

Troubleshooting

(and correcting)

EXTERIOR

Paint Failures

While some people are motivated to paint the exterior of their home or building just to change the color, many more do so because their paint job has failed. Understanding why various failures happen – and knowing how to prevent their recurrence – is essential knowledge for all paint professionals.

Although troubleshooting paint failures is something of an acquired skill, experience can be supplemented by study. To speed the learning process, PQI has put together this guide that identifies the root causes of some of the most common paint problems and provides advice on correcting them.

As you will see, exterior paint failures can take many forms. But most fall into two broad categories: adhesion failures and failures due to paint discoloration.

Good Adhesion: The Heart and Soul of Paint

Unless you are new to the paint business, you know that good adhesion is one of the most important characteristics of exterior paint. Adhesion is what allows the paint to grip the surface below, forming a tight bond that is highly durable and resistant to failure. When adhesion is compromised, it spells trouble for a paint job, manifesting itself in any one of a number of ways. Some of the most common adhesion-related paint failures are blistering, peeling, and cracking and flaking.

Cracking and Flaking refers to the splitting of paint...it may be a result of aging, but not necessarily. This type of failure first appears as hairline cracks or “checking”; in its later stages, flaking occurs. Ultimately, it will result in complete failure of the paint. The most common causes of cracking and flaking are:

- use of lower quality paint with inadequate adhesion and flexibility
- over-thinning of paint or spreading the paint too thin
- applying a latex paint at too low a temperature
- inadequate surface preparation, especially where paint is applied to bare wood without use of a primer

Solution to cracking and flaking: If the cracking does not penetrate down to the substrate, it may be possible to correct the problem by removing flaking paint with a scraper or wire brush, sanding the surface, then priming the surface and repainting. If the cracking penetrates down to the substrate, *all* of the paint should be removed by scraping, sanding and, if necessary, use of a heat gun. Again, priming should be done. Use of a top quality acrylic latex paint on the new paint job will help prevent the recurrence of cracking and flaking.

CRACKING AND FLAKING



PEELING



BLISTERING



Peeling is the spontaneous loss of ribbons or sheets of paint due to loss of adhesion. When the surface is coated with a primer and topcoat, or with several coats of paint, the peeling may involve all the coats, some of them, or just the topcoat.

There are many possible causes of peeling, including:

- swelling of a wood substrate due to penetration of rain, humidity or other moisture as a result of cracks, lack of caulking or a leaking roof
- excess humidity or other moisture escaping from within the structure through the exterior walls
- inadequate surface preparation prior to painting
- use of a lower quality paint that has inadequate adhesion and flexibility
- application of latex paint in conditions that hinder good film formation, such as very hot, very cold, or dry, windy weather
- application of an oil-based paint to a damp surface

Solution to peeling: If exterior moisture is the cause, the source of moisture should be eliminated by repairing the roof, applying caulking, or cleaning gutters and downspouts. If moist air is originating inside the building, vents may be necessary, especially in kitchen, bathroom and laundry areas. It might also be helpful to install attic louvers and exhaust fans, or employ dehumidifiers. Loose paint should be removed by scraping or wire-brushing, rough areas should be sanded, and any bare substrate primed. The final step is to repaint with a top quality acrylic latex paint, which will provide excellent adhesion and allow water vapor to escape.

Blistering is a common exterior paint failure characterized by dome-shaped bubbles in the paint. This condition is due to a lifting of the paint film from the underlying surface because of a localized loss of adhesion. There are several possible causes:

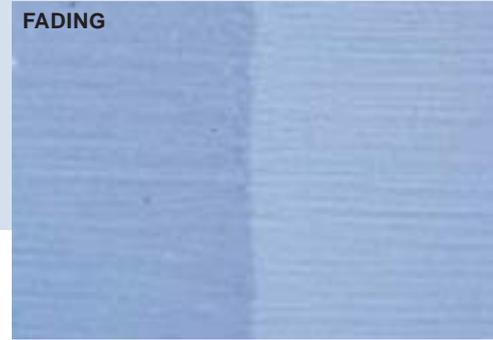
- painting in bright, direct sunshine on a surface that is very warm, especially when applying a dark-colored solvent-based coating
- application of an oil-based or alkyd paint over a damp or wet surface
- excess humidity escaping from within the home or building through the exterior walls (less likely with latex paints, which allow water vapor to escape without harming the paint film)
- exposure of a latex paint film to excessive moisture shortly after the paint has dried, especially if there was inadequate surface preparation or use of a lower quality paint

Solution to blistering: First, it is necessary to determine if the blisters go down to the surface below. If so, the problem may be due to moisture coming from behind the walls, which may require installation of siding vents and exhaust fans, and repair of loose caulking. If the blisters do not go all the way down to the surface, the problem is likely due to one of the other factors cited above, rather than moisture from within the structure. In either case, the surface should be scraped and sanded, primed wherever the substrate is exposed, and repainted with a quality exterior paint.

Paint Discoloration: An Ugly State of Affairs

Paint discoloration is, literally, an undesirable change in the color of exterior paint. It can be a simple loss of color, or the marring of paint color from a foreign substance. Either way, the unfortunate result is detrimental to, or can even ruin, the paint job. But, as with adhesion failures, paint discoloration problems can be remedied when repainting.

FADING



MILDEW



STAIN BLEED-THROUGH



Mildew is the formation of brown, black or gray spots or blotches on the surface of the paint due to the presence of fungi that feed on the paint film and other organic matter. Some common factors impacting mildew growth on a paint job are:

- warm, moist, humid conditions, which provide a hospitable environment for mildew
- use of a lower quality paint with insufficient amount of mildewcide
- failure to prime a bare wood surface before applying the paint
- painting over a surface on which mildew is already present
- applying the paint in too thin a film

Solution to mildew: To make sure the discoloration actually is mildew, apply a few drops of bleach to some of the spots or blotches, wait a few minutes, and rinse — if the dark color disappears, the problem is likely mildew. While wearing rubber gloves and eye protection, mildew should be treated with a solution of one part bleach to three parts water, leaving the solution on the surface for 20 minutes, then rinsing. Follow this with a cleaning of the surface with a detergent solution to remove the treated mildew, dirt, and other organic material. After rinsing again and allowing the area to dry, the surface should be promptly painted with one or two coats of top quality acrylic latex paint (which typically contains extra mildewcide) to help prevent recurrence. In general, satin and semigloss paints resist mildew growth better than flat finishes.

Stain Bleed-through typically appears as brown or tan discoloration on the surface of painted wood due to seepage of tannic acid through the paint film. It is most often seen on redwood, cedar or mahogany, or directly over knots in some types of pine. Latex paints are more vulnerable to stain bleed-through than are oil-based products. Possible causes include:

- failure to adequately prime and seal the wood before application of the paint
- use of a primer that is not stain-resistant
- excess moisture escaping through the exterior walls, which can transport the stain to the surface of the paint

Solution to stain bleed-through: Sources of excess moisture should be corrected. This may involve repairing the roof, replacing caulking, and cutting away heavy vegetation. If moist air is originating inside the structure, it may be necessary to install vents, exhaust fans and dehumidifiers, especially in kitchens, bathrooms and laundry rooms. Loose paint should be removed with a scraper or wire brush; the surface should then be scrubbed clean or power-washed, and rinsed thoroughly. To prevent recurrence, it is essential that a high quality stain-resistant oil-based or latex primer be applied. If the paint is latex, a latex primer should be used. If staining is severe, a second coat of primer should be applied. The surface can then be repainted using either a top quality acrylic latex paint, or a high quality oil-based paint if the primer used is also oil-based.

Fading is caused by excessive chalking or by deterioration of the color pigment itself, or both. While all paints will eventually fade after prolonged exposure to sunshine, premature fading or excessive lightening of the paint color is another form of discoloration. Fading can be due to several things:

- use of an interior paint on an exterior surface
- use of a lower quality paint, leading to rapid degradation of the pigment and/or binder
- application of a tinted paint (especially with organic colors) to a very alkaline masonry surface without benefit of a primer or sealer
- use of a paint color — like certain bright reds, blues and yellows — that is especially vulnerable to degradation from UV radiation
- tinting a white paint not intended for tinting, or over-tinting a light or medium paint base

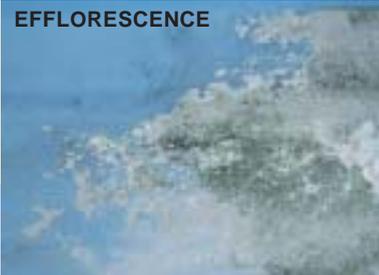
Solution to fading: Careful surface preparation is essential when correcting a fading problem. This begins with removal of any fine white chalk powder by scrubbing or power-washing, then rinsing thoroughly. If some chalk still remains, a quality oil-based or acrylic latex primer should be applied; if there is very little chalk, repainting can be done without priming, as long as the surface is sound and uniform. Either way, it is best to use a top quality acrylic latex paint for the topcoat, because this type of paint will resist fading better than an economy latex or an oil-based or alkyd paint.



Excessive Chalking is the release of an unacceptable amount of pigment as a fine powder on the surface of the paint. While some degree of chalking helps keep the surface clean, excessive chalking can result in serious color fading, rapid film erosion, and rundown over other surfaces. Among the causes of excessive chalking are:

- use of a lower quality, highly pigmented paint
- use of interior paint on an exterior surface
- failure to properly prime and seal a porous surface before applying the paint

Solution to excessive chalking: The first step in correcting this problem is removal of as much of the chalk residue as possible by scrubbing with a stiff-bristle brush, then rinsing... or by power-washing with plain water, if the substrate is sound. (**Caution:** Power-washing can damage soft wood, such as weathered cedar.) If some chalk is still present, a quality oil-based or acrylic latex primer should be applied. Then, the surface should be repainted.



Efflorescence is a paint failure that occurs on masonry and cementitious materials. Efflorescence is an unsightly formation of deposits, usually white, that is caused when the salts in mortar or masonry “leach” to the painted surface as water passes through it. It is usually caused by one of two things:

- application of paint to an improperly prepared masonry surface already containing efflorescence
- excess moisture escaping through the exterior walls

Solution to efflorescence: If exterior moisture is the cause, it should be eliminated by repairing the roof, cleaning gutters and downspouts, and sealing cracks in the masonry with a high quality acrylic latex caulk. If moist air is originating inside the building, it may be necessary to install vents or exhaust fans, particularly in kitchens and bathrooms. Next, efflorescence and loose material should be removed with a wire brush (followed by rinsing), power brush or power washer. A quality water-based or solvent-based masonry sealer should then be applied and allowed to dry. The surface should then be repainted with a top quality acrylic latex paint.

Good Practice Tip: To help prevent premature paint failure, fresh masonry should be allowed to dry and “cure” for 30 days before painting. While it is curing, the masonry can be hosed down once or twice a week to prevent efflorescence buildup. Problems can also be prevented by applying a masonry conditioner or sealer prior to painting, particularly if the surface must be painted before it is 30 days old.

As you can see, troubleshooting paint failures involves a little science, a lot of detective work, and a thorough grasp of sound painting practices. But armed with the information in this guide, even novice paint industry professionals can help customers correct virtually any paint failure and assist them in getting a new paint job that will be problem-free for years to come. ■