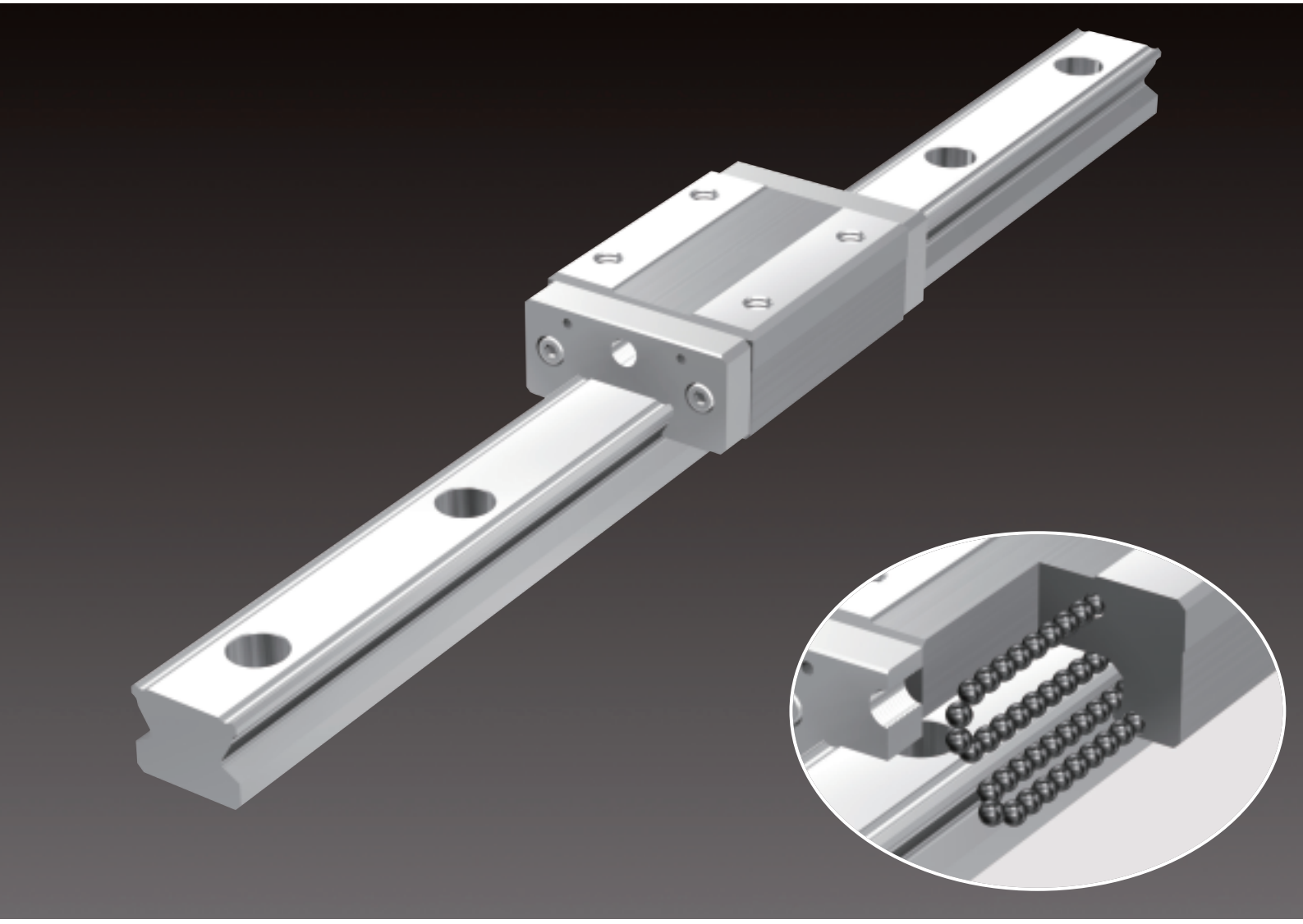
THK

NEW

Oil-Free LM Guide for Special Environments

Optimum for use under a vacuum environment (up to 10^{-6} Pa) where oil cannot be used

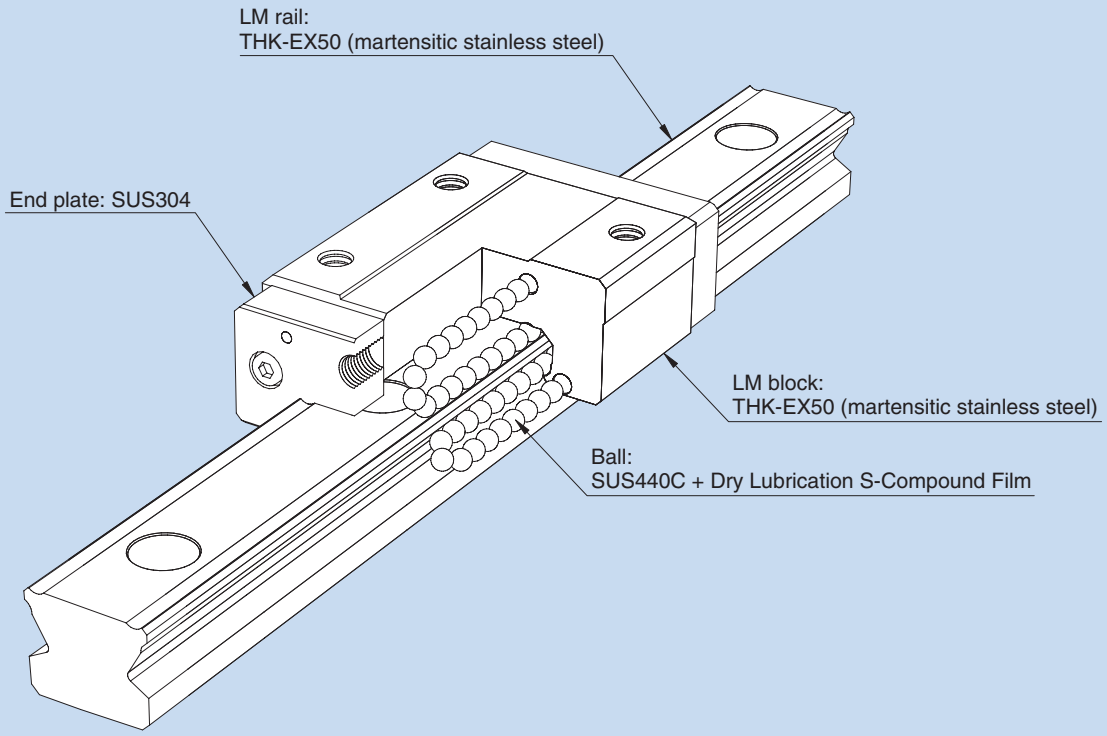
Newly developed: Dry Lubrication S-Compound Film
Low particle generation, low outgassing



THK CO., LTD.
TOKYO. JAPAN

CATALOG No.343E

Oil-Free LM Guide for Special Environments



Structure of the Oil-Free LM Guide for Special Environments

● Structural characteristics

1. Uses stainless steel
   All components are made of stainless steel for special environment.
2. Degreased and cleaned
   Special solvent is used to de-grease this solvent.
3. Does not use grease
   The product does not use any grease, but adopts a highly reliable Dry Lubrication S-Compound Film.

This achieves → Low outgassing → As a result...

Largest advantage

Suitable for applications where the vacuum level reaches 10^{-6} Pa and chemical contamination (gaseous contamination such as organic matter and moisture) is not allowed.

*Can be used at temperature up to 150°C (instantaneously 200°C).

● What is Dry Lubrication S-Compound Film

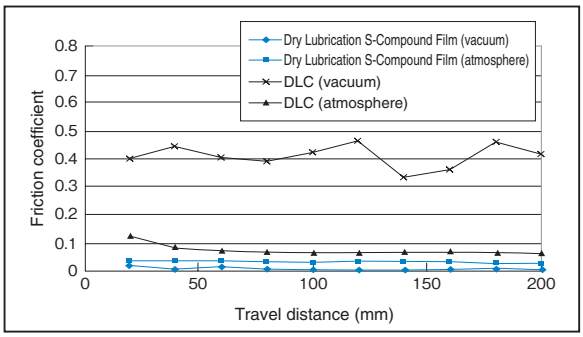
Dry Lubrication S-Compound Film is a fully dry lubricant developed for use under atmospheric to high-vacuum environments. It has superior characteristics in load carrying capacity, wear resistance and sealability to other lubrication systems.

Comparison of dry lubrication material properties

Item	Friction coefficient	Wear resistance	Hardness	Service environment
Molybdenum Disulfide (hexagonal form)	0.04	△	△	Vacuum
Soft metal	0.05 to 0.5	△	△	Atmosphere, vacuum
DLC (diamond-like carbon)	0.08 to 0.15	△	○	Atmosphere, H_2O
Dry Lubrication S-Compound Film	0.02 to 0.05	○	○	Atmosphere, vacuum

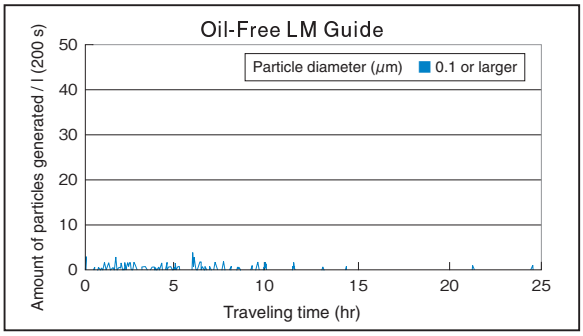
Low Friction

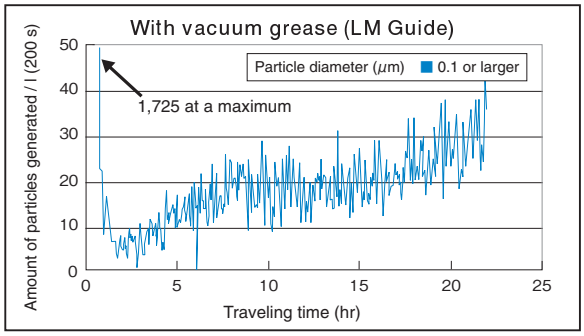
The Oil-Free LM Guide for special environments exerts superbly low frictional properties in atmospheric to vacuum environments.



Low Particle Generation

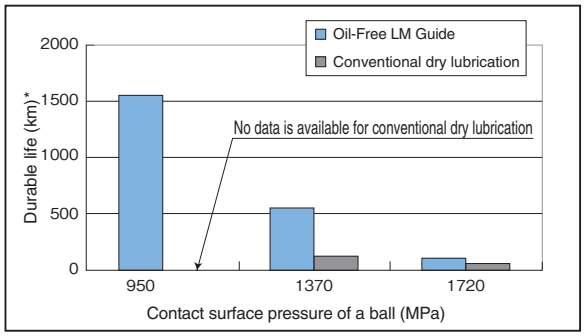
The Oil-Free LM Guide for special environments exerts a lower level of particle generation than conventional vacuum grease lubricants.





Long Service Life

The Oil-Free LM Guide for special environments has a longer service life than conventional dry lubrication.



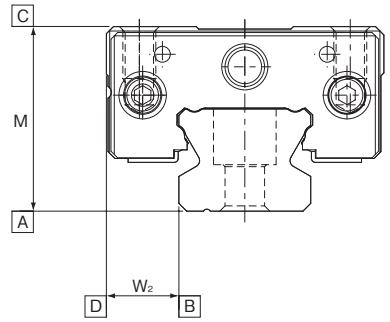
* The durable life represents the value at a point from which the Dry Lubrication S-Compound Film is no longer effective.
Note that the durable life differs from the rated service life of the LM Guide.

Applications of the Oil-Free LM Guide for Special Environments

Industry	Equipment	Advantages of oil-free LM Guide
Semiconductor / FPD manufacturing machine	Exposure machine, organic EL manufacturing machine, ion injection machine	● Little outgassing (water, organic matter) ● Low particle generation ● Operable at high temperature (up to 150°C)

Accuracy Standard

Accuracy of the Oil-Free LM Guide for special environments is classified into Precision (P), Super Precision (SP) and Ultra Precision (UP).



Unit: mm

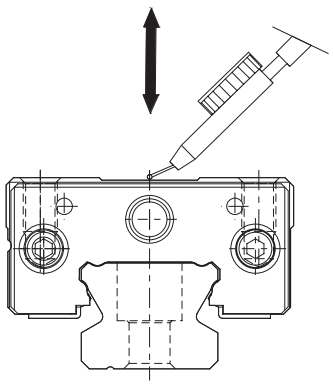
Model number	Accuracy standard	Precision grade	Super Precision grade	Ultra Precision grade
	Item	P	SP	UP
SR15MSV/W SR20MSV/W	Dimensional tolerance in height M	0 -0.03	0 -0.015	0 -0.008
	Difference in height M	0.006	0.004	0.003
	Dimensional deviation in width W_2	0 -0.02	0 -0.015	0 -0.008
	Difference in width W_2	0.006	0.004	0.003
	Running parallelism of surface C against surface A	See the table below.		
	Running parallelism of surface D against surface B	See the table below.		

Unit: μm

LM rail length (mm)		Running parallelism value		
Above	Or less	Precision	Super Precision	Ultra Precision
		P	SP	UP
—	50	2	1.5	1
50	80	2	1.5	1
80	125	2	1.5	1
125	200	2	1.5	1
200	250	2.5	1.5	1
250	315	3	1.5	1
315	400	3.5	2	1.5

Radial clearance

Radial clearance of the Oil-Free LM Guide for special environments is defined with the values in the table below.

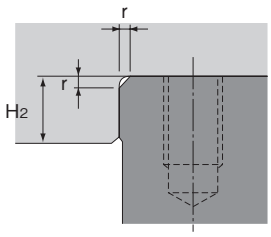


Unit: mm

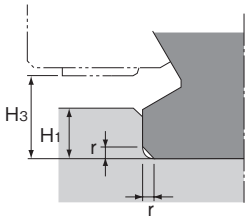
Model number	Clearance CS
SR15MSV/W	-0.002 to 0.001
SR20MSV/W	-0.002 to 0.001

Shoulder height of the mounting surface and the corner radius

Normally, the mounting surface for the LM block and the LM rail has a datum plane on the side face in order to allow easy installation and highly accurate positioning.
The corner of the mounting surface must be machined to have a recess, or machined to be smaller than the corner radius "r," to prevent interference with the chamfer of the LM block or the LM rail.



LM block section



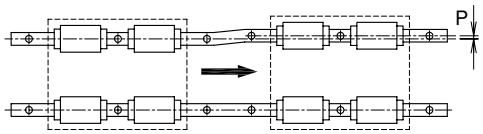
LM rail section

Unit: mm

Model number	Corner radius r (maximum)	Shoulder height of the LM rail section H_1	Shoulder height of the LM block section H_2	H_3
SR15MSV/W	0.5	3.8	4	4.5
SR20MSV/W	0.5	5	5	6

Tolerance in parallelism between 2 rails

The following table shows the tolerance in parallelism (P) between 2 rails.

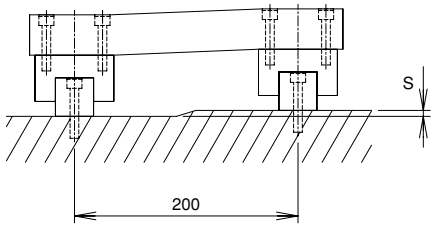


Unit: μm

Model number	Clearance CS
SR15MSV/W	8
SR20MSV/W	8

Tolerance in vertical level between 2 rails

The following table shows the tolerance in vertical level (S) between 2 rails per axis-to-axis distance of 200 mm. The tolerance in vertical level is proportionate to the axis-to-axis distance.



Unit: mm

Model number	Clearance CS
SR15MSV/W	0.020/200
SR20MSV/W	0.020/200

Flatness of the mounting surface

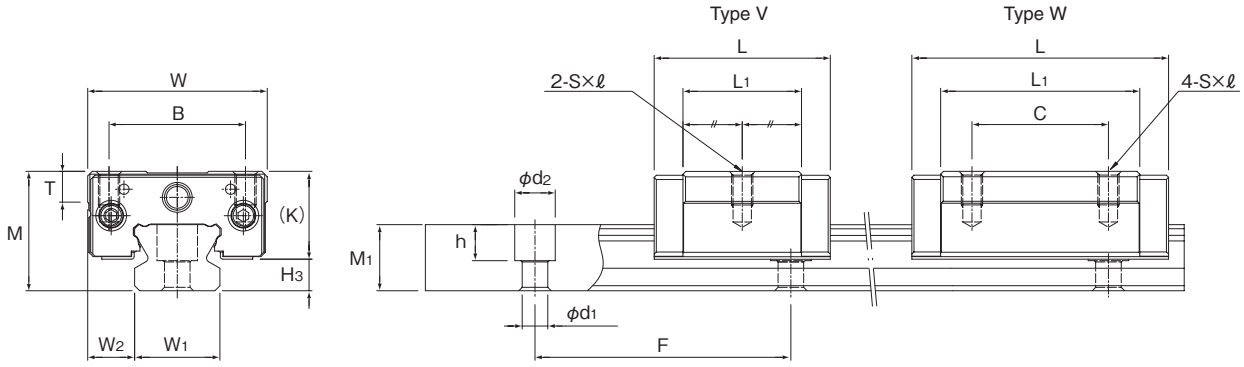
The following table shows the flatness of the mounting surface.

Unit: mm

Model number	Clearance CS
SR15MSV/W	0.020/200
SR20MSV/W	0.020/200

Model SR-MSV/W

Dimensional table for models SR-MSV/W



Unit: mm

Model No.	Outer dimensions			LM block dimensions						H3
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	K	
SR15MSV	24	34	36.6	26	—	M4×7	22.9	5.7	19.5	4.5
SR15MSW			53.2		26		39.5			
SR20MSV	28	42	41.3	32	—	M5×8	27.8	7.2	22	6
SR20MSW			60.2		32		46.7			

Unit: mm

Model No.	LM rail dimensions					Basic load rating	Static permissible moment [N·m]						Mass	
	Width W1 ±0.05	W2	Height M1	Pitch F	d1×d2×h	F0 [N]	MA		MB		MC		LM block [kg]	LM rail [kg/m]
							1 block	Double blocks	1 block	Double blocks	1 block			
SR15MSV	15	9.5	12.5	60	3.5×6×4.5	320	0.80	5.43	0.51	3.60	1.16		0.12	1.2
SR15MSW						570	2.35	13.0	1.47	8.31	2.08		0.2	
SR20MSV	20	11	15.5	60	6×9.5×8.5	430	1.35	8.44	0.87	5.52	2.05		0.2	2.1
SR20MSW						750	3.76	19.9	2.36	12.6	3.59		0.3	

Note 1: If you desire a product other than the model numbers indicated above, contact THK.
Note 2: For durability of the Oil-Free LM Guide for special environments, contact THK.

Example of model number coding

SR15MSV 1 CS + 300L P - II

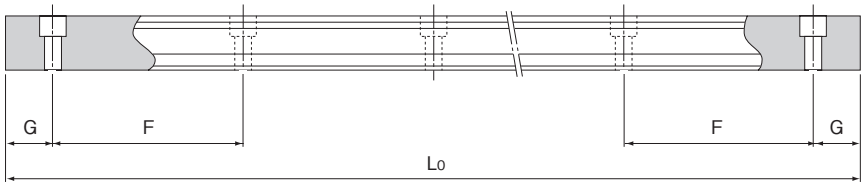
- SR15MSV: Model number
- 1: Number of LM blocks on one rail
- CS: Radial clearance symbol
- 300L: LM rail length (mm)
- P: Accuracy symbol
- II: Number of rails used on the same plane

Note With this model, a single-rail unit constitutes one set (i.e., the required number of sets when 2 rails are used in parallel is 2).

Standard length and maximum length of the LM rail

The following table shows the standard length and the maximum length of the LM rail of the Oil-Free LM Guide for special environments. If the overall rail length exceeds the maximum length, contact THK.

For dimension G if you require a special length, we recommend using the dimensions in the table. If dimension G is longer, the respective part tends to become unstable after installation, which may negatively affect the accuracy.



Standard length and maximum length of the LM rail

Unit: mm

Model number	SR15MSV/W	SR20MSV/W
Standard LM rail Length (L_0)	160 220 280 340 400	220 280 340 400
Standard pitch F	60	60
G	20	20
Maximum length	400	400

Note 1: If you desire a rail length larger than the maximum length, contact THK.
Note 2: A connected-rail type is not available.