



NORTHERN HARDWOOD NOTES

Variation In Seasonal Moisture Content

Several properties of wood are affected by moisture content-weight, fuel value, electrical conductivity, strength, and shrinkage. Differences in these properties are commonly observed in wood in service. For example, a green 2 X 4 weighs more than a kiln-dried 2 X 4, dried wood burns more easily and hotter than green wood, etc.

Furthermore, research has shown that moisture content varies within the tree (pith to bark and stem to crown) and seasonally in aspen and paper birch. (Northern conifers do not seem to vary much seasonally.) Knowing these types of variations could be important if you routinely buy and sell wood by weight.

In paper birch and trembling aspen, water content is highest in the spring just before bud break; it decreases during the summer until leaf fall, and after that increases until December (see graph). During January there is a small decrease but not as much as during summer. Most variations in moisture content were observed in the wood nearest the bark. In aspen, moisture content also generally decreases with height.

In general, the weight of a load of summer-cut (June-July) birch and aspen can be estimated by assuming that half the weight is water. Wood cut in January or February has more moisture and could be 6 or more percent heavier than the same volume cut in summer.

Moisture content will vary from year to year so you should calculate it for individual cases if you wish to be precise. In addition, if you want to compare the weights of winter-cut and summer-cut wood, the samples should include equal proportions of top, middle, and bottom logs because of moisture content variations within the tree.

Calculating Moisture Content

To calculate moisture content of a log:

1. Obtain a representative sample (disk or increment core) from the mid-portion of a log.
2. Weigh the sample green.
3. Oven-dry the sample at **105° C** for 16 to 18 hours.
4. Place in a container over a dessicant for 30 minutes and weigh at room temperature.
5. Place in oven again for 2 hours, then put the sample in container over a dessicant and weigh again at room temperature to make sure the weight has stabilized.

6. Use the following formula:

$$\text{Moisture content (percent)} = \frac{\text{Green weight} - \text{Ovendry weight}}{\text{Ovendry weight}} \times 100$$

The above formula gives the moisture content on a dry basis and is most commonly used. It could give moisture content in excess of 100 percent because sometimes the weight of water in a sample exceeds the weight of the wood itself.

References

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