



# Technical Bulletin #9

## CHIPPED TILE

January, 2000

Included in our ICBO approval is the instruction that “Cracked or broken tiles must not be installed or allowed to remain on the roof.” This requirement is intended to protect the integrity of the water shedding ability of the installed tile. As a manufacturer, we would prefer that all damaged tiles be replaced but we understand that sometimes it is less disruptive to the roof assembly to repair the tile when viable. We are often asked what constitutes a “broken” tile and at what point is the water shedding capability of the tile jeopardized. Often times the tile is intact except that a corner may be broken or chipped. Is there a limit as to how large a chip can be before it affects the integrity of the roof? Can tiles be repaired rather than replaced?

There are a number of factors that can affect the answers, ranging from the slope of the roof to the type of tile being used. Listed below are some of the issues that should be considered when evaluating the proper course of action.

- If the tile is cracked or broken across the face of the tile in either direction, it should be replaced. (See Tile Repair Instructions in the RTI / WSRCA Installation Guide)
- Tile profile - A contoured or rolled profile tile has distinct water courses that control and direct water flow. Flat tiles allow water to flow evenly across the face of the tile. Since the longitudinal interlocks are normally positioned near the high point of profile tiles, they will usually see less water than the interlock of a flat tile. It follows that broken corners would be less critical on profile tiles than on flat.
- The underlock portion of the tile will carry water even if the cover lock corner is chipped or broken. Since the required overlap of the installed tile is usually three inches, it logically follows that any broken corner exceeding three inches in length should qualify that tile for replacement, whether it is the under or cover lock portion of the tile. It is generally advisable to replace tiles with broken under locks.
- If the cover lock corner is broken less than three inches, or less than the length of the headlap, and the broken piece is available, it may be possible to repair the corner by proper adhesive application. Using an adhesive specifically formulated for concrete roof tile, follow the manufacturer’s instructions to form a complete bond along the fracture. Take precautions not to allow excess adhesive to bond to the adjacent tile or create water blockage in the under lock.
- If the corner piece is not available, aesthetics become a factor that must be considered. A small chip that may not be noticeable on a shallow sloped roof may be offensive to the owner at a steeper slope. In any case, good judgment should dictate whether the missing corner affects the integrity of the water shedding capability of the tile.

- On some tile designs, such as Split-shake and Cedarlite, the bottom edge of the tile is distressed to create a more jagged or random appearance. This process will sometimes create small chips that should not affect the integrity of the installation provided they meet the criteria mentioned above.

## HOW DO TILES GET BROKEN?

Sometimes in shipment and delivery, pallets of tile may be mishandled or bumped. Most often the damage is slight and the tiles are still usable. Tiles with chipped or broken edges can usually be installed at hips, valleys, rakes or other places requiring cut tiles. These tiles should be identified and sorted during the loading process.

Why do corners sometimes break after installation?

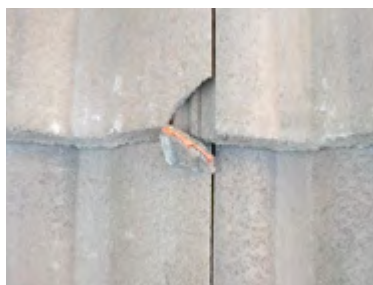
The corners of the tile at the interlock are the thinnest portion of the tile and as such are the most susceptible to damage. When properly installed, there is usually no problem with corner breakage. If the tiles are not properly aligned however, there is the potential for point loading that puts irregular pressure onto the corner, causing it to fracture. This most often happens when the tiles are applied too tightly together. Most tiles are designed to be installed with a 1/16 inch shunt or separation between the tile bodies. If this shunt is not maintained, damage from foot traffic or the expansion and contraction of the roof deck could result.

Debris left in the channel during application could also result in point loading that may break the corners under foot traffic. Sometimes, tiles can have hairline cracks that are not noticed during the original installation but show up as broken corners long afterwards. This is the most common explanation of damage where “no one has ever been on the roof”. Since tiles do not simply break by themselves, a one time repair will typically solve this problem.

## PROPER CORNER REPAIR



**Figure 1.** Broken cover lock corner



**Figure 2.** 1/16" bead of adhesive is the ideal amount that will form a proper bond and not squeeze out to block water flow.



**Figure 3.** Properly repaired corner is not visible from the ground and maintains the water-shedding integrity of the tile. The important issue is to not use too much adhesive.