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## Acid Catalysed Coatings – Formaldehyde Issues

Possible adverse effects due to skin contact or inhalation of formaldehyde has been the subject of investigation in research institutions all over the world. The irritant effects of formaldehyde are well established and most humans suffer from eye watering at atmospheric concentrations of around 1 part per million.

A safe Threshold Limit Value (TLV - TWA) has been set by Worksafe Australia. Workplace limits are site based and the responsibility for compliance is with the user of the product. Legislative limits for formaldehyde in the workplace may change, so compliance with the current level should be checked regularly.

Formaldehyde emitting products are widely used in the furniture industry. The following wood surfacing materials may be manufactured with amino (formaldehyde containing) resins:

Reconstituted wood veneers	Laminating adhesives
Resin impregnated paper foil	Acid catalysed lacquer
Some single pack lacquers	Baking enamels
Melamine construction boards	Chipboards & Medium Density Fibreboard

With this background Mirotone embarked on a deliberate programme to provide low formaldehyde emission products to the industry in Australia. Low quality acid catalysed products will contain significant quantities of free formaldehyde, which is released to the atmosphere on spraying. The amino resins used in such products have poor stability, and can only be incorporated into low solids products. Larger or smaller amounts of formaldehyde will be released depending upon the manner in which the coating is formulated and catalysed. For many years reputable suppliers of amino resins have provided the coatings industry with high quality, low formaldehyde resins. Mirotone utilises such low formaldehyde resins in its products in order to minimise formaldehyde evolution. Mirotone has installed a test apparatus to measure emissions from our coating in our R & D Laboratories. The formaldehyde measuring equipment has allowed us to lower our formaldehyde content in all our coatings and to compare our products with local and overseas competitors.

Our research has confirmed that formaldehyde emissions from products such as the MIROBILD AC range drop rapidly over the first few hours; hence the need to dry articles in a well ventilated drying room in the early stages of drying.

The concentration of formaldehyde emitted in the workplace from drying coatings is directly proportional to the volume of coating applied. Therefore the volume of airflow within the drying area must be such that the concentration in the air is less than the regulatory requirement. We recommend that specialist engineering help be sought to calculate the required airflow. The engineer will require the formaldehyde emissions reported in this way in order to calculate the level plus the airflow to maintain formaldehyde emissions below the regulatory threshold. For this reason Mirotone reports its formaldehyde emissions in mg/m<sup>2</sup>/hr and will provide the rate of formaldehyde emission of its specific products upon request.

Mirotone Material Safety Data Sheets specify the protective equipment required to spray the individual coatings. This includes facemasks with appropriate filters or air supplied facemasks. This specification of equipment has been conducted with the assistance of the Occupational Health and Safety Division of 3M. The amount of formaldehyde present over a working day may be measured by monitoring devices worn by

the operators to determine the exposure levels within the workplace. This service is available from many OH&S service providers. Regular monitoring is recommended.

Formaldehyde is characterised by its pungent odour. Employees with a history of asthma or allergies are more prone to reaction to the products emitted at the time of application or drying (even at levels lower than the Worksafe limits). Employees who have worked with the products for a long period may become sensitised to these ingredients (solvents or formaldehyde) and exhibit similar allergenic symptoms. The irritant effect will generally fade when exposure is discontinued or exposure controls are introduced.

We therefore advise our Customers to be conscious of this and to pay attention to such items as:

- The quantity of freshly painted board in the factory, ie. Number of square metres/cubic metre of air space and ventilation in the drying area.
- Method of drying, ie. By the use of heat or turbulent air or a combination of both.
- Usage of a properly constructed spray booth.
- Usage by the polisher of a chemical type respirator facemask positive for formaldehyde. Usually a simple charcoal filter.

With these simple but necessary precautions, manufacturers can safely use acid catalysed systems and the excellent properties associated with these products can be properly utilized.

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