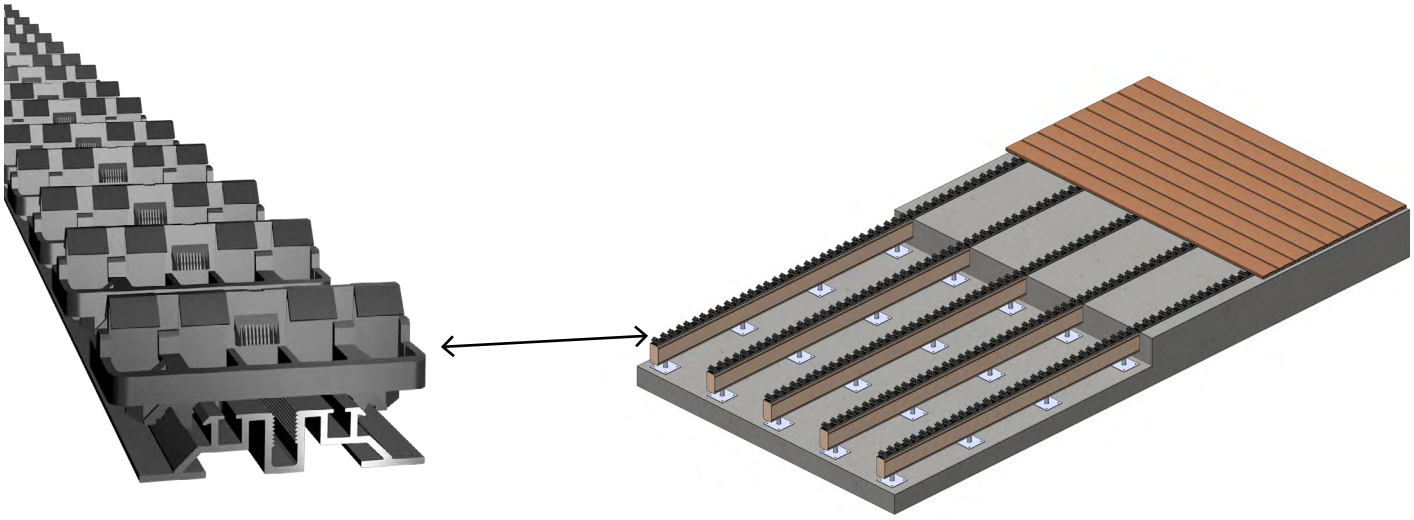
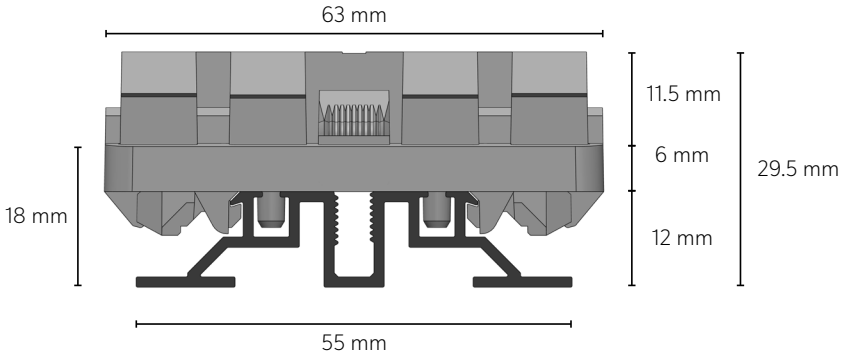
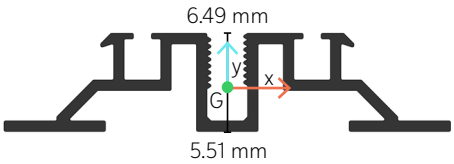
FLAT RAIL - DECKING



FLAT RAIL

FLAT RAIL DIMENSIONS - WITH CLIPS





Position of center of gravity (G)

MOMENT OF INERTIA:
Ixx = 2384.2 mm^4
Iyy = 28960 mm^4
Ixx/v = 367.4 mm^3

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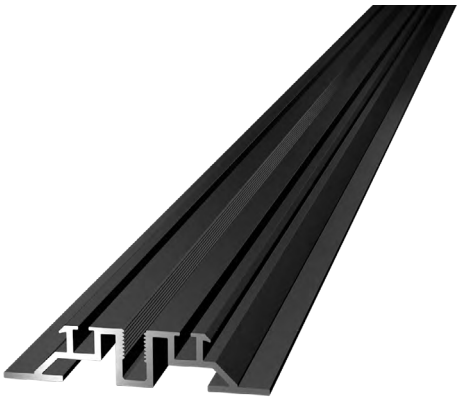
ALUMINIUM RAIL



Material	Aluminium EN AW-6060
Mass per meter of rail without clips	0.423 kg
Colour	Black
Thermal Treatment	T6
Tensile strength (MPa)	190
Tensile stress at yield (MPa)	150
Minimal elongation (%)	6
Tensile modulus (MPa)	70000
Coefficient of linear expansion (10^{-6}/K)	24
Fusion Temperature (°C)	585-655
Thermal conductivity (W/mK)	160

GRAD CLIP

Material	Polyoxymethylene
Density (kg/m³)	1410
Colour	Black
Tensile stress at yield (MPa)	64
Fusion temperature (°C)	190-220
Tensile modulus (MPa)	2850
Coefficient of linear expansion (10^{-6}/K)	110

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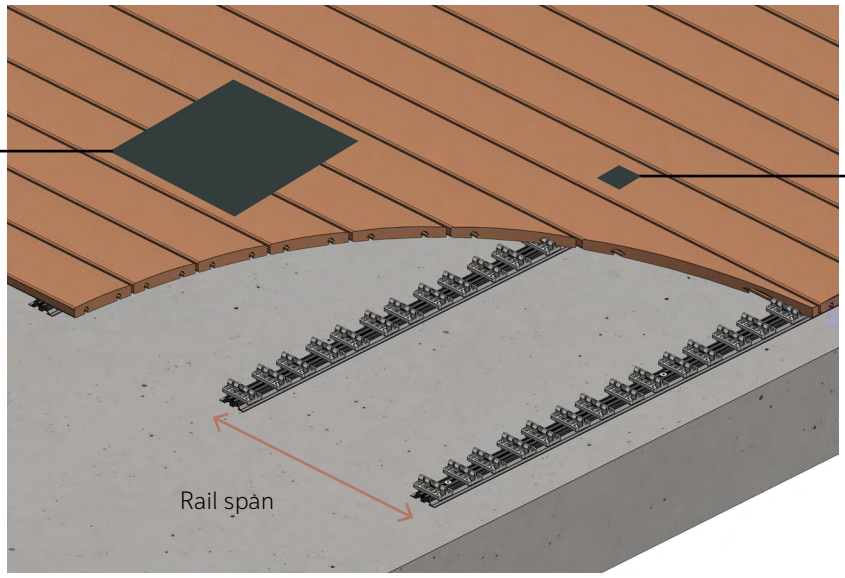
USE CATEGORIES ACCORDING TO FRENCH NORMS AND EUROCODE 1 EN 1991-1-1 FOR DECKING

Rail spans and pedestal spans are defined according to the distributed and concentrated loads, following French regulations and Eurocode 1 EN 1991-1-1, and not taking local requirements into account. As the Flat rail is not a load-bearing rail, it must be installed on a continuous support (concrete slab, wood structure, metal...). The Flat rail must be fixed to its support to guarantee the terrace's stability.

Distributed load : load distributed on a square of 1m x 1m



Concentrated load : Load concentrated on a square of 5cm x 5cm

USE CATEGORY	SPECIFIC USE		DISTRIBUTED LOAD (kN/m²)		CONCENTRATED LOAD (kN)
A	Residential: rooms in residential buildings and houses, hospital rooms and wards, hotel and hostel rooms, kitchens and sanitary facilities. Decks and balconies.		Floors	1.5	2.0
			Staircases	2.5	
			Balconies	**3.5***	
B	Offices		2.5		4.0
C	Meeting Places	C1 : Areas equipped with tables (schools, restaurants, reception halls, etc.)	2.5		3.0
		C2 : Spaces with fixed seating (theatre, cinema, conference room, etc.)	4.0		4.0
		C3 : Areas free of obstacles to human movement (museums, exhibition halls; access to administrative buildings, hotels, hospitals, stations, etc.).	4.0		4.0
		C4 : Spaces for physical activities (stage, dance hall, gym, etc.)	5.0		7.0
		C5 : Buildings intended for public events (concerts, sporting events including stands, terraces and access areas; station platforms, etc.).	5.0		4.5
D	D1 : Standard retail		5.0		5.0
	D2 : Department stores		5.0		7.0

* Maximum load for use category A

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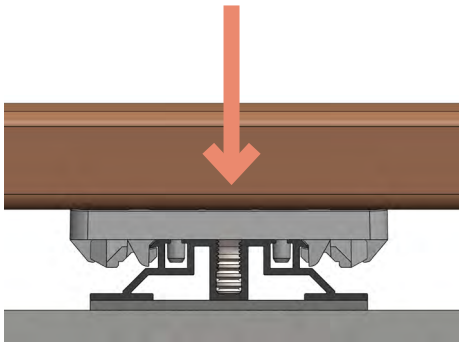
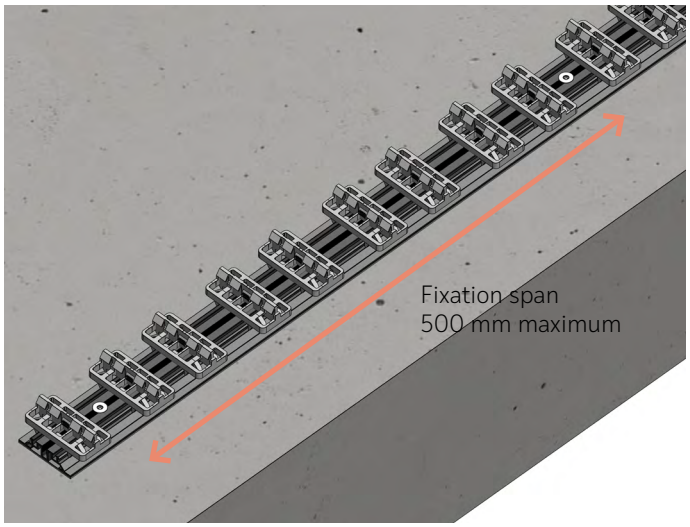
CALCULATION ASSUMPTIONS

The calculation approach used is that defined using French norms:

- NF DTU 51.4 - deck ≤1 m from the ground

Vertical load performance > 20 kN.



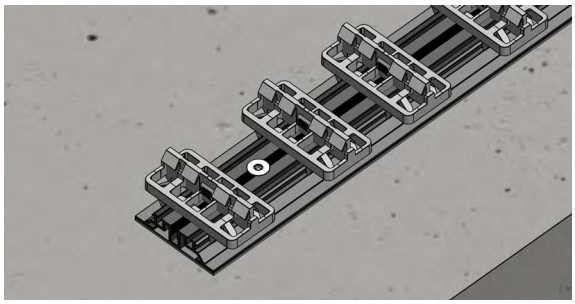


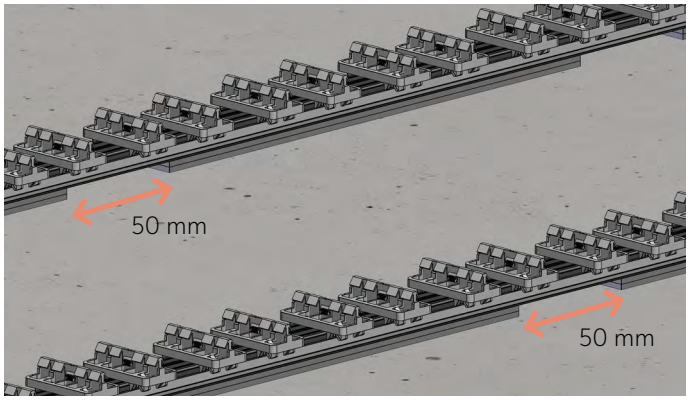
ANCHORING THE RAIL TO THE GROUND

Grad offers a nail dowel kit (ref. 1219) for fixing the rails in concrete floors.

Flat rails are anchored to wood or metal structures using fasteners supplied by the installer

We recommend a maximum distance between fasteners of 500 mm.





We recommend laying elastomer strip under the rail to avoid any interference noise between the concrete floor and the Flat rail.

To allow water to run off, we recommend leaving 50 mm gaps between pieces of elastomer strip every 500 mm.

Grad offers an elastomer strip (ref. 1220 or 1221) for this purpose. These strips have an adhesive side and must be glued to the underside of the rail.

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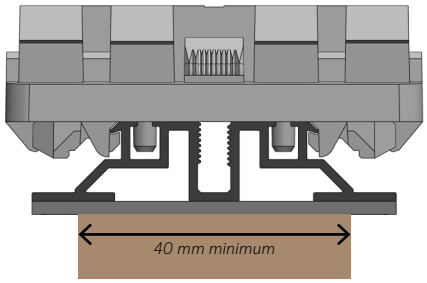
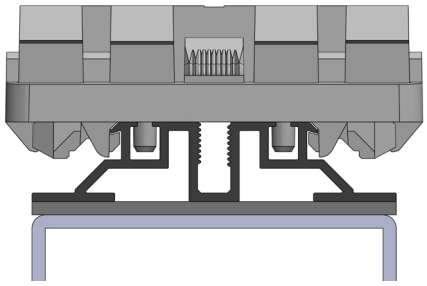


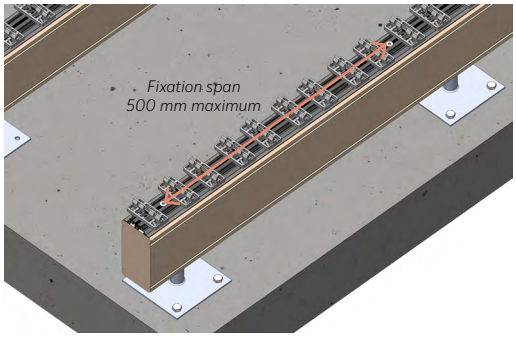


DIMENSIONING WOOD/ALUMINIUM STRUCTURES

For wooden or metal structures, the width of the rail supports must be at least 40 mm.

Caution: In cases where a metal structure is used as a support for the Flat rail, it is strongly recommended that an elastomer strip be used to prevent galvanic corrosion between the rail and the metal structure.

Fixation spans on wood/metal structures are the same as on concrete floors.



SNOW LOADS ACCORDING TO FRENCH NORMS AND EUROCODE 1 EN 1991-1-3 FOR DECKING

The centre distances in the table above apply to the following snow conditions:

REGIONS	A1	A2	B1	B2	C1	C2	D	E
Characteristic value (Sk in kN/m²) of the snow load on the ground at an altitude below 200 m	0.45	0.45	0.55	0.55	0.65	0.65	0.9	1.4
Calcul value (S,d in kN/m²) of the exceptional snow load on the ground	0.45	1	1	1.35	0.65	1.35	1.8	1.4

WIND SPEED CHARACTERISTICS

Wind speed Vb,0 (m/s)	17	22	24	26	28	30	32	34	36
Maximum characteristic lift Wk,max (kN/m²)	-0.56	-0.94	-1.11	-1.31	-1.51	-1.74	-1.98	-2.23	-2.50

Grad can carry out a study of the number of required ground anchor points if justification is required from an inspection authority.

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