Asbestos becomes a health hazard only when it is inhaled or ingested. Thus, if asbestos is present in large concentrations, it significantly heightens the chances of developing certain diseases. If you inhabit a contaminated house, the risk of developing the associated diseases is higher. Old heaters, hot water systems and stoves manufactured before the 1980s may pose a greater threat to your health than new equipment. Similarly, asbestos-containing materials, such as those found in construction materials and appliances, pose a high risk in this respect, since their brittleness makes it more likely for fibers to be disturbed. If asbestos is present in your home, you are more prone to being diagnosed with one of the associated diseases.

Contamination occurs when fibers which have been released into the environment come into contact with people. This can happen when fibers from products are even slightly disturbed. Similarly, asbestos that becomes airborne due to gardening or riding a bicycle poses a risk. The duration of exposure is an important factor, as it significantly affects the probability of developing the disease. Long-term or repeated exposure to asbestos is responsible for the majority of cases of asbestosis and pleural effusion. In the case of mesothelioma, the period between exposure and the development of the disease is much longer; the symptoms typically appear between 15 and 35 years after initial exposure. The symptoms of pleural mesothelioma are relatively similar to those accompanying mesothelioma and may include one or more of the following: recurring respiratory infections such as colds, a persistent cough, fever, chest pain, fatigue, unintentional weight loss, hoarseness, and clubbed fingers. This condition is an aggressive and rare form of cancer that typically develops within 20 to 50 years of exposure. Although the prognosis for pleural mesothelioma is less favorable than for lung cancer, it is the most common and asbestos-related cancer, as it is the most common and asbestos-related cancer. Secondary exposure refers to asbestos that is inhaled or ingested due to environmental factors, such as asbestos in the air or drinking water. Occupational exposure refers to asbestos contact with asbestos occurring in the workplace. Secondary exposure poses a significant risk, endangering the wellbeing of workers and their families. Unfortunately, a large number of companies fail to enforce appropriate procedures in this respect, endangering the wellbeing of workers and their families.

Various studies have revealed that talc and asbestos are often in close proximity of each other. Naturally occurring asbestos may occasionally be the culprit in this respect. Exposure to asbestos can cause a series of malignant diseases within several decades of first ingestion. A rare form of laryngeal cancer is perhaps the disease whose correlation with asbestos is going to be the most intriguing. Exposure to asbestos results in inflammation of the outer lining of the larynx, which may become embedded into the inner lining of the larynx and subsequently produce severe inflammation, which can lead to the development of malignant tumors. Although the prognosis for pleural mesothelioma is less favorable than for lung cancer, it is the most common and asbestos-related cancer. Secondary exposure, particularly if employees are not required to undergo a series of protective measures in order to remove asbestos from their equipment prior to exiting the premises of their workplace, increases the risk for this malignant condition as well, endangering the wellbeing of workers and their families. The families of asbestos workers are the most vulnerable to exposure to asbestos, either naturally occurring asbestos or fibers which became airborne due to gardening or riding a bicycle, for example. Therefore, it is crucial to enforce appropriate procedures to prevent secondary exposure, particularly if employees are not required to undergo a series of protective measures in order to remove asbestos from their equipment prior to exiting the premises of their workplace. Additionally, it is important to note that asbestos-related cancers are often diagnosed in the late stages of the disease, when few treatment options are available. In the early stages, the symptoms are relatively similar to those accompanying mesothelioma and may include one or more of the following: recurring respiratory infections such as colds, a persistent cough, fever, chest pain, fatigue, unintentional weight loss, hoarseness, and clubbed fingers. This condition is an aggressive and rare form of cancer that typically develops within 20 to 50 years of exposure. Although the prognosis for pleural mesothelioma is less favorable than for lung cancer, it is the most common and asbestos-related cancer. Secondary exposure, particularly if employees are not required to undergo a series of protective measures in order to remove asbestos from their equipment prior to exiting the premises of their workplace, increases the risk for this malignant condition as well, endangering the wellbeing of workers and their families.
Asbestos, a group of naturally occurring minerals, has been widely used ever since ancient times due to its convenient properties, accessibility and low cost. However, it was not until the early 1970s that the hazardous health effects of prolonged exposure were formally confirmed by multiple government agencies. Consequently, asbestos mining and employment decreased drastically and 55 countries even banned it completely. Asbestos has been deemed carcinogenic by both the International Agency for Research on Cancer and the U.S. Environmental Protection Agency. Unfortunately, exposure is far from representing a rare occurrence since asbestos is still used by numerous companies, thus posing a tremendous threat to public health. Additionally, since these minerals have had a high prevalence in the construction industry, the majority of buildings erected before the mid 1980s, including houses, are very likely to have asbestos in their insulation, wallboards or floor tiles.

Exposure to asbestos is responsible for serious respiratory conditions such as asbestosis, pleurisy and pleural effusion, as well as for terminal illnesses. Mesothelioma and lung cancer are only two of the life-threatening diseases which may follow long-term or frequent contact with asbestos fibers. Approximately 80% of pleural mesothelioma cases are caused by exposure, while the risk of developing lung cancer increases by nearly 5%.

Even though occupational exposure is the primary circumstance in which people are in regular contact with airborne asbestos fibers, inhabitants whose house was build before the 1980s are also at a high risk. As asbestos-containing materials begin aging, they tend to become brittle as well. When such products are even slightly disturbed, fibers might be released into the air and subsequently inhaled or ingested by the inhabitants. Therefore, testing your house for asbestos is crucial, particularly if you live in an old building. The purpose of this guide is to offer basic information regarding asbestos, how exposure occurs, the most common conditions caused by it and, most importantly, how to recognize asbestos-containing products in your home in order to properly dispose of it.
INTRODUCTION

Asbestos, a group of naturally occurring minerals, has been widely used ever since ancient times due to its convenient properties, accessibility and low cost. However, it was not until the early 1970s that the hazardous health effects of prolonged exposure were formally confirmed by multiple government agencies. Consequently, asbestos mining and employment decreased drastically and 55 countries even banned it completely. Asbestos has been deemed carcinogenic by both the International Agency for Research on Cancer and the U.S. Environmental Protection Agency. Unfortunately, exposure is far from representing a rare occurrence since asbestos is still used by numerous companies, thus posing a tremendous threat to public health. Additionally, since these minerals have had a high prevalence in the construction industry, the majority of buildings erected before the mid 1980s, including houses, are very likely to have asbestos in their insulation, wallboards or floor tiles.

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Asbestos is a group of naturally occurring minerals which can be found in soil and rocks. There are six types, according to the U.S. Environmental Protection Agency: chrysotile (white asbestos), which is also the most commonly used, amosite, crocidolite (blue asbestos), tremolite, anthophyllite and actinolite.

Chrysotile is present in 90% of all asbestos-containing products due to the fact that this type perfectly illustrates the numerous practical properties of asbestos: durability, resistance to extreme heat and fire, insolubility in water, inability to conduct electricity, chemical resistance, inertness, sound absorption.

Another classification of asbestos focuses on the shape of fibers. Thus, it can be either serpentine or amphibole. Chrysotile asbestos is the only type of mineral in the first category, while the remaining five fall under the amphibole group. While the fibers of serpentine asbestos are long, white, curly and have a layered structure, amphibole fibers are straight and needle-like, their color depending on the type.

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Therefore, testing your house for asbestos is crucial, particularly if you live in an old building. The purpose of this guide is to offer basic information regarding asbestos, how exposure occurs, the most common conditions caused by it and, most importantly, how to recognize asbestos-containing products in your home in order to properly dispose of it.
1. **WHAT IS ASBESTOS?**

Asbestos is a group of naturally occurring minerals which can be found in soil and rocks. There are six types, according to the U.S. Environmental Protection Agency: chrysotile (white asbestos), which is also the most commonly used, amosite, crocidolite (blue asbestos), tremolite, anthophyllite and actinolite. Chrysotile is present in 90% of all asbestos-containing products due to the fact that this type perfectly illustrates the numerous practical properties of asbestos:

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The etymological origin of the term asbestos stems from Greek, the sense of the word literally translating to inextinguishable or unquenchable. The prefix a- denotes absence, while sbestos (the verbal adjective from the verb sbennynai) means to extinguish or to quench.

Asbestos is a group of odorless and tasteless silicate minerals which can be encountered in various geographical regions all around the world. However, the most significant deposits of asbestos are located in Canada, the United States, Russia and South Africa. These minerals can be found in 20 states in the U.S., including California, Arizona, North Carolina, New York and Vermont. Asbestos mining has occurred in 17 of the previously mentioned states over the course of the past century. Chrysotile asbestos accounts for 99% of the entire current global production, while the other five types are mined scarcely in countries such as India. Russia is currently the greatest supplier of asbestos worldwide, with approximately 55% of the whole global production.
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and

and

may include one or more of the following:

coughing up blood

wheezing

fatigue

pain in the chest region

may lead to the following

with habitual tobacco use, the risk can increase by up to 90%.

frequent contact with asbestos, preponderantly in the

who suffer from lung cancer developed their disease due to

increase the risk for this malignant condition as well,

may become embedded into the inner lining of the larynx

consequently, most people find out about their affection

rarely experienced in the incipient phases of the disease and

detection often entails a significantly improved outcome, as

pleural mesothelioma is generally pessimistic, early

development of malignant tumors. Although the prognosis

which have accumulated on the surface of lungs leads to the

initial exposure, as the severe inflammation caused by fibers

The condition typically develops within 20 to 50 years of

estimated that over 80% of all cases are caused by asbestos.

cancer affecting the outer lining of the lungs

mesothelioma

research and studies have already suggested.

between exposure and the previous conditions, as multiple

oncologists believe that there is indeed a causal relation

is still under debate. However, the majority of

and

correlation between these toxic minerals and

ovarian, colorectal cancer

Secondary exposure

the rules are completely neglected.

enforced in the U.S., there are numerous instances in which

sites have a great risk of inhaling or ingesting asbestos due

instance, while the latter typically implies a higher level of

disturbed following gardening or riding a bicycle, for

employees are in regular contact with. There are over 75

generally involves great amounts of asbestos which

asbestos-related cancers, since it is the most common and

30 years for lung cancer to develop, while pleural

conditions caused by exposure to asbestos typically entail a

pleural plaques

asbestosis

mesothelioma may occur within 20-50 years of initial

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pleural effusion

Laryngeal cancer

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fatigue

hoarseness

pain in the chest region

Secondary exposure
1. WHAT IS ASBESTOS?

The concentration of naturally occurring asbestos can be as high as 25%. The raw appearance of these minerals is similar to that of wood. After asbestos is mined, the fibers are separated from the various rocks they occur on and subsequently processed and refined. The final result consists in bunches of long, hair-like fibers which may be added in a wide range of products such as insulation and cement in order to strengthen or fireproof the materials. It is worthy of note that asbestos fibers cannot be observed without a microscope in a large number of consumer products. Thus, properly testing the composition of any product you believe might contain it is essential in order to avoid exposure.

Despite a notable decrease of asbestos use in the U.S. during the last four decades, these toxic minerals are still widely present in numerous buildings, as well as in various consumer products. It has been estimated that nearly 5,000 asbestos-containing products have been manufactured over the course of the last century in the U.S.
2. A BRIEF HISTORY OF ASBESTOS USE

The employment of asbestos can be traced back to Ancient Egypt, although it has been suggested that these minerals might have been used prior to 3000 BC as well. Archaeological discoveries revealed debris containing fibers of asbestos which is estimated to date back to the Stone Age.

The bodies of deceased pharos would be wrapped in cloths made with asbestos as a part of the embalmment process in Ancient Egypt, while fibers of asbestos would be embedded into clay pots in order to increase their resistance. Several such recipients found in Finland are supposed to have been made around 2500 BC. The napkins and table cloths of Ancient Romans are also believed to have contained asbestos. Due to their remarkable resistance to fire, fibers would be sewn into fabrics and the resulting textiles were allegedly cleaned by throwing them into fire, which would also visibly whiten them.

Curiously enough, it was also the Romans, as well as the Greeks who firstly observed the harmful health effects implied by exposure to asbestos. The writings of Pliny the Elder, a Roman historian, include an observation referring to the disease of slaves which he noticed in slave miners working with asbestos. Moreover, the historian also
2. A BRIEF HISTORY OF ASBESTOS USE

describes the protective measure used by them in order to avoid or at least limit exposure, which entailed covering the mouth and nose with a thin membrane made from the bladder of a lamb or goat. Apparently, asbestos was attributed magical properties as well, since Pliny the Elder also noted that it affords protection against all spells. The Greek geographer and historian Strabo mentioned a sickness of the lungs occurring in slaves who wove fibers of asbestos into textiles. Additionally, Pliny the Younger recorded the use of asbestos as well, writing in his early journals that clothes were manufactured with asbestos (lit. asbestinon), which was rare and impressive and sold for the same price as the finest pearls.

Asbestos was also prevalent during the Middle Ages, preponderantly in fabrics. Due to the fact that accidental fires occurred frequently during feasts, King Charlemagne of France decided to have a tablecloth embedded with asbestos fibers specially made for him in order to avoid such incidents. Chrysotile asbestos in particular, which was imported from Cyprus, gained significant popularity by the end of the first millennium,
2. A BRIEF HISTORY OF ASBESTOS USE

being used for the mats and wicks of lamps, as well as for a wide variety of textiles, including cremation cloths. Marco Polo mentioned the existence of *a fabric which would not burn* manufactured by the Mongolians in 1280. Asbestos was also involved in knights’ armors, which would be insulated with a layer made of these minerals. In 1725, Benjamin Franklin brought to England a purse made with fibers of asbestos from his first visit to Russia, where the chrysotile type was already being mined during the reign of Peter the Great.

Modern time employments of asbestos include the use of fibers in Italian bank notes in the 1800s to prevent them from catching fire and the protective equipment of the Parisian Fire Brigade, such as helmets and jackets, being layered with asbestos during the middle of the 19th century. However, it was not until the Industrial Revolution that the notoriety of asbestos grew substantially. Asbestos proved to be the perfect insulator for a wide range of products which tended to overheat when in use, such as boilers, steam engines, electrical generators, steam pipes and ovens. Due to the increasing prevalence of powered machinery, the demand for asbestos has drastically risen as well. As a consequence, asbestos mining became industrialized after the late 1800s.
2. A BRIEF HISTORY OF ASBESTOS USE

The first commercial asbestos mines opened in 1879 in Quebec, Canada, followed by multiple others in Russia, Australia and South Africa. In the U.S., Henry Ward Johns founded the H.W. Johns Manufacturing Company in 1858 in Manhattan, which commercialized an innovative fireproof roofing material made with anthophyllite asbestos. In the meantime, the first asbestos mines in the U.S. opened in the Sall Mountain region in Georgia. In 1901, Manville Covering Company adhered to Johns’ and Johns Manville ultimately became the greatest manufacturing enterprise in the U.S. which employed asbestos. By the beginning of the 20th century, an astounding amount of asbestos of over 30,000 tons was produced annually around the world.

Asbestos was extensively used by the U.S. Military as well, particularly by the Navy, between 1930 and 1975, which led to thousands of veterans being diagnosed with severe conditions such as pleural
2. A BRIEF HISTORY OF ASBESTOS USE

mesothelioma within the last two decades. Although it had various applications, asbestos was primarily employed as insulation for ships, tanks and aircraft, as well as for protecting buildings and barracks against fire. However, the heydays of asbestos happened prior to and during the World War II, when the U.S. Military increased the number of asbestos-laden vessels in anticipation of conflict.

Enormous quantities of asbestos continued to be widely involved in multiple industries such as construction and automotive until the early 1970s, when several government agencies in the U.S., including the Environmental Protection Agency, began raising awareness regarding the terrible health implications asbestos can have on those frequently exposed to it. It was also during this time span that the group of minerals was formally declared carcinogenic by agencies such as the U.S. Department of Health and Human Services. Stricter regulations ensued, followed by a dramatic decrease in the production and employment of asbestos all across the country by 1985. The last mine, which was located in California, closed in 2002. Additionally, 55 countries have banned asbestos mining, use and import entirely, with notable exceptions including Canada, Russia and the U.S.
2. A BRIEF HISTORY OF ASBESTOS USE

Since exposure to asbestos occurs mainly in the workplace, a set of regulations, as well as a limit were established by the U.S. Occupational Safety and Health Administration. Thus, although no amount of asbestos is considered to be truly safe, the permissible concentration to which an employee can be exposed is 0.1 fibers per cubic centimeter, according to OSHA. The regulations refer to the safety measures, protective equipment and training employers must regularly provide their workers with when asbestos is involved in their job in any manner, form or amount.

Nevertheless, the issue of asbestos is far from being resolved, as a large number of U.S. companies choose to turn a blind eye to the use of imported asbestos-containing or asbestos-tainted products due to their accessibility and low cost. Russia, China and India are three of the top producers in the world at the moment. It is estimated that approximately 30 million pounds of asbestos are annually used in the U.S., accounting for the death of over 12,000 Americans every year due to asbestos-related terminal conditions such as lung cancer and pleural mesothelioma. Although less widespread than occupational exposure, environmental exposure entails equally serious health risks, since the inhabitants of an asbestos-contaminated house are in permanent contact with these carcinogenic minerals.
2. A BRIEF HISTORY OF ASBESTOS USE

Buildings erected before the mid 1980s, when asbestos use was still highly prevalent, imply a particularly increased risk.
3. **THE DANGERS OF ASBESTOS USE**

Asbestos becomes a health hazard only when it is airborne. Contamination occurs when fibers which have been released into the air following friction or any kind of disturbance of asbestos-containing products are inhaled or ingested. Old construction materials and appliances entail a particularly high risk in this respect, since their brittleness makes it more likely for asbestos fibers to be released in the air if such products are even slightly disturbed. Similarly, friable asbestos-containing materials, such as those found in heaters, hot water systems and stoves manufactured before the 1980s, may pose a greater threat to your health than bound products, in which fibers are tightly embedded.

If you inhabit a contaminated house, the risk of developing an asbestos-related condition increases dramatically, as prolonged duration of exposure has been demonstrated to significantly heighten the chances in this respect. Another major risk factor refers to the amount of fibers inhaled or ingested. Thus, if asbestos is present in large concentrations in your home, you are more prone to being diagnosed with one of the associated diseases.

Long-term or repeated exposure to asbestos is responsible for:
3. THE DANGERS OF ASBESTOS USE

- asbestosis
- pleural plaques
- pleural effusion
- mesothelioma
- pleurisy
- lung cancer
- pleural thickening

Nevertheless, it is worthy of note that all diseases and conditions caused by exposure to asbestos typically entail a long latency period. For instance, it takes between 10 and 30 years for lung cancer to develop, while pleural mesothelioma may occur within 20-50 years of initial exposure.

Exposure can be of three types, depending on the context in which contact with asbestos occurs:

- occupational exposure
- environmental exposure
- secondary exposure

**Occupational exposure** is responsible for the majority of asbestos-related cancers, since it is the most common and generally involves great amounts of asbestos which employees are in regular contact with. There are over 75
3. THE DANGERS OF ASBESTOS USE


demolition or mining. In the first case, contamination may result from exposure to asbestos which is either naturally occurring or fibers which became airborne due to human activities such as construction, demolition or mining. In the second case, contamination may happen when deposits of asbestos are accidentally removed from the environment.

Environmental exposure entails an indirect contact with either naturally occurring asbestos or fibers which became airborne due to human activities such as construction, demolition or mining. In the first case, contamination may happen when deposits of asbestos are accidentally


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3. THE DANGERS OF ASBESTOS USE

disturbed following gardening or riding a bicycle, for instance, while the latter typically implies a higher level of exposure since the concentration of asbestos in old buildings or around mines is significantly increased. Thus, people who live in close proximity to construction or mining sites have a great risk of inhaling or ingesting asbestos due to environmental exposure. Despite a series of strict regulations regarding protective measures during construction and demolition operations having been enforced in the U.S., there are numerous instances in which the rules are completely neglected.

**Secondary exposure** occurs when people become contaminated following contact with a person who carries
3. THE DANGERS OF ASBESTOS USE

Asbestos fibers on their clothes, skin, shoes or in their hair. The families of asbestos workers are the most vulnerable to secondary exposure, particularly if employees are not required to undergo a series of protective measures in order to remove asbestos from their equipment prior to exiting the premises of their workplace. Unfortunately, a large number of companies fail to enforce appropriate procedures in this respect, endangering the wellbeing of workers and their families.

Asbestos exposure has been demonstrated to be responsible for pleural mesothelioma and lung cancer, as well as for a series of other non-malignant yet severe diseases such as asbestosis and pleural effusion, while the
3. THE DANGERS OF ASBESTOS USE

correlation between these toxic minerals and ovarian, gallbladder, gastrointestinal, renal, colorectal and laryngeal cancer is still under debate. However, the majority of oncologists believe that there is indeed a causal relation between exposure and the previous conditions, as multiple research and studies have already suggested.

Pleural mesothelioma is a very aggressive and rare form of cancer affecting the outer lining of the lungs (pleura). It is estimated that over 80% of all cases are caused by asbestos. The condition typically develops within 20 to 50 years of initial exposure, as the severe inflammation caused by fibers which have accumulated on the surface of lungs leads to the development of malignant tumors. Although the prognosis and the average life expectancy for patients diagnosed with pleural mesothelioma is generally pessimistic, early detection often entails a significantly improved outcome, as well as an extended survival. Distressing symptoms are rarely experienced in the incipient phases of the disease and consequently, most people find out about their affection when few treatment options are available. However, the most common signs of pleural mesothelioma are:
3. THE DANGERS OF ASBESTOS USE

- a persistent cough
- chest pain
- shortness of breath
- difficulty swallowing
- fatigue
- unintentional weight loss
- hoarseness
- excessive sweating, particularly at night
- fever
- swollen face and arms

The primary cause of **lung cancer** is habitual tobacco use, accounting for up to 80% of all diagnosed cases. Nevertheless, asbestos exposure has been demonstrated to
3. THE DANGERS OF ASBESTOS USE

increase the risk for this malignant condition as well, particularly when prolonged exposure is accompanied by long-term smoking. Between 5 and 7 percent of all patients who suffer from lung cancer developed their disease due to frequent contact with asbestos, preponderantly in the workplace. When regular exposure occurs in conjunction with habitual tobacco use, the risk can increase by up to 90%.

While pleural mesothelioma develops on the outer lining of the lungs, lung cancer affects the inside of the organs and, when caused by asbestos, it implies a shorter latency period of 15-35 years of initial exposure. The symptoms are relatively similar to those accompanying mesothelioma and may include one or more of the following:

- shortness of breath
- a persistent cough
- pain in the chest region
- fatigue
- unexplained weight loss
- wheezing
- clubbed fingers
- coughing up blood
- recurring respiratory infections
3. THE DANGERS OF ASBESTOS USE

Out of all the other forms of cancer which might be caused by exposure to asbestos, **ovarian cancer** is perhaps the disease whose correlation with these minerals is going to be formally recognized within the following years. The frequent use of talcum powder as a hygiene product is believed to be the culprit in this respect, since it may occasionally be asbestos-containing or asbestos-tainted. Naturally occurring talc and asbestos are often in close proximity of each other in the earth and thus contamination is very likely to happen during mining operations.

Various studies have revealed that **drinking asbestos-contaminated water** may lead to the following malignant diseases within several decades of first ingestion:

- gastrointestinal cancer
- gallbladder cancer
- colorectal cancer
- renal cancer

**Laryngeal cancer,** however, has been generally correlated with the **inhalation** of asbestos fibers. Although its primary causes are excessive alcohol consumption and habitual smoking, the risk increases by up to 40% when these factors are associated with prolonged exposure to asbestos. Fibers
3. THE DANGERS OF ASBESTOS USE

may become embedded into the inner lining of the larynx and subsequently produce severe inflammation, which can in turn lead to the development of malignant tumors.
4. **ASBESTOS-CONTAINING PRODUCTS**

Prolonged exposure to asbestos is accountable for the death of over 12,000 Americans annually. Although the majority of circumstances in which frequent contact with these toxic mineral occurs focus on the workplace (construction sites, chemical industries, shipyards, power plants, the metal industries etc.), *environmental exposure* is by no means less dangerous. The inhabitants of houses erected before the mid 1980s are at a particularly high risk, as asbestos was significantly more widespread during the last century. It is thus of crucial importance to be well-informed in regards to the household materials and products which may contain asbestos. The following list includes the most commonly encountered asbestos-containing products in a house. However, it is far from being exhaustive.

**Construction materials and products**

- vinyl floor tiles
- insulation
- cement wallboards
- adhesives
- roof shingles
- floor backing
- ceiling tiles
- boilers
4. ASBESTOS-CONTAINING PRODUCTS

- heating ducts
- tar paper
- textured paints and coating
- decorative plasters
- fire doors
- sheet rope
- wires
- mastics
- tapes
- putty
- asphalt floor tiles
- acoustical plasters
- zonolite insulation
- roofing felt

Household appliances and other items

- electric heaters
- dishwashers
- slow cookers
- barbecue mitts
- stovepipe rings
- deep fryers
- ovens
Contamination occurs when fibers which have been released from asbestos-containing products are ingested or inhaled. Thus, if asbestos is present in large concentrations in the air you breathe, you risk developing respiratory problems which can lead to cancer.

Asbestos becomes a health hazard only when it is inhaled or ingested. Old construction materials and products are present in your home or would simply like to determine whether asbestos is present in your house or workplace. When regular exposure occurs in conjunction with habitual tobacco use, the risk can increase by up to 90%.

If you inhabit a contaminated house, the risk of developing life-threatening conditions such as pleural mesothelioma and recurrent respiratory infections is higher, with unexplained weight loss, fatigue and shortness of breath. These conditions are often accompanied by exposure to asbestos, as well as other hazardous chemicals. Thus, if you are a household worker, you should have an asbestos test performed on your home and your workplace.

The families of asbestos workers are the most vulnerable to developing conditions such as asbestosis or pleural thickening. It is estimated that 3% of the population is at risk of developing cancer following frequent exposure to asbestos, and that up to 50% of the population is at risk of developing asbestosis following frequent exposure to asbestos.

In order for the minerals to be properly identified, as well as to determine whether asbestos is present in your house or workplace, you should have an asbestos test performed. This test requires the employment of special equipment and procedures, and the employment of special equipment is required in order for the minerals to be properly identified. Thus, if asbestos is present in your home or workplace, you should have an asbestos test performed as soon as possible.

A detailed information sheet regarding the sampling process in the seventh task of asbestos abatement companies in the U.S. by state is available at the website, which is also provided in the Appendix. For instance, it takes between 10 and 30 days for a thorough examination. You can find detailed information concerning the type and concentration of toxic minerals present in your house, and the asbestos abatement companies in the U.S. by state can be contacted by visiting their website. Furthermore, asbestos abatement companies in the U.S. by state can be contacted by visiting their website, which is also provided in the Appendix.

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Therefore, both asbestos testing and removal are necessary in order to determine whether asbestos is present in your house or workplace.

Whether you suspect one or multiple asbestos-containing products are present in your home or would simply like to determine whether asbestos is present in your house or workplace, you should have an asbestos test performed. This test requires the employment of special equipment and procedures, and the employment of special equipment is required in order for the minerals to be properly identified. Thus, if asbestos is present in your home or workplace, you should have an asbestos test performed as soon as possible.

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4. ASBESTOS-CONTAINING PRODUCTS

- hair dryers
- broilers
- toasters
- fertilizers
- curling irons
- talcum powder
- cigarette filters
- stove mats
- washers
- pot holders
- ironing board covers
- crock pots
- electric blankets
- popcorn poppers

If you suspect one item in your house contains asbestos, it is highly recommended to **avoid disturbing it**, particularly if the product is brittle or friable, as more fibers will subsequently be released into the air. For the sample collecting process, it is essential to follow the instructions presented in the seventh chapter of this guide in order to minimize exposure and further contamination of your home. Do not attempt to remove disturbed or friable asbestos-containing materials yourself under any circumstances. Do-it-yourself procedures typically increase the extent of contamination and, implicitly,
4. ASBESTOS-CONTAINING PRODUCTS

the risk of exposure due to lack of adequate equipment and training. Asbestos abatement operations should be performed only by certified professionals with the aid of special devices such as HEPA vacuum cleaners (equipped with high-efficiency particulate arresting filters).

However, if you identified a non-friable or undisturbed product which might contain asbestos, you can further avoid contamination by sealing or encapsulating it. These alternative methods should be used exclusively for slightly damaged non-friable asbestos-containing materials. For brittle or severely damaged products, as well as for large appliances or contaminated areas, you are strongly advised to seek professional help.

Sealing entails the prevention of fibers being released into the air. Duct tape or specially designed sealants for asbestos products (spray, paint or coating) can be used in this respect by applying it over the damaged areas of the item. For instance, if a small portion of asbestos tape wrap on a heating duct is torn or frayed, covering it with duct tape may represent the most suitable method of avoiding exposure. Nevertheless, it is important to remember that sealing, regardless of the product employed, is only a temporary solution. The asbestos-containing item will require
4. ASBESTOS-CONTAINING PRODUCTS

appropriate disposal in the future, as it continues to deteriorate.

Encapsulation is generally preferred for insulation on heating systems and furnaces, as well as for popcorn ceilings. It is carried out by using either penetrating or bridging encapsulates, depending on the nature of the material and the complexity of the damage. Its purpose is also to prevent further contamination with asbestos fibers by covering the item with a thick sealant. Similarly, encapsulation is a temporary solution as well.
5. **ASBESTOS TESTING**

Whether you suspect one or multiple asbestos-containing products are present in your home or would simply like to ensure the safety of your new house, testing the space you inhabit for this carcinogen is vital in order to avoid life-threatening conditions such as pleural mesothelioma and lung cancer. Houses build before 1985 entail a particularly high risk of exposure, as asbestos was extremely prevalent in construction materials up until then, as well as in various household appliances which might still be in use nowadays.

The sooner you opt for asbestos testing, the less chances of developing a terminal illness you have, as studies suggested that the **duration** of exposure is a key element which can increase one’s risk of being diagnosed with such a condition. Additionally, the **dose** of inhaled or ingested fibers can also negatively influence your health. A large amount of asbestos fibers which have accumulated in your body is more likely to lead to severe inflammation over the years, which may subsequently develop in a form of cancer. Thus, if you are surrounded by numerous asbestos-containing materials which you regularly come in contact with, especially if the products are brittle or highly damaged, your health is undeniably at stake.

Since asbestos fibers can only be observed microscopically
5. ASBESTOS TESTING

in most consumer products, professional testing is required in order for the minerals to be properly identified, as well as their type and concentration. All you have to do is carefully collect a sample of the suspicious material and send it to us for a thorough examination. You can find detailed information regarding the sampling process in the seventh chapter of this guide. After our experts analyze the sample, you will receive the report, which will confirm or infirm the presence of asbestos and may include additional information concerning the type and concentration of toxic minerals, if asbestos is indeed present.

If the test results are positive and your house proves to be contaminated with asbestos, removal is necessary in order to properly dispose of the carcinogen. You should never attempt to remove asbestos-containing materials yourself, particularly if the contaminated space is extended and the materials are brittle or friable. A certified asbestos abatement company should be hired for this purpose, as its employees are well-trained and qualified to conduct complex removal operations. You can also find a list of professional asbestos abatement companies in the U.S. by state at the end of this guide. Additional information regarding their services, cost and location can be accessed by visiting their website, which is also provided in the Appendix.
Asbestos abatement is often a complex and challenging process and requires the employment of special equipment such as HEPA vacuum cleaners in order to thoroughly remove the airborne fibers. Protective clothing (coveralls), shoes and respirators are also mandatory during the clean-up, as the risk of contamination is enormous due to the disturbance and handling of asbestos materials. In most cases, you will be asked to temporarily leave your house for several days as the abatement operations are ongoing to avoid exposure.

Therefore, both asbestos testing and removal are complex tasks which demand properly trained workers and special equipment. You are strongly encouraged to send us a
5. ASBESTOS TESTING

sample for testing and, if your home is contaminated, to subsequently seek the services of a certified company which will efficiently dispose of all asbestos in your house. The costs of abatement services vary depending on your location, as well as on the complexity of the operation. Nevertheless, you will be able to find a company whose services you can afford, in most cases.
Asbestos occurs naturally on various rocks, such as serpentine, in the form of bundles of thin long hair-like fibers. Each visible fiber is made of millions of fibrils which can be observed only microscopically. However, there are notable differences between the particularities of each of the six distinct asbestos types. While chrysotile, the most prevalent type of commercial asbestos, has long, white and curly fibers, crocidolite asbestos is blue and its fibers are straight. It is also worthy of note that asbestos is typically processed prior to being added in commercial products, which significantly changes its natural appearance. Oftentimes, fibers of asbestos cannot be identified in the composition of a material without proper equipment, as the minerals are not visible, hence the importance of professional testing.

**Chrysotile asbestos**, employed in over 90% of all asbestos-containing materials and products worldwide, is also one of the most dangerous types. Its fibers are long, white and curly. The hardness of naturally occurring chrysotile is comparable to that of a human fingernail. The fibers can easily be separated into thinner strands of fibrils and vary in length from several millimeters to over 4 inches. Chrysotile asbestos is insoluble in water. However, it is not resistant to acids. It was preponderantly used in gaskets,
6. HOW TO RECOGNIZE ASBESTOS

Pipe insulation and boiler seals.

**Crocidolite asbestos** is the second most commonly used type. It has **straight blue** fibers. Nevertheless, the heat resistance of crocidolite asbestos is relatively low. The fibers are soft and friable. It is considered to be the most lethal, as the human body cannot eliminate the fibers once inhaled or ingested due to their shape. Crocidolite asbestos can be found in thermal and pipe insulation, rope lagging, cement products and coatings.

**Amosite asbestos** is the second most used type in the U.S. Its fibers are **brown and straight**. These minerals are particularly prevalent in Africa. According to EPA, amosite is also the second most dangerous type of asbestos. It may be present in high concentrations of up to 40% in insulating board. Other products which might contain amosite asbestos are thermal insulation and ceiling tiles.

**Tremolite asbestos** is scarcely encountered in consumer products. However, it may occasionally be present in insulation, paint, roofing materials and sealants as a contaminant, as well as in talcum powder and vermiculite. The color of fibers can be **white, green** or **grey**. Approximately 80,000 pounds of tremolite asbestos are
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Anthophyllite asbestos is rarely employed for commercial use as well. These minerals were primarily mined in Finland. The color of fibers can range from white to brown. It can also be encountered in various products such as vermiculite and talc powder as a contaminant. Composite flooring is one of the few products which may contain anthophyllite asbestos.

Actinolite asbestos was never present in consumer products. Nevertheless, it may occasionally occur as a contaminant in sealants, paints and even toys. It is most commonly found in metamorphic rock in the form of dark green crystals or fibrous aggregates. The texture of actinolite asbestos is significantly less flexible than that of the other five types.

It is important to remember that asbestos fibers cannot be seen in the majority of contaminated products due to their microscopic size. Consequently, having all suspicious materials in your house properly tested for asbestos is essential for the wellbeing of your family, particularly if the products are loosely-bound, brittle or severely damaged.
6. HOW TO RECOGNIZE ASBESTOS

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7. **THE SAMPLING PROCESS**

If you believe one or multiple products in your home contain asbestos, it is highly recommended to treat the items in question as asbestos-containing materials and avoid unnecessary disturbance during the sampling process. Although collecting samples of suspicious materials is not a complex process per se, protective measures and a thorough clean-up of the area you worked in are additional steps required to avoid subsequent exposure, as well as secondary exposure. This chapter will break down the sample collecting process in 3 steps: preparation, collecting the samples and clean-up.

However, before beginning the sampling, it is important to know what materials can be analyzed by our experts. Asbestos-containing products are generally divided in two categories:

- **friable (loosely-bound)** – boiler insulation, low density boards, sheet vinyl backing, pipe lagging, sprayed insulation, fire retardants, mastic adhesives etc.
- **non-friable (bonded)** – vinyl floor tiles, cement products, ceiling tiles, roof shingles etc.

Samples of both types of materials can be sent in for
7. THE SAMPLING PROCESS

analysis and the collecting process is relatively similar. However, you should handle friable asbestos-containing products with utmost caution, as fibers can be released into the air with the slightest disturbance and even in the absence of direct contact or pressure (ventilation, for instance, can promote the spreading of fibers through the room).

I. Preparation

Isolate the area you are going to collect the samples in. Ask your family to not enter the room or, if the suspicious material is outside, to not come close until the process is completed. You should also keep your pets away.

If you are going to work inside, turn off heating or cooling systems in order to minimize the spreading of asbestos fibers into the room.

Lay a plastic sheet on the floor to avoid further contamination and simplify the clean-up process.

Prepare the equipment and utensils required for the sampling process: rubber gloves, P2 respirator, disposable coveralls (particularly recommended if the suspicious
7. THE SAMPLING PROCESS

material is located above you), pliers (a knife or corer can also be used), water spray bottle, duct tape or other sealant (spray, paint, coating etc.), resealable plastic bags, plastic waste bags (preferably thick, 0.2 mm) and a damp cloth.

II. Collecting the samples

After you applied the safety measures described in the previous step, you can begin the sampling process. **Wet the material** using the water spray bottle to avoid releasing fibers into the air. You should not soak the product, as a fine mist is generally sufficient. Adding **a few drops of detergent** in the bottle is also recommended to prevent further contamination.

**Break** a small piece from the suspicious material using the pliers or **cut** a small portion from **its entire depth** with a knife or corer. It is essential to reach the inner layer of the product for an accurate examination. The size of the sample should be approximately **2 square inches** in the case of non-friable products, while **2 tablespoons** of friable material are typically required for a thorough analysis.

Place the sample in a **clean and dry resealable plastic bag** (a plastic or glass container, as well as a 35 mm film canister
7. THE SAMPLING PROCESS

can also be suitable) and seal it tightly.

III. Clean-up

Clean the outside of the sealed plastic bag using the damp cloth, as well as the surface of the product you sampled.

Seal the sampled area with a small piece of duct tape or by covering it with a special sealant which will prevent the release of asbestos fibers if the product is indeed contaminated.

Water the plastic sheet with the spray bottle, fold it carefully and securely seal it using duct tape.

Clean the area you worked in with the damp cloth. It is not recommended to use a vacuum cleaner as it could lead to further contamination.

Place the coveralls, respirator and rubber gloves in the thick plastic bags and seal them properly. In order to correctly dispose of the items, get in contact with your local municipality.

After the completion of the clean-up process, it is highly
7. THE SAMPLING PROCESS

recommended to shower and wash your clothes separately to avoid secondary exposure.

**Label** each sample, mentioning the material or product it contains, the date it was collected, the location of the item in your house, as well as your name and an identification number.

Place all the samples in a larger resealable plastic bag along with a list containing all the items you sampled.

**Send** us the samples following the instructions on our website and we will soon provide you with the report.
II. Collecting the samples

A. Preparation

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  - non-friable (bonded)

- However, before beginning the sampling, it is important to know what materials can be analyzed by our experts. Asbestos-containing materials and avoid unnecessary disturbance during the sampling process.

B. Sample collecting process

- Isolate the area you are going to collect the samples in. Ask your family to not enter the room or, if the suspicious material is outside, to not come close until the process is completed. You should also keep your pets away.

- If you are going to work inside, turn off heating or cooling systems in order to minimize the spreading of asbestos fibers into the room.

- Lay a plastic sheet on the floor to avoid further contamination.

C. Cleaning up

- Prepare the equipment and utensils required for the analysis. The size of the sample should be approximately 2 square inches or corer. It is essential to reach the inner layer of the product its entire depth.

- Break a small piece from the suspicious material using the pliers or corer. Place it in a clean and dry resealable plastic bag.

- Wet the previous step, you can begin the sampling process.

- After the safety measures described in the previous step, you can begin the sampling process.

- Samples of both types of materials can be sent in for an accurate examination. The size of the sample should be approximately 2 square inches or corer. It is essential to reach the inner layer of the product its entire depth.

D. Labeling

- When sending samples, put the address of the house and the name and identification number of the person who sampled the materials in a larger resealable plastic bag.

- Place all the samples in a bigger plastic bag. Label each sample, mentioning the material or product it contains, the date it was collected, the location of the item in your house, as well as your name and an identification number.

E. Disposing

- After the completion of the clean-up process, it is highly recommended to treat the items in asbestos, it is highly recommended to treat the items in asbestos, it is highly recommended to treat the items in asbestos.

- Send us the samples following the instructions on our website and we will soon provide you with the report.
8. **ASBESTOS REMOVAL**

The report you will receive from our experts shortly after you submit the samples might state that one or multiple products in your home contain asbestos. Although exposure to asbestos is extremely dangerous, particularly if it is prolonged or repeated, not all contaminated products pose an immediate threat to your health. In fact, abatement is only **necessary** when the asbestos-containing materials are old, brittle, highly damaged or have recently been disturbed. However, if new, slightly damaged or undisturbed asbestos-containting products are present in your house you should still be vigilant and **regularly verify the items** in order to timely detect any deterioration.

Asbestos abatement companies provide professional asbestos removal services and ensure your living space is completely safe following the clean-up. The **cost** of the procedure depends on several factors, including:

- the size of the contaminated area
- the type of asbestos-containing materials (friable products are typically more difficult to properly dispose of than non-friable items)
- the complexity of the intervention
- the state you live in
- the equipment required to thoroughly remove the
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- the complexity of the intervention
- the state you live in
- the equipment required to thoroughly remove the asbestos (coveralls, respirators, HEPA vacuum cleaners etc.)

Prior to the abatement process per se, a team of specialists will inspect and evaluate the contaminated space in order to decide on the most efficient and safe removal approach. You and your family will also be asked to leave the house for several days to avoid exposure during the abatement operations. Following the clean-up, your house will be inspected one more time to accurately determine whether asbestos was properly removed.

8. ASBESTOS REMOVAL
9. ASBESTOS ALTERNATIVES

After all the asbestos-containing products have been properly removed from your house, you will probably need to replace the contaminated items. There are numerous alternative materials with similar properties which can be employed in your home without posing any threat to the wellbeing of your family. This chapter includes seven of the most popular and accessible asbestos alternatives which you can opt for: fiber insulation, cellular glass, polystyrene and polyurethane, cellulose insulation, flour fillers, amorphous silica fabrics and thermoset plastic flour.

1. Fiber insulation can be used in the manufacturing of various products such as boards, batts, blankets and preforms. It is made from melted minerals which are subsequently shaped into fibers. Some of the most common types of fiber insulation are:

   . **ceramic wool**: with a superior thermal conductivity, ceramic wool is ideal for insulating equipment which can heat up to 2400 degrees Fahrenheit
   . **fiberglass**: suitable for lower temperatures of up to 1100 degrees Fahrenheit, fiberglass can be used for numerous applications, including boilers
   . **mineral and basalt wool**: made from melted volcanic rock, its properties are similar to those of fiberglass
After all the asbestos-containing products have been properly removed from your house, you will probably need to replace the contaminated items. There are numerous alternative materials with similar properties which can be employed in your home without posing any threat to the wellbeing of your family. This chapter includes seven of the most popular and accessible asbestos alternatives which you can opt for: fiber insulation, cellular glass, polystyrene and polyurethane, cellulose insulation, flour fillers, amorphous silica fabrics and thermoset plastic flour.

1. **Fiber insulation** can be used in the manufacturing of various products such as boards, batts, blankets and preforms. It is made from melted minerals which are subsequently shaped into fibers. Some of the most common types of fiber insulation are:
   - **Ceramic wool**: with a superior thermal conductivity, ceramic wool is ideal for insulating equipment which can heat up to 2400 degrees Fahrenheit.
   - **Fiberglass**: suitable for lower temperatures of up to 1100 degrees Fahrenheit, fiberglass can be used for numerous applications, including boilers.
   - **Mineral and basalt wool**: made from melted volcanic rock, its properties are similar to those of fiberglass and can be employed for temperatures of up to 1100 degrees Fahrenheit as well.

2. **Cellular glass** may prove to be an ideal building material due to its multiple advantages: acoustic and thermal insulating properties, durability and light weight. It is obtained by combining granulated glass with a blowing agent such as limestone or carbon and subsequently heating up the mixture. Cellular glass is also impermeable and fireproof.

3. **Polystyrene and polyurethane** are suitable for low temperatures of up to 250 degrees Fahrenheit. These materials do not contain any toxic substances and do not release any hazardous gases. Thus, polystyrene and polyurethane can safely be used for insulating your house. Another notable advantage entailed by their employment is significantly reduced energy costs of up to 35% less annually.

4. **Cellulose** can also serve as insulation in your house and is ideal for low temperatures. However, it involves a series of inconvenient aspects:
9. ASBESTOS ALTERNATIVES

- it must be treated with fire retardants prior to its use
- it requires a long period to dry
- it is not suitable for high temperatures

5. Flour fillers are made from natural resources such as rice flour, pecan shell flour or wheat flour. These materials can be employed to promote natural insulation by filling cracks and crevices. The primary advantage of flour fillers is complete safety due to the natural origin of the materials.
After all the asbestos-containing products have been properly removed from your house, you will probably need to replace the contaminated items. There are numerous alternative materials with similar properties which can be employed in your home without posing any threat to the wellbeing of your family. This chapter includes seven of the most popular and accessible asbestos alternatives which you can opt for: fiber insulation, cellular glass, polystyrene and polyurethane, cellulose insulation, flour fillers, amorphous silica fabrics and thermoset plastic flour.

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   - It must be treated with fire retardants prior to its use.
   - It requires a long period to dry.
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6. **Amorphous silica fabrics** are resistant to high temperatures. In addition to their household use as insulators, amorphous silica fabrics are also a very convenient alternative to asbestos-containing materials in numerous industries such as shipbuilding, aerospace, metal and electric power industry.

7. **Thermoset plastic flour** may be used to fill thermoset plastics, as it has a high durability and is also a good heat, sound and cold insulator. It is preferred by various industries as an alternative to asbestos due to its practical properties. Thermoset plastic flour is typically made of wood flour or other low-cost material with similar properties.
APPENDIX

LIST OF ASBESTOS ABATEMENT COMPANIES
IN THE U.S.

Alabama
S.W.A.T. Environmental of Alabama
http://swat-radon.com
Wet Out Now, LLC
http://wetoutnow.com
PuroClean Emergency Services
https://www.puroclean.com
National Dry Out
http://www.nationaldryout.com

Alaska
Alaska Demolition Contractor
http://www.alaskademolition.com
Central Environment Inc.
http://www.cei-alaska.com
Nortech
http://www.nortechengr.com
Environmental Compliance Consultants
http://www.eccalaska.com
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Arizona
American Abatement
http://www.american-abatement.com
Statewide Restoration Services, LLC
http://www.srspros.com
Envy Restoration, LLC
http://www.trustenvyaz.net
All Clear Environmental Services, LLC
http://www.acesaz.com
AZ Independent Solutions
http://azindependentsolutions.weebly.com

Arkansas
Gerken Environmental Services
http://www.gerkenenvironmental.com
Parker Environmental
http://www.parker-enviro.com
SafeGuard Restoration Group
http://safeguardsrestore.com
Snyder Environmental
http://snyderenvironmental.com
Environmental Protection Associates
http://www.epaonline.biz
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California
Fresh Air Environmental Services, Inc.
http://freshaireenvironmental.com
J & J Environmental Construction Corp.
http://jjenvironmental.com
Hazardous Waste Experts
http://www.hazardouswasteexperts.com
A-Tech Consulting, Inc.
http://www.atechinc.net
KB Environmental, Inc.
http://kbenvironmentalinc.com

Colorado
Asbestos Abatement, Inc.
https://abateproco.com
Reliance Environmental Services, LLC
http://www.relianceabatement.com
Colorado Hazardous Environmental
http://coloradoasbestosandlead.com
Meridian Environmental
http://www.meridianpros247.com

Connecticut
CT Asbestos Abatement LLC
http://www.ctasbestosabatement.com
APPENDIX

AA Asbestos Abatement LLC
http://www.aaasbestosct.com
American Environmental Services
http://www.americanenvinc.com
Innovative Environmental Industrial Services
http://www.ieindustrialservices.com

Delaware
BrightFields, Inc.
http://www.brightfieldsinc.com
Astec, Inc.
http://astecenviro.com
Harvard Environmental, Inc.
http://www.harvardenvironmental.com
Delaware Real Estate Answers LLC
http://www.derealestateanswers.com

Florida
All Phase Environmental, Inc.
http://www.allphasenv.com
Cooper & Associates
http://www.cooperandassociates.net
Best-Tec Asbestos Abatement
http://best-tec.com/wordpress1
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CDS Environmental Inc.
http://www.cdsenvironmental.com
APEX Environmental Resources Inc.
http://www.apex4mold.com

Georgia
BioRestore Asbestos & Mold Removal Company
https://www.biorestore.org
Cascade Services Company, Inc.
http://www.cascade-sc.com
Bruce Environmental Inc.
http://brucenv.com
Parker Young Construction
http://www.parkeryoung.com
Enviro-Logical Engineering, Inc.
http://www.elabatement.com

Hawaii
MD Restoration
http://mdcleaners.com
AA & C Asbestos Removal
http://aacasbestosremoval.com
Unitek Contracting Group
http://www.unitekhawaii.com
APPENDIX

R & D Technologies Inc.
http://rdtechhawaii.com
Aina Environmental Group
http://www.ainagroup.com

Idaho
Asbestos Abatement, Inc.
http://www.buildingdemo.biz
Northwest Technologies, Inc.
http://www.nwtechnologies.com
MW Mold Removal Pros
http://mwmoldpros.com

Illinois
America Asbestos Solutions, Inc.
http://asbestossolutionsinc.com
B.B. Construction Enterprise
http://bbconstructionenterprise.com
Aires Consulting
http://www.airesconsulting.com
Valor Technologies, Inc.
http://www.valortechnologies.com
Bluestone Environmental, Inc.
https://bluestonemidwest.com
APPENDIX

**Indiana**

Star Environmental, Inc.
http://starenv.net
Environmental Management Specialists, Inc.
http://emsonsite.com
AIR Co.
http://aircoindy.com
Elite Environmental
http://www.callelite.com
Environmental Assurance
http://www.eaciusa.com

**Iowa**

REW Services Corporation
http://rewservicescorp.com
Advances Environmental Testing and Abatement, Inc.
http://cleanandrestore.com
Abatement Specialists, LLC
http://www.abatement-specialties.com

**Kansas**

Dalrymple Environmental Consulting
http://dalrympleenvironmental.com
MW Mold Removal Pros
http://mwmoldpros.com
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Kentucky
Evergreen AES
http://www.evergreenaes.com
Bluegrass Environmental Services
http://bluegrassasbestosremoval.com
Abatement Solutions Technologies
http://www.abatementsolutions.net/index.html
Environmental Concerns Inc.
http://www.wetland.org/index.htm
Romac Inc.
http://www.romacenv.com/Pages/default.aspx

Louisiana
C A Labs
http://www.calabsinc.com
Arc Abatement
http://www.arcabatement.com
Petrin Corporation
http://www.petrincorp.com
Gill Industries Ltd.
http://gillindustriesltd.com/?page_id=6

Maine
New Meadows Abatement, Inc.
http://www.newmeadowsabatement.com
APPENDIX

A-Best Abatement Inc.
http://www.abestabatement.com
Atlantic Environmental Contractors, Inc.
http://www.aecne.net
Abram Environmental
http://moldmaine.com
R.J. Enterprises Inc.
http://www.rjenterprisesinc.biz

Maryland
K & K Environmental Services, LLC
http://kandkenvironmental.com
Boston Environmental and Contracting, Inc.
http://bostonenvinc.com
Maryland Cleaning & Abatement Corp.
http://mcacorp.net
Northstar Contracting Group
https://www.northstar.com
Jacob Contracting Inc.
http://www.jacobs.com

Massachusetts
Dudley Services, Inc.
http://www.dudleyasbestos.com
APPENDIX

Enviro Staffing Solutions, Corp.
http://www.envirostaffingsolutions.com
GZA GeoEnvironmental, Inc.
http://www.gza.com
A-Best Abatement Inc.
http://www.abestabatement.com

Michigan
Central Industrial Asbestos, LLC
http://ciallc.us
A.L.A.M. Inc.
http://www.alaminc.com
Bierlein Co.
http://bierlein.com

Minnesota
Asbestos Abatement Associates
http://asbestosabatementonline.com
Direct Contracting Improvement, LLC
http://www.dci247.com
Envirobate Metro, Inc.
http://envirobate.com
Sheltertech Corp.
http://sheltertechcorp.com
APPENDIX

**Mississippi**
Specialty Abatement Service Inc.
http://www.specialtyabatement.com
Action Restoration
http://www.action-restoration.com

**Missouri**
Advanced Environmental Services Inc.
http://www.aes-stl.com
Asbestos Removal Services, Inc.
http://www.arsi-mo.com

**Montana**
Montana Mold Services
https://montanamoldservices.com
Kirby Environmental
http://kirbyenvironmental.com
Abatement Contractors of Montana, LLC
http://www.acm-contracting.com
Safetech, Inc.
http://safetechmontana.com
MW Mold Removal Pros
http://mwmoldpros.com
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**Nebraska**

Wheeler Contracting  
http://www.wheelercontracting.com
Esa Inc.  
http://www.esasite.com
McGill Asbestos Abatement  
http://mcgillasbestosinc.com
ABC Abatement  
http://www.abcabatement.com

**Nevada**

All Eagle, LLC  
http://www.alleaglellc.com
Clauss Construction  
http://claussconstruction.com
Tech Results  
http://www.techresults.com
Wsc, Inc.  
http://www.wsconline.net/index.htm
Greenway Industries  
http://greenway.cc

**New Hampshire**

EnviroVantage  
http://www.envirovantage.com
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A-Best Abatement Inc.
http://www.abestabatement.com
Air Quality Experts, Inc.
http://www.airqualityexpertsinc.com

New Jersey
Best Removal Inc.
http://www.bestremovalinc.com
GSC Services Corporation
http://gscservicescorporation.com
Code Environmental Services, Inc.
http://www.codeenvironmental.com
Pro Abatement
http://www.proabatement.com

New Mexico
Keers
http://www.keers.com
Environmental Remediation Management Services
http://www.ermsnm.com
Southwest Hazard Control
http://swhaz.com
Echo Fire Protection
http://www.echofireprotection.com
Envision Environmental Solutions
http://envision-nm.com

**New York**

Mr. Chimney
http://www.mrchimney.com
International Asbestos Removal, Inc.
http://www.iaronline.com
Great Lakes Abatement Co., Inc.
http://www.greatlakesabatement.net

**North Carolina**

Piedmont Quality Air, Inc.
http://piedmontqualityair.com
Abatement Pros, Inc.
http://www.abatementpros.net/index.asp
Concord Asbestos Abatement Inc.
http://www.concordasbestos.net
Demolition & Asbestos Removal
http://www.dhgriffin.com/dari/
Abatemaster, Inc.
http://www.abatemaster.com
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North Dakota
Pillar To Post Home Inspection
https://www.pillartopost.com/home
Environmental Air Solutions, Inc.
http://www.eairsolutions.com
Horsley Specialties
http://horsleyspecialties.com
Mold Test USA
http://www.moldtestusa.com
Total Control Inc.
http://totalcontrol.com/home.html

Ohio
AHC, Inc.
http://asbestosabatementohio.com
American Abatement & Asbestos Removal Corp.
http://www.aaaamericanabatement.com
Pioneer Environmental Systems Inc.
Lepi Enterprises, Inc.
http://www.lepienterprises.com
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Oklahoma
Environmental Action Inc.
http://www.environmentalactioninc.com
Asbestos Handlers, Inc.
http://asbestoshandlers.com
Tec-An, Inc.
http://tec-an.com

Oregon
Rose City Contracting, Inc.
http://www.rosecitycontracting.com
Alpine Abatement Associates Inc.
http://www.alpineabatement.com
Pacific Environmental Group
http://pacific-environmental.com
Oregon Asbestos Abatement
http://www.oregonabatement.info
IRS Environmental, Inc.
http://www.irsenvironmental.com

Pennsylvania
Phase One Development Corporation
http://www.phaseonepittsburgh.com
ACI-TECH, Inc.
http://www.aci-tech.net
APPENDIX

NBC Environmental, LLC
http://www.nbcenvironmental.com
Frymar Construction, Inc.
http://www.frymarconstruction.net
Synertech Inc.
http://www.gosynertech.com

Rhode Island
Atlantic Abatement & Construction
http://www.atlanticabate.com
AA Wrecking & Asbestos Abatement Co., Inc.
http://www.aawrecking.net
Coastal Asbestos Abatement Co.
http://www.coastalasbestosremoval.com/home2.html
Banner Environmental Services, Inc.
http://www.bannerenvironmental.com

South Carolina
Palmetto Design & Renovation Contractors
http://www.palmettodesignandrenovation.com
Demolition & Asbestos Removal Inc.
http://www.dhgriffin.com/dari/
Chembion Environmental
http://www.chembion.com
APPENDIX

South Dakota
Mid-States Asbestos Removal
http://www.midstatesasbestosremoval.com
Prairie Environmental Consulting
http://www.prairie-environmental.com
Safetech, Inc.
http://safetechmontana.com
Horsley Specialties Inc.
http://horsleyspecialties.com
Louie’s Cleaning & Disaster Restoration
http://www.vermillioncarpetcleaning.com

Tennessee
General Construction Services
http://www.gcstn.com/Home
Vision Building Group
http://buildcarolinas.com
AAA Remediation, Inc.
http://aaaremediationinc.com
Envirorem, Inc.
http://www.envirorem.com
Levy Industrial Contractor
http://www.levycontractors.com
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Texas

Cap Construction & Environmental, LLC
http://cap-ce.com
Pacific Environmental
http://pacific-environmental.com
TriCore Services, Inc.
http://www.tricore-tx.com
Asbestos Removal, Inc.
http://www.asbestosremovalinc.com
Allen & Co. Environmental Services
http://www.allenenviro.com

Utah

Rocmont Industrial Corporation
http://rocmont.com
Asbestos Abatement Services
http://www.asbestosabatementofutah.com
A-1 Asbestos Abatement Services
http://a1asbestosremoval.com

Vermont

Environmental Products & Services of Vermont, Inc.
http://www.epsofvermont.com
Alderson Environmental Contractor
http://aldersonvt.com
APPENDIX

Mid-State Asbestos Inc.  
http://midstateasbestos.com

Catamount Environmental, Inc.  
http://www.catenv.net

MW Mold Removal Pros  
http://mwmoldpros.com

**Virginia**

Affordable Abatement & Demolition  
http://www.affordableab.com

D & D Environmental Contractors  
http://www.ddec4acm.com

Applied Restoration Group  
http://appliedrestorationgroup.com

East Coast Abatement Co., Inc.  
http://www.eastcoastdemolition.com

**Washington**

Seattle Asbestos Environmental, LLC  
http://www.seattleasbestosenvironmental.com

Edwards Environmental, LLC  
http://www.edwardsenvironmentalcorp.com

Puget Sound Abatement, LLC  
http://www.pugetsoundabatement.com
APPENDIX

West Virginia
- Reclaim Co.
  http://www.reclaimcowv.com
- Astech Corporation
  http://www.astechcorpwwv.com
- Astar Abatement Inc.
  http://www.astarabatement.com

Wisconsin
- Airtite Environmental Services, LLC
  http://www.airtiteenvironmental.com
- DJK Environmental, LLC
  http://www.djkenvironmental.com
- Asbestos Removal, Inc.
  http://www.asbestosremovalnc.net
- Brack Thermal Systems, Inc.
  http://www.brackthermal.com
- Robinson Brothers
  http://www.robinsonbros.com

Wyoming
- Abatement Contractors of Montana, LLC
  http://www.acm-contracting.com
- Safetech, Inc.
  http://safetechmontana.com
APPENDIX

MW Mold Removal Pros
http://mw mold pros.com