

Code: TLBP451
 Revision: 02
 Release: 01.07.2022

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/m³ (conservative calculation) can be determined using the following formula (1)

$$\beta_o = 0.9 \cdot k_p \cdot k_h \tag{1}$$

where

$$k_p = (450/\rho)^{0.5} = (450/600)^{0.5} = 0.86603$$

$$k_h = (20/t_p)^{0.5} \quad \text{for a panel thickness} < 20 \text{ mm}$$

$$k_h = 1.0 \quad \text{for a panel thickness} \geq 20 \text{ mm.}$$

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/m ³	EGGER OSB 3 density ≥ 600 kg/m ³	EGGER OSB 4 TOP density ≥ 620 kg/m ³
$t_p = 12$ mm	$\beta_o = 1,01$ mm/min	$\beta_o = 1,01$ mm/min	$\beta_o = 0,99$ mm/min
$t_p = 15$ mm	$\beta_o = 0,90$ mm/min	$\beta_o = 0,90$ mm/min	$\beta_o = 0,89$ mm/min
$t_p = 18$ mm	$\beta_o = 0,82$ mm/min	$\beta_o = 0,82$ mm/min	$\beta_o = 0,81$ mm/min
$t_p \geq 20 - 25$ mm	$\beta_o = 0,78$ mm/min	$\beta_o = 0,78$ mm/min	$\beta_o = 0,77$ mm/min
$t_p > 25$ mm			$\beta_o = 0,78$ mm/min (density >600 kg/m ³)

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:

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

with:

$$t_r = 4 \text{ min}$$

t_f – failure time, in minutes

β_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

$$t_{ins} = \sum t_{ins} * k_{pos} * k_j \tag{3}$$

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

For further information please contact:

EGGER Holzwerkstoffe Wismar GmbH & Co. KG

Am Haffeld 1 | 23970 Wismar | T +49 3841 301-21260 | bauprodukte@egger.com | www.egger.com

Provisional Notice:

This technical leaflet has been carefully drawn up to the best of our knowledge. The information provided is based on standards, practical experience, testing and reflects our current level of knowledge. It is intended for information only and does not constitute a guarantee in terms of product properties or its suitability for specific applications. We accept no liability for any mistakes, errors in standards, or printing errors. In addition, technical modifications may result from the continuous further development of EGGER OSB product range, as well as from changes to standards and public law documents. The contents of this guideline should therefore not be considered as instructions for use or as legally binding. Our General Terms and Conditions apply.

