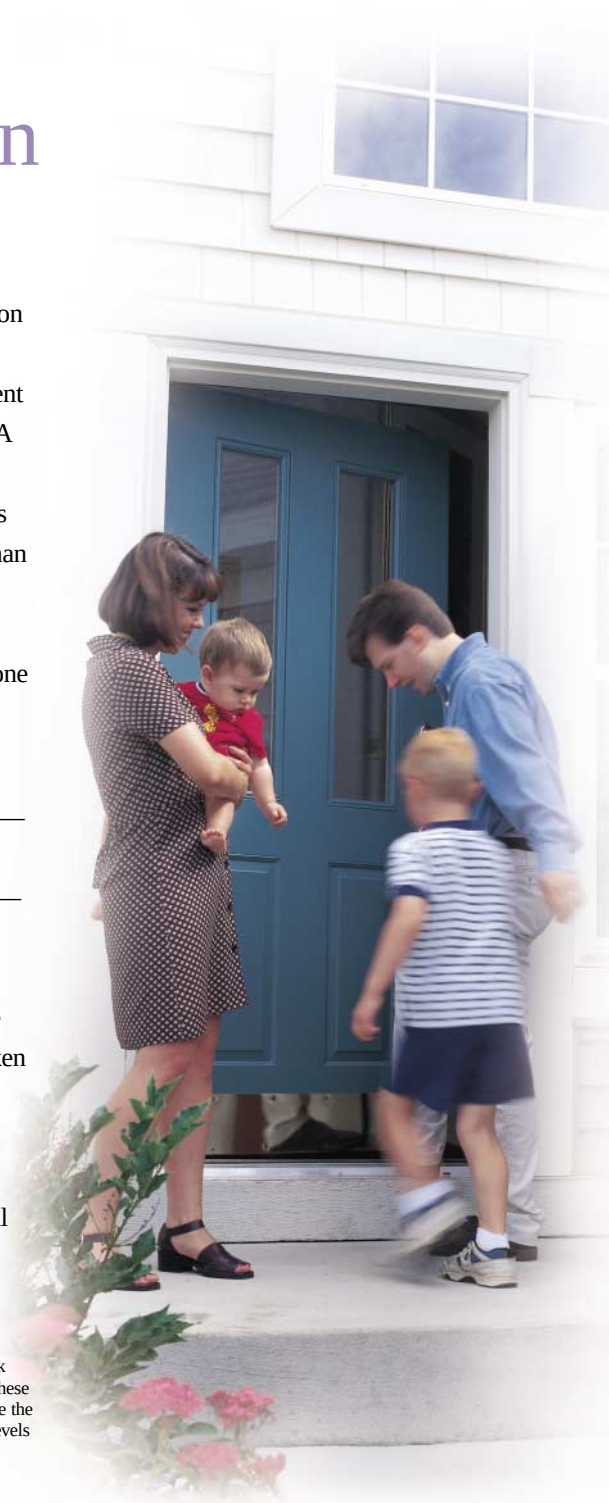
Introduction

According to the U.S. Environmental Protection Agency (EPA), many people spend as much as 90 percent of their time indoors. Another EPA study indicates that indoor air pollution may be two to five times higher—and occasionally more than 100 times higher—than outdoor levels. As a result, the EPA has identified indoor air pollution as one of the top 5 urgent environmental risks to public health.

Exposure to indoor air pollutants — such as smoke, dust, pet dander, radon*, mold and other pollutants— can pose serious health risks and contribute to respiratory disease, asthma and even lung cancer. The good news is that steps can be taken to significantly reduce, and even eliminate, many causes of indoor air pollution. By following the tips outlined in this booklet, you'll improve the indoor air quality in your home and breathe easier.



* This radioactive gas is given off by soil or rock with trace amounts of uranium or radium, as these elements decay. Concentrations of radon inside the home can range from relatively low outdoor levels to hundreds of times as much.

Reduce Indoor Allergens

Dust mites and their debris, mold, pet dander and pollen are potent allergens and can travel through the air undetected. They can be inhaled and enter the respiratory system. Infectious and non-infectious diseases can be caused by various biological agents found in a home. Health problems can result if a home has a poorly maintained ventilation system.

If you must keep pets, bathe and groom them often and minimize their access to carpeted areas and bedrooms of anyone in the house with asthma or allergies. Pet dander (minute scales of animal skin) is a known allergen.

Window coverings are magnets for dust. Use window shades made of plastic, wood or other washable materials for easy cleaning.

Mold can be found in the soil of houseplants—so check them often. If mold growth is evident, the plants may need to be re-potted or kept outdoors.

Prohibit smoking in the home. Homes with one or more smokers often have particle levels several times higher than outdoor levels.

Place allergen-resistant covers over mattresses and pillows. Feather pillows and down comforters are not recommended for individuals with asthma or allergies. Bedding should be washed every week, in water that is at least 130 degrees Fahrenheit (hot setting).

Reduce indoor air humidity

to less than 50%. This may vary from region to region across the country. Be sure to consult with your personal physician for an appropriate recommendation. This level will help reduce, and potentially eliminate, mold growth and dust mites—well known allergens found in most households. If humidity levels are too low, viruses and bacteria in the home can spread easily and increase the onset of respiratory infections, allergic rhinitis and asthma.

Consider using a higher

efficiency vacuum filter system, like a Filtrete™ Vacuum Filter System, or install a central vacuum system if your home has a chronic dust problem. If possible, install the central vacuum receptacle outside of your home or in the garage.

Never store more than a

few pieces of firewood indoors. Drying green firewood inside your home can generate mold spores that can contaminate your entire house.

Keep trees and shrubs

at least three feet away from the perimeter of a home. Tree and shrub roots can give surface water an easy route into a basement, which can lead to mold growth.

Remember that a little

common sense goes a long way. Regular and thorough cleaning of places where allergy-causing pollutants are likely to grow—including the kitchen, bathroom and basement—will keep them at a minimum.

Use a high efficiency air filter, like a Filtrete™ filter from 3M, in your central heating or air conditioning system. High efficiency filters can help reduce airborne microparticles.

Control Moisture In The Home

Moisture is generated in the home through many daily activities. Excess levels of moisture or relative humidity provide ideal environments for contaminants like mold and dust mites, which are known allergens for many people. Elevated levels of moisture can also contribute to structural damage within a home's walls, attic, foundation and exterior.

Daily activities in the kitchen and bathroom can introduce large amounts of water vapor and other contaminants into the home. Install and maintain hood exhaust fans of sufficient capacity over your kitchen range and in your bathrooms. Locate intakes where they can capture the most moisture and make sure that bath vents exhaust air outdoors and not into your attic or other interior space.

When using an exhaust fan, make sure there is a good air supply. If unsure, check with a qualified technician. Exhaust fans can draw a large amount of air from the home. As a result, a negative pressure situation may occur because the pressure inside the house is lower than the pressure outside the house.

This negative pressure can reverse the flow of combustion gases with fuel burning appliances. This reversal can draw combustion gases, including carbon monoxide (CO), nitrogen dioxide (NO_2) and water vapor into the home.

This condition occurs because the house is trying to create equal pressure between the inside and the outside of the home.

The exterior and interior of a home should be well-caulked, especially around windows and vents, to prevent water leaks. Without caulking, mold growth and structural problems may occur.

If you are building a home, insist that your builder install a proven waterproofing system, drain tile and vapor retarder to your home's foundation. A water-managed foundation can greatly improve indoor air quality by preventing problems associated with moisture.

Make sure a home's roof and windows are in good shape. Water leaks, condensation and elevated levels of humidity may not be visible, but moisture in interior wall spaces can encourage mold growth and structural degradation.

Ideally, your bathroom fan should be on a separate timer switch so it can continue removing moisture after you have turned out the light. Moisture generation from showering can enter bathroom walls and cause both fungal growth and structural decay.

It's important to route water away from your home's foundation. Keep gutters and drains clean and in good repair. Be sure downspouts have a five percent slope to carry water away from your foundation.

Water damaged carpeting can be a source for mold and other harmful contaminants. It should be removed. Consider replacing it with a smooth surface flooring such as tile, wood or vinyl.

Elevated levels of humidity can cause moisture problems including window condensation, structural rot and mold growth. To help control humidity and remove excess moisture levels from your home, consider installing a mechanical ventilation system, exhaust fans or a dehumidification system.

Insulation, installed with a good air/vapor retarder in the wall cavities, attics and foundation can help prevent water condensation problems from occurring since it keeps warm, moist air from meeting cold surfaces and forming condensation which can contribute to mold growth in the wall.

Avoid Heating Headaches

Combustion pollutants are gases or particles that come from burning organic materials such as wood, natural gas or charcoal. Combustion pollutants that may be present in homes are carbon monoxide (CO), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2). Exposure to combustion pollutants can lead to serious health problems, ranging from headaches and breathing difficulties to death. Common sources include furnaces, gas stoves and fireplaces.

Install a carbon monoxide detector with a digital display in your home. Check it regularly. Carbon monoxide, an odorless and colorless gas, can go undetected until health problems occur. Short-term and long-term exposure to high levels of CO can cause death.

Make sure all fuel burning appliances such as your furnace, hot water heater and gas range, are in good working order and that they are examined annually by a professional. Make sure the professional checks to see that the air intake is adequate and the exhaust system is operating properly.

When a wood fire is present, a window should always be kept cracked open, especially in a tightly sealed, energy-efficient house.

Select sealed combustion

or power vented heating appliances whenever possible. They have their own air supply and exhaust directly to the home's exterior.

Kerosene space heaters and unvented gas heaters are possible health hazards, and should never be the primary source of heat.

Keep wood burning stove

emissions to a minimum. Make certain that doors in wood stoves are tight-fitting.

If you install a natural gas

or wood burning fireplace, choose one that draws outside air into the combustion chamber and has sealed glass doors.

Orange or sputtering

flames in a gas-burning furnace or stove are dangerous sources of carbon monoxide. If cleaning the furnace or stove does not eliminate the problem, call the gas company or a qualified service technician.

Check flues and chimneys

for blockage and cracks that allow fumes to enter the home. Smoke particles and soot from a fireplace can enter into the living space if a fireplace is not properly vented. Make sure the chimney has a good draft up the flue and is clear of debris.

Check Household Furnishings

Selecting furnishings for the interior of a home can be a challenge if any residents are sensitive to chemicals that are used in their manufacture or preservation. Many furnishings contain formaldehyde and other volatile organic compounds (VOCs) and can off-gas chemical emissions.

When selecting cabinets

and furniture, try to choose products made of solid hardwood, not particleboard. Cabinets made from particleboard have a wood veneer finish glued to them. The particles and the glue may contain formaldehyde that, when emitted, may act as an irritant. If purchasing furniture that contains particleboard, consider sealing it with a no or low VOC sealant.

Smooth surface flooring

material, such as tile, vinyl and wood, is easy to clean and harbors fewer particles. They may be the best choice if someone in your household has allergies or asthma.

If you use carpeting,

a product with a short nap is easier to clean. Area rugs and carpets that can be removed for frequent cleaning may be the best choice

Hang dry-cleaned items,

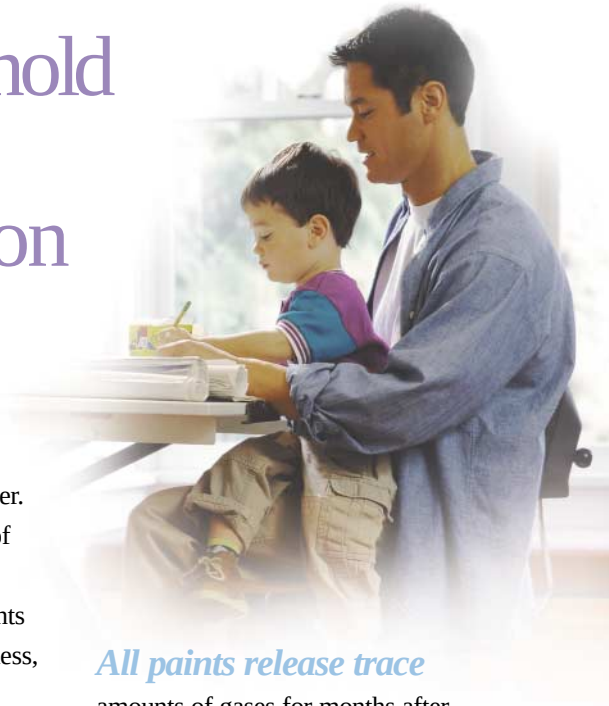
like draperies, on an outdoor clothesline to air out cleaning solvents before bringing them inside.

When remodeling,

use gypsum board, plaster or real wood for walls. Plastic or wood fiber paneling may emit formaldehyde and other VOCs.

Carpet is a hiding place for many small particles such as dust, pet dander, and mold, and vacuuming can redistribute many of these particles back into the air. Use a vacuum with a high efficiency filteration system to keep those problem particles in the vacuum cleaner where you want them. The Filtrete™ vacuum filter system is more than 95% efficient at capturing microparticles and its unique technology allows your vacuum to maximize its suction power, even as the bag fills.

Use Household Products With Caution



Cleaning agents, personal care products, paints, hobby products, solvents and pesticides make our lives easier. These materials are also sources of hundreds of potentially hazardous chemicals. The harmful components in these products can cause dizziness, nausea, allergic reactions and eye, skin and respiratory tract irritation. Some may even cause cancer with long-term exposure.

Use mechanical ventilation

to exhaust strong odors or fumes from the home. Perfume, room deodorizer, cleaning agents and even talcum powder can trigger an upper respiratory allergic reaction. Refrain from using harsh-smelling products or keep them at low levels through adequate ventilation.

All paints release trace

amounts of gases for months after application. These gases can cause upper respiratory irritation. For this reason, try to use no or low VOC-emitting paints on walls. Air out the room while painting and after application.

When installing flooring

materials use non-toxic adhesives or mechanical fasteners.

Try to avoid using aerosol

spray products. Substitute pump type products whenever they are available. Some aerosol products release particles in the air that can be inhaled into the lungs and absorbed into the bloodstream.

When performing operations that involve volatile materials such as gluing wood or cleaning metal, do so outdoors or in a well ventilated garage. When stripping furniture indoors, consider using products that do not contain methylene chloride.

Use low-toxic cleaning products whenever available. Always follow the manufacturer's instructions. You need to be aware that many household cleaning products are significant VOC generators. In addition, don't assume that all household products have been tested for health effects. Many have not, unless intended for human consumption. Consider natural cleaners like lemon juice, boric acid, baking soda and vinegar, which are good alternatives to chemical cleaning agents.

Don't permit recycling items such as newspapers, rags, cans and bottles to accumulate in your living space. These products can be sources of toxic vapors, unpleasant odors and bacteria. Store them in a covered area outdoors and recycle frequently.

In older homes, woodwork is often coated with lead paint. Make sure woodwork paint is well-maintained. Wipe away paint chips with a damp rag so that they don't get ingested by children. Be aware that stripping or sanding older, painted woodwork may release lead particles into your indoor air environment, which may then be inhaled. Consult an expert if lead paint needs to be removed.

Repair cracks in basement floors since they can be a source of moisture and radon. Install a radon monitor and have it analyzed after six months to see if your home has a problem.

Open sump basins can also be an entry point for radon and other soil gases. Cover and seal the sump basin and vent it to the home's exterior. Seal cracks in the foundation or basement or along molding. Persistent, elevated radon levels require the help of a professional contractor.

Never leave a car, lawnmower, or snowblower engine running in a garage, shed or other enclosed space. This can quickly fill the enclosed area with carbon monoxide.

Improve Air Filtration

Mechanical ventilation is a key component in creating and maintaining a healthier home. Ventilation provides a fresh source of outdoor air into the home and dilutes indoor air pollutants. High efficiency air filters, such as Filtrete™ filters from 3M, can help improve indoor air quality.

Install air conditioning so windows and doors aren't the only source of fresh air. By keeping windows and doors closed and air conditioning on, you can help prevent the entry of pollens and other outdoor allergens into the home.

Regularly change furnace and air conditioning filters every two or three months, or as required by the manufacturer.

Install and use exhaust fans that are vented to the outdoors in kitchens and bathrooms. Also vent clothes dryers outdoors. Eliminating some of the moisture that builds up from everyday activities helps to reduce mold growth.

Older homes may have furnaces or pipes covered with asbestos-containing insulating materials. Have your home inspected by someone familiar with asbestos issues. Removal is usually necessary only if the asbestos-containing insulation is coming apart/falling apart. If necessary, removal should be done by a professional contractor.

Home humidifiers and dehumidifiers can be breeding grounds for mold and bacteria. Make sure they are maintained and cleaned often.

If you have a ducted HVAC

(heating, ventilating and air conditioning) system, make sure that the fresh air intake on the exterior of the home is located well above ground and upwind from any local contamination sources, such as idling motor vehicles.

Consider purchasing

an energy recovery ventilator (ERV). Operating an ERV reduces heating and cooling costs in the home while providing a continuous supply of fresh air and whole house ventilation. Be sure the system you choose can provide adequate ventilation for the occupants and help reduce contaminants.

Forced air ductwork

requires occasional maintenance and cleaning to make sure it does not become the source of indoor air pollution. Before having your ductwork cleaned, try to determine if the ducts are actually the cause of health problems in your family. The source may lie elsewhere and cleaning the ducts may not solve the problem. If you hire a service to clean your ductwork, ask them if they can provide verification that residents of the home are protected from exposure to dislodged pollutants and chemicals used during the cleaning process.

It is important that all ducts

be tightly sealed to prevent air leakage and contaminants from entering into and circulating throughout a home. Air-sealing duct seams with mastic and mesh helps balance the pressure of airflow through the ducts.

Check your plumbing

system to make sure that all drains have full water traps and a connection to a venting system. This keeps toxic sewer gas from entering your home through the drain system. Sewer gas odor coming from a sink or water appliance is a sure sign of improper trapping and venting.