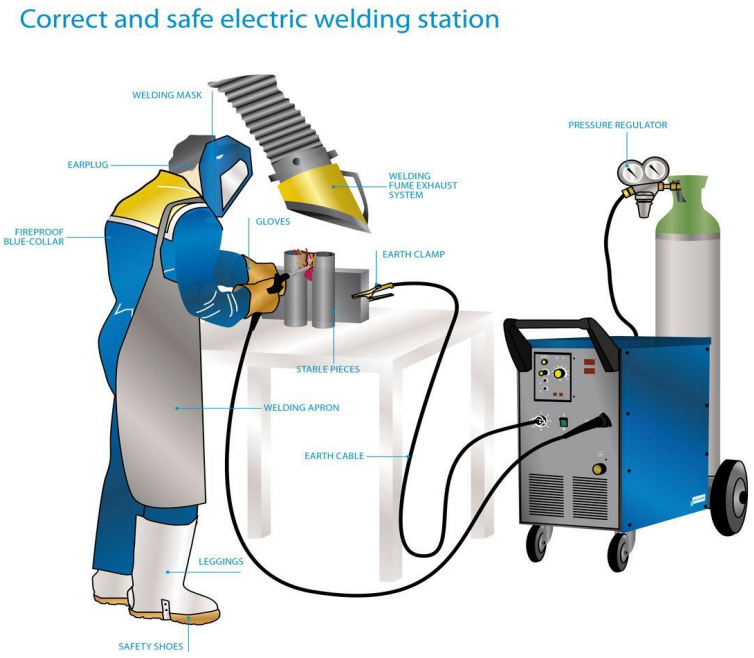
Risk Assessment Guidance

Title Welding

This risk assessment guidance has been produced to cover welding activities within workshops.

Apart from normal building security measures there is not normally access to the room in which welding is carried out. However, the welding area (including the arc itself) is completely surrounded by UV protective curtains compliant with BS EN 1598:1998.

Full face visors compliant with BS EN 169 and 175 are provided for welders. These are periodically checked for damage. Damaged eyewear is immediately taken out of use and replaced forthwith.



Job Sequence	Hazard Identification	Controls
Conduct pre-operational checks	Poor condition of the guard or chuck.	The welding equipment must be visually inspected before each use and any damage reported to the workshop manager / supervisor. Damaged equipment must not be used until a competent person has examined them.
Chemical	Gases notably ozone and nitrogen dioxide can be generated by UV light. Possibly phosgene gas if chlorinated hydrocarbon solvents used/stored near the welding area.	Adequate ventilation of the room. Mobile extraction unit with sufficiently long flexible trunking used (serviced annually by supplier and records kept). Solvents used and stored as far away from the welding area as practicable. LEV - extract to be formally recorded so that statutory inspection can be carried out every 14 months. **hosgene:** can be formed by decomposition of chlorinated hydrocarbon solvents by UV. It reacts with moisture in the lungs to produce hydrogen chloride, which in turn destroys lung tissue. For this reason, any use of chlorinated solvents should be well away from welding operations or any operation in which ultraviolet radiation or intense heat is generated.
Electrical	Electric shocks and burns due to faulty electrical equipment or faulty installation (can also cause fires – see below).	Annual servicing and maintenance checks of all equipment. Records maintained. All equipment is CE marked.

		PAT is carried out at a minimum every 12 months.
Fire	Due to malfunction of electrical equipment. Due to sparks and flying particles of hot slag.	Areas near welding activities are kept clear of flammable materials. CO_2 fire extinguisher located in close proximity – test date less than 12 months old. All works must be carried out in accordance with the companies 'Hot Works Permit' Has to be issued by the designated person from the company. Fire risk assessment undertaken as required by law – see Regulatory Reform (Fire Safety) Order 2005.
Training	Untrained Personnel.	Only trained operatives allowed to carry out welding works, they must ensure welding works are carried out in appropriate areas before commencing works and that suitable screens are in place. They must ensure that no unauthorized persons are allowed in the vicinity of the works, when welding takes place outside the workshops they must ensure there is suitable signage around the work area. The Supervisor must ensure that the appointed Health and Safety personnel is notified of any significant changes to these works before they commence.
Occupational Health	Ultraviolet. Eye	The B and C components of the UV arc spectrum are the most hazardous with regard to eye and skin damage. Both the erythemal and ocular action spectra make the UVA contributions relatively inconsequential. Published data indicates that the Effective Irradiance from an arc can be typically 8 W/m^2 (Okuna, T, et al; Ann. Occup. Hyg. Vol. 45 (7), pp. 597-601), and as such the Exposure Limit Value (ELV – Effective Radiant Exposure of $30J/m^2$) for the eye and skin can be exceeded in just a few seconds of unprotected exposure. Full face visor is recommended. The filter must be compliant with BS EN 169:2002 (plus BS EN 175: 1997) and marked as such. It is suggested that the filter shade should have a scale number of <u>at least</u> '2-4' which provides an Optical Density (OD) of approximately OD5.5 up to 313nm and OD2 up to 365nm. Scale number '2-4' also gives protection (at least OD1.3 i.e. 20 times reduction in irradiance) against the less hazardous Visible and Infra-Red (IR) parts of the arc spectrum. Visor filters must be CE marked and will protect the face as well as the eyes. NOTE: sunglasses and blowtorching goggles are not adequate for arc welding protection. The levels of effective irradiance highlighted above can lead to potential over-exposures up to several metres away from the arc. It is essential that the area where welding is undertaken is shielded from surrounding areas by suitable curtains that are compliant with BS EN 1598:1998 and marked as such. Anyone working regularly within 2 metres of an unshielded welding arc needs to be protected against skin and eye exposure in

	Exposed Skin. (Notably hands, wrist, and lower sections of the arms):	the same way as the welder. He should at least have overalls, gloves and a hand-held or head shield if required to look at the arc. Additionally, he should have anti-flash glasses with side pieces to protect from inadvertent arc eye hazards. Where reasonably practicable unprotected observers should not be allowed to approach closer than 10 metres to an arc. Tight woven cotton gloves or supple leather gauntlets may be OK for low current work. For most other arc welding processes more substantial gloves are required. The gloves should be designed to cover the hand and wrist and overlap the sleeves. Heavy-duty, dark coloured, opaque fabric will block UV, Visible and IR radiation thus protecting the skin. Note: the combined effects of UV and ozone gas can lead to rapid degradation of glove materials.
Personal Protective Equipment	Unsuitable PPE	Suitable personal protective equipment (PPE) must be supplied and used. The user must ensure that the PPE is in good condition and being used correctly.
First Aid		Make sure you are aware of the first aid provisions in place. All accidents & near misses must be reported to your Supervisor

Identify the Radiation Hazard(s)			
Artificial Optical Radiation (% of total)	**UV** (≈ 23%)	**Visible**	**IR**
Ultra Violet Radiation (% of total UV)*	**UVA** 315-400nm (≈ 70%)	**UVB** 280-315nm (≈ 11%)	**UVC** 100-280nm (≈ 19%)

* Ref: Kozlowski, C., Int. J. Occ. Med. & Environ. Health, Vol. 14 (3) pp 287-292

All persons working with this equipment or within close vicinity must sign and show that they have read and understood the risk assessment guidance and that they will follow the above control measures set out whilst working.

Additional Guidance	**COSHH Assessment**	**Method Statement**	**Other (Specify)**
		N/A	**Hot Works Permit** **Only trained persons are allowed to operate this equipment.**
Name			
Signed			Date