

# Evaluation of linear thermal expansion of WPC-Decking according to EN 15534-4

## Scope

The volume of thermoplastic polymers is highly dependent on the change of temperature. This behaviour influences the dimensions of decking boards made from WPC as well. The coefficient of linear thermal expansion shows the dependence of board length from temperature change under extreme outdoor climates. Linear thermal expansion coefficient of decking boards made from WPC is evaluated according EN 15534-4 and EN 15534-1. The standard EN 15534-4 requires a maximum linear thermal expansion coefficient of  $50 \cdot 10^{-6} \text{ K}^{-1}$ .

## Client

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## Material:

Material is a WPC-decking board in form of a hollow profile. Product name declared from IDECK is "DURO".



Figure 1: Example of WPC decking profile DURO.

## Methods:

Test is carried out according EN 15534-4 chapter 4.5.6 for decking boards and carried out according EN 15534-1 chapter 9.2. WC-decking boards with a length of 100 mm are stored in a

drying oven at 80°C after 96 h samples are removed and length is measured immediately. After that, samples are stored in a freezer at -20°C for 96 h. Length is measured in same way as after 80°C. 10 replicates are used. Mean coefficient of linear thermal expansion is calculated according ISO 11359-2:1999 chapter 3.2.2.

## Results:

Results are summarised in table 1. All replicates exhibited lower values as required from EN 15534-4. Therefore the material passes the test regarding linear thermal expansion. Mean values and standard deviation are presented.

**Table 1: Mean coefficient of linear thermal expansion.**

	mean coefficient of linear thermal expansion ( $\alpha$ ) [ $K^{-1}$ ]
mean value	$38,5 \cdot 10^{-6}$
standard deviation	$3,6 \cdot 10^{-6}$
maximal allowed	$\leq 50 \cdot 10^{-6}$
evaluation	pass