

STORING, HANDLING & USING UV & EB COATINGS

Liquid state UV & EB coatings are chemically reactive systems that require proper storage in order to: 1) avoid premature polymerization (curing), and 2) maintain their design properties. Stored improperly, they will increase in viscosity or gel and be compromised for use.

UV & EB coatings are best stored at room temperature, 20-22C, 68-72F, in a place where temperature doesn't drop below 10C, 50F, or rise above 30C, 86F. Stored as recommended these coatings generally have a stable 6 month shelf life. The viscosity of coatings is affected by temperature. Lowering temperature causes a coating to become thicker (higher viscosity), while a temperature rise will cause a coating to become thinner (lower viscosity). Either will affect application.

UV & EB coatings are supplier packaged in opaque containers (lined baked phenolic carbon steel, aluminum, or 304 stainless steel), with an airspace above the product to inhibit polymerization - 50 gal. of coating in a 55 gal. drum or 4 gal. in a 5 gal. pail. Opaque poly-ethylene containers or liners are also used, but only for formulations that are solvent free.

Generally, the cure response of UV & EB coatings is related to the products' age, meaning the older the coating, the slower the cure speed. Always sample an older coating, checking a coating's cured state physical properties against expectations before use.

When transferring and handling these reactive chemical products safe guard against direct skin and eye contact. All formulated UV & EB products contain reactive materials that are primary skin irritants and have the potential to cause burns, dermatitis, and skin irritation. Initial contact may not signal a problem, but exposure time is a factor as is repeated exposure. Some materials are also classified as sensitizers, meaning that some individuals will have allergic reactions after repeated contact, becoming sensitized. Sensitized people find that they can no longer work with or near the sensitizing products. Inhalation of vapors can irritate the respiratory tract. Ventilate and be safe, especially if spills occur or if spraying is an application technique.

When transferring coatings use low shear pumps. Diaphragm, centrifugal, or peristaltic pumps are recommended to avoid high shear which can initiate undesirable premature polymerization. Do not use gear or piston pumps.

All transfer lines, hoses and pumps must be opaque and be of stainless steel or aluminum. Opaque polyethylene or Tygon tubing can be used as long as it is solvent resistant and/or won't be affected by the UV or EB coating being handled.

Liquid UV & EB coatings must not be exposed to direct sunlight, mercury vapor, fluorescent or any other form of light energy. UV coatings (formulated with photoinitiators) are especially sensitive to these forms of light energy and will start to react (cure) and increase in viscosity. Windows and room lighting should be covered with UV filters shielding to prevent light energy from deteriorating liquid UV coatings in areas of use. Always keep containers sealed and covered to eliminate stray light exposure and limit the potential for spills.

Exposure to iron, copper and alloys thereof, peroxides, free radicals and oxidizing agents affects the stability of UV & EB coatings. Cationic chemistry cure is poisoned by exposure to amines.

Most UV & EB coating raw materials have a low vapor pressure so that odors may not be detected, but the work area still requires ventilation. Some raw materials on the other hand have strong odors that can be smelled in very low part per million concentrations.

In the event of fire take action so that no one inhales gaseous byproducts. Firemen should use self-contained respiratory emergency equipment. Class B CO2 or dry powder fire extinguishers are effective. Evacuate the area to be safe. Be extremely cautious of any bulging container. This could indicate that an uncontrolled polymerization is occurring which can lead to an explosion. If heat was being applied to heat a containerized product, stop and immediately cool the container using internal coils, water spray or a heat exchanger. If needed, add and mix in a hydroquinone inhibitor to acrylate products. Add a 50% water/50% IPA solution to cationic products.

Follow local regulations when disposing of empty containers. Care should be taken to avoid contamination of any coating with fountain solution, wash-up solvents, or substrate fibers. Waste must be proven or known to be nonhazardous in order to be handled as nonhazardous waste according to the Resource Conservation and Recovery Act (RCRA). Non-

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hazardous waste must not be ignitable, corrosive, reactive, or toxic. Those transporting, storing, treating or disposing of hazardous waste must possess the necessary local, state and federal U.S. E. P. A. permits.

Avoid UV & EB coating contact when cleaning tools, equipment or a work area. Follow safe storage, transfer and handling procedures. IPA or MEK are often used. Less aggressive IPA has a higher flash point at 53F but MEK is a better solvent with a lower flash point at 38F. Low VOC solvents are also used. Check out UV Solv 95 from U.V.Process Supply 1.800.621.1296, or try soap & water.

Ozone forms as oxygen absorbs low (184 nm) wavelengths from UV lamps. Ventilate to avoid headaches, fatigue and a dry respiratory tract. UV & EB equipment shielding and interlocks protect against exposure to stray UV lamp generated light and EB generated x-rays as well as electrical shock.

PROTECT YOURSELF

- wear chemical safety goggles when handling coatings
- wear side shielded UVA/UV B goggles near equipment, never look directly at a UV light source
- ventilate and avoid the breathing of coating vapors
- wear long sleeve shirts and pants
- never continue to wear clothing wet with coating
- use a commercial laundry to wash contaminated clothing separately - never wash with family laundry
- wear impervious polyethylene or neoprene gloves
- use barrier creams on clean skin before exposure
- wear protective shoe coverings - do not continue to wear shoes or gloves that have soaked up coating
- have eye wash and wash-up stations near coating use
- wash skin using soap & cool water, never use solvents
- wash-up always before breaks, lunch, and after work
- use disposable wipes and limit accidental exposure
- wash-up before handling food and eating, never ingest
- clean-up any contaminated tools immediately

FIRST AID - Refer to MSDS

Skin contact with UV & EB coatings

- wash immediately using soap and cool water or recommended cleansing cream NEVER use solvents! Remove any contaminated clothing. Seek medical attention for any red or blistered skin. Sun exposure after skin contact can cause severe sunburn. Avoid the sun for 24 hours after any skin exposure.

Eye contact

- flush immediately using generous amounts of water. Seek medical attention immediately

Inhalation

- get to fresh air immediately. Use a respirator if neces

SPILLS AND WASTE DISPOSAL

- prevent spread, dam and absorb with earth, clay, etc.
- ventilate and dispose of saturated material sealing it into a labeled container for incineration or landfill.
- wash-up area thoroughly, disposing of wash waters by approved means, biological treatment or incineration. **DO NOT** dispose of in sewers.
- uncured wet materials must be disposed of with strict regard for government regulations. Generally, uncontaminated low VOC, 100% solid, liquid UV & EB coatings are non-hazardous waste and can be disposed of as such in compliance with all local, state, and federal U.S.E.P.A. regulations.
- cured coatings are no safety or health hazard, and are recyclable on paper & paperboard.

LOOK TO CORK! ..for UV/EB coating creativity!