Category 12: Wood Preservatives

Wood Preservatives Learning Objectives

After studying this section, you should be able to:

✓ List common wood-destroying fungi.
✓ Describe common wood-destroying insect pests.
✓ Describe control methods for common wood-destroying diseases and pests.
✓ Explain methods for applying wood preservatives.
✓ Describe the safety measures to use during the application of wood preservatives.

Category 12 Wood Preservatives

Category 12, Wood Preservatives, involves the management and preservation of items and structures constructed of wood. Almost everywhere that wood is used today, it’s made to last longer through the use of chemical preservatives. Preservatives protect wood in telephone poles and signs, wood bridges, piers and pilings, railroad ties, and fences, walls and buildings.

The wood preservative industry extends from the chemical plants where chemical preservatives are manufactured to the shops and millworks where they are applied. Every day, thousands of people work with wood preservatives in heavy industry, at home or on farms, for utility companies and railroads, at dock yards and on construction jobs. There are many benefits from the use of wood preservatives, except when those chemicals are used carelessly. The costs can be high to those who get sick and to the environment we all share.
Wood can be damaged or destroyed by fungi, insect pests and marine borers.

These pests cause damage by using wood as both a food source and a shelter.

Fungi require favorable temperatures of 50 F to 90 F and a moisture content of about 30 percent.

Brown rot fungi are probably the most important cause of decay of softwood species used in above-ground construction in the United States.

Pests That Damage Wood

Under proper use conditions, wood can give many years of good service. But under unfavorable conditions, wood may readily be damaged and destroyed by fungi, insects and marine borers. These pests can attack in many ways, using the wood for food or shelter. Consequently, wood must be protected to ensure maximum service life when used under conditions favorable to these pests.

Wood Destroying Fungi: Both the sapwood and heartwood of most tree species are susceptible to decay. Decay fungi may grow in the interior of the wood or appear on wood surfaces as fan-shaped patches of fine, threadlike, cottony growths or as root-like shapes. Fungi produce spores that can infect moist wood during storage, processing and use. The fungi that grow on wood have the following basic requirements:

- Favorable temperature: between 50 and 90 degrees F
- Adequate moisture: a wood moisture content of about 30 percent.

Fungal strands grow throughout the wood, digest parts of it as food, and eventually destroy the strength of the wood. Decay will stop when the temperature of the wood is either too low or too high, or when the moisture content is drier than required by the fungus.

Wood decay fungi can be grouped into three major groups:

- **Brown Rot Fungi**: This type of fungus breaks down the cellulose component of wood for food, leaving a brown residue of lignin. Affected wood can be greatly weakened, even before the decay can be seen. Brown rot fungi are probably the most important cause of decay of softwood species used in above-ground construction in the United States. “Brown rot”, when dry, is sometimes called dry rot. The term dry rot is misleading, as wood must have high moisture content for fungi to cause decay. The final stage of wood decay caused by brown rot fungi can be identified by:
  - the dark brown color of the wood
  - excessive shrinkage
  - cross-grain cracking
  - the ease with which the dry wood rotted areas can be crushed to powder

- **White Rot Fungi**: This fungus breaks down both lignin and cellulose and has a bleaching effect that may make the damaged wood appear whiter than normal.

- **Soft Rot Fungi**: This fungus usually attacks green (water-saturated)
wood, causing a gradual softening from the surface inward that resembles brown rot.

- **Other wood-inhabiting fungi:**
  - Sapstaining Fungi penetrate and discolor sapwood, particularly of the soft-wood species. Typical sapstain cannot be removed by brushing or planing. Strength of the wood is little affected, but the wood may not be fit for uses where appearance is important. Southern pine beetles often carry blue-stain fungi into trees that may cause the wood of infected trees to be stained before they are cut.
  - Mold Fungi first become noticeable as green, yellow, brown or black fuzzy or powdery surface growths on softwoods. As with sapstains, molds do not reduce wood strength; however, they can increase the capacity of wood to absorb moisture, thereby opening the door to attack by decay fungi.

**Insects:** Insects pests that destroy wood fall into three basic groups: termites, carpenter ants and beetles.

**Termites** use wood for food and shelter and are the most destructive of all wood insects.

- **Subterranean Termites:** These pests build tunnels through earth and around obstructions to get to a source of wood. They require a constant source of moisture that is usually obtained from the soil. Evidence of the presence of subterranean termites may be noted by:
  - The swarming of winged forms and discarded wings observed after swarming.
  - Earthen shelter tubes built over masonry or other foundations to a source of wood.
  - The presence of white workers when termite shelter tubes are broken open.
  - The hollowed-out condition of badly infested wood products.

- **Drywood Termites:** After swarming, drywood termites enter cracks and crevices in dry, sound wood. In excavating their galleries, they occasionally discharge oval-shaped pellets through temporary openings in the wood face. The ability of the drywood termite to live in dry wood without direct contact with the soil increases its menace. However, it reproduces slowly and does not destroy wood as quickly as the subterranean termite.

**Wood destroying insects fall into three groups:**
- **Termites**
- **Carpenter ants**
- **Beetles**

**Termites use wood for food and shelter and are the most destructive of all wood insects.**
• **Dampwood Termites**: These pests are a serious problem along the Pacific Coast and do not require contact with soil, but they do require wood with high moisture content.

**Carpenter Ants** may be black or red. They usually live in stumps, trees or logs, but often damage poles or structural timbers set in the ground. Carpenter ants use wood for shelter, not for food, preferring wood that is naturally soft or has softened by decay. The galleries are large, smooth and, unlike those of termites, free of refuse and powdery wood. Mounds of sawdust indicate their presence.

Carpenter ants use wood for shelter, not for food.

General physical differences between ants and termites:

• Ants have elbowed antennae; termites do not.
• Ants have a “wasp” or narrow waist, where termites are broad.
• Ants’ wings have few veins and their hind wings are different in shape and size. Termite wings have many veins and the front and hind wings are similar in size and shape.

**Beetles** are another common wood-damaging insect that can cause serious damage.

• **Powder Post or Lyctus Beetles** attack both freshly cut and seasoned hardwoods and softwoods. Adults lay eggs in the wood pores. The larvae burrow through the wood, making tunnels from 1/16 inch to 1/12 inch in diameter. The tunnels are left packed with powder. After a larval period (from 2 to 12 months or longer) and a much shorter pupal stage, newly formed adults chew round, 1/16-inch holes through the wood surface.
and emerge to lay eggs.

- **Anobiid Beetles** attack softwoods in damp and poorly ventilated spaces beneath buildings.

- **Roundhead Borers** are longhorn beetles that damage seasoned pine timbers. Their tunneling may weaken structural timbers, framing members, and other wooden parts of buildings. Larvae may reduce sapwood to a powdery or sawdust-like consistency. They make a ticking or gnawing sound while working in the wood. Adult beetles make a ¼-inch diameter, oval emergence hole in the surface of the wood.

- **Flatheaded Borers** infest live trees as well as recently felled and dead standing softwood trees. They can cause considerable damage in rustic structures and some manufactured products by mining into sapwood and heartwood. Typical damage consists of rather shallow, long, winding galleries that are packed with fine powder. Most of the adult beetles are metallic in color.

**Marine Borers** cause extensive damage to submerged portions of marine pilings, wharf timbers and wooden boats. They include:

- Shipworm
- Pholad mollusks
- Crustacean borers

### Control of Pests That Damage Wood

If wood is to be used where it will be subject to pest attack, it must be protected. This protection can be achieved by controlling moisture content, using a wood that is naturally resistant to the pests, and chemical treatment.

**Moisture Control:** The moisture content of living trees and the wood products obtained from them is often very high, and moisture must be removed to:

- Reduce oxygen content and temperatures necessary for growth of fungi.
- Reduce damage by insects.
- Reduce shrinkage.
- Reduce weight and increase strength.
- Prepare wood for chemical preservative treatment.

**Use of Naturally Resistant Wood:** The sapwood of all native tree species and the heartwood of most species have natural resistance to decay. The heartwood of cedar, junipers, redwood, locusts and post oak are resistant to, but not immune to, attack by decay fungi and insects.
Chemical Control: The proper application of preservatives can protect wood from decay and stain fungi, insects and marine borers. The effectiveness of preservative treatment depends on the chemical formulation selected, method of application, sapwood to heartwood proportions, moisture content of wood, preservative retention, chemical penetration and distribution.

Types of Wood Preservatives fall into three broad categories: creosote and creosote solutions, oil-borne preservatives and waterborne preservatives (inorganic arsenicals).

- **Creosote and Creosote Solutions** are an oily byproduct of making coke from bituminous coal. It is used for railroad ties, large timbers, fence posts, poles and pilings.
  - Advantages:
    - toxic to wood-destroying fungi, insects and some marine borers
    - low volatility
    - ease of handling and applying
  - Disadvantages:
    - yields a dark colored, oily, unpaintable surface
    - has a strong odor
    - tends to bleed from wood surfaces
    - cannot be used in houses and other living areas due to toxic fumes

- **Oilborne Preservatives**: tributyltin, copper and zinc napthenate are generally insoluble in water and are dissolved in petroleum or other organic solvents. They are used commercially to treat poles, lumber, cross arms, timbers and fence posts. This group also includes pentachlorophenol.
  - Advantages:
    - toxic to fungi, insects
    - can be dissolved in oils with a wide range of viscosities, vapor pressures and colors
    - low solubility
    - can be glued
    - easy to use and handle
  - Disadvantages:
    - may leave an oily unpaintable surface
    - some applications may provide less physical protection to wood than creosote
    - should not be used in homes or living areas because of toxic fumes
    - toxic and irritating to plants, animals and humans
• **Waterborne Preservatives:** Borates are primarily used for lumber, plywood, fence posts, poles, pilings and timbers.
  
  o Advantages:
    - treatment presents no hazard from fire or explosion
    - wood surface is left clean and is paintable
    - safe for interior use
    - leach resistant; no odor
  
  o Disadvantages:
    - unless wood is re-dried after treatment, it is subject to warping
    - does not protect from weathering

• **Alternative Preservatives** (to address health effects):
  
  o Collectively, all of the Ammoniacal Copper Quat (ACQ) products are sometimes referred to as alkaline copper quaternary preservatives.
    - Ammoniacal Copper Quat (ACQ, Types A, B and C): Wood treated using this water-based preservative is paintable. See [http://www.epa.gov/oppad001/reregistration/cca/acq.htm](http://www.epa.gov/oppad001/reregistration/cca/acq.htm).
    - Amine Copper Quat (ACQ-D) – Similar active ingredients to ACQ-type A but uses ethanolamine instead of ammonia to act as the treating solution carrier.
  
  o Copper Boron Azole-Type A (CBA-A) – Another new-generation wood preservative that contains copper and boric acid. The wood is greenish-brown and has little or no odor.
  
  o Borate Oxide (SBX).—A class of wood preservatives that contain non-toxic boron as the active ingredient. Borate compounds include sodium octaborate, sodium tetraborate, sodium pentaborate and boric acid. Borate oxide preservatives are water soluble and do leach. They are not recommended for wood in soil or in constant water contact.
  

### Methods of Applying Wood Preservatives

**Pressure Processes:** The basic principle involves the placement of wood materials in an airtight, steel cylinder or retort and immersing it in a preservative under pressure to force the preservative into the wood. There are basically two pressure treatment processes:

- Full-Cell
- Empty-Cell

### Alternative wood preservatives include:

- Alkaline copperquat
- Copper azole
- Borate oxide

### Methods of applying wood preservatives fall into two broad categories:

- Pressure processes
- Non-pressure processes
Wood preservatives are considered pesticides and are subject to the same rules and regulations as all other pesticides.

Like all pesticides, users of wood preservatives must read, understand and follow all label instructions for mixing, applying, storing and disposing of wood preservatives.

Non-Pressure Processes:

- Brushing, spraying and pouring treatments
- Creosote: Oil-borne or water-borne salts are applied to the surfaces of the wood product to be treated.
- Dipping: Immersing wood in a preservative solution for several seconds to minutes.
- Cold Soaking: Soaking dried wood for two to seven days in a vat containing an unheated liquid oil preservative.
- Steeping: Submerging wood into a tank full of an inorganic, arsenical salt at atmospheric temperature for several days or weeks.
- Hot and Cold Bath (Thermal Process): With two tanks, the wood product first is submersed into a hot solution of preservative or boiling water, followed by immersion into a tank of cold solution.

Using Wood Preservatives Safely

In November 1986, federal regulations administered by the Environmental Protection Agency (EPA) restricted the sale and use of certain preservatives to ensure only properly trained applicators, or persons under their direct supervision, have access to these chemicals. Additional restrictions were imposed in the 1996 Wood Preserving Resource Conservation and Recovery Act. Wood preservatives affected by these regulations are:

- Creosote
- Pentachlorophenol
- Inorganic Arsenicals: EPA approved labels on pesticide products, including wood preservatives, are the primary source of information on regulations affecting the worker. On March 17, 2003, residential uses of chromated copper arsenate (CCA)-treated wood were voluntarily cancelled. Alternatives include using wood that has been pressure-treated with ammoniacal copper quat (ACQ) or copper boron azole (CBA), or using cedar, redwood, metal or plastic materials.

The wood preservative label covers:

- application methods
- precautions for workers
- emergency first aid for high-level exposure
- disposal instructions for used pesticide solutions and containers

The label also has the force of law, and is enforced by state regulatory agencies. The label should be readily available, and all who are responsible should be familiar with the label’s contents. Other sources of information
include the material safety data sheets (MSDS) that are supplied by the manufacturer.

**Handlers of wood preservatives should know:**

- The health risks in working with these chemicals and the symptoms of overexposure.
- Basic safety, personal hygiene and personal protection requirements to minimize or eliminate exposure risks.
- Environmental concerns and best management practices, including proper waste disposal.
- What to do when accidents do happen, including emergency first aid and emergency spill response.

**Health Effects**

Basic to understanding health risks is knowing routes of exposure. Wood preservatives can enter the body in one of three ways:

- through the skin
- by breathing it into the lungs
- by swallowing it

Nearly every inch of your body is covered and protected by skin. But, the skin is like a sponge and absorbs surprising amounts of what it touches. When the skin is sweaty, it absorbs even more.

The eyes are especially vulnerable to damage from contact with chemical preservatives. Injury to the eyes often may be permanent.

You breathe dozens of times a minute, and anything in the air enters the bloodstream very quickly. Many wood preservatives have a strong odor and taste, so it’s unlikely a person would swallow a dangerous amount. However, when ingested, less than a cup can cause death.

The most likely routes of exposure are from:

- skin contact
- inhalation of vapors, dust or particles

Exposure occurs when protective clothing isn’t worn and other precautions aren’t observed.

**Acute symptoms** occur from exposure to high concentrations of chemicals. These symptoms are the same for all three chemicals.

- headaches
- nausea
- increased perspiration
All three types of chemical wood preservatives produce the following exposure symptoms:

- Headache
- Nausea
- Increased perspiration

In addition to the shared symptoms, each preservative also has specific symptoms. These are listed on the page to the right.

Acute symptoms are usually noticed soon after exposure and are usually treatable if first aid response is quick.

In contrast to acute symptoms, some symptoms or health problems, called chronic symptoms, emerge only after a prolonged time or repeated exposure. Chronic exposure can also aggravate existing health problems related to the skin, kidneys, liver or lungs. Being aware of these symptoms helps you protect your health and perhaps your life.

Beyond headaches, dizziness and nausea, other symptoms and health risks are specific to each chemical.

- **Creosote: Use had been phased out**, but existing treated materials are still in use.
  - **Acute Symptoms**: Irritates the skin, may burn like a sunburn. Vapors and fumes may irritate the respiratory system.
  - **Chronic Symptoms**: Prolonged and repeated exposure may lead to dermatitis and permanent sensitivity. Some cases of chronic creosote exposure have been associated with skin cancer. Laboratory studies also show that creosote can pose a risk of genetic damage.

- **Pentachlorophenol (Penta)**
  - **Acute Symptoms**: Ingestion of penta solutions, inhalation of concentrated vapors or excessive skin contact with penta may lead to fever, headache, weakness, dizziness, nausea and profuse sweating. In extreme cases, loss of coordination and convulsions can occur. Higher levels of exposure can be fatal.
  - **Chronic Symptoms**: Penta exposure may result in skin disorders like chloracne. Excessive poisoning may also cause damage to the kidneys, liver and the central nervous system. Laboratory studies show that penta can cause birth defects. Pregnant women must not be exposed to this chemical. In addition, penta contains the dioxin contaminant hexachlorodibenzo-p-dioxin that has been shown in laboratory studies to pose risks of cancer.

- **Inorganic Arsenicals: These have been phased out**.
  - **Acute Symptoms**: If swallowed, high concentrations may cause nausea, headaches, diarrhea and abdominal pain. Extreme symptoms include dizziness, muscle spasms, delirium and convulsions.
  - **Chronic Symptoms**: Chronic effects can include liver damage, loss of hair and fingernails, anemia and skin disorders. Long-term inhalation has been linked to lung cancer in humans. In a variety of studies, chronic exposure to arsenic compounds has been linked to risks of
skin cancer, genetic damage, adverse reproductive effects, disturbances in behavior and damage to the central nervous system.

**Personal Protection**

Wood preservatives are classified “restricted-use” based on the potential human risk from chronic (repeated) exposure over time. Applicators as a group are most likely to be exposed repeatedly. Consequently, applicators must know what precautions are required and then use those precautions as a normal and routine part of their work with wood preservatives.

Exposure can occur in a variety of ways:

- during mixing and handling of chemicals
- while working around spray or dip operations
- when handling freshly treated wood
- when cleaning and servicing equipment
- when disposing of waste materials

Risks are directly related to the degree of exposure. Most risks occur during application of the chemical and then as it volatilizes, or evaporates, soon after the treatment occurs. A closed system for mixing and delivering preservative and mechanically handling treated wood helps to reduce potential exposure, but does not eliminate the possibility of exposure.

Exposure can be reduced by:

- wearing proper protective clothing
- practicing effective personal hygiene
- observing plant safety precautions

**Protective Clothing Blocks Routes of Entry:** Unprotected skin can absorb chemicals whenever you come in contact with chemical concentrates or solutions, mists, fumes, vapors or treated wood itself. The skin on certain parts of the body, such as the forearm, the groin and just below the eyes, absorbs chemicals more easily.

Shirts and pants must completely cover the arms and legs. Coveralls are a convenient alternative. Long sleeves do make a difference. Workers in a sapstain operation who used long sleeves exclusively showed a 40 percent reduction in urine levels of Penta after three weeks of long sleeve use.

Wear gloves made from an impermeable material. Some situations may require aprons, boots or even a full impermeable material suit. Hot weather can make this type of clothing uncomfortable to wear. But remember, the hotter the weather, the more your skin will absorb, so wear PPE!

Permeable materials, such as leather, will not adequately protect your skin.
Goggles or face masks are needed to protect the eyes from vapors, splashes and spills during handling, maintenance and clean-out of chemicals.

To protect the lungs, a face mask, dust mask or respirator may be needed.

The wood preservative product label lists protective clothing and Personal Protective Equipment (PPE) required for use.

DO NOT WEAR LESS PROTECTIVE CLOTHING THAN THE LABEL INDICATES.

Impermeable clothing materials considered suitable for use with Creosote, Penta, and Inorganic Arsenicals include:

- Neoprene
- Polyvinyl Chloride (PVC)
- Polyvinyl Acetate (PVA)
- Nitrile compounds (NBR)

Goggles or face masks are needed to protect the eyes from vapors, splashes and spills during handling, maintenance and clean-out of chemicals. To protect the lungs, a face mask, dust mask or respirator may be needed.

Sawing, drilling or machining treated wood may create sawdust that contains harmful amounts of preservative. If the job is small and can be done outside, a dust mask may be sufficient protection for your lungs. But if the work is done in a confined space, a respirator may be required. Other situations that may require use of a respirator include:

- opening or entering pressure treatment cylinders
- cleaning or repairing tanks and vats
- using spray applicators, especially in poorly ventilated areas or when visible mist is present
- working in an arsenic treatment plant, if the level of exposure exceeds permissible limits

Make sure your respirator is properly fitted and maintained. Seek training in the correct use of and fit of your respirator. Replace worn out or damaged equipment immediately. Appropriate respirators may vary by chemical. However, all respirators must be OSHA/NIOSH approved.

Chemical overexposure affects people differently. Tolerance levels vary from one person to another, so if you are more sensitive than average, increase your level of protection.

The wood preservative product label lists protective clothing. **DO NOT WEAR LESS PROTECTIVE CLOTHING THAN THE LABEL INDICATES.**

Other precautions for workers are also described on the label. These are work habits that can significantly reduce the risks of chronic exposure to wood preservative chemicals. General precautions include:

- Don’t eat, drink or smoke in the work area.
- Wash your hands often, especially before using the restroom, eating or smoking. Use only a mild soap, not an abrasive one.
- Remove your gloves to handle paperwork, phones or other equipment.
- Be careful when putting your gloves back on.
- Leave your work clothes, boots, gloves and other protective gear at the
plant.

- **If you must launder work clothes at home**, do them separately from other household laundry.

Wearing protective clothing and following the general precautions listed above helps decrease your risk of harmful chemical contact, both from accidental and day-to-day exposures.

**First Aid**

First aid information on the chemical in use must be readily available. Product labels give basic first aid directions, as do Material Safety Data Sheets (MSDS) supplied by the chemical manufacturers. Know and post the phone number of the nearest poison control center that is prepared to give advice 24 hours per day. Program the number into your cell phone.

In an emergency, remember to send someone to call or get help while you treat the victim. Most accidents involve chemical splashes on skin or eyes, or inhalation of fumes, spray mist or dust. The following general steps describe treatment for accidental exposure to wood preservatives:

- **Skin contact**: Remove contaminated clothing and immediately wash affected area with mild soap and cool water. Hot water opens pores and allows deeper chemical penetration. Do not scrub skin, but rinse until there is no “soapy” feeling left. Consult physician if skin irritation persists.
- **Eye contact**: Flush eyes with running water. Lift upper and lower eyelids for complete irrigation and continue for 15 to 20 minutes. Then, see a physician.
- **Inhalation**: Move victim to fresh air and apply artificial respiration, if necessary. Get medical help immediately.
- **Ingestion**: If preservative has been swallowed, immediately call the local poison control center for advice.
  - If the victim is conscious and creosote or pentachlorophenol was swallowed, have the victim drink one or two glasses of water. Then induce vomiting by giving syrup of ipecac or touching the back of the throat. After vomiting ceases, administer two tablespoons of “USP Drug Grade” activated charcoal in water.
  - If an arsenical has been swallowed, drink large quantities of water or milk, if available. With arsenical ingestion, the victim tends to vomit involuntarily. Get professional medical help immediately. Lay an unconscious victim on his side, with the head lower than the torso. This will help prevent choking. Keep the victim warm and check breathing regularly until help arrives.
Environmental Effects

People are not the only ones who can suffer from the careless use of wood preservatives. A community’s health and environment may also suffer. Creosote, penta and the inorganic arsenicals are toxic, a characteristic that allows them to kill the microorganisms that cause decay and to repel insects that destroy wood. Unfortunately, these chemicals are not selective and other plant and animal life can also be harmed.

Careless use of wood preservatives over the years has polluted surface and ground waters in many parts of the country. Pollution has resulted from obvious sources, such as spills or illegal discharges of chemicals into ditches, storm drains or sewers, as well as from less obvious sources, such as unconfined drippings from freshly treated wood. Contaminated runoff can pollute lakes, streams and wetlands, and may damage habitat for fish and wildlife. Specific effects vary, but penta, creosote, and inorganic arsenicals are all toxic to fish and other wildlife. Penta, for example, is extremely toxic to fish. Exposure to penta concentrations in the parts-per-billion (ppb) range can cause death within minutes for many species of salmon and trout.

Groundwater pollution is more hidden from view, but it too can be a serious problem. In many communities, groundwater is the only source of drinking water. Cleanup, where possible, is difficult and costly. Groundwater contamination can persist for years. Testing has documented contamination in public and private wells at levels exceeding health advisories. Groundwater is typically affected by contamination of the overlying soil. Applying preservatives on unpaved or unprotected soil, chemical spills, overflow from tanks and holding ponds, and improper disposal can all result in soil contamination. If proper precautions are not taken, soil may become saturated with preservatives. In fact, soil contamination has been documented at depths of 60 feet. From the soil, contaminating chemicals may leach into the groundwater and eventually migrate to drinking water wells. To reduce the risk of environmental contamination, protective measures must be part of your plant design and operation. Some general common sense precautions include:

- Apply or mix preservatives only in a contained area.
- Allow freshly-treated wood to drip in a roofed and contained enclosure
for a reasonable time.

- Recapture contaminated runoff for future recycling or disposal.
- Don’t burn treated wood except in an approved incineration facility, as toxic gases may be produced.
- Dispose of wastes properly.

**Emergency Spill Response**

Working with toxic chemicals places a responsibility on you to protect the health and environmental quality of your community. Spills are usually caused by negligent actions, such as overfilling tanks or incorrect valve settings, but spills also occur as a result of vandalism or from illegal dumping to avoid the proper disposal.

Response to any spill must be **immediate**. Prompt action can save cleanup time, money, possible legal action and even life. Although most businesses have emergency response procedures, some general steps for effective spill response are:

- **Protect life and property.** Warn others in the vicinity and evacuate, if necessary. Provide protective equipment to onsite personnel. Keep unauthorized people out of the area.
- **Secure the source of the spill.** When a spill or leak is evident, use common sense to act quickly and stop the flow. Shutting down mechanical delivery systems can prevent jam-ups and possible injury.
- **Contain the spill.** Block off drains, culverts and ditches. Surround the spilled chemical with dirt, sand, booms or commercial absorbents.
- **Contact authorities immediately.** Send someone to inform your plant manager or supervisors as soon as possible. Call fire, police, highway or water departments, if needed.
- **Clean-up the spill.**
- **Properly dispose of spill material.**

**Conclusion**

Preserving wood and wood products from damage by insects or fungi often requires the use of toxic preservatives. In November 1986, use of three wood preservatives was restricted to certified applicators or to persons under their direct supervision. Regulations requiring protective clothing and precautions also went into effect. Follow the information in this chapter carefully to avoid harm to yourself, others or the environment. Specifically:

- Know the symptoms of wood preservative poisoning.
- Observe precautions and use protective clothing to keep chemicals:
o Off your skin and hair.
o Out of your eyes.
o Out of the air you breathe.

- Learn basic first aid.
- Protect the environment.
- Dispose of waste properly.
- Know your spill response procedure, so you can act quickly in an emergency.

The wood preservative section was developed in 1986 by Mediatek, Inc., for the Environmental Protection Agency as a training aid for individuals seeking certification for the use of wood preservatives. This section was updated in 2013.