Blayson Wax Products - Technical Information

Colophony

Background

- Following concerns in the electronics industry where asthma was connected to fumes from soldering, the asthmagen colophony, and colophony derivatives, have been of concern in the investment casting industry and the subject has been under discussion for some time.
- Accordingly individual foundries have been left to decide how they view and deal with the colophony issue as dictated by their individual circumstances.

Blayson position

- Blayson decided as a matter of policy over 10 years ago to avoid the use of colophony in its wax products.
- Colophony – can be defined as gum rosin.
- Blayson wax products do not contain gum rosin.
- Blayson does use esters (derivatives) of rosin, but these products do not contain rosin itself. The esters are defined as 'resin acids'.
- Each ester has a different chemical identity and a different Chemical Abstracts Service Registry Number (CAS No.) from that of rosin.
- The ester products used by Blayson fully comply with all applicable EU National and Community legislation relating to chemicals, such as UK "CHIP" Regulations (SI-2002-1689) and the Dangerous Substances Directive 67/548/EEC as amended.

HSE study

- HSE has assigned colophony based solder flux fume MEL (maximum exposure limit) of 0.05mg/m^3 for the 8 hour time weighted average, and 0.15mg/m^3 for the 15 minute reference period.
- However HSE states that control must always be reduced as far as is reasonably practicable below MEL since this is not the safe level for all persons.
- A study was undertaken at 6 foundries to measure the exposure to colophony fume by inhalation arising from wax injection and assembly activities and observing the factors that influenced exposure – this was reported in full in the 'Foundry Trade Journal' June 2003 issue.
- The study found that colophony content ranged between 0.38% to 2.1% w/w for pattern and runner waxes, and 38% w/w for the 2 'sticky' waxes with less than 0.5% w/w for the soft waxes.
- The injection machine operator's exposures were typically low at less than 0.008mg/m^3 and were similar to the background magnitude. This suggests that colophony is not emitted by wax melting and injection.
- Assembly was affected by several factors: the colophony level of the waxes; the presence of LEV (local exhaust ventilation) at assembly stations; volume of work; number of operators; method of assembly.
- The most important factor was the colophony content of the waxes
- Where effective LEV was installed exposure was minimal.
- The use of adhesive wax for assembly rather than welding resulted in low readings.

Conclusions

- HSE have determined that there is minimal risk resulting from the melting and injection of investment casting wax, providing recommended temperatures are not exceeded.
- The latest HSE testing indicates that providing correct procedures are followed that the levels of resin acid released from Blayson waxes are of minimal risk.
- HSE does however recommend adequate and efficient extraction at the assembly stage irrespective of the type of wax used.

A member of The Blayson Group Ltd
Blayson Olefines Ltd, Denny Industrial Centre, Pembroke Avenue, Waterbeach, Cambridge CB25 9QP
Tel +44 (0) 1223 861491 Fax +44 (0) 1223 441500 email sales@blayson.com
www.blayson.com