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| **Risk Assessment Title:** | UV Exposure Unit |
| **Description of the task / activity / area:** | Exposure of UV-sensitive materials such as coated silkscreens and PCBs to transfer an image for printing or etching. |

| **Ref No.** | **What are the hazards?**  **How could they cause harm?**  **What are the possible injuries/illnesses?** | **Who could be harmed?** | **What control measures are already in place?** | **Current risk** | | | **Detail any additional control measures needed**. | **Revised risk** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Likelihood** | **Severity** | **Risk level** | **Likelihood** | **Severity** | **Risk level** |
| 1 | Electrical Fire | All space users | None | 1 | 3 | 6 | The appliance needs an inspection to ensure all internal wiring is in good condition.  Ensure any ventilation for the unit is working and filters/grilles are cleaned.  Ensure all fuses are correct.  Run several tests under supervision to monitor how the device operates on longer duty cycles. | 1 | 3 | 3 |
| 2 | Electrocution | Operator and first aiders | None | 2 | 3 | 6 | Device should be PAT tested periodically in line with the organisation's policy.  Specifically, ensure the metal touch points are not higher than 0.1Ω + the cable reading back to the CPC/earth. Also ensuring the CPC is reading acceptably. | 1 | 3 | 3 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | UV Exposure to Skin or Eyes | Operator and those in the vicinity | None | 3 | 2 | 6 | Ensure that no UV light is leaking, this could be completed using a torch shining from the inside out.  Ensure there is a safety interlock that either holds the unit shut, and/or directly breaks the power circuit to the light or unit immediately. | 0 | 2 | 2 |
| 4 | Ozone production from UV light | Operator and those in the vicinity | None | 2 |  |  |  |  |  |  |
| 5 | Inappropriate operation | Operator | None | 2 | 2 | 4 | Ensure the exposure unit’s safe operation is included in the induction for the area. | 1 | 2 | 2 |
| 6 | Bulb implosion/explosion | Technician | None | 3 | 2 | 6 | Bulb type needs to be identified, at minimum a full face shield and gloves should be used to protect from broken glass and possible Mercury |  |  |  |
| 7 | Mercury metal | Technician | None | 3 | 2 | 6 | Pregnant people must not be involved in the changing of the bulb.  When changing the bulb suitable PPE will need to be identified for handling it both with an intact bulb, but also in the event it breaks.  Chemical spillage process for cleaning up liquid Mercury in the event of a bulb break.  Caution – previous operators of the machine may have spilt Mercury from broken bulbs inside the machine.  Seek to replace the bulb and ballast with an alternative UV source that doesn’t require Mercury. | 1 | 2 | 6 |

**ACTION PLAN**

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| **Ref No.** | **Action required** | **Responsible person/s** | **Due date** | **Status / date closed** |
| 1 | Add an electrical interlock that disables power to the bulb and/or whole unit. | Electrician |  |  |
| 2 | Have the device inspected by an electrician and PAT tested. | Electrician |  |  |
| 3 | Add the device to the periodic PAT testing. | Directors |  |  |
| 4 | Use a visible light torch to ensure there is no light leaks. | Technician |  |  |
| 5 | Run a “burn in” test to ensure expected operation. | Technician |  |  |
| 6 | Ensure adequate ventilation of Ozone gas. | Technician |  |  |
| 7 | Add the device to the space induction. | Technician |  |  |
| 8 | Prepare a plan to inform existing inductees of the new equipment. | Technician |  |  |
| 9 | Install a UV safety warning. | Technician |  |  |
| 10 | Look for an instruction manual online which might indicate if there is a duty cycle limit for the vacuum pump. | Technician |  |  |
| 11 | A suitable storage place needs to be identified for storage of the old and new bulbs. | Technician |  |  |
| 12 | A disposal route for old bulbs needs to be identified for old bulbs | Directors |  |  |
| 13 | A chemical spill routine and PPE need to be prepared should a bulb break in the machine, or on the way to the disposal place if a bulb was to break and spill liquid Mercury. | Technicians |  |  |
| 14 | Seek an alternative light source replacement for the exposure unit if possible. | Technicians + Electrician. |  |  |

**Appendix 1 - Matrix Table Explained**

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| 1. **Risk rating matrix** | | | **Severity** | | |
| **Slight harm**  **(1)** | **Moderate harm**  **(2)** | **Extreme harm**  **(3)** |
|  |  | *Health* | *Nuisance and irritation, e.g. headaches*  *Temporary ill health leading to discomfort* | *Partial hearing loss, asthma, ill health leading to permanent minor disability* | *Severe life shortening diseases, permanent disability*  *Acute fatal diseases, permanent total disability* |
|  |  | *Safety* | *Superficial e.g. bruises*  *Superficial e.g. minor cuts, eye irritation* | *Lacerations, burns, concussion, minor fractures e.g. fingers/toes* | *Multiple injuries, major fractures*  *Fatal injuries* |
| **Likelihood** | **Unlikely (1)** | *Isolated or “one off” occurrence*  *Unusual but may have happened before* | **VERY LOW** | **LOW** | **MEDIUM** |
| **Likely (2)** | *Will probably occur several times a year* | **LOW** | **MEDIUM** | **HIGH** |
| **Very likely (3)** | *Recurring and frequent, predictable* | **MEDIUM** | **HIGH** | **VERY HIGH** |

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| **Calculation of risk** |
| Use the table above to calculate the overall risk level of each hazard identified. Simply use the calculation: Likelihood (1, 2 or 3) x Severity (1, 2 or 3) to reach your overall risk level. See below for what this means in practice and what you need to do next. |

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| --- | --- |
| **Very low**  **(1)** | These risks are considered acceptable. No further action is necessary other than to ensure that the controls are maintained. |
| **Low**  **(2)** | No additional controls are required unless they can be implemented at very low cost (in terms of time, money and effort). Actions to further reduce these risks are assigned low priority. Arrangements should be made to ensure that the controls are maintained. |
| **Medium**  **(3-4)** | Consideration should be given as to whether the risks can be lowered, but the costs of additional risk reduction measures should be taken into account. The risk reduction measures should be implemented within a defined time period (usually no greater than within 3 months). Arrangements should be made to ensure that the controls are maintained, particularly if the risk levels are associated with harmful consequences. |
| **High**  **(6)** | Substantial efforts should be made to reduce the risk. Risk reduction measures should be implemented urgently within a defined time period (usually no greater than within 1 month) and it might be necessary to consider suspending or restricting the activity, or to apply interim risk controls, until this has been completed. Considerable resources might have to be allocated to additional controls. Arrangements should be made to ensure that the controls are maintained, particularly if the risk levels are associated with extremely harmful consequences and very harmful consequences. |
| **Very high**  **(9)** | **These risks are unacceptable**. Substantial improvements in risk controls are necessary, so that the risk is reduced to an acceptable level. **The work activity should be halted** until risk controls are implemented that reduce the risk so that it is no longer very high. **If it is not possible to reduce risk the work should remain prohibited. The H&S Team must be consulted.** |