



Mine Safety Appliances Co.

BRADDOCK, THOMAS AND MEADE STREETS

Pittsburgh, Pa. March 29, 1937

Mr. Kehoe
Director
Kettering Laboratory
University of Cincinnati
Cincinnati, Ohio.

Dear Dr. Kehoe:

Recently our representatives, Messrs. McElhattan and Moll, had the pleasure of discussing some of our safety equipment with you and have asked that we write you regarding recommended protection for workmen who are exposed to poisonous gases in welding, brazing and cutting operations, using electric and acetylene equipment.

The possible hazards in this work vary with the type of equipment used and the conditions under which the work is performed. Obviously, the workmen are exposed to metallic smoke or fumes generated by the flame or arc on the metal and from the gases produced by the flame or by volatilization of the electrodes. If ordinary iron is processed, the metallic smoke from the iron is primarily iron oxide. If, however, the iron has been colored with a substance such as lead oxide paint, the fumes will then contain lead and lead poisoning from this source is rather frequent.

Cases are on record where persons were burning iron that had such a heavy coating of bituminous paint in a closed space, such as inside a sewer pipe, and the incomplete combustion of the bituminous coating produced enough carbon monoxide to cause poisoning. The fumes that may be given off by the electrodes when work is done with electric arcs depends, as previously stated, on the composition of these electrodes and these compositions vary so widely that it is difficult to make any generalizations regarding the nature of the fumes.

High temperature flames, and especially arc, are capable of producing oxides of nitrogen; also ozone has been reported, but the oxides of nitrogen are the most important. They are a very irritating class of gases.

Whether or not significant injury will be caused obviously depends upon the conditions under which the work is done, referring especially to size of flame or arc, confinement or ventilation of the space, proximity of the man to the point of generation of the fumes or gases, and duration of exposure, i.e., whether or not the work is intermittent or of a continuous nature with repeated daily exposure.

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Because it is so difficult to determine just what poisonous gases or fumes might be present in the working atmosphere adjacent to welding operations, unless a special study is made of each condition, we usually recommend the use of a supplied air mask or respirator. We are inclosing a descriptive bulletin showing the MSA Abrasive Mask and while this mask is primarily designed for use in sand blasting work. it can be modified so as to make it a good welding mask. To do this the rubber hood is left off the mask and the screen now protecting the lens is changed to glass, which will not permit the harmful light rays to pass through it.

The small half-mask type respirator fitting over the nose and mouth and having a corrugated tube through which air is supplied to the facepiece is shown in the inclosed small leaflet. Such a mask is worn underneath an ordinary welding helmet. Both of these masks, however, require a supply of uncontaminated compressed air. However, if fresh air is available within a few feet of the wearer, it is possible for him to use a hose approximately 1" in diameter and inhale the fresh air through this hose.

If there is any other further information which we can give you on safety equipment please let us know.

Very truly yours

MINE SAFETY APPLIANCES CO.


J. B. Davies
Manager
Industrial Department

JBD/15/kmb

Incl. Bul. CS-2-Abrasive
CS-2-Air Line

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