PRIMARY CAUSES for PAINT FAILURE

DIRT and GRIME:
Paint needs a “stable” surface to adhere to. Any dust, dirt, or grime that settles on a surface to be painted will compromise the ability of any surface coating (pre-treatment, primer or finish paint) to “stick.” Paint is designed to bond to the substrate. Any foreign unstable matter such as dirt will not allow the coating to “grasp” a “stable” surface.

Always wash the surface prior to applying any product: pre-treatment, primer or topcoat. Do not power wash. Use “garden hose” pressure only. Use a quality-cleaning product containing TSP. Follow the directions on the container, add to warm water, apply and agitate with a scrub brush, rinse and dry completely. Be careful when using TSP. Use rubber gloves and wear eye protection. Start from the bottom up to avoid streaking. Avoid getting TSP on any glass surface as it might cause etching, especially “soft” vintage glass.

In addition to removing dirt and grime, de-gloss all shiny surfaces by sanding or using a liquid de-glosser, readily available and designed specifically for this purpose. A glossy surface like a dirty surface does not allow the new coating to “grasp” the surface.

TIP: It is recommended to clean, prep and paint one side of a building at a time. If the entire building is cleaned at the same time, by the time the painting is started, dirt and airborne pollutants have reappeared on the area first cleaned.

HIGH MOISTURE CONTENT:
Moisture comes in two forms that can cause premature paint failure: liquid and vapor. The liquid form usually manifests itself as a surface condition. This is commonly caused by not waiting long enough after washing the surface to dry out before proceeding with an application of the pre-treatment, primer or paint. Another is having water leaking behind a surface creating an intermittent or continual wet condition. This can be caused by a multitude of reasons: failing roofing, flashing, gutters caulking, etc. In addition to causing premature paint failure, this liquid form of moisture can create conditions ripe for decay, rot and mold to occur in or on a wood component. This moist condition can also provide an environment conducive to termite and carpenter ant infestation.

CAUTION: Pressure washing is not recommended due to the high pressure that is utilized. Experience has shown that high pressure can damage and literally remove the “soft” grain on wood siding and trim. It also drives water moisture deep into the wall cavity and so soaks the wall assembly that it often takes up to a week or longer to dry out properly.

The second form, water vapor is more difficult to control. Basically, water vapor can travel from the interior of a structure through a wall assembly to the exterior, depending on the porosity of the specific materials that make up the assembly. The water vapor can then condense on the backside of the exterior subsheathing and/or siding and continue to force its way through, blistering the paint from behind. This type of paint failure can be a result of a variety of factors. Temperature and humidity differentials (for example: 60% level in the
interior of the building and 10-15% outside during the winter season) separated by the wall assembly are key factors in creating this condition. The permeability of the paint coatings used on both the interior and exterior are also a factor. Additionally, the presence of a vapor retarder and its location in the assembly also can play a part. Usually paint blistering, if caused by moisture vapor migration, occurs on the exterior face of the exterior walls especially where the kitchen or bathrooms are located on an exterior wall, areas where high levels of humidity can exist. Each situation needs to be assessed individually.

Another related concern as it relates to both forms of water: liquid and vapor, is a condition that can be created when moisture is trapped in a wall cavity that has been insulated with loose fill cellulose type insulation. Often if this insulation is wetted and can not dry out due to its trapped condition, the exterior siding will absorb the water from its back side and result in an environment conducive to rot, insect infestation and will hinder its ability to hold paint due to its continual wetness.

In summary, never paint a wet surface. Purchase a moisture meter; a diagnostic tool that determines the moisture content of a surface. They are inexpensive and readily available at most paint stores. Locate and eliminate all sources of water intrusion. Any surface that exceeds 15% moisture content is considered too wet to apply any product. Avoid painting if rain is forecasted within 24 hours of an application or during periods of “high” humidity. If it rains soon after an application it might thin out or wash the product off the surface. High humidity will slow the drying time between coatings. Follow the temperature parameters for each individual product. Some special formulated “slow-cure” paints are designed to extend the application temperature range.

**ROT OR DECAY AND WEATHERED WOOD:**

Paint will not adhere well to rotten or decayed wood. It is similar to painting over dirt or grime in that the coating does not have a “stable” surface to “grasp”. It’s even less stable in that as the decay continues to spread, more and more of the wood siding or trim disappears and is replaced with the living decay.

**NOTE:** Research, on those oil-based paints which contain vegetable oils, are found to actually provide nourishment to the fungi, which promote decay.

Remove all decay down to adjacent sound material. Introduce a borate system to eliminate further decay. Borate is a naturally mined element used to protect wood from wood destroying organisms. Repair utilizing an epoxy consolidant and paste system such as manufactured by Abatron. Repairing and maintaining as much of the “original” fabric is preferred rather than total replacement. If replacement is necessary, replace with “in kind” material. In the case of wood, the new replacement should match in profile using an appropriate decay resistant species with good paint adhesion properties such as heart pine, western red cedar or clear redwood. Pre-treat all faces including the backside and all cut ends before installing.

Weathered wood is any wood that has been exposed to harmful light and moisture.

**NOTE:** Weathered wood often appears gray in color. This surface needs to be “resurfaced” prior to any application of pre-treatment and primer. The weathered surface is a result of the wood cells drying out and breaking down into a “dusty” film. By sanding or shaving this “gray”
away a “new” surface is exposed which is more stable hence more receptive to pre-treatment.

“UNSTABLE” OR “FAILED” EXISTING PAINT, INCLUDING TOO MANY LAYERS:
Any previous paint layers that are loose, flaking, blistered or checked are considered “failed” and need to be removed prior to the application of any additional coating. Flaking is generally a result of paint incompatibility. Blistering is often a result of vapor moisture migration discussed earlier. Alligating or cracking as discussed in Common Paint Defects occurs as a result of too many layers of paint. All these conditions are adhesion problems and the cause should to be investigated and remediated before proceeding. Paint removal methods need to be utilized to remove the paint down to bare substrate. Common methods are thermal, chemical and abrasive. Failure to do so will continue to “haunt” the new work. Refer to PAINTING THE EXTERIOR OF YOUR HISTORIC BUILDING guide for detailed information on recommended removal techniques. For best performance, remove all existing layers of paint before applying new 100% acrylic latex products.

PAINT INCOMPATIBILITY:
Adhesion problems can occur when incompatible products are used. This often refers to the application of an acrylic/latex coating over an oil/alkyd product or vise versa. These products have a dissimilar chemical compositions and cure by different methods. They also have different coefficients of movement; they expand and contract at different rates. Oil/alkyds dry hard and become brittle as they age while latex/acrylics maintain their elasticity and additionally are permeable allowing vapor moisture to pass through them. It is recommended to use the same manufacturer for the primer and topcoat to further reduce the effect of incompatibility.

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