A FEW CLARIFICATIONS ARE IN ORDER!

THE WARPING OF BOARDS

DEFINITION

«Warping» is the deformation of a cross-section of a planar element, giving it a curved tile shape (which would enable water to be channelled through). The elements associated with this deformation are timber boards used to produce surface structures such as: flooring, cladding and decking. The term «boards» is derived from their large width (up to 25 cm) and their reduced thickness (2 cm on average).

ORIGIN

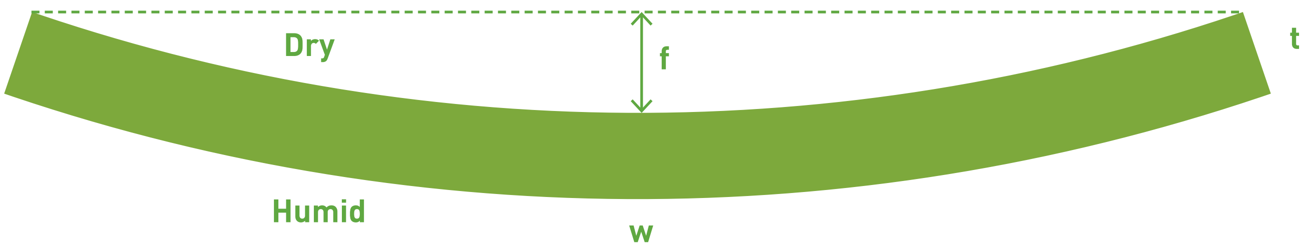
Boards cut on a slab may tile during the drying process due to differences in radial and tangential shrinkage (refer to the deformation sheet, the timber «pulls towards its core» as it dries).

Also, the warping of a cladding board can be caused by a difference in the humidity between the two sides. In fact, due to its function as a coating material, the board is subjected to a relatively dry environment on its face (by being exposed to sun, the wind or the air of a room that is regularly renewed), while its underside faces a confined environment (sheltered from light, or in the case of decking, close to the ground) that is more humid.

Note: the two phenomena can compensate for each other or be cumulative. For this reason, when the elements are cut on a slab, it is recommended that the core side be oriented outwards if possible in order to minimise the warping of the boards (bending will tend to occur in opposite directions).

The longest distance between the points on a face before and after deformation of a board is known as the warping sag (f).

Cross-section of a warped thin board:



The warping sag f can be estimated according to the following formula:	f =	$\frac{\alpha.e.w.\Delta H}{800}$

Where:

w is the width of the board in mm

t is the thickness of the board in mm

e (=w/t) is the elongation of the board

α is the shrinkage coefficient in % of dimension per % of humidity

ΔH is the difference in humidity content between the board's face and its backside in %.

Exemple : if w = 145 mm ; e = 7 ; α = 0,25%/% ; ΔH = 8%, then f = 2,5 mm.

This formula shows that a 1% change in humidity content between the surface and the underside is as important as a 1 point change in elongation.

Therefore, cladding should never be installed in a very dry or sunny climate with timber that has not been sufficiently dried. The difference in humidity content between the two sides would quickly become highly significant and result in unacceptable deformations.

It should be noted that during artificial drying, cladding boards are placed in more extreme climatic conditions (in terms of humidity and temperature) than those commonly encountered by the structures during their service life. The dryer has two benefits: it releases some of the timber's internal stresses by reducing the timber's absorption and desorption kinetics and it enables the identification of timber elements that are too nervy or that contain reaction timber that will deform during drying.

Artificial drying is required for flooring boards, but it is not necessary for many outdoor decking structures where the humidity content of both sides of the timber will balance out: humid or moderate climates, floor spacing, ventilation of the underside of the decking, drainage of the floor, installation in autumn, etc.

Given the wide variations in stability observed in timber varieties, maximum elongations have been defined for each of them, solely to limit the risk of post-installation board deformation.