

HOME ECONOMICS GUIDE



After the Fire is Out Cleaning Household Textiles and Clothing

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While fires do cause considerable damage to homes and their contents, "after the fire" activities can cause even more damage. It is important to take immediate action, but more important, appropriate action. Carpets, draperies, upholstered furniture and clothing usually can be refurbished after a fire, except for scorched or severely water damaged items.

Fire creates two types of smoke damage—the **visible soot** and the **invisible odor**. Because each fire is different, it is not possible to provide one set of guidelines on how to remove soot and odor. For example, smoke odor from wood could react differently to certain cleaning products than smoke odor from plastics. It usually is difficult for inexperienced home owners to remove soot and smoke odors without professional assistance or advice.

This guidesheet provides emergency steps to take after the fire is out and explains some of the processes professional fire restorers use to remove soot and smoke damage. Information about cleaning clothing is based on research findings. Often dry cleaning is recommended to remove soot and smoke odors from clothing, but that may not always be the answer.

What to Do First

Even small fires can cause severe damage and be extremely costly. That is why it is wise to contact the appropriate individuals to help you. If you have insurance, contact your insurance agent for his/her suggestions and advice. If you rent your dwelling, the owner should be notified as soon as possible so that you can both assess the damage.

Consider contacting a professional fire restorer. They deal with problems similar to yours every day. If your insurance agent doesn't suggest someone, look in the yellow pages of the telephone directory



If your home is damaged by fire, consider contacting a professional fire restorer.

under *Carpet and Upholstery Cleaners* or *Fire and Water Damage Restoration*. Keep in mind most professional fire restorers will travel a certain distance to restore fire damaged property. Inquire about the experience the fire restorer has had and, if possible, secure some references of persons they have served. Usually the professional fire restorer can provide helpful hints to prevent further damage, determine what items can or cannot be refurbished, and estimate the cost of deodorizing and cleaning your home. Hiring a professional fire restorer can be costly, but the best way to remove smoke odor and soot is with the appropriate equipment and appropriate chemicals.

Preventing Fire Damage

Don't attempt to clean any household textiles unless you know the proper procedures, because you can cause additional damage. Whether you hire a professional or do the work yourself, you can minimize further damage by following these guidelines.

- Do not touch nor attempt to clean carpets, upholstered furniture, draperies, or other household textile items. Those cleaning actions will only smear

Using a professional fire restorer will help ensure that your home and possessions will be taken care of in the best way possible.



- soot into the fabric, making cleaning more difficult.
- Dry wet carpets, upholstered furniture, draperies and clothing as soon as possible to prevent mold and mildew. Hang clothing outside on a clothesline, prop up wet upholstery cushions for even drying, and use fans and dehumidifiers to dry carpets and draperies.
- Place aluminum foil or wood blocks between furniture legs and wet carpeting to prevent rust stains.
- Open windows for ventilation.
- Change the furnace filter (if operating) at least **once a day** until the filter shows no soot. This will help keep particles from being distributed into the air.
- Cover clean items with plastic while further repairs are being carried out in the dwelling to prevent re-soiling.

Removing Soot from Household Textiles

Before carpets, draperies, upholstered furniture and clothing can be deodorized or cleaned, the soot must be removed. Because soot is oily, it can stain items easily. This is why upholstered furniture, curtains, and other textile items should not be touched after a fire. If a professional fire restorer is hired, they will remove soot with a heavy duty vacuum.

If you don't plan to hire a professional fire restorer, some of the soot can be removed by holding a vacuum cleaner nozzle slightly **off** the surface of an item to be cleaned. It is best not to use vacuum cleaner attachments with brushes or upright vacuums because the brushes tend to force soot into carpets, upholstered furniture and curtains. Cover carpets with plastic after removing the soot. The plastic will prevent workmen, inspectors and visitors

from grinding dirt into the carpet. After the soot is eliminated, the smoke odor will need to be removed.

Removing Smoke Odor from Household Textiles

Smoke odor could remain in clothing, upholstered furniture, carpets, and draperies unless it is properly deodorized. Professional fire restorers and some dry cleaners use a deodorizing process that actually breaks up the smoke molecule to eliminate the odor. This deodorization process is called the **ozone treatment** (see illustration, page 3). The ozone treatment produces an oxidizing agent that creates the same sweet smelling air associated with a rain storm. The ozone treatment can be done by a professional fire restorer at the home with an ozone generator. Sometimes household textiles are deodorized in an ozone room. If the process is done at home, clothing, upholstered furniture and other textile items are put under a tent while the ozone generator is operating. Clothing and other textile items should be deodorized **before** they are cleaned; otherwise, the smoke odor could be set in the fabric.

Household deodorizing products are temporary relief methods. Deodorizing with perfumes, aerosol sprays, and disinfectants generally only mask the smoke odor. The smoke odor will still remain after the spray or perfume evaporates. In addition, deodorizing sprays may interact with smoke odor and create an additional odor.

Removing Smoke Odor from the Home

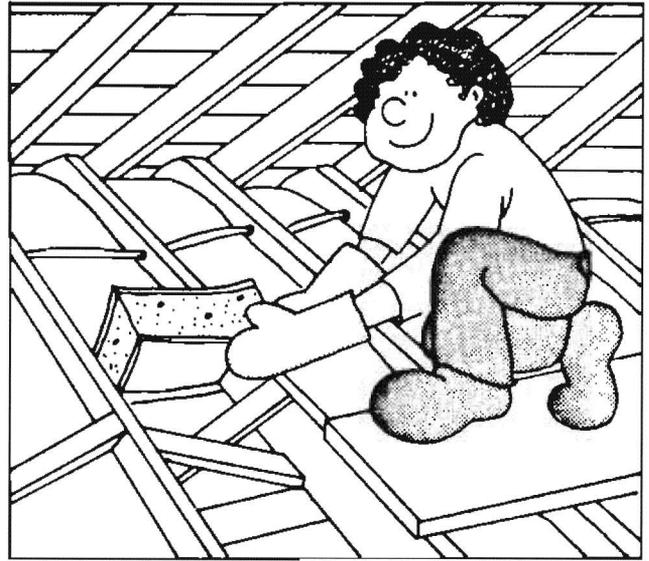
Smoke can enter and remain in and between the walls of the living space. If it is not properly removed,

the smoke odor reoccurs from time to time, particularly during damp periods. Therefore, action should be taken to properly remove all smoke odors.

During a fire, the heat will expand pores in the walls and fill the pores with smoke. After the fire, the house cools, the pores close up and trap the smoke odor. On warm days the pores will open and release the trapped smoke odor, which could settle on furnishings. Professional fire restorers can eliminate the smoke odor with a process called thermal fogging, which opens the pores in the walls and neutralizes the smoke odor. There is probably no process a home owner could use that would work as effectively as thermal fogging.

Household vents and ducts trap smoke odors. During a fire, smoke drifts through the ducts and becomes lodged on the sides. Since it may be impossible to clean the ducts; some professional fire restorers will use a chemical sealer to secure smoke permanently to the sides of the ducts. This procedure prevents smoke odors from drifting in the air at a later time.

If the attic has been insulated prior to the fire, it may be necessary to remove the insulation. Insulation cannot be cleaned; unfortunately, it will need to be replaced because insulation will retain smoke odors.

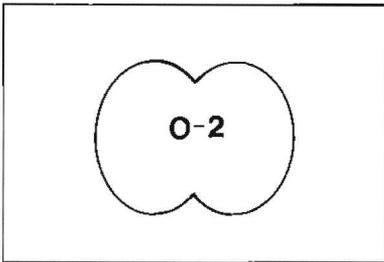


Insulation retains smoke odors. It should be replaced.

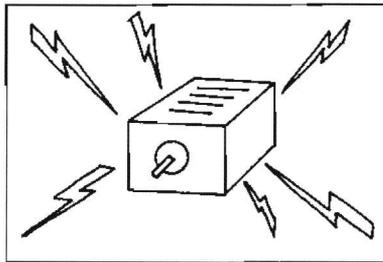
Cleaning Household Textiles

After deodorizing household textiles, the items can be cleaned. Dry cleanable clothing and draperies should be taken to a professional dry cleaner. Some professional fire restorers will clean draperies and upholstered furniture in the home.

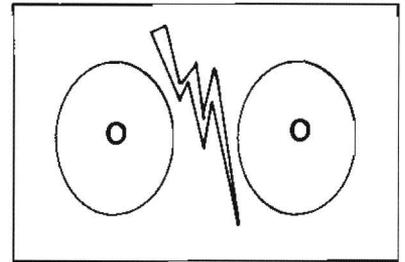
The Ozone Treatment



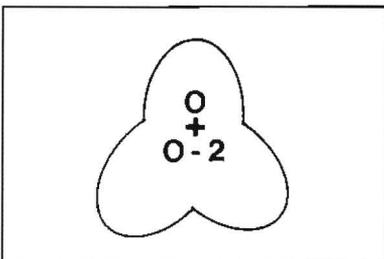
Air is $\frac{1}{5}$ oxygen. Each oxygen molecule has two atoms (O-2).



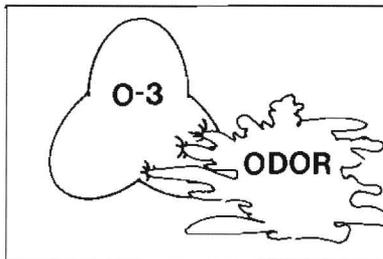
When a silent electrical discharge in an ozone generator . . .



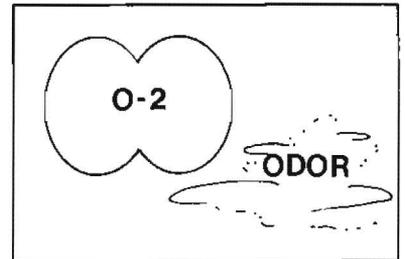
. . . strikes an oxygen molecule and splits it into two free atoms . . .



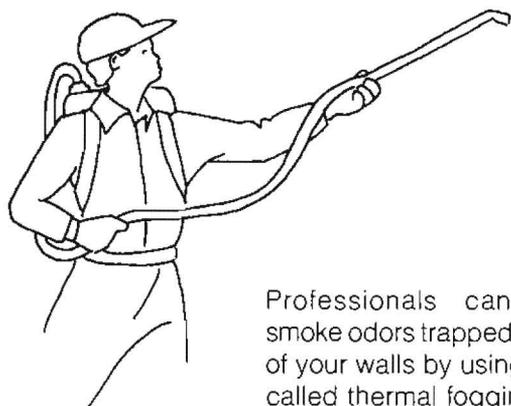
. . . each free atom (O) then joins an unsplit oxygen molecule (O-2) . . .



. . . making the supercharged but short lived ozone molecule (O-3).



This intense oxidizing agent attacks bacteria that cause odor, mold, etc., then returns to oxygen (O-2).



Professionals can eliminate smoke odors trapped in the pores of your walls by using a process called thermal fogging.

Carpets should be cleaned by a professional carpet cleaner. Sometimes the carpet will need to be cleaned twice. The first cleaning will be done before repairs begin, and another cleaning will be done after the house has been cleaned. If the carpet is wet after the fire, it will need to be dried before any cleaning can be done. In some cases it may be necessary to remove the carpet for complete drying. After the house is cleaned, the dried carpet can be replaced. Most professional fire restorers can clean draperies, carpets, upholstered furniture and other textile items.

Restoring Appearance and Removing Odor from Clothing

Soiled clothing is cleaned by a variety of laundry methods, therefore, it would be expected that not all fire damaged clothing could be cleaned equally as well by the same method. Sort fire damaged clothing as you would sort any soiled clothing by the recommended care method (found on the permanent care label), color and degree of soil.

Some clothing may require dry cleaning because of fiber content, dyes used in the fabric or incompatibility of fabrics such as linings and face fabrics. In

some cases, these articles may be subjected to a careful wetcleaning process, even though they are labeled dry clean only. This can be done only with professional expertise when it is felt that the garment will not be wearable unless another process is used.

Sort washable clothing by color (light/medium/dark) and soil (light/moderate/heavy). The majority of clothing items will probably be cottons, polyesters, and polyester/cotton blends. These can be most effectively renewed by using a warm water wash with either a non-built liquid detergent (Era)* or a low phosphate powder detergent and a liquid chlorine bleach (All and Clorox)*. This recommendation is based on the research findings of Cloud, Bondurant and Keith at Louisiana State University in their study of removing smoke damage from apparel fabrics.

The tests were carried out under laboratory conditions and were evaluated after an equivalent of five home launderings. Therefore, it may not be possible to reach the desired state of color restoration or whiteness after one or two washings. But visibly smoke damaged clothing should be restored after five launderings.

The researchers evaluated four fiber content fabrics (100% polyester, 65/35 polyester-cotton blend, 50/50 polyester-cotton blend, 100% cotton) and four cleaning solutions: powder detergent, liquid detergent, powder + liquid bleach, and dry cleaning. The fabrics responded differently to the four cleaning treatments. **Table 1** (below) summarizes the effects the different cleaning treatments had on fire damaged fabric samples.

Registered trademark

*Mention of specific product name does not imply endorsement, but is only for clarity of the product type.

Table 1
Restoration of Appearance With Fire Damaged Fabrics

Cleaning Method	Fiber Content of Fabrics			
	Polyester	65/35	50/50	Cotton
Powder detergent	P/E	N	P/E	P/E
Liquid detergent	P/E	E	E	E
Powder detergent and bleach	P/E	E	E	E
Dry cleaning	P/E	N	N	N

E = Effective, return to original state

P/E = Partially effective, not returned to original state

N = Non effective

Table 2
Removal of Smoke Odor With Fire Damaged Fabrics

Cleaning Method	Fiber Content of Fabrics			
	Polyester	65/35	50/50	Cotton
Powder detergent	E	E	E	E
Liquid detergent	E	E	E	E
Powder detergent and bleach	E	E	E	E
Dry cleaning	P/E	P/E	P/E	P/E

E = Effective, did not differ significantly from undamaged fabrics

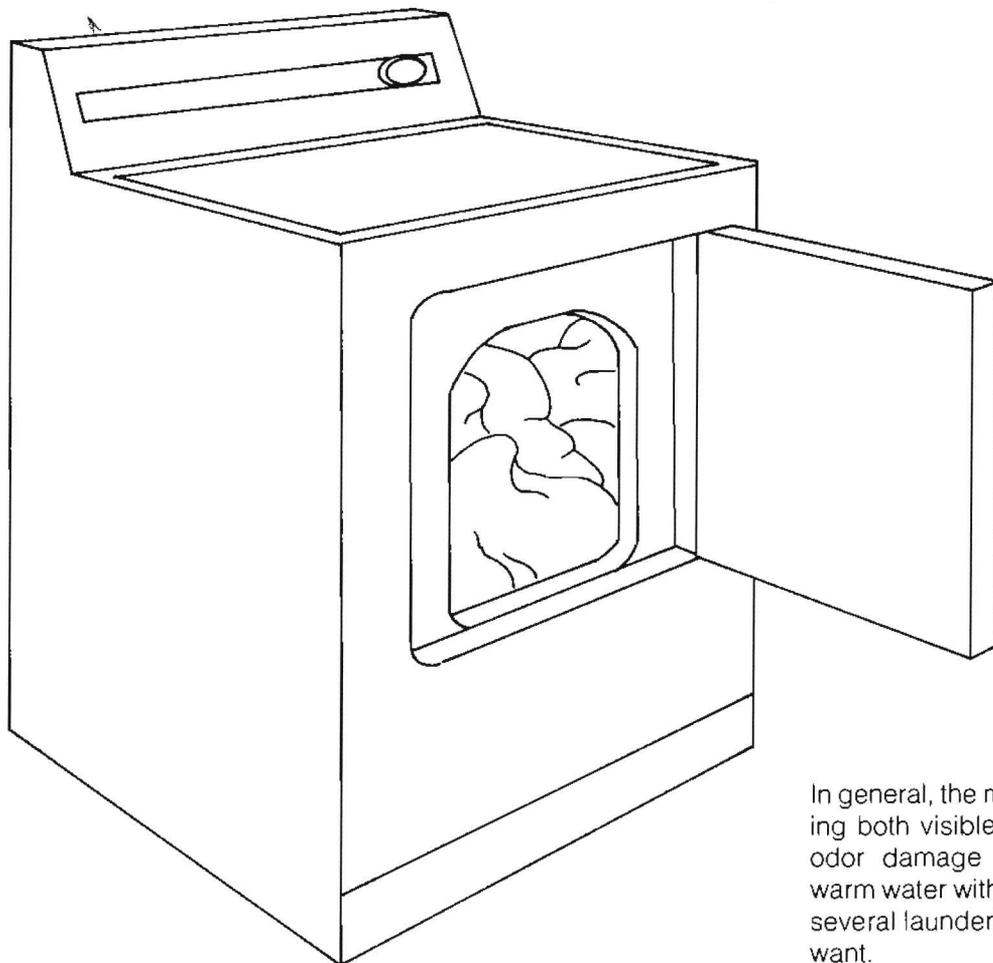
P/E = Partially effective

The researchers found that 100% polyester fabrics were not successfully returned to their original color state. The dry cleaning method was the least effective method of restoring fabric appearance, with the powder detergent method only partially effective. Liquid detergent (Era) and powder detergent plus bleach (All and Clorox) were the most effective in restoring appearance to fire damaged fabrics.

Smoke odor damage was most effectively treated by the three home laundry methods; there was no

significant difference by fiber content as shown in **Table 2 (above)**. The dry cleaning solution did remove a significant amount of odor, but not as effectively as home laundry methods.

Based on the results of this research, it is suggested that visible smoke and odor damaged cotton, polyester and polyester/cotton blend fabrics be washed in warm water with a liquid detergent such as Era for one to five launderings. As bleach may have a damaging effect on the fabric color or fiber content, it



In general, the most effective method of removing both visible smoke damage and invisible odor damage from clothing is washing in warm water with a liquid detergent. It may take several launderings to achieve the results you want.

would be more feasible to use the liquid detergent. Dry cleaning did not effectively remove the visible soil nor odor resulting from fire damage as did the home cleaning techniques and would add unnecessarily to the cleaning costs.

Summary

To effectively remove soot as well as visible and odor smoke damage from household textile items such as carpet, draperies and upholstered furniture, it is necessary to use the appropriate chemicals, the right equipment, and judgment that comes from experience. Professional fire restorers who are properly trained have the knowledge and materials to refurbish household textiles after a fire.

The most important guideline for home owners to remember is not to begin cleaning until the visible soil and smoke odor are removed. In the long run, money can be saved by contacting a professional fire restorer immediately. These experts can be identified through

insurance agents and generally are willing to travel several miles to restore a home.

Damaged clothing in closets and drawers can be restored by home cleaning methods. Research results indicate that home laundry methods are most effective for the majority of washable fabrics and dry cleaning is of limited effectiveness.

References

- Cloud, R.M., Bondurant, L.A., Keith, N.K. "Efficacy of Four Cleaning Solutions in Removing Smoke Damage From Apparel Fabrics," *Clothing and Textiles Research Journal* 2, 1983-84, 55-57.
- Eickelberger, R. Executive Vice-President of the Building and Maintenance Division for Atkins Chemical and Service Company, Columbia, MO.
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- Lyle, D. "Smoke and Odor Problems," Bulletin FC-45, International Fabricare Institute, c 1979.