

# TOLERANCES ACCORDING TO UNI EN 10219 STANDARDS

CHARACTERISTIC	HOLLOW PROFILES WITH ROUND SECTION	HOLLOW PROFILES WITH SQUARE / RECTANGULAR SECTION	
		Length of sides mm	Tolerance
Outside dimensions (D, B e H)	± 1% with a minimum of = 0.5 mm and a maximum of ± 10 mm	H, B <100 100 ≤ H, B <200 H, B >200	= 1% with a minimum of ± 0.5 mm = 0.8% = 0.6%
Thickness (T)	For D < 406.4 mm T ≤ 5 mm: 3 10% T > 5 mm: 3 0.50 mm For D > 406.4 mm ± 10% with a maximum of 3.2 mm	T ≤ 5 mm: ± 10% T > 5 mm: ± 0.50 mm	
Circularity tolerance (ovalization) (O)	2% for hollow profiles that have a ratio between diameter and thickness not greater than 100 <sup>1</sup>		
Concavity/Convexity (Fig. 1)	=	X1 and X2 = 0.8% max with a minimum of 0.5 mm on the length of the side	
Perpendicularity of the faces (Fig. 2)	=	0 = 90° ± 1°	
Profile of outside corner rounding (Fig. 3)	=	See Table 2 below	
Torsion or twisting (Fig. 4)	=	V = 2 mm plus 0.5 mm for each meter of length	
Straightness (Fig. 5)	e = 0.20% of the total length	e = 0.15% of the total length	
Mass (M)	± 6% on each individual profile		

- 1) When the ratio between diameter and thickness is greater than 100 the circularity tolerance must be agreed upon.  
2) The tolerance for convexity and concavity is independent of the tolerance on the outside dimensions.

**PROFILE OF OUTSIDE CORNER ROUNING (TABLE 2)**

Thickness T mm (fig. 3)	Profile of outside corner rounding C <sub>1</sub> , C <sub>2</sub> or R mm
T ≤ 6	from 1,6 T to 2,4 T
6 < T ≤ 10	from 2,0 T to 3,0 T
10 < T	from 2,4 T to 3,6 T

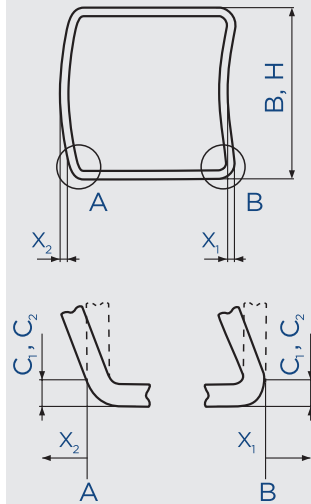
- 1) It is not necessary that the sides (faces) are tangential to the arcs of the corner rounding

**LENGTH TOLERANCES <sup>1)</sup>**

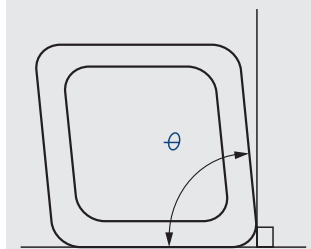
Type of length	Range of length mm	Tolerance
Current production length	from 4.000 to 16.000, with a range of 2,000 for each item of the order	10% of the profiles supplied can be below the minimum in regard to the range ordered, but not below 75% of the minimum of range itself
Approximate length	> 4.000	+ 50 mm
Precise length	< 6.000 ≥ 6.000 ≤ 10.000 > 10.000	+ 5/ - 0 mm + 5/ - 0 mm + 5/ - 0 mm + 1 mm/m

- 1) The customer must indicate in the inquiry and order the type of length required and the range of length or length required.

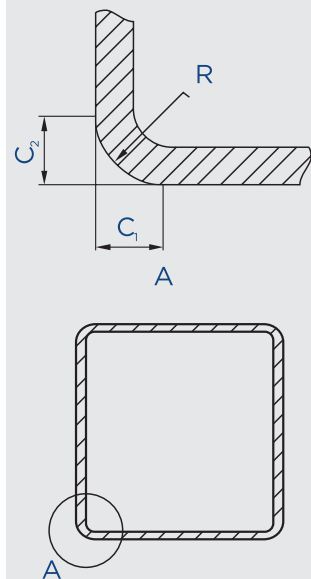
**FIG. 1 DEGREE OF CONCAVITY/CONVEXITY**



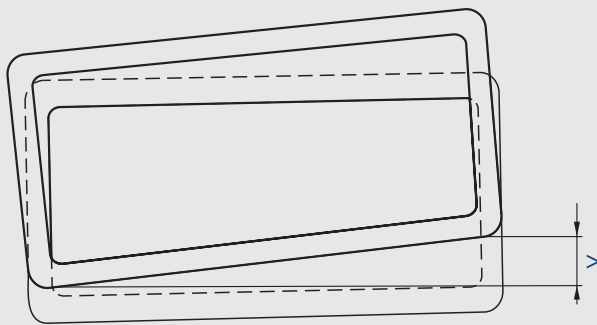
**FIG. 2 DEGREE OF PERPENDICULARITY**



**FIG. 3 MEASUREMENT OF OUTSIDE CORNER ROUNING**



**FIG. 4 DEGREE OF TORSION**



**FIG. 5 DEGREE OF STRAIGHTNESS**

