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## Wood & Moisture Content

Woodworking businesses are continually battling the problem of wood movement, especially shrinking in our semi-arid climate of Western Canada. This problem is especially pronounced in the cold, dry winter months. In an effort to inform, educate and help our valued customers, RS Doors would like to provide this information to help you understand and deal with the issue.

The moisture content (MC) of wood is directly related to the Relative Humidity (RH), and the temperature of the surrounding air. The equilibrium moisture content (EMC) of wood occurs when it has reached equilibrium with its environment and is no longer gaining or losing water. When wood is losing moisture, it is shrinking, conversely, when it is gaining moisture it is expanding. Wood is generally kiln dried to a moisture content of 7 - 8%, so for example, if it is installed in a house where the Relative Humidity is 25% at a temperature of 70 degrees F, then that wood is going to reach an EMC of 5.4% (see chart below). That 2% drop in moisture content would mean an 18" wide panel will shrink approximately 1/8". So you will see a 1/16" wide line down either side of the panel, which is a huge problem, especially with dark stains. Proper finishing of the wood products will slow this process down, but it will not stop it. This primarily affects the wood across the grain and not lengthwise. (It does shrink or expand some lengthwise also, but the amount is so small it is basically negligible.)

Homeowners, with good reason, do not want to see white lines down the sides of their doors in their brand new kitchen. What must be understood however, is that this is not a defect in the manufactured product, it is totally due to changes in the Relative Humidity. To avoid this, the wood needs a consistent humidity level. So the object is to keep it as close as possible to the kiln-dried MC throughout the manufacturing and finishing process, and also in the environment where it is installed. We recommend a RH level of 35 - 45% in the home. This will mean an EMC in the 7 - 8% range and that will provide stability for the wood products.

For your convenience, we have included an EMC chart, which shows the relationship between Relative Humidity, Ambient Air Temperature and the Moisture Content of wood.

## Equilibrium Moisture Content (EMC) Chart

This chart provides the equilibrium moisture content for wood based on relative humidity and temperature.

Relative Humidity %	Ambient Air Temp							
	30°F -1°C	40°F 4°C	50°F 10°C	60°F 16°C	70°F 21°C	80°F 27°C	90°F 32°C	100°F 38°C
5	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2
10	2.6	2.6	2.6	2.5	2.5	2.4	2.3	2.3
15	3.7	3.7	3.6	3.6	3.5	3.5	3.4	3.3
20	4.6	4.6	4.6	4.6	4.5	4.4	4.3	4.2
25	5.5	5.5	5.5	5.4	5.4	5.3	5.1	5.0
30	6.3	6.3	6.3	6.2	6.2	6.1	5.9	5.8
35	7.1	7.1	7.1	7.0	6.9	6.8	6.7	6.5
40	7.9	7.9	7.9	7.8	7.7	7.6	7.4	7.2
45	8.7	8.7	8.7	8.6	8.5	8.3	8.1	7.9
50	9.5	9.5	9.5	9.4	9.2	9.1	8.9	8.7
55	10.4	10.4	10.3	10.2	10.1	9.9	9.7	9.5
60	11.3	11.3	11.2	11.1	11.0	10.8	10.5	10.3
65	12.4	12.3	12.3	12.1	12.0	11.7	11.5	11.2
70	13.5	13.5	13.4	13.3	13.1	12.9	12.6	12.3
75	14.9	14.9	14.8	14.6	14.4	14.2	13.9	13.6
80	16.5	16.5	16.4	16.2	16.0	15.7	15.4	15.1
85	18.5	18.5	18.4	18.2	17.9	17.7	17.3	17.0
90	21.0	21.0	20.9	20.7	20.5	20.2	19.8	19.5
95	24.3	24.3	24.3	24.1	23.9	23.6	23.3	22.9
98	26.9	26.9	26.9	26.8	26.6	26.3	26.0	25.6

Figures based on data provided by the U.S. Forest Products Laboratory

At RS Cabinet Doors, we are continually looking for ways to improve and also to work with and help our customers. So where there is a problem, we try to find a solution. As much as we want all our products to be installed in humidity controlled environments, so there is no wood movement, we do live in a place called Reality, and this is not always possible. So our solution to this problem is, for a nominal cost, pre-staining the edges of your solid panels before assembly, in a color that will closely match the color of your finish. You can either send us some stain, or we may have a color here that is close. Then, if the panels do shrink, there is stain on the edges, and there will not be a visible line that is so unsightly to your customers. A small cost now to avoid big costs down the road. Please contact us if you are interested, or for more information on this service.