

## How to Prevent Blisters in Caulking/Chinking Material

Occasionally, blistering of a chinked or caulked surface occurs. A chinked area is more susceptible to blistering due to the larger joint size. After several years of investigation, Sashco Sealants has uncovered most or all of the causes\* of this problem and can recommend ways to prevent it. At first it was thought that the chinking itself was to blame. But the facts do not support this. For example:

- The same batch of product has blistered on one log and not on another.
- It is common to find blisters on one side of a house and not the other.
- Blisters occur above a certain point on a wall and not below it.
- Some blisters appear to be random on a chinking line and others are in a straight row.
- Blisters often reappear in the same place when repaired with the same batch of chinking or even with a different batch.

The Causes are Site related and not product or batch related.

**Causes of Blisters:** The basic cause of any blister is a build-up of gas between the log, the backing surface, and the chinking/caulking. It occurs during The early curing stages when The chinking is soft but has a skin formed on the surface. Heat usually in the form of direct sunlight causes the gas to expand. As the gas expands, it pushes the chinking out, causing a "bubble" or blister. This gas comes from water, wood sap, or even backing material.

**What Circumstances Create the Gas? Trapped Water Vapor:** As chinking/caulking dries, it gives off water vapor. Any physical condition which traps the resulting water vapor could cause a blister, especially if the logs and chinking are heated by direct sunlight here are some things that could trap this vapor.

Note: Sikaflex is not affected by water vapor in the same as other caulking/chinking because it is a polyurethane. Moisture makes it set up faster and will not generally cause blistering.

- Crack or indentation in foam or polyethylene backer rod which doesn't go all the way through. Even tiny spaces can trap enough vapor to create a blister big enough to see.
- Air bubble trapped during the application process against non-porous backer material.
- Dead-end crack in wood where moisture vapor can accumulate and expand when heated. (This, most likely, is the most wide-spread cause.)

### Backing Material

- Backer rod out-gassing. Closed cell backer rod has a puncture and is squeezed by expanding logs. The gas used to make the rod forces a blister in the chinking/caulking.

On day 1 the backer rod and sealant are applied in the cool part of the day. On day 2 the sun comes out heats the logs. This causes the backer rod to be squeezed, and forces a small amount of gas in the backer rod to leave the rod at a rupture or weak spot and make a blister in the sealant. The phenomenon has been known to occur in the caulk and sealant industry for many years and occurs randomly and unpredictably.

**Pitch Pockets:** Logs often have what is termed "pitch pockets". These are areas of concentrated pitch, or sap, sometimes containing several gallons! (Pitch pockets of 50 or more gallons are known)! This sap (or its vapor) will follow cracks in logs, coming out of the log almost anywhere. It especially exits at the knots Where the sap flow was directed during the life of the tree. Sap has a volatile component and, when heated, forms a gas that causes blisters. Some blisters appear to be in the dead center of the chinking/ caulking. Upon close investigation, however, most or all of the bubbles are connected to a crack in the log surface. The blisters are often the result of sap vapor, which can come through the tiniest of holes in the wood. Pitch pockets are often the cause of blisters, which line up in a straight row. They are simply aligned with the crack in the log

along which the sap is traveling. In the heat of direct sunlight some of the liquid sap in the pitch pocket turns into a gas that is under pressure and can form a blister as it tries to escape the log.

**Prevention of Blisters:** Some of these causes cannot be controlled. Two factors can be partially controlled - heat and backer rod selection/preparation. Since heat normally is responsible for turning undetected gas into unsightly blisters, it makes sense to control this element as much as possible. Once the chinking/caulking has become firm, it can then resist the low pressure from the water or sap vapor and the blisters can then be prevented.

#### **Control the Heat:**

- Chink or caulk on the shady, cool side.
- Protect walls from direct sunlight for a few days by covering with a light colored tarp, cloth or plastic. Leave plenty of room for ventilation. It is important to cover the logs as well as the chinking/caulking so the entire surface will stay cool.
- Stain logs first. This can help to close some pitch pocket holes before chinking/caulking.
- Although rare, it is possible for excessive heat to build up inside a log home during the early curing stage and cause blisters. If this could occur, make sure windows and doors are left open to allow cool air to ventilate the interior.

#### **Control the Backing Material**

- Use blunt tools to install closed cell backing materials, being careful to avoid puncturing or denting.
- Open cell backer rod \*\*may be used in place of closed cell backer rod. These backer rods will not generate gas and they can help dissipate any gas originating from another source.\*\* The weakness of this type of backer rod is that it is more susceptible to absorbing moisture if the chinking or caulking is ruptured and driving rain is forced through to the backer rod.
- When chinking/caulking over flat insulation (styrofoam, bead board or foil-faced foam board), surface cracks, holes, or dents should be covered with a high quality sticky mylar tape, 2" wide preferably. (The tape will tend to prevent as much as 80% of the blisters that would otherwise form.) Extruded styrene foam (such as Dow Chemical's blue "Styrofoam") has a greater tendency to cause blisters than white bead board or foil-faced urethane foam.
- A fresh blister can sometimes be eliminated by puncturing the surface skin (to let the moisture vapor escape) and pushing the chinking/caulking back into place. This step can cause marring of the chinking finish, but can be smoothed out 2-3 days later (after the chinking has firmed up) with a small amount of Log Jam applied and smoothed. Often the blister will not reappear. To be effective, this action must be taken within the first day after application, while the underlying chinking/caulking is still wet. This method can be the most effective and efficient since the blisters are caught very early (before they become very large) and repaired quickly.
- More thoroughly cured blisters must be cut off flush and the cavity filled approximately one-fourth to one-half full and allowed to dry. If the cause of the original blister is still present, then it will push the fresh chinking/caulking out into a shallow blister below the surface of the surrounding chinking/ caulking. This may be allowed to dry and a second application, blending with the surrounding chinking, will complete the repair. (See the drawings below.)

If you can cover a crack or hole with mylar tape, only one repair step is needed. Chinking/caulking can be installed flush with the surrounding material.