

PAINTING LESSONS

Paint problems come in dozens of forms due to hundreds of possible causes. Some, like paint that blisters because it was applied to damp wood, are usually obvious and easy to diagnose. Others are obscure. But most lie somewhere in the middle — just mysterious and new enough to dodge your precautions, but common enough to catch you sooner or later.

We talked to painters around the country to round up some of the troublesome paint problems they had run into. Here are their stories.



Case studies teach how to steer clear of exterior paint failures

by David Dobbs

Fading Fast

Painting contractor Mark Robson, whose Ram-Mar Painting is based in Santa Barbara, Calif., recently painted a high-end multi-unit condo project in Newport Beach.

The problem. The building interiors were spec'd out in straight white, both walls and trim. The plan called for a good oil enamel on the baseboards and a lot of other interior trim that normally doesn't get a gloss finish. The walls were flat latex. And within six months, the trim in some of those houses was almost a mustard color next to the white walls. The enamel had yellowed, but the flat latex remained white.

"The builder wanted to know if we were using a defective paint," said Robson. "But we used just what he told us to. He tried to correct it by painting again with another batch of white oil enamel, but it yellowed too."

What Robson had run into was, as he put it, "a two-fold problem that blind-sided nearly everyone": a regional decorating trend calling for straight white enamels on trim surfaces; and new environmental regulations that have compromised the fade resistance of those same oil-based enamels (see "Coping with Low-VOC Paints," 6/90).

"All oil-alkyd resin materials yellow," said Robson. "But they yellow more now than in the past because of the higher resin content in these

low-VOC paints. The yellowing effects can be dramatic in as little as three months. And it's especially noticeable because of the extremely light colors that people are asking for — whites and near-whites."

Robson found that the degree of yellowing varied with exposure to sunlight. Surfaces that got little or no sunlight yellowed faster than those that were well-lit. Sunny living rooms, he said, might not have a noticeable problem, while a closet or the interior of a cabinet would have mustard-colored trim.

"And to add to the problem," he said, "some of the people who own these condos use them only in summer. They close them up the other nine months — lights off, curtains shut. They walked in nine months later and it was like getting hit with a sledgehammer."

The fix. Robson, who strongly prefers oil for anything spec'd for enamel because of its superior sheen, says there's no great way out of this jam.

"One option is to use latex. But latex has its own problems. It doesn't stand up to abrasion and washing as well as oil does, and it doesn't stick to previously painted surfaces as well unless you really prep the surface. It can freeze windows shut and stick other surfaces together, though latexes are better about that than they used to be. Sometimes it doesn't cover as well as an oil material would, on both old and new work. But mostly, you

just cannot get the appearance, feel, and hard durability of oil out of a latex enamel."

He prefers changing the color to off-whites since these tend to be yellow-gray to begin with. "Off-whites won't fade as greatly — at least it won't jump at you when you walk in the room. Use something as dark as a Navajo White and you're probably not going to have problems with the homeowner. It will discolor, but probably not enough to notice. Lighter than that, though, and you're taking chances if you're using oil."

Slippery Stucco

Where Robson paints, in southern California, spray-on stucco — actually a plaster material — is a popular exterior treatment. But Robson has found that the prep work done by stucco subs can foul things up for the painters.

The problem. Robson's crew painted the woodwork on an entire 40-house subdivision. It looked fine when they finished, but the paint on the exterior of the window frames peeled off in less than three or four months. It was worst nearest the glass, but peeled well away from the glass as well.

With a little detective work Robson discovered that the plasterers, who spray the stucco over the outside walls, had sprayed an oily solution over all the windows. Like greasing a frying pan, this lets any stucco that hits the glass come off

easily.

"But too often," said Robson, "whoever is shooting the stuff isn't too worried about how much they get everywhere else, like on the window frames. So the oil impregnates the wood around the windows, and then the paint won't stick to it. It's easy for us to overlook that the stuff is there. And there's no way to get it out of the wood anyway."

In the end, Robson had to go back to the site, scrape all the peeling paint off the window frames to expose bare wood, wash the wood with solvent, and reprime and repaint. (The builder paid for it all.) But even with these steps, says Robson, the longevity of the finish coat will be compromised.

To avoid this problem, Robson now warns the builder and offers advice on how to prevent it: Have the plasterers mask the windows; leave the window casings off until after the plasterers are gone; or have the painters come out ahead of the plasterers and prime the windows. Of these, priming is the least effective, since the oil will still stick to the primer, which will require cleaning afterward. Keeping the oily solution from ever hitting the window frames in the first place is the best prevention and keeps painting costs down.

"Of course," he said, "there are some whiny painters out there, so sometimes the builder just doesn't believe us."

Mildew appeared on this house (right) in Momence, Ill., within a year of repainting. Decorator Margaret Clifton traced the problem to new blends of oil-base paint that don't contain mercury mildewcides. Where a ten-year-old Sears paint was used on the porch (far right), the walls were still gleaming white.



Mildew Mystery

For many jobs, painters still look to oil-base paints for superior performance. But Margaret Clifton, of Prairie's Decorating Service in Momence, Ill., found out the hard way that new formulations don't always act like the old blends.

The problem. "In June of 1989, our local veterinarian — we call him Doc, he's retired and in his 70s — had us paint his house. It's a big house on a big corner lot. A real showpiece. Doc had always used oil paint, so he really wanted oil. So we spec'd the top-of-the-line oil from our supplier. Doc also had some old Sears oil paint from 8 or 10 years before, and he wanted to use that up, too. We were leery of that, but he wanted it, so we told the painter to put it on the garage and on the porch, where it would at least be sheltered. As for the garage, we figured it would make less difference there if it faded early or went bad.

"The painters did a great job. The house was sparkling, and all fall, winter, and most of the spring it looked great. Strangers would compliment the owners on how good the place looked."

But in June of 1990, Doc called Clifton and asked her to drop by — there was something he wanted to show her. When she drove up, it was clear what he wanted her to see. The expensive oil-base paint she had spec'd had turned gray on every side of the house — with mildew. There was no doubt whatsoever it had grayed, for the Sears paint on the porch and garage was still sparkling white.

"We called the paint company. A rep came out, looked it over, and confirmed it was mildew and that it was pretty bad. He said the cool, damp spring we'd had probably accelerated it.

"I asked him, Why the porch? He said the old Sears paint almost surely had mercury in it, but his company, anticipating the ban on mercury, had removed mercury from all their formulas several years before. The mildewcides they used now, he said, just weren't as good. He further explained that mildew feeds on oil, so it had plenty of good feed."

Doc wanted to know why it was on his house and not his neighbors'. The rep said the other houses might be painted with paint containing mer-

cury, or perhaps they were painted with latex paints, which aren't as likely to get mildew. He also said that mildew spores travel airborne, and that it's somewhat random as to where they land and thrive. At the rep's invitation they rode around the neighborhood and saw many other houses with mildew problems, usually under windows, under eaves, and on the shaded sides of the houses. "But there was one big house on Main Street that had it as bad as Doc's," said Clifton. "I called them and they said they too had used a top-of-the-line oil-base paint."

The fix. This lesson on mildew and mildewcides didn't satisfy the doctor. Nor did the rep's recommended "solution": Wash the house with a mixture of one part chlorine bleach to three parts water and one part trisodium phosphate. That, he said, should remove the mildew, but it wouldn't prevent it from coming back. To do that, he would probably need to repaint with a latex — which, though the house had been prepped beautifully for the oil-paint job, would nevertheless be expensive, because the painters would have to sand the whole house to rough up the nice glossy finish of the oil paint.

In the end, said Clifton, the client decided he'd accept it if the paint company would pay for the cleaning of the house with the bleach.

"The big problem," said Clifton, "is that there's such a contrast with the old Sears paint. Where we used the oil it's all gray — but the porch and garage are beautiful white. That sure doesn't help matters."

Dew Point Dilemma

In Stowe, Vt., where painting contractor Jay Bowen of Eastern Painting and Refinishing is based, the painting season is short, and summertime brings heavy use of the second homes and resort sites that make up much of his work. So Bowen must often paint exteriors in early spring or late fall, when cold evening temperatures can bring heavy dew. Six years ago, this dew nearly took the paint off the large colonial he was repainting in Burlington, Vt.

The problem. The 150-year-old house needed major prep work: scraping and sanding right down to the wood. Then Bowen's crew applied an

oil primer and two coats of white latex finish on both the clapboards and trim. This was in late September.

"We finished brushing the second coat on a nice fall day with the temperature in the 60s. We worked until late in the afternoon, and as we were putting away our brushes it got cooler and damp. It didn't start raining, but a sort of mist developed as it got dark. It stayed foggy all night. But most of the paint had tacked up nicely before we left, so we felt we'd be all right.

"When we went back the next day to hang the shutters, we found the siding on two sides of the house was completely wet — as wet as if we'd just brushed it on. Most of it wasn't quite dripping wet, but some of it had run off onto the bushes. This scared the hell out of us. We thought we were going to have to take it all off and start over."

The fix. "Because the paint was still so wet, we were able to brush out what was on there, using a can of paint to keep the brushes wet. Had the paint been oil," said Bowen, "a skin would have formed, and the water from the dew would have discolored everything. Then we would have had to let it dry, sand it, and repaint. With the latex, there was no skin and we could pick up where we left off."

They were also fortunate that they arrived on the job early in the day, because if they had waited until afternoon, the drips would have hardened, and they would have had to scrape or sand. "We just got real lucky," said Bowen. "Plus it happened to be a good sunny day, so by the afternoon our backbrushing work had set up nicely. We never had any problems with that house. That paint job is six years old now. We went back last year for a little touch-up work, and the job was basically in great shape."

The moral of this story, says Bowen, is that with a high dew point (high relative humidity and cooler nighttime temperatures) and a short day, you can get into trouble. In fall and spring he now pays attention to weather forecasts to find out whether the overnight low is expected to dip below the dew point. Then he keeps an eye on the weather in the afternoon so he can leave the paint sufficient time to dry. "If there's any chance that we might get a big enough drop in temperature to cross the dew point," said Bowen, "we knock off with a couple of hours of

daylight left."

Double-Coat Troubles

Bowen was once called in to diagnose and correct another problem that turned out to be caused by damp paint. This one, however, was brought on not by the weather, but by the original painting contractor's impatience.

The problem. "It was on a big, new house in Stowe, Vt., that was sided in cedar. We were called in to look at it four months after the original job was done. They had put on two coats of an oil-base solid stain. Both coats were bubbling right off the surface. This was on two or three areas of the house — the back, and two areas on one side. So we suspected an application problem rather than a problem with the wood or the stain.

"The factory rep from the stain manufacturer was called in to take a look, and his best guess was that the first coat hadn't been allowed to fully cure before the second coat was put on. At that point the owner recalled that the shaded front of the house — which was the side in best shape — had been first-coated one afternoon and top-coated the next. The problem sides, on the other hand, got two coats in one day, and got a lot of midday sun.

"This is actually a fairly easy mistake to make with solid stains," said Bowen, "because they can appear dry on the surface but still be damp underneath. If you put a second coat on at that point, the solvent in the first coat won't be able to evaporate, and it'll bubble the stain. In this case, the sides in question were exposed to the sun, so after a first coat in the morning, the painters probably checked it at lunch and found it dry to the touch. But underneath, the first coat hadn't cured.

"This was also in the spring, so they might have felt some time pressure, because you don't get that many good painting days in spring here. It may rain three or four days, then you'll get a forecast for two or three days of good weather, and you want to jump right on it. But you should really give it a day to dry out.

"The same thing can happen with an oil-base paint. It's less dangerous with a latex, since it can breathe. But oil-based coatings can't."

The fix. For this reason, Bowen likes to let all oil-base coatings cure for

Great Paint Debates

Many painting questions are perennial topics of debate. Oil versus latex often tops the list. But following close behind are three other questions builders and painters must answer when building and painting any house with wood siding:

- whether to backprime the siding before installing it;
- whether to apply the siding rough side out or smooth side out; and
- whether to “weather” the siding by leaving it exposed for a while before painting it.

Vermont painting contractor Jay Bowen ran into all three issues on a recent job, when he painted a new house sided in cedar with two coats of oil-base solid stain. Six months after painting the house, he was called back because the stain was bubbling in some areas. He called a representative from the paint manufacturer, and together they concluded that:

- the wood had not been allowed to weather enough, so that the moisture and extractives contained in cedar were pushing the paint off;
- the “mill glaze” (a smooth gloss left on the siding by the mill’s cutting equipment) on the painted smooth side of the siding inhibited a good paint bond; and
- moisture coming from inside the house and through the siding, which was not backprimed, also contributed to the problem.

Little wonder that Bowen feels uncomfortable painting new siding that is smooth-side out and that has not been backprimed. But as a painter, he usually isn’t consulted by the builder on how the siding will go up and whether it gets backprimed — he just deals with what he finds. If he was consulted, he says, “I’d say backprime it, put it smooth side out, let it weather a few weeks, then put on a full coat of oil primer and two coats of latex finish coat. That would give me a system I’d feel comfortable guaranteeing.”

In fact, a primer and two top coats of paint over a well-prepared surface should last 6 to 12 years, according to paint researchers at the U.S. Forest Products Lab in Madison, Wis. With just one coat of paint over a primer, the expected life is reduced by half.

Backpriming. On backpriming, Bowen stands firmly with the growing industry consensus. Most siding manufacturers, such as the Western Wood Products Association, and most coatings suppliers recommend backpriming, according to Fred

Churchill, who owns Churchill Coatings of Worcester, Mass.

Essentially, explained Churchill, backpriming is a way of giving the siding its own vapor barrier to protect it from moisture being pushed out of the house. If the back of the siding is roughly the same permeability as the front of the siding, moisture movement in and out of the wood is both slowed and equalized, and the extremes of moisture and dryness, swelling and shrinking, are reduced.

Without backpriming, moisture absorbed through the back of the siding will then push off the paint on the front as it tries to find a way out. The result is blistering, peeling, and cupping wood.

Rough side vs. smooth. The question of whether to mount siding smooth side out or rough side out is less clear-cut. To Jay Bowen, the question of smooth versus rough is intertwined with that of weathering.

“If it’s rough side out,” he says, “you can paint right away. If it’s smooth side, I like to let it weather a few weeks so the grain opens up a bit. Rough side means more difficult application — you have to both spray and heavily backbrush. Smooth side is easier to brush, or it can just be sprayed with some spot backbrushing.”

Bill Feist, who has studied the fine points of paint-to-wood bonding for over a decade at the U.S. Forest Products Lab in Madison, Wis., argued that Bowen is putting the cart before the horse. Rather than matching the paint treatment to the siding presented, he said, “the question of smooth versus rough should be determined by what finish you’re going to put on it.”

If you’re applying a paint, said Feist, leave the smooth side exposed. This is mainly a matter of ease of application and aesthetics. It will be less prone to cause air pockets or gaps in the paint surface, allow the paint to level more evenly, and produce a much smoother, more attractive finished surface — which is the look people spec’ing paint are after in the first place.

If you’re applying anything called

a stain, however, Feist recommends coating the rough side. This includes so-called “solid stains,” which are oil-based formulations with a pigment level heavier than semi-transparent stains but lighter than true paints. The rough side, he said, will better absorb the oils in the stain and allow application of more stain (up to 2 to



Blistering paint is the unsightly result of moisture pushing through from the interior of the building. Backpriming the siding is the preferred method of preventing the problem.

3 times as much as on the smooth side), providing more long-term protection. This penetration is more important for stains than for paints, because stains preserve wood primarily with their penetrating oils, while paints preserve with their impermeable opaque film. As for aesthetics, a stain is expected to show the wood’s grain, so the rough side’s noticeable grain and rough appearance won’t be a liability.

Whether to weather. Bowen’s method of letting smooth-side siding weather for a few weeks follows what for years has been the conventional wisdom — that weathering allows rain and sun to remove extractives from the surface of the wood and opens the grain, allowing primer or stain to better penetrate the surface and create a better bond.

According to Fred Churchill of Churchill Coatings, this approach was also recommended during the mid-1980s by many paint manufacturers to solve a problem known as “mill glaze.” Most commonly seen along the upper East Coast, mill glaze is, depending on whom you talk to, either the smooth, shiny, surface put on siding by the faster mill equip-

ment of the mid-1980s, or a film of extractives that form during drying. Bill Feist said that 95% of the mill glaze reports he has received have come from the upper East Coast, suggesting the problem might be due to either cutting equipment or drying methods used by the Canadian mills that supply much East Coast lumber.

Mill glaze or no, Feist argued strongly that

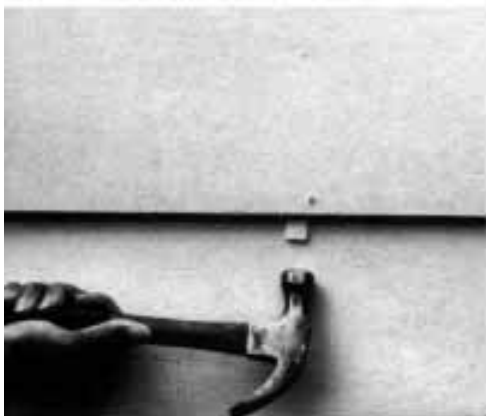
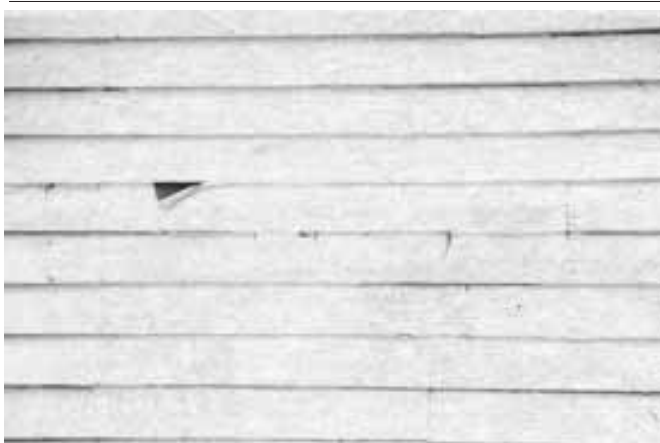
weathering wood compromises the wood’s ability to hold paint or stain. For a study he wrote in 1987, “Paint Adhesion to Weathered Wood,” Feist exposed several batches of siding to the weather, painting one batch immediately, then painting the rest at two-week intervals. Then he kept an eye on the paint-to-wood bonds to see which fared best.

He found that siding weathered longer than two weeks formed a significantly weaker bond to paint than did siding painted immediately after installation. He concluded that after two weeks the top layer of wood became too compromised structurally to hold the paint well. “The lignin, the natural glue that holds the tree together, is degraded by ultraviolet light. That loosens up the wood surface fibers, and then you’re trying to put a coating onto a less coherent, uniform surface. It’s very similar to a sunburn on skin, or rust on metal — it oxidizes. The whole substance is less adhesive.”

This may actually improve initial penetration and bonding, says Feist, but it will also lead to early paint failure. In other words, you won’t likely get called back in six months, but you might get called back in three or four years. His report therefore “strongly recommended that any unprotected wood [to be painted] not be allowed to weather outdoors for more than two weeks before it is protected with some finish that will prevent photo-degradation and water damage.”

Feist suggested that instead of weathering smooth-side wood, painters should prep the surface by either lightly sanding it or, preferably, power spraying with water as soon as the siding is up, letting it dry for a day or two, and then painting. The spray-and-dry treatment, he said, will give the good effects of weathering — the removal of extractives from the surface and the slight opening of the grain from wetting and drying — without the bad effects, which are due primarily to ultraviolet degradation from exposure to sunlight.

— D.D.



No vapor barrier and high indoor humidity caused severe paint peeling on this building (above). Painting contractor Jay Bowen found that driving small wedges (left) under every sixth row of siding, 2 or 3 feet apart, allowed the moisture to escape and solved the problem.

at least 24 hours before recoating, while he'll recoat latexes after only 12 hours.

As for the cure on the Stowe job, Bowen had to scrape the bubbled areas off and repaint. "That was most of the material on those two walls," he said. "You could scrape it off with one pass of a sharp scraper."

After scraping he left the surface bare for two or three days to let it dry, then resealed it with another linseed-oil-base solid stain. He let that dry for another three days, then put on the second coat. The house didn't have any more problems.

Vapor Barrier Blues

One of the most common causes of paint failure is moisture being pushed through the siding from behind, due to high indoor humidity and the lack of a good air and vapor barrier. The ideal solution for this problem is to install vapor barriers indoors, ventilate baths and kitchens, and backprime the siding. A house wrap can also help by keeping moist interior air from getting to the back of the siding. But owners may balk at the expense of these measures. Jay Bowen found an innovative way to increase paint longevity on a building he was painting all too often.

The problem. "There's one commercial building we used to do every two years, in Stowe. It was a big clapboard building near a river, with shops downstairs and apartments upstairs. It was about 150 years old. Every year the whole thing would peel.

"The first time we went back and spot-scraped and painted. It peeled in two years. So we did it right — scraped

it down to the wood, put on an oil primer and two coats of good latex. Within a year it was peeling like crazy."

The side that peeled the most faced a river, but it also got a lot of sun in the afternoon. So it was prone to pick up moisture at night and dry in the day. But the main problem was from within. "You could look at the outside walls and see exactly where the bathrooms and kitchens were, the peeling was so bad there," said Bowen. "We knew we had to get rid of that moisture. But the owners didn't want to re-side the building."

The fix. Since Bowen couldn't keep the moisture inside, he decided to let it get out easier so it wouldn't peel the paint. His solution was to tap wedges under every sixth row or so of clapboards, spaced about 3 or 4 feet apart. The tiny wedges were just big enough to leave a fingernail-sized gap. He also put a few round, one-inch vents into the walls, and primed the whole thing with Zinsser's Bull's-Eye (William Zinsser & Co. Inc., 39 Belmont Dr., Somerset, NJ 08875; 201/469-8100), which is designed to prevent cedar and knot bleed, and followed that with two coats of latex.

"We had no further serious problems," said Bowen. "There were still areas that would peel, but it wasn't the same drastic peeling problem. We'd just have to spot scrape down to bare wood, put on an oil primer and two coats of latex, and they'd be all right for a few years." ■

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