Mold and Mildew

Your simple guide on avoiding it



Go knowing

If it matters to you, it matters to us

When you move abroad, you want to be sure that your precious belongings will arrive in good condition. If you are moving to or from a humid climate, where mold and mildew occur most, there are precautions you can take to prevent it. If it does form, there are also proven removal techniques.

Because our goal is to help you move and settle in as quickly as possible, we share your desire to keep your possessions safe. This guide is one small way we hope to make your transition simpler.

For more helpful information about moving internationally, visit <u>www.crownrelo.com</u>.



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1. How to prevent and remove mildew

Mildew is a thin, often whitish, growth produced on many kinds of surfaces by molds. Molds are simple plants belonging to the group known as fungi. Though always present in the air, molds that cause mildew need moisture and certain temperatures in order to grow. They commonly develop in muggy summer weather, especially in houses that are closed.

Molds that cause mildew flourish in damp, warm, poorly-ventilated places such as cellars, crawl spaces in houses without basements, closets and even damp clothes and shower curtains. In homes, these molds tend to develop on fabrics like cotton, rayon, silk and wool and on wood and paper. Newly built houses are also more susceptible to the growth of these molds due to the moisture in building materials.

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



2. Prevention

2.1 Keep things clean

Keep closets, dresser drawers, basements and any place where mildew is likely to grow, as clean as possible. Soil on articles can provide ideal conditions for the growth of mildew. Greasy films, such as those that form on kitchen walls, also contain many nutrients for mildew organisms.

Soiled clothing is more likely to mildew than clean clothing. Because most man-made fibers, such as acetate, acrylic, polyester and nylons, are resistant to mildew, clean fabrics of these fibers will not support mold growth. But soil even on these fabrics may supply food to start mildew. Thorough cleaning of all soiled fabrics, regardless of fiber-type, may help prevent mildewing.



2.2 Get rid of dampness

2.2.1 By drying 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, and circulating the cool air back in to the room. Mechanical dehumidifiers are useful in non air-conditioned homes, and in basements without air-conditioning. A humidistat can be attached to the unit to control the humidity in a room.

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

Heat – If necessary, get rid of the dampness by heating the house for a short period of time. Then open the doors and windows to let the moisture-laden air out. An exhaust fan may be used to force it out.

To dry the air in closets and other small areas, an electric light may be burned continuously. The heat will be sufficient to prevent mildew if the space is not too large. Precaution: Be sure to place the light bulb at a sufficient distance from clothing to avoid the danger of fire.

Chemicals that absorb moisture -

Silica gel. activated alumina. or calcium chloride may be used to absorb moisture from the air. They are sold in department stores and drugstores and by building-supply dealers, sometimes under various trade names. Silica gel and activated alumina are not harmful to fabrics. The porous granules remain dry on the surface even when saturated - they hold half their weight of water. To use, hang cloth bags of the chemical in clothing closets, or place an open container of it in the closet – preferably on a shelf or the floor. Keep closet doors closed so that moisture from the 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.

To dry, simply place moist granules in a vented oven at 300°F for several hours. Then put in an airtight box and cool before reusing. Silica gel is specially treated with a color indicator and is pink when full of moisture, blue when dry. Calcium chloride also absorbs moisture from the air. It is available both in small white granules of the chemical, and in specially prepared products that employ calcium chloride soaked on a porous clay-like material.

Calcium chloride-on-clay products do not drip when saturated. They can be regenerated by driving off the absorbed moisture in an oven. To use one of these products, hang cloth bags that contain it in closets, basements, pantries, or wherever dampness occurs.

Granular calcium chloride holds twice its weight of water. But, as it absorbs moisture it liquefies. Do not let this chemical come in contact with clothing or household textiles; it can make holes in them.

To use granular calcium chloride, put it on a non-rusting screen supported in an enameled container. Then place the open container in the closet and keep the door shut. When granular calcium chloride becomes liquid replace it with fresh chemical.



Both silica gel and alumina can be used over and over, if dried between times.



2.2.2 By adequate ventilation

Ventilation is the process of renewing or circulating the air. These air movements are of great importance in removing excess moisture.



When the air outside is drier than inside, ventilation will allow dry air to enter the house, take up excess moisture, and be carried out. When natural breezes are not sufficient, electric fans can be used to circulate the air. They may be placed in a window, set in a wall, or ducted to the attic.

Poorly ventilated closets get damp and musty during continued wet weather, and articles stored in them are prone to mildew. Improve ventilation by leaving closet doors open to permit natural ventilation, or by installing a fan. In addition, hang clothes loosely to provide for proper air circulation. Dry all clothing wet by rain or perspiration before putting it in the closet.

Cooking, laundering and bathing may add two or more gallons of water to the house within one day unless ventilation is adequate. It is necessary to use some type of exhaust fan to provide adequate ventilation.

2.3 Get rid of musty odors

Musty odors, which indicate mold growth, are sometimes noticeable in such places as basements and shower stalls. Taking special precautions to fend off musty odors in a timely fashion will prevent the onslaught of mold growth. Usually musty odors disappear if the area is well heated and dried. If the odors remain, additional treatments (described in the following paragraphs) may be necessary.

Chlorinated lime (commonly called chloride of lime or bleaching powder) should be used in cellars with dirt floors to remove musty odors. Sprinkle and leave it over the floor 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 chloride bleaches available in grocery stores. Use ½ to 1 cup of liquid household bleach to a gallon of water. Rinse with clear water and wipe as dry as possible. Keep windows open until walls and floors are thoroughly dry.

Precaution: Work quickly and carefully on plastics and asphalt tile to avoid spotting the surface.

Quaternary ammonium compounds may also be used on floors and walls. They are usually available as 10% solutions. Use 1 ounce to each gallon of water.

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



2.4 Give some articles and surfaces special care

2.4.1 Clothing and household fabrics

Keep fabrics dry – Never allow clothing, or other fabricated articles, to remain damp or wet. Soiled clothes should be dried before depositing them into a hamper. Dishcloths should be washed and hung to dry, or spread out, as should damp towels. Wet shower curtains left bunched together or stuck to a surface will most likely form mildew, and should therefore be stretched out.

Wash soiled garments and household fabrics in plenty of hot soapy water; rinse well and dry thoroughly and quickly. Fabrics dried slowly may get sour and musty in smell – a sign of mold growth. When washing musty white cotton materials, add dilute chlorine bleach as directed on the container. (Never use chlorine bleach on silk or wool. Some colored fabrics and some treated with special finishes may also be affected by chlorine.) Sprinkle for ironing only as many articles as can be ironed in a day; shake out and dry those not ironed.

Clothing and other household fabrics should be treated with water-repellent sprays to assist with the eradication of moisture and decrease susceptibility to mold growth.

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

In order to have sufficient chemicals on the fabric for 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.



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 an inhibitor, do not leave starch in fabrics to be stored; mold feeds on starch finishes.

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

Store with mildew inhibitor – Certain volatile chemicals, the vapors of which inhibit mold growth, may be used to protect fabrics during storage.

One such chemical, paradichlorobenzene, effectively controls mildew on clothing and other apparel when used in packages, trunks, or garment bags that are kept as airtight as possible. This chemical, which is widely recommended for moth control, is available in grocery and drug 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 of the crystals for 100 cubic feet of air space, and proportionately less for smaller spaces. As the vapors leak out, mildew protection disappears and the chemical must be replenished.

Paradichlorobenzene is also available in spray cans.

2.4.2 Leather goods

To protect leather against mildew, sponge with lpercent solution of dichlorophene in denatured or rubbing alcohol. Hexachlorophene and thymol can also be used in the same way (I percent solution in alcohol). Your pharmacist can get these chemicals and make the solutions for you. Shoe and luggage stores may have solutions packaged especially for leather goods.

Before sponging the article, test the solution on a small area where it will not show to see if it will change the color of the leather. Treat both the inside and the outside of shoes; repeat as often as needed.

Another way to protect leather goods is to apply a good wax dressing. In selecting the one to use, read the labels on the packages. Some shoe dressings on the market contain both a fungicide (hexachlorophene or paranitrophenol) to prevent mold growth and wax or silicone resin to protect against perspiration and wet weather. A thin coat of floor wax applied to shoes - to both the uppers and the soles - keeps moisture out and so helps to prevent mildew. Do not use paranitrophenol on white or light-colored leather.

During warm, humid weather, protect stored shoes, jackets, luggage, and other leather articles with paradichlorobenzene or paraformaldehyde; wrap the articles in packages and seal them. If luggage has plastic fittings and hangers, do not use paradichlorobenzene.

A low-pressure spray containing a fungicide is another option for the prevention of mildew damage during storage. Spray shoes and other leather articles thoroughly to wet the surface. As soon as they are dry, wrap them or place them in airtight containers.

> **Precaution:** Do not inhale the mist from the fungicide and do not use spray near flame. Follow all precautions given on the can.



2.4.3 Paper and books

In damp summer weather keep papers and books as dry as possible to help control mold growth. Burn a small electric light continuously in the bookcase, with doors closed as tightly as possible. Alternatively, a chemical dehumidifier, such as silica gel or calcium chloride, can be used in a closed space.

Also effective in preventing mildew are the volatile mildew inhibitors, paradichlorobenzene and paraformaldehyde. Hang a bag containing one of these in the closed bookcase, or dust books and papers with paraformaldehyde, then wrap them in tight packages. Use this chemical sparingly; it is poisonous and may be very irritating to some persons.

Low-pressure sprays containing a fungicide can protect paper products against mildew. Unless they are kept in a closed container respray them frequently.



To prevent mildew on book covers, apply a clear shellac or thin varnish to which 2 to 3 percent of salicylanilide or dichlorophene has been added. First try to shellac on a small section of the cover, to see if it will change the color.



3. Removal

3.1 Clothing and household fabrics

Remove mildew spots as soon as they are discovered. Don't 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. Fabrics should be aired out in the sun. 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, bleach with lemon juice and salt or use a bleach. Test colored fabrics for colorfastness to the bleach.

Lemon juice and salt – Moisten stain with a mixture of lemon juice and salt. Lay out in the sun to bleach then 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 of water. Use hot water if safe for fabric; otherwise use lukewarm water. Sponge or soak the stained area in the solution. You can also sprinkle the dry powder directly on the damped station.

Let solution or powder remain on the stain 30 minutes or longer, then rinse thoroughly. If the mildew stains have been on the fabric for some time, it may be necessary to soak the article overnight in the bleach solution. If it is safe for the fabric, the use of sodium perborate at, or near, boiling point may remove stubborn stains.

Chlorine bleach – Mix 2 tablespoons of liquid chlorine bleach with 1 quart warm water. Sponge stain or soak stained area in the solution. Allow bleach to remain on fabric from 5 to 15 minutes, then rinse thoroughly. Never use a chlorine bleach on silk, wool, or spandex fabrics. Some fabrics with wash-wear or other special finishes may be damaged by chlorine bleaches.



3.2 Upholstered articles, mattresses and rugs

Loose mold should be removed first from the outer coverings of upholstered articles, mattresses, rugs and carpets by brushing with a broom. Do this outdoors if possible to prevent the scattering of mildew spores in the house.

Vacuum 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 so you should empty the bag carefully (preferably outdoors) in order 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 wrung out of diluted alcohol (I cup denatured or rubbing alcohol to I cup water). Dry the article thoroughly.

Sponge mildew rugs and carpets with thick suds or a rug shampoo. 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 as directed will stop mold growth.

If molds have spread 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 of the classified section in your local directory.



3.3 Leather goods

To remove mildew from leather goods, wipe with a cloth wrung out of 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 of a mild soap or detergent, saddle soap, or soap containing a germicide or fungicide. 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 various colored growths show on the inner sole and lining and up into the toe. You can remove this kind of mildew with formaldehyde solution, obtainable from your druggist. Moisten a cotton-tipped applicator stick with the solution and swab the inside of each shoe thoroughly. Then wrap shoes tightly in a paper or plastic bag and allow the formaldehyde vapors to permeate the shoe materials for at least an hour. Before wearing the shoes, air them thoroughly out-of-doors. Precaution: Vapors of formaldehyde are very irritating; do not inhale them. Do not get the solution on your skin.

Low-pressure sprays especially intended for freshening shoes are available at shoe and department stores. They contain hexachlorophene, dichlorophene, or other fungicides. Use them as directed and repeat as needed.

Another way to stop mold growth in leather goods is to scatter crystals of paradichlorobenzene or to dust paraformaldehyde powder in shoes or luggage, then place in tight containers.

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.

3.4 Wood

Use heat and improved ventilation to get mildewed wood as dry as possible. Wood that is badly infected may need to be replaced, preferably with wood that has been treated or that is naturally decay-resistant.

Clean mildewed floors, woodwork and other wooden parts of structures by scrubbing them with a mild alkali, such as washing soda or trisodium phosphate (4 to 6 tablespoons to a gallon of water) or with disinfectants such as a quaternary disinfectant or pentachlorophenate. Rinse well with clear water and allow the wood to dry thoroughly. Then apply a mildew-resistant paint.

If the mold has grown into the wood under paint or varnish, it may be necessary to scrub the wood first with an abrasive cleaner. Follow this by washing with a solution containing 4 to 6 tablespoons of trisodium phosphate and 1 cup of household chlorine bleach to a gallon of water. Finally, rinse the wood well with clear water. Dry thoroughly and apply a wood preservative before repainting.

3.5 Paper and books

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

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

Spread the pages of books out fan-wise to air. If the books are very damp, sprinkle cornstarch or talcum between the leaves to absorb the moisture. Leave starch or powder on for several hours, then brush off. See suggestions for keeping books and papers dry. Use a mildew inhibitor such as paradichlorobenzene or paraformaldehyde to stop mold growth.



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