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Guideline for printers on the safe use of energy curing printing inks and varnishes

The purpose of this document is to provide guidance on the safe use of Ultraviolet (UV) / Electron Beam (EB) inks and varnishes. It is complementary to the respective supplier's safety data sheet (SDS).

Energy curing technology is important in the production of all types of printing applications where their fast drying, durable and high gloss finish make them suitable for immediate use.

For this purpose, two major energy sources are used: ultraviolet lamps and electron beam. Both emit energy, which directly converts appropriate reactive liquids to solids.

1. Product hazards

UV/ EB curing acrylate can cause skin and eye irritation.
The effect on skin can depend upon intensity and duration of contact as well as individual susceptibility. Certain individuals may develop sensitisation or allergic reaction after repeated exposure and will need to be removed from the source of contact.

Since energy-curing products are not corrosive, their presence on the skin may not be immediately noticed. This increases the potential for skin irritation and normal day to day activities may spread the effects to other parts of the body.
Persons known to have a history of skin sensitisation should not be employed using these materials.

Some products may be eye irritants and care has to be taken to prevent these products from coming into contact with the eyes as well as more sensitive areas such as mouth and nose.

With high speed printing presses small ink droplets may become airborne. The mist formed has the potential to present a hazard from inhalation and may be irritating to the skin or respiratory tract or sensitising to the skin. It is essential that the presses have appropriate extraction installed.

2. Safe handling

Skin contact should be avoided.
Long-sleeved protective clothing should provide adequate protection and should be changed immediately if contaminated. Contaminated clothing should be laundered at a commercial laundry before re-use. Do not take contaminated clothing home for cleaning.

Gloves that are resistant to energy curing products must always be worn when direct contact with the material is possible. For advice on the safe use of gloves, refer to suppliers' safety data sheets and technical information from glove manufacturers. Further information can also be obtained from the websites of ESIG (http://www.esig.org/en/library/publications/best-practice-guides) and RadTech Europe (http://www.radtech-europe.com).

In the event of accidental contamination the skin should be washed with neutral pH soap and water. Solvents must not be used as they will degrease the skin and possibly promote

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irritation. In case of accidental skin contact avoid concurrent exposure to the sun or other sources of UV light, which may increase the sensitivity of skin.
Recommended barrier creams should be applied to clean skin and should not be applied after contamination.

Safety glasses or other adequate eye protection must be worn whenever handling any type of chemicals. In the case of splashing into the eyes, wash thoroughly with water ensuring that contact lenses, where worn, are previously removed. Refer to the SDS and seek medical advice immediately. Avoid sources of light that may increase eye sensitivity.

UV lamps emit high intensity UV (and visible and infrared) light. Therefore it is necessary to ensure that suitable screening is used to protect the operators from skin and eye effects. In addition, ozone may be generated from the lamps. Thus it is essential that UV lamp housing extraction is sufficient to provide good working environmental conditions.
EB systems emit ionising radiation and must be adequately shielded and meet any national ionising radiation regulations or Approved Codes of Practice.

Accidental ingestion may occur through poor working practices. Therefore, eating, drinking and smoking should be prohibited in the immediate area where these products are being handled. Hands must always be washed before break periods.

3. Spills/Disposal

Good levels of hygiene must be maintained and spillages must be cleaned up immediately.

Energy curing systems remain wet unless exposed to the appropriate energy, so spillages and accidental contact can spread to other places. Ensure that no material is accidentally transferred to any parts of equipment.

In common with many other materials, the uncured products are typically classified as "hazardous waste" for disposal purposes which should be done according to national regulations. It is not anticipated that they would have an adverse effect on the disposal process and may provide a positive energy source in the case of incineration.

Any used wipes from clean-up or wash-up operations should be placed immediately in a separate, labelled container to prevent accidental exposure of other personnel in the work area and treated appropriately by waste disposal regulation or special laundry.

A large spillage should be contained and removed with non-combustible material such as sand or earth. The spill area should then be thoroughly washed with hot detergent solution. Since energy curable materials will not dry by evaporation, it is important that any spill be completely removed. Otherwise, these materials will remain wet and a continuous source of exposure.

4. Conclusion

All types of UV/EB products can be handled safely as long as the user is trained in and observes all recommended safety procedures.

Always refer to the supplier's Safety Data Sheet and take appropriate actions. Seek guidance if necessary. It is the legal responsibility of users to carry out risk assessments based on their specific applications. Attention must also be paid to any specific national legislation, code of practice or guidelines.

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