.25	2.67
23	18	11	9	7	60	20	M6x20	16.27	32.40	0.38	0.32	0.32	0.41	2.67
28	23	11	9	7	80	20	M6x25	16.42	28.10	0.40	0.21	0.21	0.45	4.35
28	23	11	9	7	80	20	M6x25	23.70	47.46	0.68	0.55	0.55	0.76	4.35

Heavy Load and Super Heavy Load
Ball Type Cold Electroplated Low Linear Blocks (Flange)
Series BCT LBF



Model No. (Precision H & P)	Unit Price US$	Dimensions of Aembly (mm)			Dimensions of Block (mm)												
		H	H1	N	W	B	B1	C	L1	L	K1	G	M	T	T1	H2	H3
BCT LBF 15 SC	7.28	24	4. 5	18. 5	52	41	5. 5	–	23. 1	40. 1	14. 8	5. 7	M5	5	7	5. 5	6
BCT LBF 15 CC	6.72	24	4. 5	18. 5	52	41	5. 5	26	39. 8	56. 8	10. 15	5. 7	M5	5	7	5. 5	6
BCT LBF 20 SC	8.68	28	6	19. 5	59	49	5	–	29	50	18. 75	12	M6	7	9	6	6
BCT LBF 20 CC	8.12	28	6	19. 5	59	49	5	32	48. 1	69. 1	12. 3	12	M6	7	9	6	6
BCT LBF 25 SC	12.86	33	7	25	73	60	6. 5	–	35. 5	59. 1	21. 9	12	M8	7. 5	10	8	8
BCT LBF 25 CC	12.30	33	7	25	73	60	6. 5	35	59	82. 6	16. 15	12	M8	7. 5	10	8	8
BCT LBF 30 SC	16.78	42	10	31	90	72	9	–	41. 5	69. 5	26. 75	12	M10	7	10	8	9
BCT LBF 30 CC	16.22	42	10	31	90	72	9	40	70. 1	98. 1	21. 05	12	M10	7	10	8	9

Notes: The above prices apply to quantities of 1-50pcs.
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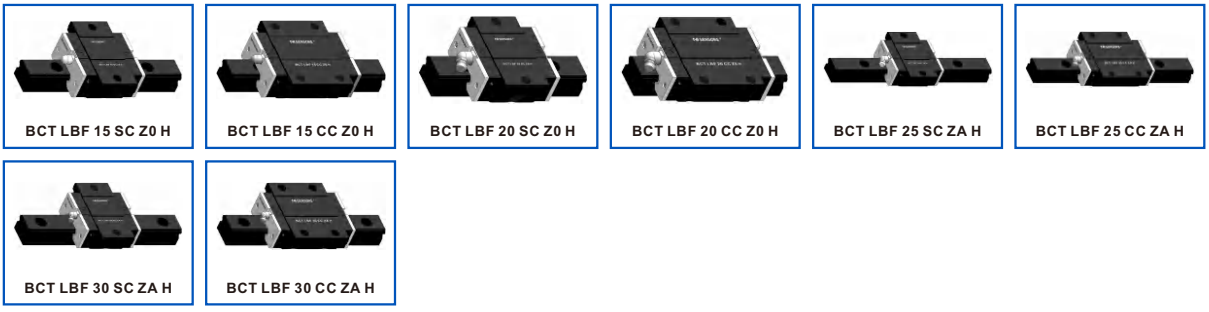
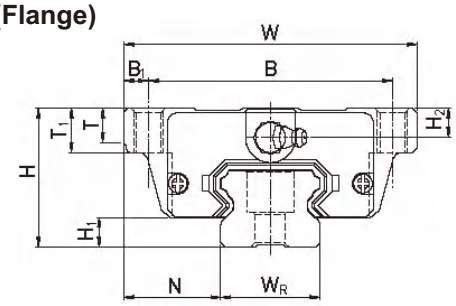
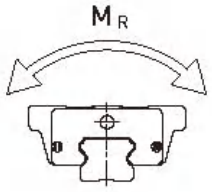
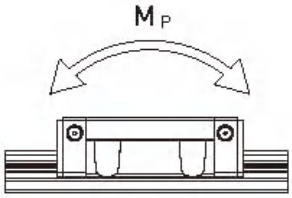
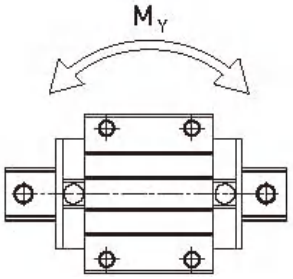


Heavy Load and Super Heavy Load
Ball Type Cold Electroplated Low Linear Blocks (Flange)
Series BCT LBF









Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
										MR	MP	MY	Block	Rail
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	KN-m	KN-m	KN-m	kg	kg/m
15	12.5	6	4.5	3.5	60	20	M3x16	5.35	9.40	0.08	0.04	0.04	0.12	1.25
15	12.5	6	4.5	3.5	60	20	M3x16	7.83	16.19	0.13	0.10	0.10	0.21	1.25
20	15.5	9.5	8.5	6	60	20	M5x16	7.23	12.74	0.13	0.06	0.06	0.19	2.08
20	15.5	9.5	8.5	6	60	20	M5x16	10.31	21.13	0.22	0.16	0.16	0.32	2.08
23	18	11	9	7	60	20	M6x20	11.40	19.50	0.23	0.12	0.12	0.35	2.67
23	18	11	9	7	60	20	M6x20	16.27	32.40	0.38	0.32	0.32	0.59	2.67
28	23	11	9	7	80	20	M6x25	16.42	28.10	0.40	0.21	0.21	0.62	4.35
28	23	11	9	7	80	20	M6x25	23.70	47.46	0.68	0.55	0.55	1.04	4.35

Quality Management
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NIKO® NIPPON KODO AUTOMATION TECHNOLOGY

UKAS ISO9001

日本高導オートメーションテクノロジー株式会社
会社法人等番号　１３０９ー０１ー００１３３２

Website: http://www.nipponkodobearings.com

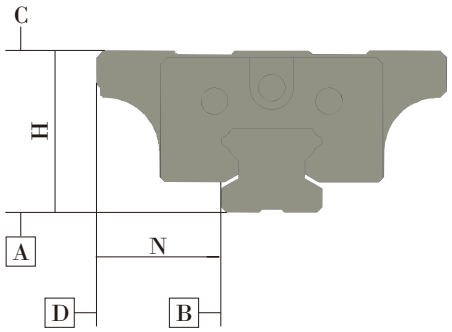
Technical Information

NiSENSORE BCT Linear Guideways – Precision

Accuracy Classes

The accurcy of BCT HB series

Precision H & P.



(1) Accuracy Standard

Unit: mm

Items / Accuracy Classes	BCT HB - 15, 20		BCT HB - 25, 30, 35	
	High (H)	Precision (P)	High (H)	Precision (P)
Dimensional tolerance of height H	±0.03	±0.015	±0.04	±0.02
Dimensional tolerance of Width N	±0.03	±0.015	±0.04	±0.02
Variation of height H	0.01	0.006	0.015	0.007
Variation of width N	0.01	0.006	0.015	0.007
Running parallelism of block surface C to Surface A	See Table	See Table	See Table	See Table
Running parallelism of block surface D to Surface B	See Table	See Table	See Table	See Table

Items / Accuracy Classes	BCT HB - 45	
	High (H)	Precision (P)
Dimensional tolerance of height H	±0.05	±0.025
Dimensional tolerance of Width N	±0.05	±0.025
Variation of height H	0.015	0.007
Variation of width N	0.02	0.01
Running parallelism of block surface C to Surface A	See Table	See Table
Running parallelism of block surface D to Surface B	See Table	See Table

(2) Accuracy of running parallelism

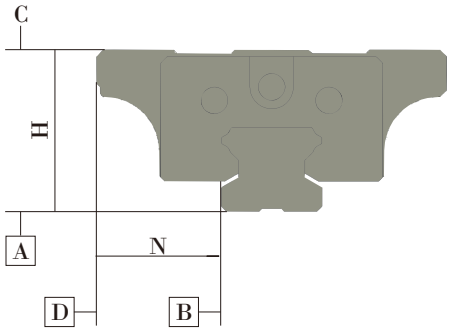
Rail Length (mm)	Accuracy (μm)	
	High (H)	Precision (P)
0 ~ 100	7	3
100 ~ 200	9	4
200 ~ 300	10	5
300 ~ 500	12	6
500 ~ 700	13	7
700 ~ 900	15	8
900 ~ 1100	16	9
1100 ~ 1500	18	11
1500 ~ 1900	20	13
1900 ~ 2500	22	15
2500 ~ 3100	25	18
3100 ~ 3600	27	20
3600 ~ 4000	28	21

NiSENSORE BCT Linear Guideways – Precision

Accuracy Classes

The accurcy of BCT LB series

Precision H & P.



(1) Accuracy Standard

Unit: mm

Items / Accuracy Classes	BCT LB - 15, 20		BCT LB -25, 30, 35	
	High (H)	Precision (P)	High (H)	Precision (P)
Dimensional tolerance of height H	±0.03	±0.015	±0.04	±0.02
Dimensional tolerance of Width N	±0.03	±0.015	±0.04	±0.02
Variation of height H	0.01	0.006	0.015	0.007
Variation of width N	0.01	0.006	0.015	0.007
Running parallelism of block surface C to Surface A	See Table	See Table	See Table	See Table
Running parallelism of block surface D to Surface B	See Table	See Table	See Table	See Table

(2) Accuracy of running parallelism

Rail Length (mm)	Accuracy (μm)	
	High (H)	Precision (P)
0 ~ 100	7	3
100 ~ 200	9	4
200 ~ 300	10	5
300 ~ 500	12	6
500 ~ 700	13	7
700 ~ 900	15	8
900 ~ 1100	16	9
1100 ~ 1500	18	11
1500 ~ 1900	20	13
1900 ~ 2500	22	15
2500 ~ 3100	25	18
3100 ~ 3600	27	20
3600 ~ 4000	28	21

NiSENSORE BCT Linear Guideways

Preload Class & Rigidity Stiffness

Rigidity stiffness for BCT HB series

Rigidity depends on preload, below formula can be used to determine deformation depending on rigidity.

$$\delta = \frac{p}{k}$$

δ Deformation (μm)
p Operating load (N)
k Rigidity (N/μm)

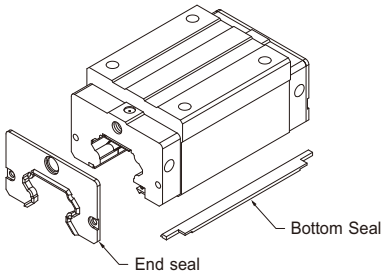
(1) Raidial stifness for BCT HB Series

Load Class	Series/size	Rigidity depending on preload		
		Z0	ZA	ZB
Heavy load	BCT HB 15 C	196	365	483
	BCT HB 20 C	232	460	678
	BCT HB 25 C	292	539	705
	BCT HB 30 C	354	618	823
	BCT HB 35 C	395	642	865
	BCT HB 45 C	505	738	980
Super heavy load	BCT HB 20 H	300	611	824
	BCT HB 25 H	378	715	935
	BCT HB 30 H	453	820	1093
	BCT HB 35 H	509	855	1150
	BCT HB 45 H	649	970	1298

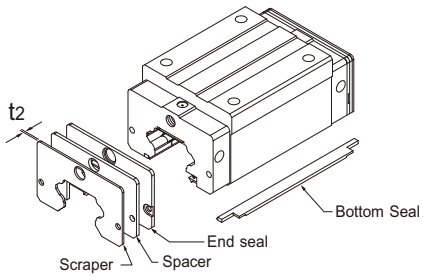
Dust Proof Accessories

1. BCT HB Codes of standard dust proof accessories

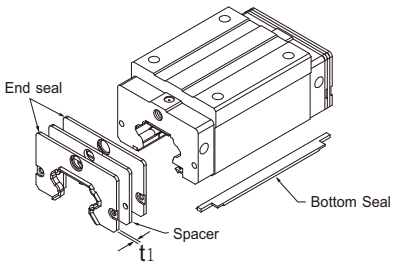
If the following accessories are needed, please add the code followed by the model number.



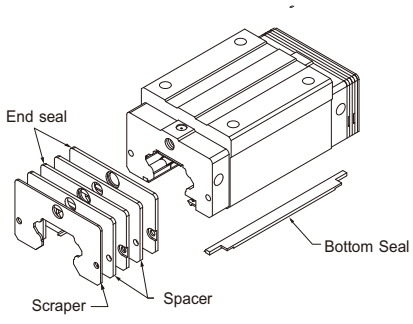
No symbol: Standard Protection
(End seal + Bottom Seal)



ZZ (End seal + Bottom Seal + Scraper)



DD (Double seals + Bottom Seal)
Note: HN_20/25/65 are without spacer.



KK (Double seals + Bottom Seal + Scraper)

NiSENSORE BCT Linear Guideways

2. Rigidity stiffness for BCT LB series

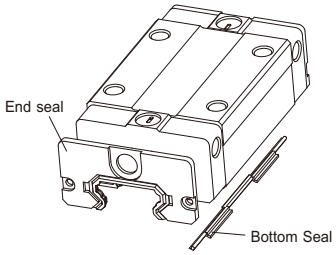
Stiffness depends on preload. The following table shows stiffness value of each size.

(2) Raidial stifness for BCT LB Series

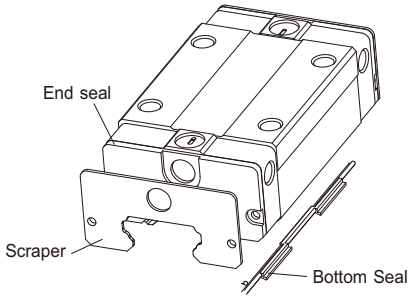
Load Class	Series/size	Rigidity depending on preload		
		Z0	ZA	ZB
Medium load	BCT LB 15 S	200	260	290
	BCT LB 20 S	250	320	360
	BCT LB 25 S	300	390	440
	BCT LB 30 S	370	480	550
Heavy load	BCT LB 15 C	200	260	290
	BCT LB 20 C	310	400	460
	BCT LB 25 C	390	510	580
	BCT LB 30 C	480	620	710

3. LB Codes of equipment

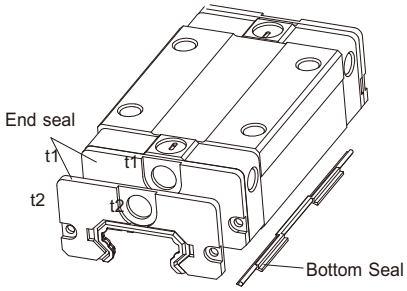
If the following equipment is needed, please indicate the code followed by the model number.



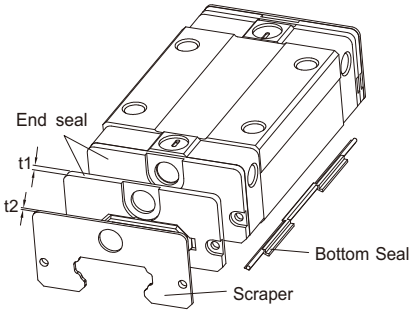
No symbol: Standard Protection
(End seal + Bottom seal)



ZZ (End seal + Bottom seal + Scraper)



DD (Double seals + Bottom Seal)



KK (Double seals + Bottom Seal + Scraper)

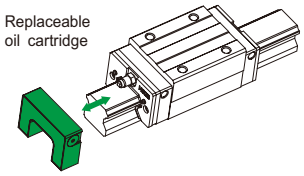
4. Construction of E2 Type

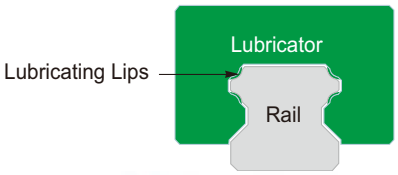
E2 self-lubricating linear guideway contains a lubricator between the end cap and end seal.
Outside of the block is equipped with a replaceable oil cartridge, the configuration of which is listed below.

Lubrication oil flows from the replaceable oil cartridge to the lubricator and then lubricates grooves of rails.
The Oil cartridge comprises a oil conductor with 3D structure that enables the lubricator to contact oil despite that blocks are placed at a random position , and thus the lubrication oil inside the oil cartridge can be used up via capillary action.

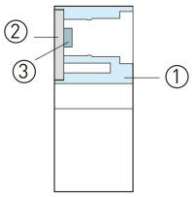
NiSENSORE BCT Linear Guideways

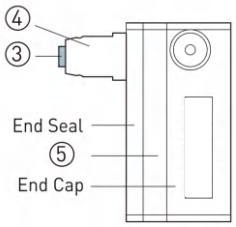
4. Construction of E2 Type





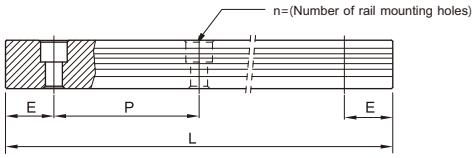
Configuration of the self-lubricant acessory
1. Oil cartridge
2. Cartridge cover
3. Oil conductor
4. Connector
5. Lubricator





Standard and Maximum Lengths of Rail

NISENSORE offers standard rail lengths for customer needs. For non-standard E-values, the recommended dimension should no greater than 1/2 of the pitch (P) dimension. This will prevent an unstable rail end.



$L=(n-1)xP+2xE$ - Eq. 5

L : Total length of rail (mm)
n : Number of mounting holes
P : Distance between any two holes (mm)
E : Distance from the center of the last hole to the edge (mm)

(1) Rail Standard Length and Max. Length for BCT Linear Guideways

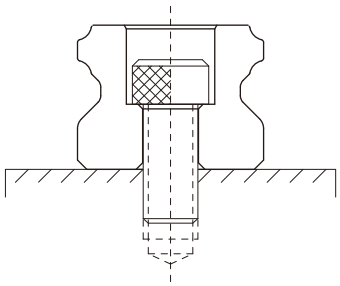
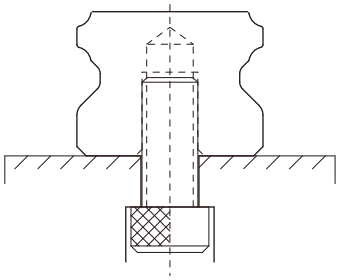
unit: mm

Item	15	20	25	30	35	45
Standard Length L(n)	160 (3)	220 (4)	220 (4)	280 (4)	280 (4)	570 (6)
	220 (4)	280 (5)	280 (5)	440 (6)	440 (6)	885 (9)
	280 (5)	340 (6)	340 (6)	600 (8)	600 (8)	1200 (12)
	340 (6)	460 (8)	460 (8)	760 (10)	760 (10)	1620 (16)
	460 (8)	640 (11)	640 (11)	1000 (13)	1000 (13)	2040 (20)
	640 (11)	820 (14)	820 (14)	1640 (21)	1640 (21)	2460 (24)
	820 (14)	1000 (17)	1000 (17)	2040 (26)	2040 (26)	2985 (29)
		1240 (21)	1240 (21)	2520 (32)	2520 (32)	
			1600 (27)	3000 (38)	3000 (38)	
Pitch (P)	60	60	60	80	80	105
Distance to End (E)	20	20	20	20	20	22. 5
Max. Standard Length	4,000 (67)	4,000 (67)	4,000 (67)	3,960 (50)	3,960 (50)	3,930 (38)
Max. Length	4,000	4,000	4,000	4,000	4,000	4,000

Note : 1. Tolerance of E value for standard rail is 0.5 ~ -0.5 mm. Tolerance of E value for jointed rail is 0 ~ -0.3 mm.
2. Maximum standard length means the max. rail length with standard E value on both sides.

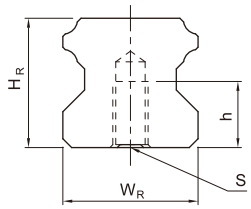
Rail types

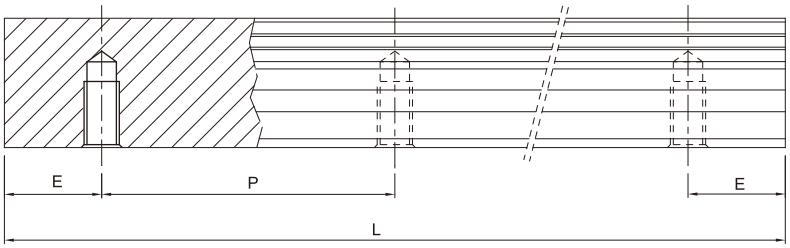
Besides the standard top mounting type, NiSENSORE also offers bottom mounting type rails.

Mounting from Top	Mounting from Bottom
	

Dimesions

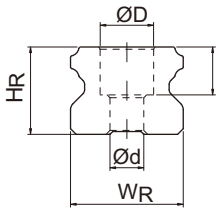
1 Dimesions for BCT HBR - T (Rail Mounting from Bottom)

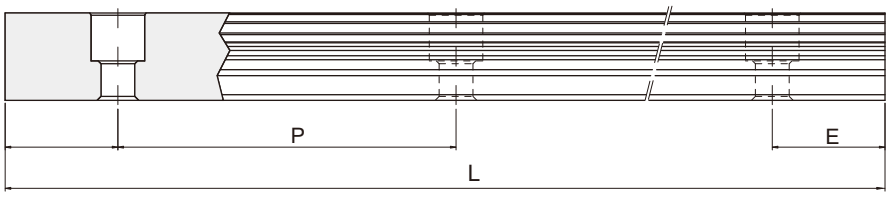




Model No.	Dimensions of Rail (mm)						Weight
	W_R	H_R	S	h	P	E	(kg / m)
BCT HBR 15 T	15	15	M5 x 0. 8P	8	60	20	1. 48
BCT HBR 20 T	20	17. 5	M6 x 1P	10	60	20	2. 29
BCT HBR 25 T	23	22	M6 x 1P	12	60	20	3. 35
BCT HBR 30 T	28	26	M8 x 1. 25P	15	80	20	4. 67
BCT HBR 35 T	34	29	M8 x 1. 25P	17	80	20	6. 51

2 Dimensions for BCT HBR - U (large mounting hole, rail mounting from top)





Model No.	Mounting Bolt for Rail(mm)	Dimensions of Rail (mm)							Weight (kg/m)
		W_R	H_R	D	h	d	P	E	
BCT HBR 15 U	M4x16	15	12. 5	7. 5	5. 3	4. 5	60	20	1. 23

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Website: http://www.nipponkodobearings.com

Black Cold Electroplated Cage Roller Guides

Typical Applications

High-precision machinery, semiconductor equipment,

aerospace systems, and other demanding environments.

1. Material Composition - Cage Roller Guideway

1.1 Materials

Block:
S55C

Guide Rail :
100Cr6

Roller :
100Cr6

Oil Nozzle :
Brass

Components :
5.1 Wiper : NBR
5.2 Return Tube : PA66
5.3 Bottom Dust Seal : PA66
5.4 Rail Clamp : PA66
5.5 Rail Bolt Cover : PA66(Black)
5.6 Roller Chain Belt : PA66

1.2 Material Composition Table

Material name.	Material composition table (%)							
C55E	C	Si	Mn	P	S	Ni	Cr	Mo
	0.52-0.60	0.15-0.35	0.60-0.90	≤0.035	≤0.035	≤0.4	≤0.4	≤0.1

Material name.	Material composition table (%)					
100Cr6	C	Si	Mn	P	S	Cr
	0.93-1.05	0.15-0.35	0.25-0.45	0.025	0.025	1.30-1.65

Material name.	Material composition table (%)								
Brass	Cu	Zn	Pb	Fe	Sn	Al	Mn	Ni	Si
	60.5 - 63.5	Balance	≤0.08	≤0.15	≤0.05	≤0.5	≤0.05	≤0.3	≤0.3

Material name.	Material composition table (%)		
PA66	AA	HMDA	H2O
	45.7	54.3	< 2. 0

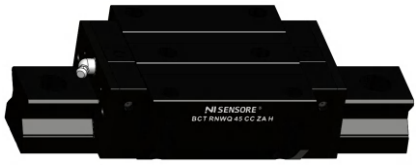
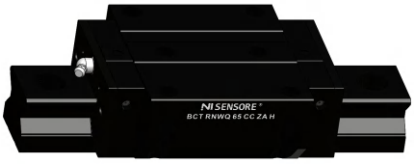
Material name.	Material composition table (%)	
PE	AA	HMDA
	45.7	54.3

Material name.	Material composition table (%)	
NBR	C3H3N	C4H6

2. Cage Roller Guideways 3D photo

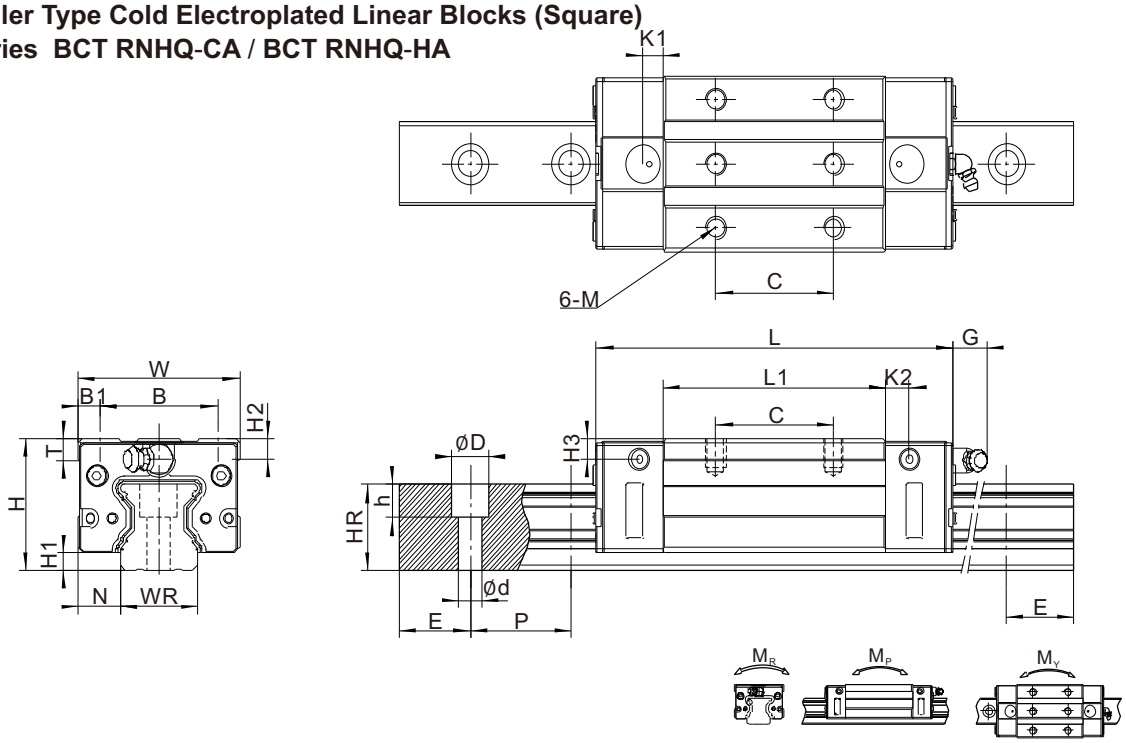
 NiSENSORE BCT RNHQ 20 CA ZA	 NiSENSORE BCT RNHQ 20 HA ZA	 NiSENSORE BCT RNHQ 25 CA ZA
 NiSENSORE BCT RNHQ 25 HA ZA	 NiSENSORE BCT RNHQ 30 CA ZA	 NiSENSORE BCT RNHQ 30 HA ZA
 NiSENSORE BCT RNHQ 35 CA ZA	 NiSENSORE BCT RNHQ 35 HA ZA	 NiSENSORE BCT RNHQ 45 CA ZA
 NiSENSORE BCT RNHQ 45 HA ZA	 NiSENSORE BCT RNHQ 55 CA ZA	 NiSENSORE BCT RNHQ 55 HA ZA
 NiSENSORE BCT RNHQ 65 CA ZA	 NiSENSORE BCT RNHQ 65 HA ZA	 NiSENSORE BCT RNWQ 20 CC ZA
 NiSENSORE BCT RNWQ 20 HC ZA	 NiSENSORE BCT RNWQ 25 CC ZA	 NiSENSORE BCT RNWQ 25 HC ZA

2. Cage Roller Guideways 3D photo

 NiSENSORE BCT RNWQ 30 CC ZA	 NiSENSORE BCT RNWQ 30 HC ZA	 NiSENSORE BCT RNWQ 35 CC ZA
 NiSENSORE BCT RNWQ 35 HC ZA	 NiSENSORE BCT RNWQ 45 CC ZA	 NiSENSORE BCT RNWQ 45 HC ZA
 NiSENSORE BCT RNWQ 55 CC ZA	 NiSENSORE BCT RNWQ 55 HC ZA	 NiSENSORE BCT RNWQ 65 CC ZA
 NiSENSORE BCT RNWQ 65 HC ZA		

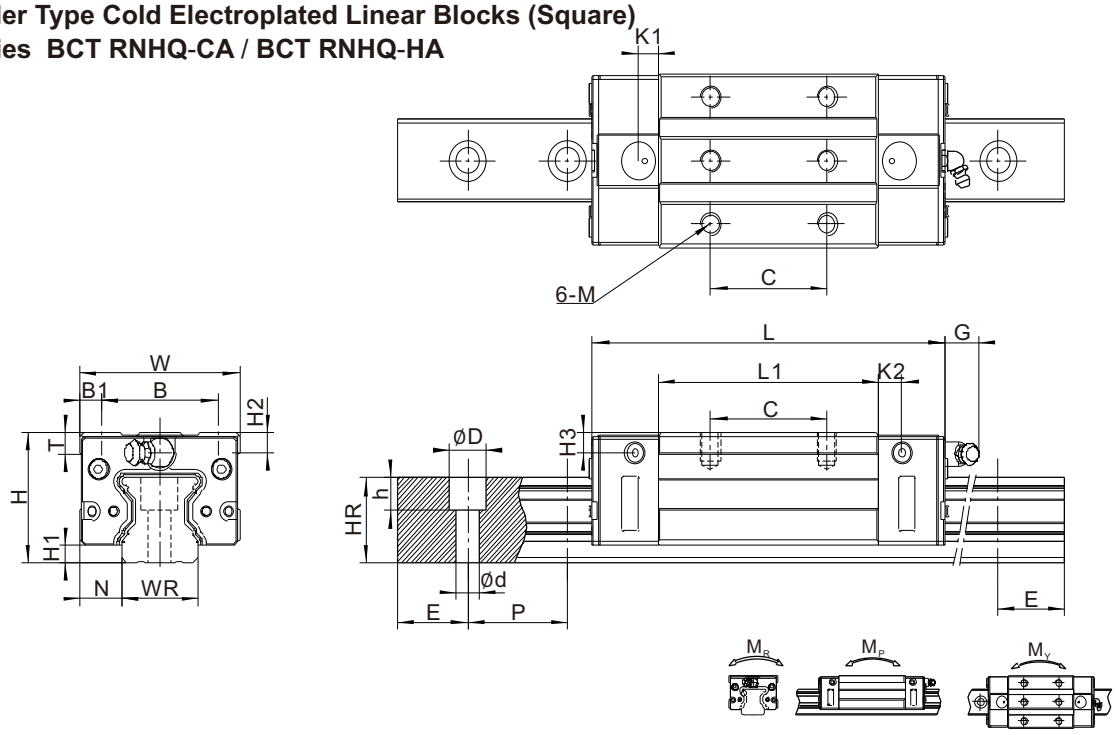
Product Information

High Rigidity
Roller Type Cold Electroplated Linear Blocks (Square)
Series BCT RNHQ-CA / BCT RNHQ-HA



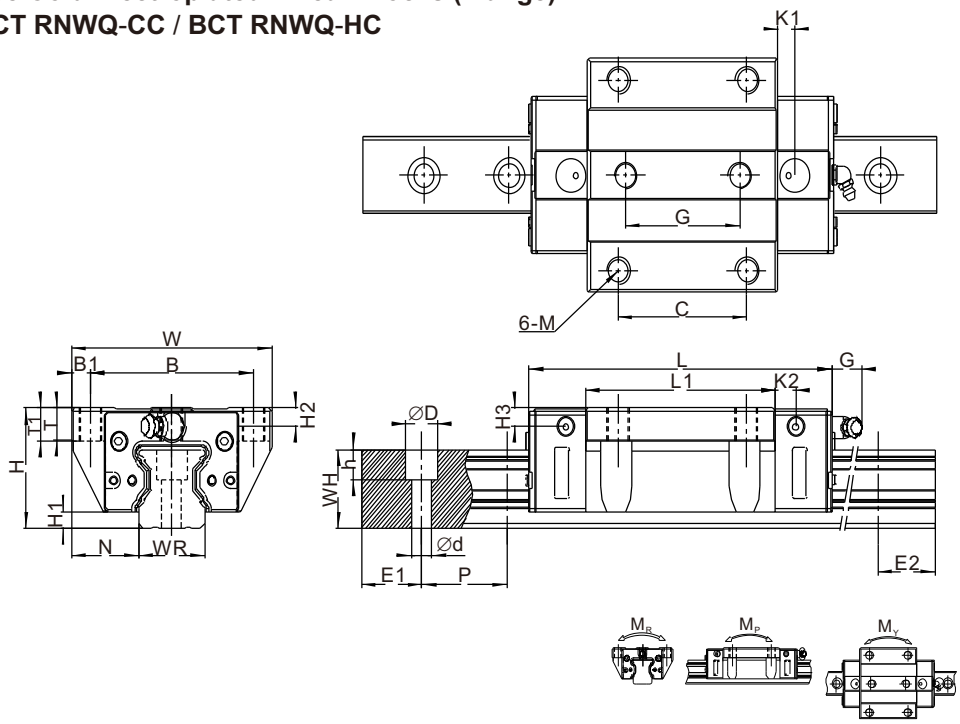
Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)												
	H	H1	N	W	B	B1	C	L1	L	K1	K2	G	MxL	T	H2	H3
BCT RNHQ 20 CA	34	5	12	44	32	6	36	57.5	86.6	5	4.6	8	M5 x 8	8.3	8.5	8.5
BCT RNHQ 20 HA							50	77.5	106.6							
BCT RNHQ 25 CA	40	5	12.5	48	35	6.5	35	55.1	96.3	6	7	12	M6 x 10	10	9.5	9.5
BCT RNHQ 25 HA							50	83	124.2							
BCT RNHQ 30 CA	45	6	16	60	40	10	40	71	114	8	8	12	M8 x10	9.5	9.5	10
BCT RNHQ 30 HA							60	93	136							
BCT RNHQ 35 CA	55	6.5	18	70	50	10	50	82	131	8	12	12	M8 x14	12	16	16
BCT RNHQ 35 HA							72	110	159							
BCT RNHQ 45 CA	70	8	20.5	86	60	13	60	106	158	8	10	13	M10x20	16	20	20
BCT RNHQ 45 HA							80	142	194							
BCT RNHQ 55 CA	80	10	23.5	100	75	13	75	125.5	182.5	8	13	13	M12x20	19	22	22
BCT RNHQ 55 HA							95	176.5	233.5							
BCT RNHQ 65 CA	90	12	31.5	126	76	25	70	160	226	16	16	13	M16 x20	25	15	15
BCT RNHQ 65 HA							120	226	292							

High Rigidity
Roller Type Cold Electroplated Linear Blocks (Square)
Series BCT RNHQ-CA / BCT RNHQ-HA



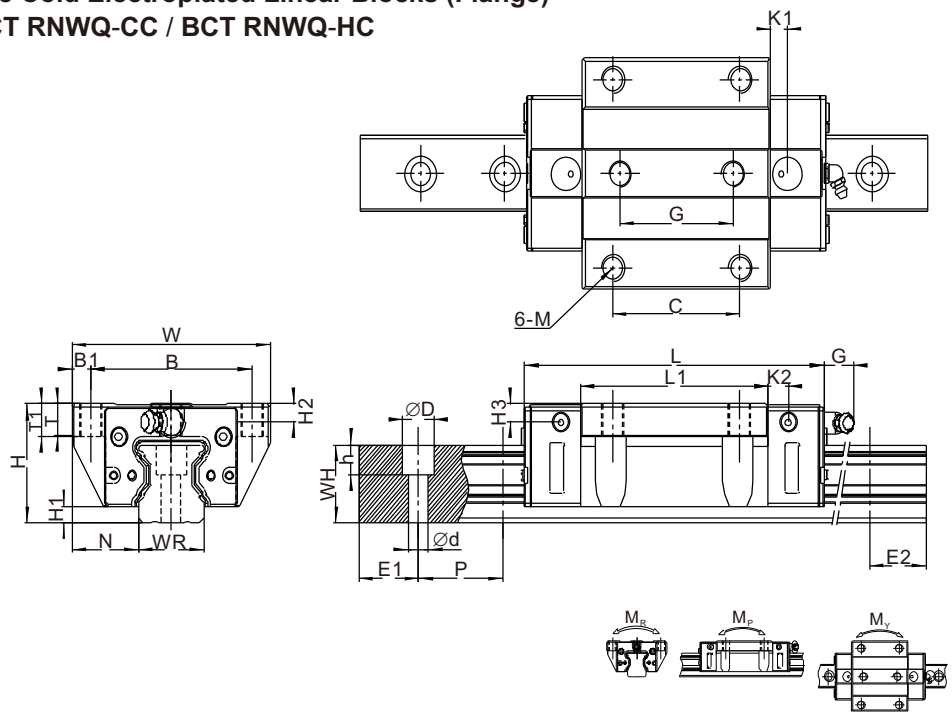
Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	MR KN-m	MP KN-m	MY KN-m	Block kg	Rail kg/m
20	21	9.5	8.5	6	30	20	M5 x20	24.05 30.34	45.83 61.77	0.69 0.93	0.466 0.846	0.466 0.846	0.41 0.55	2.76
23	24	11	9	7	30	20	M6 x25	28.54 39.13	50.21 75.31	0.78 1.12	0.65 1.15	0.65 1.15	0.53 0.78	3.12
28	28	14	12	9	40	20	M8 x30	48.62 61.45	81.29 109.98	1.80 2.05	1.55 1.92	1.55 1.92	0.92 1.21	4.47
34	30	14	12	9	40	20	M8 x30	55.14 69.62	95.64 129.11	2.01 2.66	1.22 2.30	1.22 2.30	1.60 2.10	6.13
45	38	20	17	14	52.5	22.5	M12 x35	95.63 120.60	178.72 240.89	4.75 6.55	3.55 5.80	3.55 5.80	3.20 4.19	9.99
53	44	23	20	16	60	30	M14 x45	147.64 196.95	255.03 369.80	8.20 11.25	5.60 10.4	5.60 10.40	4.92 6.72	14.14
63	53	26	22	18	75	35	M16x50	213.00 275.3	411.60 572.70	16.20 22.55	11.59 22.17	11.59 22.17	8.89 12.13	20.30

High Rigidity
Roller Type Cold Electroplated Linear Blocks (Flange)
Series BCT RNWQ-CC / BCT RNWQ-HC



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)														
	H	H1	N	W	B	B1	C	C1	L1	L	K1	K2	G	M	T	T1	H2	H3
BCT RNWQ 20 CC BCT RNWQ 20 HC	30	5	21.5	63	53	5	40	35	57.5 77.5	86.6 106.6	5	4.6	8	M6	10	14	4.5	4.5
BCT RNWQ 25 CC BCT RNWQ 25 HC	36	5	23.5	70	57	6.5	45	40	55.1 83	96.3 124.2	6	7	12	M8	10	13	5.5	5.5
BCT RNWQ 30 CC BCT RNWQ 30 HC	42	6	31	90	72	9	52	44	71 93	114 136	8	8	12	M10	9.5	14	6.5	7.3
BCT RNWQ 35 CC BCT RNWQ 35 HC	48	6.5	33	100	82	9	62	52	82 110	131 159	8	12	12	M10	12	13	9	9
BCT RNWQ 45 CC BCT RNWQ 45 HC	60	8	37.5	120	100	10	80	60	106 142	158 194	8	10	13	M12	16	18	10	10
BCT RNWQ 55 CC BCT RNWQ 55 HC	70	10	43.5	140	116	12	95	70	125.5 176.5	182.5 233.5	8	13	13	M14	18	18	12	12
BCT RNWQ 65 CC BCT RNWQ 65 HC	90	12	53.5	170	142	14	110	82	160 226	226 292	16	16	13	M16	22	23	15	15

High Rigidity
Roller Type Cold Electroplated Linear Blocks (Flange)
Series BCT RNWQ-CC / BCT RNWQ-HC



Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
WR	HR	D	h	d	P	E	(mm)	C(KN)	C0(KN)	MR KN-m	MP KN-m	MY KN-m	Block kg	Rail kg/m
20	21	9.5	8.5	6	30	20	M5x20	24.05 30.34	45.83 61.77	0.69 0.93	0.466 0.846	0.466 0.846	0.48 0.65	2.76
23	24	11	9	7	30	20	M6x25	28.54 39.13	50.21 75.31	0.78 1.12	0.65 1.15	0.65 1.15	0.72 0.91	3.12
28	28	14	12	9	40	20	M8x30	48.62 61.45	81.29 109.98	1.80 2.05	1.55 1.92	1.55 1.92	1.16 1.52	4.47
34	30	14	12	9	40	20	M8x30	55.14 69.62	95.64 129.11	2.01 2.66	1.22 2.30	1.22 2.30	1.75 2.40	6.13
45	38	20	17	14	52.5	22.5	M12x35	95.63 120.60	178.72 240.89	4.75 6.55	3.55 5.80	3.55 5.80	3.43 4.57	9.99
53	44	23	20	16	60	30	M14x45	147.64 196.95	255.03 369.80	8.20 11.25	5.60 10.40	5.60 10.40	5.43 7.61	14.14
63	53	26	22	18	75	35	M16x50	213.00 275.30	411.60 572.70	16.20 22.55	11.59 22.17	11.59 22.17	11.63 16.58	20.30

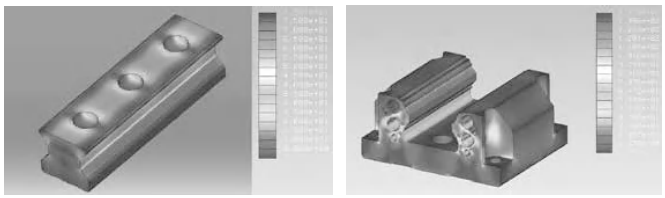
Technical Information

3. RNQ Series – High Rigidity Roller Type Linear Guideway

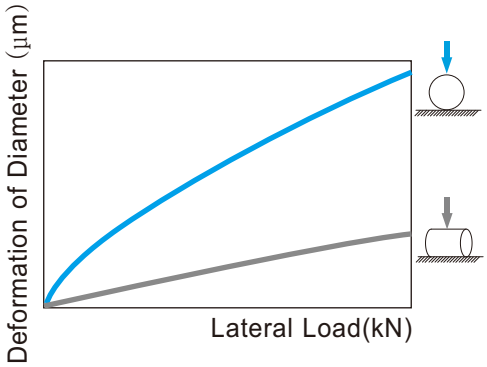
3.1 Advantages and features

The new RNQ series from NiSENSORE features a roller as the rolling element instead of steel balls. The roller series offers super high rigidity and very high load capacities. The RNQ series is designed with a 45-degree angle of contact. Elastic deformation of the linear contact surface, during load, is greatly reduced thereby offering greater rigidity and higher load capacities in all 4 load directions.The RNQ series linear guideway offers high performance for high-precision manufacturing and achieving longer service life.

(1) Optimal design
FEM analysis was performed to determine the optimal structure of the block and the rail. The unique design of the circulation path allows the RNQ series linear guideway to offer smoother linear motion.

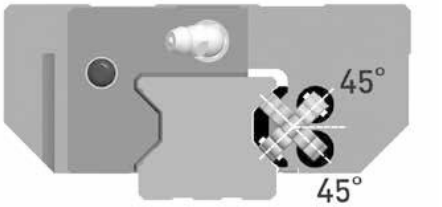


(2) Super high rigidity
The RNQ series is a type of linear guideway that uses rollers as the rolling elements. Rollers have a greater contact area than balls so that the roller guideway features higher load capacity and greater rigidity. The figure shows the rigidity of a roller and a ball with equal volume.



(3) Super high load capacity
With the four rows of rollers arranged at a contact angle of 45-degrees, the RNQ series linear guideway has equal load ratings in the radial, reverse radial and lateral directions. The RG series has a higher load capacity in a smaller size than conventional, ball-type linear guideways.

(4) Operating life increased
Compare with the ball element, the contact pressure of rolling element is distributed on the line region. Therefore, stress concentration was reduced siginificantly and the RNQ series offers longer running life. The nominal life of RNQ series can be calculated by using Eq.



The acting load will affect the nominal life of a linear guideway. Based on the selected basic dynamic rated load and the actual load. The nominal life of ball type and roller type linear guideway can be calculated by Eq.2.5 respectively.

$$L=\left(\frac{C}{P}\right)^{\frac{10}{3}}\cdot 100km=\left(\frac{C}{P}\right)^{\frac{10}{3}}\cdot 62mile \quad \text{Eq. 2.5}$$

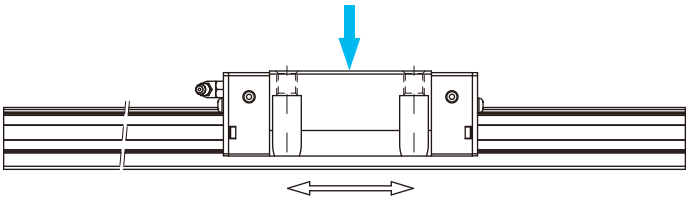
If the environmental factors are taken into consideration, the nominal life is influenced greatly by the motion conditions, the hardness of the raceway, and the temperature of the linear guideway. The relationship between these factors is expressed in Eq.2.6.

$$L=\left(\frac{fh\cdot ft\cdot C}{fw\cdot P}\right)^{\frac{10}{3}}\cdot 100km=\left(\frac{fh\cdot ft\cdot C}{fw\cdot P}\right)^{\frac{10}{3}}\cdot 62mile \quad \text{Eq. 2.6}$$

L : Nominal life
C : Basic dynamic load rating
P : Actual load
fh : Hardness factor
ft : Temperature factor
fW: Load factor

3.2 Test Data

Nominal life test



Model of the test system

Table 3.1

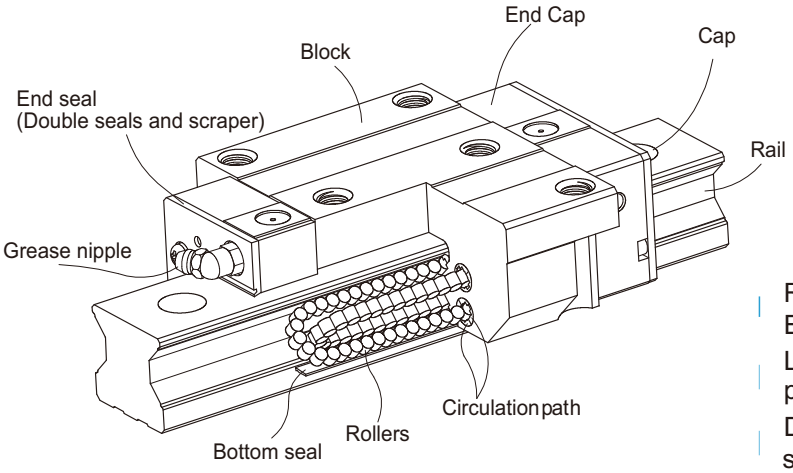
Tested model 1: BCT RNHQ 35 CA Preload: ZA class Max. Speed: 60m/min Acceleration: 1G Stroke: 0.55m Lubrication: grease held every 100km External load: 15kN Traveling distance: 1135km	Test results: The nominal life of BCT RNHQ 35 CA is 1000km. After traveling 1135 km, fatigue flaking did not appear on the surface of the raceway or rollers. 

Table 3.2 Durability Test

Tested model 2: BCT RNWQ 35 CC Preload: ZA class Max. Speed: 120m/min Acceleration: 1G Stroke: 2m Lubrication: oil feed rate: 0.3 cm^3 External load: 0kN Traveling distance: 15000km	Test results: Fatigue flaking did not appear on the surface of the raceway or rollers after traveling 15000 km. 

Note: The data listed are from samples.

3.3 Construction of BCT RNQ Series



- Rolling circulation system: Block, Rail, End cap, Circulation path, rollers
- Lubrication system: Grease nipple and piping joint
- Dust protection system: End seal, Bottom seal, Cap, Double seals and Scraper

BCT RNQ Series - High Rigidity Roller Type

3.4 Model Number of BCT RNQ series

BCT RN series linear guideways are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain P-class accuracy. Because of strict dimensional control, the interchangeable type linear guideways are a wise choice for customers when rails do not need to be matched for an axis. The model number of the BCT RNQ series identifies the size, type, accuracy class, preload class, etc.

(1) Interchangeable type

BCT RNWQ	2 0	C	C		E	Z 0	H	Z Z / E 2
Series	Models					Preload	Class	Accessories
①	②	③	④		⑧	⑨	⑩	⑫

BCT RNR	2 0				R	2 0 0 0	E		H	R C
Series	Model					Rail Length (mm)		Preload		Accessories
①	②				⑥	⑦	⑧	⑨	⑩	⑫

(2) Non-Interchangeable type

BCT RNWQ	2 0	C	A	2	R	2 0 0 0		Z A	H	II	D D / E 2
Series	Models					Rail Length (mm)		Preload			Accessories
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫

Remarks:

③
Load Types
C: Heavy Load
H: Super Heavy Load

⑥
Rail Mounting Type
R: Mounting Type
T: Bottom

④
Block Mounting Type
A: Mounting From Top
B: Bottom
C: Top or Bottom

⑧
E: Special Block
None: Standard Block

⑤
No. of Blocks per Rail

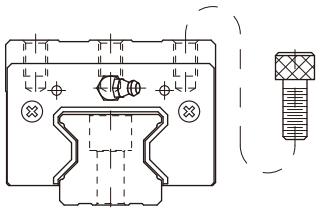
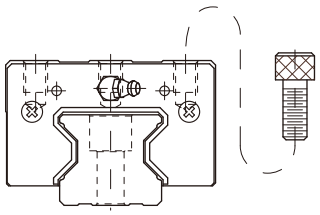
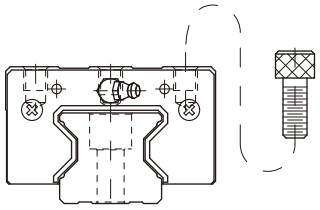
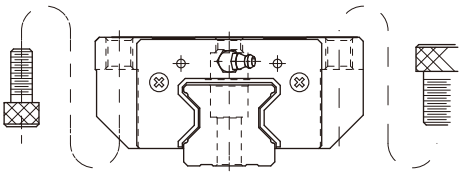
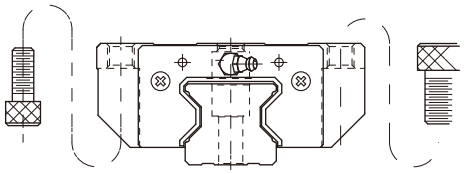
⑪
Nos. of rails per axis set 1

3.5 Types

(1) Block types

NiSENSORE offers two types of guide blocks, flange and square type. Because of the low assembly height and large mounting surface, the flange type is excellent for heavy moment load applications.

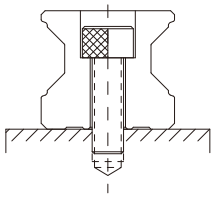
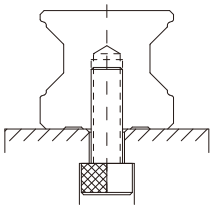
Table 3.3 Block Types

Type	Model	Shape	Height (mm)	Rail Length (mm)	Main Applications
Square	BCT RNHQ-CA BCT RNHQ-HA		28 L 90	100 L 4000	Automation Systems Transportation equipment CNC machining centers Heavy duty cutting machines CNC grinding machines Injection molding machines Plano millers Devices requiring high rigidity Devices requiring high load capacity Electric discharge machines
Square (low)	RNL-CA RNL-HA		24 L 70	100 L 4000	
Square (Ultra low)	RNS-CA RNS-HA		44 L 52	100 L 4000	
Flange	BCT RNWQ-CC BCT RNWQ-HC		24 L 90	100 L 4000	
Flange (Ultra low)	RNF-CC RNF-HC		44 L 52	100 L 4000	

(2) Rail Types

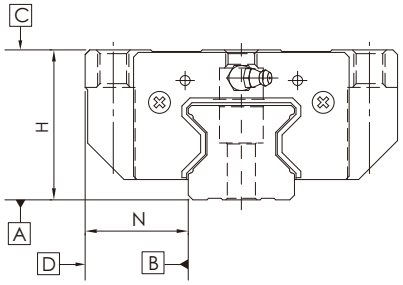
In addition to the standard top mounting type, NiSENSORE also offers the bottom mounting type of rails.

Table 3.4 Rail Types

Mounting from Top	Mounting from Bottom
	

3.6 Accuracy Classes

The accuracy of the RN series can be classified into four classes: high (H), precision (P). Customers may choose the class by referencing the accuracy requirements of the applied equipment.



(1) Accuracy of non-interchangeable

Table 3.5 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 20 High (H)	BCT RN - 20 Precision (P)
Dimensional tolerance of height H	± 0.03	0 - 0.03
Dimensional tolerance of Width N	± 0.03	0 - 0.03
Variation of height H	0.01	0.006
Variation of width N	0.01	0.006
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

Table 3.6 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 25, 30, 35 High (H)	BCT RN - 25, 30, 35 Precision (P)
Dimensional tolerance of height H	± 0.04	0 - 0.04
Dimensional tolerance of Width N	± 0.04	0 - 0.04
Variation of height H	0.015	0.007
Variation of width N	0.015	0.007
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

Table 3.7 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 45, 55 High (H)	BCT RN - 45, 55 Precision (P)
Dimensional tolerance of height H	± 0.05	0 - 0.05
Dimensional tolerance of Width N	± 0.05	0 - 0.05
Variation of height H	0.015	0.007
Variation of width N	0.02	0.01
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

Table 3.8 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 65 High (H)	BCT RN - 65 Precision (P)
Dimensional tolerance of height H	± 0.07	0 - 0.07
Dimensional tolerance of Width N	± 0.07	0 - 0.07
Variation of height H	0.02	0.01
Variation of width N	0.025	0.015
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

(2) Accuracy of interchangeable

Table 3.9 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 20 High (H)	BCT RN - 20 Precision (P)
Dimensional tolerance of height H	± 0.03	± 0.015
Dimensional tolerance of Width N	± 0.03	± 0.015
Variation of height H	0.01	0.006
Variation of width N	0.01	0.006
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

Table 3.10 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 25, 30, 35 High (H)	BCT RN - 25, 30, 35 Precision (P)
Dimensional tolerance of height H	± 0.04	- 0.02
Dimensional tolerance of Width N	± 0.04	- 0.04
Variation of height H	0.015	0.007
Variation of width N	0.015	0.007
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

Table 3.11 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 45, 55 High (H)	BCT RN - 45, 55 Precision (P)
Dimensional tolerance of height H	± 0.05	± 0.025
Dimensional tolerance of Width N	± 0.05	± 0.025
Variation of height H	0.015	0.007
Variation of width N	0.02	0.01
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

Table 3.12 Accuracy Standards

Unit: mm

Items / Accuracy Classes	BCT RN - 65 High (H)	BCT RN - 65 Precision (P)
Dimensional tolerance of height H	± 0.07	- 0.035
Dimensional tolerance of Width N	± 0.07	- 0.035
Variation of height H	0.02	0.01
Variation of width N	0.025	0.015
Running parallelism of block surface C to Surface A	See Table	
Running parallelism of block surface D to Surface B	See Table	

(3) Accuracy of running parallelism

Table 3.13 Accuracy of Running Parallelism

Unit: mm

Rail Length (mm)	Accuracy (μm) H	P	SP	UP
~ 100	7	3	2	2
100 ~ 200	9	4	2	2
200 ~ 300	10	5	3	2
300 ~ 500	12	6	3	2
500 ~ 700	13	7	4	2
700 ~ 900	15	8	5	3
900 ~ 1,100	16	9	6	3
1,100 ~ 1,500	18	11	7	4
1,500 ~ 1,900	20	13	8	4
1,900 ~ 2,500	22	15	10	5
2,500 ~ 3,100	25	18	11	6
3,100 ~ 3,600	27	20	14	7
3,600 ~ 4,000	28	21	15	7

3.7 Standard and Maximum Lengths of Rail

NiSENSORE offers a number of standard rail lengths. Standard rail lengths feature end mounting hole placements set to predetermined values (E). For non-standard rail lengths, be sure to specify the E-value to be no greater than ½ the pitch (P) dimension. An E-value greater than this will result in unstable rail ends.

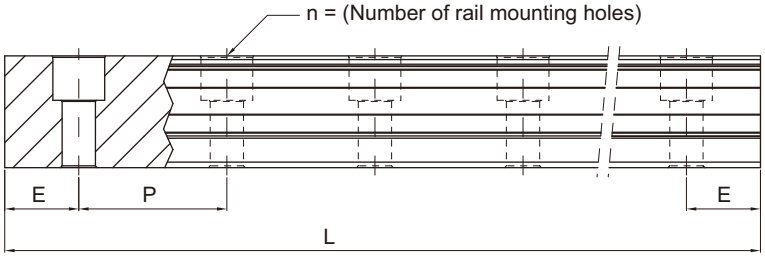


Table 3.14

unit: mm

Item	BCT RN 20	BCT RN 25	BCT RN 30	BCT RN 35	BCT RN 45	BCT RN 55	BCT RN 65
	220 (7)	220 (7)	280 (7)	280 (7)	570 (11)	780 (13)	1,270 (17)
	280 (9)	280 (9)	440 (11)	440 (11)	885 (17)	1020 (17)	1,570 (21)
	340 (11)	340 (11)	600 (15)	600 (15)	1,200 (23)	1,260 (21)	2,020 (27)
	460 (15)	460 (15)	760 (19)	760 (19)	1,620 (31)	1,500 (25)	2,620 (35)
Standard Length L (n)	640 (21)	640 (21)	1,000 (25)	1,000 (25)	2,040 (39)	1,980 (33)	-
	820 (27)	820 (27)	1,640 (41)	1,640 (41)	2,460 (47)	2,580 (43)	-
	1000 (33)	1,000 (33)	2,040 (51)	2,040 (51)	2,985 (57)	2,940 (49)	
	1180 (39)	1,240 (41)	2,520 (63)	2,520 (63)	3,090 (59)	3,060 (51)	-
	1360 (45)	1,600 (53)	3,000 (75)	3,000 (75)	-	-	-
Pitch (P)	30	30	40	40	52.5	60	75
Distance to End (Es)	20	20	20	20	22.5	30	35
Max. Length	4,000(133)	4,000(133)	4,000(100)	4,000(100)	4,000(76)	4,000(66)	4,000(53)

Note : 1. Tolerance of E value for standard rail is 0.5~-0.5 mm. Tolerance of E value for jointed rail is 0~-0.3 mm.

2. Maximum standard length means the max. rail length with standard E value on both sides.

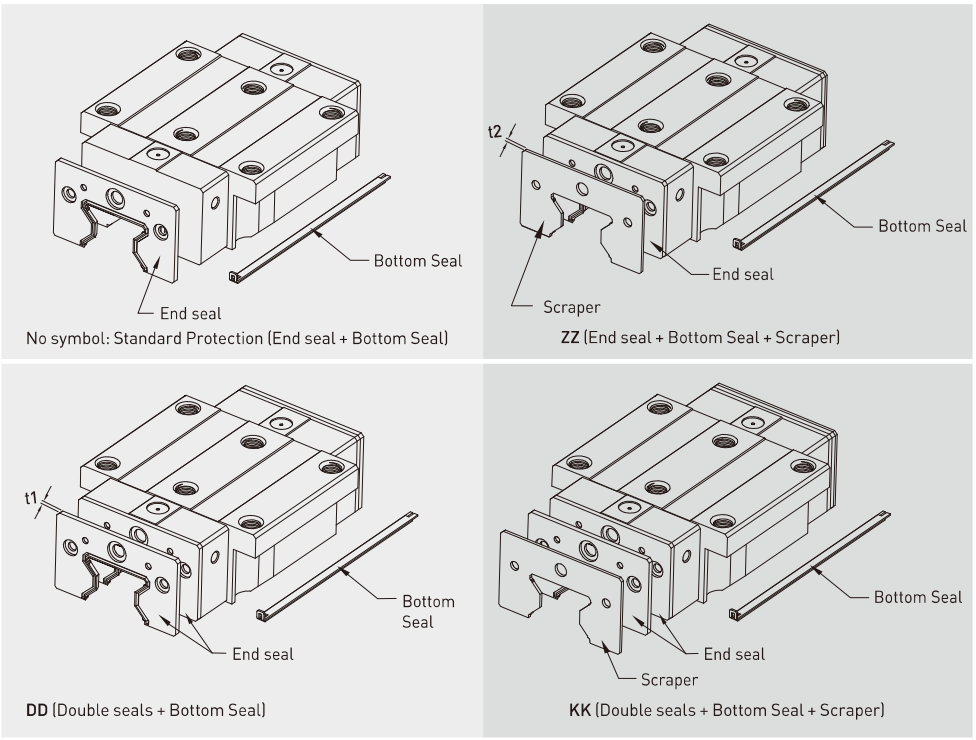
3. If different E value is needed, please contact NIKO.

3.8. Dust Proof Accessories

(1) Codes of accessories

If the following accessories are needed, please add the code followed by the model number.

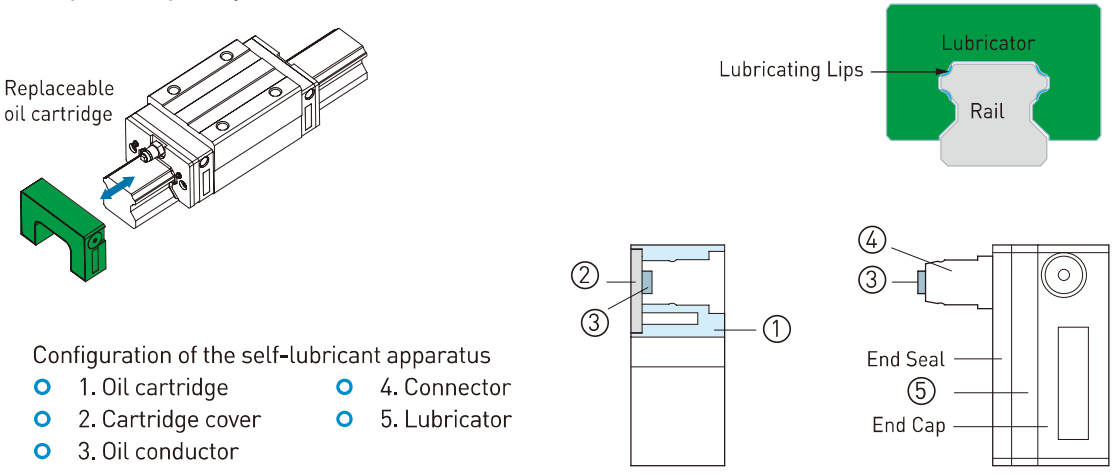
Table 3.15



3.9. E2 Type-Self lubrication Kit for Cage Roller Guideway

E2 self-lubricating guideway contains a lubricator between the end cap and end seal.
Outside of the block is equipped with a replaceable oil cartridge, the configuration of which is listed below.

Lubrication oil flows from the replaceable oil cartridge to the lubricator and then lubricates grooves of rails. The Oil cartridge comprises a oil conductor with 3D structure that enables the lubricator to contact oil despite that blocks are placed at a random position, and thus the lubrication oil inside the oil cartridge can be used up via capillary action.



Configuration of the self-lubricant apparatus

- 1. Oil cartridge
- 2. Cartridge cover
- 3. Oil conductor
- 4. Connector
- 5. Lubricator

Applications

Applications

Introducing Nisensore's Anti-Corrosion Linear Guides

In addition to sensors, we have spent over three years developing our innovative anti-corrosion linear guides. These guides are primarily designed for use in medical equipment, food processing machinery, semiconductor vacuum systems, woodworking machinery, military machinery, aerospace machinery, and marine machinery.

Main Features of our stainless steel linear guides

1. Can be used in low and medium vacuum environments
2. High rust resistance
3. Low pollution
4. Noise reduction

Nisensore achieves these effects through the following processes:

1. Use of stainless steel material
2. Application of condensation electroplating technology

By combining 1 and 2, utilizing high-nickel performance and efficiency,
CNC high-precision grinding, we now can produces:

Model Sizes: M5, M7, M9, M12, M15, 15, 20, 25, 30, 35, 45
Block Types: Square and Flange type
Precision: To meet market demands, we offer C and H options, If a specific production precision (P) is required, please contact NiSENSORE for custom processing.

Advantages of Nisensore's Anti- Corrosion Stainless Steel Linear Guides

Designed primarily for the global market, this series offers high efficiency and cost-effectiveness.

Due to our careful selection of materials and advanced technology, the hardness and rigidity of our products are relatively high compared to others. As a result, the lifespan calculations are excellent, surpassing those of well-known brands and general steel and stainless steel products.

The advantages of replacing ordinary linear guides

The advantages of replacing ordinary linear guides (typically made of carbon steel) with stainless steel linear guides may indeed bring better comprehensive benefits to users under the same precision conditions. A detailed analysis is as follows:

1. Core Advantage Analysis

1.1. Corrosion Resistance and Environmental Adaptability

Stainless steel guides contain alloy elements such as chromium and nickel, which form a passive film, significantly improving corrosion resistance. They are suitable for the following scenarios:

1.1.1. Humid environments (e.g., food processing, pharmaceuticals, marine equipment)
1.1.2. Chemical exposure environments (e.g., laboratories, electroplating plants)
1.1.3. High-cleanliness requirements (e.g., medical equipment, semiconductor manufacturing)

-Ordinary guides with only surface coatings (e.g., chrome plating, blackening) are prone to rust after long-term use due to coating wear, leading to reduced precision or jamming.

1.2. Reduced Maintenance Costs and Downtime Risks

-Stainless steel guides do not require frequent anti-rust treatments, reducing the use of lubricants and cleaning frequency, thereby saving labor and consumable costs.
-Ordinary guides in corrosive environments may seize due to rust, requiring regular replacement and increasing the risk of unexpected downtime.

1.3. Hygiene and Cleanliness

-The smooth surface of stainless steel resists microbial adhesion, complying with food-grade (FDA) or medical-grade (GMP) standards, making it suitable for industries requiring frequent cleaning or disinfection.

1.4. Long-Term Precision Stability

-In corrosive environments, stainless steel guides maintain more stable motion accuracy over time due to their strong anti-rust properties, with less deformation and wear on the guide surface.
-Ordinary guides may generate oxide particles due to rust, accelerating slider wear and indirectly affecting precision.

2. Factors to Consider

2.1. Higher Initial Cost

-The material and processing costs of stainless steel are typically 20%~50% higher than those of ordinary carbon steel. However, if the application environment has high corrosion risks, long-term maintenance costs may offset the initial investment.

2.2. Differences in Mechanical Properties

-Hardness and Wear Resistance: Ordinary guides with hardening treatments (e.g., quenching) may have higher surface hardness than stainless steel, but modern stainless steel guides can improve wear resistance through special heat treatments (e.g., precipitation hardening).
-Load Capacity: If both designs meet the same specifications (e.g., HIWIN or THK series products), their static and dynamic load capacities are similar.

2.3. Lubrication Requirements

-Stainless steel guides perform better in low-lubrication or dry environments, but compatibility must be considered when using specialized lubricants (e.g., food-grade grease).

3. Is It Better for Users?

3.1.Suitable for Corrosive/High-Hygiene Environments: Stainless steel guides are significantly superior to ordinary guides, reducing total cost of ownership (TCO) and improving reliability.

3.2.General Dry Environments: If there is no corrosion risk, ordinary guides offer better cost performance but require strict anti-rust maintenance.

3.3. Long-Term Operation of Precision Equipment: Even in mild environments, the stability and low-maintenance features of stainless steel guides may still provide greater advantages.

Therefore, under the same precision conditions, stainless steel guides are the better choice for users facing corrosion, hygiene, or long-term maintenance-free requirements.
Conversely, if budget is limited and the environment is controllable, ordinary guides can still meet basic needs.

Under the hypothetical market strategy of launching stainless steel linear guides at the same price as ordinary carbon steel guides, whether sales volume can be expanded requires a comprehensive analysis of technical advantages, market demand, cost balance, and competitive landscape. Below is a detailed assessment based on industry trends and current conditions:

① Machining center

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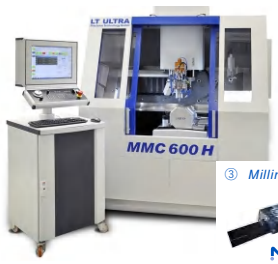
② Lathe

NI SENSORE®



③ Milling machine

NI SENSORE®

④ Boring machine

NI SENSORE®

⑤ Electric discharge machine

NI SENSORE®

⑥ Punching press

NI SENSORE®

⑦ Laser beam machine

NI SENSORE®

⑧ Woodworking machine

NI SENSORE®

⑨ NC drilling machine

NI SENSORE®

⑩ Tpping cender

NI SENSORE®

⑪ Wire cutting machine

NI SENSORE®

⑫ Cartesian coordinate

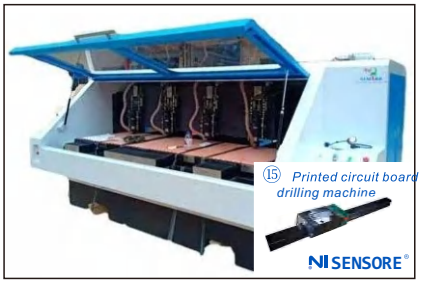
NI SENSORE®

⑬ Cylindrical coordinate

NI SENSORE®

⑭ Wire bonding machine

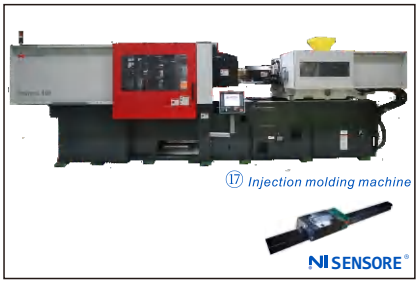
NI SENSORE®



⑮ Printed circuit board drilling machine

NI SENSORE®


Electronic component inserter


⑰ Injection molding machine

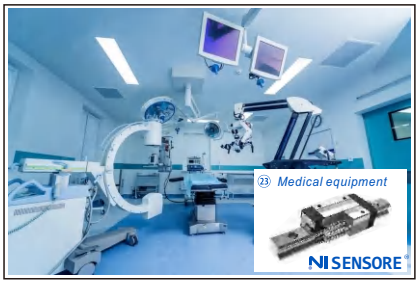

⑱ Office equipment


⑲ Conveyance system


XY table


㉑ Wire cutting machine


㉒ Welding machine


㉓ Medical equipment


㉔ Digitizer


㉕ Inspection equipment

Marketing

Market Strategy

1. Market Potential and Demand Drivers

1.1. Surge in Niche Market Demand

-High-Corrosion Applications: Industries such as food processing, medical equipment, and semiconductor manufacturing have extremely high requirements for corrosion resistance.

The inherent anti-rust properties of stainless steel guides can significantly reduce maintenance costs and extend equipment lifespan.

-Hygiene and Cleanliness Requirements: Medical and laboratory equipment require frequent disinfection. Stainless steel materials comply with FDA and GMP standards, making them more competitive as replacements for ordinary guides.

-Emerging Industry Demand: Fields like robotics, 3D printing, and optical equipment demand higher precision and stability. Stainless steel guides can meet these needs through technological upgrades (e.g., high rigidity, low friction).

1.2. Green Manufacturing and Policy Support

-Global environmental policies are becoming stricter. Stainless steel guides, with their high recyclability and optimized energy consumption (e.g., green manufacturing processes), align better with sustainable development trends and may receive policy support or market preference.

2. Feasibility Analysis of Pricing Strategy

2.1. Challenges in Balancing Cost and Profit

-Material Cost Differences: Stainless steel materials typically cost 20%-50% more than carbon steel. Maintaining the same selling price requires cost reduction through economies of scale, process optimization (e.g., precision casting), or supply chain integration.

-Technology Upgrades to Offset Costs: For example, using precipitation-hardened stainless steel or new lubrication technologies can extend product lifespan, amortizing long-term usage costs and attracting customers despite higher initial prices.

2.2 . Market Penetration Strategy

-**Differentiated Positioning:** Target specific industries (e.g., medical, food) to promote the high-value-added features of stainless steel guides, emphasizing total cost of ownership (TCO) advantages rather than just the initial purchase price.

-Bundled Sales and Services: Offer free maintenance packages or extended warranties to offset price disadvantages and enhance customer loyalty.

3. Competitive Landscape and Substitution Effects

3.1. Potential to Replace Ordinary Guides

-At the same price, the performance advantages of stainless steel guides (e.g., corrosion resistance, low maintenance) could quickly capture market share from ordinary guides in high-demand scenarios, especially in the rapidly growing automation and high-end manufacturing sectors in the Asia-Pacific region.

-Domestic companies (e.g., Hiwin, TBI Motion) have narrowed the gap with international brands through technological breakthroughs and localization strategies. With appropriate pricing, they could accelerate the import substitution process.

3.2 . Competitor Reactions

oInternational brands (e.g., THK, NSK) may respond with technology barriers or price cuts.

However, domestic manufacturers leveraging local supply chains and cost advantages can maintain competitiveness.

4. Risks and Challenges

4.1. Initial Market Acceptance

Some customers may stick to traditional carbon steel guides due to inertia. Market education (e.g., case studies, industry certifications) is needed to raise awareness of stainless steel guides' value.

4.2. Production and Supply Chain Pressures

Stainless steel guide production requires higher-end equipment and processes. A sudden surge in demand could lead to capacity bottlenecks, necessitating flexible production lines or strategic partnerships.

5.Strategy Effectiveness Assessment

-Limited Short-Term Sales Growth: In general industrial scenarios (e.g., dry environments, low-load equipment), ordinary guides still offer better cost performance. Stainless steel guides should focus on niche markets.

-Significant Long-Term Growth Potential: As high-end manufacturing, green transitions, and emerging industries expand, the differentiated advantages of stainless steel guides will gradually emerge. With cost optimization and targeted marketing, sustained market share growth is achievable.

Recommendations:

5.1. Prioritize entry into rigid-demand sectors like medical and food industries to establish benchmark cases.

5.2. Explore government subsidies or environmental certifications to lower customer procurement barriers.

5.3. Collaborate with upstream and downstream partners (e.g., material suppliers, equipment manufacturers) to build an ecosystem and share R&D and production costs.

With these strategies, stainless steel guides could achieve structural sales growth at the same price, but short-term investments must be balanced with long-term returns.

The Perspective of Global Stockists

From the perspective of global stockists (e.g., distributors, logistics centers, regional warehouses), the performance differences between stainless steel linear guides and ordinary carbon steel guides during transportation and long-term storage directly impact inventory management costs, product damage risks, and supply chain efficiency. Below is an analysis of core pain points for stockists and the potential advantages of stainless steel guides:

1. Key Issues in Transportation and Storage

1.1. Environmental Risks During Transportation

-Humidity and Salt Spray: During shipping or in humid regions, ordinary carbon steel guides are prone to rust if not adequately protected, leading to damage or returns (requiring additional anti-rust packaging or desiccants).

-Temperature Fluctuations: Extreme temperatures can accelerate coating degradation on ordinary guides, whereas stainless steel guides resist corrosion without relying on surface treatments.

1.2. Long-Term Storage Stability

-Warehousing Environment Limitations: Ordinary guides require climate-controlled warehouses (high cost), whereas stainless steel guides can tolerate non-controlled environments (e.g., short-term outdoor storage).

-Inventory Turnover Pressure: Ordinary guides may become obsolete due to rust if unsold, while stainless steel guides' corrosion resistance extends safe storage periods, reducing emergency clearance risks.

2. Advantages of Stainless Steel Guides for Stockists

2.1. Reduced Logistics and Packaging Costs

2.1.1. Simplified Protection Measures:

-Ordinary guides need vacuum packaging, anti-rust oil coatings, or desiccants, while stainless steel guides require only basic dust-proof packaging, saving materials and labor costs.

-Example: For shipping to Southeast Asia, stainless steel guides can reduce packaging costs by 30% (no anti-rust film needed).

2.1.2. Lower Insurance and Dispute Risks:

-Rust is a common cause of shipping damage. Stainless steel guides' corrosion resistance reduces insurance costs and post-sale disputes.

2.2 Optimized Inventory Management Efficiency

2.2.1. Extended Safe Storage Periods:

Stainless steel guides can be stored for 1-2 years without rust in suboptimal conditions (e.g., humidity below 60%), whereas ordinary guides need turnover within 6 months (especially in tropical regions).

2.2.2. Reduced Warehousing Requirements:

Ordinary guides require dehumidification equipment or dedicated storage, while stainless steel guides can be mixed with other corrosion-resistant goods, lowering facility investments.

2.3. Reduced Obsolescence Losses and After-Sale Costs

-Higher Residual Value:

Long-unsold ordinary guides may be scrapped due to rust, while stainless steel guides can be polished or refurbished for resale, minimizing inventory depreciation losses.

-Lower Return Rates:

Fewer returns or claims from end-users due to rust improve stockists' brand reputation.

3. Potential Challenges to Balance

3.1. Higher Initial Inventory Costs

Stainless steel guides may be slightly heavier (due to material density), increasing shipping costs if charged by weight. Lightweight designs (e.g., structural optimization) can offset this.

3.2. Market Perception and Promotion Barriers

Some stockists may mistakenly associate "stainless steel = high price." Data comparisons (e.g., TCO analysis) can demonstrate long-term cost-effectiveness.

3.3. Supply Chain Coordination Requirements

olf upstream suppliers cannot provide stable stainless steel guide supplies (e.g., low capacity), stockists may face shortages. Long-term agreements or diversified suppliers are needed.

4. Strategic Recommendations: Maximizing Stockist Benefits

4.1. For Transportation:

-Offer "zero-rust packaging" options to attract logistics-focused stockists.

-Partner with logistics firms to create "anti-corrosion cargo routes," reducing overall shipping cost.

4.2. For Warehousing:

-Launch "long-term inventory assurance programs," committing to repurchase or redistribute unsold stainless steel guides to ease stockist concerns.

-Provide storage environment audits to optimize space allocation (e.g., placing stainless steel guides in non-climate-controlled areas).

4.3. Digital Tool Support:

-Develop inventory management SaaS platforms to monitor guide conditions (e.g., humidity exposure duration) and predict optimal turnover cycles, boosting stockist confidence.

5. Inventory Competitiveness of Stainless Steel Guides

-Short-Term: In cost-sensitive markets (e.g., Southeast Asia, coastal industrial zones), stainless steel guides can quickly attract stockists by reducing hidden expenses.

-Long-Term: As green supply chain (ESG) requirements tighten, corrosion-resistant, low-maintenance products will gain global distributor preference, creating differentiated advantages.

Final Benefits:

By lowering stockists' full-cycle costs (transportation → storage → after-sales), stainless steel guides at the same price can not only increase sales but also build stable, sustainable supply chain partnerships, aiding market penetration.

Linear Guide Production: Carbon Steel vs. Stainless Steel

Based on search results and industry competition analysis, the current proportion of manufacturers capable of producing carbon steel and stainless steel linear guides can be assessed as follows:

1. Overall Market Competition Landscape

1.1. High Global Market Concentration: The top 10 global linear guide manufacturers (e.g., THK, Hiwin, NSK) hold 91% market share. These companies typically produce both carbon steel and stainless steel guides, but high-end stainless steel guides rely more on technologically leading brands (e.g., Schneeberger, INA).

1.2.Divergence Among Chinese Manufacturers:

- Carbon Steel Guides: Mainland Chinese manufacturers (e.g., Gaoxin Kate, Nanjing Gongyi) focus on low to mid-range carbon steel guides, with numerous players but weaker technical capabilities, dominating the low-end market.
- Stainless Steel Guides: Miniature and high-end stainless steel guides are mainly produced by Taiwanese companies (e.g., Hiwin, TBI) and a few advanced mainland firms (e.g., Zhejiang Haochen, Shaanxi Hanjiang Machine Tool), representing a small proportion.

2. Estimated Manufacturer Proportion by Capability

2.1. Carbon Steel Guide Manufacturers:

-Due to lower technical barriers and costs, and broad applications (e.g., general industrial machinery), over 80% of Chinese linear guide manufacturers focus on carbon steel products.

-Small and medium-sized manufacturers, lacking advanced material processing capabilities, almost exclusively produce carbon steel guides.

2.2. Stainless Steel Guide Manufacturers:

-Globally, ~20%-30% of manufacturers can mass-produce stainless steel guides, primarily leading international firms and a few local leaders.

-In China, fewer than 15% of manufacturers stably produce stainless steel guides, often relying on imported materials or joint R&D.

3. Impact of Technical and Cost Limitations

3.1. Material and Process Barriers:

-Stainless steel guides require overcoming challenges like high-hardness machining and corrosion-resistant coatings, with material costs 20%-50% higher than carbon steel.

-Most small manufacturers lack the equipment to enter the stainless steel market, concentrating on carbon steel.

3.2. Market Demand Drivers:

High-value sectors (e.g., semiconductors, medical) are increasing demand for stainless steel guides, prompting leading manufacturers to expand capacity. However, smaller players remain focused on carbon steel due to small quantities.

4. Regional Market Differences

-Developed Markets: In EU/US/JP, stainless steel linear guide production accounts for 40%-50% due to strong high-end manufacturing demand.

-Emerging Markets: In China and Southeast Asia, carbon steel guides dominate (>70%), with stainless steel guides mostly imported or supplied by local leaders.

5. Comprehensive Capacity Proportion

-Globally: Carbon steel guide manufacturers account for 70%-80%, stainless steel for 20%-30%.

-China: Carbon steel manufacturers exceed 85%, stainless steel manufacturers are below 15%.

Future Trend: As green manufacturing and high-precision equipment demand grows, the proportion of stainless steel guide manufacturers will gradually rise, but carbon steel will remain dominant in the short term.

Balancing Cost and Competition: THK's Play for High-End Market Control

From THK's perspective as a global linear guide leader and large stockist, launching stainless steel guides at the same price as carbon steel guides requires balancing cost control, market demand, supply chain optimization, and brand strategy. The analysis is as follows:

1. Cost and Profit Balance

1.1. Material and Process Cost Differences

-Stainless steel guides cost 20%-50% more in materials.

To maintain price parity, THK could:

-Scale Production: Increase output to amortize fixed costs (e.g., molds, production lines).

-Optimize Processes: Adopt precision casting or automation to reduce waste (e.g., THK's ER series uses ultra-thin lightweight designs to save material).

-Integrate Supply Chains: Secure long-term contracts with stainless steel suppliers for lower prices.

1.2. Inventory Turnover Efficiency

-Stainless steel guides' corrosion resistance extends storage periods (1-2 years vs. 6 months for carbon steel), reducing obsolescence risks.

-Implement dynamic inventory management (e.g., JIT) to prioritize stainless steel guides in humid regions (e.g., Southeast Asia), cutting maintenance costs.

2. Market Demand and Competition Strategy

2.1. Capture High-End Segments

-Stainless steel guides are in high demand in semiconductors and medical device. THK can leverage its ER series' high precision to dominate these sectors (48% of global downstream applications).

-Offer customized solutions (e.g., salt spray-resistant guides) for Asia Pacific (57% of global market share).

2.2. Undercut Competitor Pricing Power

-Price parity could force smaller players out of the high-end market (unable to match stainless steel cost compression), consolidating THK's dominance (top 5 players hold 85% global share).

-Pressure Chinese rivals (e.g., Nanjing Gongyi) with brand and technology advantages.

3. Supply Chain and Inventory Optimization

3.1.Transport and Storage Cost Savings

-Stainless steel guides simplify packaging (no anti-rust oil/vacuum sealing), reducing shipping costs (e.g., 30% lower packaging fees for Southeast Asia routes).

-Store stainless steel guides in non-climate-controlled warehouses, freeing up controlled spaces for other sensitive products.

3.2. Risk Hedging

-Establish regional hubs (e.g., Dongguan China; Stuttgart, Germany) for faster response to global demand, minimizing long -distance transfers.

-Offer "overstock buyback programs" to refurbish or redistribute unsold guides, easing stockist concerns.

4. Risks and Mitigation

4.1. Short-Term Profit Pressure

-Initial Gross Profit Margin declines may be offset by bundled sales (e.g., guides + lubricants) or government green subsidies.

4.2. Supply Chain Resilience

-Diversify material sourcing (e.g., Japan, Korea, Taiwan) to avoid geopolitical or pandemic disruptions.

5. NiSENSORE Competitive Edge

By pricing stainless steel guides equally, THK can penetrate high-growth markets (semiconductors, medical) while optimizing inventory and branding for long-term gains.

Despite short-term cost pressures, technological leadership and supply chain integration can expand global market share (projected $4.2 billion by 2030), cementing THK's industry dominance.

Comparison of SUS 440C Stainless Steel Rails vs. Cold Hard Chrome-Plated Rails in Salt Spray Testing

1. Material Properties & Corrosion Resistance Mechanisms

1.1. SUS 440C Stainless Steel

-Composition: High-carbon martensitic stainless steel (16-18% Cr, 0.95-1.2% C).

-Advantages: High hardness (HRC 58-60), excellent wear resistance.

-Corrosion Resistance: Chromium oxide passive film provides protection, but high carbon content reduces corrosion resistance (forms chromium carbides, depleting free chromium).

1.2. Cold Hard Chrome-Plated Rails

-Process: Electroplated chromium layer (typically 10-50μm) on carbon steel substrate.

-Advantages: Extreme hardness (HRC 65-70), low friction coefficient.

-Corrosion Resistance: Chromium layer is inherently corrosion-resistant, but pores or scratches expose the carbon steel substrate to galvanic corrosion.

2. Salt Spray Test Performance (ASTM B117)

Test Criteria	SUS 440C Stainless Steel	Hard Chrome-Plated Rails
Initial Resistance	48–96 hrs (no visible rust)	24–48 hrs (if pore-free)
Extended Test (240h)	Localized pitting (high-carbon zones)	Base steel rusts through pores → coating blisters
Failure Mode	Pitting, passive film breakdown	Pore corrosion → substrate rust → coating delamination
Scratch Test Impact	Slow rust propagation at scratches	Immediate substrate exposure → rapid rusting

3. Key Influencing Factors

3.1.SUS 440C Limitations

-Chromium Carbide Precipitation: Poor heat treatment increases intergranular corrosion risk (visible as grain boundary rust in salt spray).

-Surface Treatment: Polishing or passivation improves corrosion resistance (e.g., electropolishing enriches surface chromium).

3.2. Hard Chrome Plating Challenges

-Porosity: Thinner coatings (<20μm) have higher pore density.

-Adhesion: Pre-treatment (e.g., nickel undercoat) enhances bonding to prevent peeling.

4. Test Data Reference

4.1. SUS 440C (Passivated):

-96 hrs: No significant rust.

-240 hrs: Pitting at edges or machining marks.

4.2. Hard Chrome (20μm):

-48 hrs: Coating intact.

-120 hrs: Red rust at pores.

-240 hrs: Severe substrate corrosion, coating blistering.

5. Application Recommendations

5.1. Harsh Environments (e.g., marine, chemical processing):

-SUS 440C (with optimized heat treatment + passivation).

-Alternative: SUS 440C + Chrome Plating (combined hardness and corrosion resistance).

5.2. Moderate Environments (e.g., industrial machinery):

-Hard chrome plating (cost-effective but requires periodic inspection).

6. Improvement Strategies

6.1. For SUS 440C:

-Optimize heat treatment (avoid chromium carbide aggregation).

-Apply anti-corrosion coatings (e.g., PTFE).

6.2. For Hard Chrome Plating:

-Increase thickness (≥30μm) + pore-sealing treatments (e.g., micro-crack chromium).

-Use stainless steel substrate (e.g., 304) + chrome plating for better baseline resistance.

7. Conclusion

-Salt Spray Resistance: SUS 440C > Hard Chrome (if undamaged).

-Cost-Effectiveness: Hard chrome is cheaper upfront but may incur higher maintenance costs.

-Optimal Solution: SUS 440C substrate + hard chrome plating (best balance of hardness, wear resistance, and corrosion resistance).


NISENSORE

INNOVATIVE TECHNOLOGY

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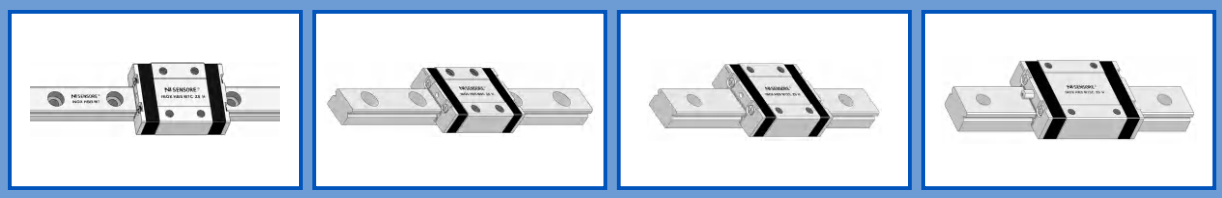
BALL & ROLLER GUIDEWAYS

Stainless Steel Miniature Linear Guideways



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