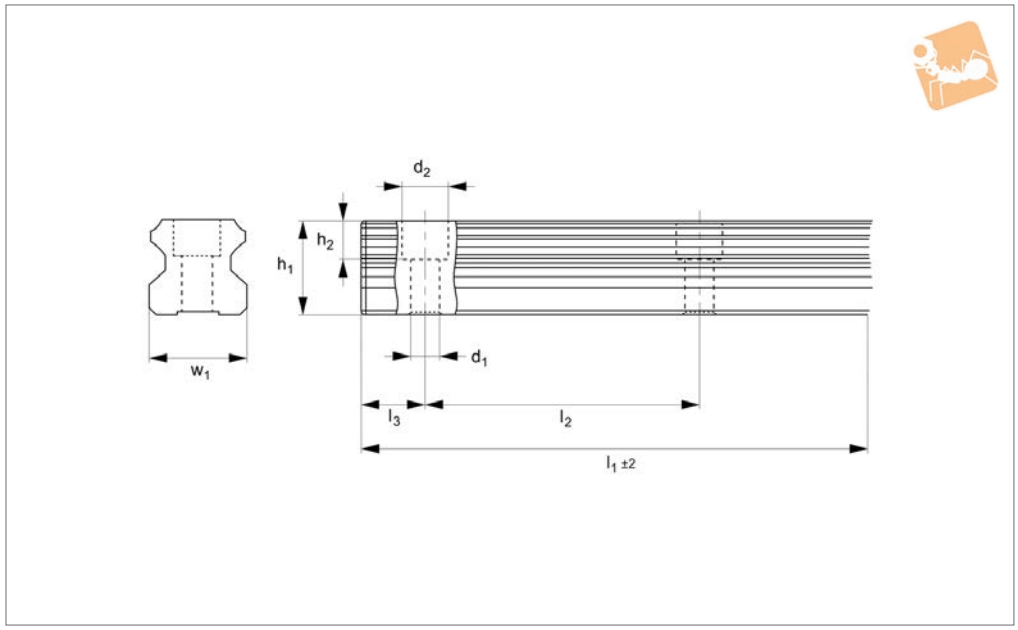
25mm Aluminium Linear Guide Rail
with stainless raceways



L1018.25

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

Technical Notes
Compact, light-weight design. 60% saving versus steel versions. The aluminium rails are made of high quality aluminium alloy with hardened stainless steel raceway.

Tips
These are very lightweight aluminium rails and can only be used with our light-weight aluminium carriages. For standard steel linear guideways and carriages see part no. L1016.

Order No.	Rail size	l_1	w_1	h_1	d_1	d_2	h_2	l_2	l_3	Weight kg
L1018.25-0180	25	180	25	21.8	7.0	11.0	8.9	60	30	0.2
L1018.25-0240	25	240	25	21.8	7.0	11.0	8.9	60	30	0.3
L1018.25-0300	25	300	25	21.8	7.0	11.0	8.9	60	30	0.4
L1018.25-0360	25	360	25	21.8	7.0	11.0	8.9	60	30	0.5
L1018.25-0420	25	420	25	21.8	7.0	11.0	8.9	60	30	0.5
L1018.25-0480	25	480	25	21.8	7.0	11.0	8.9	60	30	0.6
L1018.25-0540	25	540	25	21.8	7.0	11.0	8.9	60	30	0.7
L1018.25-0600	25	600	25	21.8	7.0	11.0	8.9	60	30	0.8
L1018.25-0660	25	660	25	21.8	7.0	11.0	8.9	60	30	0.8
L1018.25-0720	25	720	25	21.8	7.0	11.0	8.9	60	30	0.9
L1018.25-0780	25	780	25	21.8	7.0	11.0	8.9	60	30	1.0
L1018.25-0840	25	840	25	21.8	7.0	11.0	8.9	60	30	1.1
L1018.25-0900	25	900	25	21.8	7.0	11.0	8.9	60	30	1.1
L1018.25-0960	25	960	25	21.8	7.0	11.0	8.9	60	30	1.2
L1018.25-1020	25	1020	25	21.8	7.0	11.0	8.9	60	30	0.0
L1018.25-1080	25	1080	25	21.8	7.0	11.0	8.9	60	30	0.1
L1018.25-1140	25	1140	25	21.8	7.0	11.0	8.9	60	30	0.2
L1018.25-1200	25	1200	25	21.8	7.0	11.0	8.9	60	30	0.3
L1018.25-1260	25	1260	25	21.8	7.0	11.0	8.9	60	30	0.3
L1018.25-1320	25	1320	25	21.8	7.0	11.0	8.9	60	30	0.4
L1018.25-1380	25	1380	25	21.8	7.0	11.0	8.9	60	30	0.5
L1018.25-1440	25	1440	25	21.8	7.0	11.0	8.9	60	30	0.6
L1018.25-1500	25	1500	25	21.8	7.0	11.0	8.9	60	30	0.6
L1018.25-1560	25	1560	25	21.8	7.0	11.0	8.9	60	30	0.7
L1018.25-1620	25	1620	25	21.8	7.0	11.0	8.9	60	30	0.8
L1018.25-1680	25	1680	25	21.8	7.0	11.0	8.9	60	30	0.9
L1018.25-1740	25	1740	25	21.8	7.0	11.0	8.9	60	30	0.9
L1018.25-1800	25	1800	25	21.8	7.0	11.0	8.9	60	30	1.0
L1018.25-1860	25	1860	25	21.8	7.0	11.0	8.9	60	30	1.1
L1018.25-1920	25	1920	25	21.8	7.0	11.0	8.9	60	30	1.2
L1018.25-1980	25	1980	25	21.8	7.0	11.0	8.9	60	30	1.2

25mm 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
L1018.25-2040	25	2040	25	21.8	7.0	11.0	8.9	60	30	0.1
L1018.25-2100	25	2100	25	21.8	7.0	11.0	8.9	60	30	0.1
L1018.25-2160	25	2160	25	21.8	7.0	11.0	8.9	60	30	0.2
L1018.25-2220	25	2220	25	21.8	7.0	11.0	8.9	60	30	0.3
L1018.25-2280	25	2280	25	21.8	7.0	11.0	8.9	60	30	0.4
L1018.25-2340	25	2340	25	21.8	7.0	11.0	8.9	60	30	0.4
L1018.25-2400	25	2400	25	21.8	7.0	11.0	8.9	60	30	0.5
L1018.25-2460	25	2460	25	21.8	7.0	11.0	8.9	60	30	0.6
L1018.25-2520	25	2520	25	21.8	7.0	11.0	8.9	60	30	0.7
L1018.25-2580	25	2580	25	21.8	7.0	11.0	8.9	60	30	0.7
L1018.25-2640	25	2640	25	21.8	7.0	11.0	8.9	60	30	0.8
L1018.25-2700	25	2700	25	21.8	7.0	11.0	8.9	60	30	0.9
L1018.25-2760	25	2760	25	21.8	7.0	11.0	8.9	60	30	1.0
L1018.25-2820	25	2820	25	21.8	7.0	11.0	8.9	60	30	1.0
L1018.25-2880	25	2880	25	21.8	7.0	11.0	8.9	60	30	1.1
L1018.25-2940	25	2940	25	21.8	7.0	11.0	8.9	60	30	1.2
L1018.25-3000	25	3000	25	21.8	7.0	11.0	8.9	60	30	0.0
L1018.25-3060	25	3060	25	21.8	7.0	11.0	8.9	60	30	0.1
L1018.25-3120	25	3120	25	21.8	7.0	11.0	8.9	60	30	0.2
L1018.25-3180	25	3180	25	21.8	7.0	11.0	8.9	60	30	0.2
L1018.25-3240	25	3240	25	21.8	7.0	11.0	8.9	60	30	0.3
L1018.25-3300	25	3300	25	21.8	7.0	11.0	8.9	60	30	0.4
L1018.25-3360	25	3360	25	21.8	7.0	11.0	8.9	60	30	0.5
L1018.25-3420	25	3420	25	21.8	7.0	11.0	8.9	60	30	0.5
L1018.25-3480	25	3480	25	21.8	7.0	11.0	8.9	60	30	0.6
L1018.25-3540	25	3540	25	21.8	7.0	11.0	8.9	60	30	0.7
L1018.25-3600	25	3600	25	21.8	7.0	11.0	8.9	60	30	0.8
L1018.25-3660	25	3660	25	21.8	7.0	11.0	8.9	60	30	0.8
L1018.25-3720	25	3720	25	21.8	7.0	11.0	8.9	60	30	0.9
L1018.25-3780	25	3780	25	21.8	7.0	11.0	8.9	60	30	1.0
L1018.25-3840	25	3840	25	21.8	7.0	11.0	8.9	60	30	1.1
L1018.25-3900	25	3900	25	21.8	7.0	11.0	8.9	60	30	1.1
L1018.25-3960	25	3960	25	21.8	7.0	11.0	8.9	60	30	1.2
L1018.25-4000	25	4000	25	21.8	7.0	11.0	28	60	30	5.0

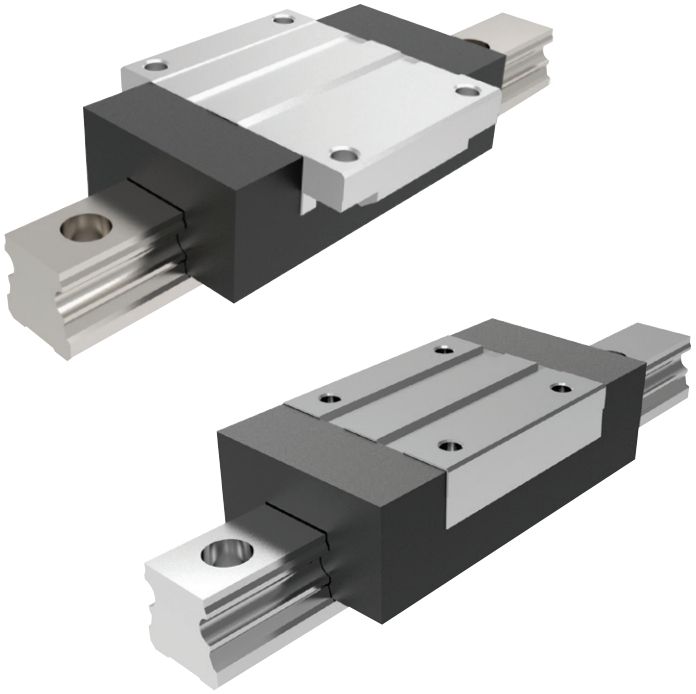
Ordering Example

L1018 • R20 – 0940 – 20

- L1018: product number
- R20: rail size
- 0940: overall length (mm) (max. length 4000) (l_1)
- 20: distance to first hole (l_3)

Product overview

Automotion 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 m/s**
Acceleration	**a_{max} = 30 m/s^2**
Temperature	**T = 0º - 60ºC**

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 enviroments.
- Oscillating conveyor systems.
- Danger of life or physical systems (for example unsecured overhead installation).

Aluminium Linear Guideways

Selection

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")

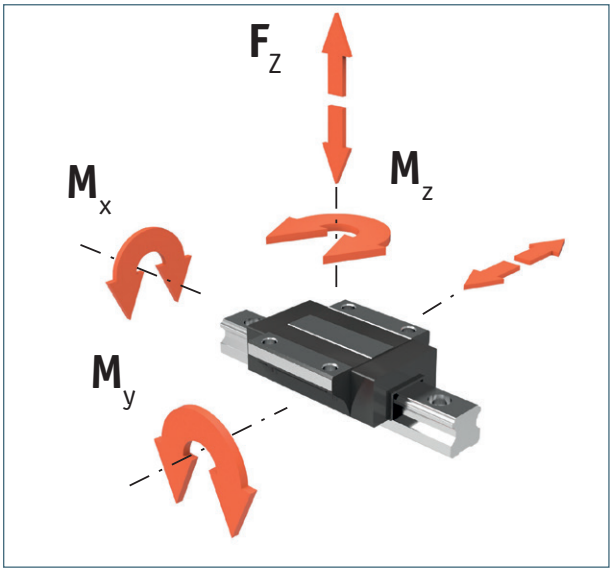
If F_{comb} /C > 0.4: carriages is sized too small, select the next largest size and repeat the calculation (step 2 and 3).

The ratio must always be F_{comb} / C≤ 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)	For values, see carriage data tables
M_L	=	dynamic longitudinal moment load capacity	(Nm)	For values, see carriage data tables
C	=	dynamic load capacity	(N)	For values, see carriage data tables
b	=	operating factor, (see below)		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:

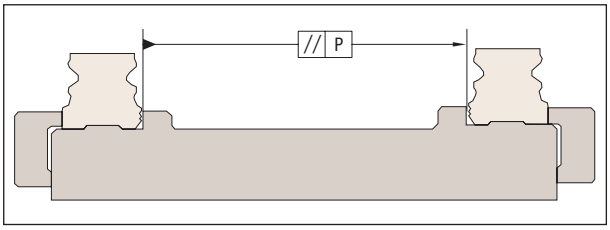
Values for operating factors b	
1,0	Clean environment, low technical demands, manual operation
1,5	In a linear motion axis with ball screw drive
2,0	Linear motion axis with toothed belt drive
6,0	Linear motion axis with pneumatic drive
9,0	In very dirty environments

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}.

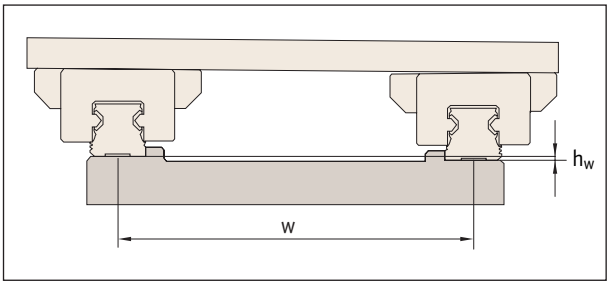
Parallelism

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

Height deviation

Permissible height deviation in lateral direction "h_w"

$$h_w \leq w.f$$

h_w = Allowable height deviation (mm)
w = Distance between rails (mm)
f = Calculation factor

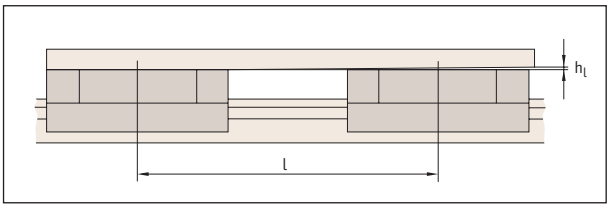
Allowable height deviation in longitudinal direction

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

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



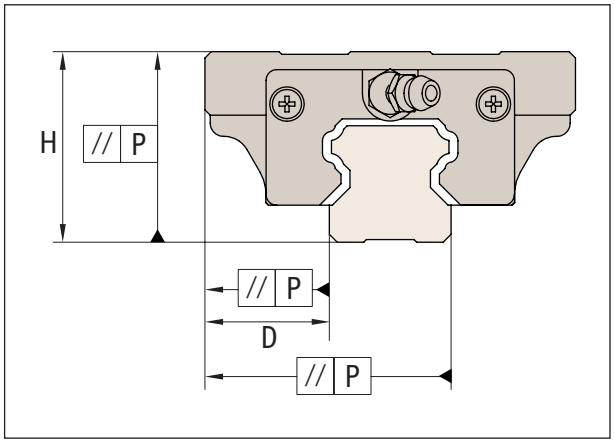
Calculation factor	Standard	Preload
g	6×10^{-4}	$2,1 \times 10^{-4}$

Height tolerance “H”

The height tolerance of several carriages on a rail is maximum ±30µ. In a combination of several carriages and rails the maximum is ±120µ.

Side tolerance “D”

The maximum side tolerance of several carriages on a rail is ±30 µ. In a combination of several carriages and rails, the maximum is ±70 µ.



Deviation of parallelism