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Technical leaflet

Charring rate of EGGER OSB

Calculation of the EGGER OSB charring rate

General

EN 1995-1-2 (EUROCODE 5) specifies the calculation method for calculating the charring rate of wood and wood-based materials as explained below.

For EGGER OSB 3 the characteristic density ρ is declared to be 600 kg/m³. For EGGER OSB 4 TOP, according to DOP-745-02, the declared density in the thickness range >10 mm to 25 mm is \geq 620 kg/m³.

Determining the charring rate of EGGER OSB boards

According to EUROCODE EN 1995-1-2, 3.4.2 (9), the charring rate of wood-based panels with a density of 600 kg/m³ (conservative calculation) can be determined using the following formula

$$R_0 = 0.9 * k_p * k_h$$
 (1)
where
$$k_p = (450/p)*0.5 = (450/600)*0.5 = 0.86603$$

$$k_h = (20/t_p)0,5$$
 for a panel thickness < 20 mm

$$k_h = 1.0$$
 for a panel thickness \geq are 20 mm.

According to formula (1), the charring rate for OSB boards with the following thickness is calculated with:

Nominal thickness	OSB/ 3 acc. to EN 300 density ≥ 600 kg/m³	EGGER OSB 3 density ≥ 600 kg/m³	EGGER OSB 4 TOP density ≥ 620 kg/m³
t _p = 12 mm	ß _o = 1,01 mm/min	ß₀ = 1,01 mm/min	ß _o = 0,99 mm/min
t _p = 15 mm	$\beta_o = 0.90 \text{ mm/min}$	ß₀ = 0,90 mm/min	$ \beta_o = 0.89 \text{ mm/min} $
t _p = 18 mm	$\beta_o = 0.82 \text{ mm/min}$	ß₀ = 0,82 mm/min	$ \beta_o = 0.81 \text{ mm/min} $
$t_p \ge 20 - 25 \text{ mm}$	$\beta_o = 0.78 \text{ mm/min}$	ß₀ = 0,78 mm/min	$\beta_o = 0.77 \text{ mm/min}$
t _p > 25 mm			$\beta_o = 0.78 \text{ mm/min}$ (density >600 kg/m³)









According to the CE declaration of performance DOP-745-02, the following requirements for the characteristic density apply to EGGER OSB 4 TOP:

Nominal thickness	Density [kg/m³]	
8 - 10 mm	≥ 620	
>10 - 25 mm	≥ 620	
>25 - 40 mm	≥ 600	

Determination of the failure time (D) of panels

According to EUROCODE EN 1995-1-2, C.2.3, the failure time for fire protective claddings made of wood-based panels can be determined by the following formula:

$$t_f = (h_p/S_0) - t_r \tag{2}$$

with:

 $t_r = 4 \text{ min}$

t_f - failure time, in minutes

ßo - is the design charring rate for one-dimensional charring under standard fire exposure, in mm/min

hp - thickness of the cladding made of wood-based panels, in mm.

In case of fire protection claddings made of wood-based materials, the time of the beginning of the burning t_{ch} of the building component should be determined with

 $t_{\text{ch}} = t_{\text{f}}$

Determination of the failure time (E) of horizontal cladding at the joints

A joint does not have an effect on the separating performance if it is backed with a batten or a structural element, which will prevent the travel of hot gases into the structure.

According to EUROCODE EN 1995-1-2, E.2, the failure time to horizontal claddings made of wood-based panels due to fire load from below can be determined according to the following formula

$$t_{ins} = \sum t_{ins} * k_{pos} * k_{j}$$
 (3)

with

t_{ins} - basic insulation value, in minutes (up to 60 minutes fire resistance period t_{ins} = 1.1 * h_p)

k_{pos} - position coefficient (uninsulated, fire exposed side - 0,8; unexposed side - 0,6 / Table E.3 and E.4)

k_j - joint coefficient for non-backed joints according to Fig. 1

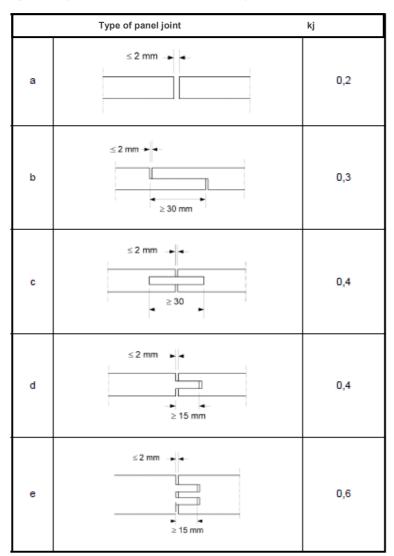








Figure. 1: joint coefficient k_j for non-backed joints



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