



Technical Data Sheet

BASIC PAINT INFORMATION

Why Paint?

There are many facts or features about paint. They can be mildew resistant, fade resistant, scrubbable, or tinted to thousands of colors. However, paints really have two main benefits: protection and decoration. Those are the reasons people paint.

Outside, a film of paint is another layer of protection between the rain, sun and other elements. Inside, paint can protect against dirt, bumps and nicks. Although a layer of paint may only be 1/1000th of an inch thick, it takes many years to wear away, allowing the surface beneath it to last much longer. When paint does begin to wear, it is much less costly and time consuming to replace than a wall or piece of furniture.

With an infinite number of colors available, paint is also an easy way to decorate and personalize a home. Changing a wall or trim color can give a room a new look and feeling. Color can make a large room seem smaller or help brighten up a small, dark area. Colors also affect people's moods. With paint, almost anything can be done quickly and for a reasonable cost.

The Components of Paint

There are four basic components of paint:

- **Pigment** - Pigment is a fine powder which gives color and hiding power to paint. To a large degree, it also determines the thickness, luster and general character of the paint.
- **Binder** - (also called resin or vehicle): The binder is the "glue" which holds the pigment in place. Binders give resistance to chipping and moisture. They may be flexible, in order to expand and contract with a substrate, or hard to hold up to scrubbing. Binders allow a paint film to stick to a surface. They also affect the gloss level.
- **Thinner/Solvent** - Makes the paint liquid. When the thinner evaporates, only the binder and pigment are left. The most common thinners are water, in latex paints, and mineral spirits, in oil paints.
- **Additives** - Additives are used to impart stability, develop body and control film properties. Examples are mildicides and freeze/thaw stabilizers

Sheen Levels

The appearance of the dry paint film as light reflects off its surface is referred to as the paint finish or sheen.

There is a wide range of sheens, but they are most often classified as:

- Flat or Matte
- Eggshell
- Satin
- Semi-gloss
- Gloss or High-gloss

The type of sheen directly affects the cost of the paint and its durability. In general, as the sheen level moves from flat to glossy, the cost is higher and the durability is better. For instance, a glossy paint may cost more than a flat paint, but in certain applications, it may be selected because it will last longer and be easier to clean.

To more fully understand the application that each sheen is best suited for, you'll need to understand some more about the chemistry of paint. Paint, as you recall, is essentially a mixture of pigment and a vehicle (binder). Latex is water-thinned and oil/alkyds are solvent-thinned.

The sheen of a paint product is a function of the pigment volume concentration (PVC), which is the ratio of total pigment to the total non-volatile components. The PVC directly affects the durability and cost of the product:

- When PVC is high, there is a higher ratio of "extender" pigments (flattening agents) and a lower level of resin to hold the film together.
- When PVC level is low, there is a higher level of resin, which fills in the surface and creates levels of glossiness, and a lower ratio of "extender" pigments.



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Flat or Matte

Flat, sometimes called "matte", sheens, create a uniform, light-diffusing appearance.

The subtle flat sheen tends to minimize surface defects on both interior and exterior applications. On exteriors, for instance, flat sheen is popular on shingles and rough siding because the flat, velvety finish hides many defects in the substrate surface. On interiors, the flat sheen hides minor imperfections and does not detract from the furnishings in the room as a glossy wall paint might.

The quality level difference, due to the lower cost of the materials used in formulating the product, affects the durability. The durability, sometimes expressed as a warranty of a various length of time, will be less than a glossy sheen.

Eggshell

Eggshell is a step up in terms of durability from a flat sheen paint. Generally offered only in interior paints, eggshell sheen paints offer the washability and scrub ability of a satin sheen paint, while having nearly the same sheen level as a flat paint.

Eggshell paints are also very good at hiding surface imperfections, while emitting very little shine.

Satin

Satin sheen has a low lustre and an attractive, soft, glowing appearance without the glossy look. The satin sheen is more durable than a flat paint. These durable finishes are excellent for both woodwork and walls on the interior, and on the body and trim of the house exterior.

Semi-gloss

Semi-gloss finishes create a modern, mid-level sheen coating which is ideal in areas where durability and scrub ability are of importance. Many homeowners choose this tough, easily-cleaned finish for such high-punishment areas as hallways, stairway walls, kitchens, bathrooms, and children's rooms. The higher ratio of binder to pigment helps create a finish that resists soil and wear. For this reason, a semi-gloss finish is often applied where extra protection is needed.

Gloss or High-gloss

Glossy finishes, with their lower PVC, create a hard, smooth surface. They dry to a bright, shiny finish that is very easily maintained. Just wiping with a damp sponge is usually all that is needed to clean off dirt. This finish is used on wood, plaster or metal interior surfaces. It's good for any smooth surface and on trim, doors, lawn furniture, railings, playground equipment and other application requiring very high durability.

The gloss finish is used only in limited areas on exterior surfaces, such as house shutters and trim. The gloss house paints will flatten over time after exposure to the elements. Depending on the severity of the climate, as well as the self-cleaning properties of the paint, this will take place in a few years. This is evidence of the "wearing down" of the paint which prepares it for future coats.

Conventional Air Spraying

The basic function of an air atomizing spray gun is to use compressed air to break up material into small droplets and give these droplets direction. The spray gun itself provides two convenient valves to start and stop the flow of compressed air and fluid. The mixing of air and material can take place outside the spray gun between the "horns" of the air nozzle. This is described as "external mix atomization". If the mixing of air and material takes place inside the air nozzle of the spray gun, we use the term "internal mix nozzle".

Material can be brought to the spray gun by creating a vacuum at the face of a siphon-type external mix nozzle. This vacuum draws the material through a tube coming from an open top material container to the air nozzle of the spray gun for atomization. This method of atomization and material delivery is called "siphon spraying". When heavier fluids or higher production rates are required, the material can be pressurized and forced up to the air nozzle for atomization. This method is then called "pressure feed spraying".



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Airless Spraying

Airless spraying is a method of spray application that does not directly use compressed air to atomize the paint or other coating material. Hydraulic pressure is used to atomize the fluid by pumping high pressure through a small orifice in the spray nozzle. As the fluid is released at these high pressures, it is separated into small droplets resulting in a very fine, or atomized spray. The fluid is discharged from a small nozzle orifice at such a high velocity that the material tears itself apart and sufficient momentum remains to carry the droplets to the surface.

Air Assisted Airless Spraying

Air assisted airless combines the best features of compressed air atomization and airless atomization to form a process called air assisted airless. This process provides faster application of material than compressed air. A soft spray results in reduced fog and waste, with the ability to penetrate into recesses and cavities while still achieving a fine atomization, which is important on certain substrates such as wood. This system works best with slow to medium production line speeds, and thin to medium viscosity materials. It is ideally suited for stains, fillers, glazes, lacquers, and polyurethanes.

Recent attempts to reduce emissions and hazardous wastes through improved application efficiency has led to refinements of all types of spray atomization systems including the process of air assisted airless. A new generation of air assisted airless is now available that includes the benefits of high volume low pressure (HVLP) atomization. This new system is often referred to as Hydraulically Assisted HVLP. It combines the speed of air assisted airless with the finish quality, EPA acceptance and superior finish of conventional HVLP.

HVLP Spraying

High Volume Low Pressure (HVLP) spraying has quickly become the biggest trend in finishing today. HVLP uses approximately the same volume of air as a conventional spray gun, but at lower pressures to atomize the fluid. Reducing air pressure at the nozzle reduces the velocity of the air stream and the atomized fluid. The result is much lower bounce-back and much higher transfer efficiency.