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Health & Safety With UV Inks

Health and Safety issues are common concerns among printers in the process of converting from conventional solvent based inks to UV curable inks. We all know that solvent inks will dry quickly if we splash some on our skin or clothing. Rapid solvent evaporation is responsible for the perceived low irritancy of solvent inks, as dried inks have lower irritancy than wet inks. Some printers think that solvent ink is harmless compared to UV, but the truth is that good industrial hygiene and safe working practices are recommended for *all* ink systems. Hazards are associated with all industrial chemicals (inks, wash-up solvents, screen chemicals, etc.), including dermatitis and skin sensitization, along with hazards related to UV curing reactors.

There are three primary routes of exposure to chemicals in the workplace. First, there is ingestion, when chemicals are accidentally eaten or somehow taken into the mouth. Occasional splashes into the mouth may happen, but ingestion is usually not a problem in print departments. Wear face shields (photo from UVPS) in the reclaim room to prevent splashes to the mouth and eyes. Wash your hands before eating to avoid accidental ingestion of inks and screen chemicals.

The second route is through the skin. Skin exposure occurs primarily because of a breakdown in the natural oils in our skin. Solvents and harsh or aggressive cleaners can remove these oils, leaving our skin without the natural barrier. Solvents and screen washes tend to liquefy inks, allowing easier penetration into the skin. After printing, it is just too easy to reach for a solvent rag to clean the ink from our skin, but that is actually not a good practice at all. It is far better to go to the sink to wash up with soap & water, or a special printer's hand cleaner (photo of UV Hand Cleaner from UV Process Supply).

The third route is by inhalation. If you can smell it, then you are inhaling it! At some print companies, you can smell the inks and solvents from down the road! Shops must have sufficient ventilation in order to reduce staff exposure to inhaled chemicals and solvent vapours. Since most screen solvent vapours are heavier than air, vapour extraction should be at floor level, not at the ceiling. Floor extraction will reduce overall exposure to inhaled vapours, since solvent fumes are not pulled up through staff "breathing zones". Excessive inhalation of chemical vapours can contribute to nausea, headaches, and sickness. Incidentally, just because something smells bad, does not mean that it is necessarily bad for you. (Think of the smell when Grandma cooks cabbage!) Changes in odour may be automatically perceived as bad, when in fact they may simply be different. Most people get used to changes in ink or screen wash odours within one or two weeks.

A specific inhalation situation exists with UV dryers. UV energy reacts with oxygen in the air to generate ozone (an oxygen molecule with three atoms of oxygen instead of the normal two). Ozone in the upper atmosphere around the planet is a good thing, as it shields us from excessive UV from the sun. Ozone in our breathing zone is not so good, as ozone is reactive. The best method to deal with the potential ozone problem is to ensure adequate ventilation and extraction of air from the UV reactor. Also, wear UV-blocking shop glasses around the UV dryer. These photos from UVEX show common styles of UV-blocking shop glasses.

Whether we use solvent or UV inks, we will need to clean squeegees and screens after printing the job. Cleanup is one of our points of greatest exposure to chemicals, as both inks and screen washes can be in contact with skin for long periods. Cleaning a screen by

leaning over it while using fast-flashing solvents will also dramatically increase exposure through inhalation.

Basic protections such as barrier creams (photo from Hand-Sense) and gloves are recommended as part of good industrial hygiene. Skin-tight “surgical” gloves can be worn during many shop operations. Heavy solvent-resistant nitrile gloves are used during the cleanup of press equipment and screens. Reclaiming staff may require full-length heavy-duty neoprene gloves. The trend toward nitrile gloves (shown in the photo from Lab Safety Supply) is partly due to the number of people who are allergic to latex gloves (photo from Lab Safety Supply) and the powders used in them, and partly to the problems associated with thin polythene disposable gloves.

Once solvents have removed skin oils, our exposed skin is susceptible to drying. Once dry, skin can become irritated enough to show signs of dermatitis, such as redness, scaly appearance, itchiness, and puffiness. Repetition of the exposure-dryness-dermatitis cycle can lead to skin sensitisation, which is a type of allergic reaction. The photo from the American Academy of Dermatoloy shows a person’s arm with allergic contact dermatitis.

For companies that do not currently have personal protection gear in place, UV Process Supply (www.uvprocess.com) offers a package called the UV Starter Kit, with gloves, barrier creams, goggles, wipes, cleaners, and other necessary items. Contact your suppliers for information on locally available personal safety items.

Companies are required to provide safe working environments and adequate protection from chemicals, but each day, we individually must make decisions about maintaining good industrial hygiene. Each staff member can take precautions against excessive exposure to inks, solvents, camera darkroom materials, and other chemicals. Remember these three rules, and you will minimize potential hazards related to UV inks:

1. **Don’t eat it!**
2. **Don’t breathe it!**
3. **Don’t leave wet ink on your skin!**

Staff members often have questions about particular inks, so please contact your ink supplier for more information on H&S with UV.

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