

Survey and analysis of worker's breathings patterns in actual arc welding operation.

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Abstract

Arc welders in the steel and machine manufacturing industries are exposed to high dust concentration and a high incidence of pneumoconiosis has been seen among welders. Therefore, improvement of work environment and consistent use of respirators are directed by the authorities in Japan. Although the use of high efficiency respirator is considered effective in protecting workers from health problems in such a hazardous environment, the performances of respirators are directly affected by amount of respiration of wearers. So, we investigated breathing patterns of arc welders in actual work environment. Additionally, we measured dust concentration that welders are exposed during their operations using an individual dust sampler with PM4 impactor. In this survey, workers performed various work activities such as acetylene gas cutting and polishing with sanding tool besides arc welding. Thus worker's breathing patterns were analyzed for each work activity during their work, and calculation was made to obtain such respiratory data as minute volume, breath frequency and peak flow rate. As the results, it was found that dust generated by arc welding consisted largely (more than 90%) of respirable dust compared with cutting or polishing, and worker's breathing patterns showed lower at arc welding operations relative to other work activities. It seems that this is because workers breathe and move steadily in order to place the weld beat on plate precisely. Consequently, while the average minute volume calculated from respiratory data of whole work activities was 20.2LPM, the result from welding operations alone was 17.9LPM.

(247/250 words)

Memo: I would like to make a presentation on platform.