House Wall Paint: two types of paints and a manufacturing process of latex paint

(image from www.bidsbypros.com)

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Introduction

This description is designed for the general audiences who are interested in the effective use of the different types of paints and the general paint manufacturing procedures. American coating association defines that paint is a group of emulsions mainly composed of pigments in a liquid medium. Paint is one of the essential components in people’s lives. With the use of the paint, people can communicate each other and even set the rule in the society. This document will mainly present a manufacturing process of latex-paint production and a comparison of two different types of paints. Additionally, the document will demonstrate a basic history of paint usage, that of paint manufacturing, and each element of paint.

History and background knowledge of paint manufacturing

A paint has been used since ancient time, 30,000 years ago. Ancestor used paints to record their lives, to communicate each other, and to decorate their pictorial symbols. As times goes by, the paint and coatings industry has been remarkably developed for the mass production during the Industrial Revolution era. Especially, in the mid 1880s, paint factories and its business began to grow in the United States. The paints were used in different sectors; housing, aviation, vehicles, cans, furniture, and so on. Since the paint is an artificial and chemically complex product, some of the elements in the paint are harmful to people. Specifically, lead pigments were limited and finally removed in the house painting for people’s health.
Paint components

(image from www.mpi.net)

Pigment

(image from http://www.pigments.com/)

Pigment is a material that determines a color of a paint and can be attained both naturally and artificially. Same as the principle of colors on all the objects, pigments reflect or transmit light selectively based on the wavelength of the light. Normally, most of the pigments are in a powder form before they are added to the binder. Two different categories of pigments exist; one is soluble, and the other is insoluble. Either way, pigments are fugitive, which means a color of pigment fades away over a period of time with an exposure to the light.
Resin (binder)

The binder exists in a form of liquid, but over the time, when the resin contacts with air, it hardens and finally becomes a solid. The main purpose of a binder is pigment’s adhesion in a paint.

Solvents & Additives

These two materials determine paint’s coating and its color; additive affects appearance and durability of a paint coating, and viscosity of the paint.
Brief overview of paint manufacturing process

1. Preparing raw materials

Resin, pigment, and additives are purchased or stored before manufacturing the paint. Normally, power pigments are stored in the warehouse, and the resins and other solvents are stored in tanks.

2. Mixing

All the raw materials are sent to mixing tanks and premixed in a mill base machine.

3. Milling

To disperse the pigments evenly, the premixed paints are sent to the disperser.
4. **Blending**

All the milling and color dispersion are adjusted in the blending tank.

5. **Filtering**

By filtering the paint, it determines the thickness of the paint and also the viscosity of it.

6. **Package**

After the all the quality check is done compared to the standard paint, it starts to fill the paint in the containers. All the fill-in processes are done with the conveyor belt and palletize for the mobility.

7. **Shipping and storing**

It could either store in the warehouse before the shipment or directly load on the truck by the forklift for the transport the paints.
Two Types of Paints

Based on the purpose, people can use two different types of paints, water-based latex paints and oil-based paints. As it can be assumed from the name of the paint, a solvent of latex paints is water, and a solvent of oil-based paints is petroleum distillates. Water-based latex paint is commonly used for the indoor and outdoor of wall painting.

Latex Paints

Water-based latex paints are commonly used for everyone regardless of professional skills in painting. People can apply the paints on the wall and clean up the rest of the paint easily. In addition, latex paints have great durability; the color doesn’t easily fade away, and the paint is rigid enough to resist a cracking. The interior paint-application is preferred for latex paints.

Oil-Based Paints

Oil-based paints are adhesive to the surface of the objects that they are applied. Therefore, the paint firmly holds its form and does not easily transform its figure after applying it. Comparatively, oil-based paints are hard to handle: applying, disposal, and management. oil-based paints are hard to apply and have a limitation of use; the paint cannot be used on fresh masonry and galvanized iron. Furthermore, it takes at least a day to dry up. Since the paints are oil-based, to clean up the paints, it requires paint thinner and should not be poured to the drain for the removal. Furthermore, problems occur when oil-based paints are oxidized because the oxidized paint cracks and becomes brittle. This paint is often used for coloring interior trims of house.
Comparison by a chart (Oil-Based Paints versus Latex Paints)

This charts will give one to one comparison in an aspect to durability, color retention, ease of application, mildew resistance, versatility, odor, disposal, and drying time.

<table>
<thead>
<tr>
<th></th>
<th>Oil Based</th>
<th>Latex</th>
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</thead>
<tbody>
<tr>
<td>Durability</td>
<td>Excellent adhesion; better adhesion than latex on heavily chalked surfaces</td>
<td>Excellent adhesion to most substrates; better elasticity than oil.</td>
</tr>
<tr>
<td>Color Retention</td>
<td>Not as good as latex; more likely to chalk and fade in sunny exposure.</td>
<td>Superior resistance to chalking and fading, especially when exposed to bright sun.</td>
</tr>
<tr>
<td>Ease of Application</td>
<td>More difficult to apply due to greater &quot;drag,&quot; but goes on heavier for better one-coat hiding and coverage.</td>
<td>Goes on smoothly and evenly, with less brush drag.</td>
</tr>
<tr>
<td>Mildew Resistance</td>
<td>Vegetable oil base can provide nutrients for mildew growth; most products contain mildewcide to minimize growth.</td>
<td>Less inherent tendency to grow mildew; mildewcide additives discourage mildew growth, help maintain fresh appearance.</td>
</tr>
<tr>
<td>Versatility</td>
<td>Can be used on most materials, but for new concrete, stucco and other masonry, a sealer or pre-treatment is required; should not be applied directly to galvanized metal.</td>
<td>Can be used on wood, concrete, stucco, brick, galvanized metal, vinyl siding, aluminum siding, etc.</td>
</tr>
<tr>
<td>Odor</td>
<td>Noticeably more odor than latex.</td>
<td>Very little odor.</td>
</tr>
<tr>
<td>Clean Up</td>
<td>Turpentine, paint thinner or other solvent.</td>
<td>Simple water cleanup.</td>
</tr>
<tr>
<td>Drying Time</td>
<td>Eight to 24 hours.</td>
<td>One to six hours, permitting quick recoating.</td>
</tr>
</tbody>
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(image from [http://www.californiapaints.com/](http://www.californiapaints.com/))
Conclusion

Other than just these two oil-based and latex paint, the paints also can be categorized based on a sheen and glossy level, especially when the paints are used for interior design. These various types of paints give a different texture, thickness, and glossiness. Likewise, mechanisms, manufacturing processes, and types of paints can be modified based on the use of the paint. However, this document suggests the most common form of paints that people are familiar with. Based on these generic forms of paint mechanisms, paint manufacturing processes, and paint types, a new form of coloring and decorating methods are derived. After reading this paint descriptions, people can use these different types of paints based on their intentions and can have basic understandings of the paint manufacturing process.