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Deadly Asbestos"

# CONTROLLING DEADLY ASBESTOS

Asbestos fibers  
cause lethal  
health problems.  
Now they cause  
legal health  
problems, too.



**T**ime's up with asbestos, finally. The Occupational Safety and Health Administration (OSHA) passed a rule on July 21, 1986, affecting the approximately 285,000 garages doing brake and clutch work. Enforcement started January 21, 1987, so it's time for you to find out how much asbestos is in the air you breathe in your shop.

The law establishes a new Permissible Exposure Level (PEL) of 0.2 fibers per cubic centimeter (f/cc) of air. Any shop over that will be monitored often and will have to provide respirators, protective clothing and industrial laundry service, and separate pressurized asbestos-free changing rooms, showers and lunch rooms.

You probably won't be required to do all that. Most

automotive shops that do brake or clutch work are more likely to fall into the 0.1 to 0.2 f/cc "action level," according to OSHA. If this is the case in your shop, there will be changes you will have to make.

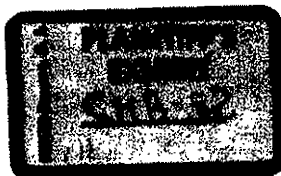
If inspectors find your shop falls into the "action level" category, it will be regularly checked and you will have to observe particular safety standards, including employee health surveillance in the form of regular checkups, and accurate records of exposure levels. There may be additional requirements imposed by your insurance company, many of which are preparing their own tests and standards which may be more stringent than the government's are.

While the government test and inspection details

By Joe Woods

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have not been determined yet, OSHA says it will enforce the new laws. At first, asbestos monitoring will be random, with special attention paid to shops where there are complaints or other reasons to suspect a violation. But don't ignore the issue until you are inspected. The risks of asbestos fiber dust extend to the whole community. And knowledge of asbestos hazards is becoming widespread, too. With or without federal inspections, shops that cloud the air with asbestos may have to do without mechanics

or customers once people learn about the danger.

The only sensible way to protect yourself from asbestos dust is to control it in the first place. If you stay below the 0.1 f/cc "action level," you save money and preserve the health of everyone in the shop.

Asbestos fiber dust, it turns out, is much more dangerous than was thought, and the number of workers harmed is considerably greater, too. Researchers at New York's Mt. Sinai School of Medicine have found that nearly half of all mechan-

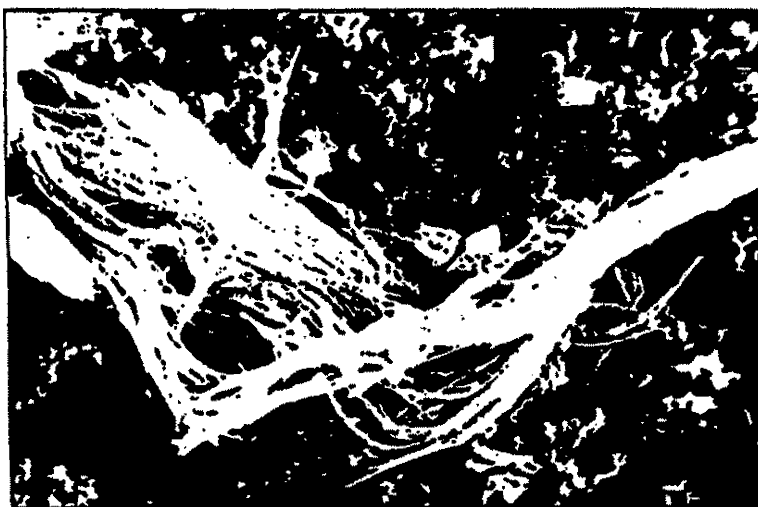
ics who have worked with uncontrolled brake dust develop asbestosis, a disease affecting the lungs. Arguably, work at a Soviet nuclear plant is safer. Worst of all, perhaps, is that it usually takes 15 to 30 years after exposure for the damage caused by asbestos to show up. At least with that other invisible shop threat, carbon monoxide, you (or your survivors) know immediately if you are affected.

### Asbestos Risks

The Environmental Protection Agency (EPA) published a report in 1986 on the prevention of asbestos disease. In the report, the EPA listed cancers and other health effects caused by exposure to asbestos. If you work in a shop where there is careless asbestos use, you could one day suffer from any of the following illnesses.

Asbestosis develops when particles of asbestos in the lungs cause the growth of scar tissue. Scar tissue in the lungs inhibits oxygen from getting to the bloodstream. Scar tissue development is very gradual and is usually not noticed until it is advanced. There is no treatment; there is no cure. If you have asbestosis, you'll be buried with it, and probably sooner than you would have been otherwise. Obviously, as with any serious injury, prevention is the only rational course of action.

Lung cancer is currently the most common cause of asbestos-related death, and its frequency appears to correspond to the level of exposure. In addition, if someone is a smoker, the combination of that and the asbestos produces a risk much higher than you might think. Though no combination tests have been done for brake mechanics in particular, asbestos insulators who smoke have a lung cancer risk over fifty times higher than nonsmokers who avoid asbestos exposure altogether. Other cancers (voice box, stomach and large intestine) are believed caused by asbestos. Some of



If you could see in microscopic detail, at 10,000 times normal magnification, you'd know which brakes have asbestos fibers and which don't. But there are many manufacturers of brake linings and many applications to vehicles. To be safe, you have to assume all brakes have asbestos. Some sort of asbestos containment program is necessary for every shop.



the dust, as you would suppose, is swallowed. These can occasionally be treated with surgery and radiation or chemotherapy.

Mesothelioma, a cancer affecting the lining of the chest or abdominal cavity, is caused by asbestos fiber dust. It is untreatable and fatal, and it is particularly associated with very limited and indirect exposure, such as washing clothing contaminated with asbestos dust or even embracing someone with asbestos dust on the skin and clothing. What that means is that the fibers can be transported home and cause the death of a member of your family, someone who had nothing to say about whether or not to observe safeguards.

#### Why Asbestos?

The facts are, asbestos is cheap and effective. Even with the severe health risks involved, asbestos is still used in about 15% of new cars and a somewhat higher percentage of new trucks; the larger the vehicle, the more likely it is you'll find asbestos.

The working elements of clutch and brake friction surfaces, exhaust gaskets and donuts and a few other automotive parts consist of binders, chiefly high-temperature polymers, and chrysotile asbestos, a magnesium silicate fiber with great tensile strength, heat resistance, chemical stability and low cost.

Asbestos handles high heat. Even in a panic stop or a sideslipped clutch, only the tiny high points of the pad, shoe or disc actually touch the metal surface. The brake or flywheel is heat-conductive and spreads the temperature throughout, but the high points just get hotter, sometimes as high as 1850°F. The wire-like structure of the material, for all practical purposes, does not break or melt or dissolve.

But those very properties that make asbestos such an excellent material for a brake or clutch make it dangerous in the human body.

Asbestos remains just as indestructible inside you as it does on brakes and clutches. If you've ever swallowed loosened rust or siphoned gasoline, your body's fluids disassembled the first and diluted the second and eventually carried the nauseous stuff away. Not so with asbestos: It doesn't melt; it doesn't burn; it doesn't break; it doesn't dissolve; it doesn't dilute; it doesn't digest.

The risks of asbestos are more like the risks of high-voltage electricity, sharp-edged unshielded

fans, or poisonous explosive gases and fluids: Avoiding the injury is better than repairing the damage.

#### Handling Asbestos

Even five or ten years ago you could see brake mechanics blasting dust from brakes with compressed air. Blasting asbestos dust away is now illegal and generally regarded as nearly suicidal. It's as bad as running the engine in a closed shop without an exhaust hose. But most mechanics would recognize the smell of asbestos, just as readily as



One: Have the HEPA (high-efficiency particulate air) vacuum cylinder under the brake as you remove the drum.



Two: The containment cylinder is placed around the brake and the backing plate. Leave the vacuum running.



Three: Using the asbestos-tight glove, reach into the cylinder and blow all the fibers into the vacuum collector.



Four: Once the asbestos dust is removed, you can then go on to replace the brake shoes and parts as needed.

they can recognize the smell of 90-weight lubricant, ATF or gasoline. And if you've smelled brakes, you've inhaled asbestos.

Probably the worst thing you can do to spread asbestos is to grind or bevel brakes. Beveling shoes to reduce brake noise can release as many as 72 million measurable asbestos fibers into the air of your shop, and untold billions too small to measure. Pass on that job. If somebody's brakes are loud, but you can't find a factory-bevelled set, just let the brakes squeal.

Other mistakes include removal by water or brake cleaner spray blast and wiping the dust off with wet or dry brushes or rags. Those latter methods also leave you with the problem of what to do with the contaminated brushes and rags.

Respirators are not practical either. First of all, you would need the kind with hoses to supply outside air, which is very inconvenient in a shop. Second, everyone in the shop, office staff and customers included, would have to wear one all the time. Third, respirators wouldn't control the asbestos fiber dust problem. Instead, they move dust from the shop to the mechanic's home, and still leave a layer of asbestos dust over everything in the shop.

Unfortunately, considering that almost all older cars used asbestos brakes or were relined with them, and that some new cars still do, you have to assume that every car has asbestos brakes and take precautions accordingly. You can tell some non-asbestos brakes by their color—after you have the drum off or caliper loose. But of course, if they do contain asbestos, it's too late. The fibers are airborne.

Yes, it is very annoying when the dangers become known and the control expenses must be paid just as car and truck makers are moving away from asbestos. The risk is there anyway, and you have to contain it.

Fortunately, OSHA has found some asbestos removal techniques



There are several other HEPA vacuums on the market. With this one you blow the air through a screen to collect the dust. As in all HEPA asbestos containment vacuums, the filter is critical.

that are safe and effective. If you work with asbestos brakes or know someone who does, read on. These systems could extend your life.

The first type of asbestos removal system is a containment system,

which surrounds the brake with a sealed cylinder or box. Each of these devices isolates the brake area and contains the asbestos dust so you can safely vacuum it up. You reach into the container, most often with asbestos-impermeable gloves, and blow the dust off with an air gun. A high-efficiency particulate air (HEPA) vacuum system draws the asbestos dust into a canister and blows the exhaust air through a special filter. This filter is the essential part of the equipment. It is capable of retaining any particle larger than 0.3 microns (a micron is one-thousandth of a millimeter).

The systems don't easily remove asbestos dust from clutches because there's not much free space around a transmission or a pressure plate for the containers to fit. Therefore, containment system manufacturers recommend the vacuum attachment be used instead. Similarly, there is difficulty fitting containers over brakes with a seized drum. The solvent-mist system, discussed below, may be more effective for both clutches and



Different HEPA vacuums for different applications. This one can fit odd-sized military equipment. A plexiglass box replaces the transparent cylinders in the other versions.

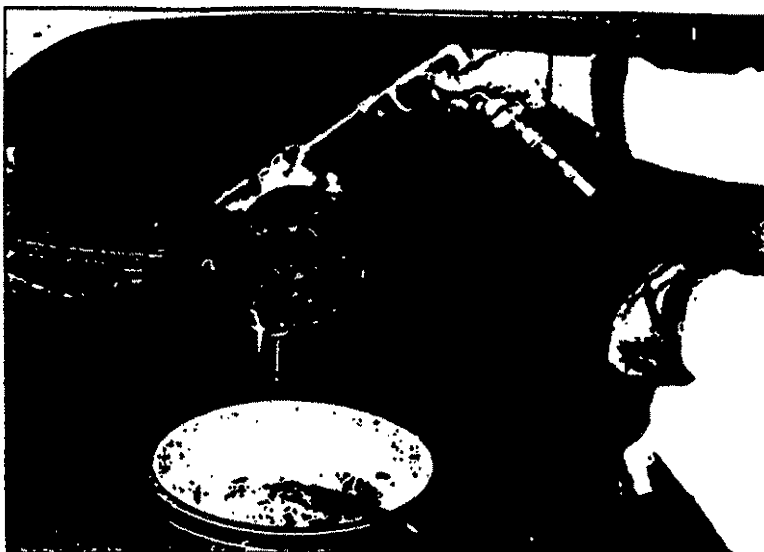


brakes on which the drums need to be pounded off.

The special HEPA filter also explains why the attempt to collect asbestos dust in an ordinary shop vacuum is almost as bad as blasting the dust away with an air gun: The particles go right through an ordinary filter and the vacuum motor spreads millions of hazardous particles through the air as far as 75 feet from the vacuum.

The HEPA filter exceeds the legal requirement for filtration, but this is not too much of a good thing. The law measures exposure by counting particles larger than 5 microns. Many researchers suspect the far more numerous smaller particles are the more dangerous ones. Five microns is not the point at which the asbestos fibers become harmless; it's the point at which they get expensive to count.

Once the HEPA vacuum is full, you must double-bag the dust, put it in a sealed drum, and label it to indicate that it contains asbestos fibers that can cause lung disease and cancer. Then you contract with



An alternative to the HEPA vacuum is the "bird bath" system. Flush the asbestos fibers into the pan with the solvent. But there's more toxic waste to dispose of with this system.

a toxic waste hauler to dispose of the asbestos properly.

The second removal system found effective by OSHA is a low-velocity solvent mist to moisten the asbestos fiber dust until it is all

stuck together. Then the entire glop is removed, solvent and all. One type, called a "bird bath" because of the shape of its solvent collecting pan, uses recirculating water and detergent to soak off the dust. This solvent is not blasted on like brake cleaner, bouncing some asbestos into the air. Instead, it's misted on. According to OSHA, these solvents can either be applied by special sprayers attached to your air hose or from aerosol cans. The latter might be an economically attractive alternative for a shop that doesn't do enough brake and clutch work to warrant buying an HEPA system. The advantage of the solvent mist is that there is a considerable savings in cost. The disadvantage is that the amount of asbestos-contaminated waste produced, including the fluid, is greater than it would be if a vacuum containment system were used.

But finally, whether you use these methods to remove asbestos from brakes or clutches, or you avoid that kind of work altogether, it's good to know that asbestos is being used less. And that's good for all of us. ●

*Research assistance by Jeff Braines*

## More Information

For information about asbestos containment systems, you may contact:

**Ammco Tools**  
Wacker Park  
North Chicago, IL 60064  
(312) 689-1111

**Clayton Associates**  
P.O. Box 589  
30 Southard Avenue  
Farmingdale, NJ 07727  
(201) 938-6700

**Control Resource Systems**  
670 Mariner Drive  
Michigan City, IN 46360  
(219) 872-5591

**Hako Minuteman**  
111 South Route 53  
Addison, IL 60101  
(312) 627-6900

**Nilfisk of America**  
300 Technology Drive  
Malvern, PA 19355  
(215) 647-6420

For information about asbestos-related illnesses, contact your local American Lung Association, or:

**The White Lung Association**  
of New York  
12 Warren Street  
New York, NY 10019  
(212) 619-2270