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**SSERC Risk Assessment** (revised version March 2018)

(based on HSE’s INDG 163 ‘Risk assessment - A brief guide to controlling risks in the workplace’)

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| Activity assessed | Copper Etching |
| *Date of assessment* | 03/12/2019 |
| *Date of review (****Step 5****)* |  |
| *School* |  |
| *Department* |  |

| Step 1 | Step 2 | Step 3 | Step 4 | | |
| --- | --- | --- | --- | --- | --- |
| *List Significant hazards here:* | *Who might be harmed and how?* | *What are you already doing?*  *What further action is needed?* | *Actions* | | |
| *by whom?* | *Due date* | *Done* |
| **Degreasing** |  |  |  |  |  |
| Soy sauce may contain nuts | Technician, teacher, pupil by splashes | Only a problem for those with allergies. Check beforehand. If severe then leave this step out. If not then provide appropriate protection. |  |  |  |
| Calcium carbonate has no significant hazard |  |  |  |  |  |
| Vinegar has no significant hazard |  |  |  |  |  |
| **Ground** |  |  |  |  |  |
| Molten candle wax | Teacher, pupils by contact on skin | Use tongs/ holders where appropriate and allow to cool |  |  |  |
| Copper sulphate solution is harmful if swallowed and causes eye damage | Technician, teacher by inhalation and splashes | Wear indirect vent goggles (BN ES 166 3) |  |  |  |
| Etch solution harmful if swallowed and causes eye damage | Technician, teacher, pupil by splashes | Wear indirect vent goggles (BN ES 166 3) |  |  |  |
| **Printing** |  |  |  |  |  |
| Printing ink has indeterminate hazards depending on the composition – consult the MSDS | Technician, teacher, pupil by splashes | If contact with eyes or skin wash out/ off with copious quantities of water |  |  |  |
| Thinners is flammable, harmful and dangerous for the environment. (Usually contains xylene but can be others) | Technician, teacher, pupil by inhalation and splashes | Wear indirect vent goggles (BN ES 166 3). If contact with eyes or skin wash out/ off with copious quantities of water.  Keep well away from any sources of ignition |  |  |  |

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| **Description of activity:**  Removing dirt, grime, oil etc from the surface of a piece of zinc foil for etching by using soy sauce, washing up liquid, calcium carbonate and vinegar.  Melting some tea light candles to produce a ground for the etch plate. Then using a cocktail stick to scratch a design into the ground ready for etching.  Etching the design using a copper sulphate/ sodium chloride or cooking salt etchant (solution) ready for printing.  Using filter paper and printing ink to create prints of the etch plate. |

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| **Additional comments:**  Be aware of nut allergies if using the soy sauce for degreasing the etch plate. (An alternative is simply to degrease using propanone)  When using the thinners carry out in well ventilated lab. A less messy version is to use water-soluble poster paints instead of printers ink. The print is not quite as good but it’s a lot cleaner.  After experiments ensure hands are thoroughly washed.  Disposal of the etch solution is done by adding hot water to the etch solution dissolve any solid sulphates. Then add zinc or aluminium fillings and leave overnight. Add sodium carbonate until there is no more fizzing and/ or the pH is between 7 and 8. Then run the filtrate down the drain with copious quantities of water. Then place the precipitate into a sealed bag and store for disposal by licensed contractor. |