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## Roofing with Polymers

Posted by **Matt Power, Editor-In-Chief**

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The problem with plastics is that they don't go away. Eventually, they break apart, but only into smaller pieces—not into their basic components. At a certain point, they become prone to absorbing nasty chemicals such as DDT. The particles ultimately find their way into the oceans, where fish eat them, mistaking them for plankton. Result: Ecosystems are poisoned from the bottom up.

The extent of plastic polluting the planet—especially the oceans—has just come to light. The problem is far worse than anyone imagined. The North Pacific Subtropical Gyre, a massive ocean wasteland of (mostly) plastic pollution, first discovered in 1997, now covers an area the size of Africa. Rubber, too, is a huge problem.

What does all this have to do with plastic-composite roofing? Plenty. With millions of tons of manmade polymers already part of our world—and no way to break the molecules down—the best alternative may be to reuse the stuff—to recapture it and turn it into products and materials that take advantage of plastic's semi-immortality. At the same time, any virgin plastics should be fully recyclable at the end of their product life. Polymer-based roofing products—faux slate, faux tile, and faux cedar shakes are showing how to put plastics to good (re)use.

### The Bottom Line

From a roofing contractor or builder's standpoint, polymer roofs are an easy sell. They're lighter and thus easier to handle and install than clay or slate. They require less maintenance and can last twice as long as cedar shakes. Also, polymer surfaces are smooth—with no granules to tumble into gutters, so they're well suited for rainwater collection. RPM roofing (see link below) actually tested that assumption with good results.

Most polymer products have a Class 4 impact rating and Class A fire rating, with the exception of Global Hybrid's "Old World Spanish" barrel tile, which has a Class C rating—because of its shape. Also, all of the products mentioned here have a 50 year or greater warranty, and most come in several colors, not to mention dozens of possible combinations.

With so many good features, why isn't plastic roofing taking over the market? Simple. Most brands cost about three times that of asphalt shingles—pushing it over into the custom home/boutique category.

Unfortunately, people who are willing and able to pay three times as much for their new roof often are not the most environmentally minded. That means the roofing needs to look enough like the natural product it emulates—slate, cedar shakes, or clay tile—to satisfy people with demanding visual tastes.

Frederick Depp, owner of **Windward Exteriors** in Gaithersburg, Md., has been installing natural slate, clay tile, and EcoStar plastic composite products for several years, primarily on high-end custom homes,

"One of the things that has given [plastic composites] a black eye in the past is poor installation," he explains. "You'll get several pallets on the jobsite with 80 or 90 bundles on a pallet. But you have to mix the colors from the different

pallets, and really blend them. There's an intentional shade difference between pallets. It's part of what gives them a natural look."

If the shingles aren't mixed properly, he explains, the roof elevation will look blotchy, with large blocks of a single color. If all that mixing of products sounds time consuming, Depp says not to worry. "Once you get into a rhythm it's pretty easy," he says. "We've done it enough ... we should know. You don't need mathematical precision—the only time we actually count shingles is if it's a special blend like Mountain Plum, where you have 10% of a different color."

Not all synthetic roofing products require that extra step, however. For example, DaVinci Slate comes premixed with exact proportions of each shade within each bundle.

## Optimizing the Details

With any durable roofing, the longevity of the product is only as strong as the underlayments and fasteners. A 100-year clay tile roof with a 30 lb. felt underlayment is unlikely to live out its potential. The same is true of plastic-based composites. Brands tend to vary on these details. EcoStar requires stainless steel fasteners. Other brands typically call for corrosion-resistant or galvanized fasteners. Some companies offer proprietary underlayments and venting systems.

"When you've got a 50-year-plus roof you're going to want a high-quality copper flashing," says Depp. "You also definitely use stainless steel fasteners. With a product like EcoStar, we use their Aquaguard underlayment, along with ice and water shield on the eaves. They also make their own ridge vent called Attic Guard.

Depp also notes that polymer products should only be applied over a clean deck, so that durability of all components is ensured. Synthetic roofing tends to weigh about the same as standard or architectural asphalt shingles.

## Regional Advantages

Builder Curtis McLachlan has specified DaVinci's synthetic slate product in the Lake Tahoe, Nev., highlands for several years. The area is a rugged testing ground, with heavy snowfalls and aggressive freeze-thaw temperature changes.

"I like to make houses look like they belong here," he says. "These products do a real good imitation of slate, and it's long lasting, fireproof stuff. Also, up here in snow country, wood shingles and shakes are a fire hazard. They take a real beating because of the snow and ice buildup. I had used architectural (asphalt) composition shingles, and I like those because they hold the snow. Metal roofs don't work up here unless it's a small cabin because the snow tends to slide off and break things—rails and fences. That's why the composites are a good fit. They're 50/50—meaning they hold the snow for a while, then shed it. I tend to put a snow pull on so the owner can remove the snow and control it."

>

The polymer products, he says, are less likely to tear when removing all that snow. He puts an underlayment of ice and water shield over the whole deck. In the five years or so that he has been using the product, he says, he's never had a shingle fail, fade significantly, or fall off the roof.

"It was my roofer that actually brought the idea to me in the first place," McLachlan recalls. "He liked the look of it, and the fact that it's lightweight."

## Selling Up

The "faux" cosmetics of synthetic roofing may be its strongest selling point, but that doesn't mean you can't sell the product based on its other strengths. Is cost is the main concern, even the most transient buyers may see the value in a product with very high resale return. In-house research by Enviroshake suggests a 70%–80% return on investment (ROI). For clients building their "last home," or a home for their family members, there's always the "cost-over-time" approach. A polymer roof may cost much more than asphalt initially, but studies have shown that because it requires very little maintenance and lasts for decades, it's a better deal over the long term.

Time Interval	Polymer Roof	Asphalt	Cedar Shake Wood	Slate Stone
Current Materials Cost	\$21,250	\$2,800	\$ 9,150	\$30,000
Current Installation Cost	\$ 4,100	\$4,100	\$ 8,450	\$10,200
Current Total Cost	\$25,350	\$6,900	\$17,600	\$40,200

15 Years		\$6,900		
30 Years		\$6,900	\$17,600	
45 Years		\$6,900		
60 Years		\$6,900	\$17,600	
75 Years		\$6,900		
90 Years		\$6,900	\$17,600	
Total Materials Cost	\$21,250	\$19,600	\$36,600	\$30,000
Total Installation Cost	\$ 4,100	\$28,700	\$33,800	\$10,200
<b>Total Cost Over Time</b>	<b>\$25,350</b>	<b>\$48,300</b>	<b>\$70,400</b>	<b>\$40,200</b>

Source: Adapted from [rubburconcepts.com](http://rubburconcepts.com). The company could not be reached and may be defunct.

Polymer-based roofing tends to cost more initially, but because it requires almost no maintenance and has high durability, it's a sound investment over time.

Also, at least one manufacture—RPM Roofing of Terra Haute, Indiana--has focused on cutting the up front costs of its polymer products. RPM offers 100% recycled (except UV stabilizers and colorants) roofing products at a cost similar to that of architectural asphalt shingles. Randy Zych, the company CEO, says he has kept manufacturing costs by cutting out the middle man. Engineering, design and production are done at one central plant.

"We're also doing a lot of automation, he adds, shipping everything direct from this plant, and keeping an eye on the bottom line. We'll also ship directly to the end user."

Polymers, for better or worse, will probably outlast human beings on the planet. Since we're stuck with this material, why not put it to a use that solves a basic human need—a roof over our heads—at the same time keeping more plastics (and rubber) from entering our ecosystems at the molecular level. Long live synthetic roofing!

### Polymer Roofing Products--Side by Side

#### Percent Recycled Polymers

DaVinci	0%	TPO
Enviroshake	95%	plastic* and EPDM
EcoStar "Majestic Slate"	80%	TPO and EPDM
Global Hybrid Roofing "Old World Spanish"		60%-80% not available
RPM Roofing	100%	polypropylene ** and EPDM

\*type of plastic not identified by company

\*\* from medical waste

### Additional Information

#### Plastic Composite Roofing

DaVinci  
[www.davinciroofscapes.com](http://www.davinciroofscapes.com)

EcoStar  
[www.ecostarllc.com](http://www.ecostarllc.com)

Enviroshake  
[www.enviroshake.com](http://www.enviroshake.com)

A 90 YEAR FAKE SLATE POLYMER ROOF?

Global Hybrid Roofing Solutions(formerly Titan Roofing)  
[www.globalhybridroofingsolutions.com](http://www.globalhybridroofingsolutions.com)

RPM Roofing  
[www.rpmroofing.net](http://www.rpmroofing.net)

**Durable Underlayments**

Benjamin Obdyke  
Synshield  
<http://www.benjaminobdyke.com/visitor/product?key=synShield>

Johns Manville  
Durabase  
DuraBase, an asphalt and nonwoven polyester roofing underlayment

**Additional Synthetic Roofing Projects--Photos**

Curtis McLachlan  
[www.woodfitter.com](http://www.woodfitter.com)

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