



## Chimneys Suffer The Heartbreak of Psoriasis:

by Mike Lennon

Illustrated by Sally Groom

**B**rick on houses can suffer from skin diseases. In temperate climates you will see it everywhere but mostly on houses 20 years and less in age and most often on the chimneys. Glance at many suburban chimneys above the roof line and you will see where the outer surfaces of the bricks have literally broken off to a depth of up to one half inch, usually in what appears to be a random pattern, not much unlike a skin rash. While this has little effect on the structure of the house, cosmetically it is a disaster.

**Why It Happens:** The phenomenon of flaking, or more correctly spalling of brick facings occurs due to the bricks absorbing moisture and then having this moisture freeze within the bricks when the outside temperature drops below freezing. Expansion of the moisture due to freezing stresses the bricks and if they

are stressed often enough, the outer layer or face of the brick will separate from the rest of the brick.

**The "Freeze-Thaw" Cycle:** Our brick work is especially susceptible to spalling since our weather has a lot of "freeze-thaw" cycles that coincide with a lot of rain. Colder parts of the country get cold and stay that way. Not here. Our early Spring and late Fall weather is often rainy and sees quite a few freezing nights and thawing days. The expansion force taking place within wetted bricks as absorbed moisture freezes and thaws occurs over and over until the surface pops off. Ironically our relatively mild weather actually sets up more harmful forces than more severe weather.

**Some Bricks Are Affected More Than Others:** All bricks are sponge like in that they will naturally absorb some water and then breathe it back out into the atmosphere. Molded bricks tend to have a lot of voids within and are well able to handle internal expansion. Denser bricks tend to be less absorbent and hence less vulnerable. Old bricks reclaimed from demolished structures are often much more vulnerable. They often contain cracks and flaws or were underburned in the brick kilns originally. Some orange colored bricks are especially vulnerable. These bricks, called "salmon" bricks were used for party walls between row houses and never intended for weather exposure. These bricks can absorb moisture through their faces and will disintegrate in short order.

**How Water Actually Gets Into Bricks:** It is extremely rare when brickwork absorbs water through the brick facings themselves. A brick that has spalled due to water absorption has almost certainly gotten the water through the mortar around the bricks and not through the bricks themselves. Holes or missing pieces of mortar, soft mortar that readily admits water, and tiny cracks where the mortar bonds to the bricks are almost always the avenues through which water soaks the brick. Shutting off the water cures the problem.

**Why The Chimney Is A First Rate Victim:** The more recent chimneys tend to be "capped" by spreading a mortar wash around the fireplace flue lining to cover the top course of brick. These mortared or "water wash" chimney caps just don't do the job. They almost always crack soon after installation, don't bond well to the bricks and the flue liners and are usually too porous. Builders should use **PRECAST CONCRETE CAPS** or should form around the top of the chimney and **POUR A CONCRETE CAP**. A silicone or polyurethane caulking should be used where the flue liner and chimney cap join. Couple the building techniques today with the increased general exposure of chimneys above the roof line, and you get a lot of flaking brick.

**What To Do If Your Chimney Has Psoriasis:** Inspect your cap. Check where it meets the flue liners and where it joins the brickwork. Separations here will readily admit the rain. These areas and any cracks through the cap itself should be caulked but if there are a lot of cracks or the surface is mottled and loose, you should consider redoing the cap. This is relatively easy but be sure to use the right materials. Use grey water proof cements sold across the counter under names like "Copoly," "Lehigh," "Lonestar," "Martin Marietta," etc. Mix according to directions and spread it out so that it slopes to shed water and is at least 2 inches thick. Consider a metal cap. Sheet metal shops can make up custom caps that will fit snugly and merely need to be set and caulked in position.

**Dealing With The Spalled Bricks Themselves:** If your chimney bricks have spalled, the spalled surfaces are likely sources of future moisture absorption as are the tiny cracks between their surfaces and the mortar around them. This must be dealt with. The spalled bricks can be cut out and replaced (Expensive), the offending bricks can be parged over (cosmetically unattractive), or you can attempt to seal the flaked surfaces with a clear sealer (cosmetically unchanged).

**Warning:** Though the Brick Institute of America does not recommend sealers of any type over brick work, they do recognize that when appropriately applied considerable good can be accomplished with these products. The fear seems to be that moisture can be trapped inside the bricks and exaggerate the problem. No doubt there is some validity to this thought so either be certain that all moisture is out of the bricks and that all sources have been eliminated or hire yourself an expert diagnosis (Hard to get.). Contact a brickyard. **Materials:** You will probably have good luck using any of the following clear sealers:

1. Hydrozo Clear Double 7
2. Chemstop Heavy Duty
3. White Roc M-6-50-8 Clear Masonry Sealer
4. Wandex Silicone Clear Water Repellent 4494-6
5. Unelko Water Repellent
6. Drylok Silicone

Masonry suppliers usually carry this type of product. You will normally either coat the individual flaked bricks and the joints immediately around or coat the entire upper reaches of the chimney. Use a

garden sprayer, or a brush or roller. Follow the manufacturers directions.

**Spalled Brick In Other Locations:** Other prime areas of spalling brick are around windows and doors or wherever poor masonry joints are found. Use a top quality caulk to seal openings around window and door trim. Here are some top performers:

1. "Mono" (an acrylic terpolymer which gives off an odor as it cures) and the newcomer "Dymonic" (a modified polyurethane with no curing odor) made by Remco, both for about \$3.00 per 11 oz. tube. Comes in about 9 colors.

2. Sika Flex I-A, a polyurethane sealant with a built in primer. Made by the Sika Co. it comes in about 9 colors and costs between 4 and 5 dollars per 11 oz. tube. (VERY POPULAR AMONG THE PEOPLE WHO SHOULD KNOW)

3. Dow 795 from the Dow Chemical Co. It is a silicon sealant and comes in 11 oz. tubes and 4 or 5 colors and costs around \$4.00 to \$5.00 per tube.

An 11 oz. tube is usually good for about two regular size windows. All of the above caulking compounds are available from the C.C. Murphy Co., 600 Caton Ave., Baltimore, MD 21229. Phone 347-5498.

Occasionally one wall of a building will display spalling brickwork. This is usually due to tiny cracks where the mortar meets the bricks. If the mortar is soft it should be "re-pointed" with new mortar. If it is hard and tight, a clear sealer "might" be helpful. A competent investigation should be made to determine the actual water entrance prior to doing any work. NEVER APPLY ANY SEALERS OVER EFFLORESCENCE. Efflorescence (a white powdery appearance on the brick) indicates that moisture is coming through the mortar from behind. Sealing over this without shutting off the source will accelerate the problems.

Water entering brickwork at grade or ground level should have the grade improved so that it slopes away from the wall or house. Ideally the bricks themselves will receive some waterproofing first if the grade level is built up. This is usually done with a troweled coating of portland cement covered with bitumen.

