

Not too long ago, someone asked The Rohm and Haas Paint Quality Institute “What causes exterior paint to fail?”

Actually, all exterior paint exposed to the weather will eventually fail at some point, no matter how well it has been applied, usually by cracking and/or loss of adhesion, or by erosion to the substrate.

How long a paint job will actually last depends on a number of factors, including the nature and condition of the substrate, the type of coating applied and the severity of the weather the paint has to stand up to.

So, a more helpful question to ask is, “What causes exterior paint to fail prematurely?” With that question in mind, here are seven factors we have observed as frequent causes of early paint failure:

1 Failure to smooth rough edges

Paint will not adhere well to an “unstable” surface such as old paint that exhibits marginal adhesion. Scraping is the usual method of removing this type of surface, but it can require special attention. That’s because the paint remaining after the worst has been scraped off will probably have rough edges. When new paint is applied, it can flow over these rough edges, resulting in inadequate thickness and creating areas of vulnerability where it can fail prematurely.

The preventive measure is to taper the edges of the old paint by “feather sanding” them, using medium grit (#120) garnet paper for general exterior use, and finishing with fine grit (#220) garnet paper where close-up appearance is important with semigloss and gloss paint.

However, don’t be too aggressive with your feather sanding. Painters report, for example, that power sanding may generate enough heat to degrade the adhesion of the old paint, resulting in failures. And, of course, do **not** sand if lead may be in the old paint.



Premature Failures

2 Failure to prepare weathered wood

Controlled exposure tests conducted by The Rohm and Haas Paint Quality Institute and others have clearly shown that, all else being equal, primer and paint will not adhere to wood that has been weathered as well as it will to the same wood that has not been weathered. Even exposure for just a few weeks before painting can make a

significant difference. The result could be cracking and peeling after just a year or two rather than good performance for far longer.

Prior to priming or staining, refresh the surface of weathered wood by thorough sanding. Remove any wood that is gray from weathering. Medium grit (#120) garnet paper works well. If you're going to ultimately apply a gloss or semigloss paint, re-sand with fine grit (#220) sand paper.

Power washing can also be effective, but be careful that the water jet does not cut into and damage the wood. For this reason, it is best not to use power washing on softer siding woods such as cedar and redwood, particularly if well weathered. If power washing, use plain water without a cleaning agent or bleach.



3 Failure to use a primer

The benefits of using an appropriate primer are consistent with those gained from good surface preparation. They include maximizing all of the following:

- Adhesion of the finish coat
- Uniformity of sheen or gloss
- Hiding and hiding uniformity
- Gloss development of the finish coat
- Mildew resistance
- Lack of discoloration from the substrate

In general, prime any surface that has not been previously painted. Also prime any surface areas exposed by loss of paint, such as those that have peeled after years of exposure or have been exposed as part of surface preparation. It's important to note that almost any paint job, even over existing surfaces that are sound and continuous, will benefit from the application of an appropriate primer.



4 Failure to correct a source of water behind the substrate

Even though a surface has been properly prepared and painted, the presence of moisture behind the paint can result in blistering and peeling.

On masonry surfaces, moisture from behind can also carry white, crystalline salts ("efflorescence") to the surface, which can lift the paint or accumulate on the paint and ruin its appearance.

Some common sources of water intrusion are:

- A crack or split in the exterior wall or siding that allows rain to enter
- A faulty seal or caulking at corner joints or where siding meets trim, particularly around windows and doors
- A cracked or open wall cap or chimney cap
- An open chimney top that allows rain to enter and run down the flue until it makes its way into the wall (A rain cap placed over brick and stucco chimneys can often avert this.)

If you can't eliminate the source of water intrusion yourself, be sure to make your customer aware of the situation so that he or she can take the necessary corrective action.



5 Failure to apply paint at the correct spread rate

While a painter may feel good about getting extra coverage out of each gallon of primer or paint, many key properties may suffer. These include crack resistance, mildew resistance, durability and, in the case of primers,

stain blocking and corrosion resistance.

All of these properties are directly impacted by dry film thickness. In short, the thicker the film, the better the coating will perform

in each of these properties. So be sure to follow the manufacturer's recommended spread rate.

Thinning paint prior to application can also compromise these properties. Thinned paint applied at the recommended spread rate will dry to a thinner than intended film, because of the reduced solids concentration, and this can hurt performance. For this reason, do not thin paints unless necessary, such as for application by spraying, and then only according to the manufacturer's instructions.



6 Failure to apply latex paint at the proper temperature

The microscopic particles of binder in latex paint are thermoplastic, meaning they harden as the temperature drops. In order for them to fuse or coalesce and bind the pigment into a tough, continuous paint film, they must not be applied at too low a temperature.

If the temperature is too low when latex paint is applied, the appearance may look fine, but the film integrity and adhesion are probably poor. And, what may have been a 10-year paint job may need repainting in a relatively short time.

Moreover, the time needed for adequate film formation extends beyond dry-to-touch. Because of this, try to avoid applying latex paint unless the temperature is predicted to stay above the minimum recommended application temperature for the next 36 hours.

The temperature of the surface being painted must also be taken into account. It, too, must be at or above the minimum application temperature at the time of painting.

Applying paint when the temperature is too high can also compromise film formation. That's because the process of binder coalescence takes a certain time to occur properly. If the paint dries too quickly, the binder particles lose mobility and don't have enough time to form an optimum, durable film.

As a result, avoid painting in any combination of the following conditions that can make latex paint dry too rapidly: Painting in temperatures over 90°F; painting in direct sunshine; painting in very dry and/or windy weather; and painting a dry, porous surface that will quickly absorb water from the wet paint.



7 Failure to use correct type and quality of paint



And, of course, there is always the suitability – and quality – of the paint. A paint designed for the job is essential. For example, gloss paint designed for use on metal will probably crack if applied to wood. Similarly, paint designed for indoor use will perform unsatisfactorily if used outdoors.

The quality of the paint is just as important. The Rohm and Haas Paint Quality Institute recommends using a top-of-the-line product for most exterior applications. Choosing an exterior paint based mainly on low initial price can compromise both protective and decorative properties.

Generally speaking, top-of-the-line 100% acrylic latex paints provide the best overall performance. Compared with oil-based paints, and assuming good surface preparation, these paints will provide considerably better long-term performance with respect to color and gloss retention, mildew resistance and crack resistance.

As you can see, many factors impact the performance of an exterior paint job, including the seven described here. Keep these in mind and they will help you achieve a quality, longer-lasting paint job. ■