

Resin Acids – Are Your Workers Protected?

Written for AIHCE Exp2019 by:

Joseph Lohkamp, CIH, CSP

Jim Kenny, CIH, CSP, MPH, FAIHA

Presented to San Diego ASSP by:

J. Michael Strange

Chubb Global Risk Advisors

Disclaimer

The information contained in this presentation is not intended as a substitute for legal, technical or other professional advice, nor is it intended to supplant any duty to provide a safe workplace, operation, product, or premises. Chubb Global Risk Advisors makes no express or implied warranty that all accidents or incidents can or will be prevented, or that numbers of accidents or amounts of losses will be reduced. Chubb Global Risk AdvisorsSM is a service of ESIS[®], Inc., a Chubb company. Chubb Global Risk AdvisorsSM provides claim and risk management services to a wide variety of commercial clients. ESIS' innovative best-in-class approach to program design, integration, and achievement of results aligns with the needs and expectations of our clients' unique risk management needs. With more than 60 years of experience, and offerings in both the US and globally, ESIS provides one of the industry's broadest selections of risk management solutions covering both pre and post-loss services. Chubb is the marketing name used to refer to subsidiaries of Chubb Limited providing insurance and related services. For more information, visit us at www.chubb.com.

Introduction – What are Resin Acids

- Rosin - Derived from Pine Trees
- 3 types of Pine Rosin
 - Gum Rosin – from Tapping Live Pines
 - Tall Oil Rosin – Recovered from Pine Wood Kraft Pulping
 - Wood Rosin – Solvent extracted from Harvested Wood

Introduction – What are Resin Acids

- Rosin contains:
 - 90-95 % Resin Acids - diterpenic monocarboxylic acids – such as abietic acid
 - 5-10 % nonacidic compounds – ethyl chavicole, stilbene derivatices, terpene dimers, aldehydes, and several hydrophenanthrene hydrocarbons

Resin Acids – Where are they found

Only Solder Fluxes?

What about:

Paper Mills

Paper Sizing

Composites

Polymers

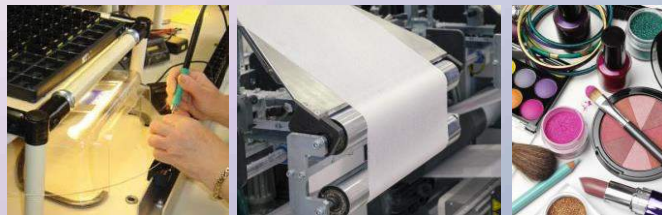
Paints

Printing Inks

Cosmetics

Machine Coolants

Adhesive formulations (hot melt
adhesives)



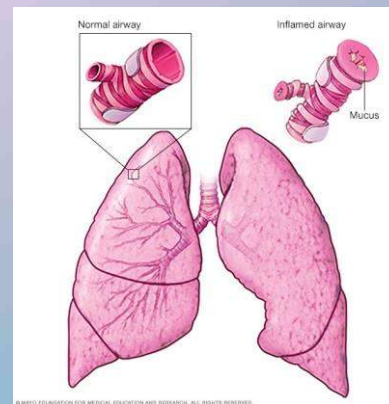
Resin Acids – Health Effects

Skin Sensitization

Contact dermatitis

Occupational Asthma (RSEN)

Eye and Respiratory Irritation



Occupation Exposure Levels – What to Sample For?

- Colophony
 - 1- Abietic Acid –traditional way
 - Total Resin Acids
-
- What about aldehyde exposure?
 - Proposed TLV says that aldehyde exposures need to be evaluated when colophony is used in hot processes.



Occupation Exposure Levels – How much is to much?

- UK HSE WEL – Resin Acids in Rosin (Colophony)
 - 0.05 mg/m³ (8 hour TWA)
 - 0.15 mg/m³ (15 min STEL)
- 2020 ACGIH TLV – TWA 0.001 mg/m³ , as total Resin Acids, Inhalable Particulate Matter; RSEN; DSEN

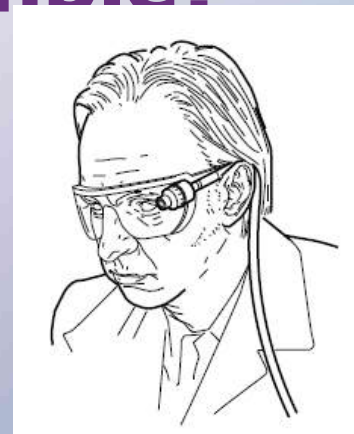
Resin Acids – How do we sample?

UK HSE Method – MDHS 83-3

GC FID – 13 mm Swinnex with MCE Filter
1–2 liters per minute (2 lpm STEL Samples)

Proposed TLV – Inhalable Particulate Matter

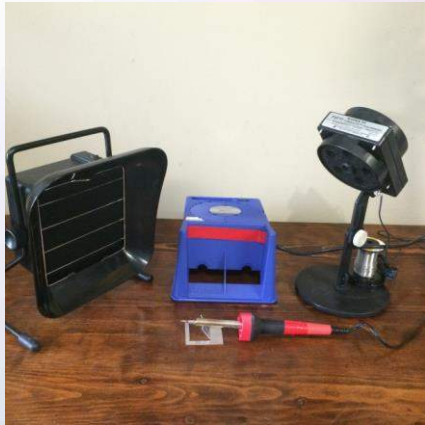
1. What filter media (MCE, GFF)
2. Need to do inhalable? Are all fumes generated respirable size?
3. How long do you need to sample to get to $\frac{1}{2}$ the TLV? Detection Limit 0.3 – 0.5 ug.



Resin Acids – How to protect your workers when soldering

Types of Ventilation

Air Displacement Boxes
(Not Recommended)



On-Tip
Extraction



Local Exhaust
Ventilation



Resin Acids – How to protect your workers from Resin Acids

- Hazard Communication to make employees aware of Hazards
- PPE to protect from contact
- Local exhaust ventilation to control vapors or fume at source

Questions?

J. Michael (Mike) Strange, CIH

Principal Consultant, Industrial Hygiene and Safety

Chubb Global Risk Advisors

Michael.strange@chubb.com

