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Asbestos

Regulated Asbestos-Containing Materials Guidance

Asbestos NESHAP
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1. INTRODUCTION:

Section 112 of the Clean Air Act (CAA) requires EPA to develop emission standards for hazardous air pollutants. In response to this section the Environmental Protection Agency (EPA) published a list of hazardous air pollutants and promulgated the "National Emission Standards for Hazardous Air Pollutants" (NESHAP) regulations. Since asbestos presents a significant risk to human health as a result of air emissions from one or more source categories, it is therefore considered a hazardous air pollutant. The Asbestos NESHAP (40 CFR 61, Subpart M) addresses milling, manufacturing and fabricating operations, demolition and renovation activities, waste disposal issues, active and inactive waste disposal sites and asbestos conversion processes.

In the initial Asbestos NESHAP rule promulgated in 1973, a distinction was made between building materials that would readily release asbestos fibers when damaged or disturbed and those materials that were unlikely to result in significant fiber release. The terms "friable" and "nonfriable" were used to make

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this distinction. EPA has since determined that, if severely damaged, otherwise nonfriable materials can release significant amounts of asbestos fibers.

Friable asbestos-containing material (ACM), is defined by the Asbestos NESHAP, as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. (Sec. 61.141)

Nonfriable ACM is any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Supbart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. EPA also defines two categories of nonfriable ACM, Category I and Category II nonfriable ACM, which are described later in this guidance.

"Regulated Asbestos-Containing Material" (RACM) is (a) friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

The purpose of this document is to assist asbestos inspectors and the regulated community in determining whether or not a material is RACM and thus subject to the Asbestos NESHAP.

The recommendations made in this guidance are solely recommendations. They are not the exclusive means of complying with the Asbestos NESHAP requirements. Following these recommendations is not a guarantee against findings of violation. The EPA intends for owners/operators to be reasonably certain whether or not they are subject to the NESHAP. In the end, if a question arises, determinations of whether asbestos containing materials are regulated by the Asbestos NESHAP are made by EPA inspectors on site.

2. FRIABLE ASBESTOS-CONTAINING MATERIALS:

Due to their high tensile strength, incombustibility, corrosion and friction resistance and other properties, such as acoustical and thermal insulation

abilities, asbestos fibers have been incorporated into over thirty-six hundred (3600) commercial products. Thermal system, fireproofing and acoustical insulation materials have been used extensively in the construction industry.

Thermal system applications include steam or hot water pipe coverings and thermal block insulation found on boilers and hot water tanks. Fireproofing insulation may be found on building structural beams and decking. Acoustical insulation (soundproofing) commonly has been applied as a troweled-on plaster in school and office building stairwells and hallways. Unfortunately, with time and exposure to damaging forces (e.g., severe weather, chemicals, mechanical forces, etc.), many asbestos-containing materials may become crumbled, pulverized or reduced to powder, thereby releasing asbestos fibers, or may deteriorate to the extent that they may release fibers if disturbed. Since inhalation of asbestos fibers has been linked to the development of respiratory and other diseases, any material which is friable, or has a high probability of releasing fibers, must be handled in accordance with the Asbestos NESHAP.

The following work practice should be followed whenever demolition/renovation activities involving RACM occur:

- Notify EPA of intention to demolish/renovate,
- remove all RACM from a facility being demolished or renovated before any disruptive activity begins or before access to the material is precluded,
- keep RACM adequately wet before, during, and after removal operations,
- conduct demolition/renovation activities in a manner which produces no visible emissions to the outside air, and
- handle and dispose of all RACM in an approved manner.

3. NONFRIABLE ASBESTOS-CONTAINING MATERIALS:

Because of the resilient nature of asbestos, it is used in materials exposed to a wide variety of stressful environments. These environments can cause the deterioration of binding materials and cause nonfriable materials to become friable. For example, asbestos-containing packings and gaskets (Category I nonfriable ACM) used in thermal systems may be found in poor condition as a result of the heat they have encountered. In petrochemical handling facilities, which may have miles of transfer pipes and fittings which contain asbestos gaskets and/or packings, profound degradation of the ACM may occur due to exposure to organic-based liquids and gases or to corrosive agents used to chemically clean these lines.

When nonfriable ACM is subjected to intense mechanical forces, such as those encountered during demolition or renovation, it can be crumbled, pulverized, or reduced to powder, and thereby release asbestos fibers. When nonfriable materials are damaged or are likely to become damaged during such activities, they must be handled in accordance with the Asbestos NESHAP.

There are two categories of nonfriable materials: Category I Nonfriable ACM and Category II Nonfriable ACM.

CATEGORY I NONFRIABLE ACM

Category I nonfriable ACM is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product which contains more than one percent (1%) asbestos as determined using polarized light microscopy (PLM) according to the method specified in Appendix A, Subpart F, 40 CFR Part 763. (Sec. 61.141)

Category I nonfriable ACM must be inspected and tested for friability if it is in poor condition before demolition to determine whether or not it is subject to the Asbestos NESHAP. If the ACM is friable, it must be handled in accordance with the NESHAP. Asbestos-containing packings, gaskets, resilient floor coverings and asphalt roofing materials must be removed before demolition only if they are in poor condition and are friable.

The Asbestos NESHAP further requires that if a facility is demolished by intentional burning, all of the facility's ACM, including Category I and II nonfriable ACM, be considered RACM and be removed prior to burning (Sec. 61.145(c)(10)). Additionally, if Category I or Category II nonfriable ACM is to be sanded, ground, cut, or abraded, the material is considered RACM and the owner or operator must abide by the following (Sec. 61.145(c)(1)):

(i) Adequately wet the material during the sanding, grinding, cutting or abrading operations.

(ii) Comply with the requirements of 61.145(c)(3)(i) if wetting would unavoidably damage equipment or present a safety hazard.

(iii) Handle asbestos material produced by the sanding, grinding, cutting, or abrading, as asbestos-containing waste material subject to the waste handling and collection provisions of Section 61.150.

CATEGORY II NONFRIABLE ACM

Category II nonfriable ACM is any material, excluding Category I nonfriable ACM, containing more than one percent (1%) asbestos as determined using polarized light microscopy according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. (Sec. 61.141)

Category II nonfriable ACMs (cement siding, transite board shingles, etc.) subjected to intense weather conditions such as thunderstorms, high winds or prolonged exposure to high heat and humidity may become "weathered" to a point where they become friable.

The following table lists examples and other relevant information about Category I and Category II nonfriable ACM.

TABLE 1. NONFRIABLE ASBESTOS PRODUCTS

(*From EPA Guidance entitled "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Purple Book)*

Subdivision Generic Name		Asbest %	Binder/sizing
Cementitious extrusion panels:		8	portland cement
concrete -like products	corrugated	20-45	portland cement
(Category II)	flat	40-50	portland cement
	flexible	30-50	portland cement
	flexible perforated	30-50	portland cement
	laminated	35-50	portland cement
	(outer surface)		
	roof tiles	20-30	portland cement
	clapboard and shingles:		
	clapboard	12-15	portland cement
	siding shingles	12-14	portland cement
	roofing shingles	20-32	portland cement
	pipe	20-15	portland cement
Roofing felts	smooth surface	10-15	asphalt
(Category I)	mineral surface	10-15	asphalt
	shingles	1	asphalt
	pipeline	10	asphalt
Asbestos-containing	caulking putties	30	linseed oil
compunds	adhesive (cold applied	5-25	asphalt
(Category I and II)	roofing asphalt	5	asphalt
	mastics	5-25	asphalt
	asphalt tile cement	13-25	asphalt
	roof putty	10-25	asphalt
	plaster/stucco	2-10	portland cement
	sealants fire/water	50-55	castor oil or polyisobuxylene
	cement, insulation	20-100	clay
	cement, finishing	55	clay
	cement, magnesia	15	magnesium carbonate
Asbestos ebony products		50	portland cement
Floor tile and vinyl/asbestos tile		21	poly(vinyl)chloride
Sheet goods asphalt/asbestos tile		26-33	asphalt
Sheet goods/resilient		30	dry oils

Except for the following, Section 61.145(c) of the Asbestos NESHAP requires that each owner or operator of a demolition or renovation activity involving RACM remove all such material from a facility being demolished or renovated before

any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal.

ACM NEED NOT BE REMOVED BEFORE DEMOLITION IF IT:

(i) Is a Category I nonfriable ACM that is not friable.

(ii) Is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition.

(iii) Was not accessible for testing and therefore was not discovered until after demolition began and, as a result of the demolition, cannot be safely removed. If not removed for safety reasons, the exposed RACM and any asbestos-contaminated debris must be treated as asbestos-containing waste material and kept adequately wet at at all times until disposed of.

(iv) Is a Category II nonfriable ACM and the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition.

4. INSPECTION PROCEDURES TO DETERMINE THE POTENTIAL FOR FIBER RELEASE FROM NONFRIABLE ASBESTOS CONTAINING MATERIALS:

Members of the regulated community (i.e. abatement contractors, industrial hygienists, building owners & operators, etc.) should become familiar with these procedures, as they are designed to enhance compliance with the Asbestos NESHAP.

GENERAL INSPECTION PROCEDURES

1. Identify all nonfriable suspect ACM and determine whether it is Category I or II.

2. If it is Category I nonfriable RACM:

- Is it in "poor condition?" [Is the binding of the ACM losing its integrity? Is the ACM peeling, cracking, or crumbling? (Remember, friable ACM may not appear in poor condition.)]

- Is it friable?

- Collect a piece of dry ACM and seal it in a transparent, re-closable sample bag.

- Apply hand pressure and observe if the ACM falls apart to the extent that it is crumbled, pulverized, or reduced to powder. Does it occur suddenly, all at once?

- Send representative samples of the RACM to an analytical laboratory which is able to test them for the presence of asbestos according to the methods specified in 40 CFR Part 763 Subpart F, Appendix A.

- Ask the owner/operator if any ACM or RACM has been sampled and analyzed. If so, determine where the samples were taken and ask if the methods of demolition/renovation were considered when assessing the fiber release potential of the material. Will it or has it been subjected to sanding, grinding, cutting or abrading?

3. If it is Category II nonfriable ACM:

- Has the material been crumbled, pulverized or reduced to powder or is there a high probability that it will be crumbled, pulverized or reduced to powder during the demolition/renovation operations, thus rendering the material friable and subject to the Asbestos NESHAP?

- If Category II nonfriable ACM has been or will be crumbled, pulverized, or reduced to powder by demolition or renovation forces, take representative samples and send them to a laboratory to test for the presence of asbestos according to the method specified in 40 CFR Part 763, Subpart F, Appendix A.

5. <u>SPECIFIC INSPECTION PROCEDURES</u>:

INSPECTIONS - CATEGORY I NONFRIABLE ACM

Packings and Gaskets

These materials are often very difficult to find because they are usually placed inside ovens, doors, pipes, boilers, etc. Often a packing or gasket is discovered

during a stripping or demolition activity. For example, some boilers have an asbestos-containing paraffin wax packing between the steam lines that travel between the mud and fireboxes. The paraffin binding of the packing may decompose due to the high temperatures, and render the packing friable. Observe all of the packing and note areas that are in poor condition. Packings in poor condition appear dry and discolored, and fibers may be visible.

A representative piece of asbestos-containing packing material (in good or poor condition) should be removed with a utility knife and sealed in a transparent, re-closable bag. Apply hand pressure to the packing in the sample bag to determine if any portion is crumbled, pulverized or reduced to powder. If the material simply deforms, but does not crumble or reduces to a powder, then the material is considered nonfriable.

Resilient Floor Covering

There is a wide variety of resilient floor covering applications that contain asbestos. The most common are linoleum flooring and vinyl asbestos tile (VAT). VAT is most commonly found in either a 9"x9" or a 12"x12" square size. The 9"x9" VAT's are normally found in older buildings because they were manufactured earlier than the 12"x12" VAT's; however, floor tile sizes and resilient floor covering applications vary greatly since many buildings have been re-tiled several times.

In order to determine if a resilient floor covering is in poor condition look for sections or tiles which are cracked or peeling to the extent that they are crumbled. Floor coverings in poor condition can often be found near doorways or loading/staging areas where the floor has sustained a lot of stress and traffic. If the floor covering is in poor condition, collect a small representative sample and seal it in a transparent, sample bag. Hand pressure should be applied to determine if the material can be crumbled, pulverized, or reduced to powder. If it can, the material is considered friable. Resilient floor covering that will be or has been sanded, ground or abraded is subject to the Asbestos NESHAP.

Asphalt Roofing Products

Asbestos-containing roofing felts have been widely used in "built-up" roofs. Built-up roofing was used on flat surfaces and consists of alternating layers of roofing felt and asphalt. The roofing felt consists of asbestos paper saturated and coated with asphalt. Asphalt-asbestos roofing products made from roofing felt coated

with asphalt were reportedly used on residential structures for only a short time (1971-1974).

To determine if an asphalt roofing product is covered by the Asbestos NESHAP, examine the RACM to spot any areas where the material is in poor condition and friable.

If possible, sample areas where fibers can be seen protruding from the matrix of the asphalt. The sample should be sealed in a transparent, re-closable sample bag and hand pressure applied to see if the sample can be crumbled, pulverized, or reduced to powder.

INSPECTIONS - CATEGORY II NONFRIABLE ACM

Asbestos Cement Pipe and Sheet Products

Asbestos-cement (A-C) pipe has been widely used for water and sewer mains and occasionally used as electrical conduits, drainage pipe, and vent pipes. A-C sheet, manufactured in flat or corrugated panels and shingles (Transite board), has been used primarily for roofing and siding, but also for cooling tower fill sheets, canal bulkheads, laboratory tables, and electrical switching gear panels. If these ACMs are crumbled, pulverized or reduced to a powder, they are friable and thus covered by the Asbestos NESHAP. Broken edges of these materials are typically friable. The fractured surfaces should be rubbed to see if they produce powder.

If Category II nonfriable ACM has not crumbled, been pulverized or reduced to powder and will not become so during the course of demolition/renovation operations, it is considered nonfriable and therefore is not subject to Asbestos NESHAP. However, if during the demolition or renovation activity it becomes crumbled, pulverized or reduced to powder, it is covered by the Asbestos NESHAP.