Technical Information System 40

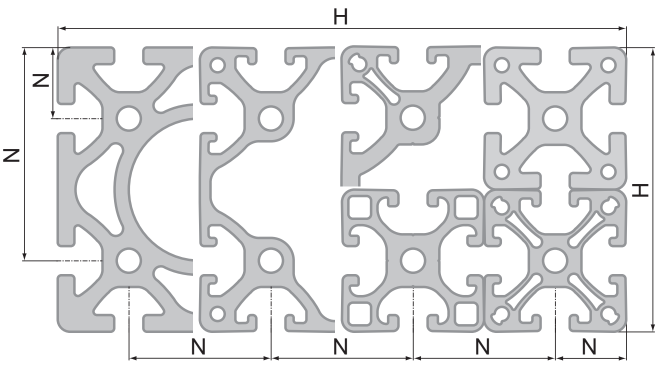
Mechanical Data

(Values in direction of press.)

- **EN AW – 6063 (in some cases EN AW 6060) T66**
- **Al Mg Si 0.5 F25 / 3.3206.72**
- **Rm:** 245 N/mm2 (minimum tensile strength)
- **Rp 0.2:** 195 N/mm2 (yield strength)
- **A5:** 10% (elongation at break)
- **A10:** 8% (elongation at break)
- **E:** Approx. 70,000 N/mm² (modulus of elasticity)
- **HB:** Approx. 75 (Brinell hardness)
- **a:** 23.4 × 10-6 1/K (coefficient of linear expansion)
- **Tolerances:** DIN EN 12020-2
- **Eloxal:** E6EV1 or E6/EV6 (Black)
- **Coating thickness:** 10–15 µm
- **Coating hardness:** 250-350 HV
- **RAL colours powder coating (on request)**

Manufacturing Tolerances

Tolerances Of External Dimensions and T-Slot Positions



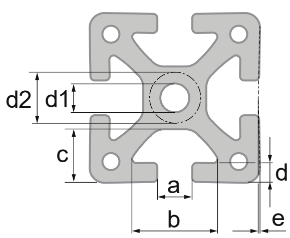
Width H (mm)		Tolerances of external dimension H or rather t-slot position N ± (mm)
over	to	
0	10	0.10
10	20	0.15
20	40	0.20
40	60	0.30
60	80	0.40
80	100	0.45
100	120	0.50
120	160	0.60
160	240	0.80

T-Slot Dimension Tolerances

The standard, double bridge, semi, light and superlight series profiles possess a standardised t-slot shape. This guarantees that all fasteners and accessories can be utilised with the different profile series and sizes.

Center Holes

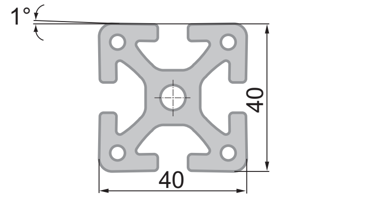
The center hole bore of the profiles can be opened up according to the table. Profiles of the series superlight (40 mm), however, may not be opened up due to the wall section around the center hole.



	40
a	8.20 ±0.1
b	20.00 ±0.1
c	12.40 ±0.2
d	4.50 ±0.1
e	0.20 ±0.1
d1	Ø 6.8 -0.2 (M8)
Up to max. d2	Ø 13 (M12) (not for superlight)

NV Profile T-Slot

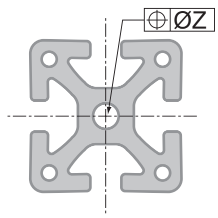
The NV t-slot is not pretensioned. The NV profile range has been designed for use with gauge plates and linear bearings, that require the profile surface to be flat. E.g. jigs, fixtures and special purpose machines.



pretensioned 1° not pretensioned

Drilling Position Tolerances

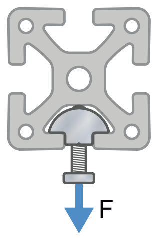
The drilling position tolerance is dependent upon the number of the center hole bores and the contour of the profile.



Profiles with open t-slots		Profiles with closed t-slots	
number of drillings	Z (mm)	number of drillings	Z (mm)
1	0.4	1	0.6
2 to 4	0.6	>1	0.8
>4	0.8		

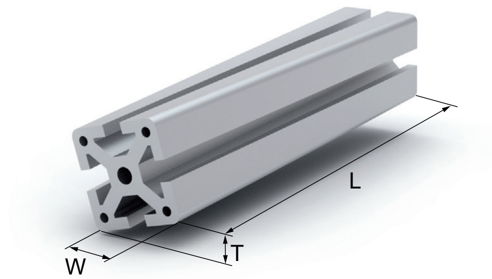
T-Slot Strength

Information in regards to the maximum allowable t-slot load capability F. These values already include a safety factor (S > 2) against plastic deformation.



Profile	Max. pull charge F
standard	5000 N
double br.	3250 N
semi	2500 N
light	2000 N
superlight	1750 N

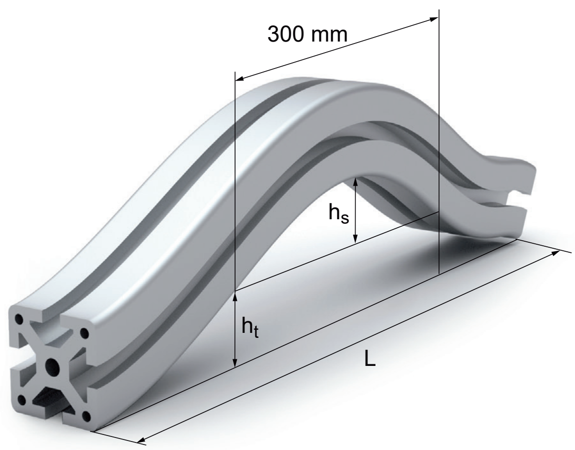
Torsion



Width W (mm)		Torsion tolerance T (mm) for nominal length L (mm)					
over	to	till 1000	till 2000	till 3000	till 4000	till 5000	till 6000
–	25	1.0	1.5	1.5	2.0	2.0	2.0
25	50	1.0	1.2	1.5	1.8	2.0	2.0
50	75	1.0	1.2	1.2	1.5	2.0	2.0
75	100	1.0	1.2	1.5	2.0	2.2	2.5
100	125	1.0	1.5	1.8	2.2	2.5	3.0
125	150	1.2	1.5	1.8	2.2	2.5	3.0
150	200	1.5	1.8	2.2	2.6	3.0	3.5
200	300	1.8	2.5	3.0	3.5	4.0	4.5

Straightness Tolerance

Longitudinal

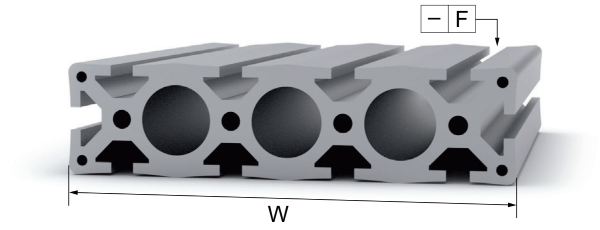


Length L (mm)	Straightness tolerance ht for nominal length L (mm)
till 1000	0.7
till 2000	1.3
till 3000	1.8
till 5000	2.2
till 5000	2.6
till 6000	3.0

The straightness tolerance ht is in relation to a corresponding length L and will not exceed the stated value in the table. The straightness tolerance hs will not exceed 0.3 mm per 300 mm in length.

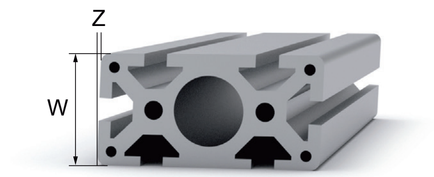
Straightness Tolerance

Transverse



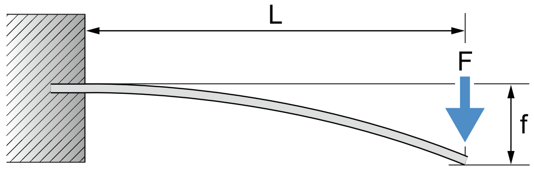
Width W (mm)		Straightness tolerance F (mm)
over	to	
0	30	0.20
30	60	0.30
60	100	0.40
100	150	0.50
150	200	0.70
200	250	0.85

Angle Tolerance



Width W (mm)		Permissible deflection Z (mm) from a right angle
over	to	
0	20	0.2
20	40	0.4
40	80	0.6
80	120	0.8
120	200	1.2
	200	1.5

Bending/Calculation



$$f = \frac{F \times L^3}{3E \times I \times 10^4}$$

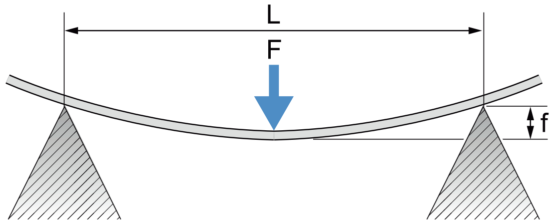
Profile bending caused by force F

$$f = \frac{m \times g \times L^4}{8E \times I \times 10^4}$$

Profile bending caused by the profile's own weight

$$\delta = \frac{(m \times g \times L + F) \times L}{W \times 10^3}$$

Control of bending stress



$$f = \frac{F \times L^3}{48 \times E \times I \times 10^4}$$

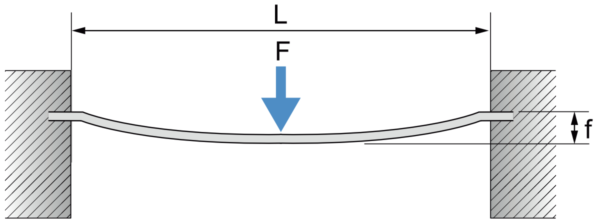
Profile bending caused by force F

$$f = \frac{5 \times m \times g \times L^4}{384E \times I \times 10^4}$$

Profile bending caused by the profile's own weight

$$\delta = \frac{(m \times g \times L + F) \times L}{4W \times 10^3}$$

Control of bending stress



$$f = \frac{F \times L^3}{192E \times I \times 10^4}$$

Profile bending caused by force F

$$f = \frac{m \times g \times L4}{384E \times I \times 10^4}$$

Profile bending caused by the profile's own weight

$$\delta = \frac{(m \times g \times L + F) \times L}{8W \times 10^3}$$

Control of bending stress

f = bending (mm)
F = force (N)
L = profile length (mm)
E = modulus of elasticity (70,000 N/mm^2)
g = fall velocity (9.81 m/s^2)
m = mass (kg/mm)
I = moment of inertia (cm^4)
W = section modulus (cm^3)