

Roofing with Gold

by Martin Holladay

Since the use of metal roofing is growing, more and more builders and homeowners are faced with the choice between steel, aluminum, and copper. Still another choice exists: For those whose budget can stretch to about \$7,000 a square, there's always gold.

"We've done a lot of roofs over the years — a lot of religious structures and a lot of government buildings," says Michael Kramer, president and founder of The Gilders' Studio in Olney, Md., one of the four or five companies in the United States that specializes in gilding roofs. "We've also done some very high-end private residences."

An ounce of gold will cover about 100 square feet of roof. The standard size for a leaf of gold is 3 $\frac{3}{8}$ inches square. Gold leaf can be ordered in different thicknesses; generally, roof gilders specify a weight of 18 to 23 grams per 1,000 leaves, and a purity of 23.5 or 23.75 karats.

"Gold leaf is generally 100 to 150 atoms thick," says Kramer. Roof gilders usually use "patent" gold or gold "rolls," two types of gold leaf that come with a paper backing for ease of handling.

A gilded roof requires a waterproof substrate — in most cases, soldered copper. To prepare for gilding, a new

copper roof is cleaned with a thin acidic wash, and then primed with a yellow alkyd paint. The roof is then painted with an oil-based size, which acts as an adhesive. "You essentially glue the gold on, overlapping the sheets about $\frac{1}{4}$ inch," says Kramer.

Once the gold is applied to the sized roof, it sticks instantly, and can't be further adjusted. "You apply the gold and press it with your hands. Then it sticks to the size and separates from the paper," says Robert Marshall, a conservator and gilder at Marshall Gold Leaf Studios in Wexford, Pa.

After the paper backing has been removed, the gold leaf is pushed into place with the softest available brushes, which are made from squirrel hair. Gilders use the brushes to smooth and "skew" the gold — that is, to fold over and remove the overlapping pieces of gold leaf that are not adhered to the size. "Once you're done skewing, you basically leave it alone, exposed to the world," says Marshall. "Gold is a very noble metal and doesn't need a coating."

Surprisingly, a gold roof won't last much longer than an asphalt shingle roof; about 20 to 30 years is average. Gold will not tarnish, and it's not damaged by acid rain. But a gold roof has two enemies: dimensional changes from temperature swings and abrasion. As the roof's copper substrate expands and contracts, small cracks between the gold leaves eventually allow the primer and size to dry out and fail. Abrasion from birds and dust storms also takes its toll.

But if you can't afford regilding in 25 years, at least you don't have to worry about leaks: The roof's copper substrate will still remain watertight for decades.



MARSHALL GOLD LEAF STUDIOS

Debbie Prady from Marshall Gold Leaf Studios applies 23.75-karat gold leaf to the roof of the historic Indiana Court House in Indiana, Pa.

