

M505: CONTROL OF HAZARDOUS SUBSTANCES

Case Study 4 – Paint Manufacturing

Super IH Paints produces a variety of specialist paints. The company understands its requirements to risk assess chemical handling within its factory. It has already identified the chemicals and tasks it needs to assess.

A video will be shown to you which shows how paint is manufactured within the factory and then how the paint vessels are subsequently cleaned.

Additional Background Information:

1. Four operators have been trained to manufacture paints in this factory. They work a single day shift, 0800 – 1600 hours with a 30-minute break for lunch. Paints are produced on a batch basis. Once the paint has been colour matched it is poured into tins. The empty vessel is returned for cleaning. Each operator cleans 4 vessels per day. Each vessel takes approximately 15 minutes to clean. Operators wear recycled cotton overalls, safety glasses, PVC elbow length chemically resistant gloves as suggested by the MSDS and safety boots.
2. To remove residual paint from the interior of the batch vessel approximately 10 litres of Butan-2-one (Methyl Ethyl Ketone) is added. Butan-2-one is a narcotic in high concentrations. Brushes and spatulas are then used to ensure that the vessel is thoroughly cleaned. The residual paint contains 2-methoxyethanol, which can be absorbed across the skin and is also known to affect the male reproductive system and bone marrow.
3. Personal monitoring has been performed and analysis of the samples obtained gave Butan-2-one 8-hour time-weighted average concentrations in the range 100 – 300 ppm. 2-methoxyethanol 8-hour TWA concentrations were all less than 1 ppm (Occupational Hygiene Report, 'Assessment of exposure to vapour and noise', Ref: KJ0087K, 01/09/05). The operators performing this task commented that they often experienced light-headedness, headache and nausea at the end of the working day.
4. Procedures describing how this task should be performed are not available.

5. Occupational exposure limits, risk phrases and boiling points for butan-2-one and 2-methoxyethanol are as follows:

- Butan-2-one (methyl ethyl ketone) – 200 ppm 8 hour TWA and 300ppm 15 minute STEL, Narcotic in high concentrations. Absorbs through skin. Risk phrases: R11, R36, R66, R67, Boiling point: 80°C.
- Paint (2-methoxy ethanol) – 5 ppm 8 hour TWA, Long-term effects on male reproductive organs. Absorbs through skin, Risk phrases: R60, R61, R10, R20/21/22, Boiling point: 125°C.
- Risk Phrases

| | | |
|-----------|---|--|
| R10 | - | Flammable |
| R11 | - | Highly flammable |
| R20/21/22 | - | Harmful by inhalation, in contact with the skin and if swallowed |
| R36 | - | Irritating to eyes |
| R60 | - | May impair fertility |
| R61 | - | May cause harm to the unborn child |
| R66 | - | Repeated exposure may cause skin dryness or cracking |
| R67 | - | Vapours may cause drowsiness and dizziness |

Exercise: Identify all sources of exposure to all workers and develop a control strategy (or strategies) to minimise the overall exposure of workers. In your answer clearly identify how the strategy you have developed will be implemented and maintained.

Note: *This case study is based on a range of archive materials adapted to create a case study for student use. It does not represent any particular company or situation past or present. Any resemblance to current people, organisations or companies is coincidental.*