

New Jersey Department of Health

HAZARDOUS SUBSTANCE FACT SHEET

COMMON NAME: FIBROUS GLASS

CAS NUMBER: None

DOT NUMBER: None

HAZARD SUMMARY

- * Fibrous Glass can affect you when breathed in.
- * Exposure can irritate the eyes, nose, and throat.
- * Contact can cause intense itching and a skin rash. The skin around the fingernails may become red and swollen.

IDENTIFICATION

Fibrous Glass is a soft wool-like material usually pink or yellow. It is used as insulation, in weatherproofing and as textile material.

REASON FOR CITATION

- * Fibrous Glass is on the Workplace Hazardous Substance List because it is cited by ACGIH and NIOSH.
- * Definitions are provided on page 5.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) for respirable dust is 5 mg/m^3 averaged over an 8-hour workshift and 15 mg/m^3 total dust averaged over an 8-hour workshift.

- * The OSHA exposure limits are recommended for nuisance or inert dusts.

NIOSH: The recommended airborne exposure limit is 3 million fiber/ m^3 of a certain size or 5 mg/m^3 of total Fibrous Glass averaged over an 8-hour workshift.

ACGIH: The recommended airborne exposure limit is 10 mg/m^3 averaged over an 8-hour workshift of Fibrous Glass Dust.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

- * Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
- * If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WAYS OF REDUCING EXPOSURE

- * Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
- * Wear protective work clothing.
- * Wash thoroughly at the end of the workshift.
- * Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Fibrous Glass to potentially exposed workers.

This Fact Sheet is a summary source of information for workers, employers, and community residents. Health professionals may also find it useful. If this substance is part of a mixture, this Fact Sheet should be used along with the manufacturer-supplied Material Safety Data Sheet (MSDS).

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Fibrous Glass**:

- * Exposure can irritate the eyes, nose, throat, and skin.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Fibrous Glass** and can last for months or years:

Cancer Hazard

- * There is limited evidence that **Fibrous Glass** injected or implanted into animals causes cancer. The human cancer risk is unclear at this time.

Other Long-Term Effects

- * Exposure can cause a skin rash with intense itching, redness, and swelling and redness around the fingernails. This may occur again when you have been away from the job for a while and first come back.
- * It is not known whether repeated exposure to small size fibers of **Fibrous Glass** (under 3.5 microns in diameter) causes lung damage. Repeated exposure to many irritating substances causes damage.

MEDICAL

Medical Testing

Before employment and every 2-3 years thereafter, the following may be useful:

- * Lung function tests.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures

Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is enclosing operations and/or providing local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is; (2) how much of the substance is released into the workplace, and (3) whether harmful skin or eye contact could occur. Better controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

- * Work clothing should be changed after work, and stored and laundered separately.
- * Wash any areas of the body that may have contacted **Fibrous Glass** at the end of each work day, whether or not known skin contact has occurred.

- * Do not dry sweep for clean-up. Use a vacuum or a wet method to reduce dust during clean-up.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

- * Avoid skin contact with **Fibrous Glass**. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- * All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- * Wear dust-proof goggles when working with **Fibrous Glass**, unless full facepiece respiratory protection is worn. This especially applies to tear-out operations.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in OSHA 1910.134.

- * Where the potential exists for exposures over 5 mg/m^3 of **Fibrous Glass**, use an MSHA/NIOSH approved respirator equipped with particulate (dust/fume/mist) filters.
- * Be sure to consider all potential exposures in your workplace. You may need a combination of filters, prefilters,

cartridges, or canisters, to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.

- * Where the potential for high exposures exists, use an MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pressure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use an MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

QUESTIONS AND ANSWERS

- Q: If I have acute health effects, will I later get chronic health effects?
 A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.
- Q: Can I get long-term effects without ever having short-term effects?
 A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.
- Q: What are my chances of getting sick when I have been exposed to chemicals?
 A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time someone is exposed and the amount of material they are exposed to.
- Q: When are higher exposures more likely?
 A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers) and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).
- Q: Is the risk of getting sick higher for workers than for community residents?
 A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. How-

ever, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Don't all chemicals cause cancer?

A: No. Most chemicals tested by scientists are not cancer-causing.

Q: Should I be concerned if a chemical causes cancer in animals?

A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

The following information is available from:

New Jersey State Department of Health
Occupational Disease Prevention and
Information Program
CN 360
Trenton, NJ 08625
(609) 984-1863

Right to Know Information Resources

The Right to Know Hotline (609) 984-2202 can answer questions about the identity of chemicals, the preparation of the workplace surveys, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-5627.

Public Presentations

Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions or trade associations, and other groups.

General References

A list of educational materials in occupational health and references used to prepare the Fact Sheets are available upon request.

Industrial Hygiene Information and Surveys

Industrial hygienists are available to answer your questions regarding the health effects of chemical substances present in your workplace. In response to requests, a field investigation, including a walk-through, air monitoring, measurements of temperature and humidity, and evaluation of existing engineering controls, can be provided.

Medical Evaluation

If you think you are becoming sick because of exposure to chemicals at your workplace, you can call to make an appointment at the Occupational Health Clinic to be examined by our physicians. The only fees are for laboratory tests. The clinic is located at the Helene Fuld Medical Center in Trenton but we can refer you to another center if you cannot travel. In addition, if a large number of individuals need to be screened, a mobile screening van can be brought to your workplace for the examinations and testing.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

CAG is the Carcinogens Assessment Group of the federal EPA.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that can cause an explosion under certain conditions or on contact with other specific substances.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

EMERGENCY INFORMATION

Common Name: FIBROUS GLASS

WARNING

DOT Number: None

NFPA Flammability: No Citation

NFPA Reactivity: No Citation

DOES NOT BURN

Health hazards on front page

FIRE HAZARDS

- * Extinguish fire using an agent suitable for type of surrounding fire. Fibrous Glass itself does not burn.
- * If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

HANDLING AND STORAGE

- * Prior to working with Fibrous Glass you should be trained on its proper handling and storage.

FIRST AID

Eye Contact

- * Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact

- * Remove contaminated clothing. Wash contaminated skin with water.

NJ POISON INFORMATION 1-800-962-1253

PHYSICAL DATA

Water Solubility: Insoluble

OTHER COMMONLY USED NAME

Fiber Glass

Not intended to be copied and sold for commercial purposes.

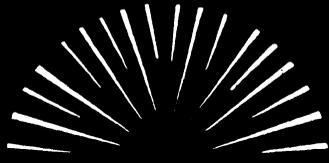


New Jersey Department of Health
CN 368 Trenton, NJ 08625
(609) 984-2202

Date prepared: November 1985

Revision:

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AUG 84



HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **FIBROUS GLASS (DUST)**

CAS Number: None
DOT Number: None

RTK Substance number: 0933
Date: November 1985 Revision: September 1995

HAZARD SUMMARY

- * **Fibrous Glass Dust** can affect you when breathed in.
- * Exposure can irritate the eyes and skin.
- * **Breathing Fibrous Glass Dust** can irritate the nose and throat.
- * Contact can cause intense itching and a skin rash. The skin around the fingernails may become red and swollen.

IDENTIFICATION

Fibrous Glass is a soft wool-like material that is usually pink or yellow. It is used as insulation, in weatherproofing, and as textile material.

REASON FOR CITATION

- * **Fibrous Glass** is on the Hazardous Substance List because it is cited by ACGIH, NIOSH and NTP.
- * Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

- * Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
- * If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) for respirable dust is 5 mg/m^3 averaged over an 8-hour workshift and 15 mg/m^3 total dust averaged over an 8-hour workshift.

- * The OSHA exposure limits are recommended for nuisance or inert dusts.

NIOSH: The recommended airborne exposure limit is $3 \text{ million fibers/m}^3$ of a certain size or 5 mg/m^3 of total **Fibrous Glass Dust** averaged over an 8-hour workshift.

ACGIH: The recommended airborne exposure limit is 10 mg/m^3 averaged over an 8-hour workshift of **Fibrous Glass Dust**.

WAYS OF REDUCING EXPOSURE

- * Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
- * Wear protective work clothing.
- * Wash thoroughly at the end of the workshift.
- * Wash thoroughly immediately after exposure to **Fibrous Glass Dust**.
- * Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of **Fibrous Glass Dust** to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Fibrous Glass Dust**:

- * Exposure can irritate the eyes and skin.
- * Breathing **Fibrous Glass Dust** can irritate the nose and throat.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Fibrous Glass Dust** and can last for months or years:

Cancer Hazard

- * There is limited evidence that **Fibrous Glass** implanted into animals causes cancer.

Reproductive Hazard

- * According to the information presently available to the New Jersey Department of Health, **Fibrous Glass Dust** has not been tested for its ability to affect reproduction.

Other Long-Term Effects

- * Exposure can cause a skin rash with intense itching, redness, and swelling and redness around the fingernails.

MEDICAL

Medical Testing

There is no special test for this chemical. However, if illness occurs or overexposure is suspected, medical attention is recommended.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for

damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

- * Work clothing should be changed after work, and stored and laundered separately.
- * Wash any areas of the body that may have contacted **Fibrous Glass Dust** at the end of each work day, whether or not known skin contact has occurred.
- * Do not dry sweep for clean-up. Use a vacuum or a wet method to reduce dust during clean-up.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

- * Avoid skin contact with **Fibrous Glass Dust**. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- * All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- * Wear dust-proof goggles when working with **Fibrous Glass Dust**, unless full facepiece respiratory protection is worn. This especially applies to tear-out operations.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS.

Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

- * Where the potential exists for exposures over 5 mg/m^3 , use a MSHA/NIOSH approved full facepiece respirator with a high efficiency particulate filter. Greater protection is provided by a powered-air purifying respirator.
- * Be sure to consider all potential exposures in your workplace. You may need a combination of filters, prefilters, cartridges, or canisters, to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
- * Where the potential for high exposures exists, use an MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pressure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use an MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure-mode.

QUESTIONS AND ANSWERS

- Q: If I have acute health effects, will I later get chronic health effects?
- A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.
- Q: Can I get long-term effects without ever having short-term effects?
- A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.
- Q: What are my chances of getting sick when I have been exposed to chemicals?
- A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.
- Q: When are higher exposures more likely?
- A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).
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- Q: Don't all chemicals cause cancer?
- A: No. Most chemicals tested by scientists are not cancer-causing.

- Q: Should I be concerned if a chemical causes cancer in animals?
- A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

The following information is available from:

New Jersey Department of Health
Occupational Health Service
Trenton, NJ 08625-0360
(609) 984-1863

Industrial Hygiene Information

Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation

If you think you are becoming sick because of exposure to chemicals at your workplace, you may call a Department of Health physician who can help you find the services you need.

Public Presentations

Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources

The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-2202.

DEFINITIONS

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NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the Public Employees Occupational Safety and Health Act, a state law which sets PELs for New Jersey public employees.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

Wise Up

Pass on the pink stuff when you pick insulation

Roughly 70% of the \$2 billion that Americans will spend this year on home insulation—\$200 million of it by do-it-yourselfers—will go for rolls of pink fiberglass made by the top cat of warm and snug, Owens-Corning. Of course, its pink stuff is pitched by none other than the Pink Panther. But if you're in the housewarming market this year, there's a better alternative: cellulose insulation. It's not only painless to install and more efficient but, best of all, is cheaper than fiberglass.

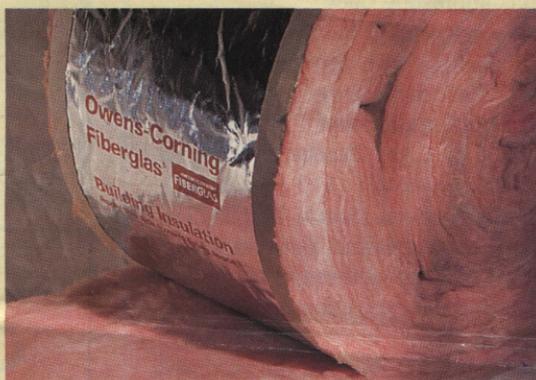
As any weekend handyman can tell you, working with fiberglass can mean enough to send even the hardiest potato back to the couch. Made primarily from blown glass and formaldehyde, the prickly glass fibers are abrasive to the skin and can trigger serious respiratory problems if inhaled. And this past July, fiberglass was added

to the Department of Health and Human Services' list of suspected carcinogens. For its part, Owens-Corning steadfastly maintains that fiberglass insulation poses no serious health risk. Says Brad Oelman, vice president of corporate relations for the \$3 billion Toledo company: "We remain confident about the safety of our product." And Dan Larson, a spokesman for the North American Insulation Manufacturers Association, an industry trade group, concedes only that "installing and breathing the stuff are the fears."

By contrast, cellulose insulation is nonabrasive, contains no suspected carcinogens and is environmentally friendly. In fact, cellulose was the dominant home insulation in the U.S. before fiberglass came into vogue more than 30 years ago.

The leading brand, Louisiana Pacific's Nature Guard, is manufactured primarily from recycled newspaper that is treated with borax and boric acid. Other cellulose brands, like Suncoast's U.S. Fiber, are similarly produced from old newspapers.

Cellulose is more economical than fiberglass partly because it is more efficient, nearly 50% better than fiberglass at keeping your house warm. Moreover, because cellulose is blown into attic ceilings, walls and floors (with an easy-to-use



LES JORGENSEN

Fiberglass can cause respiratory woes.

machine that most sellers provide free of charge), it reaches nooks and crannies that otherwise go uninsulated. "With fiberglass you get a lot of missed space," says Elgon Williams, manager of the building materials department at Home Depot in North Haven, Conn.

As for the cost of materials, cellulose wins again. To cover the typical 1,000-square-foot attic space to the recommended thickness of R-30 (which means the heat resistance is 30 times greater than an uninsulated space), you would need to buy around 35 of the 50-square-foot Nature Guard bags. Your total cost: \$245. For 1,000 square feet of Owens-Corning's pre-cut R-30 strips, you would spend nearly 40% more, or about \$340. That difference could buy the Pink Panther some tasty cat food.

—Elif Sinanoglu

A Recommended Standard for Occupational Exposure to.....

FILE

Fibrous Glass

A complete criteria document for occupational exposure to fibrous glass has been prepared by the National Institute for Occupational Safety and Health (NIOSH). NIOSH recommends that occupational exposure to fibrous glass be controlled so that no worker is exposed at an airborne concentration greater than 3,000,000 fibers/cu m of air (3 fibers/cc of air) having a diameter equal to or less than 3.5 micrometers ((u)m) and a length equal to or greater than 10 (u)m determined as a time weighted average (TWA) concentration for up to a 10-hour work shift in a 40-hour workweek; airborne concentrations determined as total fibrous glass shall be limited to a TWA concentration of 5 mg/cu m of air. This differs from the present Federal standard which classifies fibrous glass as an inert or nuisance dust with the limits of exposure being 15 million particles per cubic foot (mppcf) or 5 mg/cu m for the respirable fraction and 50 mppcf or 15 mg/cu m total dust, both as 8-hour TWA concentrations.

Fibrous glass is the name for a manufactured fiber in which the fiber-forming substance is glass. Glasses are a class of materials made from silicon dioxide with oxides of various metals and other elements, that solidify from the molten state without crystallization. A fiber is considered to be a particle with a length-to-diameter ratio of 3 to 1 or greater. It is estimated that fibrous glass is used in over 30,000 product applications. The major uses of fibrous glass are in thermal, electrical, and acoustical insulation, weather proofing, plastic reinforcement, filtration media, and in structural and textile materials. NIOSH estimates that 200,000 workers are potentially exposed to fibrous glass. Most fibrous glass that is manufactured consists of fibers with diameters 3.5 (u)m or larger. The volume of small diameter fiber production has not been determined. Fibers with diameters less than 1 (u)m are estimated to comprise less than 1% of the fibrous glass market.

Different dimensions of fibrous glass will produce different biologic effects. Large diameter (greater than 3.5 (u)m) glass fibers have been found to cause skin, eye, and upper respiratory tract irritation; a relatively low frequency of fibrotic changes; and a very slight indication of an excess mortality due to nonmalignant

respiratory disease. Smaller diameter (less than 3.5 (u)m) fibrous glass has not been conclusively related to health effects in humans but glass fibers of this dimension have only been regularly produced since the 1960's. Smaller diameter fibers have the ability to penetrate to the alveoli and this potential is cause for concern and the primary reason that fibers 3.5(u)m or smaller are subject to special controls. Experimental studies in animals have demonstrated carcinogenic effects with the long (greater than 10(u)m) and thin fibers (usually less than 1 (u)m in diameter). However, these studies were performed by implanting fibrous glass in the pleural or peritoneal cavities. The data from studies with these routes of exposure cannot be directly extrapolated to conditions of human exposure. On the basis of available information, NIOSH does not consider fibrous glass to be a substance that produces cancer as a result of occupational exposure. The data on which to base this conclusion are limited. Fibrous glass does not appear to possess the same potential as asbestos for causing health hazard. Glass fibers are not usually of the fine submicron diameters as are asbestos fibrils and the concentrations of glass fibers in workplace air are generally orders of magnitude less than for asbestos. In one study, glass fibers were found to be cleared from the lungs more readily than asbestos.

In addition to environmental limits to control exposure to fibrous glass, NIOSH also recommends work practices and engineering controls. Since fibrous glass is used in many product applications, only general guidelines for work practices have been recommended. The employer is responsible for developing work practices, consistent with the guidelines in the document, that pertain to specific operations involving occupational exposure to fibrous glass. NIOSH recommends that workers subject to fibrous glass exposure have comprehensive preplacement medical examinations with emphasis on skin susceptibility and prior exposure in dusty trades. Subsequent annual examinations should give attention to the skin and respiratory system with attention to pulmonary function. Engineering controls should be used wherever feasible to maintain

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fibrous glass concentrations at or below the prescribed limits. Respirators should only be used when engineering controls are not feasible; for example, in certain nonstationary operations where permanent controls are not feasible.

In addition, although this criteria document addresses occupational exposure to fibrous glass, we recommend that until more information is available, the recommended standard of 5 milligrams per cubic meter of air should also be applied to other man-made mineral fibers.

The recommended standard is part of a continuing series of criteria documents developed by NIOSH in accordance with the Occupational Safety and Health Act of 1970. This document was transmitted to the Department of Labor April 15, 1977, for review and consideration in the standard setting process. The criteria document on fibrous glass was initiated in 1973, reviewed, and delayed pending the development

of new data and further evaluation by the Institute. Since the data available for consideration in 1973 was not conclusive, and because similarities between fibrous glass and asbestos were of concern, NIOSH held a symposium on occupational exposure to fibrous glass in 1974. The symposium was a means of gaining input on scientific questions many of which pertained to the criteria document. The criteria document has been reviewed by 19 consultants, 4 professional societies, representatives of industry and labor, and Government agencies having interest and responsibility for occupational safety and health. The proposed standard is considered appropriate, and no additional information that would affect the recommended standard is available at this time.

The following is the first chapter of the criteria document. It contains the NIOSH recommendations for controlling worker exposure to Fibrous Glass.