UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: SEP 12 1977

SUBJECT: Asbestos-Containing Spray-On Materials

FROM: Linda S. Chaput LSC
Standards Development Branch

TO: The Files

From August 24 to 30, 1977, I contacted by telephone several persons to obtain information on the properties of various asbestos-containing spray-on materials. It was necessary to request this information because of several comments submitted on the March 2, 1977, proposed amendments to the asbestos standard. The commenters stated that a non-friable material would not release asbestos fibers during spray application and that any material with a bituminous or resinous binder would not be friable and should, therefore, be exempted from the standard. Very little information was provided by commenters to support these statements, however. Therefore, the following persons were contacted to obtain the information discussed in the remainder of this memorandum.

Robert Mereness, Executive Director
Asbestos Information Association (8/24 & 25/77)

Richard Carter
Johns-Manville, Denver (8/24/77)

Dick Fricklas
Johns-Manville, Denver (8/24/77)

Ed Fenner
Johns-Manville, Denver (8/29/77)

Dick Alexander
Monsey Products (8/25/77)

John Myers
Union Carbide (8/30/77)

Questions and Responses

1. Does it necessarily follow that if a sprayed-on material is not friable, then it will not release asbestos fibers during spraying, and if so, why?

To be non-friable after drying, a sprayed material would require a type of binder that would have a "sticky" consistency. Such a binder would so thoroughly coat the asbestos fibers that they could not be separated from the binder. During spraying, the binder takes on an

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oily form as a result of the solvents and acts in the same manner as a dust suppressant, completely saturating the asbestos fibers. The spraying action causes the material to be broken down into droplets which are actually small replicas of the total mass. If the total mass would not release fibers, then neither would the smaller replicas of it. Also, each droplet is many times larger than each asbestos fiber so that the fibers are surrounded by the binder. There was some disagreement among all the parties contacted as to whether the fibers are "encapsulated" or "impregnated" by the binder. "Encapsulated" implies surrounded while "impregnated" implies encapsulated as well as wetted through. Actually, the fibers are not completely encapsulated nor completely impregnated; there is generally a combination of the two mechanisms. Thus, encapsulation and/or impregnation may be total or partial for any one fiber.

2. What is the difference between the terms "bituminous" and "resinous"? Does "resinous" include "bituminous"?

The general consensus was that "resinous" may include "bituminous," but usually the terms are used to mean different things. "Bituminous" refers to asphalt- or coal tar-based materials while "resinous" refers to other natural or synthetic binder materials. Bitumens are normally soft and semi-elastic; resins may be either hard or soft, brittle or pliable, depending on their composition.

3. Are all resinous materials non-friable after drying?

Some resinous materials may be friable after drying or after aging. Such resins as epoxies and acrylics may be somewhat brittle. Bitumens normally are not friable and retain their soft, elastic quality.

4. Is there a minimum amount of binder necessary to bind the asbestos fibers during spraying and after application?

There is not an exact minimum percentage that should be used in all cases. The important thing is to have a proper combination of binder and pigment. Pigments are particles which are added to impart various properties to a material; asbestos is usually added to enhance the thixotropy (ability of the material to decrease in viscosity upon stirring or spraying and to return to the original viscosity when the stirring or spraying stops). When the mixture reaches the point where just enough binder is present to completely fill the voids left between the pigment particles, it has reached the critical pigment volume concentration (CPVC). If the CPVC is exceeded (too much pigment), the material will not wear or weather well and will not be competitive with other materials. If the CPVC is not exceeded, there is sufficient binder to keep asbestos fibers from being released. Therefore, it could be said that the minimum amount of binder necessary to bind the asbestos fibers during and after application is any amount which would not cause the CPVC to be exceeded.