

SURFACE PREPARATION



PLASTER AND DRYWALL SUBSTRATES

There are fewer problems associated with preparing and painting interior gypsum plaster or drywall surfaces as compared to surfaces of exterior exposure. These interior surfaces are normally painted for decorative purposes and are not exposed to the severe weather conditions of exterior exposure. However, faulty construction or poor workmanship in the application of plaster or drywall can cause premature paint failures. These failures may take the form of paint peeling from the surface or the discoloration of the painted surface.

PREPARING NEW PLASTER SURFACES

Most of the problems encountered in painting plaster are concerned with peeling—paint peeling from plaster and paint peeling from paint (lack of intercoat adhesion). Peeling is due to water or moisture and stains from alkali or mildew. Eliminating these problems is a part of the necessary surface preparation.

New plaster surfaces should be allowed to dry thoroughly before application of any primers, sealers or paints. Drying or curing of lime plaster, which is not too widely used today, requires a minimum of 30 to 60 days. Drying time for the more popular gypsum plasters is considerably less. Atmospheric conditions during the drying period have a bearing on the drying time, regardless of the type of wall surface used.

Plaster which has dried too rapidly will show many fine, hair-like cracks over the entire surface. This condition requires close inspection as each coat of paint is applied. These cracks may show through the finished paint.

In addition to being thoroughly dry before painting, new plaster surfaces should be free of dust, dirt or grease and oil. It may be necessary to smooth and level rough spots or small plaster imperfections by sanding.

Soft or chalky plaster may be the result of insufficient wet troweling of the finish or white coat. An oil base primer should be used on soft or chalky plaster since the oil wets the chalk and provides adhesion of the primer-sealer.

Plaster which contains lime may cause staining on these surfaces, because lime is alkaline. For the best performance on alkaline surfaces, an alkali resistant coating such as latex base primer sealers should be used.

**PREPARING PREVIOUSLY
PAINTED PLASTER**

PREPARING PREVIOUSLY PAINTED PLASTER

Previously painted plaster surfaces should be dry, and free of: dirt, grease and wax before recoating. Painted plaster in good condition may require only light sanding and washing with a detergent solution prior to repainting.

Glossy surfaces should be dulled by sanding, chemical deglossing material or washing the surface with a strong detergent solution. Any loose, chipped or peeling paint must be removed by scraping or sanding. Walls, from which wallpaper has been removed, must be washed thoroughly to remove glue sizing and wallpaper paste before painting the plaster surface.

**REPAIRING PLASTER
SURFACES**

REPAIRING PLASTER SURFACES

Before painting old or new plaster, all holes, cracks and other surface imperfections should be repaired. Powdered or ready mixed paste spackling materials or drywall finishing compound may be used for this purpose. Spackling compounds, with their quick drying time and minimal shrinkage are used for minor surface repairs. Where large cracks exist, remove all loose plaster as far back as necessary to reach firm areas. Large cracks can be filled with spackling compounds or drywall finishing compounds. It should be noted that it may be more economical to use drywall finishing compounds to repair seriously damaged areas. Quick setting drywall finishing compounds similar to spackling compounds have reduced material shrinkage and quick drying time. Bridging large cracks can be remedied by using specially prepared materials in kit form. Large cracks can also be repaired with spackling and drywall finishing compounds and self-adhesive nylon or paper drywall joint tape. Large crack repairs usually require an application of a skim coat. When the patched areas have dried, sand smooth and spot prime with the same type of primer sealer used on new plastered surfaces.

**PREPARING NEW
GYPSUM DRYWALL**

PREPARING NEW GYPSUM DRYWALL

New drywall surfaces normally need no special preparation before painting. Drywall should be examined carefully to determine if joints and joint tapes are concealed and smooth. Make sure all fasteners or nail heads are covered to produce a smooth continuous surface. If additional smoothing is necessary, a fine grain sandpaper should be used so that the surface paper is not roughened. Major installation or finishing defects noted on the drywall board should be properly repaired before painting. Sanding dust should be removed as much as possible before painting.

ASPHALT AND ASPHALT COATED SURFACES

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Sometimes there is a desire to coat asphalt surfaces to make them more attractive in color. Coatings designed especially for this purpose should be used. When coating asphalt surfaces with solvent-thinned paints, the surface must first be sealed with shellac or pigmented shellac to prevent bleeding.

Asphalt surfaces, to be coated with traffic paints, must be free of oil and grease. Oil and grease can be removed by scrubbing the surface with a strong detergent solution, followed by a thorough flushing with clear water. Solvents cannot be used for this purpose as they will activate asphaltic materials. When the surface has dried, traffic paints may be applied.

FIBERGLASS

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Most primers will adhere very well to fiberglass. However, it should be noted that lacquer type coatings may excessively soften the surface of fiberglass.

Molded fiberglass frequently has a release agent on the surface which will interfere with paint adhesion. This can be removed by a thorough detergent washing or solvent cleaning.

CANVAS & AWNING MATERIALS

CANVAS DECKING AND AWNING MATERIALS

The surface to be coated must be clean and dry, free from dirt, grease and oil. These surfaces should be painted with coatings specifically designed for these materials. Linseed oil based coatings tend to deteriorate these fabric materials. Enamels or other types of hard coatings tend to crack, chip and peel, due to their lack of flexibility.

GLASS

Glass surfaces must be cleaned with non-greasy or non-waxy cleaners which do not leave a film that would be detrimental to the adhesion of the glass coating. Following the use of any cleaner, the glass should be washed with a solution of isopropyl alcohol before painting.

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All surfaces must be properly prepared to receive protective coatings since the performance of the new coating is directly related to the condition of the surface to which it will be applied. There is no substitute for proper surface preparation. Quality coatings, applied with utmost skill, will fail prematurely if applied over poorly prepared surfaces. For this reason painters must be familiar with the characteristics of various types of wood and surface conditions.

NEW EXTERIOR WOOD SURFACES

New wood should be clean, smooth, dry, free of oil, grease and dirt before applying any paint. Small amounts of oil or grease can be removed by wiping the surface with mineral spirits. Excessively rough spots on new wood surfaces should be sanded lightly before painting.

Moisture is the greatest single cause of paint failure. Excessive moisture content in wood may be due to atmospheric conditions or "green" or insufficiently seasoned new lumber. In either case, coating failure will result when the moisture or sap from unseasoned lumber is released. Back priming of exterior wood prior to installation is advisable whenever possible because the coating helps to prevent the entrance of moisture into the back of the lumber.

Some wood, particularly pine, contains knots, pitch streaks or sappy spots which will "bleed" through coatings and cause paint flaking or surface staining.

These surface defects must first be cleaned of residue and sealed with either a vinyl sealer formulated for this specific purpose or a pigmented shellac designed for exterior use. In some extreme situations, pitch pockets may have to be cut out, sealed and puttied before painting.

Redwood and red cedar contain water soluble resins or dyes which present a special problem. When water based paints are applied over redwood or red cedar, the water soluble resins or dyes in the wood are activated and will bleed through the water based coatings. To prevent this bleeding, redwood and red cedar must first be primed, preferably with two coats of stain resistant primer, prior to the application of the water based topcoat.

PREVIOUSLY PAINTED EXTERIOR WOOD SURFACES

Painted wood surfaces must be free of dirt, mildew and loose paint before repainting. Excessive chalking or dirt may be removed by washing with water and/or detergent if the dirt deposits are extremely heavy or exhibit an oily film. High pressure cleaning using cold water, hot water, steam or chemicals is quite effective in removing dirt and chalk deposits from the surface before repainting.

METAL SUBSTRATES

Steel is man's most versatile metal and it serves industry in countless ways. It is a symbol of strength and durability, and it would probably last forever except for corrosion. Corrosion of metal will result when metal is exposed to moisture in the atmosphere. The best way to prevent the corrosion of metal is to prevent moisture from reaching the metal surface. There are many protective surface coatings designed to do this, but the surface must first be properly prepared to provide an adequate bond between the paint and the metal surface. This lesson will cover the various surface preparation requirements for ferrous metals, that is, those that contain iron or steel and other types of non-ferrous metals which contain no iron or steel in their manufacture.

TYPES OF SURFACE CONTAMINANTS

Before studying specific cleaning and preparation procedures, the various types of surface contaminants must be considered. Any one of these conditions or any combination of them can effectively prevent a protective coating from adhering to the metal surface, allowing corrosion to start. Examples of surface contaminants or surface conditions that must be considered when preparing metal surfaces for paint are:

- rust
- rust scale
- mil scale
- dirt
- chemicals
- oil and grease
- old coatings in various stages of failure

SOLVENT CLEANING

In many cases, the metal surface may contain dirt, oil or grease. Before any other method of preparation is used, these contaminants should be removed. Dirt may be removed merely by brushing the surface with a stiff brush followed by dusting. Oil and grease can be removed by a process called solvent cleaning. This process uses a solvent, such as mineral spirits, to remove the oil and grease. The solvent is wiped or brushed on the surface with clean rags or brushes followed by a final cleaning with clean rags or brushes and clean solvent. It is always advisable to wash the surface with a detergent solution followed by a final wash with clear water before painting a metal surface which has been cleaned with a solvent. A solvent cleaned and final water rinsed substrate should not be left exposed to the elements. It must be stated that solvent saturated rags are a fire hazard and should be disposed of properly.

ACOUSTICAL CEILING MATERIALS

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Loose dirt and dust may be removed from these surfaces using a vacuum cleaner, being careful not to gouge or scratch the relatively soft surface. Grease may be removed from acoustical materials using a detergent solution and wiping the surface with a non-colored rubber sponge. Excessive use of water must be avoided as the surface may become soft.

Any type of wall paint may be used to coat acoustical materials. Coating procedures are limited to rolling or spraying these surfaces, as brush application may destroy the acoustical value of the material by closing the surface openings.

FIRE OR SMOKE DAMAGED SURFACES

FIRE OR SMOKE DAMAGED SURFACES (MINOR DAMAGE)

Surfaces that have been exposed to minor fire damage should be cleaned and prepared following the normal surface cleaning procedures for the particular substrate. Painting over discolored surfaces may cause stains to bleed through coatings applied over them. When cleaning does not completely remove the smoke and water stains resulting from fire damage, such stains should be sealed with a coat of pigmented shellac prior to application of the finish coat. Badly charred materials cannot be prepared for painting and must be replaced.

MASONRY AND CONCRETE SUBSTRATES

Many modern buildings are constructed in some form of concrete, stucco or brick. These surfaces are used primarily because they provide additional strength and resistance to the elements, but even these cannot survive indefinitely without protection. Many materials and methods are used for protecting and beautifying these structures. They cannot be used successfully without knowledge of the composition of the surface and the procedures required to prepare these surfaces for coating.

PREPARING NEW CONCRETE SURFACES

The surface preparation and treatment procedures are essentially the same for interior and exterior masonry surfaces. All new masonry construction should be allowed to dry or age sufficiently before painting. This drying or curing time will vary considerably depending on atmospheric conditions during the drying period and whether the construction is above or below grade level.

All masonry surfaces must be free of dirt, grease or oil before painting. In most cases, a thorough washing with a detergent solution followed by flushing with clear water will remove these surface contaminants. New concrete block surfaces should be scraped and wire brushed to remove loose or excess mortar from the surface of the block. Poured or precast concrete may have an oily "release agent" on the surface which must be removed by solvent cleaning or washing with a detergent solution. Any loose or powdery masonry must be scraped or wire brushed until a firm hard surface is achieved.

EFFLORESCENCE ON MASONRY SURFACES

One of the most common causes of paint failure on painted or unpainted interior and exterior masonry surfaces is the formation of a white powdery material. This condition, known as efflorescence, is caused by moisture or water entering the surface. As moisture enters the masonry, water soluble salts are brought to the surface and, as the water evaporates, these salts are deposited on the surface as a white salty material. When this condition exists, the causes of the moisture problem must be corrected before the surface can be safely painted. If efflorescence is minor, remove the surface deposit by scraping or wire brushing and washing the affected area with a mild detergent, followed by a thorough rinsing with clear water. In some cases, efflorescence is severe enough to require extensive construction repairs to prevent the entry