Storage of Paint

Introduction

Generally, paints are liquid and organic in nature, whether they are solvent borne or waterborne. The organic nature of the paint makes unlimited conservation or storage impossible - paint will age also in the can. Pigments and fillers (inorganic or organic) will be dispersed in the liquid media (binder and solvents) and also the stability of this dispersion is time dependent.

Scope

This guideline is intended to provide an overview of important parameters related to paint storage stability such as temperature, container condition and paint shelf life. The guideline is valid for Hempel's liquid paint products both waterborne, solvent borne and solvent free including epoxies, polyurethanes, polysiloxanes, silicates, silicones, alkyds & acrylics.

Temperature

The single most important parameter affecting the storage stability of paint is the temperature - in general the higher the storage temperature the faster the ageing.

Low temperatures:

Solvent borne paints will in general resist even heavy frost conditions. They will all become more viscous and unsuitable for application, but slowly re-heating will in most cases result in the original consistence of the paint.

Some of the binder ingredients of certain two component paints (epoxy and polyurethane) with high solids content (or solvent less) may at sub-zero temperatures form crystals and may therefore require special heating and re-mixing if exposed to too low temperatures.

Waterborne coatings should never be exposed to frost. If the temperature drops below the freezing point of water, the paint will become irreversibly destroyed.

High temperatures:

High temperatures may have significant effects on the quality of the paints - the most important ones are:

- Higher temperature lowers the viscosity and this will affect the stability of dispersion or suspension of the pigments and fillers – they will have a higher tendency to settle at the bottom of the can.
- Higher temperatures will also accelerate the natural ageing of paints.
- In some paints the additives are temperature sensitive, and the effect can be either increased (e.g., making the paint very thick), decreased or even destroyed - (e.g., ruining the anti-sagging properties).

  Some additives may seed out - filling the paint with small lumps that affects the application properties and final appearance.
- Chemically reactive coatings may be sensitive to elevated temperatures – alkyds and oil paints will start to cross link which will increase viscosity to a level where the paint gels, and epoxies may lose their reactivity. This already happens as part of the natural ageing at normal temperatures, but above 40°C the process is accelerated.
- Paints and paint components should not be stored at temperatures above 40°C [104°F]. For some products, the storage temperature must be lower (this will be clearly stated on the label). In hot climates Hempel recommends to store paint in airconditioned storage or containers and only take out just prior to application.

Application (good paint Practice)
Irrespective of the storage temperature paint is typically designed for application at a temperature of 15 - 30°C (paint temperature) - exceeding these temperatures may affect film forming properties.

Storage

The standard metal containers for paint can resist a certain amount of atmospheric exposure, however prolonged exposure to humid conditions will degrade labels and corrosion will eventually occur. This will make identification more difficult and may on a little longer term affect the integrity of the can.

If possible, turn the can upside down every 3 months - to reduce the amount of settlement.

Store the paint in a sheltered but well-ventilated area.

Shelf Life

Shelf life is the time the product will keep in good condition when stored under cover in original, sealed containers under recommended storage conditions. It will decrease at higher temperatures, e.g. as a rule of thumb will at 35°C/95°F is half the shelf life at 25°C/77°F. The canned product will carry a “best before” label for guidance. However the paint will often be usable well beyond the “best before” date. See steps a-e here below.

If no specific limitation is given, a paint should not be stored for more than

- five years at 25°C/77°F or three years at 35°C/95°F for one-component products from the date of production
- three years at 25°C/77°F or two years at 35°C/95°F for two-component products from the date of production.

Long-term storage and storage at high temperatures may require careful re-mixing of the paint prior to application due to sediment in the can. Redispersing of settlement may become more difficult towards the end of the products shelf life.

If storage conditions are unknown and in case of doubt about the suitability of the paint material, this can be verified by checking the following:

a. Visual inspection of the can. There should be no sign of leakage and no corrosion on the inside. Bulging cans may be a sign of gas evolution in aged product and should be handled with care.
b. Homogenous appearance. After thorough mixing the paint must appear homogeneous and all settlement must be redispersed. (some binders e.g. epoxy curing agents may darken over time. This is a cosmetic issue with no negative impact on the corrosion protection)
c. Apparent viscosity in can. After mixing the paint must not appear gelatinous or require excessive thinning for proper application.
d. Application in specified film thickness: a uniform, closed, defect free paint film should be obtained.
e. Drying time should not be significantly longer than normally.

If in doubt contact your Hempel representative for advice.

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