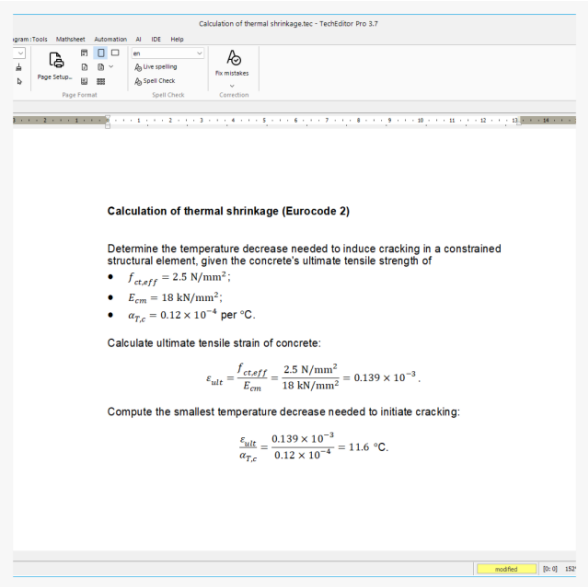
0015. Compute the smallest temperature decrease needed to initiate cracking (Eurocode 2)



Short Description

Compute the smallest temperature decrease needed to initiate cracking in accordance with Eurocode 2. A ready-made engineering report with automatic calculations. Any units of measurement are supported.

{module 343}

Description

Compute the smallest temperature decrease needed to initiate cracking in accordance with Eurocode 2. A ready-made engineering report with automatic calculations. Any units of measurement are supported.

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Video

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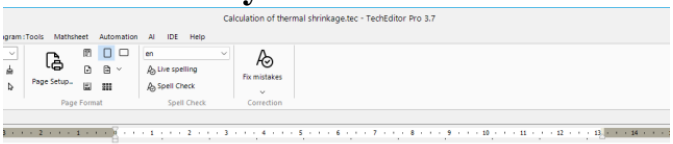
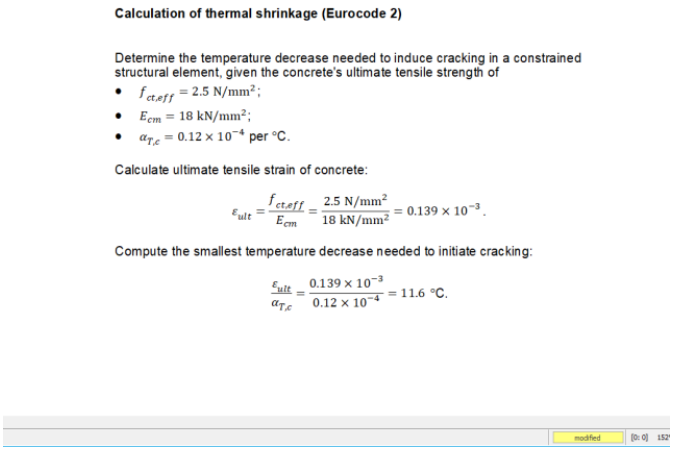
Specification

General	
Language	english
Files	
File Size (MB)	0..20
Engineering	
Material	reinforced concrete
Standard / Code	Eurocode

Product Gallery





Calculation of thermal shrinkage (Eurocode 2)

Determine the temperature decrease needed to induce cracking in a constrained structural element, given the concrete's ultimate tensile strength of

- $f_{ct,eff} = 2.5\ \mathrm{N/mm^2}$;
- $E_{cm} = 18\ \mathrm{kN/mm^2}$;
- $\alpha_{T,c} = 0.12 \times 10^{-4}$ per °C.

Calculate ultimate tensile strain of concrete:

$$\varepsilon_{ult} = \frac{f_{ct,eff}}{E_{cm}} = \frac{2.5\ \mathrm{N/mm^2}}{18\ \mathrm{kN/mm^2}} = 0.139 \times 10^{-3}.$$

Compute the smallest temperature decrease needed to initiate cracking:

$$\frac{\varepsilon_{ult}}{\alpha_{T,c}} = \frac{0.139 \times 10^{-3}}{0.12 \times 10^{-4}} = 11.6\ °\mathrm{C}.$$