SUSTAINABLE
MATERIALS

Acclimating

Acclimating material is one of the most important aspects of installing a natural material into the space to which it is going, and special care needs to be taken to ensure it is done properly.

This document is designed to be a primer on that, and the subject matter in general. Acclimation is a component of the 'Installation' process, as it relates to ensuring that the material is suitable to be installed.

> *Definition* of '**acclimation**' (per Meriam Webster dictionary): physiological adjustment by an organism to environmental change.

Acclimating involves ensuring a material is at equilibrium within the space it is being installed or applied.

> *Definition* of '**equilibrium**' (per Meriam Webster dictionary): a state of balance between opposing forces or actions that is either static (as in a body acted on by forces whose resultant is zero) or dynamic (as in a reversible chemical reaction when the rates of reaction in both directions are equal).

When a product or material is at equilibrium with the surrounding environment, inherent movement (with respect to expansion and contraction) will be relatively minor. When a product or material is NOT in equilibrium with the space it is placed in, it WILL reach equilibrium through a process of adjustment (ie: acclimation).

- If the moisture content of the material is higher than the environment, the material will lose moisture as it reaches an equilibrium point. In many materials this event manifests itself through a process of shrinking.
- If material is drier than the surrounding environment, conversely it will absorb moisture from the environment. This process typically manifests itself visually via expansion.

The goal of acclimating is to reach the equilibrium point of stable site conditions. Stable site conditions are conditions that do not abruptly change, and any changes that do occur are minor and gradual.

Time allows materials to acclimate, so they reach equilibrium. The amount of time needed varies based on numerous criteria, which include:

- Site conditions (temperature and relative humidity of the space)
- Moisture content of material (that which is being applied to the space)
- Method of 'acclimating' material

Being that site conditions are typically what they are, as is the moisture content of the material being applied in the space, the method of acclimating that material has the most effect on the time necessary to acclimate the material to its' equilibrium state.

- If a product is wrapped in plastic, it may literally take forever to reach site equilibrium.
- If it is a closed box, that may only be slightly better.
- If stacked on the ground, this is an improvement, but ultimately it takes a long time to fully acclimate, and during that time, acclimation will be disproportional relative to materials' surface that touches 'air'. The sides that you see (ie: open to air) will acclimate much faster than the sides of the material that do not have air flow around them (all parts other than the outside pieces, and the perimeter edges). So, unless it is allowed to fully acclimate (to full equilibrium), the reality is that the center pieces/material will be less acclimated than the outer or edge sections of that material.
- The only efficient way to ensure expedited acclimation is to ensure there is 'air flow' around the entire surface area of the material and/or piece(s). This typically involves 'stacking on stickers' or a similar method suitable for materials' size and shape.

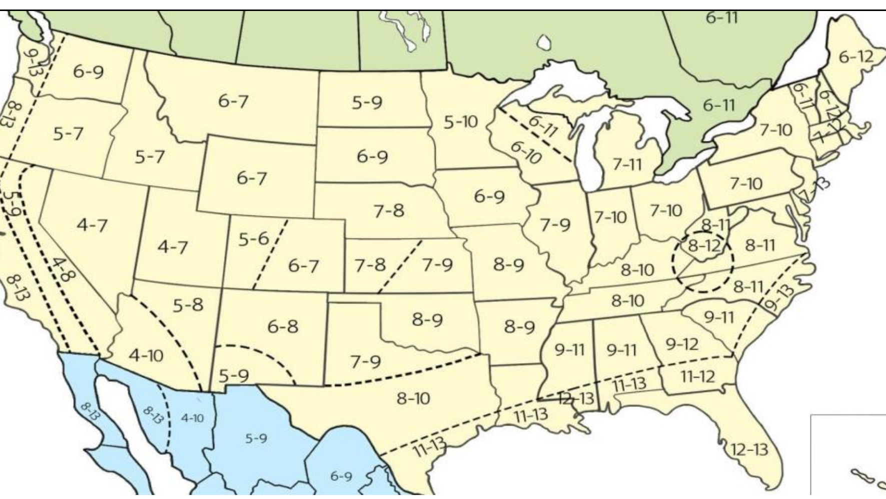
Material stored in other ways will still reach its' equilibrium point (all material will reach an equilibrium), but the time will vary based on all criteria referenced earlier.

	
Stacking wood flooring planks	Stacking tiles ‘on stickers’

The true litmus test of whether a material is acclimated to equilibrium is with the use of a moisture meter which is a typically a hand-held device that reads the ‘moisture content’ of the specific material being analyzed.

Though there are many brands of moisture meters on the market, one of the most well respected is Delmhorst, who has meters that test drywall, concrete, wood, and other materials. And, based on the actual ‘material’ being tested, they have calibrations to ‘correct’ the standard reading, so it is applicable to the specific material being tested. For example, with the Delmhorst J2000 meter (often used for wood-based products), ‘Douglas Fir’, as a species, is the base line species. For other woods, through testing, they have developed a conversion to show what, for example, Oak’s moisture content would be based on testing OAK using the baseline species of Doug fir.

All geographies have different micro-climates, and within that, structures (building interiors, etc.) have specific conditions. And, though taking a regional or micro-climate approach is typically sufficient for analyzing target product moisture content conditions, an effective way (at least for existing construction environments) is to measure the moisture content of a material that has already been equalized to that space, and then you use the ‘correction’ calculation of the material you are installing and equalize it to the MC% of that existing material. The best protocol for analyzing acclimation and when a material is at equilibrium, is to test it over time (say for example, once a day), and you chart the MC% changes. Once the changes level off, they are at equilibrium to that space under those conditions. This last method (of charting the changes until the curve has flattened) does not require the use of moisture meter corrections, as it simply shows a point of equilibrium.



The numbers referenced above show average moisture contents for interior use of wood products throughout the US. Actual ‘micro-climate’ conditions will vary within any area, and there will also be seasonal fluctuations that can cause deviations.

For additional information, moisture-meter correction charts for our materials, or if you have any questions, please let us know.

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