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### Verification methods for the load-bearing function

Analysis of


- entire structure (global analysis)
- sub-assemblies (e.g. frames)
- members (e.g. walls, floors, columns, beams)

Thermal elongation can be neglected!

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### Timber structures in fire

"Big cross-sections"



Linear timber members -  
Columns, beams, slabs

"Small cross-sections"



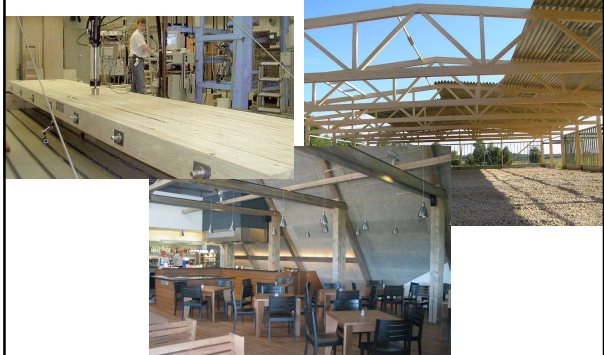
Timber frame assemblies

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## Design of Linear Members

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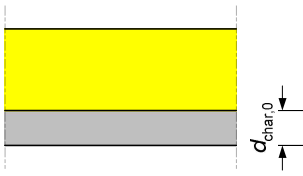
### Linear members



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### Charring

$d_{char,0} = \beta_0 t$

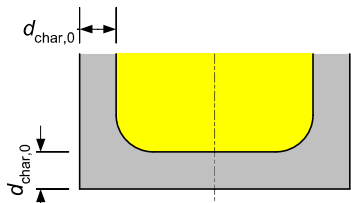


timber slab

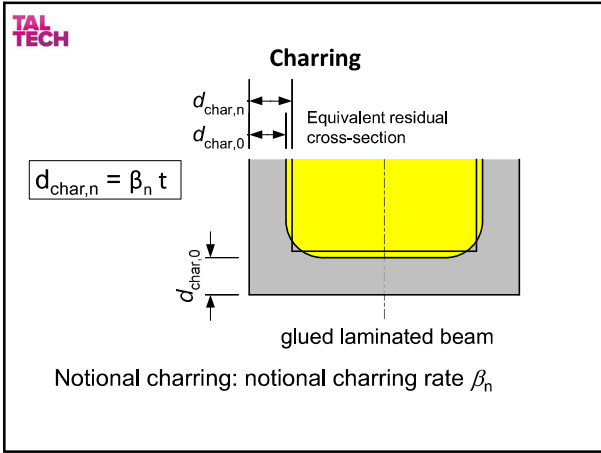
One-dimensional charring: charring rate  $\beta_0$

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### Charring



glued laminated beam



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**Charring rates  $\beta$**

	$\beta_o$ , mm/min	$\beta_n$ mm/min
<b>Softwood</b>		
Glulam	0,65	0,7
Sawn wood	0,65	0,8
<b>Hardwood</b>		
density > 290 kg/m <sup>3</sup>	0,65	0,7
density > 450 kg/m <sup>3</sup>	0,5	0,55

