

**CALCULATION**

**Calculation of temporary supports for Alinvest furnaces.**

**The most restrictive case is considered, which applies to the melter, whose temporary support length is 3,160 mm.**

Slimming formula:

$$\lambda = L_k / i$$

**$\lambda$** : Ratio of slenderness or mechanical slenderness.

**$L_k$** : Buckling length or effective length, which depends on the supporting conditions of the abutment.

**$i$** : Turning radius, which is obtained as follows:

$$i = \sqrt{I/A}$$

**I**: Moment of inertia of the cross-section.

**A**: Cross-sectional area.

**Bi-articulated:**

- $\beta=1$

$$L_k = \beta L$$

Beam data:

- $L = 3.160\text{mm} = 316 \text{ cm} = L_k$
- Beam: HEB 200
- $E = 210.000 \text{ N/mm}^2$

	<b>x</b>		<b>y</b>	
<b>I= Beam inertia</b>	5.513,48	cm <sup>4</sup>	2.001,03	cm <sup>4</sup>
<b>W= Resistant module</b>	551,35	cm <sup>3</sup>	200,10	cm <sup>3</sup>
<b>A= Area</b>	75,30	cm <sup>2</sup>	75,30	cm <sup>2</sup>
<b>i=turning radius</b>	8,56	cm	5,16	cm

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- $\lambda = L_k / i = 316 / 5,16 = 61,2$
- Correction factor (w) = 1,32
- $\sigma = 131 \text{ Kg/cm}^2$
- Euler formule:

$$P_c = \frac{\pi^2 \cdot E \cdot I}{L_k^2} = 41.491 \text{ Kgs Maximum load} > 7.500 \text{ Kgs real load} \quad \text{OK}$$