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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 ≥ 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/m^3 (conservative calculation) can be determined using the following formula (1)

$$ß_o = 0.9 * k_p * k_h \quad (1)$$

where

$k_p = (450/\rho)*0.5 = (450/600)*0.5 = 0.86603$

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

$k_h = 1.0$ for a panel thickness ≥ 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	$ß_o$ = 1,01 mm/min	$ß_o$ = 0,99 mm/min
t_p = 15 mm	$ß_o$ = 0,90 mm/min	$ß_o$ = 0,90 mm/min	$ß_o$ = 0,89 mm/min
t_p = 18 mm	$ß_o$ = 0,82 mm/min	$ß_o$ = 0,82 mm/min	$ß_o$ = 0,81 mm/min
t_p ≥ 20 – 25 mm	$ß_o$ = 0,78 mm/min	$ß_o$ = 0,78 mm/min	$ß_o$ = 0,77 mm/min
t_p > 25 mm			$ß_o$ = 0,78 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:

$t_f = (h_p/ß_o) - t_r$ (2)

with:

t_r = 4 min

t_f – failure time, in minutes

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

h_p - 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

$t_{ch} = t_f$

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)

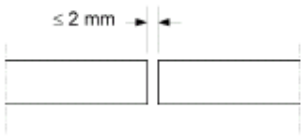
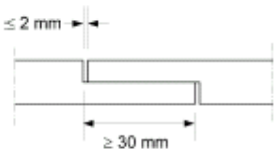
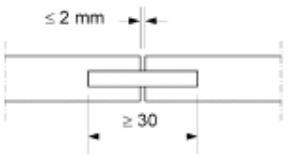
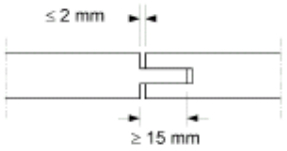
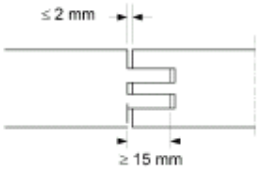
with

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

	Type of panel joint	kj
a		0,2
b		0,3
c		0,4
d		0,4
e		0,6

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