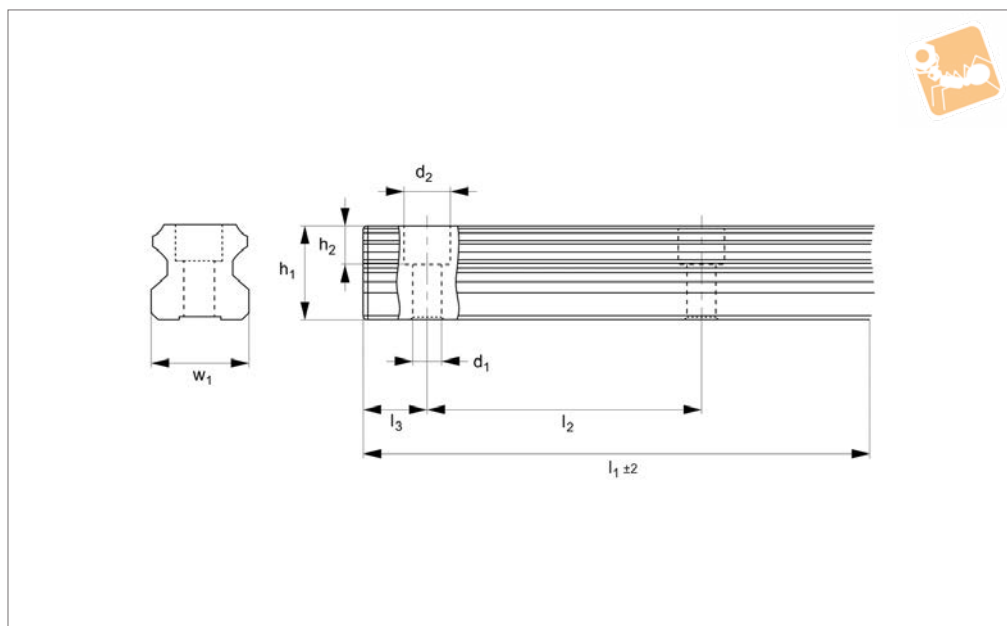




20mm Aluminium Linear Guide Rail

with stainless raceways

Linear Guide-ways



L1018.20

LINEAR GUIDEWAYS

Material

Aluminium profile (AlMgSi0.5, anodized 12-15μ). Raceway stainless steel (X46Cr13), hardened to 58-62HRC.

versus steel versions. The aluminium rails are made of high quality aluminium alloy with hardened stainless steel raceway.

weight aluminium carriages. For standard steel linear guideways and carriages see part no. L1016.

Technical Notes

Compact, light-weight design. 60% saving

Tips

These are very lightweight aluminium rails and can only be used with our light-

Order No.	Rail size	l_1	w_1	h_1	d_1	d_2	h_2	l_2	l_3	Weight kg
L1018.20-0180	20	180	20	19.3	6.0	9.4	7.7	60	30	0.1
L1018.20-0240	20	240	20	19.3	6.0	9.4	7.7	60	30	0.1
L1018.20-0300	20	300	20	19.3	6.0	9.4	7.7	60	30	0.2
L1018.20-0360	20	360	20	19.3	6.0	9.4	7.7	60	30	0.2
L1018.20-0420	20	420	20	19.3	6.0	9.4	7.7	60	30	0.2
L1018.20-0480	20	480	20	19.3	6.0	9.4	7.7	60	30	0.3
L1018.20-0540	20	540	20	19.3	6.0	9.4	7.7	60	30	0.3
L1018.20-0600	20	600	20	19.3	6.0	9.4	7.7	60	30	0.3
L1018.20-0660	20	660	20	19.3	6.0	9.4	7.7	60	30	0.4
L1018.20-0720	20	720	20	19.3	6.0	9.4	7.7	60	30	0.4
L1018.20-0780	20	780	20	19.3	6.0	9.4	7.7	60	30	0.4
L1018.20-0840	20	840	20	19.3	6.0	9.4	7.7	60	30	0.5
L1018.20-0900	20	900	20	19.3	6.0	9.4	7.7	60	30	0.5
L1018.20-0960	20	960	20	19.3	6.0	9.4	7.7	60	30	0.5
L1018.20-1020	20	1020	20	19.3	6.0	9.4	7.7	60	30	0.6
L1018.20-1080	20	1080	20	19.3	6.0	9.4	7.7	60	30	0.6
L1018.20-1140	20	1140	20	19.3	6.0	9.4	7.7	60	30	0.6
L1018.20-1200	20	1200	20	19.3	6.0	9.4	7.7	60	30	0.7
L1018.20-1260	20	1260	20	19.3	6.0	9.4	7.7	60	30	0.7
L1018.20-1320	20	1320	20	19.3	6.0	9.4	7.7	60	30	0.8
L1018.20-1380	20	1380	20	19.3	6.0	9.4	7.7	60	30	0.8
L1018.20-1440	20	1440	20	19.3	6.0	9.4	7.7	60	30	0.8
L1018.20-1500	20	1500	20	19.3	6.0	9.4	7.7	60	30	0.9
L1018.20-1560	20	1560	20	19.3	6.0	9.4	7.7	60	30	0.9
L1018.20-1620	20	1620	20	19.3	6.0	9.4	7.7	60	30	0.9
L1018.20-1680	20	1680	20	19.3	6.0	9.4	7.7	60	30	1.0
L1018.20-1740	20	1740	20	19.3	6.0	9.4	7.7	60	30	1.0
L1018.20-1800	20	1800	20	19.3	6.0	9.4	7.7	60	30	1.0
L1018.20-1860	20	1860	20	19.3	6.0	9.4	7.7	60	30	1.1
L1018.20-1920	20	1920	20	19.3	6.0	9.4	7.7	60	30	1.1
L1018.20-1980	20	1980	20	19.3	6.0	9.4	7.7	60	30	1.1

20mm Aluminium Linear Guide Rail
with stainless raceways



Order No.	Rail size	l_1	w_1	h_1	d_1	d_2	h_2	l_2	l_3	Weight kg
L1018.20-2040	20	2040	20	19.3	6.0	9.4	7.7	60	30	1.2
L1018.20-2100	20	2100	20	19.3	6.0	9.4	7.7	60	30	1.2
L1018.20-2160	20	2160	20	19.3	6.0	9.4	7.7	60	30	1.2
L1018.20-2220	20	2220	20	19.3	6.0	9.4	7.7	60	30	1.3
L1018.20-2280	20	2280	20	19.3	6.0	9.4	7.7	60	30	1.3
L1018.20-2340	20	2340	20	19.3	6.0	9.4	7.7	60	30	1.3
L1018.20-2400	20	2400	20	19.3	6.0	9.4	7.7	60	30	1.4
L1018.20-2460	20	2460	20	19.3	6.0	9.4	7.7	60	30	1.4
L1018.20-2520	20	2520	20	19.3	6.0	9.4	7.7	60	30	1.4
L1018.20-2580	20	2580	20	19.3	6.0	9.4	7.7	60	30	1.5
L1018.20-2640	20	2640	20	19.3	6.0	9.4	7.7	60	30	1.5
L1018.20-2700	20	2700	20	19.3	6.0	9.4	7.7	60	30	1.5
L1018.20-2760	20	2760	20	19.3	6.0	9.4	7.7	60	30	1.6
L1018.20-2820	20	2820	20	19.3	6.0	9.4	7.7	60	30	1.6
L1018.20-2880	20	2880	20	19.3	6.0	9.4	7.7	60	30	1.6
L1018.20-2940	20	2940	20	19.3	6.0	9.4	7.7	60	30	1.7
L1018.20-3000	20	3000	20	19.3	6.0	9.4	7.7	60	30	1.7
L1018.20-3060	20	3060	20	19.3	6.0	9.4	7.7	60	30	1.7
L1018.20-3120	20	3120	20	19.3	6.0	9.4	7.7	60	30	1.8
L1018.20-3180	20	3180	20	19.3	6.0	9.4	7.7	60	30	1.8
L1018.20-3240	20	3240	20	19.3	6.0	9.4	7.7	60	30	1.8
L1018.20-3300	20	3300	20	19.3	6.0	9.4	7.7	60	30	1.9
L1018.20-3360	20	3360	20	19.3	6.0	9.4	7.7	60	30	1.9
L1018.20-3420	20	3420	20	19.3	6.0	9.4	7.7	60	30	1.9
L1018.20-3480	20	3480	20	19.3	6.0	9.4	7.7	60	30	2.0
L1018.20-3540	20	3540	20	19.3	6.0	9.4	7.7	60	30	2.0
L1018.20-3600	20	3600	20	19.3	6.0	9.4	7.7	60	30	2.1
L1018.20-3660	20	3660	20	19.3	6.0	9.4	7.7	60	30	2.1
L1018.20-3720	20	3720	20	19.3	6.0	9.4	7.7	60	30	2.1
L1018.20-3780	20	3780	20	19.3	6.0	9.4	7.7	60	30	2.2
L1018.20-3840	20	3840	20	19.3	6.0	9.4	7.7	60	30	2.2
L1018.20-3900	20	3900	20	19.3	6.0	9.4	7.7	60	30	2.2
L1018.20-3960	20	3960	20	19.3	6.0	9.4	7.7	60	30	2.3
L1018.20-4000	20	4020	20	19.3	6.0	9.4	7.7	60	30	2.3



Product overview

Automation aluminium profile rails and ball bearing runner blocks are designed especially for all sorts of linear movements and are therefore suitable for use in most type of applications.

The rails consist of profiled aluminium, having two pressed-in hardened stainless steel shafts serving as the raceways for the balls of the runner blocks. Advantages are the light-weight and corrosive resistant materials. Fixing holes in the attachment surfaces enable machine parts to be directly mounted onto the runner blocks.

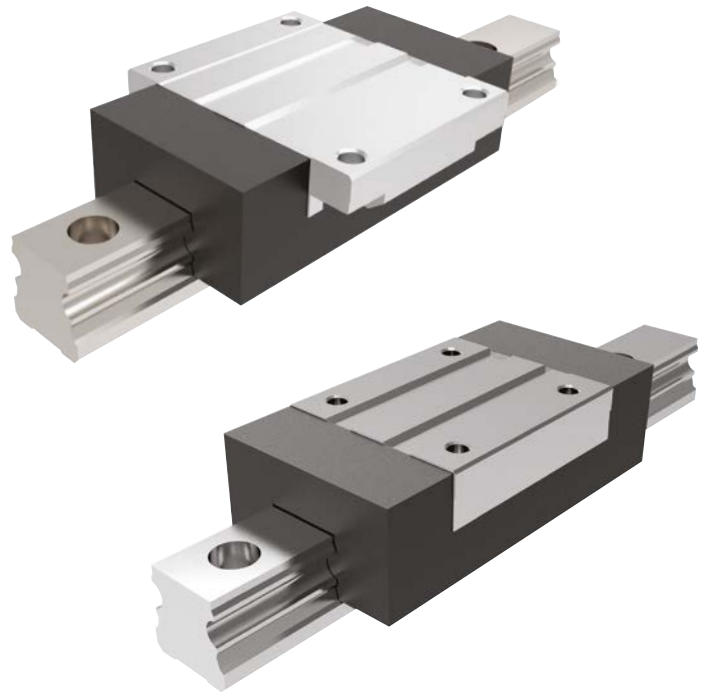
With this combination, it is possible for us to offer a guide system, which achieves a good price/performance ratio.

Product range:

- There are two versions of our carriages: flanged and unflanged.
- There are two accuracies for our carriages: standard precision (0) and a high precision called "P" (available on request).
- The standard carriage is not pre-loaded.
- The dynamic load rating (C in the data tables) is based on a service life of 100 Km.

Advantages:

- Compact, light-weight design with a weight saving of 60% compared to steel versions.
- Same fixing hole dimensions as steel, ball linear guideway systems.
- Much greater parallelism and height offsets of mounting bases possible, providing a degree of misalignment.
- Performs well in aggressive environments (dust, shavings etc.).
- Significantly better corrosion resistance compared to steel versions.
- Carriages initially greased in-factory, therefore provided with long-term lubrication.
- Due to ball retainers in the carriages, carriages can be removed from the rail without any loss of balls.
- Complete interchangeability between other manufacturers steel rail systems.
- Both sides of rail are reference edges. The carriages have one reference edge, which can be verified by turning it on the rail.



Application range:

Speed	$v_{\max} = 2 \text{ m/s}$
Acceleration	$a_{\max} = 30 \text{ m/s}^2$
Temperature	$T = 0^\circ - 60^\circ\text{C}$

Applications:

Our rails can be used in a broad range of applications - especially in light machinery, handling technology, jigs and fixtures, assembly technology, manual displacement systems, machine enclosures, door – and window technology, display systems, aerospace, medical, food and many more.

Our aluminium rail guides cannot be used in the following applications:

- Main axis of a CNC or tooling machine.
- Aggressive and dusty environments.
- Oscillating conveyor systems.
- Danger of life or physical systems (for example unsecured overhead installation).



Determination of the carriage size:

1. Pre-select the carriages
2. Determine F_{comb} (see below)
3. Calculate the ratio of the dynamic load capacity "C" of the selected carriages relative to F_{comb} (F_{comb} divided by "C")

If $F_{comb} / C > 0.4$: carriage is sized too small, select the next largest size and repeat the calculation (step 2 and 3).

The ratio must always be $F_{comb} / C \leq 0.4$, otherwise F_{max} will be exceeded.

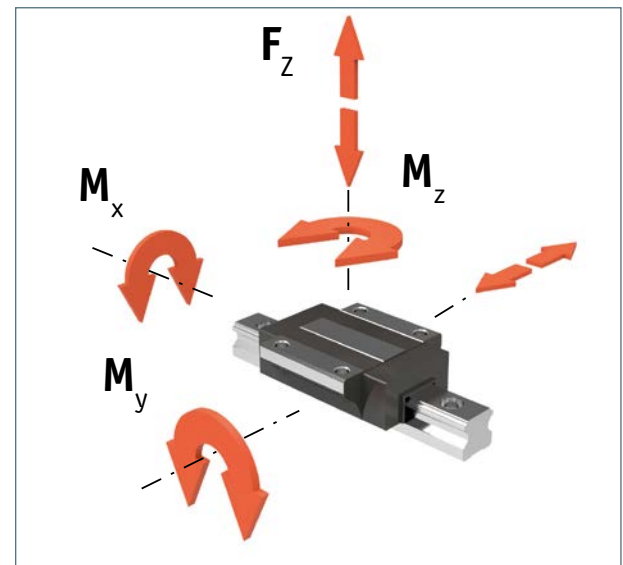
Note:

The load ratio F_{comb} / C is the quotient of the equivalent dynamic load on the bearing divided by the dynamic load capacity "C".

Calculation of load on bearing for a carriage:

$$F_{comb} = b \cdot \left(|F_z| + |F_y| + C \cdot \frac{|M_x|}{M_t} + C \cdot \frac{|M_y|}{M_L} + C \cdot \frac{|M_z|}{M_L} \right)$$

F_{comb}	= combined equivalent load	(N)
F_y, F_z	= Dynamic load	(N)
M_x	= torque of the X-axis ¹⁾	(Nm)
M_y	= torque of the Y-axis ²⁾	(Nm)
M_z	= Moment um die Z-Achse ²⁾	(Nm)
M_t	= dynamic torsional moment load capacity	(Nm)
M_L	= dynamic longitudinal moment load capacity	(Nm)
C	= dynamic load capacity	(N)
b	= operating factor, (see below)	



— For values, see carriage data tables

— For values, see carriage data tables

— For values, see carriage data tables

For values, see table

"Recommended values for operating factors "b".

- 1) Torque M_x will only be fully effective in an application with a single guide rail.
- 2) Torque M_y or M_x will only be fully effective when only a single carriage is mounted on one guide rail.

Recommended operating factors b:

Values for operating factors b	
1,0	Clean environment, low technical demands, manual operation
1,5	In a linear motion axis with ball screw drive
2,0	Linear motion axis with toothed belt drive
6,0	Linear motion axis with pneumatic drive
9,0	In very dirty environments

Static load rating

A static load rating can not be easily determined, because of the composite material (aluminium/stainless steel combination). Instead of this, you can find the values F_{max} and M_{max} .



Aluminium Linear Guideways

General mounting instructions

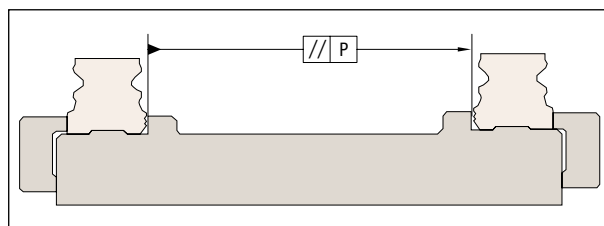
Aluminium Guideways

Parallelism

Please note the parallelism is required in the structure for correct installation. Parallelism of the installed rails is measured at the guide rails and the carriages.

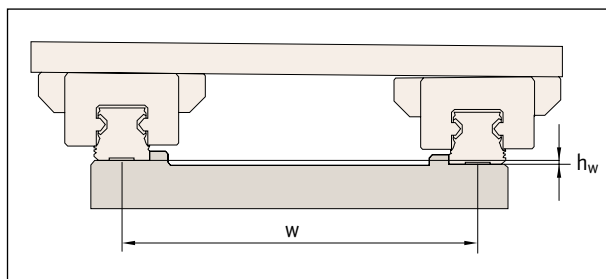
Any parallelism offset will cause a slight increase in preload on one side of the assembly.

As long as values specified in the table are met, the effect of parallelism offsets on the service life can generally be neglected.



Size	Permissible deviation in parallelism P_{max}	
	Standard	Preload
15	0,027	0,018
20	0,031	0,021
25	0,034	0,022

mm



Calculation factor f	Standard $1,2 \cdot 10^{-3}$	Preload $0,75 \cdot 10^{-3}$
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Height deviation

Permissible height deviation in lateral direction " h_w "

$$h_w \leq w \cdot f$$

h_w = Allowable height deviation (mm)

w = Distance between rails (mm)

f = Calculation factor

Allowable height deviation in longitudinal direction

Allowable height deviation in longitudinal direction " h_l "

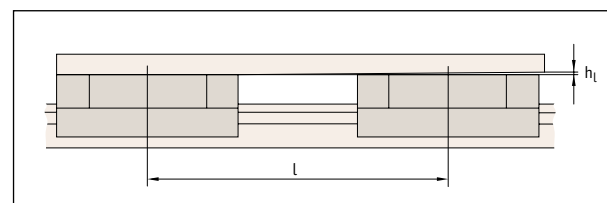
$$h_l \leq b \cdot g$$

h_l = Permissible height deviation (mm)

b = Distance between carriages (mm)

g = Calculation factor

$$h_l = l \times [6 \times 10^{-4}]$$



Calculation factor g	Standard 6×10^{-4}	Preload $2,1 \times 10^{-4}$
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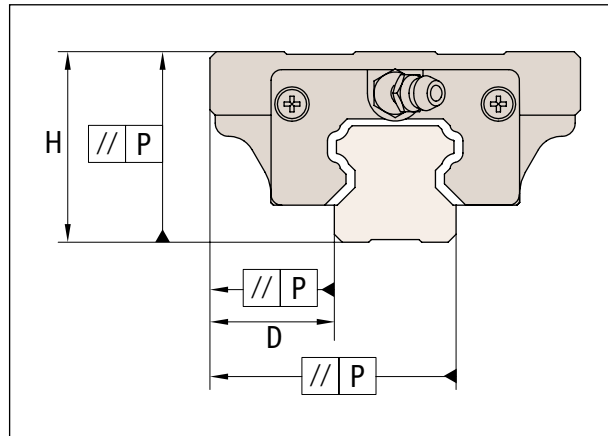


Height tolerance "H"

The height tolerance of several carriages on a rail is maximum $\pm 30\mu$. In a combination of several carriages and rails the maximum is $\pm 120\mu$.

Side tolerance "D"

The maximum side tolerance of several carriages on a rail is $\pm 30\mu$. In a combination of several carriages and rails, the maximum is $\pm 70\mu$.



Deviation of parallelism

