If conventional spray application is not controlled correctly, large losses of paint can result from overspray and rebound from the surface, in addition to problems such as poor flow, sagging and pinholing. The major disadvantage of conventional spray is that high build coatings can generally not be applied by this method, as most paints have to be thinned to a suitable viscosity for satisfactory atomisation, and so lose their high build properties.

Airless spray

Unlike conventional spray, air is not mixed with the paint to form a spray, hence the name airless spray, Atomisation is achieved by forcing the paint through specially designed nozzles or tips, by hydraulic pressure. The required hydraulic pressure is usually generated by an air powered pump having a high ratio of fluid pressure to air input pressure. Pumps with ratios between 20: 1 and 60: 1 are available, perhaps the most common being around 45: 1

The chief advantages of airless spray are :

1 . High build coatings can be applied without thinning.

2. Very rapid application possible, giving an economic advantage.

3. Compared to conventional spray, over spray and bounce-back reduced, leading to reduced losses of material and lessening dust and fume hazards.

The tips, through which the paint is forced to achieve atomisation, are precisely constructed from tungsten carbide. The atomised "fan" of paint is produced by a slot ground on the face of the orifice. Various orifice sizes together with different slot angles are available. The choice of tip is governed by the fluid pressure required to give atomisation coupled with the orifice size needed to give the correct fluid delivery rate. The fluid delivery rate controls the film thickness applied.

Different slot angles produce spray fans of different widths. The selection of a particular fan width depends on the shape and size of the structure to be painted. Choice of fan width is also related to orifice size- for the same orifice size, but paint applied per unit area will be less, the wider the spray fan.

Generally tips with an orifice size 0.009" -0.013" are suitable for coatings to be applied at approximately 50 microns (2mils) wet film thickness. Tip sizes from 0.013"-0.019" for wet films of 100-200 microns (4-8) mils) and 0.019"-0.013" for 200 microns (8 mils) and above. Heavy-duty mastics, which are applied at very high film thickness, may need tips with orifices as large as 0.040" to 0.060". Spray data given in our data sheets are indicative subject to final adjustment depending on pump pressure, tips sizes, thickness of coating and type of the coating, etc.

There are several designs of tips available, the choice of which depends upon the finish required, the ease of application and ease of cleaning blockages from tips.

With some products, the decorative effect achieved with airless spray is not as good as can be achieved by conventional spray. However, airless spray application is now widely accepted as a convenient method of applying high performance and decorative coatings.

PAINT APPLICATION

Introduction

The objective in applying a paint coating is to provide a film which will give protection and decoration to the surface being painted. The success of any paint application will be governed by a number of parameters, including:

- Film thickness applied
- Method of application
- Conditions during application

These are discussed below:

Surface preparation

The importance of surface preparation to the success of a paint system cannot be overemphasized. A separate section on surface preparation has been included in this manual.

Film thickness

An adequate film thickness is essential for the success of any coating system. Under application will generally result in premature failure for obvious reasons. However, the old aged of "the more paint, the better" can be equally dangerous. The gross over application of modern high technology paint coatings can lead either to solvent entrapment and subsequent loss of adhesion, or to splitting of primer coats. With the majority of coatings, the limits of acceptable dry film thickness allow for reasonable practical variation, but the correct film thickness should always be the target during application.

The actual dry film thickness recommended for a particular surface will depend on the type of paint system being used and the nature of the surface. Recommended dry film thickness for individual products are given on the Product Data Sheets and System Specification Sheets.

Methods of application

The accepted methods of applying the protective coatings described in this manual are by brush, roller, conventional spray and airless spray. The advantages and disadvantages of each method are briefly discussed below:

Brush application

Brush application is relatively slow, but is generally used for decorative paints and for coating small areas. It is particularly suitable for coating complex areas where the use of spray methods would lead to considerable losses due to over spray and associated dry spray problems.

However, most high build coatings are designed for application by airless spray, and high film build will generally not be achieved by brush application. In general, twice as many coats will have to be applied by brush to achieve a similar build when compared to airless spray.

Roller application

Roller application is faster than brush on large, even surfaces and can be used for the application of most decorative paints.

However, control of film thickness is not easily achieved. As with brush, high film build will generally not be attained. Care must be taken to choose the correct roller pile length, depending on the type of paint and degree of roughness of the surface.

Conventional Spray

This is a widely accepted, rapid method of paint application in which paint is atomised by a low pressure air stream. Conventional spray equipment is relatively simple and inexpensive, but it is essential to use the correct combination of air volume, air pressure and fluid flow to give good atomisation and a paint film free from defects.