Stiffness parameters for Lett-Tak prefabricated roof elements modelled as an ortotropic shell

The given values are valid for Lett-Tak roof elements with a glued connection between steel profiles and wooden ribs

Height of steel profile	Thickn. steel profile	Dxx [1]		Dxy [2]	Dyy [3]	DGxy [4]		Kxx	Kxy	Kyy	KGxy	Hxz	Hyz
		Steel support	Glulam support			Steel support	Glulam support						
mm	mm	kN / m	kN / m		kN / m	kN / m	kN / m	kNm² / m	kNm² / m	kNm² / m	kNm² / m	kN / m	kN / m
210	**1,00**	57 000	38 000	0	26 800	Use 4600 kN/m for 15 mm plywood roof sheathing and 5400 kN/m for 18 mm plywood roof sheathing	Use 4400 kN/m for 15 mm plywood roof sheathing and 5100 kN/m for 18 mm plywood roof sheathing	5 100	Use 0,29 kNm²/m for 15 mm plywood roof sheathing and 0,51 kNm²/m for 18 mm plywood roof sheathing	Use 0,7 kNm²/m for 15 mm plywood roof sheathing and 1,4 kNm²/m for 18 mm plywood roof sheathing	Use 0,10 kN/m for 15 mm plywood roof sheathing and 0,17 kN/m for 18 mm plywood roof sheathing	9 800	Use 375 kN/m for 15 mm plywood roof sheathing and 450 kN/m for 18 mm plywood roof sheathing
210	**1,20**	68 000	43 000	0	26 800			5 600				14 300	
210	**1,50**	83 000	49 000	0	26 800			6 300				22 700	
210	**1,85**	101 000	55 000	0	26 800			7 000				34 900	
310	**1,00**	60 000	40 000	0	26 800			9 500				9 800	
310	**1,20**	71 000	44 000	0	26 800			10 500				14 300	
310	**1,40**	81 000	48 000	0	26 800			11 400				19 700	
310	**1,60**	92 000	52 000	0	26 800			12 200				25 900	
310	**1,80**	102 000	55 000	0	26 800			13 000				33 000	
360	**1,00**	61 000	40 000	0	26 800			12 300				9 800	
360	**1,20**	72 000	45 000	0	26 800			13 600				14 300	
360	**1,40**	83 000	49 000	0	26 800			14 800				19 700	
360	**1,60**	94 000	52 000	0	26 800			15 900				25 900	
360	**1,80**	104 000	56 000	0	26 800			16 900				33 000	
360	**2,00**	115 000	58 000	0	26 800			17 800				40 900	
440	**1,60**	97 000	53 000	0	26 800			23 000				20 000	
440	**1,80**	108 000	56 000	0	26 800			24 500				25 500	
440	**2,00**	118 000	59 000	0	26 800			26 000				31 600	

1) Values for Dxx are based on support connections with 5 cartridge fired pins in steel or 5 x 10 mm screws in glued laminated timber (glulam).
Simplified correction for a differend number of fasteners *n* : Multiply the given Dxx value with $(n/5)^{0,18}$ (steel) or $(n/5)^{0,56}$ (glulam).

2) Effect of transverse strain on the axial stiffness may be neglected for Lett-Tak elements

3) Valid for 15 mm plywood thickness and 100 mm screw spacing in longitudinal element joints. See Fig. 1 for other options.

4) Valid for 5 fasteners at support and 100 mm screw spacing in longitudinal element joints. See Fig. 2 for other options.

Figure 1 Dyy - effect of plywood thickness and screw spacing in longitudinal element joints

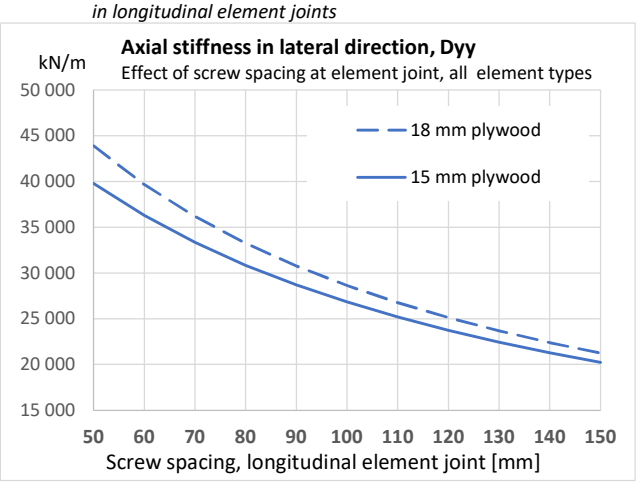

Figure 2 DGxy - effect of plywood thickness and screw spacing in longitudinal element joints