

Equilibrium (wood) Moisture Chart

The moisture content of wood, below the fiber saturation point, is a function of both the relative humidity and temperature of the surrounding air (vapor pressure). Equilibrium moisture content (MC) is defined (moisture at which wood is neither gaining nor losing moisture). When a substance is no longer releasing or gaining moisture equilibrium exists. (Dri-Eaz Corporation · www.dri-eaz.com)

RH	Temperature Dry Bulb - °F						
	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
20%	4.6	4.6	4.6	4.6	4.5	4.4	4.3
25%	5.5	5.5	5.5	5.4	5.4	5.3	5.1
30%	6.3	6.3	6.3	6.2	6.2	6.1	5.9
35%	7.1	7.1	7.1	7.0	6.9	6.8	6.7
40%	7.9	7.9	7.9	7.8	7.7 ^(A)	7.6	7.4
45%	8.7	8.7	8.7	8.6	8.5	8.3	8.1
50%	9.5	9.5	9.5	9.4	9.2	9.1	8.9
55%	10.4	10.4	10.3	10.2	10.1	9.9	9.7
60%	11.3	11.3	11.2	11.1	11.0	10.8	10.5
65%	12.4	12.3	12.3	12.1	12.0	11.7	11.5
70%	13.5	13.5	13.4	13.3	13.1	12.9	12.6
75%	14.9	14.9	14.8	14.6	14.4	14.2	13.9
80%	16.5	16.5	16.4	16.2	16.0 ^(B)	15.7	15.4
85%	18.5	18.5	18.4	18.2	17.9	17.7	17.3
90%	21.0	21.0	20.9	20.7	20.5	20.2	19.8
95%	24.3	24.3	24.3	24.1	23.9	23.6	23.3

(A) 7.7 moisture content (40% relative humidity at 70°F) would equal ASHRAE recommended indoor relative humidity of 30% to 50%.

(B) Wood supports fungi growth at 16.0 moisture content at 80% relative humidity at normal residential comfort temperature of 70° F.

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U.S. Forest Products Laboratory --- Division of the U.S. Department of Agriculture:

(Wood Handbook, Wood as an Engineering Material, Drying and Control of Moisture Content and Dimensional Change · Chapter 12 · William T. Simpson)

“Softwood lumber intended for framing in construction is usually targeted for drying at an average moisture content of 15%, not to exceed 19%. Softwood lumber for many other uses is dried to a low moisture content, 10% to 12% for many appearance grades to as low as 7% to 9% for furniture, cabinets, and millwork.

Hardwood lumber for framing in construction, although not common use, should also be dried to an average moisture content of 15%, not to exceed 19%. Hardwood lumber for furniture, cabinets, and millwork is usually dried to 6% to 8% moisture content.”

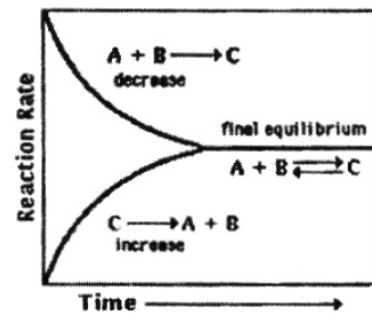
Loss Recovery Guide with Standards:

(Section 7.16.f - Equilibrium, William Yobe & Associates)

“Technicians would encounter two states of equilibrium during water mitigation services:

- Interior atmosphere-to-exterior atmosphere
- Interior atmosphere-to-material saturation

Equilibrium exists when two states of matter are equal with each other, meaning the decreasing rate of the forward action becomes equal with the increasing rate of the reversing action as shown in Figure 7-16.



Equilibrium Reactant Chart

Figure 7-16

Temperature would be the balance point of equilibrium since the temperature is the shared property.

When the temperature is raised during equilibrium, it causes endothermic reactions to occur, while lowering the temperature causes an exothermic reaction, resulting in the equilibrium to react to minimize the change.

An equilibrium state with respect to high humidity could be considered a state of atmospheric disorder, meaning liquid water will evaporate at the same rate that water vapor condenses, resulting in the natural occurrence of secondary damages.”