



## THREE-TAB SHINGLE TOLERANCES

by Tom Bollnow

Each month in this column, NRCA's technical services staff will answer readers' technical questions. If you have a question you would like answered, send it to Professional Roofing magazine, 10255 W. Higgins Road, Suite 600, Rosemont, IL 60018-5607; or fax (847) 299-1183.

**Q:** What is the acceptable tolerance for three-tab asphalt shingle alignment?

**A:** There are no published tolerances for cutout locations regarding overall alignment of individual three-tab shingle strips. Dimensional variations of individual strip shingles are not common problems. However, if variations in shingle lengths are significant, the cumulative effect of the variance could result in divergent butt lines or misaligned cutouts.

ASTM D 225, "Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules," states that shingles shall not vary more than plus or minus 1/4 inch (6 mm) from nominal dimensions established for each style and size. ASTM D 3462, "Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules," states that shingles shall not vary in length or width by more than plus or minus 1/8 inch (3.2 mm) from nominal dimensions established for each size and the length (long dimension) of shingles without cutouts shall not vary by more than plus or minus 1/4 inch (6 mm).

The asphalt shingle production process uses fiberglass or organic reinforcement

mats as carriers on which shingles are built. A mat moves as a continuous web through the manufacturing process, which culminates at the shingle cutting machine. The cutting operation determines its length and width and locates cutouts on three-tab shingle strips.

The visual appearance of cutout misalignment on a three-tab shingle installation typically increases in severity as the slope of a roof line decreases. If cutout alignment is a primary design concern, there are several application techniques that may minimize the cumulative effect of misalignment.

Racking, or the straight-up method, could be used. Racking refers to a vertical application of shingles as opposed to the more conventional lateral, or across-and-up, installation. However, racking is not recommended because of shingles' increased susceptibility to wind-uplift damage, greater possibility of shading and all alternate course butt-joint alignment that may increase moisture infiltration.

Another application technique is the use of alternative offset patterns. Generally, three-tab asphalt shingle installation follows the 6-inch offset method but may be accomplished using 4- or 5-inch offset patterns, as well. (See "Offset patterns for asphalt shingles," May issue of Professional Roofing, page 72.)

In addition, vertical guidelines can be used. Vertical guidelines are used for racking and as reference points for pattern alignments when maneuvering around and across obstacles, such as dormers or skylights.

Using vertical guidelines to align cutouts and compensating for misalignments by trimming or increasing butt-end spacing may produce shingle butt-end joints with gaps, overlaps or tight-fitted seams. These conditions may cause buckles, sags, or irregular lines at the joint or in the overlapping shingle.

Aesthetic problems associated with asphalt shingles generally can be significantly reduced by doing the following:

- Using installation practices and details based on accepted industry publications
- Selecting premium-grade asphalt shingles from manufacturers with documented, long-term performance records
- Arranging to inspect dimensions, workmanship and appearance of samples of actual shingle shipments for substantial projects

Dimensional variations of individual strip shingles seldom are an issue. However, the cumulative effect of variations in shingles' lengths may be significant.

Chalk lines can provide visible guidelines to help maintain proper vertical alignment during shingle installation. However, cutout misalignment up to 1/2 inch (12.5 mm) between adjacent courses from chalk lines may occur as installation moves across a roof system. This can occur even if asphalt shingles comply with American Society for Testing and Materials' standards for dimensional tolerances. Those variations in cutout alignment should not affect asphalt shingle performance.

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