Circular AE-825

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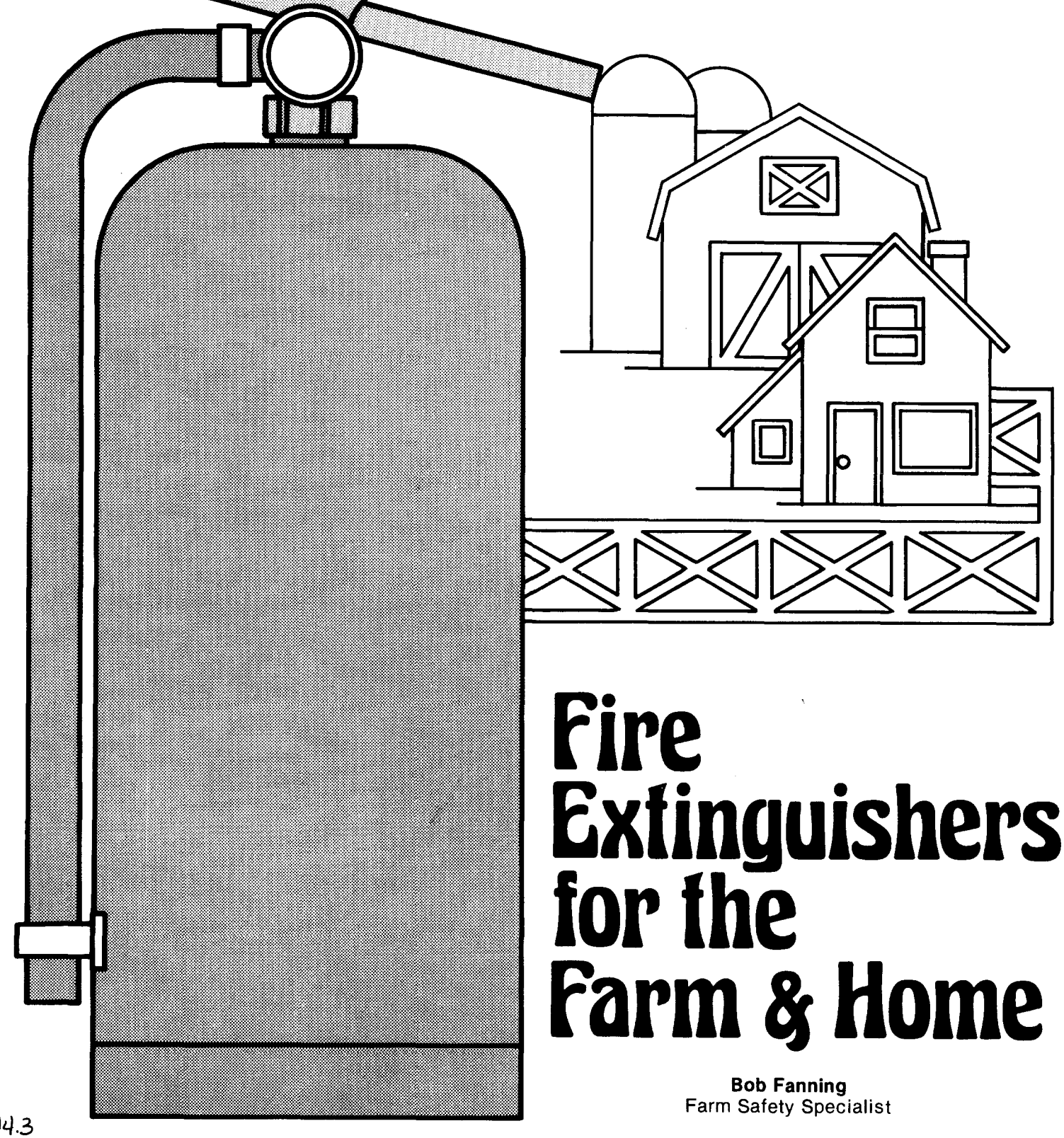

Fire Extinguishers for the Farm & Home

Bob Fanning
Farm Safety Specialist

COOPERATIVE EXTENSION SERVICE
North Dakota State University Fargo, North Dakota 58105

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Fire destroys millions of dollars worth of farm property each year in the United States. In 1979, the North Dakota State Fire Marshall's Office reported a loss of $1,364,490 in 206 farm fires. People also suffer from fire. In a one-year burn study conducted in 1980 by the College of Home Economics at NDSU, 637 people were treated for burn injuries in North Dakota hospitals. Of these 637 people, 218 were hospitalized and 14 died.

Farm property and lives are in more danger from fire than most urban property because of the time it takes for fire protection equipment and personnel to get there. At a farm fire, large quantities of water may be difficult to get quickly and the average rural fire engine can carry only 300 to 500 gallons of water. Farms should be equipped with simple, practical, portable fire extinguishers. Quick use of a fire extinguisher can prevent property damage and, in many cases, save lives. Many fires on farms occur in the home, repair shop, livestock barns and on tractors and combines.

If a farm fire should start:

(1) Make sure all persons are well away from the danger area. When possible, rescue livestock, but do not risk human life to do so.
(2) Have someone call the local fire department.
(3) If the fire is small, use the right fire extinguisher and fight the fire.

For a fire to burn there must be fuel, oxygen and heat. Eliminating any one of these ingredients will extinguish the fire.

Classification of Fires:

Fires are classified as A, B, C or D fires according to the material that is burning. Because of the characteristics of the different fires, the extinguisher that works well on one type of fire may be dangerous or ineffective to use on another type. There are four different classifications of fire.

Class A—Combustible Solids

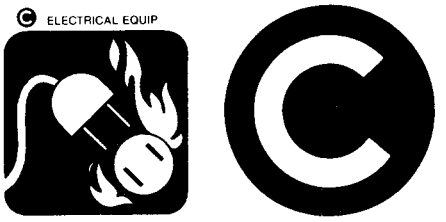
Fires in combustible solids such as wood, paper, rubbish, straw and rubber are called Class A fires. These materials burn deep and may smolder after the flames have been knocked down. A Class A fire may flashback because of the heat that remains in the material. The most effective method of extinguishing a Class A fire is to cool it with water. Other types of extinguishers will knock down the flames and give temporary control but will not extinguish the fire unless the fuel is cooled to below the ignition temperature.

Class B—Flammable Liquids

Class B fires involve gasoline, oil, paints, grease, kerosene and other flammable liquids.

Dry chemical, carbon dioxide, foam, and halon type extinguishers are all effective on Class B fires because they produce a smothering effect. With flammable liquid fires, the vapor is what burns. When the flame is extinguished, the fire is out. Continue to blanket the fuel for a short time to ensure that the fire does not flashback.

Do not use water or water type extinguishers on a Class B fire. The water tends to spread the fuel, especially when the fuel is lighter than water. Water soaked sacks or blankets may be effective in smothering a Class B fire if the fuel will not be spread easily.



Class C—Energized Electrical Equipment

Fires involving electrical appliances, electric motors, electric wiring or electric service panels are Class C fires. Class C fires must be fought with an extinguishing material that is electrically non-conductive. These include carbon dioxide, dry chemical and halon. If it is possible to disconnect the electric current, extinguishers suitable for Class A and B fires can be used.

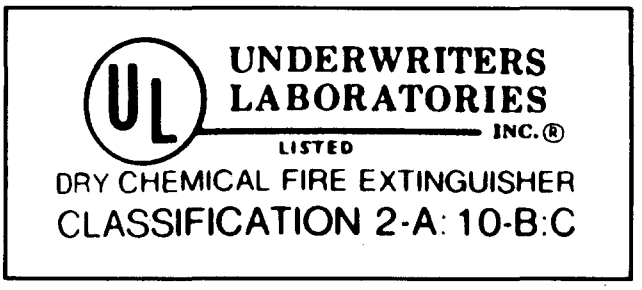
The use of water or wet sacks on a Class C fire may result in an electric shock.

Class D—Combustible Metals

Class D fires involve combustible metals such as magnesium and sodium. These fires occur mostly in industrial situations and are not normally a concern in the farm and home. A special dry chemical extinguisher is needed for Class D fires.

Fire Extinguisher Ratings

Portable fire extinguishers sold in North Dakota must be listed by the Underwriters Laboratories, Inc. and/or Factory Mutual. The fire extinguishing potential for the various classifications of fire is given a rating. The ratings are determined by actual tests and appear on the extinguisher label.



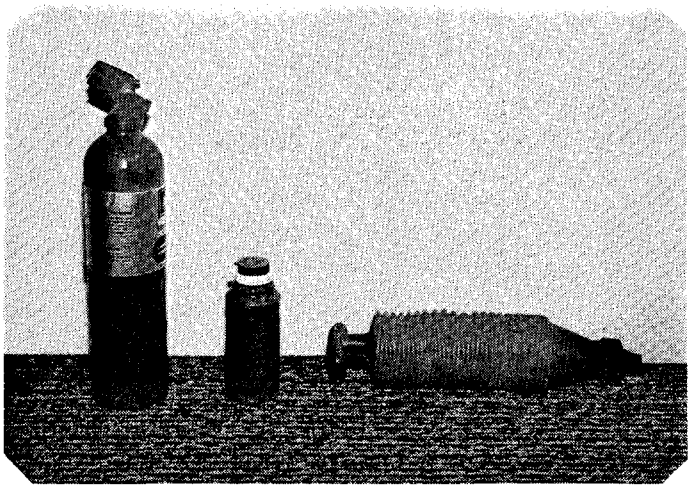
The rating is a number and letter combination. The letter indicates the type of fire the extinguisher can be used on. The number is an indicator of the size of fire the extinguisher will put out. The ratings for Class A fire extinguishers indicate the relative extinguishing potential of one model or size compared to another. A 4A extinguisher can be expected to extinguish twice as much Class A fire as a 2A extinguisher.

The number on Class B fire extinguishers indicates relative size as well as the square-foot area of deep-layer flammable liquid fire that an average operator can extinguish. For example, a 6B unit can be expected to extinguish 6 square feet of deep layer flammable liquid fire. A 6B unit will also extinguish twice as much Class B fire as a 3B unit.

Class C fires are either Class A and/or Class B fires with electrical equipment present. The C rating is the same as the Class A or the Class B rating depending on what is burning.

Some types of fire extinguishers, such as the dry chemical, are multi-purpose suitable for Class A, B and C fires. These may be rated such as 4A-16BC. Note that the A rating is considerably smaller than the B rating. Dry chemical, carbon dioxide and halon fire extinguishers all carry a low A rating compared to the B rating. Although these extinguishers may knock the flames down, the fuel often remains hot, may continue to smolder and restart. Small extinguishers of the dry chemical, carbon dioxide and halon type may not be rated for Class A fires because of the ineffectiveness on them.

Beware of small, unapproved fire extinguishers that may come in a small plastic container or aerosol type container. These may be useful inside an automobile and put out a very small fire, but be worthless on a machine or building fire of any size.



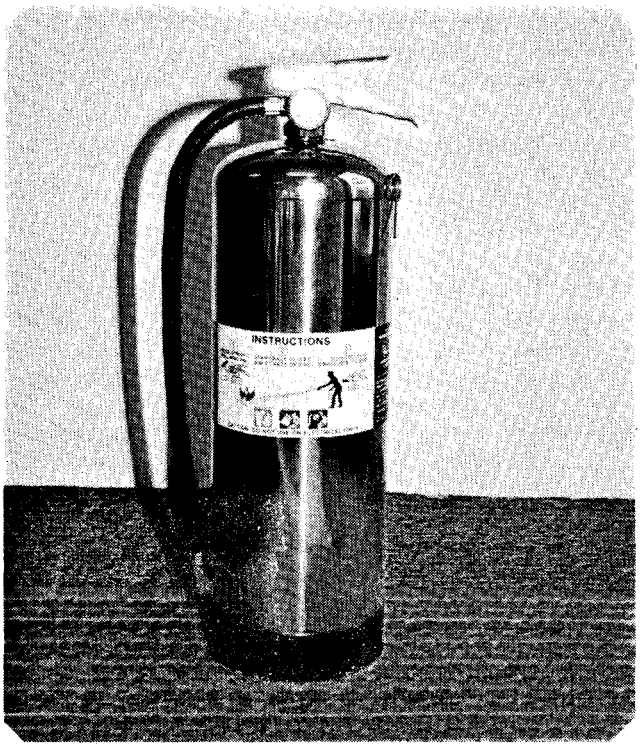
Small, unapproved fire extinguishers should not be considered protection against a farm fire.

Types of Fire Extinguishers and Their Use:

Different types and models of fire extinguishers have been devised over the years. Several types of fire extinguishers are no longer recommended because they are not reliable or dangerous to use. Soda acid and carbon tetrachloride are two examples. If you own one of these extinguishers, replace it with an approved extinguisher of adequate size for your application. If you are in question, check with your fire department or insurance agent. There is no one type that is best for all classes of fires. Following are the portable fire extinguishers that are currently approved by Underwriters Laboratory and/or Factory Mutual.

Pressurized water is the most effective portable extinguisher for Class A fires. These units are available in 2½ gallon capacity. The water is expell-

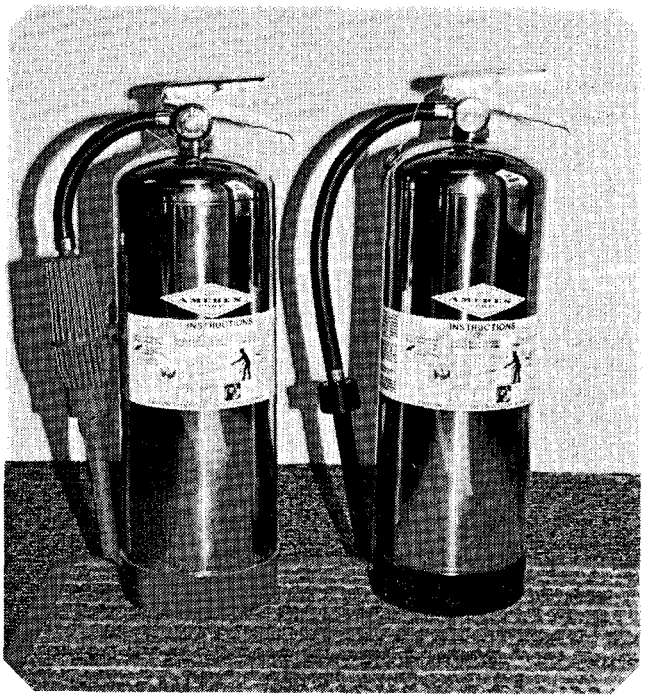
ed by air pressure. These models have a hose and nozzle for directing the stream of water. The 2½ gallon unit will deliver a stream of water for about one minute and up to 30 feet horizontally. A pressurized water extinguisher must be protected from freezing.



Pressurized water extinguisher for Class A fires.

When a pressurized water extinguisher needs to be stored outdoors and exposed to below-freezing temperatures, an alkali-metal-salt solution (available at any fire equipment servicing agency) is used in place of the water. This type of extinguisher is labeled as a "loaded stream" unit. The loaded stream extinguisher operates the same as the pressurized water. There are some applications where the loaded stream extinguisher may be necessary, but it is expensive to maintain. In most cases, a more practical extinguisher that is unaffected by cold temperatures (such as ABC dry chemical types) can be substituted for considerably less money.

Two types of foam extinguishers are available. Both come in 2½ gallon capacity and operate very similar to the pressurized water extinguisher. One model contains a solution that forms a foam when discharged. The other type is a pressurized-water unit with a special attachment in the hose that holds a cartridge. The cartridge contains pellets that react with water and create foam as the water passes through the hose. Foam type fire extinguishers work well on Class A fires and also on Class B fires. They should not be used on Class C fires.



Two types of foam extinguishers are available.

A carbon dioxide or CO_2 fire extinguisher is a high pressure cylinder containing liquid carbon dioxide under pressure. Carbon dioxide extinguishes a fire by cooling and by displacing the oxygen. Carbon dioxide extinguishers work well on Class C fires and have the advantage that they leave no residue. Range of the carbon dioxide extinguisher is less than that of other types. To be effective, the CO_2 must be ap-

A Carbon Dioxide or CO_2 extinguisher.

plied within a range of 3 to 8 feet. CO_2 fire extinguishers are available in sizes from 5 to 20 pounds.

Dry chemical fire extinguishers are available in sizes from 2½ to 30 lbs. The extinguishing agent is a dry powder that smothers the fire. The chemical is propelled by dry nitrogen or carbon dioxide gas under pressure. In one type, the cylinder is pressurized. With the cartridge type there is no pressure in the main cylinder, but a pressurized cartridge is attached to the cylinder and punctured when needed. Dry chemical extinguishers are effective on Class B and C fires. They can also be used to knock down the flames on Class A fires until water can be used to extinguish the smoldering material completely. Multipurpose ABC dry chemical is designed to stick to heated surfaces and prevent flashback, but these extinguishers are not highly effective on Class A fires. Dry chemical fire extinguishers are relatively inexpensive for the protection they give and are often considered a good, all-around extinguisher. One disadvantage of the dry chemical extinguisher is the chemical residue that is left.

A pressurized cylinder and a cartridge type dry chemical extinguisher.

Halon 1211 is a recent addition to the fire extinguisher field. Halon 1211 is a gas that smothers a fire and is effective on Class B and C fires. These units were developed for use on computers and other sensitive, electrical equipment that cannot tolerate powder residue or a cold gas such as CO_2. The advantage of the halon extinguisher is that it leaves no residue. However, the halon extinguisher is expensive for the protection it gives, will dissipate quickly in the outdoors, and extensive exposure to the gas can be toxic in an enclosed area. Ventilate the area after using a halon extinguisher.

A Halon 1211 fire extinguisher.

Other, more specialized extinguishers are also available, such as the Chimfex, chimney fire extinguishing stick. This stick is to be thrown into the firebox of a woodburning appliance in the case of a chimney fire.

In some cases, such as expensive equipment or machines, an automatic fire extinguishing system can be installed. Consult a fire protection equipment agency for help with these systems.

Water or dirt that is sprayed, thrown with a bucket or shoveled can also be effective in extinguishing a fire.

How to Use a Fire Extinguisher:

Although there are several different types of fire extinguishers, their operating mechanisms for discharge are nearly the same. It does pay to familiarize yourself with the extinguisher at your home or place of work in case a fire does break out.

There are four steps to operate most fire extinguishers:

1. **Pull** the pin. Most fire extinguishers have a locking pin to prevent accidental discharge.
2. **Aim** the nozzle, horn or hose at the base of the fire.
3. **Squeeze** the handle.
4. **Sweep** the extinguisher from side to side at the base of the fire.

Always have a fire extinguisher recharged after it is used, even if you don't discharge it completely.

Become familiar with your fire extinguisher before a fire starts.

Fire extinguishers mounted in buildings should be easy to find and easy to reach.

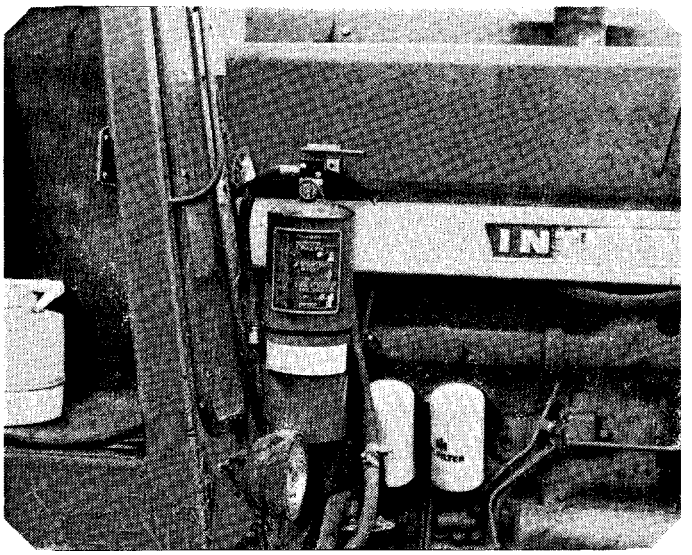
Type and Location of Extinguishers Around the Farmstead:

Wall mount a 2A-10BC extinguisher where it is convenient to the kitchen and heating system in the farm home. Locate more extinguishers in other areas of the house and garage, especially if you have a large home.

The farm shop is a good location for another extinguisher, use two or more if you have a large shop. Locate a 2A-10BC near the welding area and one near fuel storage.

Each piece of motorized farm machinery should have a 2A-10BC extinguisher mounted near the operator's platform. On a large machine such as a combine, two or more extinguishers may be needed.

Each farm building that houses valuable machinery or livestock should also be equipped with one or more 2A-10BC extinguisher(s) depending on the size and accessibility of the building. Mount each extinguisher where it is visible and easily accessible. Fire extinguishers should be red or mounted on the wall with a red square behind them.



Mount extinguishers on farm implements so they can be reached from the ground or near the operators platform.

In choosing a fire extinguisher for a location on the farm, consider the type of fire expected, the maintenance that will be required, provisions for cold temperatures if not in a heated area, and cost. In some cases, where a valuable machine or building is concerned, consider installing an automatic fire extinguishing system.

Maintenance and Inspection

When a fire starts, there is a good chance of extinguishing it if you have a working fire extinguisher of the correct type and size.

All fire extinguishers require periodic inspection and testing to make sure they are working properly. Extinguishers should receive a quick visual check monthly or more often if subject to theft, vandalism, damage or severe conditions. You can do the periodic inspections yourself. If you need help, your local fire department and insurance agent are good resources. For maintenance and testing, go to a fire equipment servicing agency. Many of the fire equipment servicing agencies belong to NAFED (National Association of Fire Equipment Distributors). NAFED is an organization that works to improve the fire equipment industry and the fire equipment servicing industry.

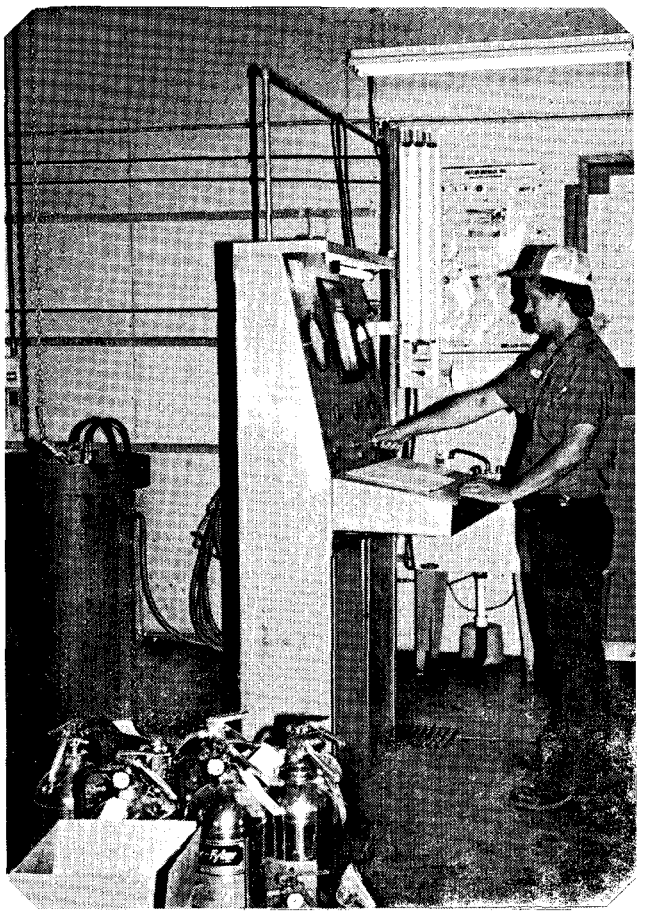
Take your extinguishers to a reputable fire equipment servicing agency for maintenance and recharging.

Pressurized water extinguishers should receive a visual inspection of the hose, pressure gauge and overall condition once each year. Every five years a pressurized water extinguisher should receive a hydrostatic pressure test to see if the extinguisher shell is sound.

Maintenance for loaded stream extinguishers should consist of a complete check once a year. The solution must be emptied and the parts checked to see if they are still working. The solution in a loaded stream extinguisher is very corrosive and it may cause some of the parts to seize. The solution and the frequent maintenance required causes this to be an expensive extinguisher to own.

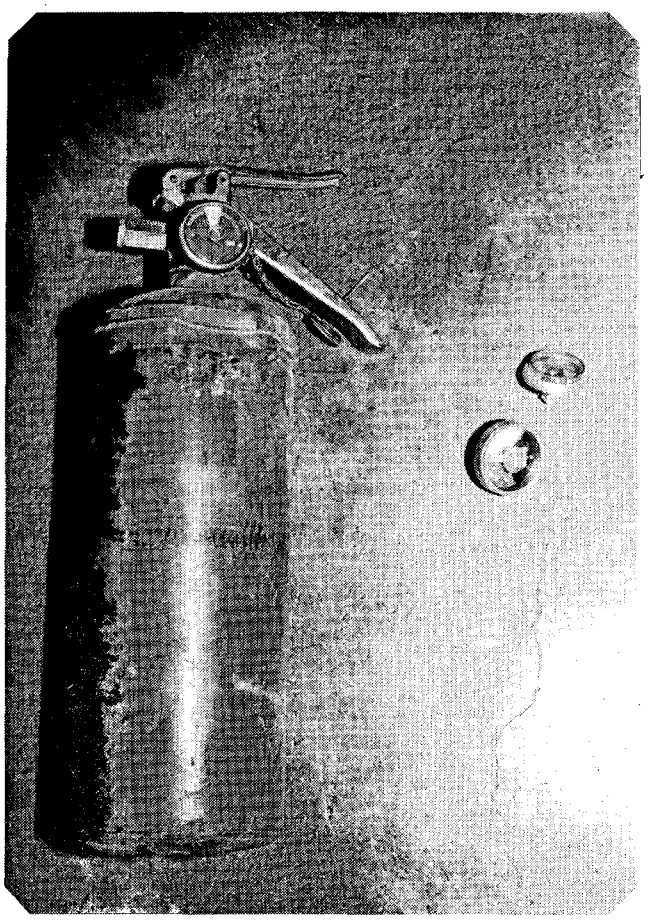
Maintenance for a foam extinguisher is the same as for pressurized water.

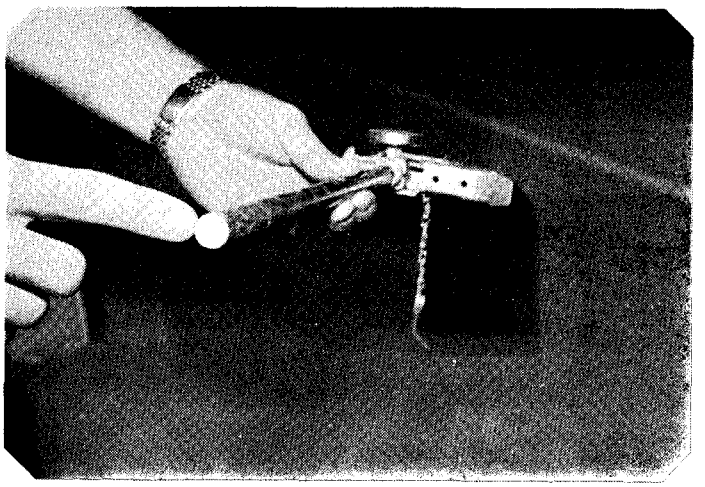
Carbon dioxide extinguishers should be weighed, visually inspected, and given a continuity test of the wire in the hose once each year. The wire in the hose is to prevent static electricity from building up as the carbon dioxide gas is discharged and reigniting a flammable liquid fire after it is out. Every five years, a CO_2 extinguisher should receive a hydrostatic pressure test.

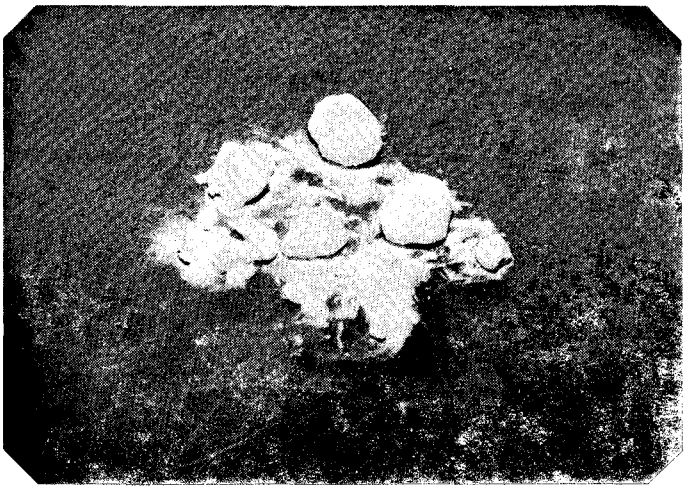


Extinguisher shells should be hydrostatically pressure tested according to the schedule for that type of extinguisher.

Dry chemical extinguishers should be given an external visual inspection each year. The overall condition of the extinguisher should be checked, the hose inspected for obstructions and the extinguisher weighed. A six-year maintenance is recommended for dry chemical extinguishers. The extinguisher is completely dismantled and inspected. The cylinder is inspected for rust and dents, the chemical is sifted to check for lumps, the pressure gauge is tested, and the discharge tube is inspected for damage or obstructions. Once each 12 years, a dry chemical extinguisher should be hydrostatically pressure tested. If a dry chemical extinguisher is mounted on a machine and subject to vibration, it should be inspected more often than a stationary extinguisher. Consult your fire equipment servicing agency or local fire department for suggestions.







Problems that show up include dents, stuck gauges, plugged discharge tubes and lumps in dry chemical.

Halon fire extinguishers should be weighed and visually inspected yearly and hydrostatically pressure tested every 12 years.

If you purchase good quality fire extinguishers of the right type and maintain them properly, you can control many fires before they get out of control.

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