

## Log Home Restoration and Maintenance Terms

“Organic architecture seeks superior sense of use and a finer sense of comfort, expressed in organic simplicity”. **Frank Lloyd Wright**

### Maintenance Design Terms



**Backsplash/Splash Back:** Condition causing water to “splash back” onto the log surface such as: decks, ground, landscaping, or any objects too close to the log wall.

**Roof Overhangs:** The portion of roof that extends beyond the log wall. The International Log Builders Association (ILBA) Standards recommends one foot of overhang for every eight feet of log wall height. Longer overhangs help protect lower log courses from the elements.

**Flashing:** Protection added around doors, windows, chimney and wall terminations to protect against water, air and insect infiltration.

**Ground Clearance:** The distance between the ground and the 1<sup>st</sup> log course (sill). Higher ground clearance protects lower log courses from backsplash. ILBA Log Building Standards recommend a minimum of 3’ of ground clearance to the first log course to protect lower log courses from backsplash.

**Exposed Log Ends:** Term used when the log ends extend beyond roof overhang and are exposed to the elements.

**Drainage System:** System designed to protect logs by directing the flow of water away from the home such as gutters, sloping grade away from the home and footing drains.



## Log Terms

(Re: Moisture, Settling, Fungus, Checking, Log Parts and more)

**Log Profiles:** Profiles are the various milled shapes of the logs when looking at a cross-section. For example a flat/round log is flat on one side and round on the other.



**Kiln Dried-logs:** Method of drying logs using heated air flow.

**Air Dried-logs:** Method of allowing logs to dry naturally over an extended period of time.

**Drip Edge:** Log profile design in which water draining off a log surface will drip on lower log keeping moisture away from log joints.

**Caulk Channel:** Groove in a log profile which allows for the use of backer rod and caulk to properly seal between log courses.

**Mill Glaze:** The milling process can cause extractives to come to the surface and harden which may adversely affect stain adhesion.



**Moisture Meter:** Device used to measure moisture content.

**Moisture Content:** The amount of water contained within wood. Water contained within the wood may be 'free water' found in cell cavities or 'bound water' found in the cell walls. Drying of wood does not result in significant shrinkage until all free water has been removed. The point at which no free water remains and shrinkage begins is known as the fiber saturation point (FSP), which occurs at about 28 percent moisture content.

**Equilibrium Moisture Content (EMC):** The percent of moisture the log will seek to acclimate to the relative humidity in the area.

**Equilibrium Moisture Level (EML):** This refers to the geographic areas average experienced humidity level.

**Fiber Saturation Point:** Point in the drying process where cell cavities loose all their free water but bound water remains.

**Bound Water:** Moisture existing in the cell walls. The evaporation of bound water causes the logs to shrink.

**Free water:** Moisture inside the cell cavity. No shrinkage occurs while logs are losing free water.

**Decay Resistance:** The ability of wood to resist the effects of exposure to air, water and the ultraviolet rays in sunlight. While wood species vary in their resistance, none are completely decay proof.

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**Green Logs:** Logs with moisture content greater than 19% are called "green" logs. Walls built of green logs can settle up to  $\frac{3}{4}$  inch per foot.

**Dry Logs:** Typically logs with moisture content at 19% or below.

**Settling:** The loss of log wall height over time. During the first two years when the majority of wall log settling takes place, a wall may lose  $\frac{3}{4}$  inch per foot of wall height. This means that an 8 foot tall wall may lose up to 6 inches in height before it has finished settling.

## Causes of Settling:

1. Shrinkage of log diameter as the logs dry to a stable condition. This condition is known as *Equilibrium Moisture Content* (EMC). EMC is reached when the log moisture content acclimates to the average relative humidity of the home site.
2. Wood compression: Over time, the weight of the structure will compress wood fibers, causing the wall logs to settle. Compression causes less settling than shrinkage.

**Cellulose/Hemicellulose/Lignin:** The three primary components in wood cells. Lignin acts as the glue that holds wood cells together.



**Fungus:** Wood destroying organisms. There are (3) types of fungi which can vary in color and texture most commonly seen on logs: black, blue-green and white.

- **Mold/Mildew:** Discoloration on the wood surface but not structurally harmful and typically black.
- **Sapstain:** Discoloration within the wood, typically blue-green.
- **Decay:** This type of fungi can cause serious damage as they feed on the structural components of the wood cell.

**Algae:** Unlike fungi which feed on wood, algae produces its food from sunlight but is an indication of high moisture content in the log typically green in color.

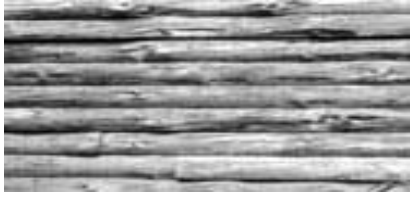
**Extractives:** Wood chemicals found in heartwood that leach to the log surface.

**Checking:** Cracks that open in the log as moisture is released. Upward facing checks over  $\frac{1}{4}$ " should be sealed.



**Microchecking:** Many small checks that occur when moisture is released quickly due to excessive heat exposure from the sun.

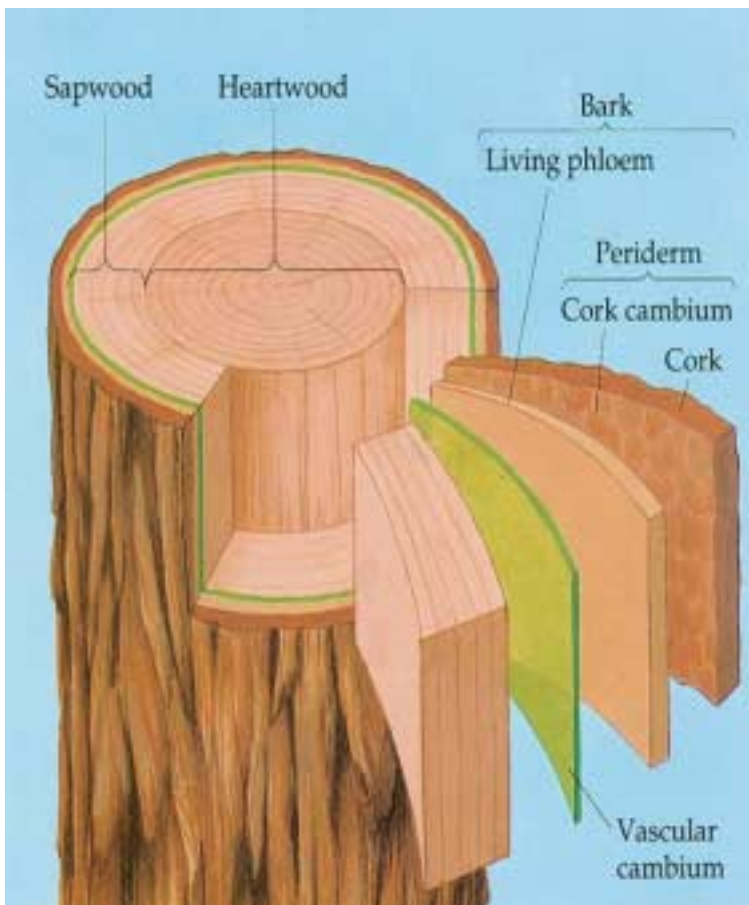
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**UV Damage:** Breaking down of cell walls which take on a black appearance. For sealants to give good long-term life they must be formulated for adequate UV resistance.

**Weathering:** Cell walls that are broken down causing the blackened appearance, common on the upper log curvature.

## Parts of a Log



- **Innerbark:** (*Phloem*) Responsible for transferring food from the leaves throughout the rest of the living tree.
- **Outerbark:** The exterior layer that insulates the living tree from the elements and insects.
- **Cambium Layer:** A thin membrane layer of living cells that produces new bark on one side and new sapwood on the other side.
- **Heartwood:** The central supporting structure of a mature tree.
- **Sapwood:** (*Xylem*) Makes up the most of the logs and responsible for transferring water from the roots to the leaves.

## Log Preparation Terms

**TSP:** A product used for cleaning dirt, grease or wax.

**Borate:** A preservative applied to logs to protect them from decay and insect infestations.

**Chlorine Bleach:** Household bleach will kill mold and mildew but will not clean the logs. It may damage wood fibers and inhibit stain adhesion if not completely rinsed.

**Sodium Percarbonate Bleach:** Also known as "Oxygen Bleach", kills mold and mildew but does not harm the wood fibers and is more environmentally friendly than household bleach.

**Oxalic Acid:** A naturally occurring acid which will remove iron and tanning stains but does not kill mildew.

**Corn Cob Blasting:** Similar to sandblasting but using corn cob grit to remove the existing finish. Corn cob is lighter than sand and will not be as abrasive to the wood.

**Powerwashing:** Water directed under pressure through a fan nozzle used to remove some weathered finishes. Must be done correctly and allow drying time before applying a finish.

**Fuzzing:** Fuzzy texture that may be left on a log surface after powerwashing. Can be removed by light sanding or the use of an Osborne Brush.

**Osborne Brush:** Commonly used on a variable speed angle grinder for removing fuzzing, texture, stains and any other debris from the log surface.

**Chemical Stripping:** The use of a chemical stripper on the log surface to loosen finish and remove with a power washer.



Before Corn Cob Blasting



After Corn Cob Blasting

(Photos courtesy of Sashco)

## Stain/Finish/Coating/Preservatives Terms



**Exterior Finishes:** Log homes must have a finish applied that will allow moisture vapor to pass through the finish while water in liquid form is kept out. Using a waterproof finish will trap moisture inside the logs and can cause logs to decay from the inside.

- ❑ **Water-Based:** A type of finish which is usually non-penetrating.
- ❑ **Oil-Based:** A type of finish which is usually penetrating.
- ❑ **Oil Borne:** Requires solvent clean-up.
- ❑ **Water Borne:** Requires water clean-up.
- ❑ **Oil Based/Water Borne:** The latest technology includes oil based penetrating stains that clean up with water.
- ❑ **Semi-transparent:** General classifications of finishes possessing certain amounts of solid materials that provide protection against damaging UV rays of and allow some wood grain to show through.
- ❑ **Translucent:** Clear finishes which show the grain in the wood. These finishes may have limited UV protection.

**Compatibility:** The ability of a finish and sealant to work together.

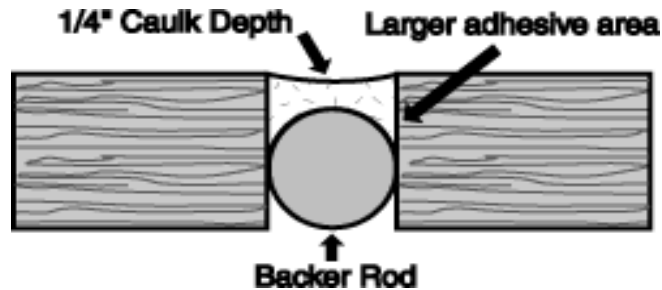
**Back brush:** The act of vigorously brushing finish application into a log component

**Coating:** Another term for finish or stain.

**Preservative:** A chemical applied to logs or timbers to protect them from decay and the effects of weathering. Preservatives may contain a mixture of chemicals designed to protect against different threats such a mold, mildew or ultraviolet light.



## Caulking/Chinking/Sealant Terms



**Caulking:** Sealant used to fill joints and spaces between logs. Caulk comes in tubes or pails and is applied with a caulk gun in a narrow strip or 'bead' that dries to a tough elastic coating.



- **Blended Caulking:** Matches the log finish to hide caulking.



- **Contrasted Caulking:** Usually a lighter color to enhance caulking.

**Chinking:** Filling used between rows of logs. Traditional chinking is mortar-based. Modern synthetic chinking, manufactured to look like traditional chinking, is similar to caulk but with greater elasticity.

**Adhesion Failure:** Term used when caulking pulls away from the log surface.

**Cohesive Failure:** Failure occurs when caulking adheres to log surface but the caulking itself tears apart.

**Substrate Failure:** Term used when caulking actually tears the log surface away from the logs.



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**Backer Rod:** Typically a foam-like material used to configure expansion/contraction joints and provide a surface that a sealant will adhere to.

**Impel Rod:** Borate rod which are inserted into an area of the log that is exposed to excessive moisture to prevent decay.

**Closed Cell Backer Rod:** A closed cell round foam that repels moisture which is used on external log joints. Texture is firm and may need a blunt tool to push deeper into joint to allow for chinking.

**Open Cell Backer Rod:** Very flexible, soft and compresses to fit most size joints. This does not have a water resistant coating making it breathable therefore allows for a faster cure. Best used in the interior.



**Two Point Adhesion:** Sealants need to be applied so that they only adhere to the two opposing sides of a properly configured joint, usually created by using backer rod.

**Three Point Adhesion:** Term used when the sealant adheres to "3 points". The top log, bottom log and the back of the caulking channel which greatly reduces its ability to stretch.

**Gaskets:** The presence of gaskets installed between log courses to help prevent moisture and air infiltration can sometimes be verified by examining exterior corners.

**Acrylic Latex Sealants:** Latest technology log sealants are latex based.



Sashco



PermaChink

## Log Repair Terms

**Epoxy:** Material used to solidify log components suffering some form of decay.

- **Liquid Epoxy:** A liquid that reconstitutes existing rotted wood fibers.
- **Wood Filler Epoxy:** Putty-like substance that once cured is harder than the log surface itself. Used to shape the log after the liquid epoxy has hardened.

**Full Log Replacement:** Logs that are replaced when more than 50% of the log is structurally unsound due to decay.

**Half Log Replacement:** A cost effective alternative to full log replacement to repair a log with surface decay (decay not exceeding 50%).

**Log Crown:** A log end that is replaced due to decay.



## Common Log Home Insects



Carpenter Ant



Carpenter Bee



Termite



Powder Post Beetle



Old House Borer

**Carpenter Ants:** Do not eat wood however build nesting galleries. Eggs and holes are in various sizes and usually found in decayed wood.

**Carpenter Bees:** ½" Round holes commonly found in fascia and trim. Males swarm area for protection but do not have stingers. Females lay eggs in galleries and have stingers.

**Termites:** Build tunnels underground searching for wood. Termites are evidenced by tunnels on foundation walls.

**Powder Post Beetles:** Evidenced by tiny, "pin like", round exit holes usually clustered in a group. Powdery talc like substance may be found in certain species.

**Old House Borers:** Evidenced by larger oval or round exit holes. Larva can feed for 1-15 years and may cause structural damage.