Topics for discussion on

"Ductility aspects on the behaviour of timber-concrete composite structures"

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For what the ductility?… energy dissipation, redistribution of internal forces, increase reliability coefficient, …

Anyway… Ductile connection behaviour is not rewarded in EC5!

Comment on EN 26891 (1991)

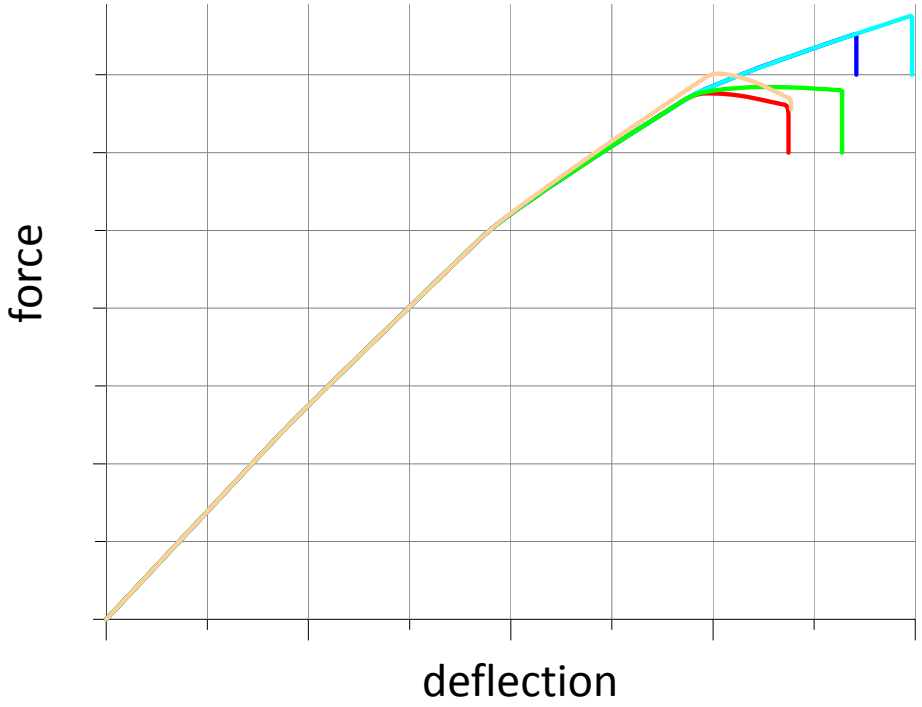
The standard procedure laid down in the end the test after reaching the maximum load.
In order to assess the ductility (u_f) would be necessary to conduct the test in excess of that limit.

Relevance of Ductility on timber-concrete composite structures

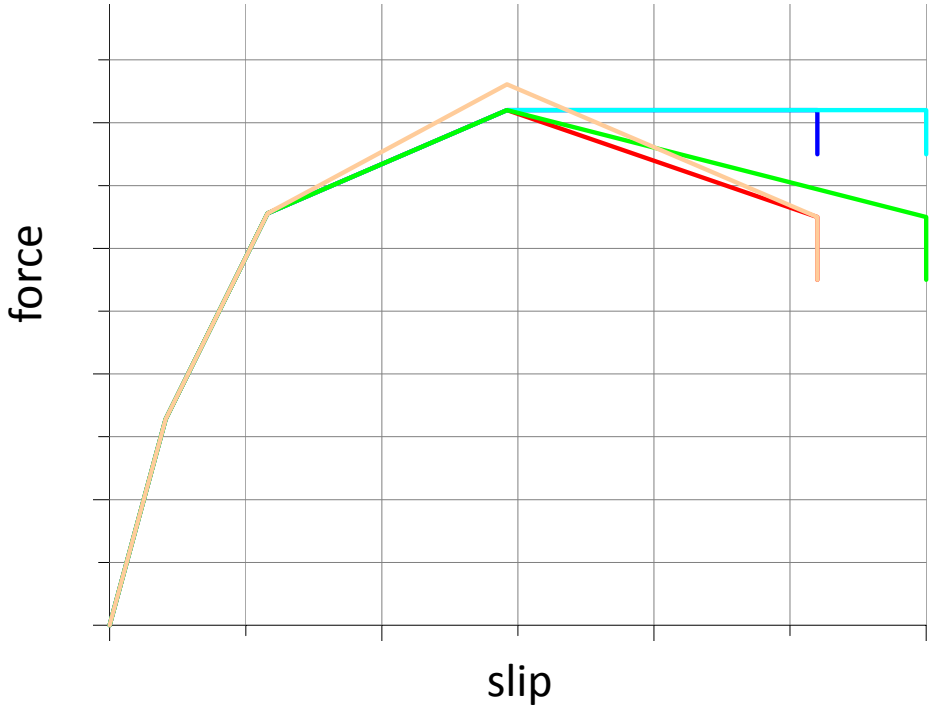
Correspondence between the connections and the beams is made through the colors in each of the diagrams.

For example, the difference between using connections with the blue behavior (dark and bright) corresponds to a difference in the load carrying capacity of the beam

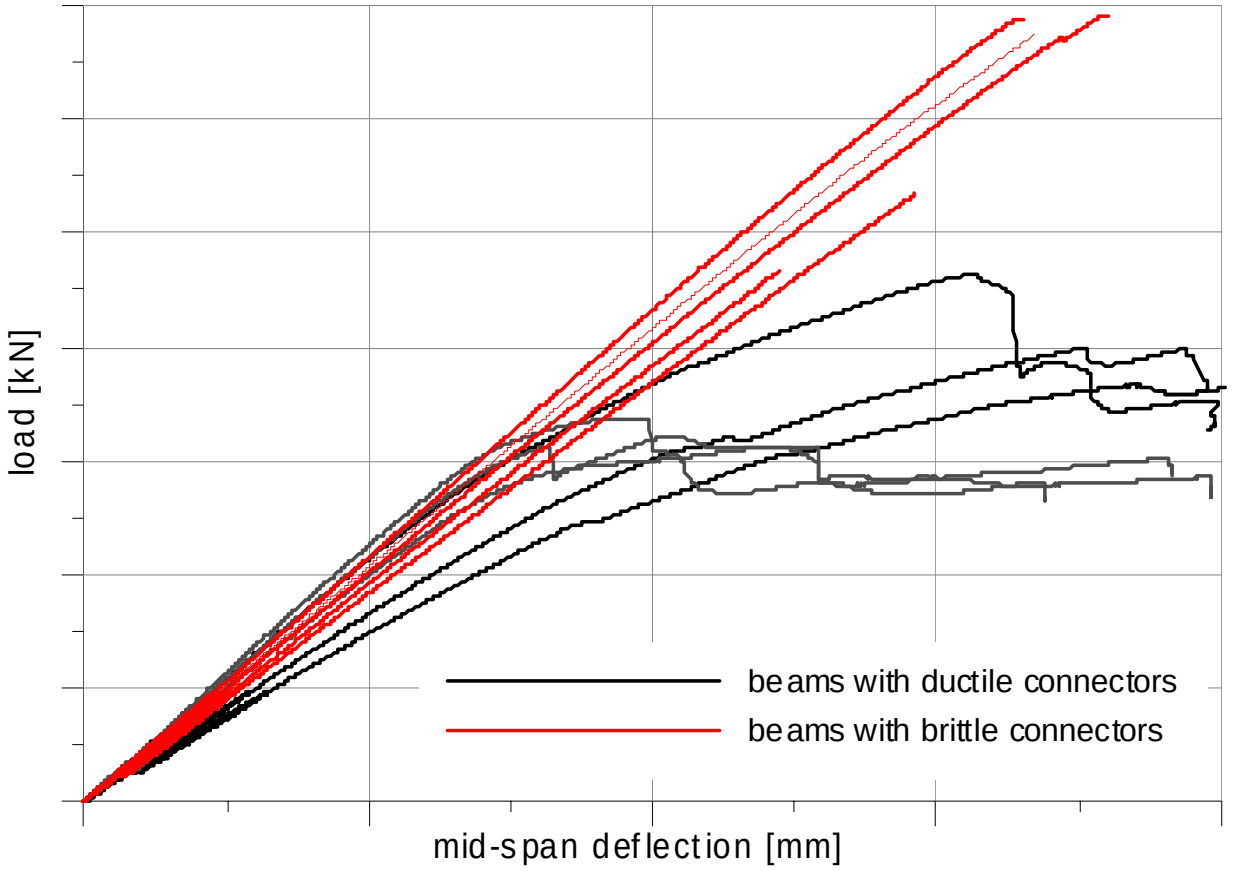
Load-deflection diagrams
Composite Beams



Load-slip diagrams
Connections



The following load-deflection diagrams correspond to TCC beams using ductile or fragile failure connections, obtained on experiments.



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Results of testing timber-concrete connections according to EN 26891

➢ *Configuration without interlayer between timber and concrete (39 specimens)*

	F_{max} [KN]	K_s [KN/mm]	u_y	u_u	u_f	D_f	D_u
mean	16,4	31,8	0,546	1,470	2,153	4,1	2,9
cv [%]	11,1	12,1	22,2	48,9	42,7	46,7	59,9
max	19,8	41,9	0,789	3,090	4,000	9,0	9,0
min	11,4	24,1	0,266	0,695	0,984	1,7	1,2

➢ *Configuration with 25mm interlayer between timber and concrete (44 specimens)*

	F_{max} [KN]	K_s [KN/mm]	u_y	u_u	u_f	D_f	D_u
mean	15,4	21,0	0,765	1,394	2,667	3,6	1,9
cv [%]	8,0	10,6	16,4	49,8	26,1	32,5	50,2
max	18,2	27,1	1,034	3,727	4,000	7,7	4,6
min	13,4	17,3	0,478	0,569	1,529	2,0	1,0

Connection components: Screws, SFS® VB 48-7,5x100

Glued-laminated timber, C18

Lightweight concrete, f_{lcm}=30MPa & ρ=1600kg/m^3