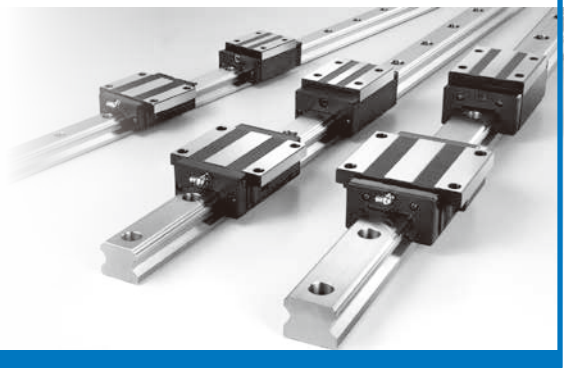
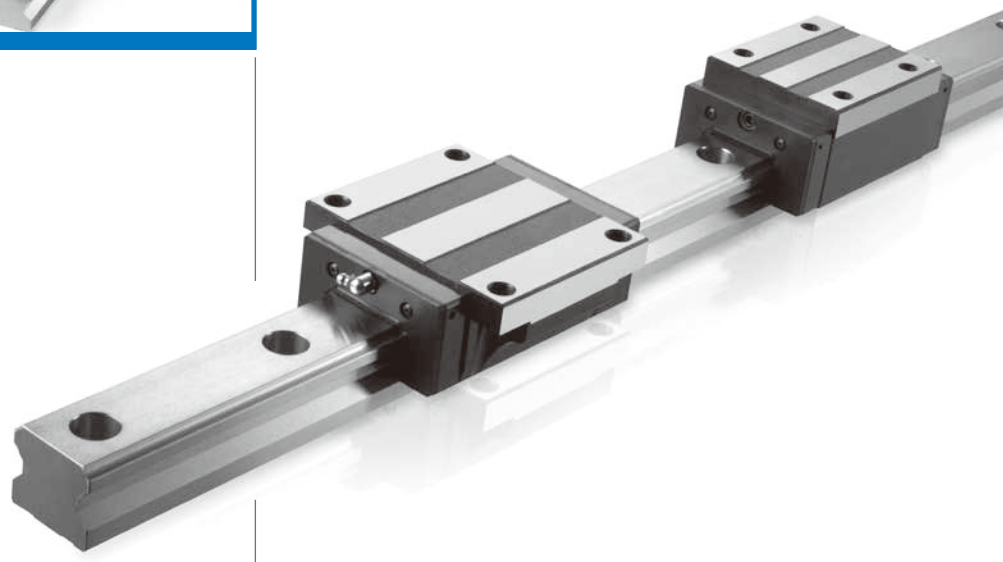
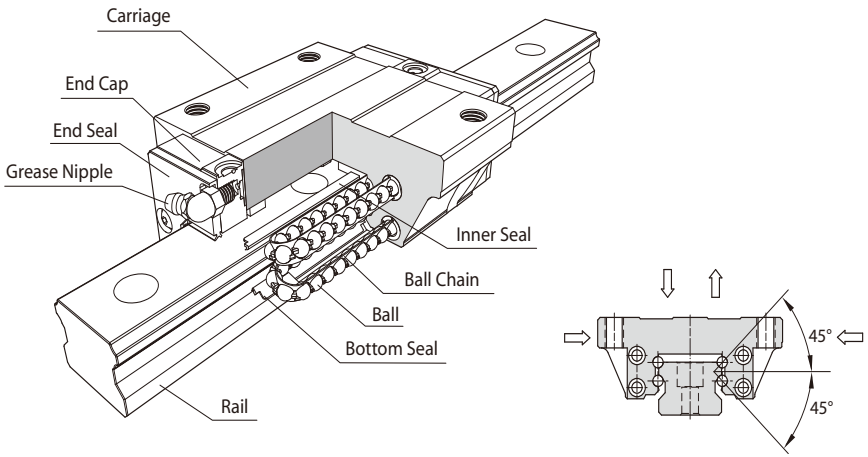


Linear Guideway



Ball Chain Type, SME Series

Construction



Characteristics

The ball chain type linear guideway, SME series, equip with the patent of ball chain design can make the movement smooth and stability, especially suit for the requests of high speed, high accuracy.

The Optimization Design of Four Directional Load

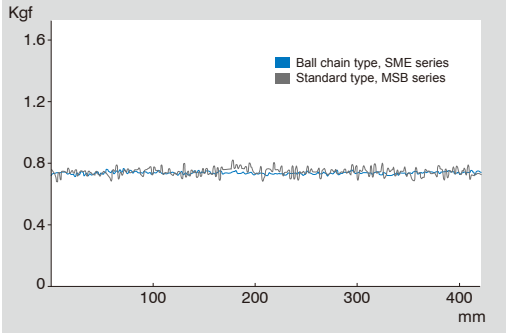
Through the structure stress analysis, SME series have four trains of balls are designed to a circular contact angle of 45° and the section design for high rigidity. Except for bearing heavier loads in radial, reversed radial and lateral directions, a sufficient preload can be achieved to increase rigidity, and this makes it suitable for any kind of installation.

Self Alignment Capability

The self adjustment is performed spontaneously as the design of face-face (DF) circular arc groove. Therefore, the installation error could be compensated even under a preload, and which results in precise and smooth linear motion.

Ball Chain Design, Smooth Movement

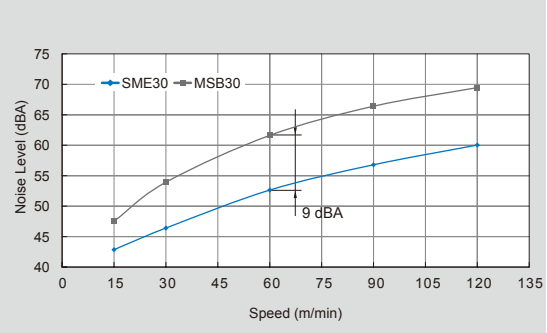
The concise and smooth design of circulating system with strengthened synthetic resin accessories and cooperating with the ball chain, these can avoid interference between balls and make the balls more stability during passing in and out the load district. Besides, the ball chain can keep the ball move in a line and improve the movement most smooth substantially.



Rolling resistance test

Low Noise, Good Lubricant Effect

The ball chain design avoids interference between balls, lowers the operating noise, and can keep the lubricant between the balls and ball chain effectively. Moreover, improve the movement smooth and service life of the whole, can meet high accuracy, high reliability and smooth and stability.

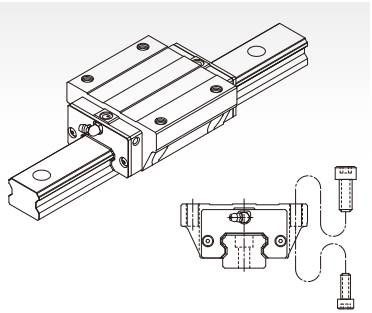


Noise level comparison test

Carriage Type

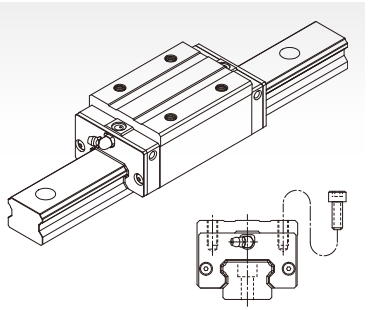
Heavy Load

SME-EA Type



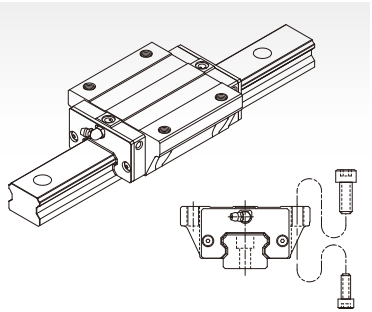
This type offers the installation either from top or bottom side of carriage.

SME-SA Type



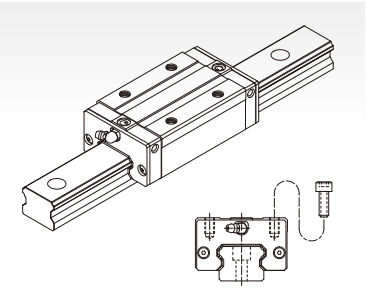
Square type with smaller width and can be installed from top side of carriage.

SME-EB Type



All dimensions are same as SME-EA except the mounting hole dimensions of carriage are different and the height is lower, which do not change the basic loading rating.

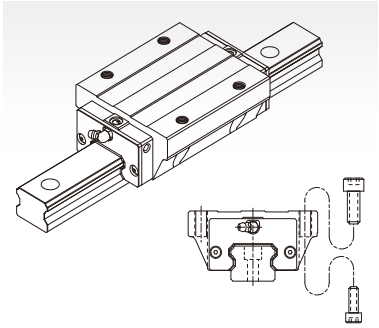
SME-SB / SME-SV Type



All dimensions are same as SME-SA except the mounting hole dimensions of carriage are different and the height is lower, which do not change the basic loading rating.

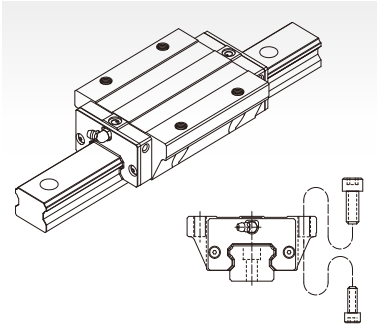
Ultra Heavy Load

SME-LEA Type



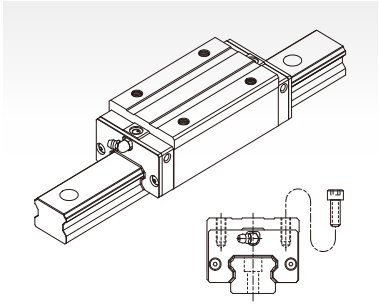
All dimensions are same as SME-EA except the length is longer, which makes it more rigid.

SME-LEB Type



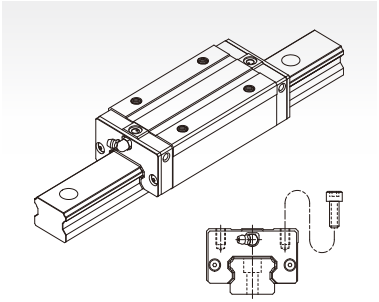
All dimensions are same as SME-EB except the length is longer, which makes it more rigid.

SME-LSA Type



All dimensions are same as SME-SA except the length is longer, which makes it more rigid.

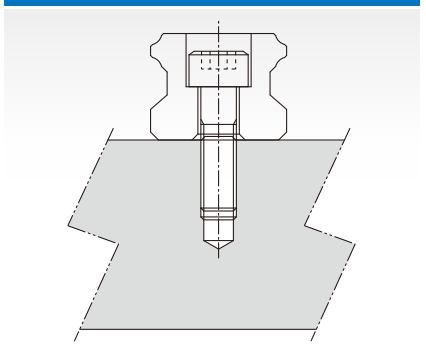
SME-LSB / SME-LSV Type



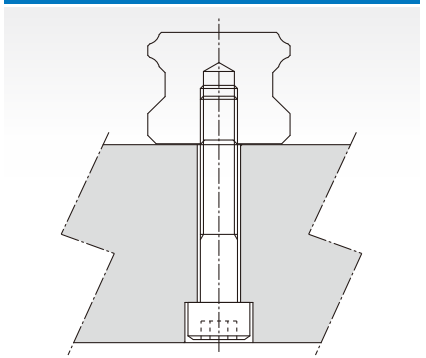
All dimensions are same as SME-SB and SME-SV except the length is longer, which makes it more rigid.

Rail Type

Counter Bore(R type)



Tapped Hole(T type)



Description of Specification

Non-interchangeable Type

SME 25 EA 2 SS F0 +R 1000 -20 /20 P II

Series：**SME**

Size：**15, 20, 25, 30, 35, 45**

Carriage type：**Heavy load**

EA：Flange type, mounting either from top or bottom

EB：Compact flange type, mounting either from top or bottom (Size only 15, 20, 25)

SA：Square type

SB/SV：Compact square type

Ultra heavy load

LEA：Flange type, mounting either from top or bottom

LEB：Compact flange type, mounting either from top or bottom (Size only 15, 20, 25)

LSA：Square type

LSB/LSV：Compact square type

Number of carriages per rail：**1, 2, 3 ...**

Dust protection option of carriage：

No symbol, UU, SS, ZZ, DD, KK (refer to Dust Proof [**B1-232**])

Preload：**FC** (Light Preload), **F0** (Medium preload), **F1** (Heavy preload)

Code of special carriage：**No symbol, A, B, ...**

Rail type：**R** (Counter-bore type), **T** (Tapped hole type)

Rail length (mm)

Rail hole pitch from start side (**E1**, see **Fig.7**)

Rail hole pitch to the end side (**E2**, see **Fig.7**)

Accuracy grade：**N, H, P, SP, UP**

Code of special rail：**No symbol, A, B ...**

Dust protection option of rail：**No symbol, /CC, /MC, /MD ...**

(refer to Code of Contaminaiton for Rail [**B1-233**])

Number of rails per axis：**No symbol , II, III, IV ...**

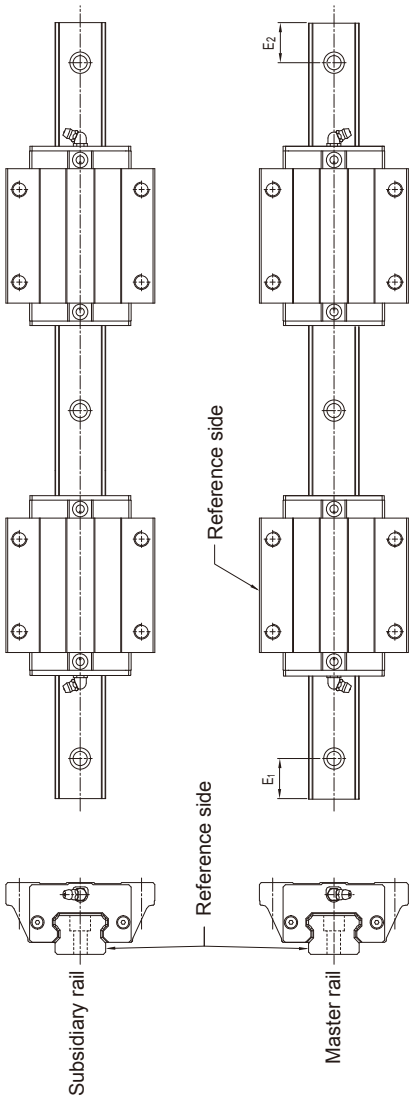


Fig.7

Interchangeable Type

Code of Carriage

SME 25 EA SS FC H

Series：**SME**

Size：**15, 20, 25, 30, 35, 45**

Carriage type：**Heavy load**

- **EA**：Flange type, mounting either rom top or bottom
- **EB**：Compact flange type, mounting either from top or bottom(Size only 15, 20, 25)
- **SA**：Square type
- **SB/SV**：Compact square type

Ultra heavy load

- **LEA**：Flange type, mounting either from top or bottom
- **LEB**：Compact flange type, mounting either from top or bottom(Size only 15, 20, 25)
- **LSA**：Square type
- **LSB/LSV**：Compact square type

Dust protection option of carriage：**No symbol, UU, SS, ZZ, DD, KK**
(refer to Dust Proof **[B1-232]**)

Preload：**FC** (Light Preload), **F0** (Medium preload)

Accuracy grade：**N, H, P**

Code of special carriage：**No symbol, A, B, ...**

Code of Rail

SME 25 R 1000 -20 /20 H

Series：**SME**

Size：**15, 20, 25, 30, 35, 45**

Rail type：**R** (Counter-bore type), **T** (Tapped hole type)

Rail length (mm)

Rail hole pitch from start side (**E1**, see **Fig.7**)

Rail hole pitch to the end side (**E2**, see **Fig.7**)

Accuracy grade：**N, H, P**

Code of special rail：No symbol, **A, B ...**

Dust protection option of rail：No symbol, **/CC, /MC, /MD ...**
(refer to Code of Contamination for Rail **[B1-233]**)

Accuracy Grade

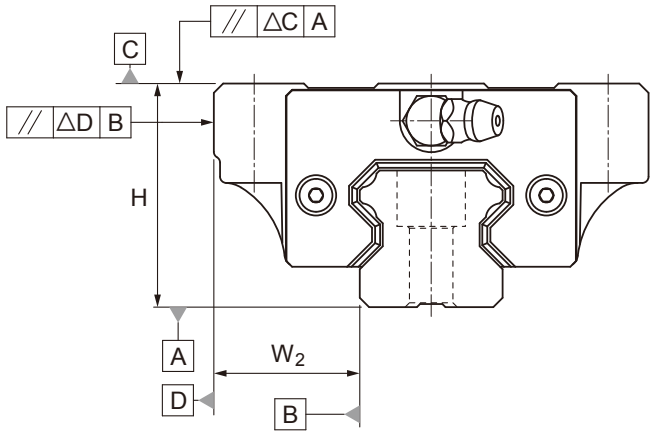


Table 8 Running Parallelism

Rail length (mm)		Running Parallelism Values(μm)				
Above	Or less (incl.)	N	H	P	SP	UP
0	315	9	6	3	2	1.5
315	400	11	8	4	2	1.5
400	500	13	9	5	2	1.5
500	630	16	11	6	2.5	1.5
630	800	18	12	7	3	2
800	1000	20	14	8	4	2
1000	1250	22	16	10	5	2.5
1250	1600	25	18	11	6	3
1600	2000	28	20	13	7	3.5
2000	2500	30	22	15	8	4
2500	3000	32	24	16	9	4.5
3000	3500	33	25	17	11	5
3500	4000	34	26	18	12	6

Non-Interchangeable Type

Model No.	Item	Accuracy Grade				
		Normal **N**	High **H**	Precision **P**	Super Precision **SP**	Ulitra Precision **UP**
15 20	Tolerance for height H	±0.1	±0.03	0 -0.03	0 -0.015	0 -0.008
	Height difference ΔH	0.02	0.01	0.006	0.004	0.003
	Tolerance for distance W_2	±0.1	±0.03	0 -0.03	0 -0.015	0 -0.008
	Difference in distance W_2(ΔW_2)	0.02	0.01	0.006	0.004	0.003
	Running parallelism of surface C with surface A	ΔC (see the Table 8)				
	Running parallelism of surface D with surface B	ΔD (see the Table 8)				
25 30 35	Tolerance for height H	±0.1	±0.04	0 -0.04	0 -0.02	0 -0.01
	Height difference ΔH	0.02	0.015	0.007	0.005	0.003
	Tolerance for distance W_2	±0.1	±0.04	0 -0.04	0 -0.02	0 -0.01
	Difference in distance W_2(ΔW_2)	0.03	0.015	0.007	0.005	0.003
	Running parallelism of surface C with surface A	ΔC (see the Table 8)				
	Running parallelism of surface D with surface B	ΔD (see the Table 8)				
45	Tolerance for height H	±0.1	±0.05	0 -0.05	0 -0.03	0 -0.02
	Height difference ΔH	0.03	0.015	0.007	0.005	0.003
	Tolerance for distance W_2	±0.1	±0.05	0 -0.05	0 -0.03	0 -0.02
	Difference in distance W_2(ΔW_2)	0.03	0.02	0.01	0.007	0.005
	Running parallelism of surface C with surface A	ΔC (see the Table 8)				
	Running parallelism of surface D with surface B	ΔD (see the Table 8)				

Interchangeable Type

Model No.	Item	Accuracy Grade		
		Normal N	High H	Precision P
15 20	Tolerance for height H	±0.1	±0.03	0 -0.03
	Height difference ΔH	0.02	0.01	0.006
	Tolerance for distance W_2	±0.1	±0.03	0 -0.03
	Difference in distance W_2(ΔW_2)	0.02	0.01	0.006
	Running parallelism of surface C with surface A	ΔC (see the Table 8)		
	Running parallelism of surface D with surface B	ΔD (see the Table 8)		
25 30 35	Tolerance for height H	±0.1	±0.04	0 -0.04
	Height difference ΔH	0.02	0.015	0.007
	Tolerance for distance W_2	±0.1	±0.04	0 -0.04
	Difference in distance W_2(ΔW_2)	0.03	0.015	0.007
	Running parallelism of surface C with surface A	ΔC (see the Table 8)		
	Running parallelism of surface D with surface B	ΔD (see the Table 8)		
45	Tolerance for height H	±0.1	±0.05	0 -0.05
	Height difference ΔH	0.03	0.015	0.007
	Tolerance for distance W_2	±0.1	±0.05	0 -0.05
	Difference in distance W_2(ΔW_2)	0.03	0.02	0.01
	Running parallelism of surface C with surface A	ΔC (see the Table 8)		
	Running parallelism of surface D with surface B	ΔD (see the Table 8)		

Note: Definition of interchangeable: It is confined to the carriage on the single rail, not including the exchange of multiple rails and carriages.

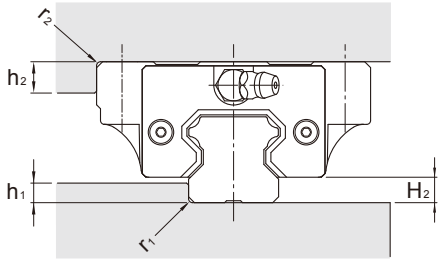
Preload Grade

Series	Preload grade		
	Light preload (FC)	Medium preload (F0)	Heavy preload (F1)
SME15	0.01~0.03C	0.04~0.06C	-
SME20			0.07~0.09C
SME25			
SME30			
SME35			
SME45			
SME15L	0.01~0.03C	0.04~0.06C	0.07~0.09C
SME20L			
SME25L			
SME30L			
SME35L			
SME45L			

Note: C is basic dynamic load rating in above table. Refer to the specification of products, please.

The Shoulder Height and Corner Radius for Installation

SME series



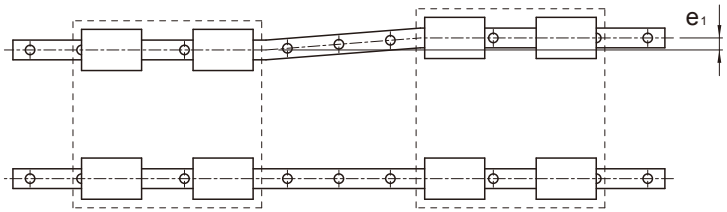
Unit: mm

Model No.	r_1 (max.)	r_2 (max.)	h_1	h_2	H_2
15	0.5	0.5	2.5	5	3.5
20	0.5	0.5	3.5	5	4.7
25	1	1	5	6	5.8
30	1	1	5	7	7.5
35	1	1	6	8	8
45	1	1	8	8	10

Dimensional Tolerance of Mounting Surface

SME with the self alignment capability, the minor dimensional error in mounting surface could be compensated and achieves smooth linear motion. The tolerances of parallelism between two axes are shown as below.

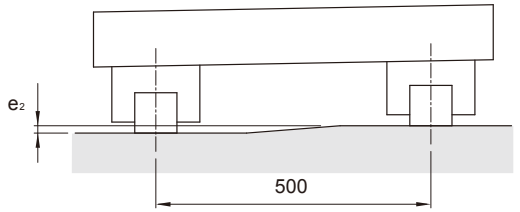
The parallel deviation between two axes (e_1)



Unit: μm

Model No.	Preload Grade		
	FC	F0	F1
15	25	18	-
20	25	20	18
25	30	22	20
30	40	30	27
35	50	35	30
45	60	40	35

Level difference between two axes (e_2)

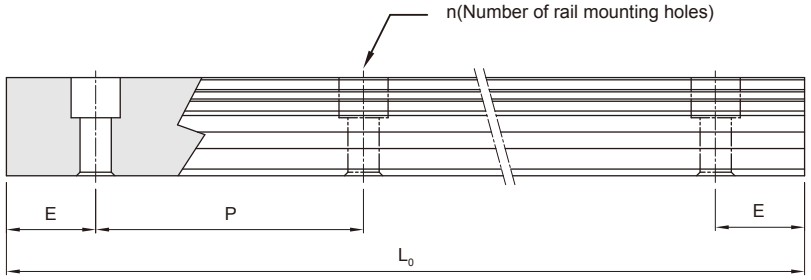


Unit: μm

Model No.	Preload Grade		
	FC	F0	F1
15	130	85	-
20	130	85	50
25	130	85	70
30	170	110	90
35	210	150	120
45	250	170	140

Note: The permissible values in table are applicable when the span is 500mm wide.

Rail Maximum Length and Standard



$L_0=(n-1)\times P+2\times E$

L_0 : Total Length of rail (mm)

n : Number of mounting holes

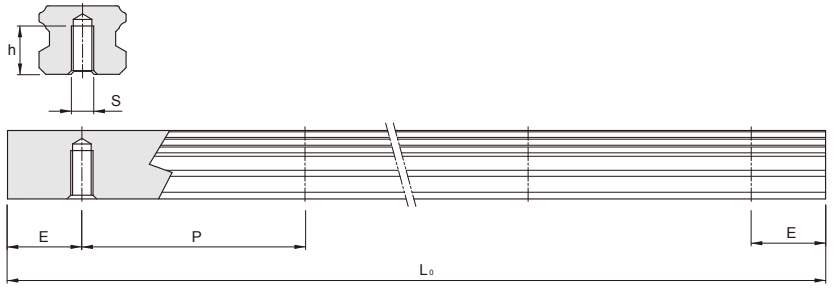
P : Distance between any two holes (mm)

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

Unit: mm

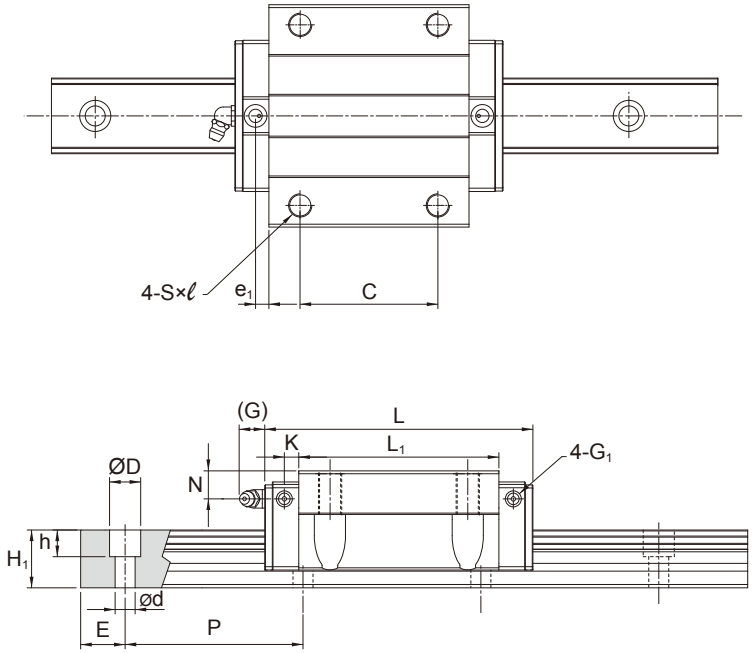
Model No.	Standard Pitch (P)	Standard ($E_{std.}$)	Minimum ($E_{min.}$)	Max (L_0 max.)
SME 15	60	20	5	4000
SME 20	60	20	6	4000
SME 25	60	20	7	4000
SME 30	80	20	8	4000
SME 35	80	20	8	4000
SME 45	105	22.5	11	4000

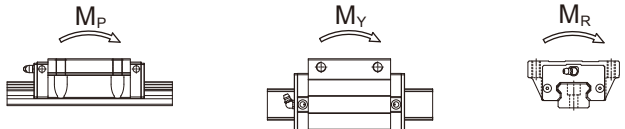
Tapped Hole Rail Dimensions

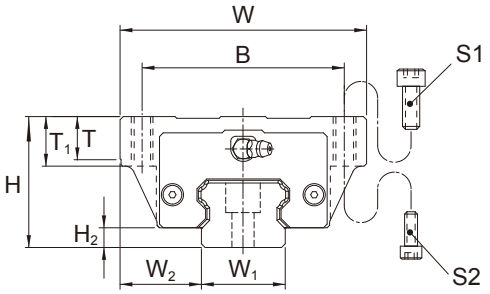


Rail Model	S	h(mm)
SME 15 T	M5	8
SME 20 T	M6	10
SME 25 T	M6	12
SME 30 T	M8	15
SME 35 T	M8	17
SME 45 T	M12	24

Dimensions of SME-EA / SME-LEA







Model No.	Bolt Size	
	S_1	S_2
SME 15	M5	M4
SME 20	M6	M5
SME 25	M8	M6
SME 30	M10	M8
SME 35	M10	M8
SME 45	M12	M10

Unit: mm

Model No.	External dimension					Carriage dimension											Grease Nipple
	Height H	Width W	Length L	W_2	H_2	B	C	S×ℓ	L_1	T	T_1	N	G	K	e_1	G_1	
SME 15 EA SME 15 LEA	24	47	64.4 79.4	16	3.5	38	30	M5×8	48 63	5.5	8	5	5.5	2.7	-	M4	G-M4
SME 20 EA SME 20 LEA	30	63	78.5 97.5	21.5	4.7	53	40	M6×10	58.3 77.3	7	10	8	12	3.7	-	M4	G-M6
SME 25 EA SME 25 LEA	36	70	92 109	23.5	5.8	57	45	M8×13	71 88	7	13	10	12	4	-	M4	G-M6
SME 30 EA SME 30 LEA	42	90	107.6 132.6	31	7.5	72	52	M10×15	80 105	12	15	8	12	6.5	5.4	M6	G-M6
SME 35 EA SME 35 LEA	48	100	120.6 150.6	33	8	82	62	M10×15	90 120	12	15	8	12	6.5	6	M6	G-M6
SME 45 EA SME 45 LEA	60	120	140 174.5	37.5	10	100	80	M12×18	106 140.5	12	18	10	13.5	8.5	6.1	M6	G-PT 1/8

Unit: mm

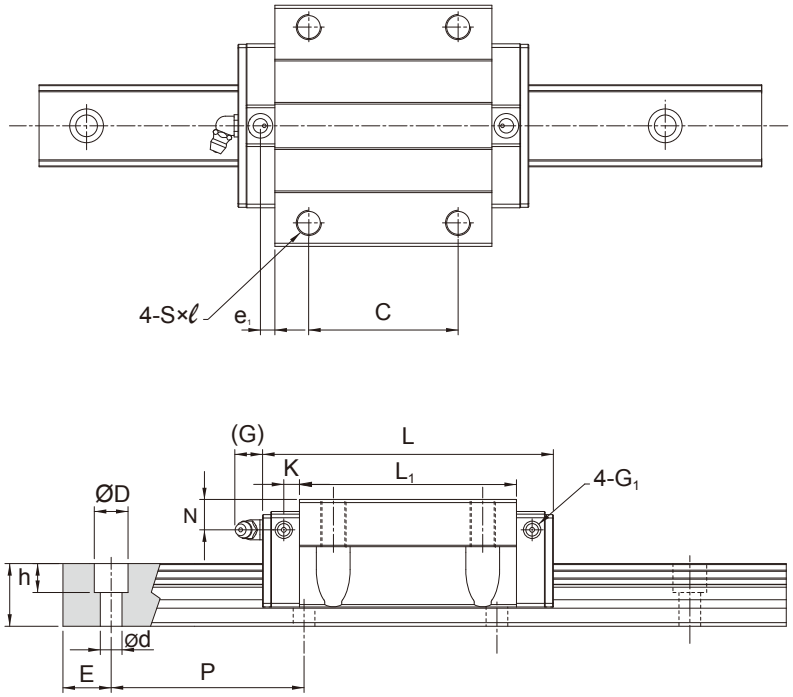
Model No.	Rail dimension					Basic load rating		Static moment rating					Weight	
	Width W_1	Height H_1	Pitch P	E std.	D×h×d	Dynamic C kN	Static C_0 kN	M_P kN-m Single*	M_P kN-m Double*	M_Y kN-m Single*	M_Y kN-m Double*	M_R kN-m	Carriage kg	Rail kg/m
SME 15 EA SME 15 LEA	15	13	60	20	7.5×5.8×4.5	12.5 15.4	20.2 27.5	0.14 0.25	0.69 1.15	0.14 0.25	0.69 1.15	0.16 0.21	0.22 0.29	1.4
SME 20 EA SME 20 LEA	20	15.5	60	20	9.5×8.5×6	20.4 25.3	32.1 43.6	0.27 0.49	1.34 2.24	0.27 0.49	1.34 2.24	0.33 0.44	0.42 0.62	2.3
SME 25 EA SME 25 LEA	23	18	60	20	11×9×7	28.3 33.0	44.3 56.1	0.45 0.71	2.14 3.20	0.45 0.71	2.14 3.20	0.52 0.66	0.67 0.89	3.2
SME 30 EA SME 30 LEA	28	23	80	20	14×12×9	39.4 47.0	59.5 76.5	0.68 1.11	3.37 5.32	0.68 1.11	3.37 5.32	0.83 1.07	1.18 1.54	4.5
SME 35 EA SME 35 LEA	34	26	80	20	14×12×9	54.7 67.6	81.0 109.9	1.07 1.92	5.25 8.75	1.07 1.92	5.25 8.75	1.41 1.91	1.74 2.28	6.2
SME 45 EA SME 45 LEA	45	32	105	22.5	20×17×14	72.7 90.0	105.8 143.6	1.61 2.88	7.82 13.08	1.61 2.88	7.82 13.08	2.41 3.27	3.22 4.21	10.5

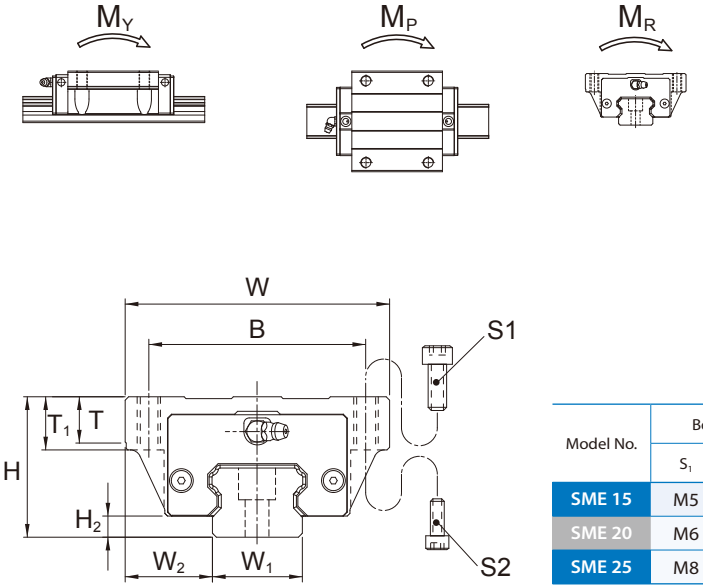
Note: The basic dynamic load rating C of ball type is based on the 50 km for nomonal life. The conversion between C for 50 km and C_{100} for 100 km is C=1.26 x C_{100}.

Note*: Single: Single carriage/ Double: Double carriages closely contacting with each other.

Product
LINEAR GUIDEWAY
Specifications | Dimensions of SME

Dimensions of SME-EB / SME-LEB





Unit: mm

Model No.	External dimension					Carriage dimension											Grease Nipple
	Height H	Width W	Length L	W_2	H_2	B	C	S×ℓ	L_1	T	T_1	N	G	K	e_1	G_1	
SME 15 EB	24	52	64.4	18.5	3.5	41	26	M5×8	48	5.5	8	5	5.5	2.7	-	M4	G-M4
SME 15 LEB			79.4				36		63								
SME 20 EB	28	59	78.5	19.5	4.7	49	32	M6×8	58.3	7.0	8	6.0	12	3.7	-	M4	G-M6
SME 20 LEB			97.5				45		77.3								
SME 25 EB	33	73	92	25	5.8	60	35	M8×10	71	7.0	10	7.0	12	4	-	M4	G-M6
SME 25 LEB			109				50		88								

Note: The basic dynamic load rating C of ball type is based on the 50 km for nomonal life. The conversion between C for 50 km and C_{100} for 100 km is C=1.26 x C_{100}.

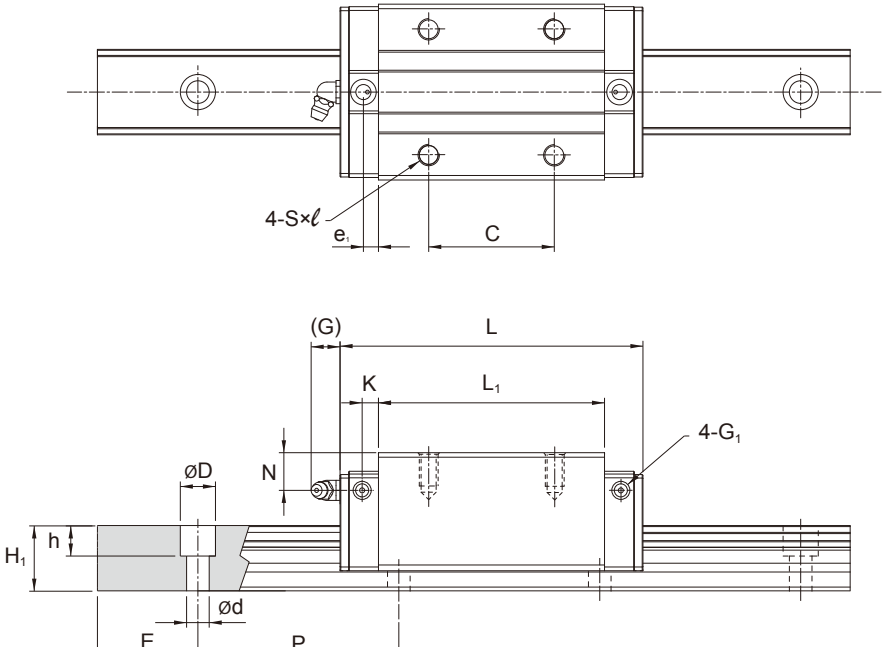
Note*: Single: Single carriage/ Double: Double carriages closely contacting with each other.

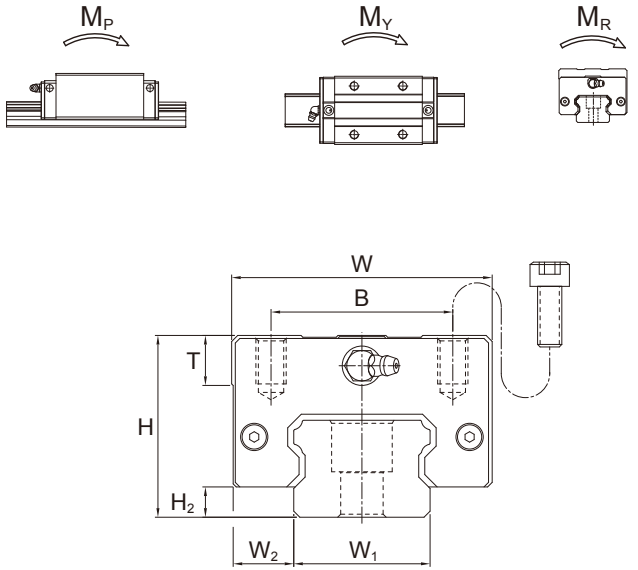
Model No.	Bolt Size	
	S_1	S_2
SME 15	M5	M4
SME 20	M6	M5
SME 25	M8	M6

Unit: mm

Model No.	Rail dimension					Basic load rating		Static moment rating					Weight	
	Width W_1	Height H_1	Pitch P	E std.	D×h×d	Dynamic C kN	Static C_o kN	M_P kN-m		M_Y kN-m		M_R kN-m	Carriage kg	Rail kg/m
								Single*	Double*	Single*	Double*			
SME 15 EB	15	13	60	20	7.5×5.8×4.5	12.5	20.2	0.14	0.69	0.14	0.69	0.16	0.21	1.4
SME 15 LEB						15.4	27.5	0.25	1.15	0.25	1.15	0.21	0.27	
SME 20 EB	20	15.5	60	20	9.5×8.5×6	20.4	32.1	0.27	1.34	0.27	1.34	0.33	0.39	2.3
SME 20 LEB						25.3	43.6	0.49	2.24	0.49	2.24	0.44	0.55	
SME 25 EB	23	18	60	20	11×9×7	28.3	44.3	0.45	2.14	0.45	2.14	0.52	0.42	3.2
SME 25 LEB						33.0	56.1	0.71	3.20	0.71	3.20	0.66	0.65	

Dimensions of SME-SA / SME-LSA





Unit: mm

Model No.	External dimension					Carriage dimension										Grease Nipple
	Height H	Width W	Length L	W_2	H_2	B	C	S×ℓ	L_1	T	N	G	K	e_1	G_1	
SME 15 SA	28	34	64.4	9.5	3.5	26	26	M4×7.5	48	6	9	5.5	2.7	-	M4	G-M4
SME 15 LSA			79.4						63							
SME 20 SA	30	44	78.5	12	4.7	32	36	M5×7	58.3	6	8	12	3.7	-	M4	G-M6
SME 20 LSA			97.5				50		77.3							
SME 25 SA	40	48	92	12.5	5.8	35	35	M6×12	71	8	14	12	4	-	M4	G-M6
SME 25 LSA			109				50		88							
SME 30 SA	45	60	107.6	16	7.5	40	40	M8×12	80	8	11	12	6.5	5.4	M6	G-M6
SME 30 LSA			132.6				60		105							
SME 35 SA	55	70	120.6	18	8	50	50	M8×14	90	11	15	12	6.5	6	M6	G-M6
SME 35 LSA			150.6				72		120							
SME 45 SA	70	86	140	20.5	10	60	60	M10×20	106	16	20	13.5	8.5	6.1	M6	G-PT 1/8
SME 45 LSA			174.5				80		140.5							

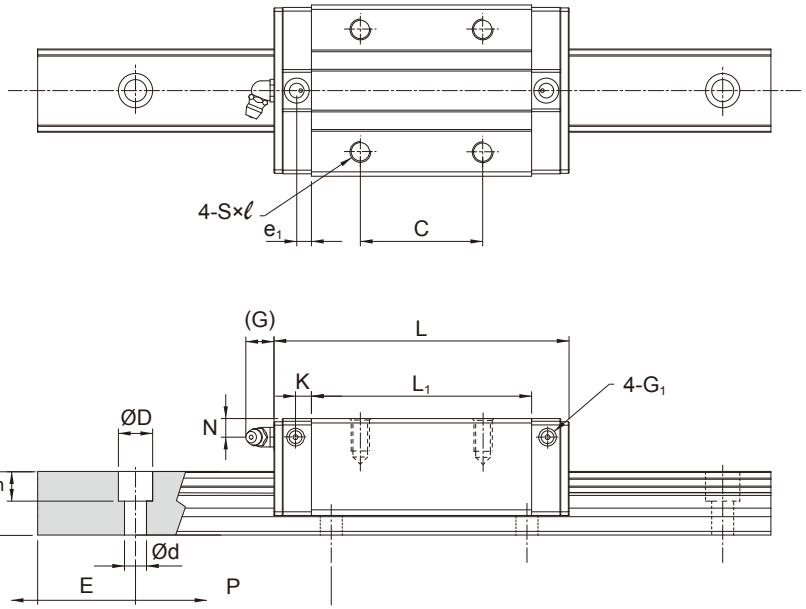
Note: The basic dynamic load rating C of ball type is based on the 50 km for nomonal life. The conversion between C for 50 km and C_{100} for 100 km is C=1.26 x C_{100}.

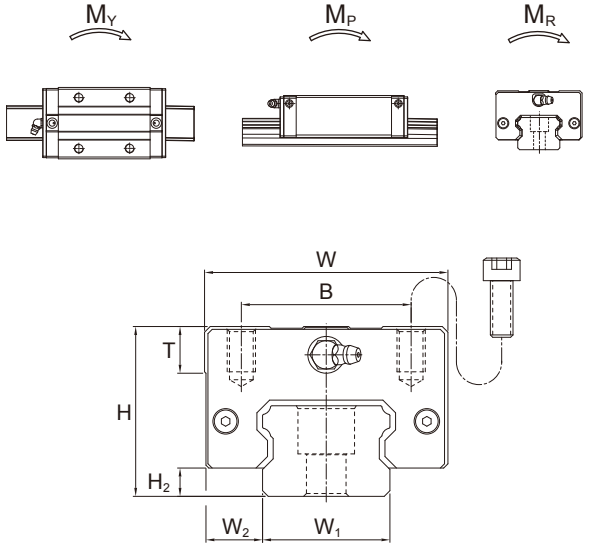
Note*: Single: Single carriage/ Double: Double carriages closely contacting with each other.

Unit: mm

Model No.	Rail dimension					Basic load rating		Static moment rating					Weight	
	Width W_1	Height H_1	Pitch P	E std.	D×h×d	Dynamic C kN	Static C_o kN	M_P kN-m		M_Y kN-m		M_R kN-m	Carriage kg	Rail kg/m
								Single*	Double*	Single*	Double*			
SME 15 SA	15	13	60	20	7.5×5.8×4.5	12.5	20.2	0.14	0.69	0.14	0.69	0.16	0.22	1.4
SME 15 LSA						15.4	27.5	0.25	1.15	0.25	1.15	0.21	0.25	
SME 20 SA	20	15.5	60	20	9.5×8.5×6	20.4	32.1	0.27	1.34	0.27	1.34	0.33	0.30	2.3
SME 20 LSA						25.3	43.6	0.49	2.24	0.49	2.24	0.44	0.39	
SME 25 SA	23	18	60	20	11×9×7	28.3	44.3	0.45	2.14	0.45	2.14	0.52	0.56	3.2
SME 25 LSA						33.0	56.1	0.71	3.20	0.71	3.20	0.66	0.73	
SME 30 SA	28	23	80	20	14×12×9	39.4	59.5	0.68	3.37	0.68	3.37	0.83	0.93	4.5
SME 30 LSA						47.0	76.5	1.11	5.32	1.11	5.32	1.07	1.21	
SME 35 SA	34	26	80	20	14×12×9	54.7	81.0	1.07	5.25	1.07	5.25	1.41	1.57	6.2
SME 35 LSA						67.6	109.9	1.92	8.75	1.92	8.75	1.91	2.05	
SME 45 SA	45	32	105	22.5	20×17×14	72.7	105.8	1.61	7.82	1.61	7.82	2.41	3.06	10.5
SME 45 LSA						90.0	143.6	2.88	13.08	2.88	13.08	3.27	4.00	

Dimensions of SME-SB / SME-LSB





Unit: mm

Model No.	External dimension					Carriage dimension										Grease Nipple
	Height H	Width W	Length L	W_2	H_2	B	C	S×ℓ	L_1	T	N	G	K	e_1	G_1	
SME 15 SB	24	34	64.4	9.5	3.5	26	26	M4×5	48	6	5	5.5	2.7	-	M4	G-M4
SME 15 LSB			79.4				34		63							
SME 20 SB	28	42	78.5	11	4.7	32	32	M5×5.5	58.3	6	6	12	3.7	-	M4	G-M6
SME 20 LSB			97.5				45		77.3							
SME 25 SB	33	48	92	12.5	5.8	35	35	M6×7	71	8	7	12	4	-	M4	G-M6
SME 25 LSB			109				50		88							
SME 25 SV	36	48	92	12.5	5.8	35	35	M6×9	71	8	10	12	4	-	M4	G-M6
SME 25 LSV			109				50		88							
SME 30 SB	42	60	107.6	16	7.5	40	40	M8×10	80	8	8	12	6.5	5.4	M6	G-M6
SME 30 LSB			132.6				60		105							
SME 35 SB	48	70	120.6	18	8	50	50	M8×11	90	11	8	12	6.5	6	M6	G-M6
SME 35 LSB			150.6				72		120							
SME 45 SB	60	86	140	20.5	10	60	60	M10×16	106	16	10	13.5	8.5	6.1	M6	G-PT 1/8
SME 45 LSB			174.5				80		140.5							

Note: The basic dynamic load rating C of ball type is based on the 50 km for nomonal life. The conversion between C for 50 km and C_{100} for 100 km is C=1.26 x C_{100}.

Note*: Single: Single carriage/ Double: Double carriages closely contacting with each other.

Unit: mm

Model No.	Rail dimension					Basic load rating		Static moment rating					Weight	
	Width W_1	Height H_1	Pitch P	E std.	D×h×d	Dynamic C kN	Static C_o kN	M_P kN-m		M_Y kN-m		M_R kN-m	Carriage kg	Rail kg/m
								Single*	Double*	Single*	Double*			
SME 15 SB	15	13	60	20	7.5×5.8×4.5	12.5	20.2	0.14	0.69	0.14	0.69	0.16	0.19	1.4
SME 15 LSB						15.4	27.5	0.25	1.15	0.25	1.15	0.21	0.22	
SME 20 SB	20	15.5	60	20	9.5×8.5×6	20.4	32.1	0.27	1.34	0.27	1.34	0.33	0.26	2.3
SME 20 LSB						25.3	43.6	0.49	2.24	0.49	2.24	0.44	0.35	
SME 25 SB	23	18	60	20	11×9×7	28.3	44.3	0.45	2.14	0.45	2.14	0.52	0.31	3.2
SME 25 LSB						33.0	56.1	0.71	3.20	0.71	3.20	0.66	0.49	
SME 25 SV	23	18	60	20	11×9×7	28.3	44.3	0.45	2.14	0.45	2.14	0.52	0.44	3.2
SME 25 LSV						33.0	56.1	0.71	3.20	0.71	3.20	0.66	0.62	
SME 30 SB	28	23	80	20	14×12×9	39.4	59.5	0.68	3.37	0.68	3.37	0.83	0.85	4.5
SME 30 LSB						47.0	76.5	1.11	5.32	1.11	5.32	1.07	1.10	
SME 35 SB	34	26	80	20	14×12×9	54.7	81.0	1.07	5.25	1.07	5.25	1.41	1.22	6.2
SME 35 LSB						67.6	109.9	1.92	8.75	1.92	8.75	1.91	1.61	
SME 45 SB	45	32	105	22.5	20×17×14	72.7	105.8	1.61	7.82	1.61	7.82	2.41	2.86	10.5
SME 45 LSB						90.0	143.6	2.88	13.08	2.88	13.08	3.27	3.57	