

SPONSORED BY

**SATTERWHITE**  
**LOG HOMES**  
*Family, Experience, Quality*

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Photos courtesy of Satterwhite  
unless otherwise stated



## PICKING A HOUSE LOG

As you begin to research log homes, you'll discover there are major differences in various types and brands of house logs, and this results in substantial differences in design and construction.

Removal of dead timber from this high altitude hillside reveals vigorous young trees and helps protect them from wildfire.

**O**NE PRIMARY DISTINCTION in log homes is between **milled house logs**, which are planed to a uniform shape and size, and **full tree logs** used in handcrafting, where every joint is hand-fit.

Handcrafters use full trees, where every tree varies in diameter, length, and taper. Handcrafted log homes are extremely labor and material intensive. In addition, handcrafted homes have special issues with settling, and require highly expert design and construction techniques. The results can be breathtaking, but high cost is a limiting factor and handcrafted log homes are a very small segment of the log home industry.

**Milled logs are machined into uniform shapes, called “profiles.”** Because manufactured logs are all identical in size, they are much less labor intensive to assemble. There is also much greater yield, with more usable logs produced per tree. Almost all manufactured logs include matching interlocking surfaces on top and bottom, forming “tongue and groove” joints. This eases construction while stacking and fastening logs, and it enhances the weather seal of exterior walls.



# A Look at **WOOD TECHNOLOGY**

The log manufacturing process begins when trees are harvested in the forest, delimbed, and bucked to length to fit log trucks. Once transported to the log yard, loads of logs are weighed, then unloaded and sorted into log decks. At the sawmill, trees go through a series of processes. The first operation, called the “head saw,” is performed by a highly skilled sawyer who quickly assesses how to cut the trees to maximize utilization. The round natural face of the tree is removed, and the tree is squared off into an intermediate rough cut timber called a “cant.”

Cants are sorted by size, graded, and moisture tested. Green wood is

defined as freshly sawn wood where the cellular structure is completely saturated with water. Water content of green wood can range from 30% - 200% of the dry volume. All wood used in log homes must be dried, or cured, because wood shrinks dramatically as moisture dries out.

The water absorbent properties of wood fiber is what makes paper towels useful. In house logs, it is important to keep water content stabilized in order to avoid expansion and contraction, which would cause problems.

The drying stage of making house logs can vary dramatically among different brands of log homes due to wood species, climate zones of forests, ambient humidity of storage conditions in log yards, chemistry particulars of the wood fiber, how

long and where sawed cants are stored, and accelerated methods of drying such as forced air or heated kilns.

One thing is certain: all wood must be dried and cured before it is used in log home construction because wood fiber shrinks in size as it dries out. When a log home is built with improperly dried wood, the consequences are devastating. No material in history has served mankind as well as wood for homes and shelter, but all bets are off if wood is used incorrectly. A log home built without respect for shrinkage characteristics can literally tear itself apart, become drafty and full of air and water leaks, which in turn produces terrible energy inefficiency. Not to mention a raft of other problems as log walls settle in height and crush doors and windows. Exterior log walls can po-



## **CLOCKWISE FROM BOTTOM LEFT:**

A headsaw at work; Active logging in environmentally sensitive areas; Dead trees designated for harvest; Satterwhite Log Decks

tentially shrink inches in height in relation to interior framed walls and in relation to assemblies like the roof structure that the log walls support.

To complicate matters further, the size changes that occur in wood are not linear. Shrinkage is measured longitudinally, along the length of the log's cell structure, and also radially and tangentially across the grain of the wood. All of these various shrinkages occur at different rates, even in a single piece of wood.

Shrinkage is also not linear in proportion to the percentage of moisture content present in wood. As water is removed from the wood cells during the drying process, shrinkage occurs rapidly at first, then gradually slows as the wood nears optimal dryness.

Additional information about moisture content of wood is available from the United States Forest Service, a division of the Department of Agriculture, at this address:

[http://www.fpl.fs.fed.us/documnts/fplgtr/fplgtr190/chapter\\_04.pdf](http://www.fpl.fs.fed.us/documnts/fplgtr/fplgtr190/chapter_04.pdf)

Dimensional lumber sold at retail is considered dry when the average moisture content of a bundled unit, determined by testing one or two random samples, reaches 18%. By comparison, wood intended for use in furniture or cabinet making is dried as low as 10%, and considered unsuitable at anything over 15%.

It is easier to dry small pieces of wood than larger timbers such as house logs. Sure, it is easy to achieve surface dryness, but difficult to get a substantial mass of wood thoroughly dry.



**VERTICAL DRYING**

**HORIZONTAL DRYING**



**MOISTURE TESTING**

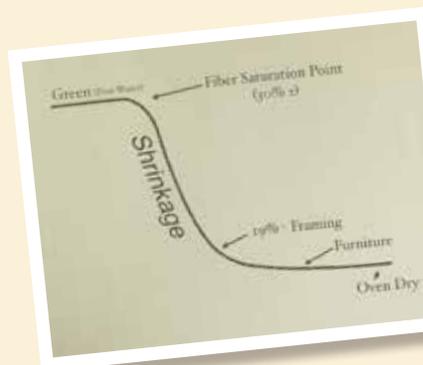
## How do log home companies deal with shrinkage?

### 1 MATERIALS PREPARATION

- Air drying
- Kiln drying
- Deadstanding
- Green-none/minimal drying

### 2 COMPENSATION IN BUILDING METHODS

- Design
- Construction techniques



	Radial	Tangential	Volume
Eastern White Pine	2.1	6.1	8.2
Loblolly Pine	4.8	7.4	12.3
Southern Red Oak	4.7	11.3	16.1
White Oak	5.6	10.5	16.3
Aspen	3.5	6.7	11.5
Northern White Cedar	2.2	4.9	7.2
Northern Red Cedar	2.4	5	6.8
Lodgepole Pine	4.3	6.7	11.1
Engelmann Spruce	3.8	7.1	11
Bald Cypress	3.8	6.2	10.5
Douglas Fir	4.8	7.5	11.8

Particulars of each log building system compensate for anticipated moisture loss during the life of the home, and the shrinkage and movement of log walls that attends drying. These factors - the characteristics of a particular brand of house log - impacts design and construction methods. The quality of the materials dictate what is practical and possible to build. Because each log home company knows the properties of their materials, it is important to note warnings and to follow the advice of your material supplier.

Because log products vary from company to company, and because properties of house logs are a critical factor in design and construction methods, different log home companies are often referred to as “building systems,” and their house logs should not be thought of as a generic, interchangeable component of your log home.

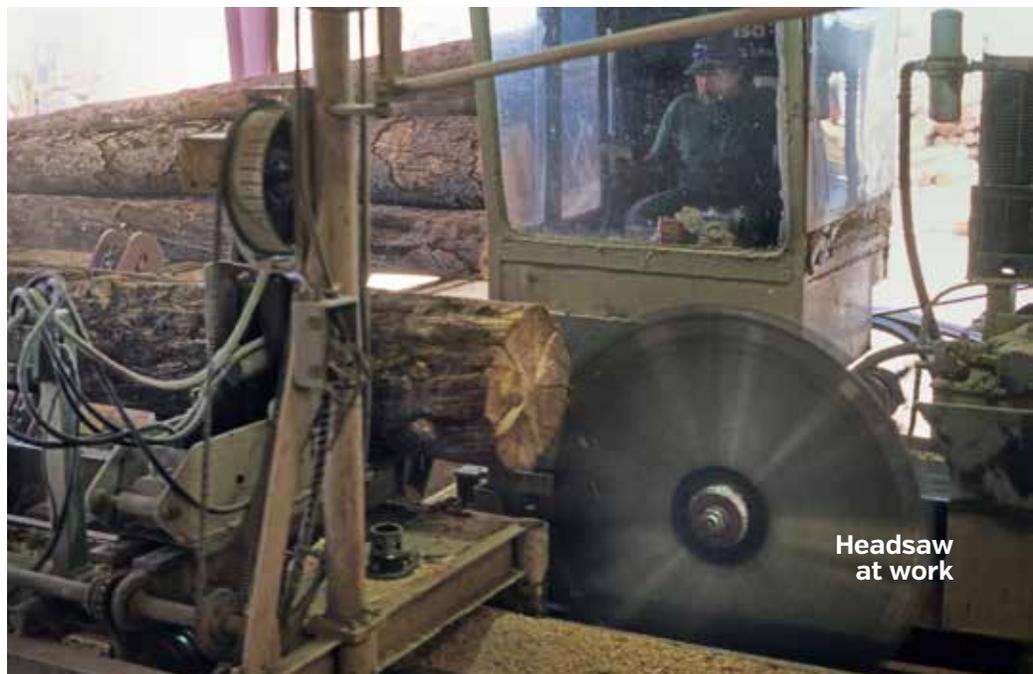
Building systems vary widely due to a range of inherent differences. Handcrafters must allow for the most settling of any log building system. Among companies producing manufactured logs, the building system reflects on the source trees and the degree of curing and dryness achieved in the manufacturing process.

### **BOTTOM LINE:**

The objective of drying wood is to achieve dimensional stability. All wood “moves” even after being incorporated into a log home. Understanding this fact and how different companies address the issue through selection of raw materials, dedication to quality control, and providing a tried and proven building system is critical to your choice of a log home company, and ultimately to the success and longevity of your family’s log home.



Loaded Log Truck



Headsaw at work



Satterwhite Log Decks

# LOG PROFILES

Milled house logs are shaped to a uniform size. There is a wide range of cross-sections available. Some are rounded on one or both sides, others are flat on both sides. Log profiles are sometimes associated with regional styles, such as the squared hewn timber look of many log homes in Appalachia.

In addition, there are different corner systems, the wood joinery where intersecting log walls meet. Some of these, such as dovetail construction, preserve the visual aesthetics of historic log construction, even though the need for this type joinery is reduced or eliminated by properly dried wood. Butt-and-pass corners are very popular, and perhaps least

expensive. This method produces corners that have the appearance of interlacing the fingers of your hands. Swedish cope, or saddle notch corner construction results in a solid corner extension, with no alternating spaces between even and odd log courses.

The basic parameter of house logs is width and height. In general, the width, or thickness, of house logs is a large determining factor in the overall cost of a particular log. At any given wall height, the thickness of the house log determines how much raw material is required. More wood equals higher cost.

Extremely large house logs are available, but as size increases, so does cost. This is because big logs can be made only from the largest trees, and the limited supply of this

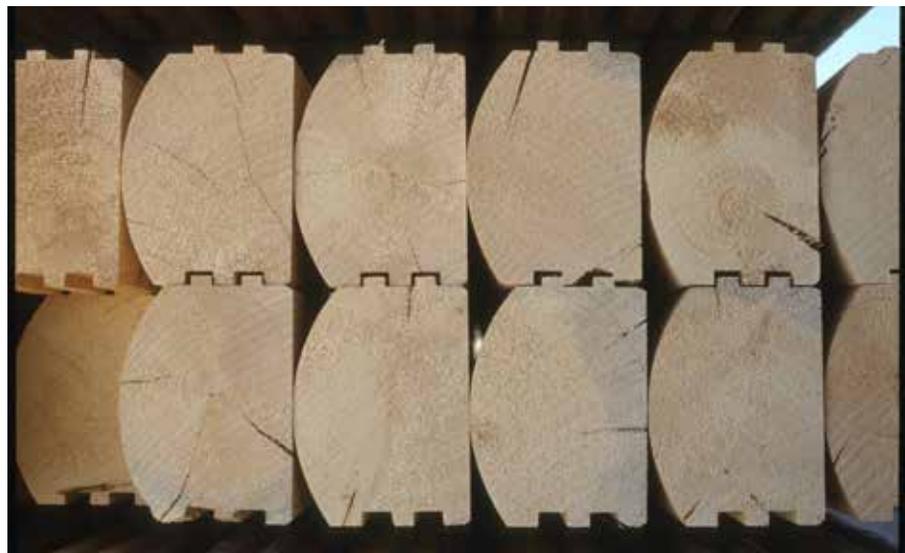
select raw material translates into issues of price and availability.

It is true that thicker log walls are more energy efficient. However, the energy efficiency of solid wood walls is very good to begin with, as a practical matter. In general, more massive log profiles cannot be justified by projected energy savings. For many people, larger logs are an aesthetic choice, not a practical consideration. Extenuating circumstances include where you intend to build, the climate zone, and government regulations. Building codes are beyond the scope of discussion here, except to say that your specific building site must be considered in advance of final planning and budgeting for your log home.



## CLOCKWISE FROM BOTTOM LEFT:

Handcrafters carve each joint to fit; Dove Tail corner joint sample; Satterwhite employee cutting Dove Tail corner joints; Milled Log Profiles





# WOOD

## THE SIMPLE SUMMARY

**W**OOD IS A TRUSTED RESOURCE for humanity, and the characteristics of wood are well known and documented by science. Still, not everyone wants or needs an engineering degree in wood technology in order to enjoy a lifetime of comfort in a beautiful log home. Here are some simple words of **wisdom**:

**1** House logs are a product of nature, and there can be considerable natural variation. It is a huge error to assume that all brands and types of house logs are a commodity, uniform in characteristics and qualities, or an easy apples-to-apples comparison.

**2** Along with all the other factors you would take into account when selecting a log home company, pay close attention to the actual product -- the wood that will become your log home. You don't have to become an expert, but you should have confidence in your vendor's unwavering dedication to quality. Not just good intentions and quick answers to routine questions, but diligent daily attention to detail that is vital to quality consistency. If you don't care what you buy, it is too easy to find someone who does not care what they sell.

**3** There is more than one way to build a log home with excellent results. Different brands are based

around different species of wood, different construction methods, and different business models. There are a great many reputable companies in the log home industry, with satisfied and extremely loyal customers. Sometimes the old saying "can't see the forest for the trees," holds true -- when selecting a log home company, it can be important to step back and look at the big picture, the forest, and not just obsess with a single issue. Perhaps more important than any specific issue is the consistency of execution. Good companies build good log homes, but great companies get it right over and over and over again, year after year, with proven experience, constant refinement

and improvement, and continuity of expertise coming from stability and employee retention.

**4** Each log home company understands the particulars of their product and has developed highly evolved methods of construction that are essential for success with their materials. Each company's "building system" is unique, not necessarily good or bad, or better or worse than others. Some customers research log homes at length and become experts at details of various building systems. Even so, it is usually a mistake to mix and match techniques from different building systems. Unless you have unlimited resources and don't mind the consequences of experimental construction, it is a wise decision to trust the experience of people who have learned what works and what does not with their specific materials and methods.

**5** If uncertainties or conflicting advice arise during construction of your log home, make sure to include input from the log home company. There are many regional variations and adaptations for various

construction specialties like foundations, and also trades like carpentry and roofing. If one of the subcontractors on your home has serious reservations about how something should be done, be sure to get the log home company involved in the discussion. It is not unusual for a tradesman to have no previous experience building log homes. Sometimes regional adaptations are vitally important. Other times, it is a coin toss how something should be done, in which case the tradesman will be most comfortable and efficient working the way he normally does. But there can be times where the log home company has specific reasons for doing something a bit differently, and experience to back up a different approach. Even if a local tradesman claims to have experience with log homes, his experience may be with a different building system and it may not produce the same results with your chosen system. When in doubt, ask for help.

**6** Select a log home company that you trust. Face it, building a home is the single largest financial commitment in life for most people, and something few individuals

ever do enough to get really good at based on personal experience. If you don't trust a company or have confidence in their product and ability, keep looking elsewhere. The stakes are too high, and it can be too easy to be skeptical whether advice given is something really necessary, or perhaps profit motivated. If you fear the company you are doing business with, and question their sound advice, this can easily work against you. At the end of the day, every reputable log home company wants happy customers, not disasters from cutting corners or agreeing to do something they know won't work. Hidden costs and bad surprises are sure to disappoint customers, and good log home companies go out of their way to avoid misunderstandings. Trust and rapport is something that goes beyond specifications and products; it gets down to the integrity of the people you choose to work with and the respect you have for them and the business practices of the company itself.

**7** Simple restatement of everything above: **Listen to the voice of experience.**



A WORD FROM THE SPONSOR:

# SATTERWHITE LOG HOMES

Since 1974, over 20,000 families have realized their log home dream with Satterwhite Log Homes. Satterwhite homes have been built in virtually every state in the nation, plus all around the world. Satterwhite house logs deliver proven performance in every type of climate and condition, from arid regions like Arizona to swamp-like humidity in bayous of Louisiana. From the tops of the mountains in Colorado to the coasts and everywhere in between, literally from sea to shining sea.

In the log home industry, Satterwhite Log Homes is the leading advocate of using dead standing timber, trees that have been killed by natural causes. At high altitudes in the arid Rocky Mountain states, entire forests are killed by beetle epidemics. These insects consume the cambium layer

of trees, the living nutrient carrying tissue just beneath the bark at the edge of the inner wood. When the cambium layer is destroyed, the tree dies. Unlike trees most people are familiar with, at high altitude there is not sufficient moisture for Englemann Spruce trees to quickly fall over and decompose. Instead, dead trees can stand for years and sometimes decades. This long drying process creates naturally cured wood that is ideal for house logs.

Satterwhite is one of the few log home companies that controls their product all the way from the forest to the jobsite.

At altitudes where Englemann Spruce occurs, higher than other alpine species like Aspen, nearly all land is owned by the U.S. Federal Government, and the trees utilized



Nick  
Satterwhite

by Satterwhite are nearly 100% sourced from the U.S. Forest Service. Americans should be proud that these forests are among the best managed in the entire world. The trees harvested by Satterwhite Log Homes are individually selected and designated for harvest by degreed foresters whose sole duty is careful management of the National Forests for the benefit of the American people. The Forest Service is motivated to manage these forests to prevent wildfire, which has become a major threat all across the American West.



High Altitude Dead  
Standing Timber

Satterwhite obtains rights to harvest dead standing timber through competitive bidding. Satterwhite logging activities on federal lands are closely supervised and conducted to the highest standards. On more than one occasion, timber sales harvested by Satterwhite have been inspected by congressional delegations.

U.S. National Forests are lands of multiple use, and are extremely popular with the public for recreation. Utah is a spectacular vacation destination holding more beauty and variety than it is possible to appreciate in a single lifetime. Satterwhite Log Homes is proud to welcome visitors and vacationers at our primary sawmill and house log manufacturing facility in Gunnison, Utah. We are also proud to have the public personally inspect areas in Utah, Colorado, and New Mexico, where Satterwhite has harvested dead standing timber.

When dead trees are removed from high altitude forests, it not only removes the threat of wildfire, but it removes a grey curtain of death

from the alpine landscape. As the dead trees are removed, a vigorous growth of young trees is exposed.

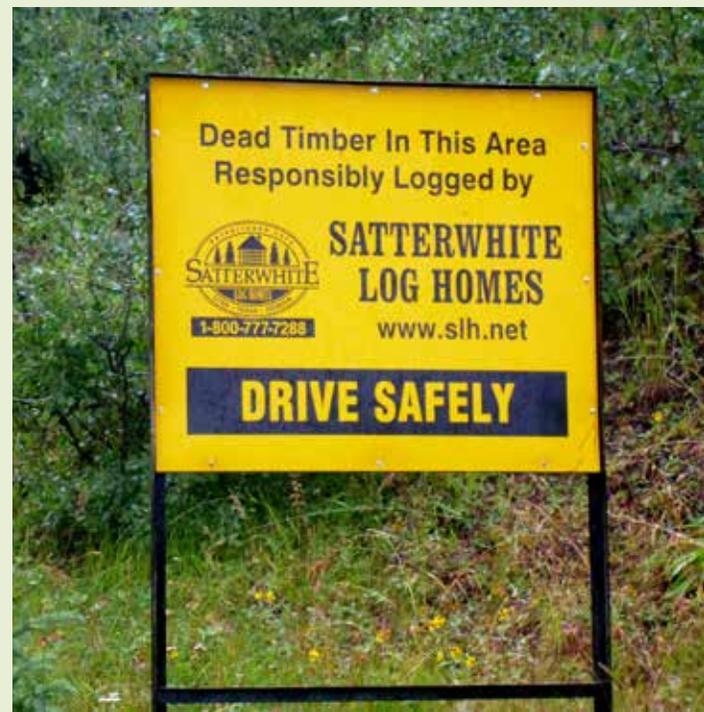
Not only is removing Dead Standing Timber the right thing to do for the environment, but Satterwhite is convinced that this special wood is nature's finest house log. The moisture content and stability of the wood is extremely low, beyond what is economically practical with artificial accelerated methods of drying applied to green-cut trees.

Unlike dimensional lumber sold at retail, every single Satterwhite house log is individually tested for moisture content. Extreme care is exercised at every step. For instance, trees and wood is handled so that moisture testing is always done in the lowest portion of each piece of wood, eliminating any measurement error due to gravity as the tree dried in the forest. Stringent standards are applied before any log becomes a part of any home.

Dry wood yields tremendous benefits both short term and long. Free of water, Satterwhite house

logs are extraordinarily light. This reduces transportation costs, and it makes materials handling by carpenters during construction much easier. But ultimately, dry wood makes for better long term performance. Since dry wood is already dimensionally stable, the Satterwhite building system does not have to incorporate special designs or convoluted workarounds to compensate for excess shrinkage and settling after the home is built. Labor costs are reduced, and Satterwhite homes can be built by carpenters with no prior log building experience.

These factors and more add up to an outstanding, proven product that benefits not only the Satterwhite customer, but also helps achieve the environmental management goals of the U.S. National Forests. Log homes deliver tremendous rustic appeal and harmony with the natural landscape. With Satterwhite, this beauty is realized not only in the end product, but also at the source in the forest. You can be proud of your Satterwhite log home, and equally proud of where it came from.



# SATTERWHITE LOG HOMES

*Family, Experience, Quality*



*Time for a relaxing, back-porch view of the world*

#### **Give in to rest and relaxation.**

After a day at the office, it's so relaxing to come home to the seclusion of your own back porch. And if it's a Satterwhite log home back porch, you'll also find the serenity of nature built right in. Creating the perfect atmosphere for private time or time shared with family and friends. The perfect complement to a scenic mountain hideaway or rolling hill retreat.

#### **Customized to your lifestyle.**

At Satterwhite Log Homes, we want your home to be "your" home! So, we encourage you to "customize" any of our 45 standard floorplans... or design your own. Add that sun porch for your resident green thumb, enlarge the master bedroom or bath, or include an upstairs playroom for the little ones.



*Family. Experience. Quality."*

[www.satterwhiteloghomes.com](http://www.satterwhiteloghomes.com)



#### **Reliability tested by time.**

We only use naturally cured logs at Satterwhite. This means excessive shrinking will not compromise your home, thus ensuring reliability. This material advantage is also backed by a guarantee of sound construction techniques, enduring design and simple attention to detail in every home we craft. It's been that way since 1974.

**Company Experience** - Family owned and operated for 40 years.

**Superior House Logs** - Milled from dead-standing timber for stability.

**Totally Custom** - Your plans or ours. Design staff ready to create your dream home.

**Our Locations** - Serving the US from Utah, Texas and Georgia.

## UTAH

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