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How to Prevent and Remove Mildew — Home Methods

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Mildew can be found on many different surfaces. It is a thin, black, or sometimes white, growth produced by mold. Molds are simple plants belonging to the group known as fungi. Though molds are always present in the air, those that cause mildew need moisture and certain temperatures to grow. They commonly develop in humid summer weather, especially in closed houses.

These molds grow on anything from which they can get enough food. In homes they develop most often on cotton, linen, rayon, silk, wool, leather, wood and paper. Many synthetic fibers resist mildew.

Molds that cause mildew flourish wherever it is damp, warm, poorly lighted and/or where air is not circulated — in cellars, crawl spaces of houses without basements and clothing closets. It can also be found on draperies and rugs in basement recreation rooms, on shower curtains and on damp clothes rolled up for ironing. These molds are also likely to grow in a new house because of moisture in the building materials.

As the molds grow, they cause considerable damage. They leave a musty odor; they discolor fabrics; and sometimes they eat into them until the fabrics rot and fall to pieces. They also discolor leather and paper.

Preventing mildew

Keep things clean

Keep closets, dresser drawers, basements — any place where mildew is likely to grow — as clean as possible. Soil on dirty articles can supply enough food for mildew to start growing when moisture and temperature are right. Greasy films, such as those that form on kitchen walls, also contain many nutrients for mildew-causing molds.

Clean clothing is less likely to mildew than soiled clothing. Because most synthetic fibers, such as acetate, acrylic, polyester and nylon, are resistant to mildew, clean fabrics of these fibers will not support mold growth. But even on these fabrics, soil may supply food to start mildew. Clean all soiled fabrics thoroughly, regardless of fiber type to help prevent them from mildewing.

Get rid of dampness

Mold spores are present in the air and may settle onto surfaces if there is sufficient moisture.

A damp basement, or any other structure, is often caused by moisture condensation from humid air onto cooler surfaces. Excessive moisture may indicate that repairs or additional insulation are needed. Replace cracked or defective mortar. Some basements are continually wet from water leaking through crevices in the wall. Make sure outside drainage is adequate.

For waterproofing concrete and other masonry walls above ground, apply two coats of cement paint, tinted with mineral coloring if desired. Waterproofed coatings to seal absorbent brick and other outside surfaces may be needed.

Spread a layer of moisture-barrier material over the soil in crawl spaces under houses. You can use heavy roofing paper

or polyethylene plastic film. Good ventilation is important. If possible, do not enclose the crawl space. In extreme cases, a fan or blower may be needed to move the humid air from under the building.

If your clothes dryer is equipped with a vent, have it exhausted to the outside to remove moist air.

Dry the air

Air conditioners and dehumidifiers. Cool air holds less moisture than warm air. Properly installed air-conditioning systems remove moisture from the air by taking up warm air, cooling it (which removes the moisture) and circulating the cool, dry air back into the room. In rooms that are not air-conditioned — especially the basement — mechanical dehumidifiers are useful. A humidistat can be attached to the unit to control the humidity. Mechanical dehumidifiers, however, can add heat to a room.

When using air-conditioners or dehumidifiers, keep windows and doors closed.

Heat

Get rid of dampness by heating the house for a short time. Then open doors and windows to let out the moisture-laden air. An exhaust fan may be used to force it out. Air in closets and other small areas can be dried by using an electric light continuously (60- to 100-watt bulb). The heat will prevent mildew if the space is not too large.

Caution
Be sure to place the light bulb far enough from clothing and other flammables to avoid the danger of fire.

Chemicals that absorb moisture

Silica gel, activated alumina, anhydrous calcium sulfate and molecular sieves may be used to absorb moisture from the air. These chemicals are not likely to be found in department stores, drug stores or hardware stores. In metropolitan areas, look in the yellow pages of the telephone book for scientific supply houses and suppliers of industrial chemicals. In rural areas or small towns, contact your local MU Extension center, high school chemistry teacher or the chemistry department of a college or university. Some of these chemicals are sold under various trade names by several companies, and others are produced by only one company.

These chemicals are not harmful to fabrics and feel dry even when they saturate the cloth. Hang cloth bags of the chemical in clothing closets. Or place an open container of it in the closet — on a shelf, preferably, or on the floor. See that the door is well-sealed and kept closed so that moisture from outside air will not get in. You may scatter the dry granules through layers of clothing and other articles that are to be stored in tightly closed chests or trunks.

All of these chemicals can be used over and over if you dry them between uses. Simply place the granules in a vented oven at 300 to 350 degrees Fahrenheit (149 to 177 degrees Celsius) for several hours. Then put the hot granules in an airtight container to cool. Silica gel and anhydrous calcium sulfate (specially treated with a color indicator) are pink when full of moisture, blue when dry.

Another chemical that absorbs moisture from the air is anhydrous calcium chloride. Calcium chloride is used in some states for melting snow on the highways, so your local road department may be able to furnish names of suppliers. The chemical is available in small, white granules that hold twice their weight of water. But it liquefies as it absorbs moisture. So do not let this chemical touch clothing or household textiles; it can make holes in them.

To use anhydrous calcium chloride, place the granules in a simple, cup-shaped container made from nonrusting screen or waxed cardboard (milk carton) perforated with small holes. Support the container in an enameled pot so the liquid can drip away from the container, leaving the calcium chloride to take up more moisture. Then place the pot in the closet, preferably on the shelf, and keep the door shut and sealed. One pound (454 grams) of calcium chloride will last from 2 weeks to 2 months, depending on the humidity. When only liquid is left, discard the liquid and start over.

Caution
Add water to the liquid before disposing of it.

Circulate the air

Air movement is excellent at removing moisture. When the air outside is drier than that inside, ventilation allows the dry air to enter, take up excess moisture and then be carried outside. When natural breezes are not sufficient, you can use electric fans placed in a window, set in a wall or vented to the attic to move air from the house.

Poorly ventilated closets get damp and musty during continued wet weather, and articles stored in them are apt to mildew. Try to improve the air circulation by opening the closet doors or by installing a fan.

In addition, hang the clothes loosely so that air can circulate around them. Dry all wet clothing (including clothes wet from rain or perspiration) before putting it in the closet.

Cooking, laundering, and bathing may add 2 gallons (7.6 liters) or more of water a day to the house, unless circulation is adequate. It is often necessary to use some type of exhaust fan.

Get rid of musty odors

Musty odors, which indicate mold growth, are sometimes noticeable in basements and shower stalls. Take special precautions to get rid of musty odors as soon as possible to prevent further objectionable and damaging mold growth. Usually musty odors disappear if the area is well heated and dried. If the odors remain, the following treatments may be necessary:

In basements, use chlorinated lime (commonly called chloride of lime or bleaching powder) to remove musty odors. Sprinkle this chemical over the floor and let it stay until all mustiness disappears. Then sweep it up.

On cement floors and on tiled walls and floors in bathrooms, get rid of mustiness by scrubbing with a dilute solution of sodium hypochlorite or other chlorine bleach available in grocery stores. Use 1/2 to 1 cup of liquid household bleach to a gallon (3.8 liters) of water. Rinse with clear water and wipe as dry as possible. Keep windows open until walls and floors are thoroughly dry.

Caution
Work quickly and carefully on plastic and asphalt tile to avoid spotting the surface.

Quaternary ammonium compounds (available in janitorial, dairy and poultry supply houses) may also be used on floors and walls. Select a product that is registered and labeled for the particular use you have in mind. Not all compounds are equally effective.

Aerosol sprays for cleaning and sanitizing bathroom walls are also available.

Special care for some articles and surfaces

Preventing mildew on clothing and household fabrics

Keep fabrics dry. Never let clothing or other fabric articles lie around damp or wet. Dry soiled clothes before putting them into the hamper. Wash out dishcloths and hang them to dry. Spread out washcloths and damp towels. Stretch out wet shower curtains. It is the wet curtain left bunched together or sticking to the wall or tub that is most likely to mildew. Sprinkle only as many articles as can be ironed in a day. Shake out and dry those not ironed.

Dry washed garments and fabrics thoroughly and quickly. Fabrics dried slowly may get sour and musty smelling — a sign of mold growth.

To help keep moisture out of clothing and household fabrics and thus make them less susceptible to mold growth, treat them with water-repellent sprays. Spray draperies, slipcovers, mattresses, overshoes and jackets and other outer garments.

Fungicide products that may be sprayed on fabrics to give them mildew protection are available in low-pressure aerosol containers. Some germicidal, mothproof and water-repellent sprays may also protect against mildew. Read labels on the container for information.

For adequate mildew protection, wet the surface of the fabric thoroughly with the spray. Unless the sprayed fabrics are kept in a closed container, they should be examined frequently and resprayed. For precautions, see Use of pesticides, including fungicides.

Clean before storing. If clothing or household textiles are not treated with a mildew-resistant finish, be sure to wash or dry clean them before storing, as soiled articles are more likely to mildew than clean ones. Unless you know that your laundry starch contains a mildew inhibitor, do not leave starch in fabrics you are going to store; molds feed on starch.

From time to time on warm, dry days, sun and air the articles stored in closets. It pays to occasionally inspect cotton, rayon, leather, and woolen clothing stored in garment bags. Unless such materials are stored with a mildew inhibitor, they may mildew. A closed bag, dampness and hot summer weather make ideal growing conditions for molds.

Store with a mildew inhibitor. Certain chemicals give off vapors that inhibit mold growth and can protect fabrics during storage.

One such chemical, paradichlorobenzene, effectively controls mildew on clothing and other apparel when used in packages, trunks or garment bags kept as nearly airtight as possible. This chemical, which is widely recommended for moth control, is available in grocery, drug and department stores under various trade names.

Scatter paradichlorobenzene crystals through the folds of garments to be packed in boxes, or hang bags of crystals at the top of garment bags so the heavy vapors settle on the materials being protected. Use about 1 pound (454 grams) of the crystals for 100 cubic feet (2.8 cubic meters) of airspace, proportionately less for small spaces. A closet 3 feet deep by 4 feet wide by 8 feet high (0.9 by 1.2 by 2.4 meters) has an airspace of 96 cubic feet (2.7 cubic meters). As the vapors leak out, mildew protection disappears and the chemical must be replenished.

Paradichlorobenzene is also available in spray cans.

Caution
Do not inhale the spray. Paradichlorobenzene damages some plastics. Therefore, remove plastic buttons and ornaments from garments and use wooden or metal hangers instead of plastic clothes hangers. See other precautions in the section Use of Pesticides.

Paraformaldehyde is another chemical that has mildew-inhibiting properties. It is sold in powder form at drugstores. Use paraformaldehyde to protect stored clothing and bedding. Place bags of the chemical where the vapors can circulate and reach all surfaces of the stored articles. Use a mixture of 3.15 ounces (89.30 grams) of actual paraformaldehyde and 0.35 ounce (9.92 grams) of paradichlorobenzene (9:1 ratio) for every 500 cubic feet (14.16 cubic meters) of airspace. A 9- by 10-foot room, 8 feet high (2.7 by 3 by 2.4 meters), contains 720 cubic feet (20.3 cubic meters) of airspace.

Low-pressure sprays containing mildew-inhibiting chemicals will also help control molds and mildew growth in a closed area. To be effective, the spray must wet the interior surfaces of the closet or storage container. Thoroughly spray into cracks and crevices. Respray as frequently as necessary.

Caution
Do not inhale the mist from the spray, since the chemical is poisonous. And do not use the spray near a flame. For directions for spraying fabrics, see the section "To remove mildew."

Preventing mildew on leather goods

To protect leather against mildew, treat with low-pressure aerosol sprays that carry specific directions. Shoe and luggage stores may have these aerosol sprays that have been specially made for leather goods.
Before treating the article, test the spray on a small area where it will not show. Do this to see whether it will change the color of the leather. Repeat the treatment as directed on the label.

Caution
Do not inhale the mist from the spray and do not use spray near flame. Follow all precautions given on the can. See the section "Store with a mildew inhibitor."

Another way to protect leather goods is to apply a good wax dressing. A thin coat of floor wax applied to shoes — to both the uppers and the soles — keeps moisture out and helps prevent mildew. Some commercially available waxes or silicon resins have antimildew properties. However, some shoe dressings contain antifungicidal ingredients that might discolor white or light-colored leather.

During warm, humid weather, protect stored shoes, jackets, luggage and other leather articles with paradichlorobenzene or paraformaldehyde. (See the section "Store with a mildew inhibitor.") Wrap the articles along with the chemical in packages and seal them. If there is any plastic on these articles, do not use paradichlorobenzene. Leather goods can also be protected by wiping them with a solution of 3/8 ounce (11 grams) of salicylanilide in 1 quart (0.95 liters) of rubbing alcohol. Dry the articles before putting them away.

Preventing mildew on unpainted wood

In damp, warm, poorly ventilated areas, surface mold often develops on wooden parts of buildings. Since new, unseasoned lumber is particularly susceptible to mildew, avoid using it whenever possible.

Preventing mildew on painted wood

Indoor wood surfaces covered with enamel or oil-resin paint rarely mildew. Softer paints on outdoor surfaces mildew more readily. Molds feed on the oil and minerals in the paint and cause a dirty-looking discoloration. They may penetrate the paint film deeply, even to the underlying wood.

Mildew-resistant paints in all colors for outdoor wood surfaces are available at paint and hardware stores. Manufacturers have suitably formulated their products with fungicides to help combat mildew attack.

Caution
Mildew-resistant paints should not be used on window sills, playpens, beds or toys because these paints can harm small children if ingested.

Preventing mildew on paper and books

In damp summer weather, keep papers and books as dry as possible to help control mold growth. If you have an enclosed bookcase, keep a small electric light lit continuously in the bookcase or use a chemical dehumidifier, keeping the doors closed as tightly as possible. Hang a bag of paradichlorobenzene or paraformaldehyde in the closed bookcase. Or dust books and papers with paraformaldehyde, then package them and seal.

Caution
Paraformaldehyde is poisonous and may be very irritating to some persons. Avoid inhaling the fumes.

Books can also be protected by wiping them with a cloth wet with a solution of 3/8 ounce (11 grams) of salicylanilide in 1 quart (0.95 liters) of rubbing alcohol. Or use low-pressure sprays containing a fungicide to protect paper products against mildew. Unless they are kept in closed containers, respray them frequently.

Removing mildew

Clothing and household fabrics

Remove mildew spots as soon as you discover them. Do not give the mold growth a chance to weaken or rot the material. Brush off any surface growth outdoors to prevent scattering the mildew spores in the house. Sun and air fabrics thoroughly. If any mildew spots remain, treat washable articles as described below. Dry clean nonwashable articles.

Wash mildew-stained articles at once with soap or detergent and water. Rinse well and dry in the sun. If any stain remains, use lemon juice and salt or another bleach. If you use a bleach, be sure to test colored fabrics for colorfastness.

- **Lemon juice and salt**
  Moisten stain with a mixture of lemon juice and salt. Spread in the sun to bleach. Rinse thoroughly.
- **Peroxygen bleach**

Mix 1 to 2 tablespoons of sodium perborate or a powdered bleach containing sodium perborate or potassium monopersulfate with 1 pint (0.47 liters) of water. Use hot water if it is safe for the fabric; otherwise, use lukewarm water. Sponge the stain or soak the stained area in the solution, or sprinkle the dry powder directly on the dampened stain. Let solution or powder remain on the stain 30 minutes or longer, then rinse thoroughly. If mildew stains have been on the fabric for some time, it may be necessary to soak the fabric in the bleach solution overnight. Applying sodium perborate solution at or near the boiling point may remove stubborn stains. Be sure this treatment is safe for the fabric.

- **Chlorine bleach**
  Mix 2 tablespoons of liquid chlorine bleach with 1 quart (0.95 liters) of warm water. Sponge the stain or soak the stained area in the solution. Allow the bleach to remain on the fabric from 5 to 15 minutes, then rinse. An additional soaking in weak vinegar (2 tablespoons to a cup of water) will stop further bleach action. Never use a chlorine bleach on silk, wool or Spandex fabrics. Some fabrics with wash-and-wear or other special finishes may be damaged by chlorine bleaches. Articles with such finishes usually have a warning on the label or on a hang tag attached to the garment when it is sold.

Upholstered articles, mattresses and rugs

First, remove loose mold from outer coverings of upholstered articles, mattresses, rugs and carpets by brushing with a broom. Do this outdoors to prevent scattering mildew spores in the house.

Run a vacuum cleaner attachment over the surface of the article to draw out more of the mold. Remember that the mold spores are being drawn into the bag of the vacuum cleaner. If the appliance has a disposable bag, remove and dispose of it immediately. If not, empty the bag carefully (preferably outdoors) to avoid scattering mold spores in the house.

Do everything conveniently possible to dry the article — use an electric heater and a fan to carry away moist air. Sun and air the article to stop the mold growth.

If mildew remains on upholstered articles or mattresses, sponge lightly with thick suds of soap or detergent and wipe with a clean, damp cloth. In doing this, get as little water on the fabric as possible so the filling does not get wet.

Another way to remove mildew on upholstered furniture is to wipe it with a cloth moistened with diluted alcohol (1 cup denatured or rubbing alcohol to 1 cup water). Dry the article thoroughly.

Sponge mildewed rugs and carpets with thick suds or a rug shampoo. Then remove the suds by wiping with a cloth dampened with clear water. Dry in the sun if possible.

Use a low-pressure spray containing a fungicide to get rid of mildew. Respray frequently, especially in localities where mildew is a major problem.

Vapors of paradichlorobenzene or paraformaldehyde, used in enclosed areas, will stop mold growth. See the section "Store with a mildew inhibitor."

If molds have grown into the inner part of an article, send it to a reliable disinfecting and fumigating service. Such services are often listed under "Exterminating and Fumigating" or "Pest Control" services in the yellow pages of the telephone directory.

Leather goods

To remove mildew from leather goods, wipe with a cloth moistened with diluted alcohol (1 cup denatured or rubbing alcohol to 1 cup water). Dry in a current of air. If mildew remains, wash with thick suds made from a mild soap or detergent, saddle soap, or a soap containing a germicide or fungicide. Then wipe with a damp cloth and dry in an airy place. Polish leather shoes and luggage with a good wax dressing.

Shoes contaminated with fungus growth on the inside often develop unpleasant odors, and colored mildew shows up on the inner sole and linings and up into the toe. You can remove this kind of mildew with low-pressure sprays especially intended for freshening shoes; these sprays are available at shoe and department stores. Use these products as directed.

Another way to stop mold growth in leather goods is to place the leather goods in a container along with crystals of

commercially prepared paradichlorobenzene-paraformaldehyde. Close the container tightly and allow the chemicals to vaporize. See the section "Store with a mildew inhibitor."

The vapors from these chemicals are effective in killing molds that have grown into leather, but they give no lasting protection against future contamination. As the vapors leak out, the chemicals must be replaced. Before using the shoes or luggage, air them thoroughly.

Wood

Use heat and increase the air circulation to get mildewed wood as dry as possible. Badly infected wood may need to be replaced, preferably with wood that has been treated or that is naturally decay-resistant.

Thoroughly clean mildewed surfaces, woodwork and other wooden parts by scrubbing them with a mild alkali, such as washing soda or trisodium phosphate (8 to 10 tablespoons to a gallon (3.8 liters) of water), or with disinfectants, such as a quaternary disinfectant or pentachlorophenate. Paint and grocery stores and janitors' supply houses sell these products under various trade names. Rinse the wood well with clear water and allow the wood to dry thoroughly. Then apply a mildew-resistant paint. (See the section "Give special care to some articles and surfaces" for precautions.)

If the mold has grown under the paint or varnish, remove all the paint or varnish from the stained areas. Then scrub with a solution containing 8 to 10 tablespoons of trisodium phosphate and 1 cup of household chlorine bleach to a gallon (3.8 liters) of water. Stronger solutions can be used if necessary. Wear rubber gloves.

If stain remains, apply oxalic acid (3 tablespoons to 1 pint (0.47 liters) of water). Caution: The acid is poisonous — handle carefully. Finally, rinse the surface thoroughly with clear water. Dry well before refinishing.

Paper and books

Remove any dry, loose mold from paper with a clean, soft cloth. If mildewed paper is damp, dry it first in an airy place. To dry wallpaper, heat the room for several hours or even days to dry the plaster as well as the paper. Plaster should be dried slowly to prevent cracking.

If mildewed paper is washable, wipe it gently with a cloth wrung out of thick soapsuds, then with clear water. Take care not to wet the paper more than necessary. Do not scrub it. Finally pat with a soft, dry cloth. If stains remain, bleach with a solution of a household bleach, then sponge with a cloth wrung out of clear water. For small stains, a commercial ink eradicator may be useful.

"Fan out" pages of books to increase air circulation. If the books are very damp, sprinkle cornstarch or talcum powder between the leaves to absorb the moisture. Leave starch or powder on for several hours, then brush off. See the section "Give special care to some articles and surfaces."

Use of pesticides

Pesticide use is governed by a federal law and administered by the Environmental Protection Agency. This law requires manufacturers to register pesticides and makes it illegal for people to use them except in accordance with the instructions on the label.

When used as directed, pesticides are safe and effective; used improperly, they can be injurious to humans, animals and plants. We caution you to read and follow all directions and precautions on pesticide labels. Note particularly what the label says on how to:

- Store pesticides properly.
- Apply pesticides so that they do not endanger humans or livestock or household pets.
- Dispose of pesticide containers so that they do not contaminate water or leave illegal residues.

Note
Safety precautions that should be taken.

- Keep pesticides out of reach of children.
- Avoid prolonged breathing of pesticide sprays or dust.
- Wear recommended protective clothing and equipment.
- Avoid swallowing, splashing in eyes, or spilling pesticides on parts of the body or clothing.
- Know appropriate antidote to use, and have the telephone number of your local Poison Control Center available for emergencies.

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