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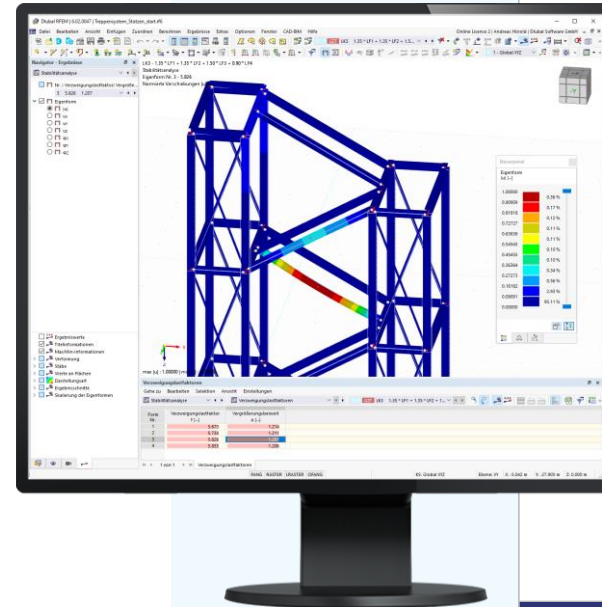


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Webinar

Stability and Warping Torsion Analyses in RFEM 6 and RSTAB 9



Questions During the Presentation



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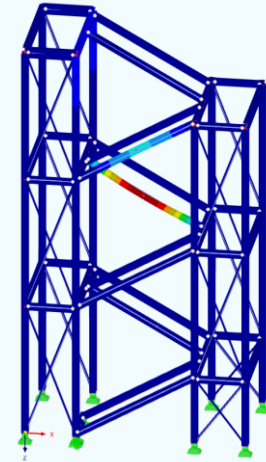


Ask questions



CONTENT

- 01** Calculation of critical load factors for entire model with and without 7 degrees of freedom
- 02** Need for consideration of warping torsion for stability analysis
- 03** Representing various ways for applying member imperfections in RFEM 6
- 04** Lateral- and flexural-torsional buckling according to Eurocode 3 using global calculation by 7 degrees of freedom, imperfections, and second-order analysis



Effects of deformed geometry of the structure

Criterion

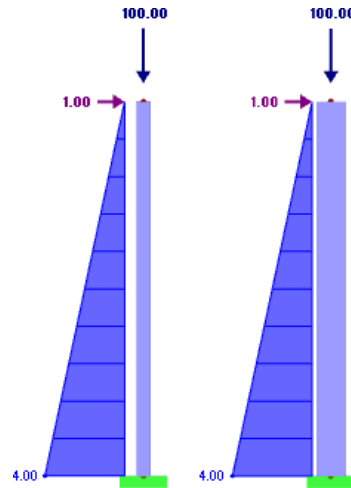
$$\alpha_{cr} = \frac{F_{cr}}{F_{Ed}}$$

Geometrically linear analysis is sufficient if

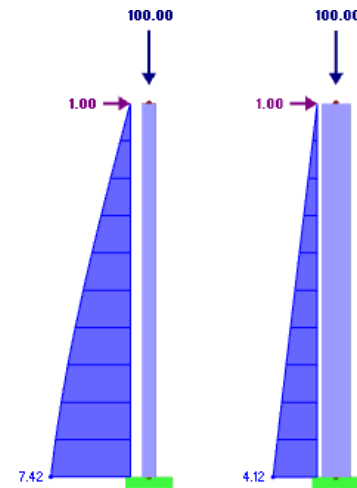
$\alpha_{cr} > 10$ for elastic global analysis

$\alpha_{cr} > 15$ for plastic global analysis

Geometrically Linear Analysis



Second-Order Analysis





Stability Analysis - Methods

Method	Component		Cross-Sections				Loading			Notes	
							N-	M ₁	M ₂		M ₃
Equivalent member design according to 6.3.1	●		●	●	●	●	●				FB, TB, FTB
Equivalent member design according to 6.3.2	●		●	●	●	●		●			LTB
Equivalent member design according to 6.3.3	●		●	●			●	●	●		FB, TB, FTB, LTB
General method according to 6.3.4	●	●	●	●	●		●	●			FB, TB, FTB, LTB (op - out of plane)
Design according to second-order analysis with 7 DOF	●	●	●	●	●	●	●	●	●	●	Global and local imperfections + second-order analysis



applicable ● other cross-sections ?

Initial bow imperfection

EN 1993-1-1 Table 5.1

Buckling curve according to EC3-1-1	Cross-section design	
	Elastic $e_{0,d}/L$	Plastic $e_{0,d}/L$
a ₀	1/350	1/300
a	1/300	1/250
b	1/250	1/200
c	1/200	1/150
d	1/150	1/100

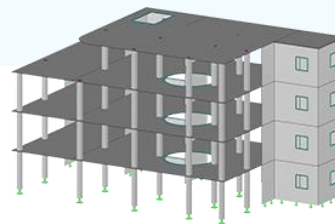
DIN EN 1993-1-1/NA NDP 5.3.2 (3) Table NA.2

Buckling curve according to EC3-1-1	Cross-section design	
	Elastic $e_{0,d}/L$	Plastic $e_{0,d}/L$
a ₀	1/600	
a	1/500	
b	1/350	as for elastic but M_{pl}/M_{el} -fold
c	1/250	
d	1/150	

Only for elastic global analysis and linear interaction of internal forces in cross-section design ▲

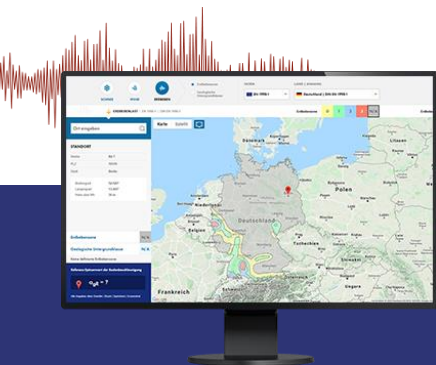


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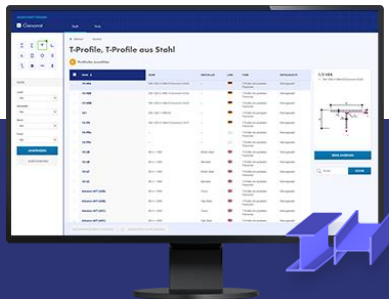
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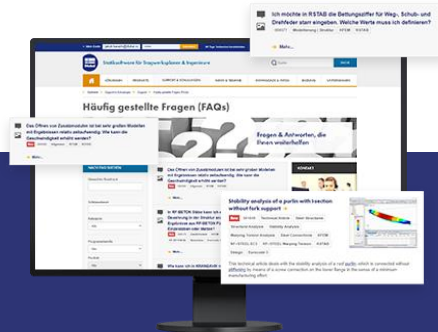
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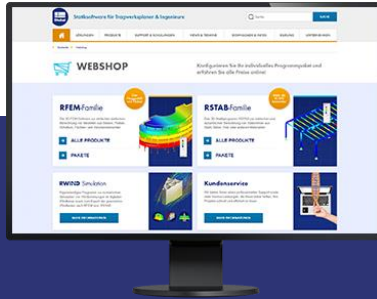
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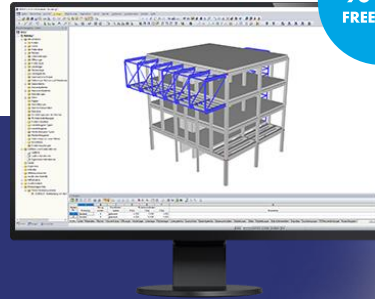
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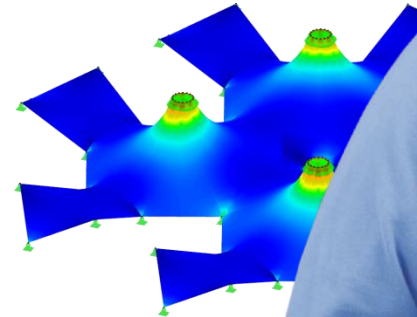
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