

## **Train Your Painters for Job Success**

Unfortunately, there is a segment of the public that harbors the perception that paint is paint and anyone can put it on. Wise painting contractors need to be certain that their workers know that this adage is not true and it all starts with educating your workers on how to read and understand the important information contained on paint can labels and data sheets. In this article we'll discuss why this information is the key to successful paint jobs.

### **Compatible primers and topcoats:**

It's important to understand the concept that you are applying a coating system, not an individual paint coat. The primer, intermediate coat, and finish coats all have different purposes and their individual properties, while varied, are coordinated. Peeling or de-lamination and several paint film defects may result from using incompatible products. Check the manufacturer's literature to determine suitable products and when several are appropriate, compare individual data sheets to select the best system to meet your needs.

### **Thinning or reducing instructions:**

The use of an improper solvent to thin paint will result in improper coating film formation which will compromise both appearance and durability. Stay within the guidelines indicated by the manufacturer. Under thinning could result in paint film defects such as orange peel or mud cracking whereas over thinning could cause incomplete hide and runs and sags. Both would lead to improper coverage.

### **Surface preparation:**

Due to their individual properties, some paints need to be applied to pristine surfaces, while others are more "surface tolerant". Sanding or abrading a surface is often recommended to improve mechanical adhesion of the coating being applied. However, the profile depth created must be consistent with the coating thickness because in some cases, the profile will be obvious through the coating and in other cases the coating may not have sufficient dry film thickness to adequately coat its substrate. The manufacturer will indicate what contaminants must be removed and how it should be accomplished.

### **Spreading rate, wet and dry film thickness:**

It is of critical importance that paints be applied at their designated thickness. When paint is applied too thin, then incomplete hide and coverage, premature chalking, lack of protection, and alkali burn often result. When the paint is applied too thick, then incomplete cure, runs and sags, mud cracking, de-lamination, and solvent entrapment are common defects.

Wet film thickness is the thickness of the liquid coating immediately after it is applied. Dry film thickness is the thickness of a coating after its solvent and other volatile components have evaporated and the coating has cured. The relationship of dry film thickness to wet film thickness is dependent upon a paint products percentage of "solids by volume". Paint can labels and technical data sheets will list the percentage of solids in two ways; solids by volume and solids by weight.

The percentage of solids by volume is the one that is important to us and can be used to determine the wet film thickness at which that paint should be applied to result in a specified dry film thickness. The simple formula is:

$$\text{wet film thickness} = \frac{\text{specified dry film thickness}}{\% \text{ solids by volume}}$$

Therefore, if you need to apply a paint at a dry film thickness of 5 mils and it has 50% solids by volume, you would need to apply it at a wet film thickness of 10 mils.

The percentage of solids by volume can also be used to calculate the spreading rate, or area to be covered by one unit of material. The formula to be used is:

$$\text{spread rate} = \frac{\% \text{ solids by volume} \times 1604}{\text{dry film thickness desired}}$$

The spreading rate is expressed in square feet per gallon and the dry film thickness is expressed in mils (one mil = 1/1000<sup>th</sup> of an inch). Therefore, if you apply a coating that has 40% solids by volume and you want to achieve a dry film thickness of 2 mils, then the spread rate is 321 square feet per gallon. Since this does not include any provision for waste, it is a theoretical or maximum spread rate. Remember to reduce this theoretical spreading rate by waste and method of application.

### **Mixing instructions:**

Because the solids in a paint often settle to the bottom of the can, it is important to follow the manufacturer's instructions for mixing the product. Single component coatings need to be mixed until they are homogeneous. Multi-component coatings must be thoroughly mixed so that proper cure is achieved. Certain products, due to their viscosity, need to be hand mixed rather than mixed with a power tool so that air is not entrained in the coating.

### **Tinting instructions:**

The amount of tint that you can add to a particular paint product is determined by the amount of pigment already supplied with the paint and a property known as that paint's critical PVC or pigment volume concentration. When too much tint is added, the color "floats" and surfaces painted will have an inconsistent appearance. For this reason, manufacturers have different tint base products available so that the amount of tint (colorant) added can make the color desired while still achieving good hide and opacity.

### **Dry time and cure time etc.:**

ASTM Standard D1640 describes a variety of drying times including set to touch, dust free, tack free, dry to touch, dry hard, dry through, and re-coat. The two items that painting contractors are usually most interested are re-coat time and cure time. Re-coat is the period of time when an additional coat of paint can be applied without causing wrinkling, lifting, loss of adhesion, etc. Usually we are concerned about the minimum recoat time. Overcoating too quickly can cause cracking of the top coat when underlying coat is still soft. However, with many products there is

a re-coat “window” where we are also concerned with the maximum re-coat time. Waiting too long to re-coat with some materials like epoxies can lead to poor adhesion of the top coat.

**Pot life:**

Knowing the pot life is important when using catalyzed materials such as epoxies and urethanes. It is the period of time after mixing, when the material remains usable with no decrease in its desirable properties. Applying a material after its recommended pot life can result in a partially cured material that may develop film defects and poor adhesion. Thinning of the material after its recommended pot life is not a valid method for extending the application time.

Successful paint jobs don't happen by accident. They are the result of careful planning and thorough preparation. By ensuring that your workers are well-trained in understanding the importance of interpreting and following the manufacturer's instructions, you've taken a giant step towards success.