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THE SAFE USE OF "CALIDRIA" RG-244

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1. Introduction

Asbestos has received a great deal of attention and publicity in the last several years and has become the first substance covered by new OSHA health regulations. Unfortunately, much of the media treatment of the subject has been emotionally oriented and distorted and in some cases has bordered on the sensational and untrue. Many users of asbestos and products containing asbestos have been mislead regarding the safety of asbestos and what is needed to comply with the OSHA requirements.

This summary has been prepared to present the question of asbestos toxicology in logical perspective. It covers asbestos toxicology in general and the key features of the OSHA regulations. Dust count data are presented for polyester manufacturing plants using RG-244 and for fabricators during the spraying of the resin and the grinding of the resultant laminates. The current status of the silica regulations is noted. Dust control methods are summarized.

2. Asbestos Toxicology

Asbestos is a generic term covering six naturally occurring fibrous minerals. It includes chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. Chrysotile is by far the most widely used variety and accounts for more than 95% of world production. It is the only type produced in substantial quantities in the United States and Canada. Also of commercial importance are crocidolite and amosite from Africa and anthophyllite from Finland.

It is accepted that asbestos, like many other foreign bodies, can cause disabling lung damage which for asbestos is commonly referred to as asbestosis. It is important to note, however, that asbestosis and statistical excess occurrences of bronchogenic carcinoma (lung cancer), the two most common asbestos-related diseases, have occurred only in workers with long-term exposures to massive concentrations of asbestos dust. The risk of this type of exposure is usually in asbestos mines and mills and in large manufacturing operations that use quantities such as 20,000-30,000 pounds per day. Long-term, massive exposures are, of course, not typical of polyester resin manufacturing operations utilizing RG-244 where only 300-400 pounds are dumped a couple of times a day.

Much has also appeared in the public press regarding the relationship between asbestos and mesothelioma, a rare type of cancer of the pleura. In almost all cases where there is a strong statistical relationship between mesothelioma and the inhalation of asbestos, crocidolite and/or amosite have been involved. Where asbestos exposure has been limited to chrysotile asbestos (RG-244 is chrysotile) there is strong evidence that no excess mesotheliomas will occur.

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Finally, there is no evidence that the general public is in any danger from the amount of asbestos fiber in the community air. The U.S. National Academy of Science states in an October 1971 publication, "Asbestos - The Need For And Feasibility of Air Pollution Controls:"

> "at present, there is no evidence that the small number of fibers found in most members of the general population affect health or longevity."

This does not, however, preclude the need for definition and control of man-made emissions into the atmosphere. The current OSHA regulations relating to the work area and the forthcoming EPA regulations protecting the atmosphere are intended to provide this control.

3. OSHA Regulations

After extensive hearings, a new standard for Exposure to Asbestos Dust was published in the Federal Register, Volume 37, No. 110 on Wednesday, June 7, 1972. The basic exposure standard is an 8-hour time-weighted average (TWA) of 5 fibers, longer than 5 micrometers, per cubic centimeter of air. The fiber limit is to be reduced to 2 on July 1, 1976. A peak concentration of 10 fibers per cc is not to be exceeded at any time.

Note particularly the use of the time-weighted average over the eight-hour shift. An operator performing one or two short additions of RG-244 per shift, as is typical of polyester producers, would have his exposure during this dumping time averaged with zero (or a low-background level) for the rest of the shift. It is important that this concept be understood for interpreting the effect of intermittent exposures.

Improper interpretation of the regulations has created many misconceptions about the equipment and procedures needed to use asbestos. If exposure limits are not exceeded, ~~there are no~~ further compliance requirements ~~except for~~ medical examinations. ~~Interpreted literally~~, medical examinations are required for all employees in any "occupation exposed to airborne concentrations of asbestos fibers." Some definition of "exposed" is necessary since evidence indicates that small amounts of asbestos fiber have existed in the atmosphere for millions of years. The source of these fibers would be from the weathering of naturally occurring surface outcrops. In its criteria document on asbestos, NIOSH recommended that "exposed to asbestos" be defined as "average exposures above one fiber per cc or peak exposures above five fibers per cc." (A number of large asbestos users have adopted this as a guideline in their operations.)

Respirators and special clothing are required in the construction trade for the spray application of insulation and fireproofing materials, and for the removal of such materials. This special protection is not required for any other use of asbestos unless exposure limits are exceeded. This is also true for other items such as specially equipped tools, product limitations, change rooms, clothes laundering and waste disposal.

4. "Calidria" RG-244 in Polyester Resin

During the last six months, Union Carbide has made asbestos dust count measurements at eight major polyester processing plants. Counts have also been made during the spraying of resin containing RG-244 and during the sanding and grinding of parts produced from such resin. In all cases, sampling and counting were done with the equipment and techniques prescribed in the OSHA regulations.

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