

Level 1

Essentials of Paint and Painting
Technology



Notes

- Because of environmental concerns, application devices with a transfer efficiency lower than 50% are being discouraged.
- Paint flows from a central supply through a high pressure pump (1000 psi to 3000 psi)
- The production rate of Airless is quite high as well as the Transfer Efficiency can be as high as 75%
- High flow rates coupled with large Airless tips dramatically allow the worker to make less passes to apply the required mil thickness.
- Because of safety concerns, the guns on an Airless Spray must be manufactured with trigger guards



There are many types of spray finishing application equipment. A wide range of manufacturers provide and endless supply of pumps, guns, hoses and accessories. We classify spray equipment by atomizes the paint, and there are 4 basic types

1. airless spray;
2. conventional air spray;
3. HVLP; and
4. air-assist airless.

Airless

Paint flows from a central supply through a high pressure pump (1000 psi to 3000 psi). This high pressure fluid goes through a fluid line to a spray gun. The high pressure fluid is expelled out the front of the gun through a small orifice or tip. As the fluid escapes into the atmosphere it expands and forms a spray pattern of small droplets (atomization). The production rate of airless is quite high as well as the transfer efficiency can be as high as 75%. This method of spray is good for large flat surfaces.

The Advantages of Airless Spray

Reduced Overspray and Fog: This is the number one advantage of airless spray. As stated, more than 75% of the paint gets to and remains on the surface. This high transfer efficiency saves on paint costs and brings a significant reduction in emissions.

Increased Production: Uniform thickness and greater penetration increases the speed of application. High flow rates coupled with large airless tips dramatically allow the worker to make fewer passes to apply the required mil thickness.

Handles Viscous Materials: Paints and coatings that have a naturally high viscosity can be sprayed with no thinning or very little thinning. Solvent use is lowered, so emissions are too.

Disadvantages of Airless Spray

Coarse Atomization: Compared to air spray, airless atomization is somewhat coarser. Coating should be able to flow out well to even out the atomized droplets once they hit the surface. Fine finishing tips and heated systems help to improve atomization.

Safety: Because of the extremely high pressure created (1000 psi to 3000 psi) with airless atomization, there is a danger of injection injuries. The pumps, lines, and guns must be manufactured to withstand these pressures. The guns themselves must be manufactured with trigger guards, trigger locks, and tip guards. The painter must also have complete safety training before using the equipment.

Expensive: The pumps, lines, guns and accessories are designed to handle and produce extremely high fluid pressures. For this reason the equipment has to be well made and strong. Typical airless systems are more expensive than air spray systems, and the maintenance costs are higher, too.

Gun Controls: An airless gun is full on/full off. When the trigger is pulled, the gun is wide open and the full amount of paint is being expelled. This characteristic can be a disadvantage when spraying intricate parts or shapes. "Feathering" of the trigger (see note below) is not possible. Speed of motion will dictate how much paint



Typical Airless System

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REVIEW

IMPORTANT NOTES - APPLICATION

Introduction

Information and knowledge covering the basic types of application equipment for Paints and Finishes.

There are three main methods of application.

- Brush - Oldest method of application. Slow in comparison to other methods but with good transfer efficiency.
- Rollers - A fast production tool with high transfer efficiency. This method of application produces a stipple texture.
- Spray - Spray painting can be achieved in many ways but the end result is small droplets of paint formed into a pattern and applied to a surface.

Brushes

A brush is a collection of bristles attached to a handle by means of a plastic setting compound.






- Chinese Hogs Hair (Pure Bristle) is the most common animal hair used. The tip of the hair flags or split to produce a fine tip for application. Suitable for oil and alkyd paints but unsuitable for water-based products.
- Synthetic (Polyester/ Nylon) is an attempt to copy the pure bristle hairs. These filaments do not react with water so they are well suited when using water-based finishes.

Brush types may be classified into five categories:

- Wall brushes
- Sash and Trim brushes
- Enameling and Varnish Brushes
- Stucco and Masonry brushes
- Specialty Brushes

Application Methods and Procedures

- Always use thinned, strained coating
- Use the right size and type of brush
- Plan the work
- Work out of a container 1/4 to 1/3 full
- Use full brush strokes
- Feather out the final strokes
- Always keep a wet edge
- Control the tack up time of the coating
- Avoid over-brushing.





STUDY QUESTIONS : APPLICATION



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1. Identify three main methods of coating application.
1. _____
2. _____
3. _____
2. How would you determine what type of application method to use for a particular product or coating?

3. What type of brush bristle would you recommend when using an alkyd slow dry enamel?

4. Synthetic bristles are suitable in what type of paint/coating?

5. Sash and trim brushes are used to paint trim work and are extensively used to _____ before rolling a surface.
6. What is an advantage of a radiator brush over a standard type brush?

7. Identify the four main parts to complete a roller painting outfit.
1. _____
2. _____
3. _____
4. _____
8. Identify the material that is most commonly used to make the roller fabric?

9. Briefly explain what "back rolling" is in both roller and spray applications.

10. Airless spraying uses very high pressures. What is the pressure range of a typical Airless system? _____. psi.