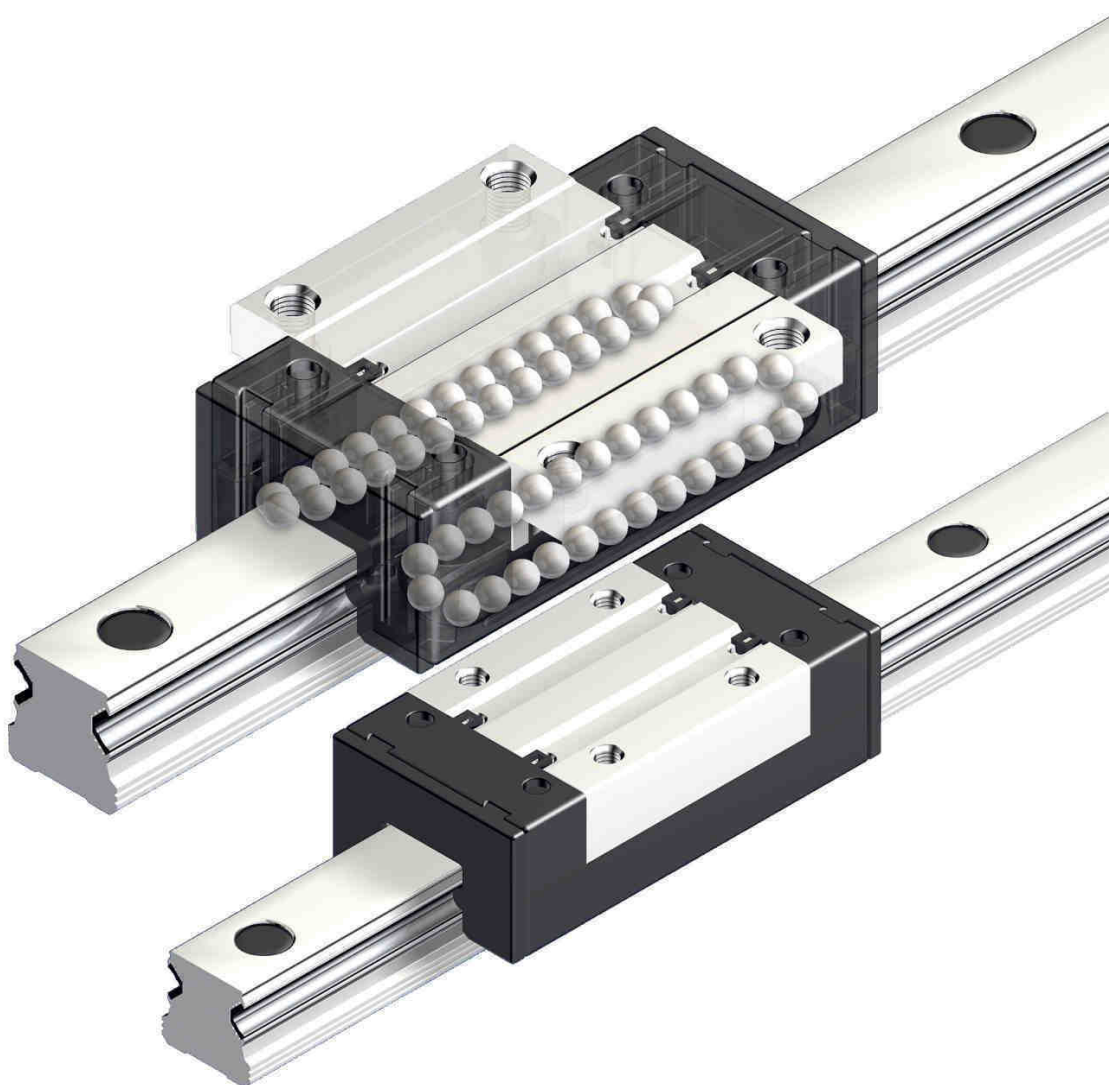




Aluminium-stainless steel Linear guideways

GLF 2013



GUIDAGE A BILLES - LINEAR GUIDWAY

Historique

- 1999 ● Création de la sté France Linéaire Industrie au capital de 7 000 € avec son stock à Vaulx en Velin.
- 2001 ● Création de notre atelier d'usinage.
- 2004 ● Fabrication des tables linéaires en interne.
- 2006 ● Développement de notre gamme de douilles à billes FLI.
- 2007 ● Développement de notre gamme de paliers et supports d'arbres FLI.
- 2007 ● Augmentation du capital à 500 000 €.
- 2008 ● Construction de notre nouvelle unité à Janneyrias et développement de notre gamme de vis à billes FLI.
- 2010 ● Modernisation de notre parc machines.
- 2011



Notre atelier

- Pont roulant avec une capacité de 5 tonnes.
- 1 ligne de tronçonnage de 20 mètres avec 2 postes de coupes (capacité 1200 coupes par jours).
- Tours numériques 2 et 3 axes
- Machine à recuire.
- Surfaceuse.
- Rectifieuse spéciale pour réalisation des aboutages de rails.
- Machine spéciale pour réalisation des taraudages radiaux sur les arbres de précision.
- Machine de contrôle de rectitude et redressage pour les vis à billes.
- Appareil de contrôle de dureté.
- Appareil de contrôle d'épaisseur de chrome.
- Appareil de contrôle de précharge des écrous de vis à billes.
- Banc de contrôle des vis à billes

Stock

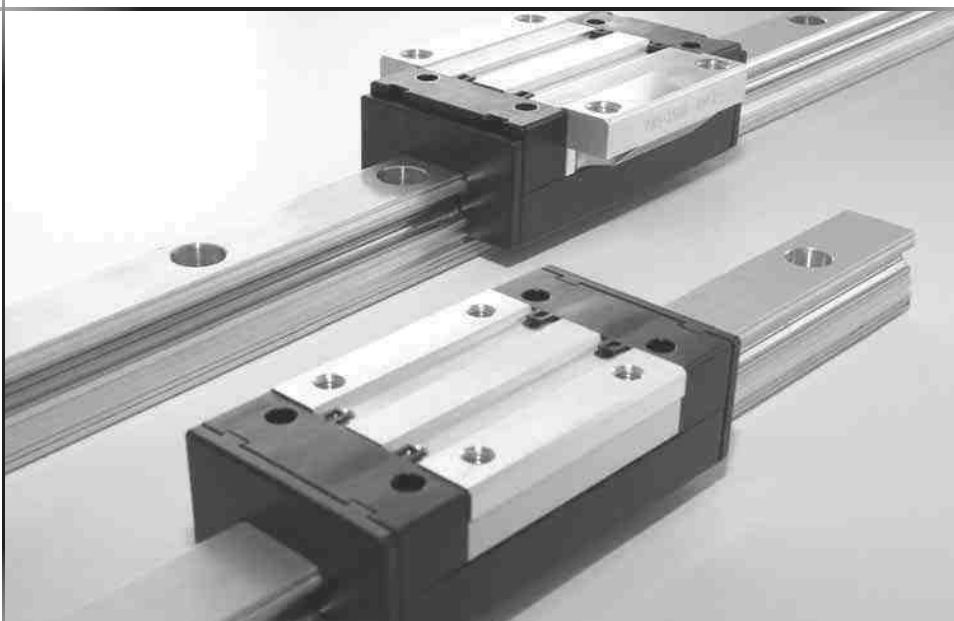
6 000 patins


4 000 mètres de rails

Performance et gain de temps

Notre équipe est uniquement constituée de **professionnels** avec au minimum 8 ans d'**expérience** dans le domaine du guidage linéaire. Cette expérience nous permet de comprendre vos besoins et de vous apporter rapidement une solution au **meilleur coût**.

Aluminium & Stainless steel Linear guideway

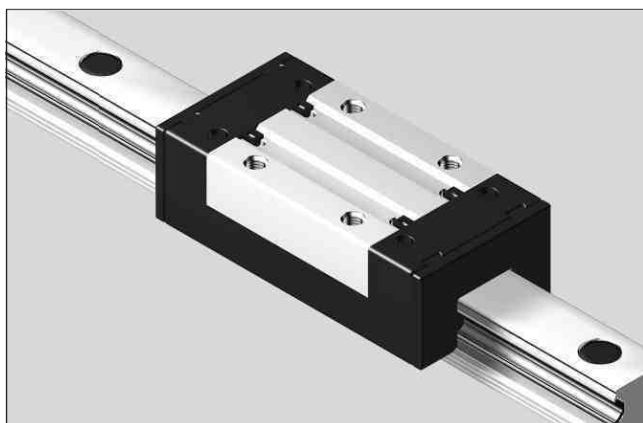
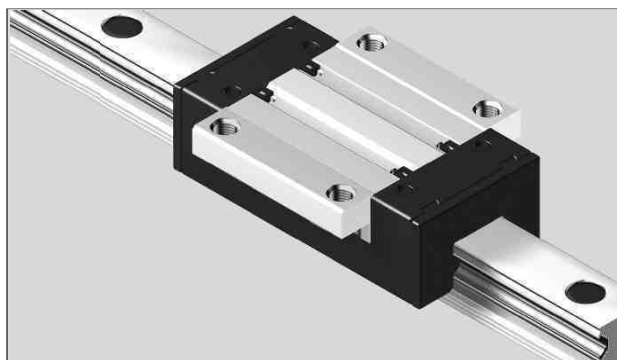


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Introduction

General Information

Alulins accurate profile rails and ball bearing runner blocks are designed especially for all sorts of linear movements and are therefore suitable for use in most types of machinery. The rails consist of wrought 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.



Advantages

Compact, light-weight design; 60% weight saving versus steel versions.

Same connection dimensions as steel ball rail systems.

Much greater parallelism and height offsets of mounting bases possible.

Insensitive in an aggressive environment (dust, shavings).

Significantly better corrosion resistance in comparison with the steel versions.

Runner blocks initially greased in-factory, therefore provided with long-term lubrication.

Due to ball retainers in the runner blocks, runner blocks can be removed from the rail without any loss of balls.

Complete interchangeability between runner blocks and rails.

Both sides of rail are reference edges. The runner block has 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_{\max}	=	60° C

Following the directions on left, our system can be inserted in many application areas such as food and packaging industry, light machinery, handling technology, jigs and fixtures, assembly technology, positioning units, manual displacement systems, machine enclosures, house and building technology and many more.

Accuracy

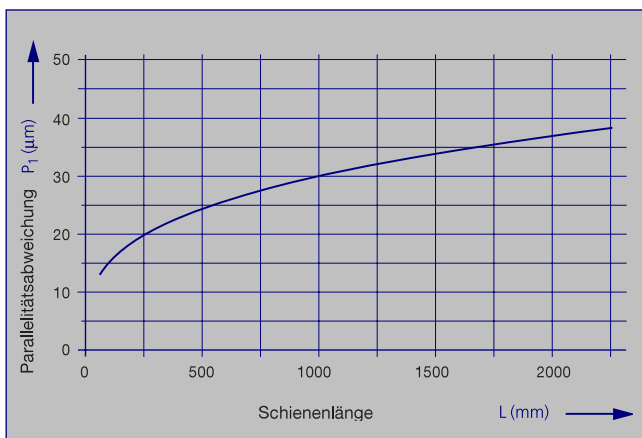
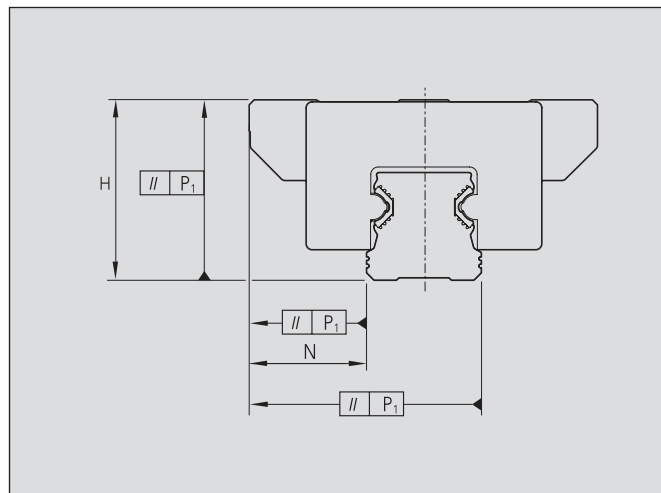
Rails are produced according to the high precision class "P". Runner blocks according to the standard class "O" or the high precision class "P". Each individual component element can be replaced by another at any time.

Tolerances for dimension "H":

Mounting more than one runner block, tolerance of the runner blocks (stock standard) is just about +/- 60 µm. Tolerance of the precise runner block is within +/- 30 µm. For any runner block/rail combination at any position, tolerance is within +/- 115 µm (stock standard), precise runner blocks within +/- 100 µm.

Tolerances for dimension "N":

Mounting more than one runner block, tolerance of the runner blocks (stock standard) is just about +/- 60 µm. Tolerance of the precise runner block is within +/- 30 µm. For any runner block/rail combination at any position, tolerance is within +/- 50µm (stock standard), precise runner blocks within +/- 40 µm.



Deviation of Parallelism

Please view the table on the left for parallelism values.

Preload ("V")

Generally we deliver runner blocks and guiding rails without preload. Minimal clearance exists between runner block and rail. Usually two runner blocks are mounted on one or two rails. With two rails and use of more than one runner block per rail, this clearance is usually equalized by parallelism tolerances.

If required, this linear guide system will be delivered with preload. Please note, we recommend this only when greater displacement force is accepted or possible.

Precision Parts ("P")

The product range also includes runner blocks with even smaller tolerances on dimensions. They were specially designed for applications requiring such precision. For details see above.

General Mounting Instructions

Parallelism

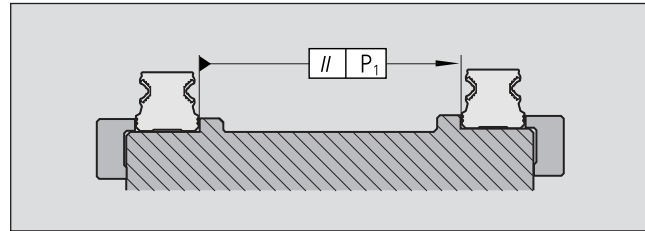
Parallelism of the installed rails measured at the guide rails and at the runner blocks.

The parallelism offset P1 causes 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.

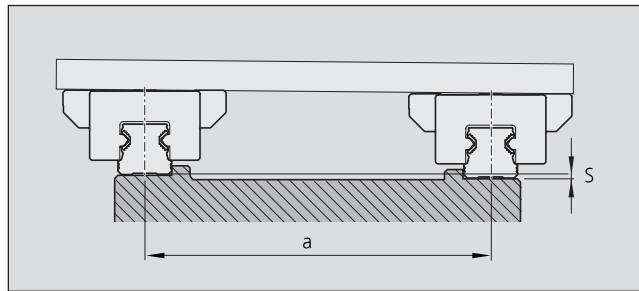
Through the deviation in parallelism (P1) the preload is increased on one side. If table values are adhered to, the influence on the service life is generally negligible.

Profiled rail systems allow substantially higher installation tolerances compared to steel rail systems.



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

Values in mm



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

Height deviation

Given adherence to the permissible height deviation "S", the influence on the service life can generally be neglected.

Permissible height deviation in lateral direction "S"

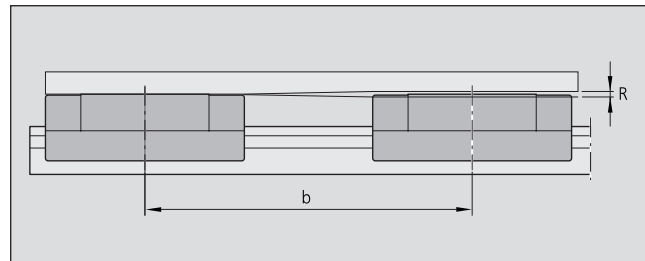
$S \leq a \cdot f$	S = Permissible height deviation (mm)
	a = distance between rails (mm)
	f = Calculation factor

Permissible height deviation in longitudinal direction

Given adherence to the permissible height deviation "R", the influence on the service life can generally be neglected.

Permissible height deviation in longitudinal direction

$R \leq b \cdot g$	R = Permissible height deviation (mm)
	b = Distance between runner blocks (mm)
	g = Calculation factor



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

Calculation of linear guiding size

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

If $F_{comb}/C > 0,4$: runner block is sized too small.
Select the next largest size and repeat the calculation (step 2 and 3).

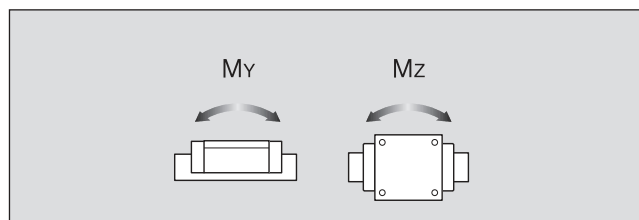
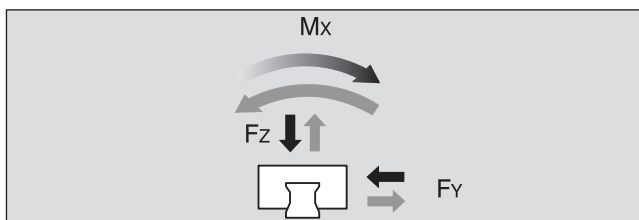
The ratio must always be $F_{comb}/C \leq 0,4$; otherwise F_{max} will be exceeded.

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".

Please control dynamic demand of bolted joints.

Calculation of load on bearing for a runner block



F_{comb}	= combined equivalent load	(N)
F_y, F_z	= dynamic loads	(N)
M_x	= torque of the X-axis ¹⁾	(Nm)
M_y	= torque of the Y-axis ²⁾	(Nm)
M_z	= torque of the Z-axis 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 factors	

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

For values, see runner blocks on page 9 and 10.
For values, see runner blocks on page 9 and 10.
For values, see runner blocks on page 9 and 10.
For values, see table „Recommended values for operating factors "b"”.

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

Recommended operating factors b

1,0	Clean environment, low technical demands, manual operation
1,2	In a linear motion axis with ball screw drive
1,5	Linear motion axis with toothed belt drive
2,0	Auxiliary axis of machine tool not subject to dirt
6,0	Linear motion axis with pneumatic drive
9,0	In very dirty environments

Note:

Not for use in applications like:

- main axis of a machine tool
- aggressive dust environment
- oscillating conveyors
- danger to life and limb (e.g. insecure overhead installation)

Lubrication Concept

We aim to achieve a lifetime lubrication, which we define as at least 30.000 km.

The following conditions apply:

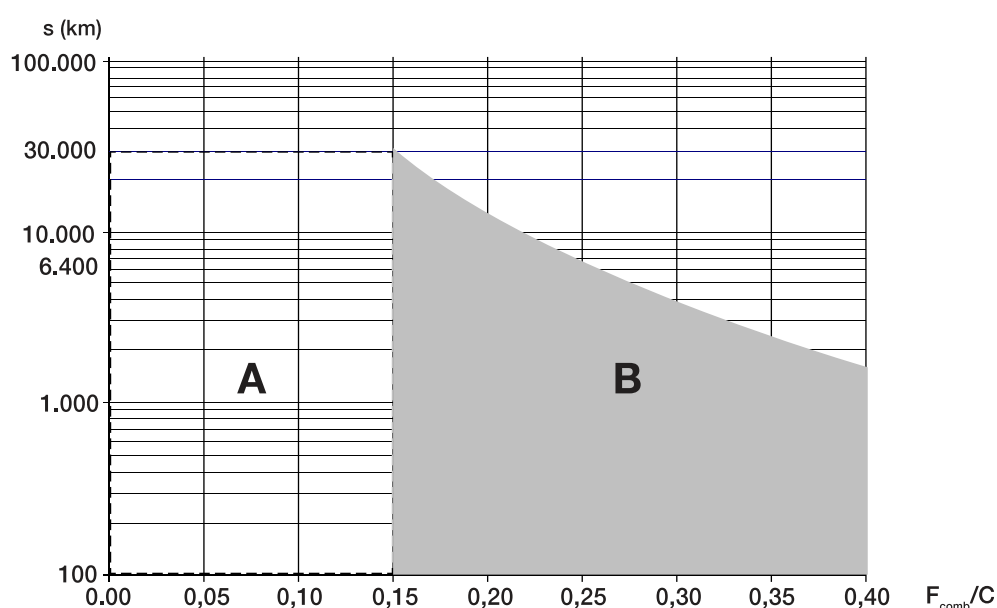
- initial greasing with Dynalub 510
- maximum speed $V_{max} = 2$ m/s
- mounted seal unit
- clean environment
- no exposure to metal-working fluids
- ambient temperature $T = 20$ to 30° C

Lifetime lubrication applies only to a ratio $F_{comb}/C \leq 0,15$, values are found on page 9 and zone A in the graph below.

For $F_{comb}/C = 0,25$ (as shown in zone B in the graph below), relubrication is necessary after a distance traveled $s = 6.400$ km.

By distance traveled ≥ 6.400 km, runnerblock should be dismantled, re-lubricated and supplied with new seal units.

Value $F_{comb}/C > 0,40$, then F_{max} is exceeded.



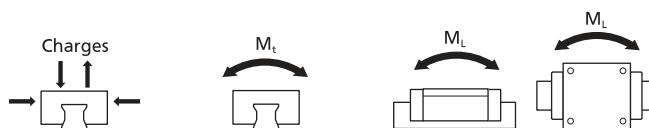
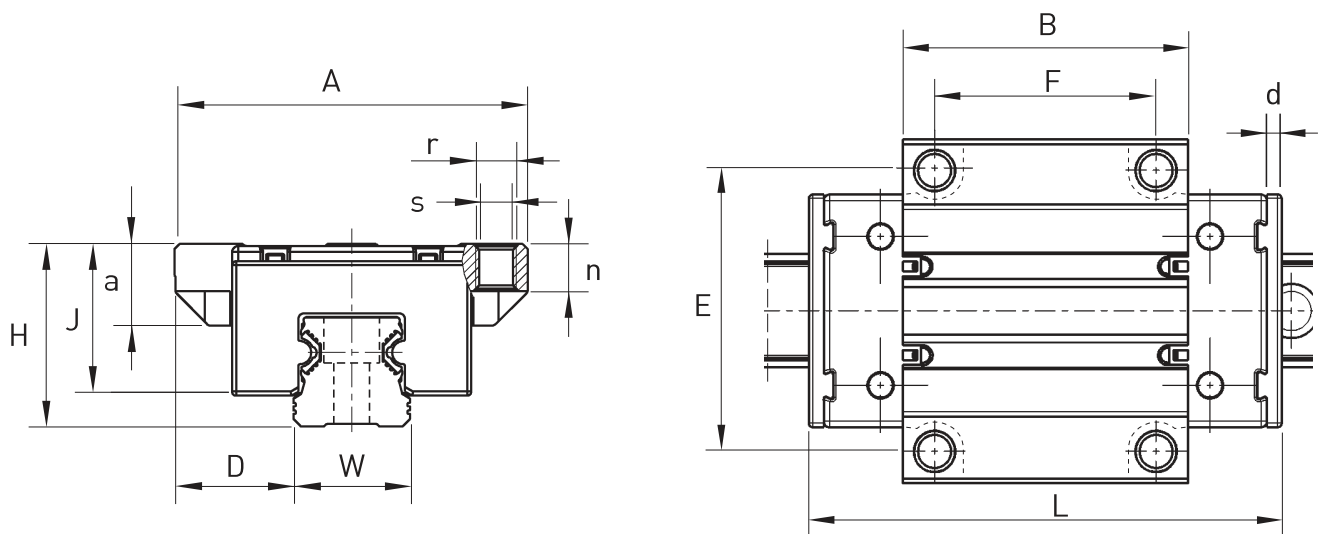
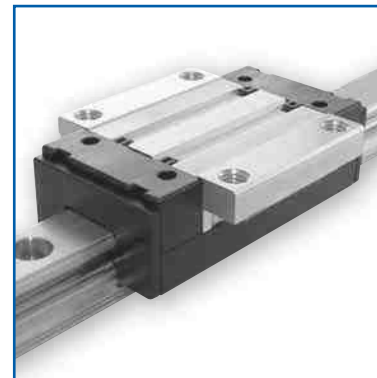
Please note:

- Take account of the general service life of lubricants
- Do not use greases with solid particles such as graphite or MoS2!
- If other lubricants are used, this may lead to a reduction in the relubrication intervals, the achievable travel in short-stroke applications and the load capacities. Possible chemical interactions between the plastic materials, lubricants and preservative oils must also be taken into account.
- If your application involves more demanding environmental requirements such as clean room, vacuum, food industry, increased exposure to fluids or aggressive media, extreme temperatures, please consult us. These situations must be investigated on a case by case basis and may require the use of a special lubricant. Be sure to have all the information concerning your application at hand when contacting us.

Type FNS

This light-weight aluminium runner block is designed for cost-effective applications such as assembly and handling processes.

Mounting dimensions are identical to those of the guiding rails and in accordance to DIN 645-1. Mounting possible from above and below. Runner block consists of wrought aluminium alloy with a tensile strength of 350 N/mm², balls and running tracks of hardened anti-friction bearing steel. All other parts are made of polyamide. The runner block is greased in-factory and has already mounted seal units, which can easily be replaced.

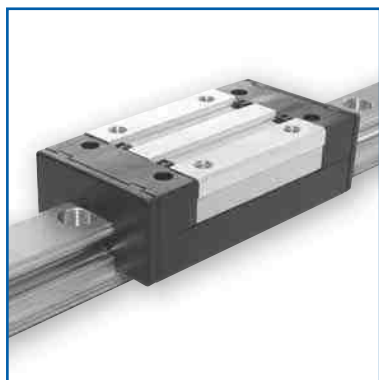


Référence Type	Dimensions - mm														Capacités de charges - N Basic load		Moments statiques - N·m Static moment (3)				Poids patin Weight block kg
	A	H ⁽¹⁾ +/-0,03	W	D ⁽²⁾ +/-0,03	L	B	E	F	s	r	n	J	a max	d	Dyn. C ⁽³⁾	F ⁽⁴⁾ max	Dyn. M _t	Stat. M _{t, max}	Dyn. M _L	Stat. M _{L, max}	
FNS-1500	47	24	15	16,	64	37,8	38	30	4,3	M5	6	19,8	11	2,5	5 000	2 000	36	14	29	12	0,08
FNS-2000	63	30	20	21,5	85,9	51,5	53	40	5,3	M6	8	24,7	13	2,8	11 000	4 400	101	40	89	35	0,18
FNS-2500	70	36	23	23,5	96	58	57	45	6,7	M8	9,3	29,9	17	3	16 000	6 400	165	66	147	59	0,26

(1) Tolerance on one guide rail. May differ due to different production charges by +/- 0,12
 (2) Tolerance on one guide rail. May differ due to different production charges by +/- 0,07
 (3) Determination of the dynamic load capacities and torques is based on a travel life of 100.000 m.
 (4) Due to mechanical operations of guide rails and runner block with their different materials, it is not possible to clearly indicate a load rating. In this case never exceed Fmax or Mmax. Otherwise malfunction or damage may occur.

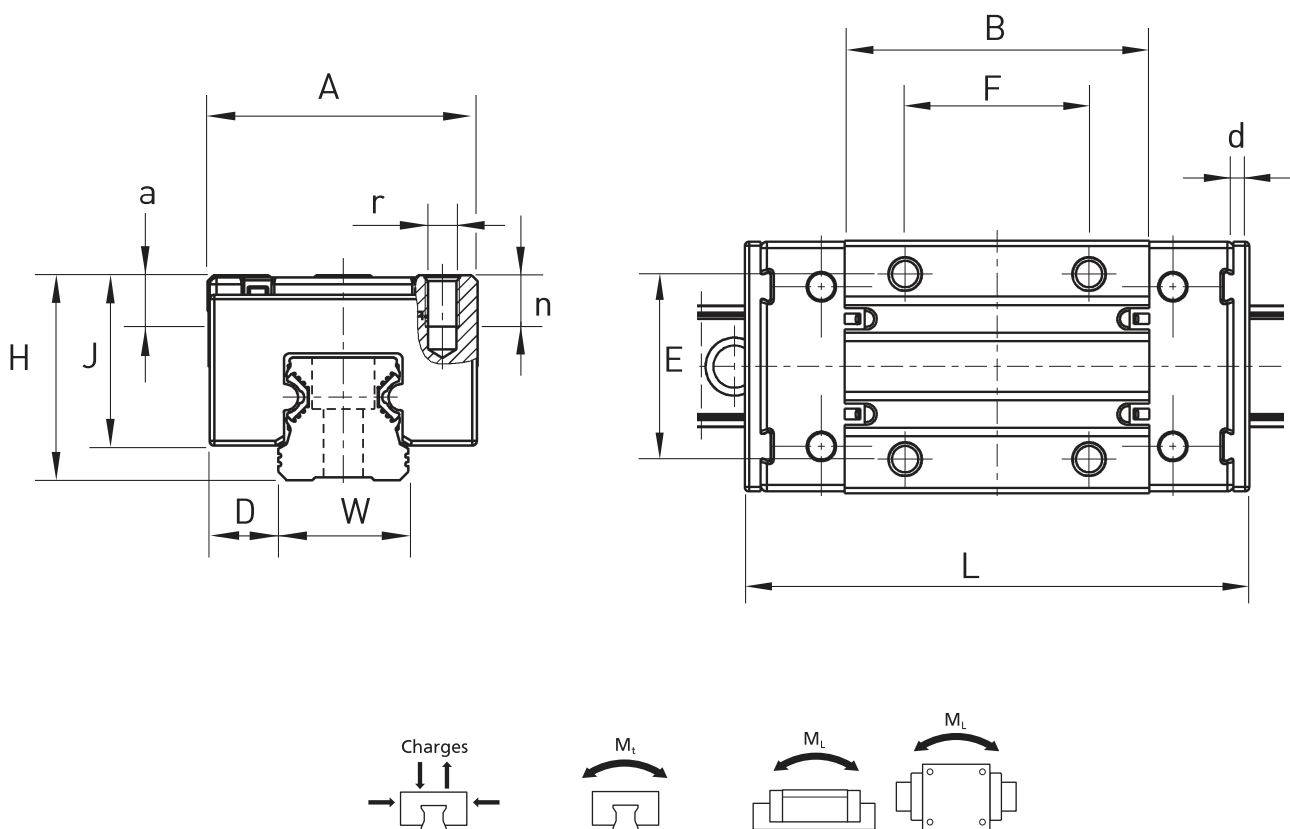
ALUMINIUM / STAINLESS STEEL LINEAR GUIDWAY

Type GNS



This light-weight aluminium runner slimmer block is designed for cost-effective applications such as assembly and handling processes.

Mounting dimensions are identical to those of the guiding rails and in accordance to DIN 645-1. Mounting possible from above and below. Runner block consists of wrought aluminium alloy with a tensile strength of 350 N/mm², balls and running tracks of hardened anti-friction bearing steel.



Référence Type	Dimensions - mm													Charges - N Basic load		Moments statiques - N-m Static moment (3)				Poids patin Weight block kg
	A	H ⁽¹⁾ +/-0,03	W	D ⁽²⁾ +/-0,03	L	B	E	F	r	n	J	a	d	Dyn. C ⁽³⁾	F _{max} ⁽⁴⁾	Dyn. M _t	Stat. M _{t, max}	Dyn. M _L	Stat. M _{L, max}	
GNS-1500	34	24	15	9,5	64,0	37,8	26	26	M4	6,0	19,8	4,1	2,5	5 000	2 000	36	14	29	12	0,07
GNS-2000	44	30	20	12,0	85,9	51,5	32	36	M5	7,5	24,7	5,5	2,8	11 000	4 400	101	40	89	35	0,15
GNS-2500	48	36	23	12,5	96,0	58,0	35	35	M6	9,0	29,9	6,4	3,0	16 000	6 400	165	66	147	59	0,22

(1) Tolerance on one guide rail. May differ due to different production charges by +/- 0,12

(2) Tolerance on one guide rail. May differ due to different production charges by +/- 0,07

(3) Determination of the dynamic load capacities and torques is based on a travel life of 100.000 m.

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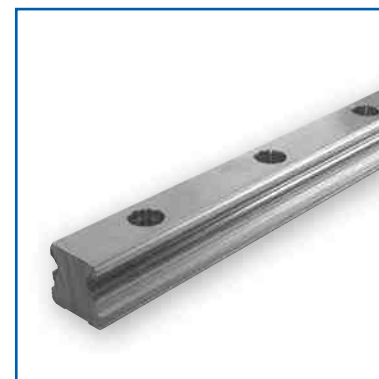
Corrosion-Resistant profiles Rail

The rails consist of a wrought aluminium alloy, the raceways of hardened and corrosion-resistant steel. Advantages in comparison with steel rails, are the light weight and cost-efficiency. Surface irregularities are evened out due to material properties.

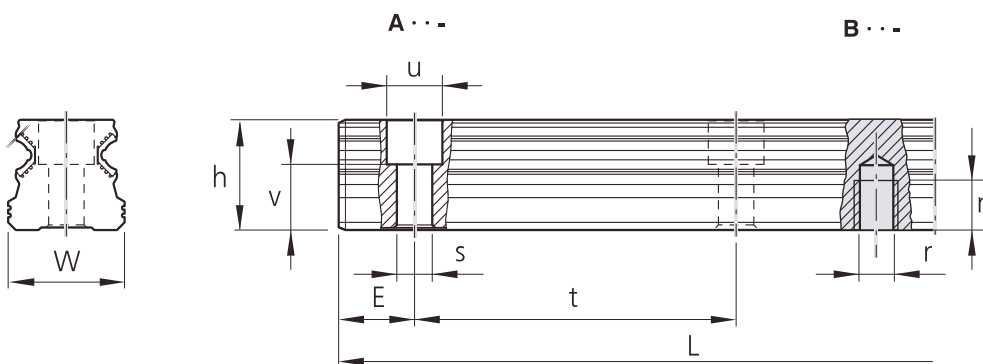
We recommend, that due to the aluminium-and-steel structure, rails should be ordered ready-made and only be separated in exceptional cases.

Order no. **A**... rails are for mounting from above, **B**... for mounting from below.

Mounting caps (plastic and metal) can be ordered separately.



Aluminium : AlMgSi0.5



Référence Type	Dimensions - mm											Poids Weight
	W	h	u	v	s	E	E_{min}	r	n	t	L_{max}	Kg/M
A15-...	15	14,0	7,4	8,1	4,4	28	10			60	4 000	0,57
B15-...	15	14,0				28	10	M5	7	60	4 000	0,57
A20-...	20	19,0	9,4	11,6	6,0	28	10			60	4 000	0,98
B20-...	20	19,0				28	10	M6	9	60	4 000	0,98
A25-...	23	21,8	11,0	12,9	7,0	28	10			60	4 000	1,25
B25-...	23	21,8				28	10	M6	12	60	4 000	1,25

→ Longueur du rail en mm

FLI linear system...



Precision shaft



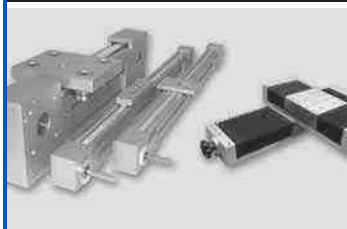
Linear bearings



Linear bearings & housing units



Ball spline



Actuator and linear tables



Slide way and slide table



Components

Ce catalogue annule et remplace l'édition précédente.

Les informations techniques contenues dans ce catalogue proviennent d'essais de laboratoires ou d'applications dignes de foi, de même que toutes autres informations verbales ou écrites fournies à la demande de l'utilisateur, ont un caractère purement informatif. Aucune garantie ne peut être donnée en ce qui concerne les erreurs éventuelles et elles n'engagent aucunement la responsabilité de la société quant à l'aptitude des produits aux applications spécifiques auxquelles l'utilisateur entend les destiner. Etant à l'écoute de nos clients, nous nous réservons le droit de pouvoir apporter des modifications sur l'évolution de notre gamme de produits du présent catalogue.



GLF 2013



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