GUIDANCE NOTE ON THE STORAGE AND HANDLING OF SOLVENT BORNE ALUMINIUM-BASED PRINTING INKS

It is well documented that aluminium particles will react under certain conditions with a number of chemicals. These include water, alkalis, oxidising agents and some acids, which can react to form hydrogen gas and heat. This exothermic reaction can be especially dangerous in a confined space, such as a sealed container, because of the build-up of pressure.

Whilst handling such materials, all process equipment should be suitable for the operation and according to explosive atmosphere classification of the area as well as appropriately earthed in accordance with best practice guidance.[1]

Whilst this potential danger with aluminium based inks cannot be fully negated, any subsequent risks can be managed by adherence to a number of recommended procedures:

1. Raw material suppliers of aluminium powders/pastes issue strict guidelines on the safe handling and storage of their products. Of prime importance is the storage in a dry area to prevent the ingress of water. To avoid contamination with other products the aluminium paste should be kept in the original shipping containers and kept tightly sealed.

2. All aluminium-based inks and pastes should be stored between 5˚C and 25˚C (unless otherwise specified) in a dry, well-ventilated place away from all sources of heat, ignition and direct sunlight. These facts should be highlighted in the printing ink technical data sheet as well as within its safety data sheet.

3. Attention must be paid to firefighting measures (do not use water-based systems). In addition, avoid storing together with incompatible materials (strong alkalis and acids).

4. Aluminium based inks may be supplied as finished inks or manufactured on-site. Where Aluminium inks are mixed or blended on site, correct facilities and procedures must be in place and care must be taken to maintain the temperature as low as possible (below 45˚C) with minimal shear. For this reason, the use of high-speed impellers requires a careful evaluation. When mixing, the paste should be added to the vehicle and not the other way round, to avoid stressing the paste. All equipment must be absolutely clean, to avoid contamination from other ink components.

5. Whether supplied as finished ink, or blended at the end users' site, printing should take place as soon as possible to minimise any possibility of gas build up during storage. Storage of open containers must be subject to control, as a too long period will increase the possibility of reaction of aluminium with other printing inks components.

6. If aluminium based inks are supplied as finished inks, the end user must be informed about their specific risks and adopt a batch rotation system to ensure minimum storage time for the product. To further reduce the risk of gas build-up, the use of vented storage containers, in a well-ventilated storage area is also recommended.

[1] such as PD CLC/TR60079-32-1-2018 or equivalent national standard

European Printing Ink Association EuPIA - a sector of CEPE aisbl
Boulevard du Triomphe 172 • 1160 Brussels
+32 2 897 20 20 • eupia@cepe.org • www.eupia.org

7. Press returns ideally should be disposed of rather than placed back into storage. However, if this is not an economic option, they should be stored in vented storage containers in a well-ventilated store.

8. It is important to remember the reactivity of aluminium when selecting clean-up materials and procedures. Use suitable wash-up solutions. When using water-miscible wash-up solutions, use water only for the final wash-up step.

9. It is important that waste aluminium-based ink is segregated from other waste sources in order to avoid contamination and any possibility of reaction and subsequent fire.

10. Spillages should be collected on chemically inert absorbent material, such as dry sand or vermiculite and disposed of in leakproof, internally lacquered containers. They should be kept separate from clean-up materials and solutions, other spilled materials and wastes (see 9. above).

Further information on storage, handling and use can be found in the safety data sheet for the specific product concerned.

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