

# ECS setting the standards in pressroom solutions

## Pressroom Chemical Guide

This document is aimed to help the reader understand how pressroom chemicals (or washes), work, what their properties are and courses of action to take in terms of recommending ways of overcoming issues on press. We shall begin by describing the different attributes of solvent washes, followed by a troubleshooting guide including commonly occurring issues on press and how to overcome them. This information is also intended to help establish the most suitable choice of wash for a given printer.

### **Evaporation (or Drying)**

This is a measure of how quickly the solvent will evaporate off a given surface when applied and left to dry (such as the blanket and/or roller surface). ECS can provide a wide range of products that meet different requirements in terms of dry speed of washes. Different printers have different preferences and choosing the right chemical in terms of its evaporation can be a compromise based on a trade-off with other factors of the wash.

Typically faster evaporating solvents are more hazardous to health and are more highly flammable. Using faster evaporating solvents can mean the press is ready to start again more quickly rather than having to wait longer for slower evaporating washes residues to finish drying. This would appear to be advantageous to the modern-day printer who wants to print at faster speeds to increase throughput, however, slower evaporating solvents are generally considered safer to handle and because they are slower they deep clean the blankets and rollers for longer allowing continual wiping with the same dose of wash, compared to having to wipe once and reapply a faster evaporating version.

Faster evaporating washes are typically higher in VOC's (Volatile Organic Compounds), whereas the industry is moving towards a more environmentally friendly approach in reducing VOC's.

Temperature can also play a part on the evaporation of solvents – generally speaking solvents will visually appear to evaporate quicker on warmer days than on colder days.

### **Odour**

Quite simply this refers to the smell of the liquid solvent. Harsher and faster evaporating aromatic solvents have a tendency to give off much stronger odours. Within the confines of a pressroom, particularly if ventilation is not good, odours can manifest and make the working environment a very unpleasant place to be.

Higher temperatures will increase the odours given off by solvents as the volatiles evaporate into the atmosphere during use.

At ECS we are able to offer a full range of products to meet customer demand regarding odours. Lower odour non-aromatic solvents are possible options in place of aromatic equivalents, it just depends on the requirements of the individual user. Always refer to what a printer is currently using and offer alternatives based on their likes and dislikes. It is also possible to add fragrances which can mask higher odour solvents making them more pleasant to work with whilst maintaining the same functionality of wash solution. Just ask our technical team for further information.

Also remember that odour is very subjective, so what one printer may like another may find unpleasant, it simply depends on the individual tastes.

### **Solvency (or strength)**

This is a measure of how efficient the solvents are at removing ink and other contaminants. It would seem common sense to assume that surely the printer always requires the "strongest wash available as this will clean the best", however, that is not always the case. Stronger aromatic solvents tend to be more aggressive on blankets and rollers and can lead to swelling which damages their compounds, meaning costly replacements are required. Therefore it is important to get the right balance. Commonly a milder less aggressive chemical is used for regular wash-ups, and use of a stronger solvent is done periodically to deep clean occasionally.

### **Flammability**

This is a measure of the flashpoint of the chemical and is referred to in Degrees Fahrenheit or Degrees Celsius. The flashpoint is the lowest temperature at which the solvent gives off enough vapour to ignite. A lower flashpoint of a solvent suggests a more flammable product.

Two common terms associated with chemicals are AII and AIII category solvents. AIII category solvents have a flashpoint >55°C. All solvents have a flashpoint below this. Often "Approved products" are required as a machine manufacturer's guideline may insist on such to maintain the machine warranty. Typically approvals are conducted by 3<sup>rd</sup> party companies – the most well known in Europe being FOGRA. They will only test and pass AIII category solvents with a flashpoint greater than 55°C, such as our C651 Elite 60, or our C805 Elite UV Wash.

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### Automatic and Manual washing systems

Most large sheet-fed and web presses nowadays incorporate some form of automatic washing system. Each specific one will contain guidance notes on how to use them and it is always important to refer to the manufacturers guidelines on how to clean each press, to uphold any manufacturer warranties. ECS provide a range of solvents suitable for most automatic systems.

Manual cleaning is usually done with a lint free cloth to avoid contaminating the system with lint from fabric. Each product will have its own specific method of use – please consult our technical datasheets for specific product usage. Most of the ECS range of pressroom chemicals can be used as both automatic and manual cleaners.

Some presses do require more specific solvents. For example Heatset Web Presses are commonly fitted with heatset ovens to dry the ink and coating. These ovens are calibrated to a specific temperature, for example 100°C, and it is highly important that the wash solution recommended is compatible with the oven temperature. Typically the flashpoint of the chemical should be set higher than the oven temperature, so as to avoid the potential for combustion to occur within the oven. This highlights the importance to question the method of use and the requirements of the press before making any recommendation.

### Water miscible vs. Non water miscible

The main difference between the two is that Water Miscible solvents contain emulsifiers that enable the solvent to mix and hold in solution when mixed with water. The purpose of this is to clean all deposits on the press with one solution. The solvent will act on the ink, whereas, the water helps clean water soluble deposits, along with paper lint and gum contained in the system. Some presses run with non water miscible washes and clean the system in a 2 step process, firstly with solvent, then with a separate water flush. The benefits of using a water miscible wash seem clear, however, some emulsifiers can be considered to contaminate the system and lead to issues such as roller stripping and is often why press operators choose to use a two step wash system. Also, by mixing with water the efficiency of the solvent is diluted by the water, which may mean taking longer to clean all ink residues. The pros and cons of both systems should be weighed up for individual requirements. ECS provide a full and complete range of chemicals with water miscible and non water miscible versions to accommodate most requirements.

Meter Roll Cleaners are a good example where a non water miscible chemical is more suitable. These are typically fast evaporating solutions that are manually used to clean excessive ink from the dampening roller. This is quite common in continuous dampening systems, where the ink and dampening rollers are integrated. Using water miscible solvents in this case can lead to ink/water emulsification issues. The Meter roll needs to stay water receptive for the best performance, therefore slow drying solvents may repel water from its surface.

### Ultra Violet (UV), Wash solutions

UV inks are often employed by the printer due to the fast processing, high quality, and low environmental impact associated with them (they are typically very low in VOC content compared to conventional and solvent based inks). Due to their nature they tend to require more specific cleaning agents than offset inks for best cleaning, but also the nature of the rubber compounds used to print UV is commonly very different. The majority of UV presses are equipped with EPDM (Ethylene-Propylene-Diene-Monomer – a synthetic rubber), blankets and rollers, and these are particularly susceptible to swelling by hydrocarbons. Typically glycol ethers and such are more suitable to these compounds as they are less aggressive to the rubber and show good UV ink solvency. ECS has a range of suitable UV Washes including the FOGRA approved C800 Biograph UV Wash and C805 Elite UV Wash, which are both recommended as safe for EPDM.

Occasionally UV can also be printed on Nitrile based rubber, most commonly when using mixed printing techniques (printing conventional on one run, then UV on the next), or when using Hybrid inks (which have a mixture of both types of ink properties). These again require a very specialist type of wash solution and ECS can offer various chemicals for such work, including our C842 All Combivash.

### Volatile organic compounds (VOC's)

Most chemicals and solvents contain at least some VOC's, with the majority being 100% VOC containing. The trend in printing is continually moving towards environmentally friendlier options, due to the impact that VOC's have on greenhouse gases in the Earth's atmosphere. Many local authorities have or are setting up legislations and incentives to try to influence the use of "greener" products to reduce VOC emissions within the general public as well as printing.

It would appear logical to simply supply low VOC products, however, typically such chemicals are both more expensive to formulate with as well as typically slower drying, and therefore many press operators choose VOC containing products instead.

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## Problem Solving

There are many issues related to cleaning that have already been covered and can simply be overcome by choosing the correct chemical to use initially based on the printers' requirements. Below are listed a few commonly occurring issues and why they occur and how to correct them.

### 1) Rubber swelling

- a) This is often caused by either using an unsuitable solvent (i.e. using a hydrocarbon based chemical on EPDM rollers), or one that is too strong. To overcome this switch to a milder or more suitable chemical.
- b) Solvent lingers for too long on the affected area. To overcome avoid excessive use of wash, switch to a faster evaporating version, or simply ensure the solvent is wiped clean from the surface during use.

### 2) Roller Stripping

- a) Emulsifiers in water miscible wash contaminating rollers by building up. Change to different emulsifier wash system, or try a non water miscible wash/lower concentration of emulsifier.
- b) Glazing of rollers. Clean with specific deglazing chemical solution.
- c) Calcium contamination from water, paper and ink residues. Clean with Calcium removal wash or solution, roller cleaning paste or shampoo. Regularly using products such as our SND103 Roller Cleaning Paste, SND125 Bio Shampoo, will help prevent both glazing and calcium contamination occurring.

### 3) Plate Blinding

- a) Caused by surfactants in water miscible wash. Again look at non water miscible versions, and/or lower/different surfactant concentration washes.
- b) Caused by calcium build up. Clean with calcium removal wash or solution, roller paste or shampoo.
- c) Some chemicals can be too strong and may strip the plate image. It is always important to test solvents, fount solutions and plate cleaners for compatibility. CTP plates for example are notoriously more susceptible to chemical attack and can often require milder choice of cleaning agents.

### 4) Inadequate cleaning

- a) Caused by improper set-up or dosage of wash. Consult manufacturers guidelines for automatic wash settings and ensure these are followed. Potentially a stronger solvent may be required as an option. For manual use ensure method of application as set out by the manufacturer of the wash solution is followed.
- b) Caused by using the incorrect or a contaminated wash. Ensure all washes when not in use have their lids replaced and labels on the containers are not removed. Ensure the system is completely purged of all wash solution before switching to a different chemical.
- c) Solvent too cold or too warm. If the solvent is too cold it will typically dry slower, whereas, if too warm it will appear to dry quicker. Try and maintain at a standard pressroom temperature of 15-25°C. In reality this may not be possible so ensure the press operator has an understanding of the effects temperature can have on solvents so they can adjust dosage and use as required.

*The information contained in this data sheet corresponds with our current knowledge and experience. The liability for the application and processing of our products lies with the buyer, who is also responsible for observing the third party rights.*

*We reserve the right to alter any of these details as a result of technical or manufacturing developments.*

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