

participants were of the opinion that this type of clothing provide sufficient protection to the worker but eliminates the problems that may be involved in laundering and storing asbestos-contaminated clothing (Ex. 123-A, 298, 330, Tr. 6/25). Several commenters stated that disposable clothing was currently required and used in asbestos operations. Dr. R. F. Boggs, Vice President of ORC, commented that International Paper requires disposable clothing for all asbestos demolition and removal operations (Ex. 123-A). M.K. O'Brien, Vice President of a local of the United Steelworkers of America, stated that Northern Indiana Public Service Company now uses full body overall-type paper disposable suits (Tr. 7/3). Daniel F. Wilton of the Sheetmetal Workers International Association, Local 28, said that the World Trade Center requires all contractors to wear disposable protective suits and boots during renovation work (Tr. 6/29).

The Primary advantage that commenters cited for the use of disposable worksuits was that this type of clothing eliminated the need for laundering and storing asbestos-contaminated articles. Dr. Boggs included in the ORC response to the Notice of Proposed Rulemaking on Occupational Exposure to Asbestos (49FR 14116), the comments of T.E. Kupferer of the Standard Oil Company (Indiana). Mr. Kupferer stated that Standard Oil (Indiana) workers involved in asbestos removal wear disposable protective clothing "because of the problems involved in storing, laundering, and handling of reusable clothing contaminated with asbestos" (Ex. 123-A).

Commenters from the BCTD also emphasized that disposable clothing should be required, stating that "while disposable overalls may not be as durable and comfortable as cotton work clothes, they . . . do not require laundering which would expose another workforce or the worker's family to asbestos" (Ex. 330, p. 68). The BCTD stressed that " . . . it is essential and feasible to provide personal protective equipment for construction workers who are exposed to asbestos . . . [and that] protective clothing [must] be provided whenever any person enters the regulated area" (Ex. 330, pp. 67-68). William L. Baker of the National Association of Demolition Contractors also cited a preference for paper uniforms because they can be disposed of (Tr. 6/25, p. 57). Mr. Baker did not think that durability was a problem because workers would "only wear them when they do the asbestos removal . . ." (Tr.

6/25, p. 57). One commenter from the N.Y.C. Board of Education, Office of Design Construction, cited the "Asbestos Abatement/Control Guidance Manual," which states that "no worker may use street clothes under disposable suits" (Ex. 92-26, p. 73).

Although these commenters agreed that disposable worksuits are preferable for large-scale asbestos removal operations, some rulemaking participants felt that disposable clothing was not necessary for other types of construction work. Connie Degrange of the Industrial Hygiene Group at Lawrence Livermore National Laboratory commented that ordinary work clothes may be worn by employees who remove or install small sections of asbestos-containing materials or perform operations involving one-time penetration of existing asbestos coverings, provided that asbestos dust in the work area is kept to a minimum (Ex. 341, p. 2, Attachment III). Joseph Jackson of the Association of Asbestos Cement Pipe Producers also felt that no special work clothes were needed during infrequent asbestos cement cutting operations because exposure levels are "very close to ambient background levels" (Tr. 7/10, p. 138).

OSHA finds that non-disposable work clothes similar to those required in the revised general industry standard will provide sufficient protection for employees engaged in construction activities, provided that such clothing is properly cleaned after work and then laundered.

Some respondents specified the articles that should be used by construction workers handling asbestos-containing materials: full body coveralls, head coverings, foot coverings, and gloves (Exs. 92-26, 92-11, 92-25, 123-A, Tr. 6/29). Therefore, the revised standard, like the existing rule, includes an enumeration of suitable articles of protective clothing. Although some commenters discussed particular types of disposable clothing, such as clothes made of Tyvek (trademark of DuPont) and shoe coverings made of rubber, OSHA has not specified particular materials for protective clothing required by the final rule.

William J. Nicholson of the Mt. Sinai School of Medicine felt strongly that "no work clothes should ever be taken home" (Tr. 6/19, p. 1-92). He supported the final rule's laundering provision, stating that clothes "have to be laundered in specially controlled laundry facilities" (Tr. 6/19, p. 1-93). Minnesota Department of Health commenters also urged that

"precautions need to be taken to prevent contamination of workers' street clothes, cars, and homes" (Ex. 92-011, p. 2). They specified that body coveralls be worn, and "these coveralls must not be worn home" (Ex. 92-011, p. 2).

Several commenters discussed methods for cleaning and disposing of personal protective clothing. The Minnesota Department of Health, in "Guidelines for Developing an Effective Asbestos Removal Plan," recommended that "reusable clothing should be washed daily or weekly depending upon work conditions, with the launderer notified of their potential contamination" (Ex. 92-011, p. 2). The guidelines also specify that "proper precautions need to be followed when handling contaminated clothing" (Ex. 92-011, p. 2). Mr. Kupferer explained that employees of Standard Oil (Indiana) are warned not to take contaminated clothing home. Instead, when the job is completed or workers leave a barricaded area, all contaminated articles are removed.

coveralls and gloves are routinely discarded along with the asbestos scrap, as are disposable head and boot coverings, if used. Hard hats are cleaned, as are boots, and any cleaning items used are also discarded with the asbestos scrap. Where rain gear is worn over the disposable coveralls, it is also cleaned before removal from the site (Ex. 123-A, pp. 3-4 of Appendix D).

Based on the weight of the evidence presented in the rulemaking record, OSHA has retained the requirements of the existing standard for laundering reusable work clothes in such a manner as to prevent the release of airborne asbestos fibers in excess of the PEL. OSHA has assigned the responsibility for laundering asbestos-contaminated protective clothing to the employer in order to prevent exposure to workers' family members that may handle such clothing.

Two concerns about personal protective clothing were expressed by commenters: heat stress and worker comfort. David Kirby, Industrial Hygienist Chemist for the Alabama Safe State Program, felt that protective clothing is not necessary in all cases because it adds to the likelihood of heat stress (Tr. 6/20, p. 183). He explained that

by the end of the four-hour shift, the guy's halfway out of the suit anyway. So unless asbestos exposure to the external area of the body is a definite threat, I feel like there may be some option involved with the use of external type protection. (Tr. 6/20, p. 183).

Dr. Boggs also included in the ORC response to the notice of rulemaking the