Safety Alert – Welding fumes & 3D printer emissions

Part 1: The fumes produced during welding mild steel have been reclassified as a carcinogen. Exposure to the fumes has been linked to both lung and kidney cancers.

This is based on the research by the International Agency for Research on Cancer (IARC). More detail is available in their recent monograph and in a Lancet article on the monograph. The research has resulted in the HSE reviewing and updating the current enforcement expectations for safe standards of all types of welding and a Safety Bulletin has been issued.

Action to be taken

All managers/supervisors responsible for welding of any type should take the following action:

1) Review and update risk assessments;
   a) Ensure that engineering controls are suitable for the fumes produced
   b) When the engineering controls do not eliminate the risk, ensure that respiratory personal protection (RPE) is specified
   c) Ensure that the need for face fit testing of the mask and health surveillance has been considered and it is stated if required.
2) Distribute the updated and approved risk assessment
3) Implement all changes made in the risk assessment including;
   a) If local exhaust ventilation is required, that it is maintained and there is the statutory examination
   b) Ensure if RPE is needed that face fitting has been undertaken and passed in the last 3 years on the mask specified
   c) Ensure that staff are trained on how to use and maintain both LEV and RPE

Part 2: HSE have published a report entitled 'Measuring and controlling emissions from polymer filament desktop 3D printers'.

This report warns that 3D printers can create harmful emissions which could potentially endanger users. The risk is associated with the emission of small particles and volatile organic chemicals when 3D printers, which are not enclosed, use polylactic acid (PLA) and acrylonitrile butadiene styrene (ABS).

Action to be taken

All managers/supervisors responsible for work with 3D printers should take the following action:

1) Review and update risk assessments to ensure they follow sector guidance 3D printing in schools and colleges; managing the risks.
2) Ensure that risk assessments and local procedures incorporate the 4 main ways to lower the risk from exposure;
   a) Setting a lower printer nozzle temperature
   b) Using a filament with a lower emission rate
   c) Placing the printer in a clear enclosing hood fitted with a extraction fan and particulate filter
   d) Maintaining a "hood clearance time" of about 20 minutes
3) Distribute updated and approved risk assessments
4) Implement all the changes made in the risk assessments, including training users.

Document control

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