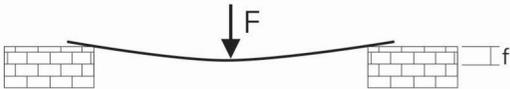# Profile Deflection Formula

For an approximate calculation of the deflection use following formulas on this page. The moments of inertia "I" of aluminium profiles are listed on the respective specification pages.

| No | Load | Formula | Picture | Example | Legend |
|----|------|---------|---------|---------|--------|
| 1 | Load 1 | $$f = \dfrac{F \times L^3}{3 \times E \times I \times 10^4}$$ | | Example load 3 - profile 40x40<br>F= 2000<br>L= 3600<br>I = 9.00<br>E= 70,000<br>Result Aprrox, f = 77 mm | |
| 2 | Load 2 | $$f = \dfrac{F \times L^3}{48 \times E \times I \times 10^4}$$ | | Example load 3 - profile 80x80<br>F= 2000<br>L= 3600<br>I = 125.52<br>E= 70,000<br>Result Approx. f = 6 mm | **f** deflection (mm)<br>**F** load (N)<br>**L** profile length (mm)<br>**I** moment of inertia (cm$^4$) |
| 3 | Load 3 | $$f = \dfrac{F \times L^3}{192 \times E \times I \times 10^4}$$ | | | **E** module of elasticity (N/mm$^2$) = 70,000<br>**m** width of load (mm)<br>**K** load factor (mm) |
| 4 | Load 4 | $$f = \dfrac{F \times L^3}{K \times E \times I \times 10^4}$$<br><br>K - load factor (mm)<br><br>$$K = 48 + \dfrac{29m}{L}$$ | | Example load 4 - profile 40x80<br>F =1000<br>L = 4000<br>I = 63.45<br>E = 70,000<br>m= 1000<br>K = 55.3<br>Result Approx, f = 26 mm | |