L1018.15

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.	l_1	w_1	h_1	d_1	d_2	h_2	l_2	l_3	Weight kg
L1018.15-0180	180	15	14.0	4.4	7.5	6.2	60	28	10.30
L1018.15-0240	240	15	14.0	4.4	7.5	6.2	60	28	13.70
L1018.15-0300	300	15	14.0	4.4	7.5	6.2	60	28	17.10
L1018.15-0360	360	15	14.0	4.4	7.5	6.2	60	28	20.50
L1018.15-0420	420	15	14.0	4.4	7.5	6.2	60	28	23.90
L1018.15-0480	480	15	14.0	4.4	7.5	6.2	60	28	27.40
L1018.15-0540	540	15	14.0	4.4	7.5	6.2	60	28	30.80
L1018.15-0600	600	15	14.0	4.4	7.5	6.2	60	28	34.20
L1018.15-0660	660	15	14.0	4.4	7.5	6.2	60	28	37.60
L1018.15-0720	720	15	14.0	4.4	7.5	6.2	60	28	41.00
L1018.15-0780	780	15	14.0	4.4	7.5	6.2	60	28	44.50
L1018.15-0840	840	15	14.0	4.4	7.5	6.2	60	28	47.90
L1018.15-0900	900	15	14.0	4.4	7.5	6.2	60	28	51.30
L1018.15-0960	960	15	14.0	4.4	7.5	6.2	60	28	54.70
L1018.15-1020	1020	15	14.0	4.4	7.5	6.2	60	28	58.14
L1018.15-1080	1080	15	14.0	4.4	7.5	6.2	60	28	61.56
L1018.15-1140	1140	15	14.0	4.4	7.5	6.2	60	28	64.98
L1018.15-1200	1200	15	14.0	4.4	7.5	6.2	60	28	68.40
L1018.15-1260	1260	15	14.0	4.4	7.5	6.2	60	28	71.82
L1018.15-1320	1320	15	14.0	4.4	7.5	6.2	60	28	75.24
L1018.15-1380	1380	15	14.0	4.4	7.5	6.2	60	28	78.66
L1018.15-1440	1440	15	14.0	4.4	7.5	6.2	60	28	82.08
L1018.15-1500	1550	15	14.0	4.4	7.5	6.2	60	28	88.35
L1018.15-1560	1560	15	14.0	4.4	7.5	6.2	60	28	88.92
L1018.15-1620	1620	15	14.0	4.4	7.5	6.2	60	28	92.34
L1018.15-1680	1680	15	14.0	4.4	7.5	6.2	60	28	95.76
L1018.15-1740	1740	15	14.0	4.4	7.5	6.2	60	28	99.18
L1018.15-1800	1800	15	14.0	4.4	7.5	6.2	60	28	102.60
L1018.15-1860	1860	15	14.0	4.4	7.5	6.2	60	28	106.02
L1018.15-1920	1920	15	14.0	4.4	7.5	6.2	60	28	109.44
L1018.15-1980	1980	15	14.0	4.4	7.5	6.2	60	28	112.86

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Order No.	l_1	w_1	h_1	d_1	d_2	h_2	l_2	l_3	Weight kg
L1018.15-2040	2040	15	14.0	4.4	7.5	6.2	60	28	116.28
L1018.15-2100	2100	15	14.0	4.4	7.5	6.2	60	28	119.70
L1018.15-2160	2160	15	14.0	4.4	7.5	6.2	60	28	123.12
L1018.15-2220	2220	15	14.0	4.4	7.5	6.2	60	28	126.54
L1018.15-2280	2280	15	14.0	4.4	7.5	6.2	60	28	129.96
L1018.15-2340	2340	15	14.0	4.4	7.5	6.2	60	28	133.38
L1018.15-2400	2400	15	14.0	4.4	7.5	6.2	60	28	136.80
L1018.15-2460	2460	15	14.0	4.4	7.5	6.2	60	28	140.22
L1018.15-2520	2520	15	14.0	4.4	7.5	6.2	60	28	143.64
L1018.15-2580	2580	15	14.0	4.4	7.5	6.2	60	28	147.06
L1018.15-2640	2640	15	14.0	4.4	7.5	6.2	60	28	150.48
L1018.15-2700	2700	15	14.0	4.4	7.5	6.2	60	28	153.90
L1018.15-2760	2760	15	14.0	4.4	7.5	6.2	60	28	157.32
L1018.15-2820	2820	15	14.0	4.4	7.5	6.2	60	28	160.74
L1018.15-2880	2880	15	14.0	4.4	7.5	6.2	60	28	164.16
L1018.15-2940	2940	15	14.0	4.4	7.5	6.2	60	28	167.58
L1018.15-3000	3000	15	14.0	4.4	7.5	6.2	60	28	171.00
L1018.15-3060	3060	15	14.0	4.4	7.5	6.2	60	28	174.42
L1018.15-3120	3120	15	14.0	4.4	7.5	6.2	60	28	177.84
L1018.15-3180	3180	15	14.0	4.4	7.5	6.2	60	28	181.26
L1018.15-3240	3240	15	14.0	4.4	7.5	6.2	60	28	184.68
L1018.15-3300	3300	15	14.0	4.4	7.5	6.2	60	28	188.10
L1018.15-3360	3360	15	14.0	4.4	7.5	6.2	60	28	191.52
L1018.15-3420	3420	15	14.0	4.4	7.5	6.2	60	28	194.94
L1018.15-3480	3480	15	14.0	4.4	7.5	6.2	60	28	198.36
L1018.15-3540	3540	15	14.0	4.4	7.5	6.2	60	28	201.78
L1018.15-3600	3600	15	14.0	4.4	7.5	6.2	60	28	205.20
L1018.15-3660	3660	15	14.0	4.4	7.5	6.2	60	28	208.62
L1018.15-3720	3720	15	14.0	4.4	7.5	6.2	60	28	212.04
L1018.15-3780	3780	15	14.0	4.4	7.5	6.2	60	28	215.46
L1018.15-3840	3840	15	14.0	4.4	7.5	6.2	60	28	218.88
L1018.15-3900	3900	15	14.0	4.4	7.5	6.2	60	28	222.30
L1018.15-3960	3960	15	14.0	4.4	7.5	6.2	60	28	225.72
L1018.15-4000	4000	15	14.0	4.4	7.5	6.2	60	28	228.00

Ordering Example

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

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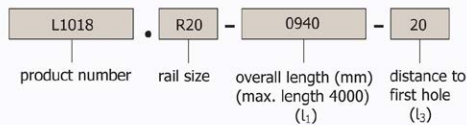
Product overview

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.
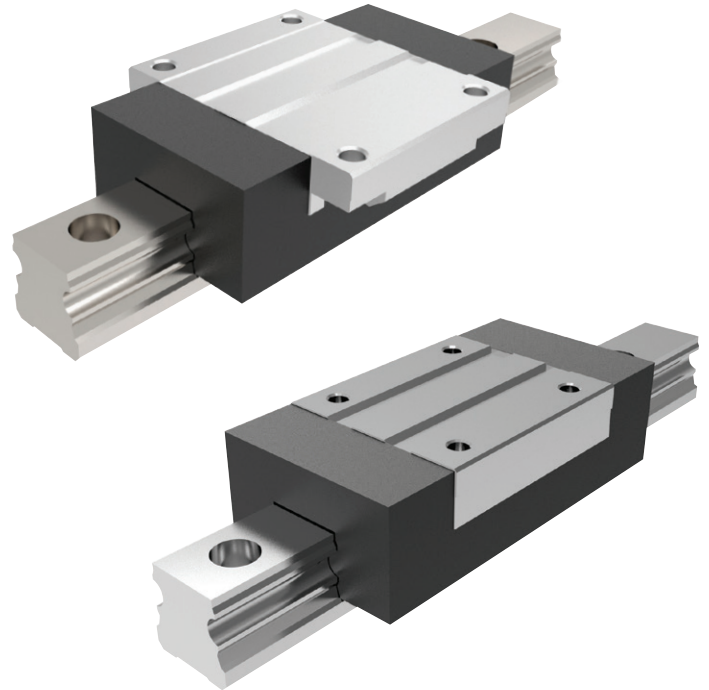
Product range:

- 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/s²**
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).

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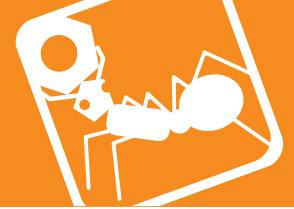
Determination of the carriage size:

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 $F_{comb}/C \leq 0.4$, 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)	
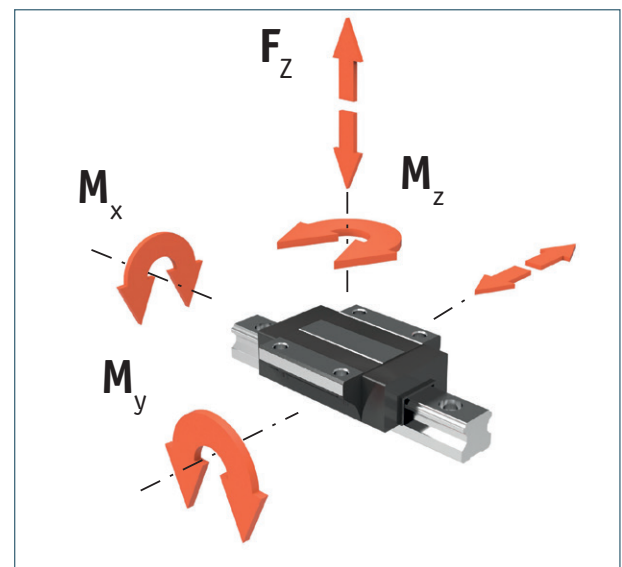
— For values, see carriage data tables
— For values, see carriage data tables
— For values, see carriage data tables
For values, see table
"Recommended values for operating factors "b".

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}.

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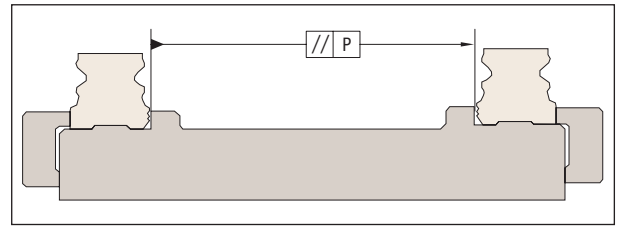
Size	Permissible deviation in parallelism P_{max}	
	Standard	Preload
15	0,027	0,018
20	0,031	0,021
25	0,034	0,022

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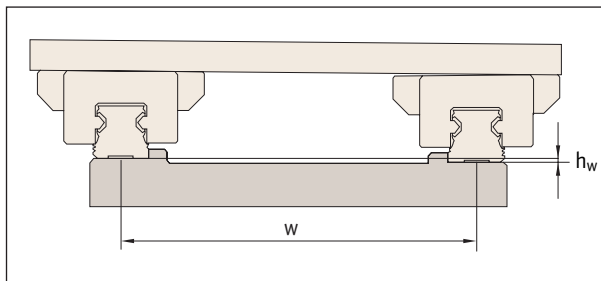
Calculation factor f	Standard $1,2 \cdot 10^{-3}$	Preload $0,75 \cdot 10^{-3}$

Height deviation

Permissible height deviation in lateral direction "h_w"
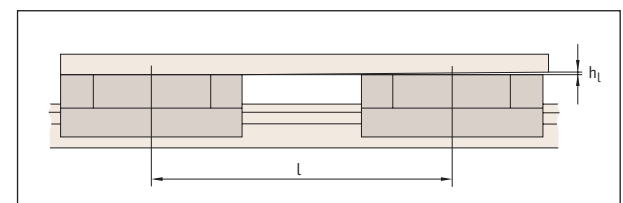
$$h_w \leq w.f$$

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

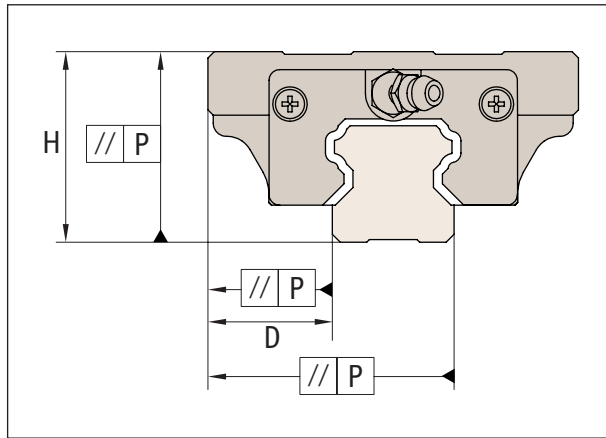### Height tolerance "H"

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

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