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UV CURING vs. WATER TECHNOLOGY

Periodically someone will ask which technology is better; UV curing or water based. The correct question is "Which is better for your particular needs?" Both offer very positive environmental properties and both are safe for the operators applying the materials. Unfortunately, since UV curing offers better performance for gloss, abrasion resistance, chemical resistance and in many cases is easier to handle, the companies which offer only water based chemistry have often resorted to negative marketing campaigns in an attempt to scare potential customers into using their products.

Both chemistries offer a reduction of solvent use but UV curing is superior because it totally eliminates solvent. Water based materials, although at a reduced level, still typically contain some VOCs and often HAPs materials. Progress in reducing these unwanted materials is continually being made. Since UV curing materials do not contain solvents they are stable on the equipment. Water based coatings will change in viscosity and must be constantly monitored for pH. Loss of amine stabilizer will cause the coating to body up or even precipitate out of solution. Stabilization with too much amine will cause drying problems. Under humid conditions the drying of the water based product can be problematic. UV curing is only affected by the amount of UV energy from the lamp system. Water based coatings can resoften with heat and humidity while UV coatings are unaffected.

Recycling of coated products was an issue that was proven to be a smoke screen. The Beloit study found that UV and water based coatings were both equally recyclable.

Handling of the wet chemistries is generally similar and without problems. This does depend on the individual formulations and the hygienic practices of the printer but if they are formulated properly and with safety for the machine operator in mind, the products are not a problem. Proper handling of all chemistry is recommended. Water based coatings will cause skin rashes just as UV chemistry if proper handling is disregarded.

Applying water based products to low surface energy substrates can be a problem since the water based material may not wet the surface well. UV curing products are generally similar and also work best when the substrate is surface treated in-line to raise the surface energy. On nonabsorbent substrates, it is difficult to dry water based inks and coatings since the water can not be absorbed. This is not a problem with UV curing products.

Waste disposal of UV coating is often less of a problem providing it is not contaminated since the UV coating is not regulated as hazardous waste while the water based coating is. This is due to the solvents, amines and coalescing agents present in the water based coatings. Some water based products have actually required red labels due to the flammability and amount of the contained solvents.

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The use of UV curing continues to grow at double digit rates. Food packaging applications is one of the largest and fastest growing areas. UV curing is able to meet the needs and demands of this sensitive industry relative to subjective concerns about odor and off-taste as well as the regulatory constraints such as CONEG.

As stated earlier, both UV curing and water based products offer significant environmental advantages over solvent based chemistry. However, UV curing offers some advantages over the water based products. Both are good products and the choice depends on the end product needs based on gloss, resistance properties and economics.

To assist you in your decision regarding these two technologies, please contact your local **SunChemical** branch for a review of your needs.