

The harmful effects of argon welding on human health

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Abstract:

In this paper, we review the damage of argon welding to human health and its prevention. Argon weld gas-type argon welding is a colorless, odorless chemical element of noble gases and chemically inert of the most abundant gases on the surface of the globe and is a gas that insulates the weld zone from the surrounding atmosphere. Lengthy exposure to welding fume is feasibly producing lung harm and numerous categories of cancer, comprising lung, larynx, and urinary tract. Gases like argon and carbon dioxide transfer oxygen in the air and can cause asphyxia, predominantly as welding in restricted or surrounded areas.



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Introduction

Argon welding can be used to connect the metals, where the heating and liquefaction process are carried out, and then binding (O'Brien, and Guzman, 2007). Some believe that argon welding does not affect the health of the worker, but there are several risks due to exposure to gas, smoke, volatile solids and high temperature in addition to strong light radiation. All of these factors are affected by the body and the eye is the body's most affected organ.



Figure 1: Hazards of welding fume

The damage and risks associated with argon welding are mentioned as follows:

- (i) Tremors in the eyelid frequently,
- (ii) unusual swelling of the eyes,
- (iii) Runoff of tears due to high radiation and gases from welding.
- (iv) Eye, cornea and conjunctivitis, which may lead to permanent loss of vision in the future.
- (v) Respiratory disturbances caused by smoke and gas from the welding practice.
- (vi) Aching skin burns due to excessive exposure to light and heat.
- (vii) Tumors in the skin that can be distorted into malignant tumors, as a result of frequent exposure to welding.
- (viii) Distortions in the face as a result of the approach of the weld and the absence of a special mask.
- (ix) Headache and persistent headache, as well as fatigue and

There are also other damages like susceptibility to burns, explosions, flammability, and solvent transformation of phosgene, thanks to the effect of radiation emitted by welding. Exposure to light causes painful skin burns.

Argon welding damage prevention

Given that this process is one of the main occupations of some people, and they cannot leave it to avoid its damages, so there are many ways to prevent the damage of this process that must be taken into account when performing the welding process, and these methods are (Kleinfeld, et al., 1957; Jeffus, 2020):

The use of welding glasses or a protective mask for welding, which is a mask of metal and transparent from the side of the eyes to see the bodies that are being welded, and is used to protect the face and eyes from heat and sparks flying and from UV rays.

Wear heat-resistant gloves. Use protective clothing to prevent burns (long-sleeved cotton overalls) and a suitable shoe. Keep an appropriate distance when performing this operation, to minimize damage. Remove flammable materials at a distance of at least (35') feet and use thermal blankets to reserve heat and spray the floor under welding with water and ensure that the welding areas are free of volatile materials, inflammable materials and flammable liquids. Natural ventilation of the place or mechanical ventilation.



Figure 2. Facing process example against welding hazard

In cases of eye infections, the treatment is the use of narcotic and analgesic eye drops to treat topical pain and the use of cold water compresses by applying them to the eye, antibiotic ointments and pain relievers to reduce the intensity of eye pain. Tea medals are also used to cleanse the eyes, by slightly moistening them and then applying them to the affected eye. In addition to using chamomile and sage, both are antiseptic and help eliminate various foreign bodies or workers in factories or in the metal industries, excessive attention must be paid to nutrition, eating vegetables, fruits, liquids in abundance, and juices in order to reduce the high temperature to which the body is exposed and attention to safety and safety standards in appropriate garments and wearing eye glasses, face masks and welding clothes to reduce burns, wear amino gloves to prevent from Electrical shock, heat, volatile sparks, covering exposed body parts, attention to putting different crops in the place of housing to purify the air from carbon dioxide and obtain healthy oxygen and air purification after exposure to smoke and gases emitted from the welding industry, preferably not to be permanently exposed to welding or continuously only 5 Hours or less per day to avoid the many damages caused by that process (Antonini, 2003; Kopchok, et al, 1988; Krewski, et al, 2007; Morais, et al., 2007; Taylor, et al, 2003).

Conclusion

Lengthy exposure to welding fumes may cause lung cancer, urinary zone, larynx in addition to nervous system and kidney hurt. Certain gases like argon, dislocate oxygen and can pose asphyxia hazards, principally in surrounded work zones. It has been feasible to be shocked during **welding**, particularly in wet circumstances, nevertheless this is typically attributable to damaged apparatus and inattentiveness. As voltages involved have been low,

a **welding** unit is less probable to **kill you** as compared to a steady power outlet. You must be noted that electrocuted indicates "killed by electricity" and not merely being shocked. So, based on above, wearing welding glasses and protective mask are necessary for preventing the harmful effects of damage of argon welding on human health.

References

- Antonini, J. M. (2003). Health effects of welding. *Critical reviews in toxicology*, 33(1), 61-103.
- Kopchok, G. E., White, R. A., White, G. H., Fujitani, R., Vlasak, J., Dykhovsky, L., & Grundfest, W. S. (1988). CO₂ and argon laser vascular welding: acute histologic and thermodynamic comparison. *Lasers in surgery and medicine*, 8(6), 584-588.
- Krewski, D., Yokel, R. A., Nieboer, E., Borchelt, D., Cohen, J., Harry, J., & Rondeau, V. (2007). Human health risk assessment for aluminium, aluminium oxide, and aluminium hydroxide. *Journal of Toxicology and Environmental Health, Part B*, 10(S1), 1-269.
- Kleinfeld, M., Giel, C., & Tabershaw, I. R. (1957). Health hazards associated with inert-gas-shielded metal arc welding. *Arch, Indusi. Health*, 15(1), 27-31.
- Jeffus, L. (2020). *Welding: principles and applications*. Cengage Learning.
- Morais, S., Costa, F. G., & Pereira, M. D. L. (2012). Heavy metals and human health. *Environmental health-emerging issues and practice*, 10, 227-246.
- O'Brien, A., & Guzman, C. (Eds.). (2007). *Welding handbook: welding processes*. American Welding Society.
- Taylor, M. D., Roberts, J. R., Leonard, S. S., Shi, X., & Antonini, J. M. (2003). Effects of welding fumes of differing composition and solubility on free radical production and acute lung injury and inflammation in rats. *Toxicological Sciences*, 75(1), 181-191.

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