



LOG GRADING

QUALITY OF MATERIALS

All of the building codes in America require structural building elements to be graded. The following excerpt from the Standard Building Code is typical of the language used in these codes:

“2301.4.1 Lumber used for load-supporting purposes,...shall be identified by the grade mark of a lumber grading or inspection agency which is accredited through a program which complies with USDOC PC 20-70...”

Every log in a log home is “used for load-supporting purposes.” Why, then, do only about 100 out of over 500 log home manufacturers grade their logs? The answer is simple-cost and competition. It cost money to grade and they apparently don’t want to spend the money. Also, their log may not fair well in the market if it is known to be of lower quality, or when comparing price to quality of the various manufacturers.

Does getting an ungraded log automatically mean you are getting lower quality? No, not necessarily, however, it means you don’t know what you’re getting. Graded logs fall into a range of grades from highest to the lowest, but no matter what the grade, if graded, you know what you are getting. You can now make the price quality comparison and determine what value you are getting.

HOW ARE LOGS GRADED

Logs are graded by visual inspection. All of the factors, such as knots, slope of grain, checks and splits, decay, holes, etc. that affect the strength of a log are taken into consideration when assigning the grade. These strength altering factors, or “defects,” found during visual inspection result in the assigned grade.

The list of defects include the following: burl, checks, compression wood, decay, edge, holes, knots, manufacturing imperfections, pitch, pitch streak, pockets, shake, slope of grain, splits, trim, wane, warp and others.

Each grade has an “allowed design stress value,” which is used by engineers and architects to choose the appropriate species, size and grade of log for the application being considered. It is also used by local code officials to assure them that the logs meet the building code requirements.

WHAT ARE THE GRADES AND WHAT DO THEY MEAN

Timber Products Inspection is a national grading agency which has established a grading program. Their program establishes the grade restrictions for each grade for wall logs. The grades are, from highest to lowest: Premium, Select, Rustic, Wall Log 40, Wall Log 30 and Wall Log 27.



“Slope of Grain” is one of the restrictions used in determining grades. Slope of Grain is a measure of the degree of twist evident in the log. This is measured by the amount of grain twist in a given distance down the length of the log. For example, 1 in 12, means the grain moved away from the axis of the log one inch in a distance of twelve inches.

Using this factor as an example of the progressive relaxation of the restriction you will find the following pattern. In Premium grade the restriction for Slope of Grain is 1 in 12; in the Select grade it is 1 in 10; in the Rustic grade it is 1 in 8; in the Wall Log 40 grade it is 1 in 6; in the Wall Log 30 grade it is 1 in 5.

Since Slope of Grain is measuring the twist that developed in the log while it was alive and growing, it is, in effect, predicting the risk that the log will “untwist” and the degree to which it will untwist. A Slope of Grain of 1 in 12 indicates a very low risk the log will untwist and if it does the movement will be very minimal. On the other hand, a Slope of Grain of 1 in 5 indicates a likeliness to untwist and to move considerably while doing so. If this log is in the middle of your living room wall and it moves significantly it is likely something unwanted will occur, such as a gap in the wall allowing air and water to penetrate.

In each of the restrictions affecting the grade of a log you will find a similar progressive relaxation of the restrictions, thus allowing greater risk of possible unwanted results or performance of the log over time.

Although the grades and restrictions are technical and quantitative their importance to the homeowner are their usefulness in assessing the risk of unwanted results or performance. Simply stated the greater the restrictions of any defect allowed in a log the greater the probability that the log will perform well, without unwanted results, over a long period of time. The lower the restriction, the greater the probability the log will develop unwanted results and poor performance over time.

Using graded logs not only assures you that you are building “legally” anywhere in the US, it gives you the knowledge of the likelihood of the performance of your logs over time. And, it gives you the ability to determine the value you are getting-the price versus quality comparison.

If you would like further information concerning grading or you would like to see more details concerning the restrictions associated with each grade you can contact us by e-mail. We have available Dr. Edwin Burke’s well written paper, *“Log Grading Methods and Raw Material Properties That Effect Houselogs and Log Home Quality.”* We also have excerpts from Timber Products Inspection’s log grading manual describing the various log grades and the restrictions associated with each.

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