Paint

Interior and exterior paints are created with unique resistance qualities, specific to the environments they operate in. Interior paints are primarily designed for stain, scrub, and blocking resistance. Exterior paints are focused on mildew, dirt, and blister/peeling resistance. Quality interior and exterior paints should incorporate color retention and resistance to fading and chalking. High quality paints will also be made of superior components and include a better ratio of those components, as listed in detail below.

Four Basic Components of All Paints (Latex or Oil Based)

- **Pigment:** *Finely ground particles or powders dispersed in latex and oil based paints that are used to provide color and hiding properties*. The more pigment used, the less glossy the paint. The PVC (pigment volume concentration) is used to indicate the volume of pigment to binder. Higher quality interior and exterior paints have a PVC in the 38-50% range. Paint with more pigment will typically hide interior surface imperfections better and is easier to touch-up. Higher pigment quantity is, however, considered less durable with exterior wood in freezing climates.
  - Prime Pigments are relatively expensive and provide whiteness, color, and hiding capability. Titanium dioxide is the predominant white pigment. Color pigments provide color by selective absorption of light. Color pigments come in two types, “organic” (brighter colors) and “inorganic” (earth tones). Color pigments are either dry powders or liquids (called colorants). Colorants are added to paint at the point of sale to create specific colors/tinting, while either dry powders or colorants are added to paint in factories to make pre-packaged colors.
  - Extender Pigments provide bulk at relatively low cost. Common extenders include clay, silica, diatomaceous silica, calcium carbonate, talc, and zinc oxide. The different extenders have unique characteristics including increased hiding capabilities (clay), improved stain resistance (clay), scrub/abrasion resistance (silica), control of sheen in varnishes (diatomaceous silica), mildew resistance (zinc oxide), corrosion inhibition (zinc oxide), stain blocking (zinc oxide), or creation of primers (zinc oxide).
- **Binder:** *A coating that binds the pigment, providing adhesion, integrity, and toughness to the dry paint film.* The binder dictates the resistance to blistering, cracking and peeling, durability to scrubbing, and resistance to chalking and fading. Binders by themselves dry to a clear, glossy film, like a finish or varnish. The binder coating is created when the liquid component of the paint evaporates leaving the binder and the pigment on the surface. An oil/alkyd based binder will oxidize as it reacts with the air, creating a tough, hard layer of paint. A water/latex based binder will use capillary action to draw the solid plastic materials and pigment together into a continuous film (see Figure 1).
  - Oil-Based Binders consist of vegetable oils (linseed, tung, and soya) and/or alkyds (which dry faster and harder than oils alone). The film created is less permeable for moisture and may be more prone to blistering.
  - Latex-Based Binders consist of solid, plastic-like materials dispersed as microscopic particles in water with a milky-white appearance. The film created retains microscopic openings that improve surface breathability, allowing moisture vapor to pass through more easily. For this reason, latex paint is more tolerant of interior moisture laden air than oil-based paint.

    There are two commonly used types of latex binders: 100% acrylic and vinyl acrylic. 100% acrylic are often specified for exterior use, but can also be used indoors when looking for a paint that is more resistant to waterborne stains (such as juice, coffee, and other beverages). 100% acrylic binders also more resistant to everyday moisture exposure from occupant lifestyles as compared to vinyl acrylic, but the differences are not nearly as pronounced as in exterior applications. A third type of latex binder, styrenated acrylic, is used for enhanced water resistance in situations such as direct-to-metal application and for places such as basement masonry walls.
- **Liquid:** *The “carrier” providing the way for the pigment and the binder to go from container to surface*. The liquid component of the paint evaporates, leaving behind the solids (pigment and binder). For oil-based paints, primers, and varnishes, the carrier is paint thinner, denatured alcohol, or lacquer thinner. For latex-based paints, the carrier is primarily water. It is important to note that thinning paint (adding liquid) reduces the solids content, and thus reduces the effectiveness of the paint.
- **Additives:** *Additional ingredients added to latex paints to enhance application processes and properties.*
  - Thickeners (Rheology Modifiers) & Surfactants: Thickeners provide the paint with adequate viscosity to ensure smooth flow, resist spattering when applied by a roller, and avoid spoilage (putrid smell). Surfactants keep paint from separating or becoming too thick, help ensure pigment continuity, and correct color tinting.
  - Biocides: Either a preservative or a mildewcide to discourage bacteria from growing.
  - Defoamers & Co-Solvents: Defoamers discourage bubble formation in paint. Co-Solvents aid the binder in forming a good film at lower temperatures. They also enhance the brushing properties, including the flow and “open time” (the time paint can be worked before it sets up).

General Considerations

With all painting options we should ask:

1. What variables will the paint be subject to?
2. Is the product suitable to those variables? What are my expectations?
3. How long do I expect the paint to last? Do I expect to re-coat annually, every 5 years or longer?
4. How successful should it be; am I willing to pay for the correct product?

When choosing paint, it is important that the paint is suitable for the variables and environment it will be expected to endure. Interior and exterior demands are clearly different (exterior applications will always need UV light and moisture considerations). However, even different interior rooms have different demands. Kitchens and bathrooms are typically exposed to more work (for example, food, spillage, and moisture may be a constant). Living or dining rooms are often bigger, thus needing excellent surface-hiding properties. Recreation rooms and sunrooms may need better abrasion resistance and UV light exposure protections.

It is also important to be aware that painting is a labor intensive, often disruptive activity. It typically requires planning, moving and covering furniture and other items, etc. Controlling the curing process is very important. Paint requires a minimum temperature of 50℉, working best when closer to 70℉. The relative humidity should be no higher than 50%. Windy and sunny conditions should be avoided when exterior painting. Surface preparation is critical.

It is for these reasons that we recommend picking the correct paint for the job (not necessarily just buying the paint that is on sale) and asking for help from a knowledgeable industry professional.

Need More Information?

Please visit www.phiinspect.com, click our "Post Inspection Support" page, and request additional documents (specifically *"The Ingredients of Paint, and their Impact on Paint Properties"*).

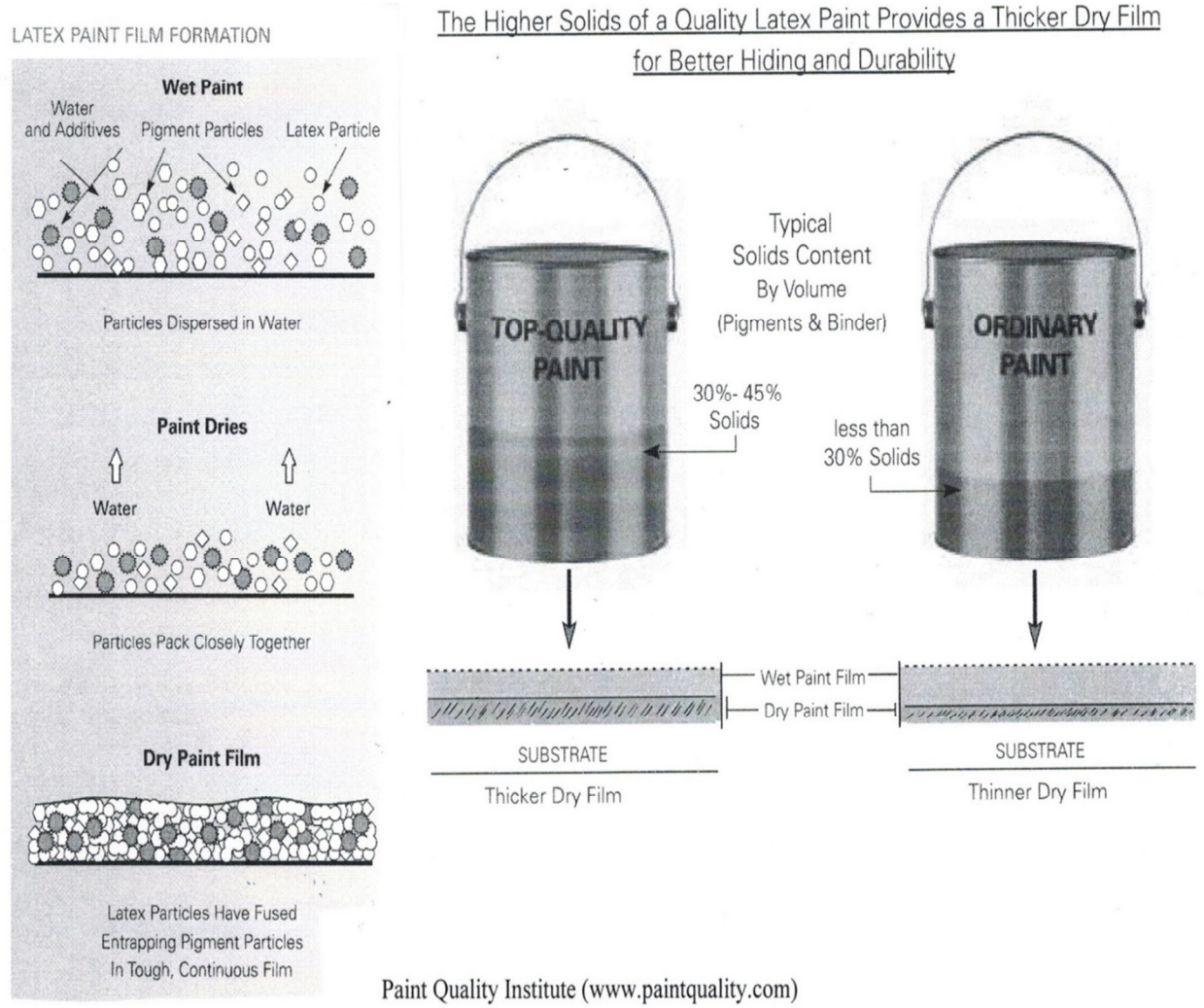

Figure 1