Moisture Content of Wood

The Effects of Moisture Changes On Wood

Some of the following information was taken from information compiled by
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Moisture and Relative Humidity (RH)

Wood is a hygroscopic material, meaning that it is continually trying to achieve an equilibrium condition with its environment. As the relative humidity (RH) changes, so does the moisture content of the wood. The following table shows the relationship between the relative humidity of the air and the moisture content of wood.

Relative Humidity of the Air	Moisture Content of Wood
1-7%	2%
8-13%	3%
14-19%	4%
20-25%	5%
26-31%	6%
32-38%	7%
39-45%	8%
46-51%	9%
52-57%	10%
58-63%	11%
64-69%	12%
70-75%	13%
76-81%	14%
82-87%	15%
88-93%	16%
94-100%	17%

Please note that temperature is not an important factor; it's just the relative humidity. Here at WalzCraft we keep our relative humidity in the 32-38% range during the winter months. This means moisture content in the wood leaving here is approximately 7%. So, as an example, let's say we ship an order of unfinished Hard Maple doors to a very humid climate such as Florida. Relative humidity in the range of 58-64% is not uncommon in southern states. Remember that wood is a hygroscopic material and will attempt to take on moisture to arrive at an equilibrium with its new environment. In this case the doors will increase in moisture content from 7% to 11%. Four percentage points doesn't seem like much , ***but it is in fact a 57% increase in moisture*** for these particular doors.

Moisture Effects on Wood Expansion and Contraction

To better understand the effects of moisture content, we must realize that the properties of wood change dramatically with changes in moisture content. The most noteworthy change is shrinking and swelling, especially in the width of a board. As you can see from the chart below, a Hard Maple door with a center panel 18" [457.2mm] wide will expand more than ¼" [6.4mm] ***when the moisture content increases by 4%.*** If proper allowances are not made within the door, this much panel expansion will act like a hydraulic jack and force the door apart.

Panel Size	2% Change in Moisture Content	4% Change in Moisture Content	6% Change in Moisture Content	8% Change in Moisture Content
152.4mm (6") Wide Center Panel	1.07mm (1/16")	2.13mm (3/32")	3.20mm (⅛")	4.27mm (3/16")
304.8mm (12") Wide Center Panel	2.13mm (3/32")	4.27mm (3/16")	6.40mm (¼")	7.90mm (5/16")
457.2mm (18") Wide Center Panel	3.20mm (⅛")	6.40mm (¼")	9.60mm (⅜")	12.80mm (½")
609.6mm (24") Wide Center Panel	4.27mm (3/16")	8.53mm (11/32")	12.80mm (½")	16.00mm (⅝")
762.0mm (30") Wide Center Panel	5.33mm (7/32")	10.67mm (7/16")	16.00mm (⅝")	20.60mm (13/16")
914.4mm (36") Wide Center Panel	6.40mm (¼")	12.80mm (½")	19.20mm (¾")	25.40mm (1")

▶ **For PRICING** ▶ *See Section **A.1*** in our current Wholesale Pricing Catalog.