

HOUSING QUALITY MATTERS

for FIRST NATIONS



Basic Home Maintenance

HOME OCCUPANTS' GUIDE

CMHC—HOME TO CANADIANS

Canada Mortgage and Housing Corporation (CMHC) has been Canada's national housing agency for over 60 years.

Together with other housing stakeholders, we help ensure that Canada maintains one of the best housing systems in the world. We are committed to helping Canadians access a wide choice of quality, affordable homes, while making vibrant, healthy communities and cities a reality across the country.

For more information, visit our website at www.cmhc.ca

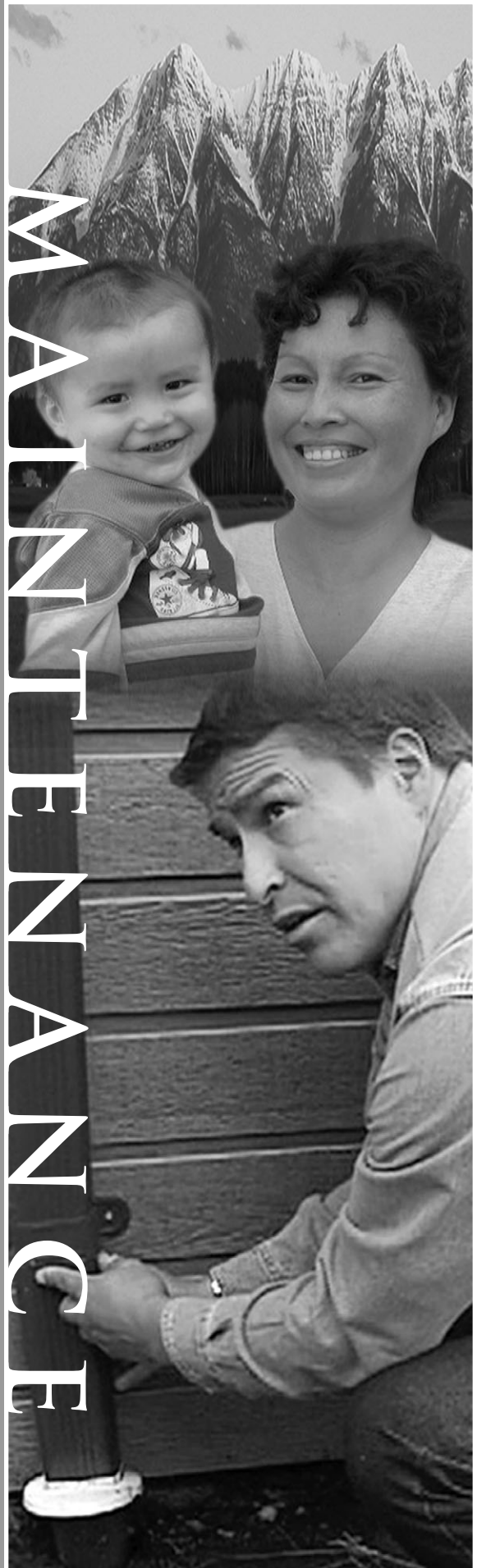
You can also reach us by phone at 1-800-668-2642 or by fax at 1-800-245-9274. Outside Canada call 613-748-2003 or fax to 613-748-2016.

Canada Mortgage and Housing Corporation supports the Government of Canada policy on access to information for people with disabilities. If you wish to obtain this publication in alternative formats, call 1-800-668-2642.

BASIC HOME MAINTENANCE

HOME OCCUPANTS'
GUIDE

MAINTENANCE



The information contained in this document represents the best available information at time of publication. CMHC assumes no liability for any damage, injury, or expense that may be suffered as the result of the use of this publication.

Climatic and Geographical Differences

Maintenance needs, concerns and customs differ across Canada due to climate and geography. Humidity varies from temperate rainforest to arid desert conditions. Temperatures range from extreme cold to sweltering hot. Building site soil conditions include permafrost, muskeg, flood plains, sand, clay and rock. All of these along with varying wind, rain and snowfall levels present unique challenges in many areas of Canada. Building customs vary across Canada both because of these challenges and due to cultural influences. The purpose of this booklet is to address general maintenance issues that are common to First Nation communities and therefore it may not address all the specific needs of any one community or area.

CMHC offers a wide range of housing-related information. For details, call 1-800-668-2642 or visit our home page at www.cmhc.ca

Cette publication est aussi disponible en français sous le titre: Introduction à l'entretien des maisons - Guide pour les occupants, OPIMS #63588.

© 2004 Canada Mortgage and Housing Corporation
Revised May 2005, January 2007

All rights reserved. No portion of this book may be reproduced, stored in a retrieval system or transmitted in any form or by any means, mechanical, electronic, photocopying, recording or otherwise without the prior written permission of Canada Mortgage and Housing Corporation. Without limiting the generality of the foregoing, no portion of this book may be translated from English into any other language without the prior written permission of Canada Mortgage and Housing Corporation.

Printed in Canada
Produced by CMHC
OPIMS # 63587

Table of Contents

Acknowledgements	x
Introduction to Basic Home Maintenance	1
Why Home Maintenance	1
What is Home Maintenance	1
Housing Policies for Home Maintenance	1
How to Do a Home Maintenance Needs Assessment	1
Warnings	1
Home Maintenance Assessment Checklist	2
Exterior	2
Interior	2
Safety with Ladders	4
Stepladders	4
Extension Ladders	4
Crawl Spaces	6
Conditioned Crawl Spaces	6
Unconditioned Crawl Spaces	6
Inspecting Your Crawl Space	6
Sealing Siding Penetrations	8
Wire and Pipe Penetrations	8
Duct Hoods	8
Repairing Vinyl Siding	10
Replacing Damaged Vinyl Siding Pieces	10
Repairing Wood Siding	13
Repairing and Replacing Damaged Pieces	14
Repairing Stucco Siding	15
Repairing Damaged Stucco	15



Cleaning Siding and Stucco	17
Moderate Dirt	17
Heavy Dirt	17
Moss, Mildew and Other Organic Growth	17
Power Washing	17
Eavestroughs and Downspouts	19
Eavestroughs (gutters)	20
Downspouts	21
Roofing Repair—Asphalt Shingles	22
Tabbing Down Loose Shingles	23
Replacing Damaged Shingles	23
Roofing Repair—Wood Shingles and Shakes	24
Inspecting Your Roof	24
Main Shut-offs	25
Electrical Panel, Main Breaker	25
Natural Gas, Main Shut-off Valve	25
Water, Shut-off Valves	26
Windows	27
Checking and Replacing Window Weatherstripping	27
Window Cleaning and Care	27
Doors	29
Exterior Door Weatherstripping	29
Door Hardware	30
Bifold Doors	31
Repairing Walls and Ceilings	32
Dents	32
Small Holes and Cracks	32
Popped Nails	33
Medium Holes up to 5 cm (2 inches)	33
Large Cracks 3 mm (1/8 inch) or larger	33
Large Holes over 5 cm (2 inches) or Water Damaged Areas	33
Torn Drywall Face Paper	34

Painting	36
Healthy Housing Tips	36
Lead in Paints	36
Preparation Before Painting	37
Priming	38
Interior Painting	38
Painting the Ceiling	38
Painting Walls	38
Exterior Painting Sequence	39
Cleaning Up	39
Oil-Based Paints	39
Disposal of Leftover Paint	39
Cleaning Sinks, Tubs and Shower Stalls	44
Sinks	44
Bathtubs and Shower Stalls	44
Drain Cleaning	44
Replacing Caulking in Bathrooms and Kitchens	46
Bathroom	46
Kitchen	48
Fixing Leaks in Waste Plumbing	49
Repairing Faucets	50
Replacing Washers and O-Rings in Seat and Washer Faucets	50
To Replace Washers and O-Rings	50
Repairing Diaphragm and Cartridge Stem Faucets	51
Repairing Ceramic Disk and Ball Faucets	52
Repairing Leaks at Handles and Spouts	52
Cleaning Aerators	52
Repairing Toilets	54
Repairing Toilets	55
Water Heaters	58
Flushing Your Water Heater	59
Testing a Relief Valve	59
Problem Solving	60
Determining the Age of Your Water Heater	61

Maintaining Septic Systems	62
Preventive Care and Maintenance	63
Recognizing Septic Problems	64
Healthy Housing™ and Indoor Air Quality	65
Why Homes can be Unhealthy	65
Three Keys to Making Homes Healthier (Eliminate, Separate and Ventilate)	66
Ventilate to Have Good Indoor Air Quality	67
Controlling Humidity	68
Relative Humidity	68
Moisture Sources	68
Ventilation	71
Natural Ventilation	71
Mechanical Ventilation (Fans)	71
Dehumidistats and Timers	74
Occupants' Guide to Mold	77
How to Prevent Mold from Growing	77
Mold-Proofing Your House, Room-by-Room	77
How to Tell if There Is Mold in Your House	79
How to Clean Up Small Mold Areas	79
Washable Surfaces	79
Moldy Drywall	79
Appliance Preventive Maintenance	81
Washing Machine	81
Dryer	82
Fridge	82
Range (Stove)	83
Fire Safety	85
House Fires Kill People	85
What Causes Fires	85
What Can I Do to Keep my Family Safe?	85
Your Family Fire Safety Plan	86
How do I Fight a Fire in my Home?	86
Here are Some Helpful Fire Safety Tips	86

Smoke Alarms	88
Smoke Alarms Should Be	88
Smoke Alarms Should Not Be	88
Ionization Sensors	89
Photoelectric Sensors	89
Maintenance and Replacement	89
Wood Heat and Chimneys	90
Woodstove	90
Connector Pipes	91
Chimneys	91
Chimney Fires	91
Firewood	92
Thermostats	93
Low Voltage Thermostats	93
Line Voltage Thermostats	94
Forced Air Furnace Maintenance	95
Duct Cleaning	97
Getting More Help	99
Glossary of Housing Terms	100

Acknowledgements

Canada Mortgage and Housing Corporation gratefully acknowledges and thanks the following individuals for their role in the development of Basic Home Maintenance: First Nations Home Occupants' Guide:

Gary Backlund
Leo Cameron
Alain Croteau
Vince Genereaux
Rob George
Cliff Grant
Richard Hall
Leo Hebert
Kelly Moote
Jim Munroe
Douglas Odjick
Sylvie Rouleau
Katie Ross
Ed Sinclair
Keith Maracle

This publication was funded by Canada Mortgage and Housing Corporation, B.C. and Yukon Region, Aboriginal Capacity Development.



Introduction to Basic Home Maintenance

Why Home Maintenance

When it comes to home maintenance, an ounce of prevention is often worth a pound of cure. Benefits to home maintenance include:

- saving money
- making homes healthier
- making living environments more enjoyable for home occupants and the community

What Is Home Maintenance

Preventive maintenance is the act of heading off problems before they occur. Usually preventive maintenance is used to prolong lifespans of certain housing components. Replacing bathroom *caulking* before leaks occur, and checking and cleaning bathroom fans are two examples of preventive maintenance.

General maintenance refers to repairing small problems before they become large and expensive problems. Sealing water penetrations in walls and fixing leaky roofs are some examples where a little time spent can prevent major repair costs in the future. General maintenance also includes minor tasks like fixing leaky faucets and running toilets. It may include removing mold and *mildew* from windows and wall surfaces.

Housing Policies for Home Maintenance

Most First Nation communities have housing policies and maintenance departments. The scope, responsibilities and administration of the policies vary between communities. Policies are often different for community-owned homes than for privately owned homes. It is important to familiarize yourself with the obligations and responsibilities in regards to maintenance for your home. In some communities all maintenance is the responsibility of the housing department and all work is performed by maintenance staff.

Nonetheless the occupant of the home knows that home better than anyone. That is why home occupants need to be aware of maintenance needs and concerns and be able to perform a home maintenance needs assessment.

How to Do a Home Maintenance Needs Assessment

Knowing when and where to do preventive and general maintenance is no easy task. You will find the sample *Home Maintenance Assessment Checklist* shown on the next page to be a useful guideline for carrying out an evaluation. By using the checklist to do a yearly maintenance walkthrough of your home, you can perform an examination of your home's potential problems and maintenance needs. The remaining pages of this book will help explain how to recognize many home maintenance issues and perform numerous home maintenance solutions. For those wanting to do a maintenance inspection, CMHC's *Homeowner's Inspection Checklist*, 62114, provides a monthly maintenance calendar that has many useful items.

Warnings

Safety should be paramount over all activities. Do not attempt any home maintenance activity without the proper tools, materials and safety equipment. Follow Workers' Compensation Board occupational health and safety regulations as well as manufacturers' specifications when using their products. Do not attempt to perform work that is beyond your abilities. Always be aware of safety hazards including hot water and live electrical circuits that could kill or injure you or those around you.

Whenever in doubt of your ability or if your safety is in question, contact your community housing department.



Home Maintenance Assessment Checklist

Exterior

<input type="checkbox"/>	1. Foundation: soil level at least 15 cm (6 in.) below the bottom of the siding/ ground slopes away from house, footings covered	(High soil levels and water can damage walls.) (Ground slope should drain rainwater away from house.) (If footings are exposed, frost upheaval can damage house.)
<input type="checkbox"/>	2. Siding/stucco condition (leaks)	(If siding is damaged or penetrated, moisture can leak in.)
<input type="checkbox"/>	3. Exterior paint condition	(Is woodwork protected from weather and UV damage?)
<input type="checkbox"/>	4. Downspout condition	(Downspouts intact, unclogged and draining away from house?)
<input type="checkbox"/>	5. Gutter condition	(Gutters in good condition and clean?)
<input type="checkbox"/>	6. Roofing condition	(Roofing damaged, shingles loose or curled?—check attic also)
<input type="checkbox"/>	7. Chimney condition	(If chimney cracked, call for professional inspection.) (Is chimney clean and cleanout door in place?)
<input type="checkbox"/>	8. HRV, fan hoods and dryer vent conditions	(Clean screens in exterior vent hoods and check flaps.)
<input type="checkbox"/>	9. Door condition—weatherstripping	(Check weatherstripping, hinges and latches.)
<input type="checkbox"/>	10. Crawl space	(Check for moisture, insects and rodents)
<input type="checkbox"/>	11. Other	(Check decks, railings and exterior stairs)

Interior

<input type="checkbox"/>	12. Door and window condition	(Check and adjust or repair if needed.)
<input type="checkbox"/>	13. Bath and kitchen caulking	(Check caulking around tub and sinks, replace if needed.)
<input type="checkbox"/>	14. Moisture problems	(Remove mold safely, use natural or mechanical ventilation to prevent moisture problems.)
<input type="checkbox"/>	15. Drywall damaged	(Repair damaged drywall.)
<input type="checkbox"/>	16. Paint condition	(Repaint where needed to protect surfaces.)

<input type="checkbox"/>	17. Other	(Loose flooring, rodents, termites, etc.)
<input type="checkbox"/>	18. Flush water heater/test pressure valve	(Flush water heater every 12 months.)
<input type="checkbox"/>	19. Carbon monoxide alarm—test	(CO alarms needed for oil, gas, propane or wood fired appliances, such as furnaces, heaters, stoves.)
<input type="checkbox"/>	20. Smoke alarms on each floor—clean	(Vacuum every 12 months, replace after 10 years) (For smoke alarms with batteries, install new batteries according to manufacturer's directions—often twice a year.)
<input type="checkbox"/>	21. Furnace filter—change	(Change furnace filters when dirty.)
<input type="checkbox"/>	22. HRV, bath fan and rangehood filters and flaps	(Clean inside fans and HRVs, wash filters, check flaps.)
<input type="checkbox"/>	23. Plumbing condition—pipes	(Inspect traps and joints for leaks and tighten if leaking.)
<input type="checkbox"/>	24. Plumbing condition—toilets	(Replace parts or wax seal if needed.)
<input type="checkbox"/>	25. Plumbing condition—faucets	(Replace washers or parts if dripping.)
<input type="checkbox"/>	26. Thermostats—working accurately	(Have malfunctioning thermostats replaced.)
<input type="checkbox"/>	27. Insulation—missing or damaged in places. Insulation exposed?	(Replace where missing for energy efficiency.) (Cover where exposed for health protection.)
<input type="checkbox"/>	28. Woodstove—connector pipe	(Is stovepipe in sound condition and screwed together at joints?)
<input type="checkbox"/>	29. Woodstove—exterior	(Are combustibles a safe distance away?)
<input type="checkbox"/>	30. Woodstove—inside fire box	(Are firebricks and gasket in good condition?)
<input type="checkbox"/>	31. Dryer duct and lint trap	(Is lint trap clean and duct undamaged?)
<input type="checkbox"/>	32. Appliance cleaning	(Clean fridge coils, washing machine hose screens, etc.)
<input type="checkbox"/>	33. Other	

Safety with Ladders

Home maintenance projects will usually require the use of a ladder to reach some of the higher locations inside and outside the home. There are a number of different ladder type products available to homeowners. Products such as special scaffolding are also available for tradespeople in the construction industry.

Personal safety must always be the first issue of concern when using ladders. The Workers' Compensation Board (WCB) has written a book on safety around the home. There are also seminars devoted to ladder and scaffolding safety. When you are first looking at undertaking any home maintenance project, always take into consideration the height of the project.

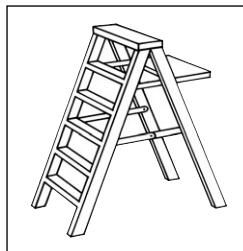
The following will provide a brief overview of what you should do when working with ladders.

Tools and Supplies

- ropes
- foam rubber
- shovel
- duct tape

Stepladders

- Follow WCB safety regulations for working with ladders and working on roofs.
- Only use CSA or ANSI Standard approved stepladders.
- When using a stepladder, always ensure the legs are separated to the maximum position, and are locked in place.
- Always ensure the legs are on secure ground and sitting flat.
- Check all rungs (steps) to make sure they are not broken or loose.
- Check that the rails are not bent, cracked or broken.
- *Never stand on the top step.*



- Have someone else hold the ladder while you are climbing up and down it.
- Wear non-slip shoes.
- Never lean over too far away from the ladder, instead climb down and move your ladder so that you are directly below your work.

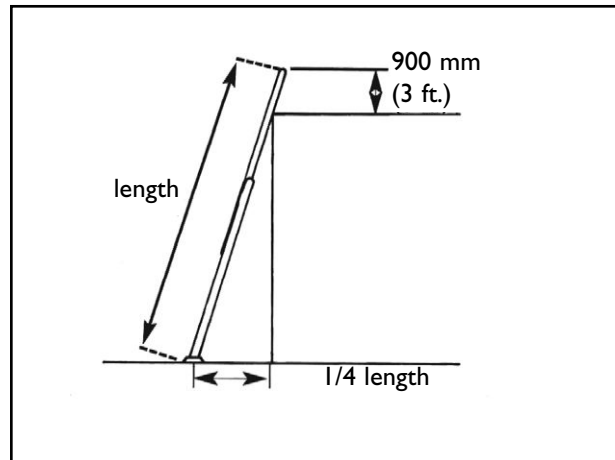
Extension Ladders



- Follow WCB safety regulations for working with ladders and working on roofs.
- Always look up above your head in the area where you want to set the ladder. Check for overhead wires, and avoid them at all times.
- Check the ground to see if it is soft. On soft ground one leg of the ladder may sink once your weight is on the ladder, causing the ladder to shift.
- Check the ground to ensure that it is level.
- Check the rungs to make sure they are not cracked, bent or broken.
- Check the rails (sides) of the ladder to make sure they are not bent, cracked or broken.
- Portable, single or extension ladders must have non-slip feet. Ladders with pivoting feet should be checked to make sure that both feet are flat on the ground or surface.
- Only use CSA or ANSI Standard approved ladders.
- Ladders must rest against a firm structure.
- Ladders must be set up with a 4 vertical to 1 horizontal slope. A rule of thumb is to stand

at the bottom of the ladder, facing the ladder with your feet touching the bottom rails. Extend your arms in front of you. Your fingertips should be touching the ladder rails at shoulder height.

- Ladders must extend approximately 1 metre (3 ft.) above a safe landing or *parapet wall*.
- Ladders should be tied, blocked, or otherwise secured to prevent slipping.
- Ladders used in locations such as doorways or passageways must be protected from being bumped or knocked over.
- Wear non-slip shoes.



TIPS

- When placing a ladder against vinyl siding, tie or tape a non-slip protection like foam on the tip of the ladder, such that the foam will protect the ladder from scratching the siding and will help prevent the ladder from slipping.
- Always have someone hold the ladder for you when climbing up or down it.
- When leaning a ladder against your *eavestrough* (gutters), install extra spacer supports in the gutters to prevent them from bending. Remember this location and use the same spot in the future to access your roof.
- Do not climb a ladder outdoors when there is thunder and lightning. Take extra care when climbing a wet ladder.
- Never leave a ladder standing. When not in use, take the ladder down.

Crawl Spaces

Does your home have a crawl space? Most Canadian homes don't and instead have either basements or are slab-on-grade type construction. A crawl space is defined as a shallow space between the lowest floor of a house and the ground. This space is somewhere between 60 cm and 1.8 metres high (2 – 6 ft.) but is usually only 60 – 90 cm high (2 – 3 ft.).

Crawl space concerns are mainly related to moisture, rodents and insect problems. Some crawl spaces flood due to high water tables or improper drainage. A poor, damaged or missing ground seal cover is a common cause of other moisture problems. Rodents, otters, raccoons, cats and dogs may find your crawl space to be a warm home and can cause problems.

Insects such as termites, carpenter ants and other woodborers can quickly do serious damage to a structure. If your crawl space is moist, it will be a good habitat for these types of insects. Spraying with poison is not a healthy solution to this problem. It may be required, but the cause of the moisture needs to be corrected first.

Conditioned Crawl Spaces

If your home has a crawl space and the crawl space is heated, then it is considered a conditioned crawl space. Normally the crawl space walls and rim *joists* will be insulated. If the access door to the crawl space is an exterior door, it too should be insulated and weatherstripped.

Conditioned crawl spaces should have closeable vents. These vents should be shut during the winter and opened during the non-heating season. The heat source should be turned off during the non-heating season. Many conditioned crawl spaces have electric *baseboard heaters* as their heat sources and a dial-type

thermostat mounted on the heater. Although the thermostat may be set to a low setting, these heaters will often come on at nighttime during the summer months, wasting energy and making homes hard to keep cool the following day.

Unconditioned Crawl Spaces

If there isn't a heat source for the crawl space, the floor system (crawl space ceiling) will typically be insulated and some provisions will have been made to keep pipes from freezing (heat tape and/or insulation). Crawl space vents may be the type that are always open or they may be the closeable type. Closeable type vents should be shut during the winter and opened during the non-heating season.

Tools and Supplies

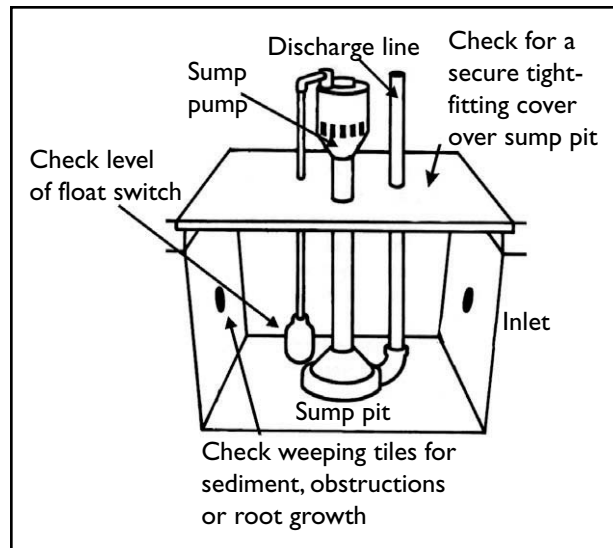
- coveralls
- kneepads
- gloves
- flashlight or trouble light
- cap

Inspecting Your Crawl Space

Crawl spaces should be inspected twice a year at the beginning and end of the heating season. They should also be inspected after periods of heavy rain.

- Inspect the crawl space floor for ground seal condition. The ground seal will either be a concrete skim coat, 6 mil or heavier poly (plastic film), or 6 mil or heavier poly covered with a thin layer of gravel. This ground seal is there to prevent moisture from the ground coming into the crawl space and adding to the home's moisture sources and causing mold. If the ground seal appears to be in poor condition, damaged or missing, you should have a new one installed.

- Inspect for signs of moisture or flooding. These might be in the form of white marks on the concrete, puddles, dried up puddles or *condensation*. If moisture signs are present, try to determine the source or call on the expertise of a maintenance worker.
- If your crawl space floods after heavy rains, a *sump pump* may be required. The crawl space floor will need to be sloped to drain to the *sump*. The *sump* should be covered to reduce airborne moisture. A better alternative is to drain the crawl space to a *sump* just outside the foundation and pump from this location. This will require creating a drainage system within the crawl space, which isn't usually an easy job to do. It will also require creating a hole in the foundation wall.
- Inspect your crawl space for wood boring insects. This is a sure sign of moisture problems and will lead to very expensive problems in a short period of time. If you see these insects or small piles of fine sawdust, the moisture problem will need correcting and the crawl space will most likely require treatment with the use of pesticides by a trained professional.



- Inspect for rodent or other animal signs such as droppings. Animals can damage the structure and insulation. They can also present a serious health risk.
- While in the crawl space, inspect the insulation to make sure it hasn't become dislodged and look at the plumbing to make sure it isn't leaking.
- Lastly, check heaters to make sure they are on for the heating season and off during the non-heating season. Check vents to make sure they are in the correct position—either open or closed depending on the season.

TIPS

- Having lights hardwired for your crawl space makes inspecting an easier job. A switch for controlling the lights should be located at the crawl space access door.
- Wear coveralls, gloves, a cap and kneepads when moving around the crawl space.
- If your crawl space has a smooth concrete skim coat, a mechanics creeper makes moving around in the crawl space easier.
- Do not store any object in the crawl space area that attracts moisture. This includes cardboard, carpet scraps, fabric or other such material.

Sealing Siding Penetrations

Most houses have at least a few wires and pipes penetrating the siding. These penetrations are easy areas for water to leak into walls and cause expensive problems.

Tools and Supplies

- hammer
- flat pry bar
- ladder
- nails
- caulking gun
- exterior *caulking*
- fibre gum

Wire and Pipe Penetrations

- To seal wire, pipe and other penetrations, first clean the surfaces, allow them to dry and then *caulk* or seal with fibre gum.

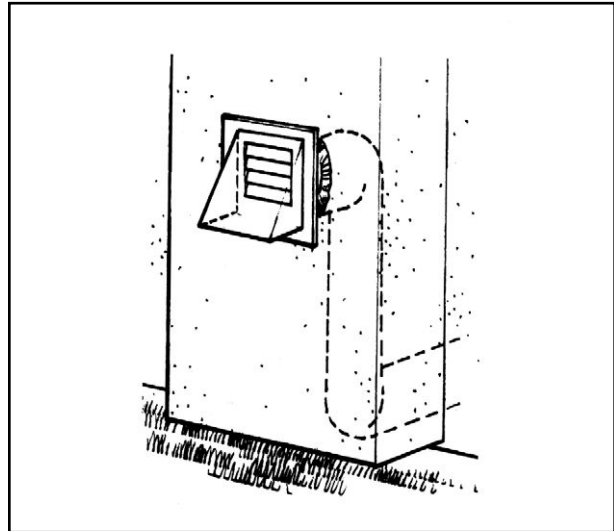


- Wires should have drip loops to prevent water from running down the wire into the wall. If missing, an electrician or maintenance person should be called to refasten the wire to create a drip loop.



Duct Hoods

Duct hoods for dryers, rangehoods and fan systems are another type of siding penetration. They are prone to damage and should be checked yearly.



- Check hoods for damage and repair or replace. Replacement hoods are sold at most hardware and building supply stores. They are available in plastic or metal and can have single or louvered flaps. Some come with magnetic closures, but this type should only be used on powerful exhaust systems that can overcome the magnet to push the flap open. When installing replacement hoods, remember to *caulk* during installation.
- Check flaps to make sure they still open and close properly. A clothes dryer flap that sticks open will cause heat loss and drafts. Flaps that are sticking can be cleaned and lubricated or replaced.
- Clean insect screens if part of the hood. Screen mesh should be no finer than 6 mm (1/4 in.) square openings. Finer openings do not allow proper airflows and will clog quickly.

TIPS

- *Caulking* should be rated for exterior use. Paintable *caulking* may be preferred for certain applications.
- Clean and dry surfaces before *caulking*. *Caulking* should be allowed to cure without freezing.
- For holes larger than the size of a dime, steel wool can be used as backing for *caulking* and will stop mice from chewing through.
- An old toothbrush works well to clean duct hood screens. If hood is part of an intake duct, the appliance should be shut off before the screen is cleaned. For exhaust hoods cleaning is easiest if the appliance is running.

Note: Many screens are removable for cleaning.

Repairing Vinyl Siding

The main purpose of siding is to keep rain and moisture from seeping into your walls and into the insulation that is within the walls. When wall cavities and insulation stay wet over a long period of time mold can form inside the walls. Maintaining vinyl siding requires an annual inspection; checking for loose pieces of siding, damaged pieces, and ensuring holes and penetration through walls are caulked and sealed.

Vinyl siding is used mainly because of its low maintenance quality. Houses clad with vinyl siding do not require exterior painting. Vinyl siding comes in different levels of quality, thickness, profiles and warranties.

As with any product, there are problems associated with vinyl siding. These include; being blown off by the wind if not properly installed, chalking or discoloring from the sun, becoming brittle in cold temperatures leading to it being easily damaged, and melting when close to a BBQ or grass fire.

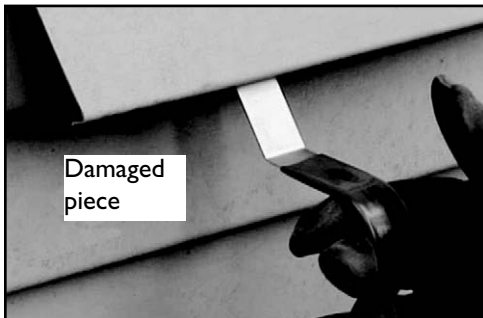
Tools and Supplies

- hammer
- siding replacement tool (zipper tool)
- replacement siding pieces
- flat pry bar
- ladder
- nails
- metal sheers
- measuring tape
- pencil
- rake and shovel

Replacing Damaged Vinyl Siding Pieces

Regular maintenance includes inspecting to replace missing pieces, repairing any damaged pieces and cleaning.

- Check for water pooling due to poor grading and drainage or splashing from the *eavestrough*. Splashing can be prevented by a change in ground surface material in the specified area. Soil levels should be at least 15 cm (6 inches) below the bottom of the siding to prevent moisture damage.
- Missing pieces should be replaced before moisture can cause damage. Follow manufacturer's instructions for installing replacement pieces.
- Damaged pieces can be removed and replaced by following the steps listed below.



1. Start by inserting the siding replacement (zipper) tool under the piece of siding (lap) immediately above the one you want to replace as shown in the picture on the left.

2. Pull the upper siding piece away to give you access to the nails holding the damaged lap in place so they can be removed.

3. Once the nails are removed, the damaged siding can be easily removed by using the zipper tool or by pushing downwards to separate the bottom of the damaged siding from the lap immediately below.

4. Installation of the new siding is basically a reversal of the removal procedure. Attach the bottom joint first. Once you have the bottom joint connected at one point, use a sliding motion to snap the rest of the lap into place.

5. While holding the upper lap away so you have access to the nail slots, nail the new lap into place.

6. Using the zipper tool with a sliding, or zipper motion, attach the upper lap to the new lap and your job is finished.

TIPS

- When repairing a corner post, you may require assistance from an experienced siding applicator for access to the proper tools and methods. Consider replacing with wood corners.
- Be sure to use galvanized or aluminum siding nails to prevent rust stains.
- REMEMBER, do not pound nails in tight. Leave the siding loose so it can expand and contract in the heat and cold.
- Cut off the damaged part of the panel you removed and save the undamaged part for any future repairs you may need to make.
- Siding should be overlapped by at least 38 mm (1 1/2 in.) or as specified by manufacturer's recommendations.
- Vinyl siding can easily be cut by hand with metal sheers. You do not need to cut with a circular saw or other power tools.

Repairing Wood Siding

The main purpose of siding is to keep rain and moisture from seeping into your walls and into the insulation that is within the walls. When wall cavities and insulation stay wet over a long period of time, mold can form inside the walls. Maintaining wood siding requires an annual inspection; checking for loose pieces of siding, damaged pieces, cracks, loose knots, rot and ensuring holes and penetration through walls are caulked and sealed.

Houses clad with wood siding require exterior staining or painting when wood grain starts to show and the colour fades. Repainting too often will cause the paint layer to become thick and more likely to crack or peel when exposed to temperature and moisture changes over the seasons.

As with any product, there are problems associated with wood siding. These include: warping, twisting, cracking and rot. Wood will absorb humidity and swell. During periods of dryness or very cold temperatures wood will shrink. This movement can cause nails to loosen and caulked joints to open.

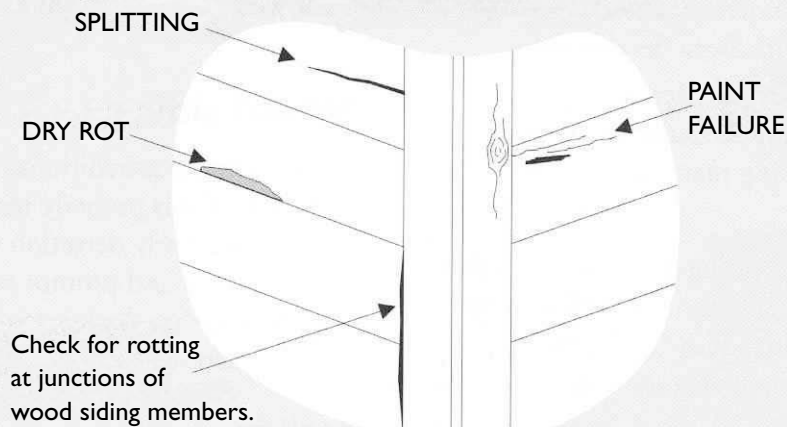
Tools and Supplies

- hammer
- flat pry bar
- nail puller
- ladder
- nails
- measuring tape
- pencil
- exterior grade *caulking*
- caulking gun
- saw
- wood (patches or siding)
- rake and shovel

WOOD SIDING PROBLEMS

Inspect wood siding closely. Hairline cracking in finish indicates need for refinishing.

Normally wood siding requires refinishing every 4 to 5 years depending on local climate.



Repairing and Replacing Damaged Pieces

It's important to keep wood siding dry to prevent deterioration and mold growth. Regular maintenance includes inspecting to find cracks or moisture problems, repairing any damaged pieces, cleaning and painting.

- Check for water pooling due to poor grading and drainage or splashing from the *eavestrough*. Splashing can be prevented by a change in ground surface material in the specified area. Soil levels should be at least 20 cm (8 in.) below the bottom of the siding to prevent moisture damage.
- Premature deterioration such as cracks, discolouration and peeling paint can be caused by leaks. Check *caulking* and replace where necessary. Replace old, cracked *caulking*.

- Most *caulking* is limited to bridging about 6 mm (0.25 in.) gaps between solid materials. Fill large cavities and holes with *fibreglass* or spray foam. Cover with a solid material like wood so only small gaps remain. *Caulk* remaining gaps.
- A piece of damaged or deformed siding can be removed and replaced. Consult a maintenance person or carpenter for assistance.
- See painting section in this booklet for information on preparing and painting siding.

TIPS

- Be sure to use corrosion-resistant siding nails to prevent rust stains. Corrosion-resistant screws may be used to help untwist or straighten warped boards.
- Clean and dry surfaces before *caulking*. A hair blow dryer can be used to dry and warm surfaces.
- A foam rope can be used as a backer for *caulking*. This will allow for a thinner bead of *caulking*, so that the *caulking* will be more elastic and less likely to pull away from one of the surfaces.
- Exterior *caulking* that is paintable such as a urethane *caulking* should be used. Coloured *caulking* may be used, but it will not usually match the siding colour.

Repairing Stucco Siding

The main purpose of *stucco* is to keep rain and moisture from seeping into your walls and into the insulation that is within the wall. When wall cavities and insulation stay wet over a long period of time mold can form inside the walls. Maintaining *stucco* siding requires an annual inspection checking for cracks, discoloured areas, and ensuring holes and penetration through walls are caulked and sealed.

Stucco does not normally require painting. However, painting can be applied to *stucco* and will help seal it against moisture. The disadvantage of painting is that the paint will have to be redone after a number of years.

As with any product, there are problems associated with *stucco* siding. These include cracking and staining.

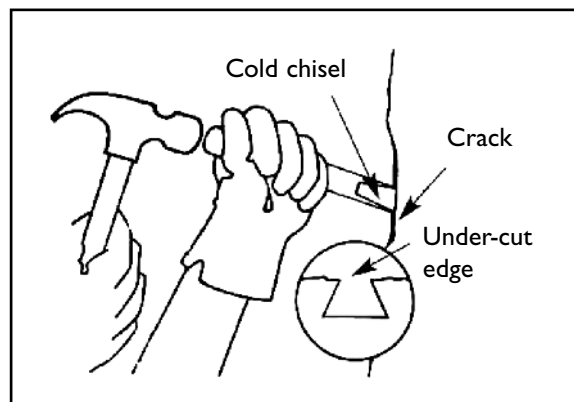
Tools and Supplies

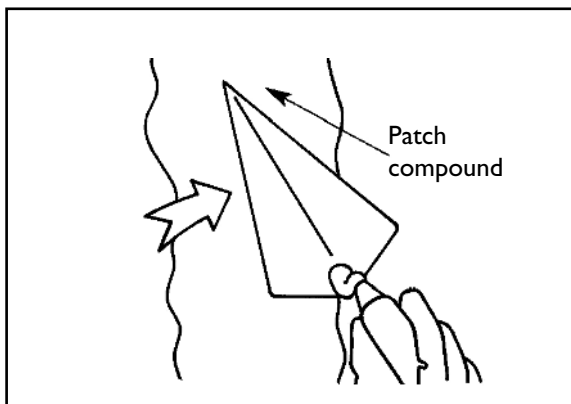
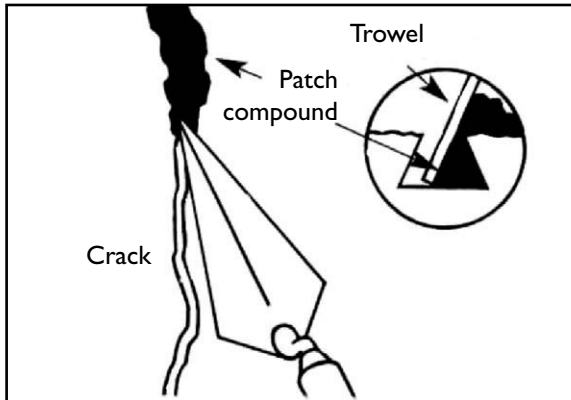
- hammer
- ladder
- cold chisel or strong awl
- putty knife
- masonry trowel
- *stucco patch compound*
- exterior grade *caulking*
- caulking gun
- backer rod
- sponge
- rake and shovel

Repairing Damaged Stucco

Cracks in *stucco* can fill with moisture. Freezing causes moisture to expand and can increase cracking and damage. If moisture seeps in behind *stucco*, it can cause rot. Regular maintenance includes inspecting to find cracks or moisture problems, repairing any damaged areas, and cleaning.

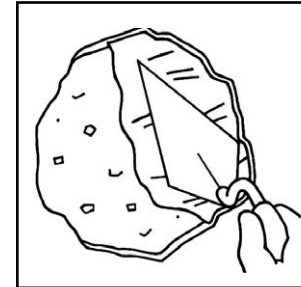
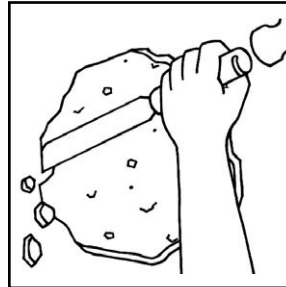
- Check for water pooling due to poor grading and drainage or splashing from the *eavestrough*. Splashing can be prevented by a change in ground surface material in the specified area. Soil levels should be at least 15 cm (6 in.) below the top of the foundation to prevent moisture damage.
 - Discolouration can be caused by leaks. Check wall surfaces for cracks and cracked *caulking*. Cracks can be filled with *caulking* or *stucco patching compound*.
 - Most *caulking* is limited to bridging about 6 mm (0.25 in.) gaps between solid materials. Scrape, clean and dry cracks before *caulking*.
 - Using *stucco patch compound* is the preferred method for sealing cracks and repairing damaged areas.
1. Remove damaged and loose *stucco*. Enlarge cracks by scraping so that they are at least 6 mm (0.25 in.) wide.



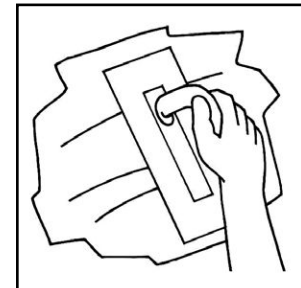
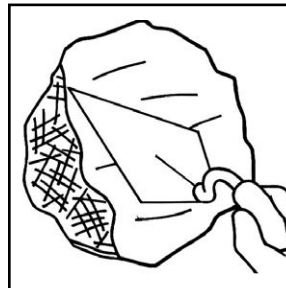


2. Surfaces should be warm and free of dust, oil and other materials that will decrease bonding.
3. Temperatures should be above 8°C (46°F). If conditions are very warm and dry, surfaces may need to be pre-wetted.
4. Large damaged areas may require metal lathe to be nailed as a backing for the *patch compound*.

5. Mix *stucco* patch as per manufacturer's instructions.



6. Apply with a putty knife and/or trowel working the material all the way into the cracks.



7. Finish with a trowel, float or sponge to match the existing surface.
8. During dry warm weather, the patching may need to be misted with water to slow curing and prevent hairline cracking of patch material.
9. Paint patched area using a product designed for *stucco*.

TIPS

- Clean and dry surfaces before *caulking*. A hair blow dryer can be used to dry and warm surfaces.
- A foam rope can be used as a backer for *caulking*. This will allow for a thinner bead of *caulking*, so that the *caulking* will be more elastic and less likely to pull away from one of the surfaces.
- Exterior *caulking* that is paintable such as a urethane *caulking* should be used. Coloured *caulking* may be used, but it will not usually match the siding colour.

Cleaning Siding and Stucco

Gentle cleaning helps to preserve siding. Buildup of dirt on siding retains moisture and causes siding to deteriorate quicker. In the case of wood siding, this can cause peeling of paint and rapid deterioration of the wood cell structure. In the case of *stucco*, dirty siding makes it difficult to locate small cracks in need of sealing.

When your siding or *stucco* becomes dirty, there are some quick methods and products that will help you to clean it.

Tools and Supplies

- detergent
- trisodium phosphate (TSP)
- bucket
- brush
- car brush
- rubber gloves
- hose with spray head
- ladder
- cleaning rags
- safety glasses

Moderate Dirt

- Occasional washing with clear water, car brush and hose.

Heavy Dirt

- Clean surface stains gently with water and a non-detergent, non-abrasive soap (or use a solution of 79 ml (1/3 cup) detergent, 158 ml (2/3 cup) trisodium phosphate (TSP) to 4.5 L (1 gal) of water). You can use a long handled brush to clean the siding, then hose gently. Do not use high pressure as it could force water behind the siding and *flashings*, which are designed to shed water coming down. When rinsing try not to spray in an upward direction.

Moss, Mildew and Other Organic Growth

- Use a commercial siding cleaner rated for the type of siding material you plan to clean (such as a vinyl siding cleaner if cleaning vinyl siding). Spray siding with hose to wet first. Wash with brush in high growth areas—rinse with car brush and hose. (*Note: Bleach is no longer recommended.*)

Power Washing

Caution: Power washers can damage siding and force water into wall cavities.

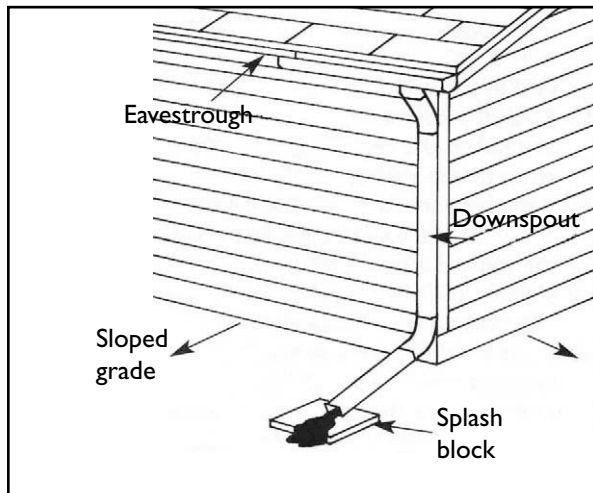
- The use of power washers by a professional company, rental or use on your own is not recommended. The high pressure will sometimes drive the water in behind the siding and around the *flashing* over windows and doors, causing moisture to be trapped in. Sometimes, the pressure may be so high that it will damage the surface of the siding and can rip vinyl siding out of the slots. **Power washing may void the siding warranty.**

TIPS

- Always start cleaning from the bottom of the siding and work to the top to avoid streaks.
- Always work on the shade side of the house.
- Wear rubber gloves and safety glasses.
- Follow manufacturers' specifications when using commercial siding cleaning products.
- Try to avoid getting cleaning products on windows. Rinse windows immediately after exposure to cleaning products. (Cleaning products can cause glass sealed units to fail prematurely and cause windows to fog between the sheets of glass.)
- Rinse off *caulking* with clear water around windows immediately.
- Turn off outside electrical plugs at the electrical panel before using any water on the house.
- Be careful around electrical lines.
- Cover plants with plastic if using commercial cleaning or TSP mixtures. They may harm your plants.

Eavestroughs and Downspouts

Eavestroughs (gutters) and *downspouts* collect and carry away rainwater that would otherwise run off your roof, splash onto the ground, erode the soil and stain the siding. More importantly, *gutters* and *downspouts* take water away from your house foundation, forming the first line of defense against a wet basement or crawl space. If you let water collect along the foundation, hydrostatic pressure will build, and water will eventually find its way inside your house.

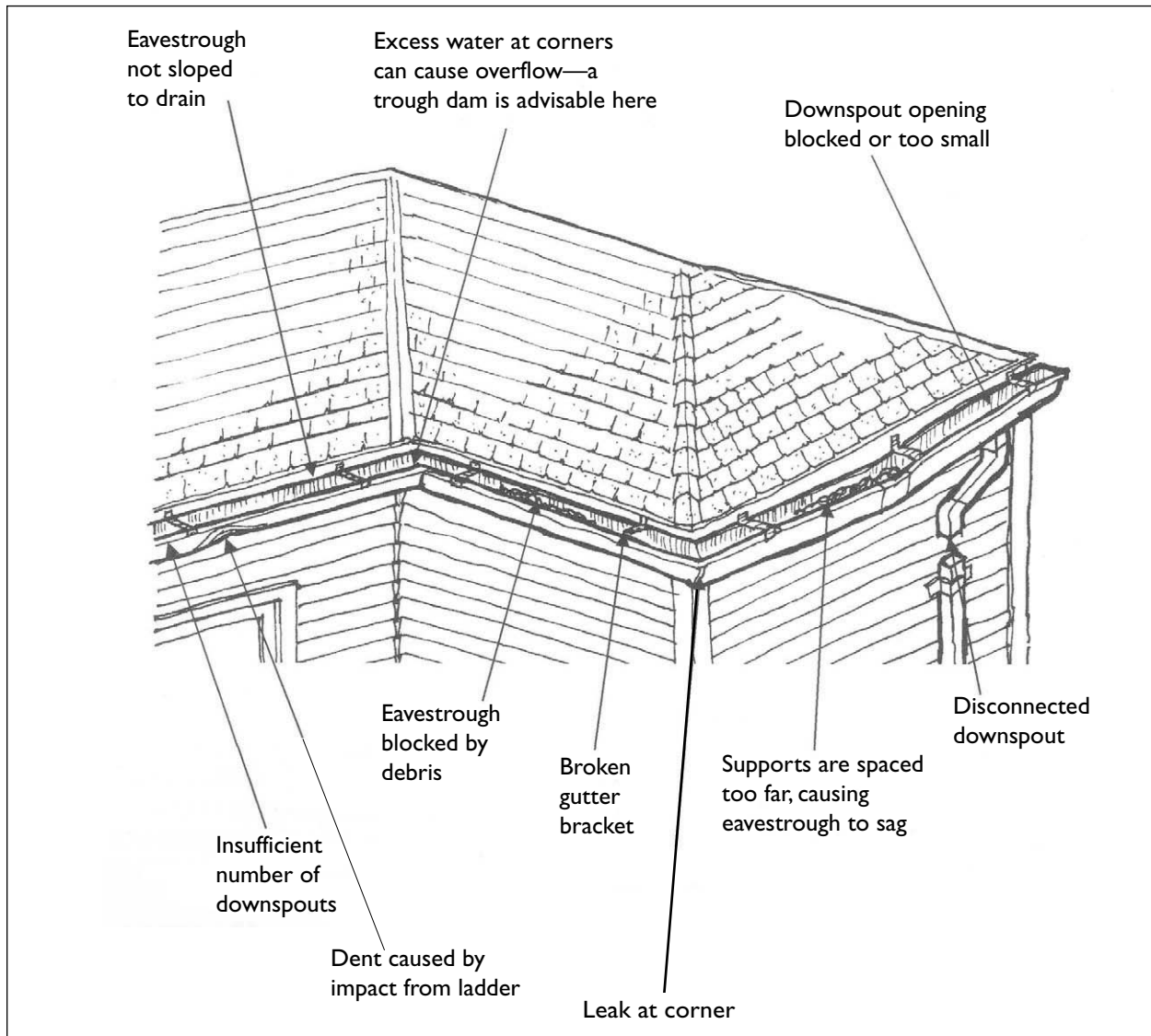


Caution: *Eavestrough* and *downspout* materials are very sharp and care should be taken to avoid cuts when cleaning or repairing.

Tools and Supplies

- gloves
- ladder
- hack saw
- hammer
- measuring tape
- screw gun or drill
- short sheet metal screws
- downspout straps
- gutter support brackets
- scoop
- bucket
- hose with spray head
- plumber's auger
- tin snips
- caulking gun
- gutter caulk *sealant*

Eavestroughs (gutters)



- Clean your gutters at least once a year, in the fall or early spring. Leaves, dirt and roof shingle granules will accumulate.
- Check for loose eavestrough hangers. If there are loose or broken hangers, they can be tightened or replaced.
- Check for leaks in corners and end caps. If they are leaking, clean, let dry and re-caulk with gutter *caulking* on the inside of the gutter.
- If your gutter has been pulled completely away from the roofline, then you may require assistance from the community maintenance department or a qualified gutter repairperson.

Downspouts

- Check to make sure all *downspouts* are properly attached to the gutters.
- Check for leaks where the *downspout* is attached to the gutter. If there is a leak, then clean, dry and re-*caulk* with gutter *caulking* inside the gutter.
- Check to make sure all *downspouts* are firmly attached to the wall with adequate downspout straps. If not, then re-attach with existing clips or get new ones and attach.
- Check the bottom of each *downspout* to ensure it is not crushed and that there is an elbow forcing the water away from the house or into a drain system. If not, repair or replace. The ground should slope away from the building.
- Check all straps to ensure they are secured to the *downspout* and wall.

TIPS

- In locations where ladders will be leaned against the gutter, extra hangers should be installed in order to add additional support for the gutter.
- If the *downspout* is clogged, force water down it with a hose. If still clogged, use a plumbing auger from the bottom up.
- Continuous gutters are best.
- *Downspout* extensions and/or splash-pads help direct water away from the building.
- Use short metal screws to attach gutter and *downspout* sections. Long screws may cause clogging from leaves and debris.
- Be careful around power lines.
- Always work with a partner to assist you.

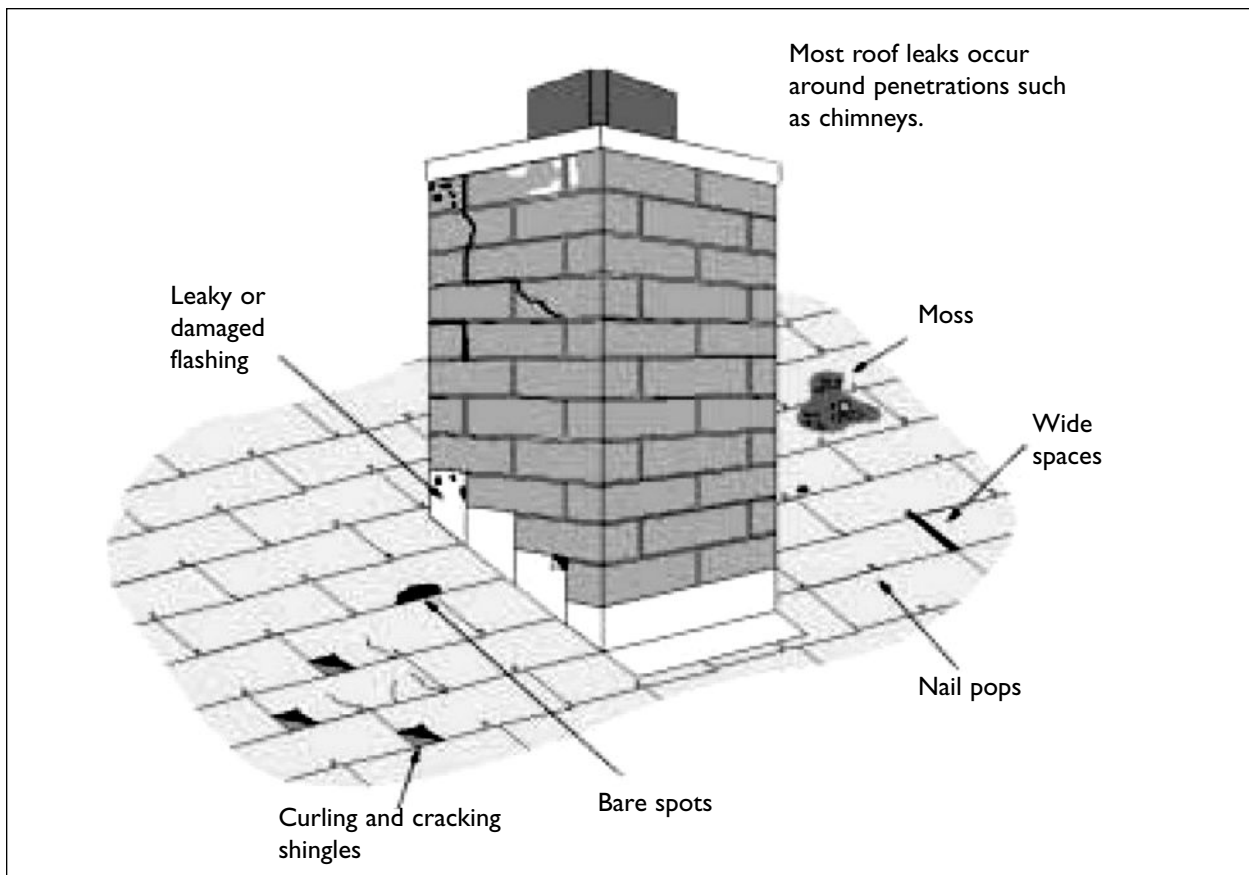
Roofing Repair—Asphalt Shingles

The purpose of a roof is to keep occupants of a house protected from the weather conditions outside and to protect the interior of a house from water damage.

If loose, curled or broken shingles are not repaired, they may become subject to wind damage. Wind damage will often spread and can affect large areas if not treated quickly. Broken and missing shingles will cause roof leaks. Leaks will damage insulation, drywall ceilings, and can lead to mold growth and rot. Loose shingles need tabbing down and damaged shingles should be replaced. Houses should normally be re-roofed every 15 to 30 years and this should be done before leaks occur.

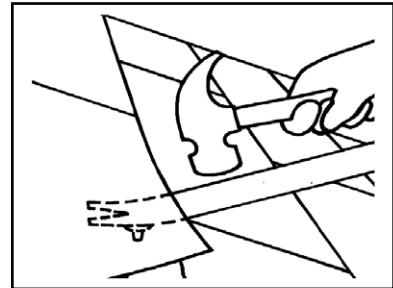
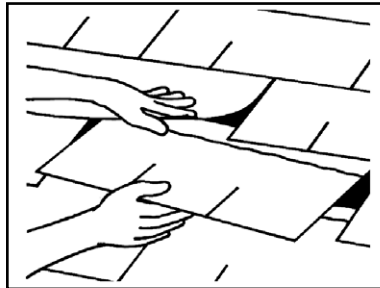
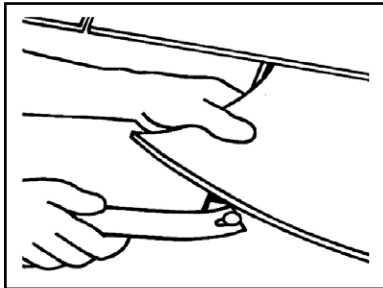
Tools and Supplies

- ladder
- safety harness
- sharp knife
- putty knife
- caulking gun
- flat pry bar
- hammer
- hacksaw blade
- replacement roofing
- roofing nails
- roofing cement
- flashlight



Tabbing Down Loose Shingles

- Locate loose and/or damaged shingles.
- If they do not need replacing, simply raise them and apply an ample amount of asphalt (lap) roofing cement (called tabbing). Press the shingles down firmly. Damaged shingles may also need to be nailed with broad-headed galvanized roofing nails.
- Apply asphalt-roofing cement over the nail heads.
- In areas subject to high winds, all shingles along the perimeter of the roof should be tabbed down.



Replacing Damaged Shingles

- Raise the shingles above the damaged one.
- Pull the nails with a claw hammer, pry bar or saw off the heads with a hacksaw blade.
- Remove the damaged shingle and slip the new shingle into place.
- Nail the new shingle in place with broad-headed galvanized roofing nails.
- Apply asphalt-roofing cement over the nail heads.

TIPS

- Follow WCB safety regulations for working with ladders and working on roofs.
- Be careful not to come into contact with power lines.
- Roof cement can be applied from a can with a narrow putty knife or from caulking tubes with a caulking gun.
- Wear gloves and work clothes when working with roofing cement.
- Check attic yearly for signs of moisture, mold, rodents, birds or bats.

Roofing Repair—Wood Shingles and Shakes

The purpose of a roof is to keep occupants of a house protected from the weather conditions outside and to protect the interior of a house from water damage.

The main concern with wood shingles and shakes is splitting, moss and rot. If loose, split, curled or broken shingles are not repaired, roof leaks may form. Leaks can damage insulation and drywall ceilings, and can also lead to mold growth and rot. Damaged and missing shingles can be replaced, but repairs to wood roofing often require a trained tradesperson. Moss growth on wood will cause rot and will shorten the life of the roof.

Tools and Supplies

- ladder
- safety harness
- binoculars
- zinc powder or moss killer

Inspecting Your Roof

- Using a ladder and/or binoculars inspect the roof for moss and loose, split, curled and damaged shingles. Avoid walking on the roof, especially when it is dry as you may crack shingles/shakes and cause them to split.
- If there is a moss problem, zinc powder or moss killer (if approved for wooden roofing) should be applied to the roof. This should be done after a rain while the roof is still damp.
- If there are loose, split, curled and/or damaged shingles, they should be replaced before leaks start.
- Many leaks are caused by damaged or missing *flashing*. If you find a piece of *flashing* has come loose or fallen off your roof, have it repaired immediately.

TIPS

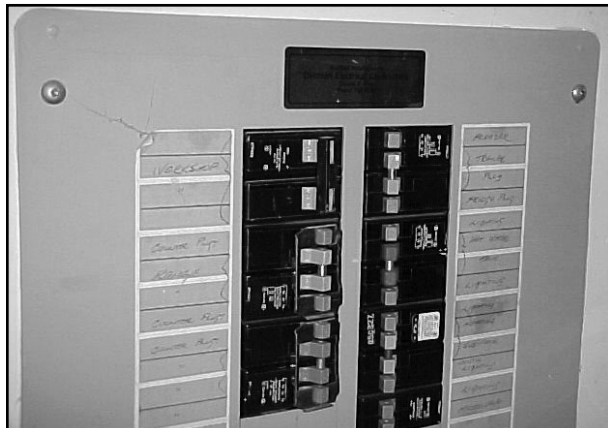
- Follow WCB safety regulations for working with ladders and working on roofs.
- Be careful not to come into contact with power lines.
- Check attic yearly for signs of moisture, mold, rodents, birds or bats.
- Finding leaks is not easy. Wind blows water uphill and once water gets under roofing, it doesn't always go straight down.

Main Shut-offs

In an emergency, and when undertaking home repairs it is important to know where all of the main shut off switches and valves are located in your house and how to turn them off. **Electrical repairs must be done by qualified electricians.**

Electrical Panel, Main Breaker

- All new and old housing units have electrical distribution (*breaker*) panels near where the outside power source enters the house. Each circuit in your house has a *breaker or fuse*. Up to 12 lights, outlets, or appliances may be on one circuit. Electrical panel *breakers* should be clearly labeled as to what is on each circuit. Electrical panels usually have one main *breaker* that will shut off all *breakers* or circuits.



- In the event of an electrical emergency, shutting off the main *breaker* will be the quickest way to shut off power to the effected circuit. This however, may cause the area to go dark, impeding your escape from the house.
- **If *breakers* trip (or fuses blow) repeatedly for a circuit, it is a symptom of a potentially serious problem and an electrician should be contacted to assess the situation.**

Natural Gas, Main Shut-off Valve

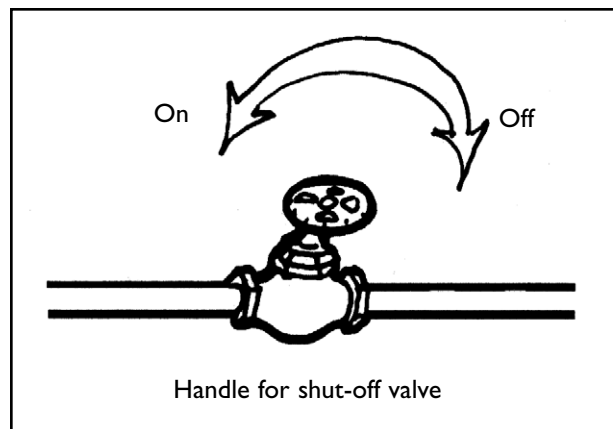
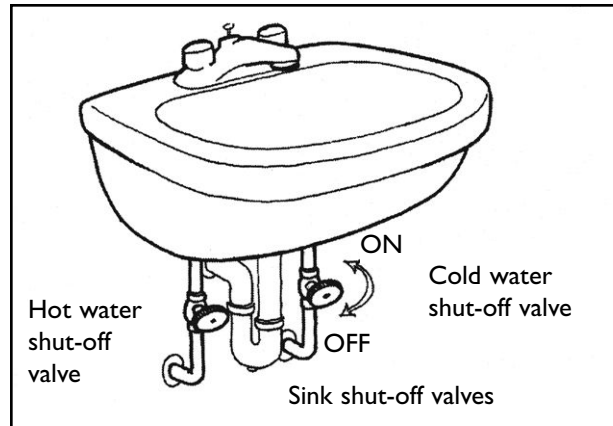
- If your house is connected to natural gas then you should be aware of where the gas meter and regulator are located. The main gas shut-off is on the regulator and meter, a crescent or pipe wrench will be required to turn it off. If there is a fire in your home, the fire department will usually turn this off as soon as they arrive. Each gas appliance has its own gas shut-off. **Do not tamper with or attempt to turn these off unless you are a qualified gas line pipefitter.**



- If you smell gas, do not try to light any appliance. Do not touch any electrical switch, or use a telephone in your building. Get everyone out of the house and use a neighbour's telephone to call the gas company or fire department.
- In the event of an earthquake, if leaking natural gas can be heard or smelled, the main shut-off valve should be closed and the house should not be reentered until safety personnel have arrived and assessed the situation.

Water, Shut-off Valves

- Each plumbing fixture in your home should be equipped with a shut-off valve. This includes your kitchen and bathroom sinks, toilet(s), washing machine, laundry tub, bathtub and hot water tank. When you are attempting to do any plumbing repairs, you will need to shut the supply valves off before you start. In some cases, the supply valves may need to be replaced. Before replacing the supply valves, you will need to shut off the main water valve. The main water valve is usually in the basement close to the water heater tank. If your main water shut-off valve begins to leak, you should call the housing office right away. They have a special key to shut off the water supply to your house (normally located near the road).



TIPS

- Do not block access to electrical panels with furniture or other objects.
- Do not block access to the main water shut-off.
- It is recommended that all shut-offs inside the home be labeled.
- Know where the shut-off valves and electrical panel are located in your home. Show your babysitter where the shut-off valves and *breakers* are located.
- Never tamper with or attempt to regulate the main gas shut-off valve.

Windows

Proper weatherstripping on windows and sliding patio doors is one of the most cost-effective measures for helping to keep your heating bills down in the winter by keeping the heat in. Weatherstripping also ensures your house is more comfortable by keeping the wind and rain from coming in through your windows. This section will provide a brief overview of replacing window weatherstripping.

Tools and Supplies

- replacement weatherstripping
- screwdrivers
- needle-nose pliers
- screen installation tool or pizza cutter
- cutters strong enough to cut weatherstripping
- silicone spray
- rags

Checking and Replacing Window Weatherstripping

- Check all **weatherstripping** around windows. There are many types. Weatherstripping will be located where the opening portion of the window meets the stationary portion of the window. It may be attached to either portion of the window. Look for loose, missing, or deteriorated weatherstripping. Rub weatherstripping with your fingers to feel if it's still in good condition.

- When replacing weatherstripping, check for the type on your window and replace with the same type. Check with the housing department to determine the name of the manufacturer. The manufacturer will let you know what type they use and where to purchase it. Weatherstripping may be a fuzzy fin seal type, rubber bumper gasket type, vinyl or metal compression type, a combination of these or other types.
- Sometimes the window manufacturer will warranty wear and tear of weatherstripping, check with the housing department before you make changes.

Window Cleaning and Care

Caring for and cleaning windows is an easy task. When done on a regular basis, it helps your windows last longer and can improve indoor air quality. Below are a few simple things to keep in mind when caring for your windows.

- Casement windows and some forms of slider type windows have adjustable hardware. Check windows to make sure they close square to the opening and that hinges and latches are working properly. Casement window hinges may need lubrication.
- Clean the slider tracks for slider aluminum or vinyl windows at least three to four times a year with a mild soap and water solution.
- To ensure your windows open and close easily, use silicone spray, wax or talcum powder to lubricate the tracks. Be careful not to get silicone spray on the glass, as it will be visible and hard to remove. Apply spray to a clean rag and then wipe the track with the rag. Silicone spray is available from most automotive suppliers.

- Glass should **not** be cleaned with products that contain vinegar or ammonia. Most commercial glass cleaners contain ammonia. Vinegar or ammonia will react with the *sealant* causing the *glazed unit* to fail prematurely. This will result in windows that are “steamed up” on the inside. **It may also void the warranty if you use vinegar or ammonia-based cleaners on the glass.** Most manufacturers recommend a mild dish detergent and water solution for window glass cleaning.
- Check window screens visually for damage. Besides keeping insects out of the home, window screens can also help reduce or stop moisture from coming in open windows when it is raining and windy.



TIPS

- Never paint weatherstripping on doors or windows.
- “Fin seal” and “kerf seal” are the best quality weatherstripping and will last longer than other types.
- Lower cost foam gaskets and plastic spring type weatherstripping will only work well for one or two years if even that long.
- Silicone spray on weatherstripping will help reduce freezing and sticking problems during cold weather.
- Removing very worn weatherstripping can be quite difficult. When experiencing difficulty, it is best to check with the window manufacturer to determine the best technique for the product you are using.
- When installing new weatherstripping, often a thin roller such as a screen tool or pizza cutter works well to push the weatherstripping into the *kerf*.
- Slider type windows can be slid open, lifted up and removed. Many vinyl sliding windows have removable tracks which can be cleaned or easily replaced if damaged. Some slider windows have wheels that ride on the track and these wheels can sometimes be replaced or adjusted.
- If glass is steamed up between the panes, the seal has failed and the glass unit will need to be replaced (mainly for aesthetic reasons).

Doors

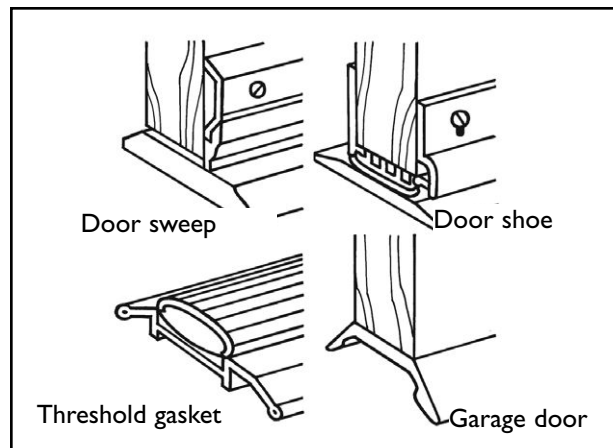
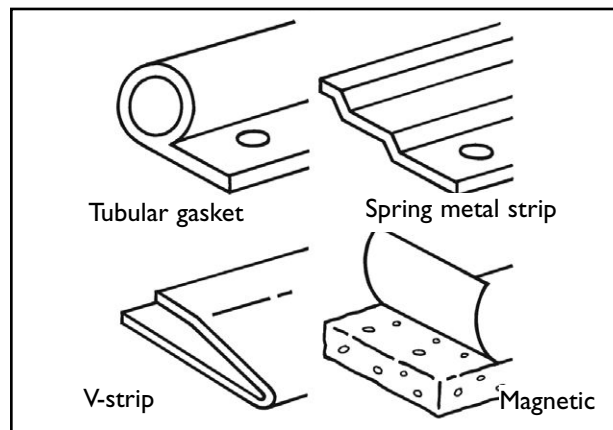
Most door maintenance involves replacing weatherstripping, tightening screws, lubricating hinges and replacing *doorstops*. Occasionally doors may need adjustment due to settlement or willful damage. Adjusting or hanging a door should be done by a carpenter or maintenance person.

Tools and Supplies

- weatherstripping kit
- measuring tape
- sharp knife
- cutters
- hacksaw
- small crescent wrench
- screw gun or drill
- screwdrivers
- hammer
- caulking gun
- exterior *silicone caulking*
- mineral spirits and rags
- glue and toothpicks
- clamps
- silicone lubricant

Exterior Door Weatherstripping

Proper weatherstripping on doors is a cost-effective measure for helping to keep your heating bills down in the winter by keeping the heat in. Weatherstripping also ensures your house is more comfortable. There are many brands and types to choose from in the building supply store. This section will provide a brief overview of replacing and/or installing door weatherstripping.

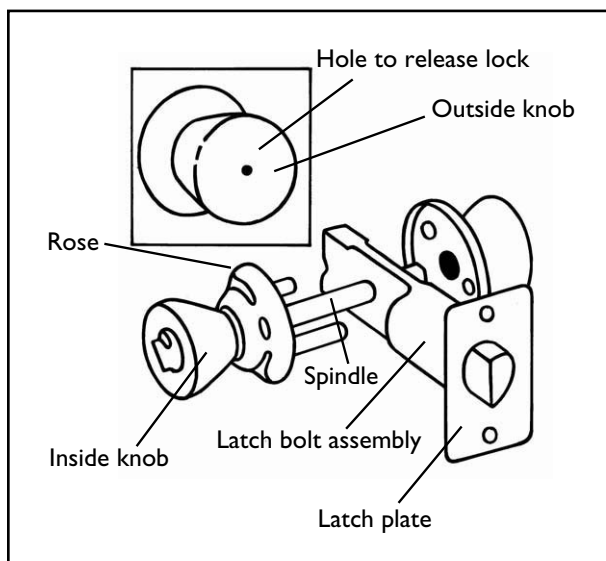


- Check the weatherstripping around the perimeter of the door. Cats and dogs love to scratch at the door when they want to come inside. This may cause damage to the weatherstripping. Usually the newer doors will have a “*kerf*seal” type weatherstripping. Pull out the damaged section of weatherstripping, measure, cut and replace with a new piece of similar type.

- There are “*kerfseal*” kits with a metal holder and screws, which can be applied to older doors that do not have the built-in “*kerfseal*”. Fasten the new weatherstripping kit on the outside of the closed door. Do not push too tight against the door. *Caulk* with silicone in the corners.
- Check the door shoe or sweep on the bottom of the door. If the little fins are worn out, it will need to be replaced. The newer “*fin seal*” sweep is the best. Measure and cut to fit. Adjust height so that sweep is not dragging too tight on the threshold. Screws for fastening the sweep are normally placed on the inside of the door.

Door Hardware

Doors will usually operate with very little maintenance, barring children swinging on the handles or hanging heavy items on the knobs or over the door. Over time, loose hinges, latches and doorknobs will have to be tightened. If these are not tightened, damage can occur to the door or doorframe. Drywall damage is likely to occur if *doorstops* are missing or broken.



Check hardware on all interior and exterior doors on a regular basis for loose knobs and hinges. A simple quick tightening of the doorknob will extend the life of the hardware. Tighten loose hinges. Visually inspect hinges to ensure pins are securely in place.

- If the screws on the hinges have pulled completely away from the doorjamb or from the door (or the holes are stripped such that the screws turn but do not tighten), it is fairly simple to repair. Fill the old screw hole with carpenter's wood glue, insert toothpicks or a golf tee or other wood slivers into the hole. Allow the glue mix and sticks to dry. Trim off excess material and re-set the door hardware screws back into the same space.
- Door hinges should be oiled with silicone based machine oil at least once a year.
- Check all *doorstops* to ensure the doorknob does not touch or damage the wall. A solid, commercial grade *doorstop* is recommended. This type can be fastened to the floor. Another preferred method is to install a *doorstop* where the door handle meets the wall. This style needs to be installed against a stud behind the drywall. If this is not possible, then a small 13 mm ($\frac{1}{2}$ in.) piece of plywood cut into a 25 cm x 25 cm (10 in. x 10 in.) square fastened to the drywall and painted to match the wall color should be applied and then the wall door stop fastened to the plywood behind the door knob.

Bifold Doors

Bifold doors are notorious for dislodging from their hardware and for coming out of alignment. Most bifold doors are hollow core with a 23 mm (7/8 in.) wood frame around the perimeter and a thin veneer on both sides. Cardboard acts as a spacer in between the panels. Common problems with bifold doors include; breakage at the bottom vertical adjusting bolt, the slide guide jumping out of the plastic socket on the channel at the top of the door, and the adjustment screw on the pivot bracket coming loose causing the door to bind.

- If your bifold door splits on the bottom vertical adjusting bolt, then you must take out the adjusting bolt. Glue the cracked frame of the bifold door and clamp it together until the glue is dry. Small finishing nails may be used to help repair the glued area. Re-install the vertical adjusting bolt. In cases where the hole for the adjusting bolt has worn and become too large, it may be advisable to replace the door.
- If the plastic socket in the top guide has become damaged, you can find a replacement part at most home supply stores. All replacement parts for the bifold door are available for purchase separately or in a kit.
- On occasion the track on the top can be damaged. Replacement tracks are also available.
- Bifold doors perform better if adjusted so that the space from the top of the door to the track is between 13 and 19 mm ($\frac{1}{2}$ and $\frac{3}{4}$ in.).

TIPS

- Often door shoes can be installed without screwing them in place. There is enough friction to hold them up and allow them to float and self adjust.
- Wax can also be used to lubricate hinge pins. Remove the pin, rub surface of pin with wax, and reinstall. Pins can be removed by driving a nail up from under the hinge in the round hole at the bottom of the pin.
- There are many different types of *doorstops* on the market. The most common type of door stop is the small spring type with a rubber tip fastened at the baseboard level. This type is often ineffective because it does not withstand the force of a quick opening door. If you spot a hole in the drywall behind the door, it is usually because of a damaged or missing *doorstop*.
- If a bifold door needs to be replaced, consider replacing with a more durable door type, such as swing type or sliding bypass door.

Repairing Walls and Ceilings

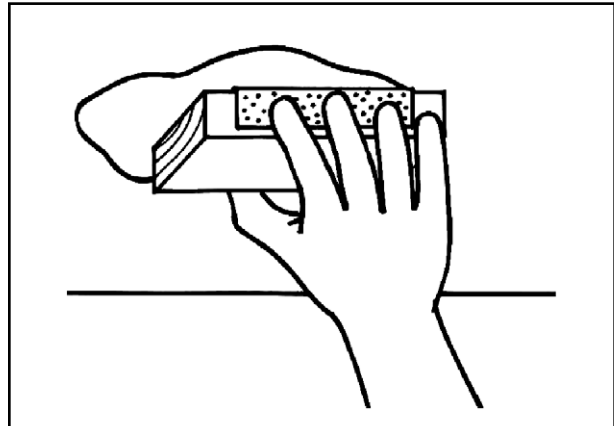
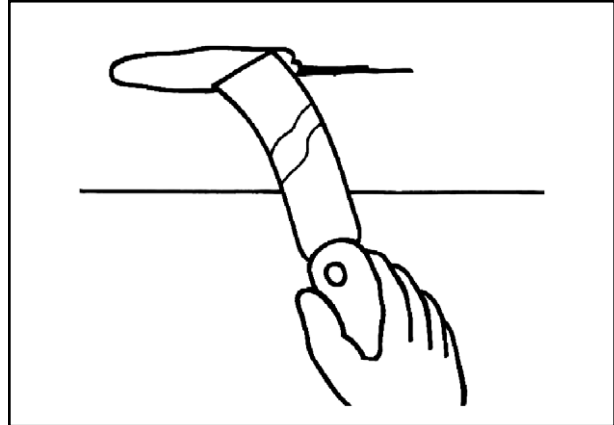
Drywall damage, especially on exterior walls, can lead to moisture problems and create potential health risks. Repairing damaged drywall is easy with the right tools and products. Follow these simple steps to repair virtually any drywall damage.

Tools and Supplies

- different width joint finishing knives
- drywall (keyhole) saw
- utility knife
- drywall (joint) tape
- drywall (joint) compound
- patch material
- sponge
- 80 – 100 grit sandpaper
- sanding block
- drywall screws
- 38 mm (1 ½ in) ringed drywall nails
- screwdriver or screw gun
- drop cloth
- dust mask
- bucket
- measuring tape
- pencil

Dents

- Simply sand over the dent and fill with *drywall compound*. Add a second coat of the compound if necessary. When dry, sand and apply primer paint.

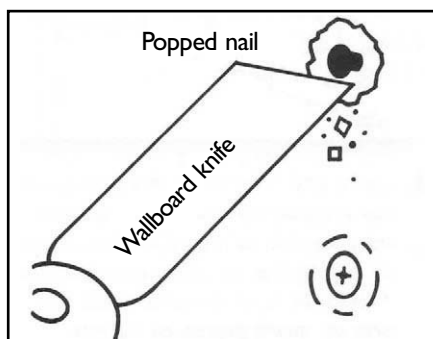
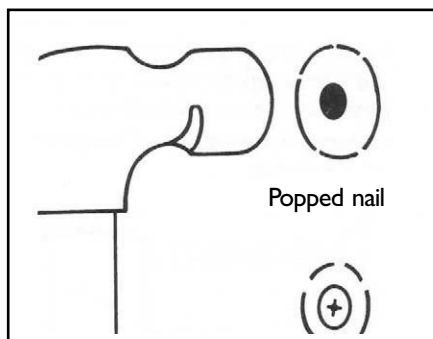
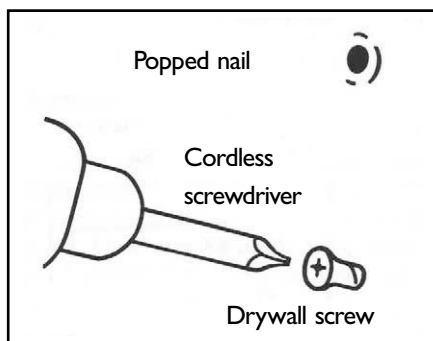


Small Holes and Cracks

- Wipe the area clean and remove all loose material, fill with *drywall compound*. Add a second coat of the compound if necessary. When dry, sand and apply *primer* paint. For large cracks, drywall tape may be required (see following pages).

Popped Nails

- Use a hammer to drive and *dimple* the *popped nail*. Then drive a new ringed nail or install a drywall screw 38 mm (1 ½ in.) from the *popped nail* and *dimple* (that is without breaking the face paper, create a slight depression the shape of a hammer head). Remove any loose material. Cover with *drywall compound*, when dry, sand and apply *primer paint*.



Note: For the following steps, if sticky-backed reinforced drywall tape is used, mudding with *drywall compound* will not be required under the tape.

Medium Holes up to 5 cm (2 in.)

- Apply generous amounts of *drywall compound* around the outside edge of the hole. *Drywall compound* should extend under all areas where joint tape will be applied. Crisscross two or three strips of joint tape over the opening and cover the tape in *drywall compound*. Let harden. Sand if necessary and then apply a second coat of *drywall compound* over the taped area. When dry, sand and apply *primer paint*.

Large Cracks 3 mm (¼ in.) or larger

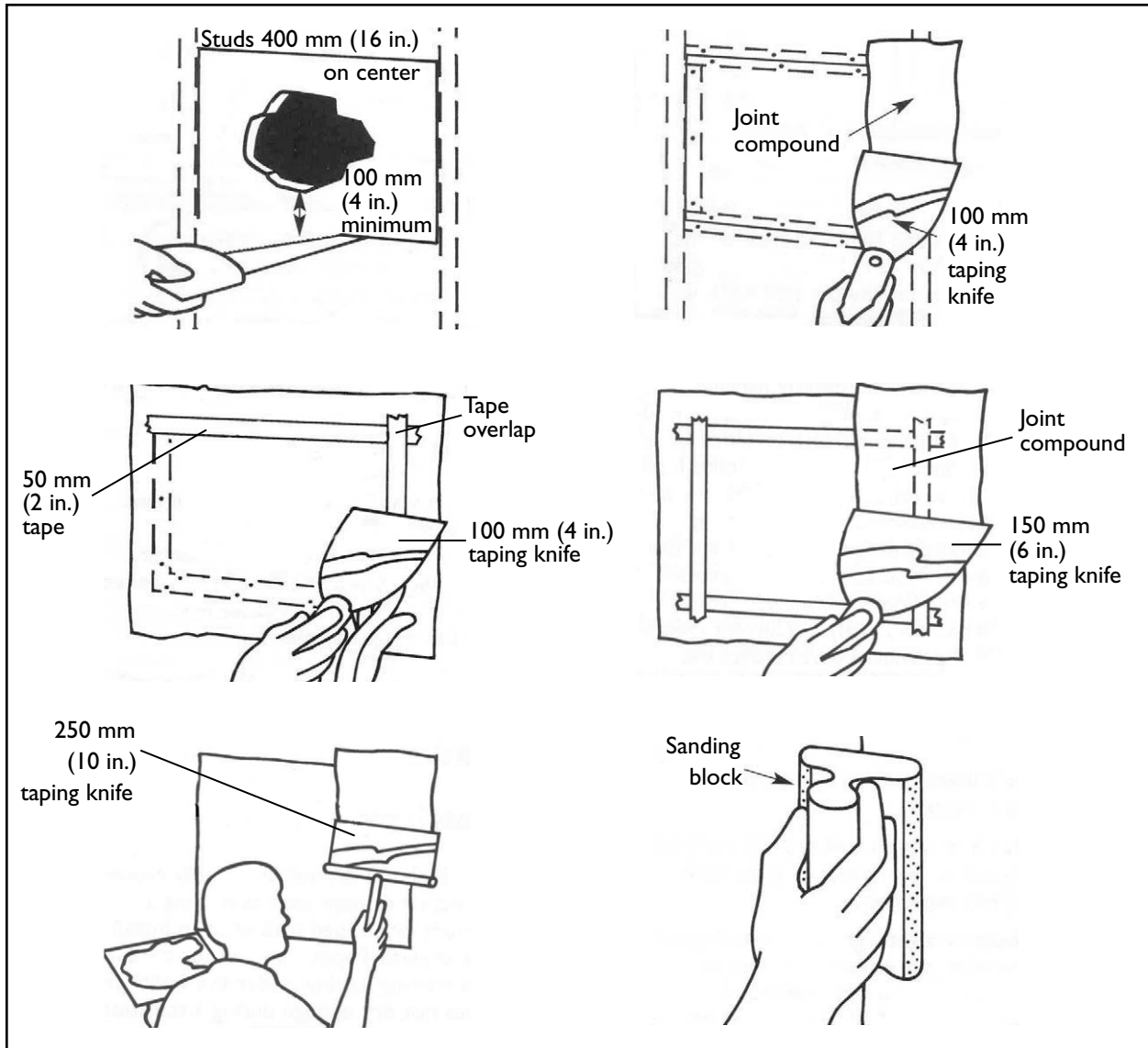
- Apply *drywall compound* into the crack with a 125 mm (5 in.) finishing knife. Apply *drywall compound* under all areas where joint tape will be applied.
- Apply joint tape over the crack. Draw the finishing knife firmly over the crack to tightly embed tape into the *drywall compound*. Let compound harden.
- Apply more compound over the tape using a finishing knife. Let it harden, sand and apply another coat of *drywall compound* if necessary. When dry, sand and apply *primer paint*.

Large Holes over 5 cm (2 in.) or Water Damaged Areas

CAUTION: Check for wires and pipes before cutting into walls. Make sure these are not damaged during the repairs.

Option 1

- Cut out a rectangular opening around the damaged drywall with a utility knife and drywall keyhole saw. Insert pieces of 1 x 4 or 2 x 4 in. behind drywall and screw into place. Insert new piece of drywall and screw to wood pieces. Spread *drywall compound* where the new drywall meets the old, attach joint tape and *feather out*. Apply an additional coat(s) of *drywall compound*, wait for compound to dry and sand between each coat. Let dry and apply *primer paint*.



Option 2

- Purchase a sticky-backed patch kit. These are usually a thin piece of metal with small holes throughout. Check to make sure the patch will cover the hole. Using sandpaper, clean off any rough edges around the hole in the wall. Attach the patch over top of the hole and apply the first coat of compound. Apply two additional coats, drying and sanding in between. Apply *primer* paint.

Torn Drywall Face Paper

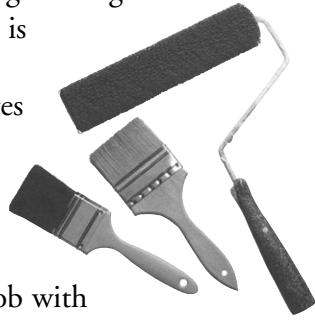
- Peel and remove all loose face paper. Apply a thin coat of *drywall compound* with a joint finishing knife over the damaged area and *feather* to get a smooth finish. Let dry and if necessary apply a second coat. When dry, sand and apply *primer* paint.

TIPS

- Metal patch kits and sticky backed mesh tape make drywall repair much easier but are not usually used by professionals due to the minor extra expense.
- There are various types of patching materials available for patching drywall. These include adhesive and non-adhesive drywall tapes, fast drying *patching compounds* and drywall bandages. Regardless of the type of patching materials you use, read the manufacturer's instructions carefully and follow each step as suggested. Some *patching compounds* dry quickly, while others require longer periods to dry.
- When applying the compound, the first coat should be thicker and the second and third coats should be thinner. Each coat should be spread a little wider. This is known as feathering as the new surface gets thinner and thinner, further away from the area being repaired.
- You can smooth out small repaired areas with a damp sponge before you apply the *primer* paint. Be careful not to take too much of the *drywall compound* off. Ensure area is dry before applying *primer* paint.
- Always keep your tools clean. Wash and dry immediately after use or in between repair jobs. Never leave tools in water because they will rust and cause staining on your application of the compound.
- To prevent your compound from drying out, always keep it covered between jobs or if you are taking a break.
- Dispose of excess *drywall compound* safely and with respect for the environment. Most landfill sites now require drywall waste to be separated.

Painting

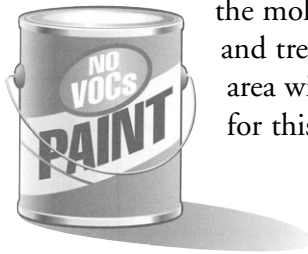
Painting can be an intimidating challenge for any home occupant. There are many different types of paint, tools, tips and tricks to ensure a good job. Re-painting existing walls in a home that is occupied, is another factor that contributes to the challenge. With a little practice and research, one can learn to do a good job with just the basics. This section will provide a brief overview of the steps in the painting process along with some tips and tricks.



Healthy Housing Tips

Select paints with no or low volatile organic compounds (*VOCs*) to promote good indoor air quality. Because paints are applied wet and cover such a large area, they can contribute significant emissions into the indoor environment while they dry and cure. Some products take a few days to cure, while others can take months. Vapours from toxic *solvents* and additives in paints can cause health problems.

Never paint over mold. In doing so, you only hide moisture problems that are causing the mold growth in the first place. First, correct the situation causing the mold growth (usually high humidity levels), next clean up the mold, and then prepare and treat (prime) the mold area with a product designed for this purpose.



Tools and Supplies

- goggles/gloves (if using *solvents*)
- bucket
- can key
- paintable caulking
- caulking gun
- extension pole
- mineral spirits
- painter's tape
- putty knife
- sandpaper
- screw driver
- stepladder
- detergent
- Trisodium Phosphate (TSP)
- patching (spackling) compound
- 8 cm (3 in.) brush
- 5 cm (2 in.) sash brush
- rollers and tray
- roller handle
- tack cloth
- stir stick
- primer
- paint
- drop cloths
- protective clothing
- cleaning rags
- roller covers

Lead in Paints

If your home is more than 40 years old, you should assume that the paint in your home contains lead. Lead-based paint is not dangerous if it is in good condition, but if it is peeling and flaking then the paint presents a potential health hazard. Sanding and scraping lead-based paint can produce large amounts of dust that contain lead. (Lead-based paint that has weathered on the exterior of your home can also pose a risk through contaminating gardens and sandboxes.)

Those especially at risk from lead-based paints are infants, young children, pregnant women and the fetus. Paint samples can be tested for lead with a home test kit or through laboratory analysis. Current federal and provincial laws now restrict the amount of lead that can be contained in commercial products.

The best way to deal with lead-based paint is to leave it alone unless it is either accessible to children or deteriorating.

There are three actions you can take:

1. **Repair**—disturb the paint as little as possible and thoroughly clean up afterwards.
2. **Encapsulate**—cover old paint with new paint or with another wall surface such as drywall or paneling.
3. **Remove**—use strict safety precautions. Removal is the most hazardous remedy. For removing small areas, use a chemical stripper, but take care to provide lots of ventilation, wear coveralls, goggles, gloves and a respirator. Seal the area with a plastic dust barrier over doorways and vents and cover all furnishings and floor surfaces with plastic sheeting. Do a thorough cleanup afterwards. Avoid sanding the surface, which releases lead dust, or peeling it using a heat gun, which releases lead fumes.

Preparation Before Painting

- Remove as much furniture as possible from the room. Cover the floor and remaining furniture with drop cloths. Plastic is often used for covering furniture, however, a good canvas drop cloth is well worth the investment as it absorbs paint, is not slippery, will not move, and is reusable.
- Remove pictures, mirrors, curtains or blinds, electrical switch plates and hardware. Mask or loosen the ceiling plates of hanging light fixtures so the ceiling plates are not tight against the ceiling. Cover the fixtures.
- If the surfaces being painted are dirty, the paint might not stick well. Use Trisodium Phosphate (TSP) or a light detergent solution and wash surfaces that are dirty and touched

frequently, or that may have oily residue caused by cooking. Be sure to wash doors and *trim*, particularly where handled. Once clean, wipe surfaces with a damp cloth to rinse and allow them to dry before painting. It is important not to leave a residue from the detergent.

- **Special note on marking pens, crayon marks and water stains: Remove as much of the markings as possible using a liquid detergent, then wipe with clean water. Use special primer paint on the remaining marks to prevent “bleeding” of these marks through the finish coat.**
- Sand glossy surfaces with a fine sandpaper to ensure the paint sticks properly. Be sure to remove sanding dust. Vacuum surfaces clean and wipe with a tack cloth.
- Examine surfaces for nail holes, cracks, and other surface imperfections. Rake out large plaster cracks in walls and ceilings with a putty knife to remove loose particles.
- Using a putty knife, firmly press *patching compound* into the crevices and smooth until flush with surface. Fill *mitered trim* jointings (which have opened) and door or window *trim* (which has separated from the wall) by pressing the compound into the crevices and smoothing with your finger. Allow compound to dry and then sand lightly. Since *patching compounds* shrink as they dry, large holes and cracks usually require a second application after the first has dried.
- Remove loose or scaling paint with a putty knife. Where removed from the walls or ceilings, sand the edges of the paint for a smooth surface. This will blend the two levels of paint and will not be noticed when re-coated. Where paint has been removed from *sash*, *trim*, or doors, sand the entire surface with fine sandpaper before painting.

Priming

This important step seals the surface prior to painting, thereby prolonging the *wet edge* of finish coats, reducing the incidence of lap marks, and ensuring uniformity in color and luster. Many layers of latex paint can actually result in a very absorbent surface. The surface can benefit by *priming* over these layers of latex paint. *Sash, trim,* and doors already coated with an enamel finish do not ordinarily require *priming* (remember, sand glossy areas to a dull finish). However, if extensive repair work has been performed, a *primer* should be applied.

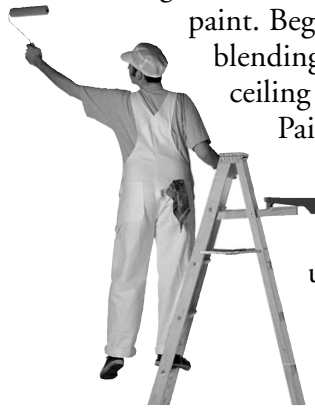
- *Spot prime* patched wall surfaces with good quality *primer*. For new drywall, a latex *primer* is recommended. For previously painted drywall, use Alkyd based *primer* sealers.
- Walls and ceilings coated with a porous flat finish should be primed with special undercoat *primers*. (Each paint product has their own brand and recommended formulas depending upon where you are painting and what type of paint you will be applying over top.)
- Wood finishes that are unpainted or previously painted and sanded to raw wood should be primed with an alkyd enamel underbody.

Interior Painting

Start where the ceiling meets the walls. Using a 5 - 8 cm (2 - 2 ½ in.) trim brush, “*cut in*” by applying an 8 cm (3 in.)—wide strip of the coating along the perimeter of the wall/ceiling line, beginning at the corner of the room. It is recommended to *cut in* a section at a time, and alternate between cutting in and painting the ceiling or walls. This maintains a *wet edge* on both the area being cut in and the rolled ceiling and wall area, which prevents a visible line between the *cut in* area and the rest of the ceiling or wall.

Painting the Ceiling

- When painting a room, the ceiling should always be painted first, before any of the walls. This allows any paint droplets that might fall onto the walls to be covered when they are painted later. Cover a roller with paint and slowly roll it back and forth over the ridges in the tray to remove excess paint. Begin near the corner, blending the coating into the ceiling line painted previously. Paint across the width rather than the length of the ceiling. Do not stop until the ceiling is completely covered. An extension pole, preferably adjustable, is a great tool; as it will allow you to reach more of the ceiling yet keep your feet on the floor. Rolling in a motion across rather than along your body will help to avoid neck and back strain.



Painting Walls

- When the ceiling is dry to the touch, return to the spot where you began coating the ceiling. Using a trim brush carefully *cut in* the wall/ceiling line. If you do not feel comfortable cutting in freehand, allow the ceiling to thoroughly dry before applying low-tack painters tape to the ceiling where it meets the walls. This will protect the ceiling while painting the walls. Let fresh latex paint dry for a minimum of 24 hours before applying low-tack tape, otherwise the paint can pull off. Certain drying conditions, such as high humidity, will increase this recommended drying time.



- Next, paint along the baseboard and around the door and window *trim*. Paint one wall at a time.
- If you are painting with a partner, one person should *cut in* and the other follow, applying paint with a roller. Paint one wall at a time in order to avoid “hat binding.” Hat binding looks like a stripe running around the border of the painted area; it occurs when the paint you *cut in* dries before the paint you roll on.
- Regardless of the surface, always start at the top and paint downward.

When choosing paint for steps, ramps, decks and porches, do not use a gloss enamel finish as it can become very slippery on wood surfaces during the winter.

Cleaning Up

Water-Thinned (Latex) Paints

- Follow the cleaning procedures below using warm soapy water instead of paint *solvent*. Latex paints are easy to clean with water, *solvent* is not required.

Oil-Based Paints

- Clean brushes by working *solvent* into bristles. Squeeze out as much paint and *solvent* as possible. Repeat until paint disappears. Rinse in clear *solvent*, then wash with soapy water, rinse and let dry. Wrap and store in heavy paper.
- Clean rollers by disassembling and scraping out as much of the paint as possible. Submerge and cover in *solvent*. When most paint has been worked out, wash and cover in mild detergent and rinse in clear water. Remove paint from the roller frame and hardware with *solvent*. Hang roller to dry.

Disposal of Leftover Paint

With landfills rapidly reaching capacity, the disposal of waste is a major environmental concern. There are several guidelines that consumers can follow in their efforts to reduce paint waste.

- Buying more paint than you need costs you money and it also creates the problem of disposing of leftover paint. Do yourself and the environment a favor by buying the right amount for the job. Your local authorized paint dealer will provide assistance in determining the right quantity for each painting project.

Exterior Painting Sequence

Painting your exterior siding and *trim* will help protect your home from moisture and weather damage. You should paint when you begin to see signs that the paint is wearing or peeling. As paint wears, the *primer* begins to show through the finish coats, the color of the old paint dulls, and the grain on wooden siding begins to show clearly.

Wait until you see these signs. If you repaint too frequently you will end up with a thick coating that's likely to crack and break away. The coating will be so thick that it will be unable to expand and contract with changes in the weather or adjust to your home's natural structural shifts. If you wait too long, the paint surface deteriorates making it hard to restore. You may need to sand down to the bare surface and begin again. By regularly surveying the condition of your exterior paintwork, you will be able to judge the right time to re-paint.

- Surfaces must be clean, dry and free of loose, cracked or peeling paint.
- Use solid stains or paint, but not transparent stain for refinishing stained exterior surfaces.
- Paint the siding.
- Paint the *trim*, railings, porches, steps and foundation.
- Paint shutters, screens, storm windows and all other removable surfaces.

- Use all the paint that you buy. An extra coat will give more protection. Share your leftovers with a neighbor who has a small area that needs painting. Consider donating the paint to a local charity, community beautification or service program, or a neighbourhood group, which is assisting the Elders, disabled or disadvantaged persons. Make sure the product you donate is in its original container with the label intact.
- Most paint stores will accept leftover paint. If yours will not, then follow the recommendations below.
- Leftover paint should not be poured down any drains (such as household sinks, toilets or storm sewers).
- Latex paints can be left to dry by removing the lid and allowing the water portion to evaporate. This should be done in an area away from children and animals. Allow remaining paint to dry completely. Check with your local authority before you dispose of the can in regular garbage. There may be a paint recycling program or a district wide bylaw in force.
- Solvent-based paints (a.k.a. alkyd or oil based) require special disposal practices, which is another good reason to avoid using this type of paint. Solvent-based paints are ignitable and present particular hazards. These products should not be disposed of down storm sewers, household drains (especially if you have a septic tank), or on the ground. They should be disposed of as a household hazardous waste. Store the paint until there is a community “household hazardous waste collection day.” If your community does not have a household waste program, contact your local or provincial government environmental control agency for disposal guidance.
- Paint thinners, turpentine, mineral spirits and *solvents* should not be poured down a drain or storm sewer. With a few simple steps, you can reuse these types of products. Let used turpentine or brush cleaners sit in a closed container until the paint particles settle out. Then pour off the clear liquid into a container, so it can be reused. Add an absorbent (i.e. cat litter) to the remaining residue and let it dry completely. Contact your local or provincial government environmental control agency for guidance on disposal.

TIPS

- Where possible avoid using alkyd paints due to high levels of *VOCs* and the associated health risks. Low or no *VOC* paint is a much healthier and safer choice.
- Paint the back of switch plates as a future color reference, or record the color names and numbers.
- Never store paint products close to open flames, heat or where children or pets can get at them.
- Tint a *primer* until it approaches the color of your top coat, particularly when you are using a deep color top coat.

TIPS (Cont'd)

- Brushes come in various shapes, contours and bristles. There are special purpose brushes for almost any surface. Brushes with China (or natural) bristles are designed for oil-based products, varnishes and stains; 100 per cent nylon bristles and polyester/nylon brushes are ideal for latex paints and other water-based finishes.
- Designed for shakes and shingles, pads are also good on smooth surfaces. They apply paint faster than a brush and can be cleaned or replaced.
- Known for fast application and smooth finishes, rollers are best on flat surfaces. The surface texture dictates *nap* length—the smoother the surface, the shorter the *nap*.
- Paint a room in top-to-bottom sequence; ceilings, walls, doors, woodwork and baseboards.
- Use low-tack painter's tape between carpet and baseboards.
- Mineral spirits or soapy water will help you remove splatters.
- Line the tray with aluminum foil before filling it. When done, pour excess paint back into the can, peel off the foil liner and dispose of it properly.
- When cleaning a brush in a container of *solvent* or water, don't stand it up; you'll bend the bristles. Instead, rinse out all the paint, rake the bristles out straight with a brush comb and hang the brush to dry. You can also help the bristles keep their shape by wrapping them in a brown paper sheath cut from a grocery bag. Secure it with a rubber band placed around the *metal ferrule* on the brush. Store the brush by laying it flat or hanging it up.
- Do not store dirty cleaning rags that have been contaminated with *solvents* or paint thinner as these may catch fire due to chemical reactions.
- Next time you're painting a room and want to take a lunch break or even knock off for the night, don't bother rinsing out the roller sleeve. Instead, roll out as much of the excess paint as possible, and then cover the roller sleeve in aluminum foil. Crimp the foil around the ends of the sleeve to seal out air.
- If you are not going to be able to get back to painting for more than 12 hours or so, pull the sleeve off the roller frame, wrap it in foil and put it in a plastic bag and pop it into the refrigerator. Your roller will stay fresh for up to four days. Take the roller out of the refrigerator a few hours before you're ready to resume painting (but do not unwrap it for at least two hours). This warm up period allows the *nap* to become pliable again and ready for painting.

Primers	
On this surface	Use this Primer
Old Alkyd Paint or Chalky Surface	Alkyd or Super Adherent Primer
Old Latex Paint	Latex or Super Adherent Primer
Bare Wood, Wallpaper	Latex Primer Rated for These Surfaces
Knots, Graffiti, Water and Smoke Stains	Stain Barrier Primer
Old Plaster	Latex Primer Rated for Plaster
Steel or Iron	Alkyd or Metal Primer

Interior Finish Guide				
	Flat	Low Lustre	Semi-Gloss	Gloss
Appearance	Soft, Gentle	Subtle, Low Glare	Medium	High
Washability	Good	Excellent	Excellent	Excellent
Scrubability	Poor	Good	Excellent	Excellent
Hiding	Excellent	Very Good	Good	Good
Stain Resistance	Poor	Good	Very Good	Excellent
Masks Wall Defects	Excellent	Very Good	Good	Poor



What to Use and Where						
		Latex			Alkyd	
	Flat	Low Lustre	(Eggshell - Pearl) Semi-gloss	Flat	Semi-Gloss	Gloss
Living/Dining Room		X				
Adult Bedroom	X	X				
Trim/Doors		X	X		X	X
Bathroom			☞ *		X	X
Hallway		X	X		X	X
Kitchen			☞ *		X	
Furniture					X	X
Ceiling (non-stucco)	X				X	X
Stucco Surfaces				X		
Kid's Room		X	X			
Family Room		X	X			

X Recommended

☞ * Clean painted surfaces with TSP and prime with super adherent latex primer. For moist bathrooms and heavy use kitchens, use Kitchen and Bath Acrylic Latex or Interior Alkyd.

Cleaning Sinks, Tubs and Shower Stalls

Sinks, tubs and showers need cleaning for obvious reasons. However, if done with the wrong product, cleaning can damage your faucets and fixtures. Certain materials such as *fibreglass* require maintenance to preserve the finish.

NEVER USE “spray and leave on” products, lime removers, toilet bowl cleaners, aromatic *solvents*, abrasive cleansers, strong liquid cleansers, or other material that could damage or dull the surface finish. Do not use harsh chemicals. Do not apply scouring compounds or use scouring pads.

Tools and Supplies

- cleaning rags
- sponge
- soft pad
- rubber gloves
- non-abrasive soap
- fibreglass cleaner and wax
- bucket

Sinks

Most sinks are either enamel coated metal, porcelain or molded countertop (imitation stone). These materials are “sensitive” and can be easily damaged if not cleaned properly.

- The best cleaning products to use on sinks are non-abrasive soaps applied with a rag, sponge or soft pad. Rinse the sink thoroughly after each cleaning.

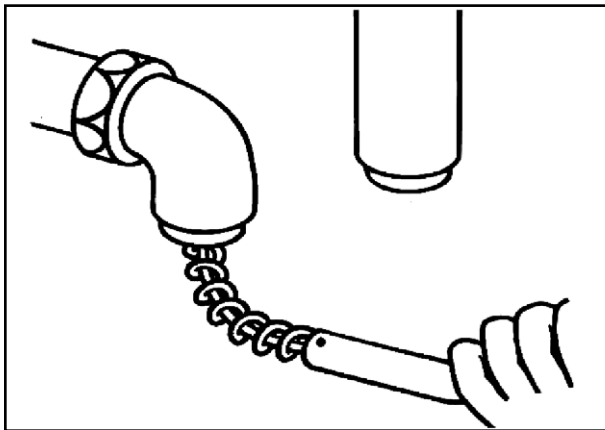
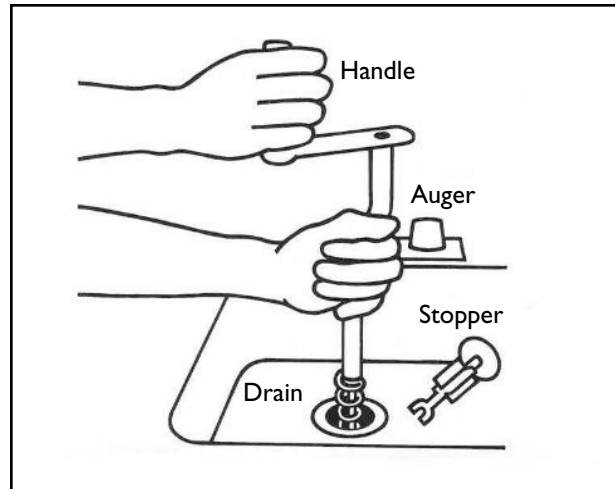
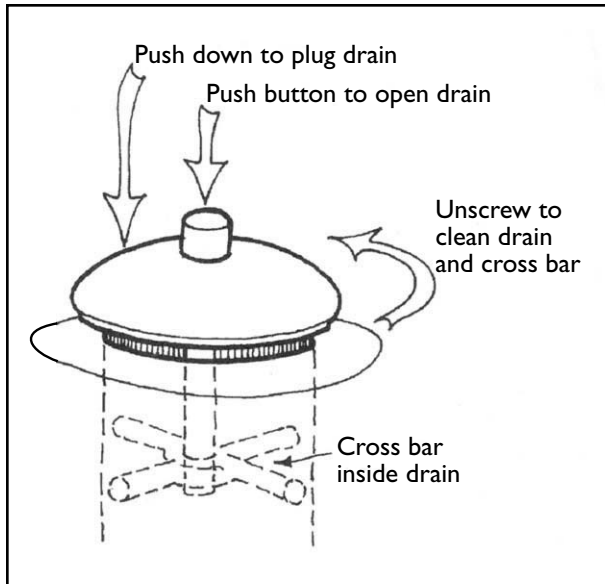
Bathtubs and Shower Stalls

Bathtubs and shower stalls are made of *fibreglass*, acrylic, enamel coated metal, or molded imitation stone. Most newer bathtubs are the *fibreglass* type. These need maintenance on a yearly basis. If in doubt as to which material you are cleaning, contact your housing department for advice.

- **Fibreglass** – clean with mild liquid household detergent and water, or foaming cleansers. Slightly stronger cleaners can be used on problem stains. Once per year a fibreglass cleaner/wax should be used to restore the finish. These products are available at marine suppliers.
- **Acrylic** – keep it bright and smooth with mild liquid household detergent and water, or foaming cleansers. Slightly stronger cleaners can be used on problem stains. Acrylic polish should be used every year or so and can be purchased from stores that sell acrylic bathtubs.
- **Enamel coated metal** – clean with mild liquid household detergent and water, or foaming cleansers. Slightly stronger cleaners can be used on problem stains.

Drain Cleaning

The use of harsh drain cleaners is not recommended. To clean a drain, pour a handful of baking soda into it and add a cup of vinegar. Put the plug in the drain and let the vinegar and baking soda work for about 20 minutes. Run fresh water into the drain. If the drain is still plugged, use a plunger or small plumbing auger (snake) to unplug it, this may require removing the drain basket. If chemical drain cleaners must be used, use a funnel and proceed cautiously. If the drain cleaner comes in contact with the sink or tub lining, it may cause permanent discoloration and/or damage to the *fibreglass* or acrylic surface. If you cannot unplug your drain, you may have to contact the housing department or a plumber for assistance.

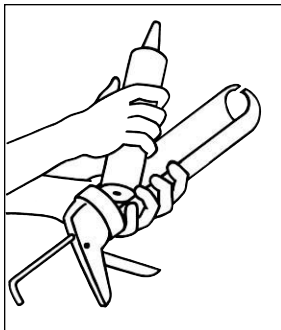


TIPS

- The use of unapproved products may void your warranty and may damage your sinks, tubs and showers.
- Tubs and showers may be quite slippery after cleaning and waxing. It is recommended that a non-slip rubber mat or non-slip strips be used.
- Tubs and showers are easiest to clean immediately after a shower.
- Wearing rubber gloves during cleaning is recommended for health and safety reasons.

Replacing Caulking in Bathrooms and Kitchens

Proper *caulking* around your bathtub and toilet is needed to ensure that water and moisture does not get into the surrounding drywall and *subfloor*. Moisture in drywall may cause mold and *mildew* to grow inside the wall. It will also cause the insulation inside the wall to lose its thermal value.



Moisture on the plywood sub-floor may cause rot and mold which will be very expensive to repair. Proper *caulking* between kitchen cabinets and walls will prevent moisture from getting in behind your cabinets and damaging the walls

and floor below. Some *caulking* or tub and tile sealants are *not mildew* resistant.

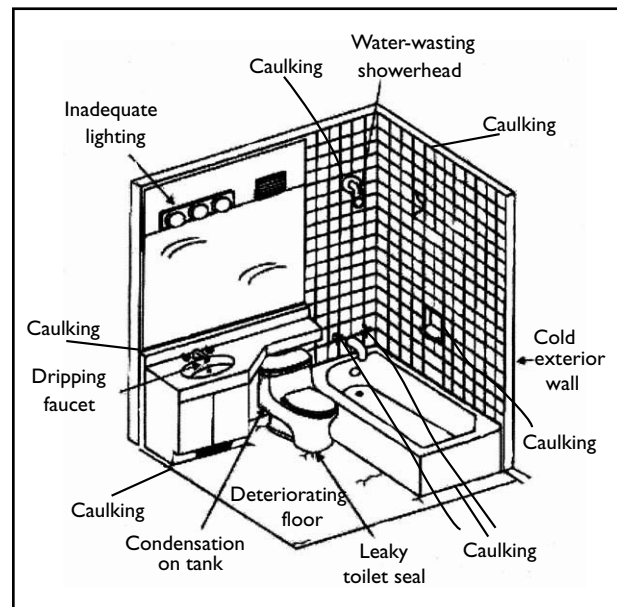
Caulking needs to be applied and maintained around bathtubs and showers where they meet the flooring and surrounding drywall and/or tub surrounds. *Caulking* may also be desirable at the base of toilets when located near bathtubs or showers and behind kitchen sinks at the wall countertop junction.

Tools and Supplies

- scraper
- flat knife
- nail or probe
- mineral spirits
- dust mask
- bucket
- garbage bag
- mildew-resistant kitchen and bath *caulking*
- knife
- detergent
- rubber gloves
- liquid silicone remover
- rags or paper towels
- caulking gun

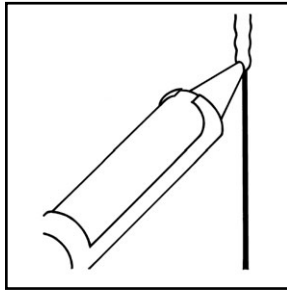
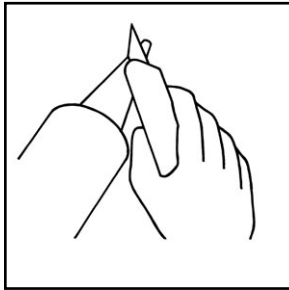
Bathroom

- Check for mold and *mildew* around perimeter of tub and wall. Check for missing pieces of *caulking* around tub. Push against the wall above the tub. If the wall is soft and easy to push, then the tub surround or tiles will need to be removed and replaced. The insulation, vapour barrier and drywall may need to be replaced and there may be a mold problem to remove inside the wall (contact your housing coordinator or housing office first).

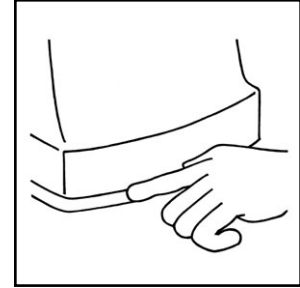


- If the wall is sound, then remove the mold as per the mold cleanup guidelines section located in this book. Always wear rubber gloves and a dust mask when cleaning up mold. Sometimes mold will be rooted right into the old *caulking*. When this happens, the *caulking* needs to be removed and replaced.
- To remove, scrape the old *silicone caulking* off with a flat knife, being careful not to scrape or scratch the enamel on the tub. Apply liquid silicone remover and then remove the remaining *silicone caulking*. Clean with warm water and detergent. Let the area dry.

- Fill the tub with warm water. The weight of the water in the tub may slightly open the space between the tub and the wall that will ensure the *caulking* can be forced in. Once *caulking* has cured, drain the tub.
- When *caulking* around a bathtub or other plumbing fixture, always use interior “*mildew resistant*” *silicone caulking*.
- To apply *caulking*, cut the tip of the caulking tube at a 90° angle to match the width of the opening between the tub and wall protection. Poke a coat hanger or other probe into the tube to break the seal. Start in one corner and hold the caulking gun at a 90° angle from the wall. Rub excess *silicone* with a wet finger or with a caulking-finishing tool. It can be a messy job, so you may want to practice applying and smoothing some sample beads on some disposable scraps of material.



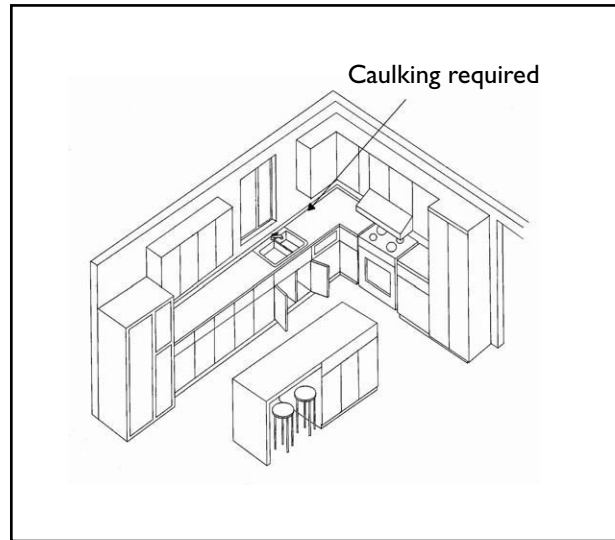
- *Caulk* between the tub and flooring, and wherever the tub meets the wall (including on the outside of the tub where it meets the wall).
- Clean around the base of the toilet bowl with detergent and water. After you have let it dry, *caulk* around the base of the toilet bowl. A small uncaulked strip should be left at the back of the base of the toilet. This is a precautionary measure in case the wax seal of the toilet fails. It will allow leaks to show, which will alert you to the failure of the wax seal.



Kitchen

The joint between the wall and countertop (within one metre of the sink) should be caulked to prevent splashes from penetrating behind the countertop and running down the wall. Many kitchen sinks are self-sealing to the countertop but some require *caulking*. To determine if your sink requires *caulking*, check underneath the sink to determine if there are signs that the moisture on the countertop has leaked through.

- Clean off old *silicone caulking* as detailed in the Bathroom section above and repeat the same *caulking* procedure between the top of the countertop and the wall.
- Check around the sink and re-*caulk* if required.

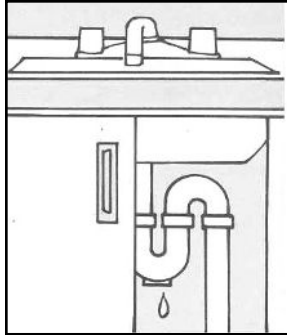


TIPS

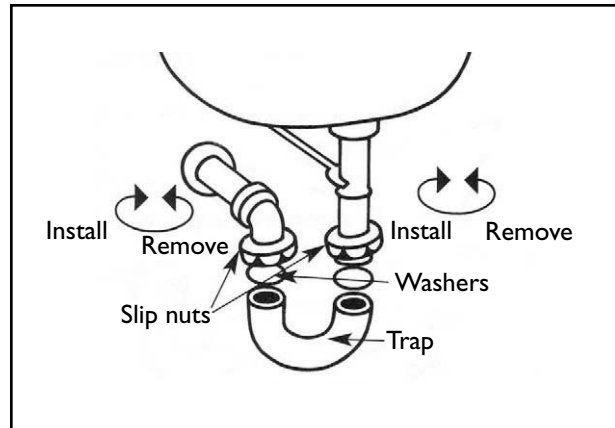
- Practice *caulking* on a hidden location to get the feel of the caulking gun.
- *Caulking* is also available in a squeeze tube, which many people find easier to use than a caulking gun.
- Start with the narrow tip in small spaces first, and then cut tip again for larger openings as you proceed.
- Always use interior “*mildew resistant*” *silicone caulking* in kitchen and bathrooms.
- If you are *caulking* in an area where you will be painting later, check the manufacturer's label to ensure the *caulking* will accept paint.

Fixing Leaks in Waste Plumbing

Waste plumbing under sinks expands and contracts with exposure to hot and cold wastewater. A double kitchen sink has at least 9 to 12 joints subject to leaking. As joints expand and contract, they can loosen and start to leak. Leaky pipes, even if they have a container to catch the leak, elevate moisture levels and promote mold growth.



- Leaking joints at sink baskets, tailpieces and metal drain fittings should be resealed to sinks, showers and tubs with plumbers' putty.
- Plastic plumbing connections have tapered plastic compression washers that seal as the connection is tightened. Normally these connections are tightened by hand, without a wrench. If a wrench is used, do not over tighten.



- Traps are used to prevent sewer gas from entering the house through plumbing drains. Except for traps, waste plumbing should be level or sloped down to drain. Plumbing sloped uphill is prone to leakage.
- Once any slope problems have been corrected, seal leaks in plastic drain connections by gently tightening by hand. If over tightened, the plastic tapered washer may distort and not seal.
- If gentle tightening does not seal the leak, disassemble the leaky joint, clean joint area and install a new compression washer. Reassemble and tighten gently by hand.

TIPS

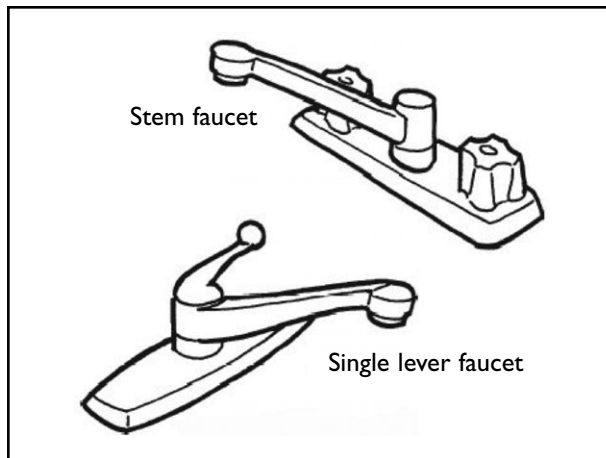
- If the above methods do not stop the leak, there may be a design fault in the plumbing and a maintenance person or a plumber may be required.
- When unsuccessful at unplugging sinks and drains and a plumber is called in, don't forget to inform them if you have used chemical drain cleaners.

Repairing Faucets

The most common faucet problems are dripping faucets or leakage around handles and spouts. In both these instances, worn parts are the main cause of problems. Fortunately, most of these parts are easily replaced.

There are three types of faucets; seat and washer (compression) faucets, diaphragm faucets and ceramic disk or ball faucets. The seat type is the most common for faucets with separate hot and cold handles. Single handled faucets are normally the ceramic or ball type. The two handle washerless type faucets are usually the diaphragm type.

Methods for repair vary, depending on the type of faucet.

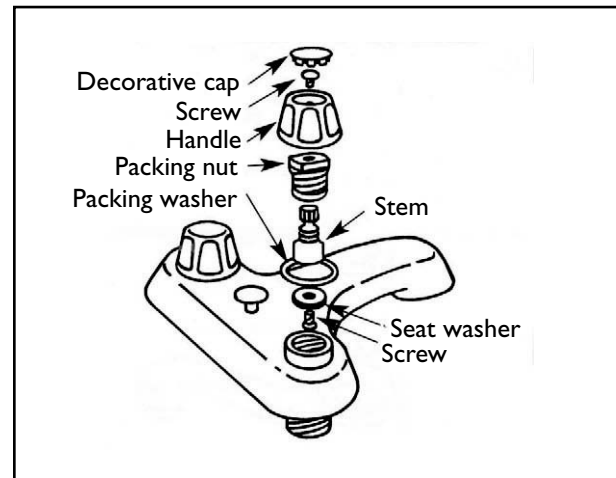


Tools and Supplies

- screwdrivers
- crescent wrench
- pliers
- seat wrench or large hex wrench
- washers
- O-rings
- replacement cartridges
- waterproof lubricant

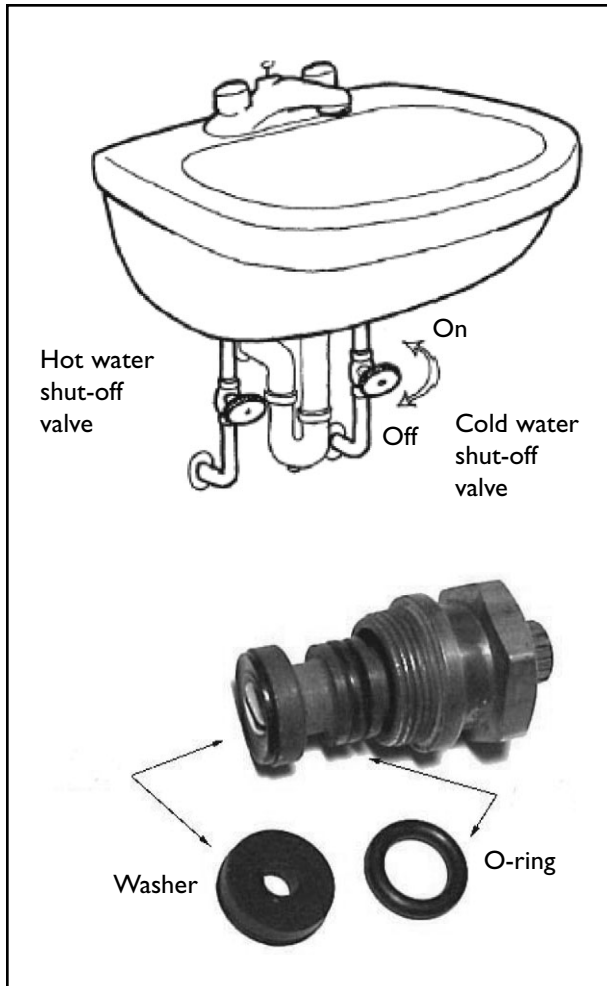
Replacing Washers and O-Rings in Seat and Washer Faucets

The washer becomes worn and hard after years of service. This often leads to a dripping faucet. Usually when worn there is a depression running in a ring around the washer, or the washer has begun to crumble with age. If a washer has worn out prematurely (in less than three years), the seat is most likely damaged and nicks the washer every time the water is shut off. If the faucet is leaking near the handle, the problem is most likely a worn O-ring.



To Replace Washers and O-Rings

- Turn off the water supply shut-off valve under the sink. For bathtubs and showers, the main water shut off for the house may be the only shut-off.
- Plug the drain to prevent losing parts down the drain.
- Remove the faucet handle.
- With a wrench, remove the stem assembly.

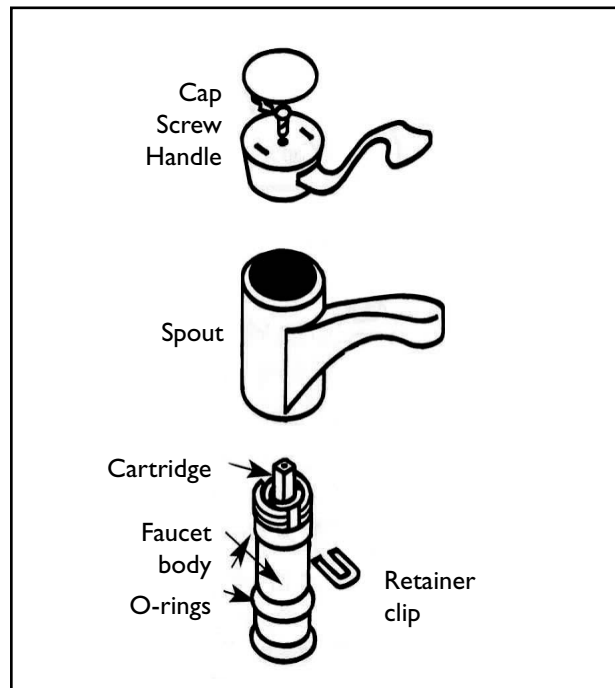


- Replace washer and tighten the screw. (Sometimes it is wise to use a new screw.)
- If leaking occurs around the handle, the O-ring may need to be replaced. Remove the O-ring by hand, or carefully pry it off with a sharp tool. Lubricate the new O-ring lightly with waterproof grease after you install it.
- When reinstalling the stem make sure the stem is in the open position, so that the washer will not get squashed or damaged when the stem assembly is tightened.

Repairing Diaphragm and Cartridge Stem Faucets

- Diaphragm and cartridge faucets are just as easy to repair as seat and washer faucets. Finding the right parts is usually the most difficult part of the job. The best method is to remove the stem and take it to your supplier.

- Examine the washer. If it is damaged, remove the washer screw, and pull the old washer off. Clean the bottom of the stem. Take your stem and old washer to your supplier if you are not sure how to select a new washer that will fit.
- Insert a new washer. Find a washer the same size and shape as the old one. If the old washer has been squashed out of shape, this may be difficult to determine, so double-check by slipping the new washer onto the bottom of the stem.
- Feel inside the faucet to determine if the seat is smooth and clean. Damaged seats can be removed with a seat wrench or large hex wrench. Occasionally seats become loose, causing faucets to drip.

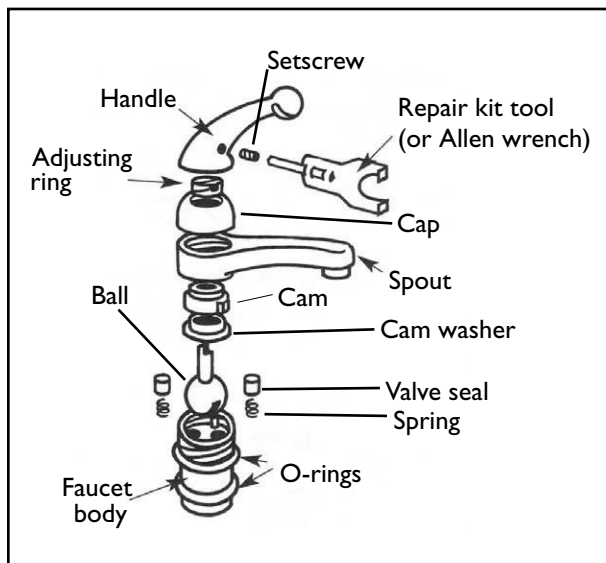


- Follow the steps above for seat and washer faucets (i.e. turn off water, remove handle, etc.)

- If faucet is dripping, the diaphragm may need to be replaced. Sometimes called a top hat stem, a diaphragm stem has a diaphragm that functions much like a seat washer. To replace it, follow the procedure above for seat washer replacement and simply pull off the worn diaphragm, and snap a new one on.
- If leaking occurs around the handle, the seal and O-rings may need to be replaced. For a cartridge stem, fix leaks by replacing the seal and O-rings. Follow the procedure above for seat washers, remove the rubber seal from the base of the faucet with a sharp pointed tool; a small spring will come out as well. Remove the O-ring by hand, or carefully pry it off with a sharp tool. Lubricate the new parts lightly with waterproof grease after you install them.

Repairing Ceramic Disk and Ball Faucets

Ceramic disk and ball faucets are normally single handle faucets. Leaks are usually caused by worn O-rings or built up mineral deposits. Repair consists of cleaning and replacing O-rings.



- Turn off the water supply shut-off valve under the sink.

- Remove the lever and cap. Some models have a setscrew that holds the lever to the lever post. Use an appropriately sized screwdriver or hex wrench to unscrew the setscrew. Loosen the screw until you can raise the lever off the post. You may have to gently pry it off with a large screwdriver.
- Lift off or unscrew the decorative cap that covers the cartridge.
- Loosen the screws holding the cartridge to the faucet body, and lift out the cartridge.
- You'll find a set of seals on the underside of the cartridge. Pull them out with your fingers, or carefully use a sharp pointed tool, being careful not to scratch the cartridge.
- Clean the openings. Check the openings for sediment buildup, and clean it away. Use a nonmetallic scrubber or a sponge.
- Put the seals back, or install replacement seals.
- Reassemble the faucet. Turn the water back on and test. If the faucet continues to leak after you have cleaned the cartridge and replaced the seals, install a new cartridge.

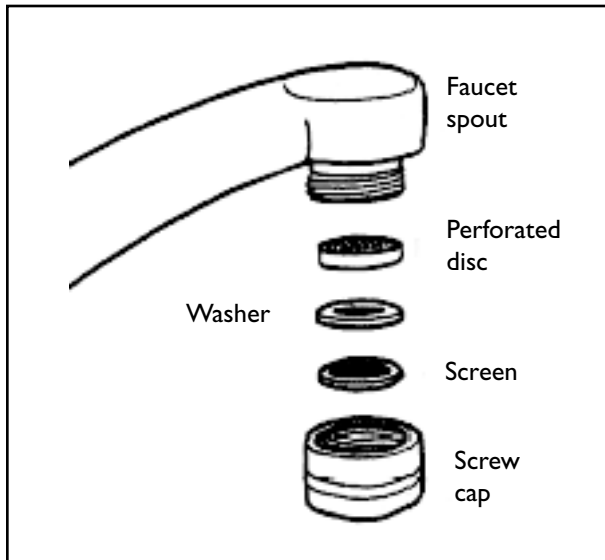
Repairing Leaks at Handles and Spouts

- Leaks at handles and spouts are usually caused by worn O-rings that can be easily replaced. O-rings allow stems and spouts to turn while maintaining a seal. Lubricate replacement O-rings with waterproof grease before reassembling.

Cleaning Aerators

- Most faucets have an aerator where the water comes out of the spout. The purpose of the aerator is to soften the water flow and control the spray in order to reduce splashing. Aerators contain fine mesh screens that need cleaning occasionally.

- If water appears to be flowing slower than normal, or if the water stream is distorted, then the aerator may need cleaning.



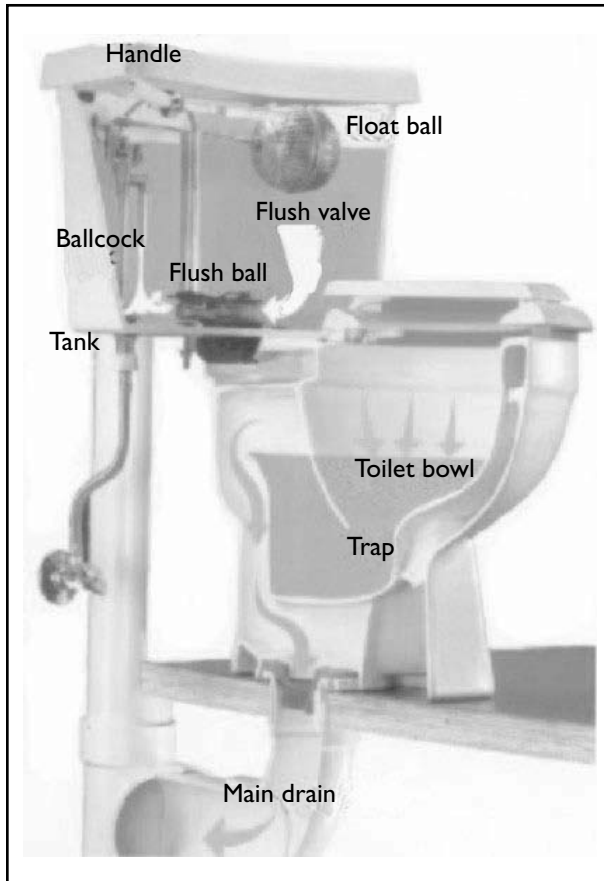
- Attempt to unscrew the aerator by hand. If unable to unscrew by hand, wrap with cloth or tape and gently use pliers to loosen the aerator.
- Screens can be removed from the aerator for cleaning or water can be run backwards through the aerator to dislodge any debris.
- When reinstalling the aerator, do not overtighten.

TIPS

- When working on faucets always put the stopper in the drain to prevent losing small parts.
- Check water shut-offs for leaks after working on faucets.
- Handles that have not been removed for years may be difficult to loosen. Once the screw has been removed, pry gently and equally from opposite sides to loosen.
- It is often best to bring the worn parts to a plumbing supply shop so that you can get the correct replacement parts. Most plumbing supplies can be purchased at hardware and building supply stores.
- It is sometimes easier and better to replace the entire stem assembly than to only replace washers.
- To remove an entire basin faucet, use a faucet wrench. It is designed to work in tight, hard to reach areas.
- If replacing supply tubes, choose plastic replacement ones instead of rigid metal, as rigid metal is harder to bend and cut without kinking or crimping.
- Aerators can be replaced with swivel type aerators, which make sink cleaning easier.

Repairing Toilets

The most common problems that occur with toilets are blockages and mechanical parts wearing out. Repair of toilets requires few tools and should be able to be performed by most home occupants.



- When someone pushes the flush handle, a chain of events starts.
- The handle lever pulls a chain that lifts the tank flapper or flush ball off the flush valve.
- As water rushes down through the opening into the bowl, the water and the waste in the toilet bowl rise high enough to start a siphon and pass through the toilet's trap, down through the closet bend, and out a drain line.

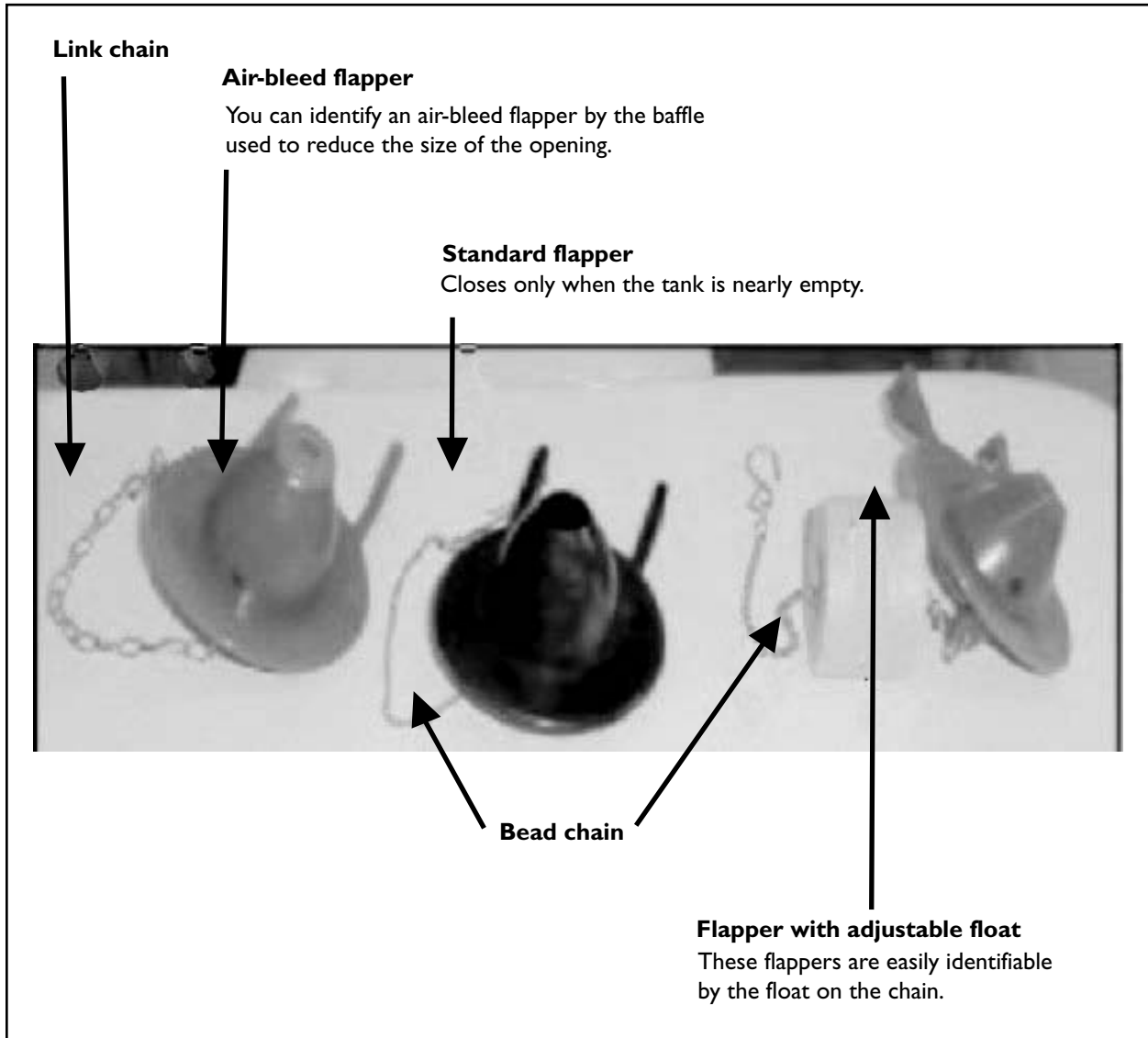
- Inside the tank, the float drops as the water level lowers. When the tank is almost empty the flap closes on the flush valve stopping the water from leaving the tank.
- The float is attached to a water supply valve called a fill valve or ballcock. Water enters through the fill valve to refill the tank.
- The ballcock also supplies water through a refill tube into the bowl through the overflow tube. When the float rises to its filled position, the fill valve shuts the water off.
- A wax ring seals the toilet bowl to a flange on the closet bend and keeps water from leaking out onto the floor. A gasket seals the tank to the bowl.



Tools and Supplies

- two large adjustable wrenches
- screwdrivers
- replacement parts
- toilet plunger
- toilet auger
- wax seal
- cleaning materials

The inner parts of a toilet are fairly simple.



Repairing Toilets

Symptom 1: Tank continuously trickles

Problem: Water continuously trickles or runs into tank and/or bowl.

Cause 1: Water level is too high.

Cure: Adjust float height shut-off levels by turning setscrew on ballcock, or replace leaky float.

Cause 2: Flapper is not sealing properly.

Cure: Clean the flush valve under the flapper, or replace worn flapper.

Cause 3: Ballcock is faulty.

Cure: Replace ballcock.

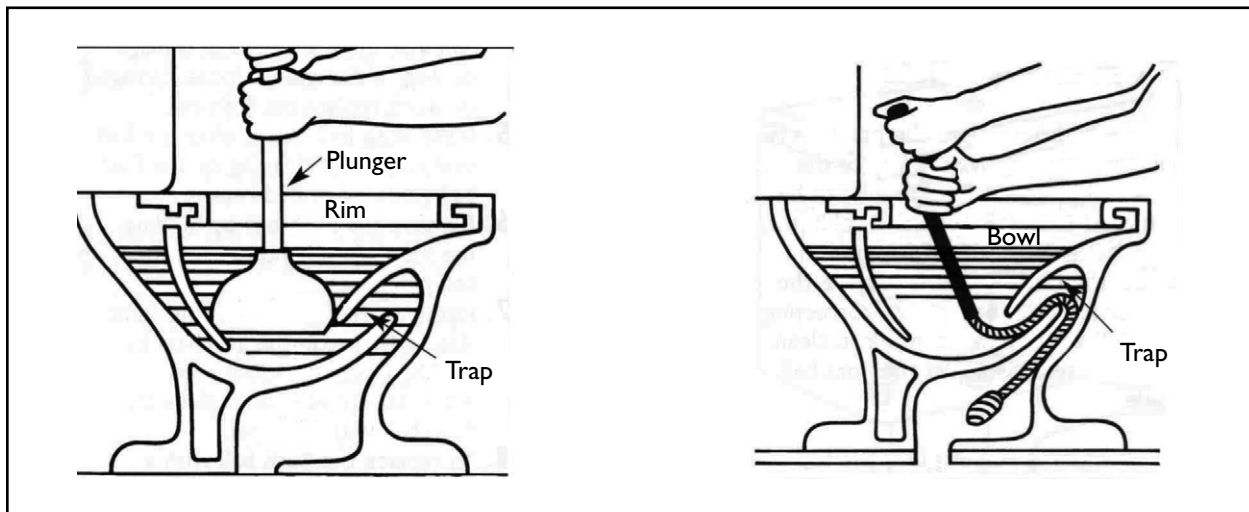
Symptom 2: Bowl overflows

Problem: Bowl overflows when flushed. Toilet flushes incompletely.

Cause: Trap, drain or bowl is partially or completely clogged.

Cure: Use a plunger or run a toilet auger through the toilet, or clear drain through plumbing cleanout. Toilet may need to be removed if badly clogged. Always use a new wax seal when reinstalling a toilet.

Note: Toilet augers (snakes) can scratch the toilet's porcelain finish.



Symptom 3: Tank and bowl leaks

Problem: Tank or bowl leaks. Leak appears as a wet spot on the floor.

Cause 1: Water is spraying against the lid.

Cure: Anchor the refill tube so it sprays into the overflow tube.

Cause 2: Gasket between tank and bowl is faulty.

Cure: Replace leaking gasket. There is a gasket where water flows from the tank to the bowl and there are gaskets for each bolt that connects the tank to the bowl. It should be easy to determine which of these gaskets is leaking by where the water is coming from.

Cause 3: Tank is cracked.

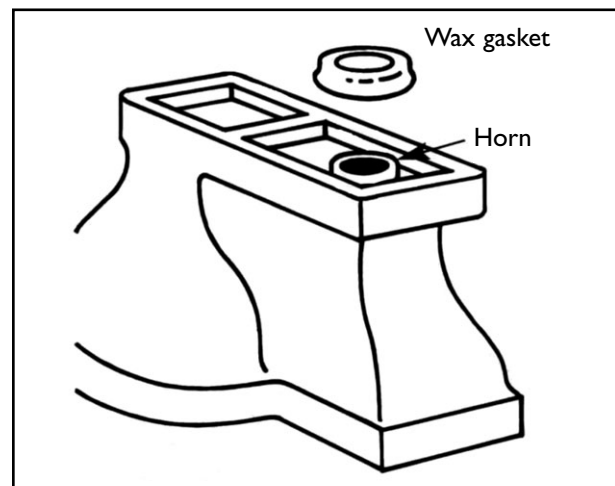
Cure: Replace the tank.

Cause 4: Wax ring is not sealing.

Cure: Pull up the toilet and replace the wax seal.

Cause 5: Bowl is cracked.

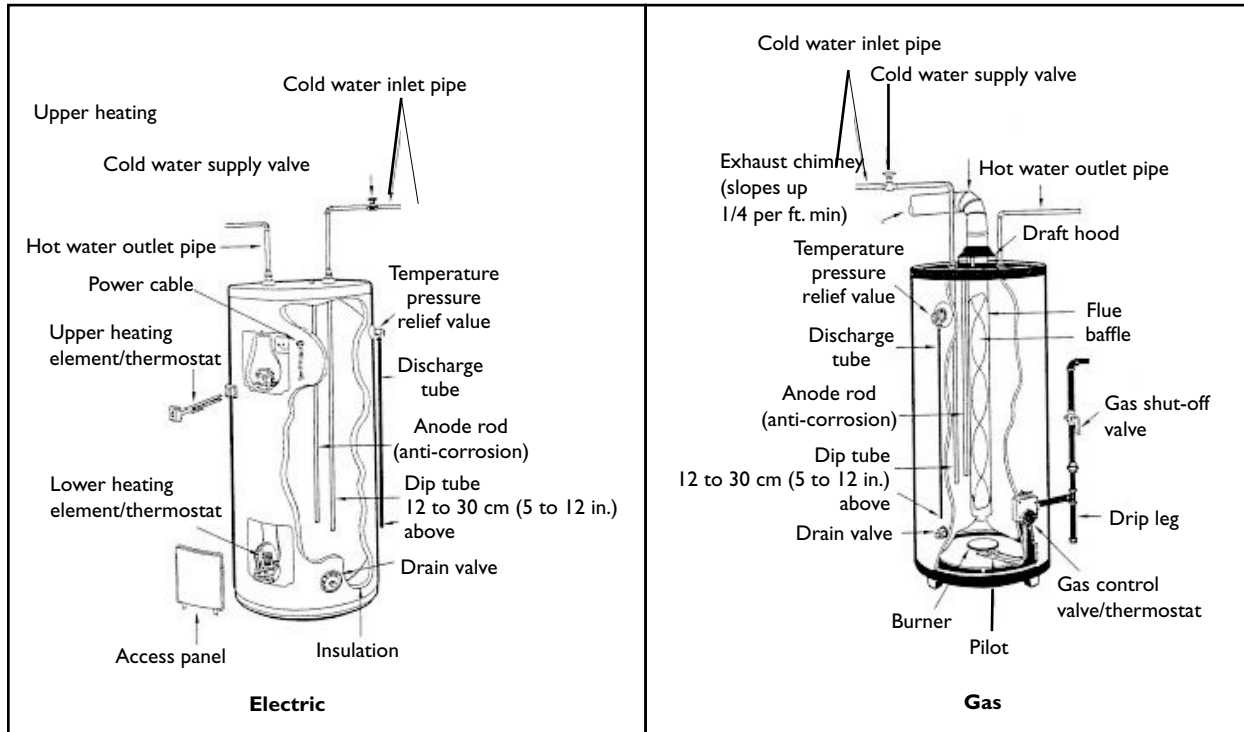
Cure: Replace the bowl.



TIPS

- Do not over tighten any nuts when replacing or repairing the toilet. Toilet bowls and tanks are made of porcelain and can easily chip or break.
- Keep a new wax seal, toilet plunger and toilet auger on hand. All three are inexpensive to purchase.
- Old wax seals can easily be removed with a butter knife and hot water or heat from a hair blow dryer.
- If a toilet is flushing slowly during a freezing and/or snowy period, check the main vent stack on the roof for ice or snow blockage.

Water Heaters



Water heaters are basically big insulated water bottles with heaters. When hot water is used, cold water enters through a dip tube to the bottom level of the water heater. This lowers the water temperature inside the tank, which causes the thermostat(s) to call for heat. In gas units, burners beneath the water tank heat the water until the preset temperature is reached. Electric resistance heating elements perform the same function in electric water heaters.

Most water heater problems are the result of sediment buildup and/or rust. You can help prevent this by opening the drain valve at least once per year and flushing out a few gallons of water. This purges rust and other buildup from the heater. An entire draining and flushing every three to five years is also recommended. This should be performed by a trained professional such as a housing maintenance worker.

The single most important component for prolonging the lifespan of a water heater is the *sacrificial anode*. This is a rod of magnesium or aluminum, which is wrapped around a steel core wire, and is screwed into the top of the tank. Connected to the steel of the tank, it creates an electrochemical reaction, similar to that of a battery, whereby the anode corrodes and the steel tank does not. In effect, the metal on the anode sacrifices itself to protect the steel tank. When there is no sacrificial metal left on the anode, the tank rusts out because now the electrochemical reaction is impacting the steel tank. When the tank rusts sufficiently, leaks occur and the tank has to be replaced. The anode is screwed into the tank. Depending on the design and location of the tank, the anode may be able to be unscrewed and replaced. **The anode rods generally last about five years depending on water conditions.**



CAUTION: Before servicing the water heater, SWITCH OFF the main electrical breaker for the water heater.

Tools and Supplies

- garden hose
- slip-joint pliers
- bucket
- screwdrivers
- adjustable wrench
- Teflon tape
- pipe wrench

Flushing Your Water Heater

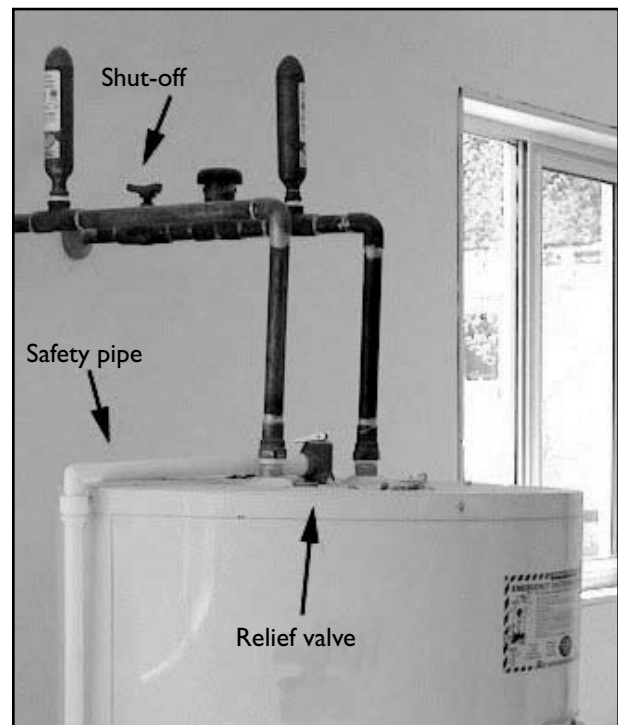
CAUTION: Flushing your water heater may put you or others at risk of being scalded by hot water. Please be careful when working on your water heater. If you are unsure how to perform this task, have a maintenance person flush your water heater for you.

- Turn off power.
- Attach hose to water heater drain and place other end of hose outdoors or into a floor drain or sink.
- Turn water heater drain several turns to allow water to flow freely through hose. When water runs clean, close drain, remove hose and turn electricity back on.

Testing a Relief Valve

CAUTION: Testing a relief valve may put you or others at risk of being scalded by hot water. Please be careful when working on your water heater. If you are unsure how to perform this task, have a maintenance person flush your water heater for you.

You'll find a relief valve either on the top of the water heater or high on the side of the water heater. This valve opens if the temperature or pressure in the tank gets too high. The valve should have a drainpipe permanently attached to it running down to floor level.



- Place a bucket under the relief valve drainpipe (unless pipe is connected to a floor drain). Test the relief valve once a year by pulling on the handle; if water rushes out of the pipe attached to it, the valve still works.
- If valve does not completely shut, pull the handle again.
- If the valve still does not shut or if water does not come out, replace it with a new one that is rated for the same Btu's listed on the label of the unit being replaced. Normally an electric tank will have a valve with a 19 mm ($\frac{3}{4}$ in.) inside diameter pipe outlet size.
- Shut off the cold water, turn off power or gas to the unit, and drain some of the water. Remove the attached drainpipe and the valve.
- Apply Teflon tape or pipe *drywall compound* to the male threads when you install the new valve. Reattach drainpipe.

Problem Solving

Most water heater problems are easy to diagnose but many repairs will require a trained professional. Home occupants can normally perform simple water heater maintenance. The following list of symptoms is designed to help you troubleshoot water heater problems and help you assess how serious the problem may be.

Symptom 1: No hot water

Cause: No power to the heater (electric). Pilot light out (gas).

Cure: Check *circuit breaker* or *fuse* (electric). Re-light pilot, have a qualified technician replace thermocouple if pilot does not stay lit (gas). Instructions for relighting the pilot light are usually on a sticker near the pilot light access.

Symptom 2: Water not hot enough or takes too long to recover

- **Cause:** Upper element burned out (electric)
- **Cure:** A qualified technician should replace the upper element.

Symptom 3: Hot water runs out quickly

- **Cause 1:** Thermostat set too low
 - **Cure:** Turn thermostat up (place candy thermometer under running hot water at a nearby sink, temperature should be around 62° C (145° F), under 54° C (130° F) is unhealthy, over 68° C (155° F) is a safety hazard).
 - **Cause 2:** Hot water travels a long way to get to faucets.
 - **Cure:** Insulate hot water pipes with pipe insulation (available at most hardware stores).
 - **Cause 3:** Sediment buildup in tank.
 - **Cure:** Flush, drain and refill tank as explained earlier in this section.
 - **Cause 4:** Lower element burned out (electric).
 - **Cure:** Have a qualified technician replace lower element.
 - **Cause 5:** Burner blocked by dirt (gas).
 - **Cure:** Have qualified technician clean and adjust burner.
 - **Cause 6:** Leaking faucets.
 - **Cure:** Repair faucet leaks as described in the Repairing Faucets section.
 - **Cause 7:** Tank not large enough for demand.
 - **Cure:** Replace with a larger tank.
- #### Symptom 4: Tank makes noise
- **Cause:** Sediment in tank.
 - **Cure:** Flush, drain and refill tank as explained previously.

Symptom 5: Leak from temperature-and-pressure-relief valve

- **Cause 1:** Thermostat set too high.
- **Cure:** Lower thermostat setting.
- **Cause 2:** Defective temperature-and-pressure-relief valve.
- **Cure:** Replace valve as explained previously.

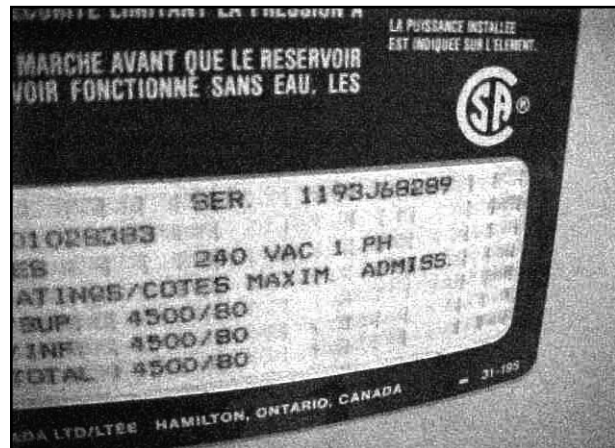
Symptom 6: Leak around tank base

- **Cause:** Tank corrosion has created a leak.
- **Cure:** Replace water heater.

Determining the Age of Your Water Heater

The first four digits of the serial number on the water heater label often contain the date of manufacture. It can take the form of month and year or week and year. A number or a letter may

indicate the month. 01 or "A" for January, 02 or "B" for February. Thus, B95 means February 1995; 1695 means the 16th week of 1995. On the label to the right, the serial number 1193J68289 shows the tank was made in the eleventh week or month of 1993 (the 1193 leading digits).



TIPS

- Water heater elements should only be replaced by qualified tradespeople.
- Adjustments to gas water heaters should only be made by qualified tradespeople.
- Water conditions vary by location. This will affect how long water heaters and anodes last and how often flushing is required.
- Anodes are made from magnesium and aluminum. Water conditions in your area may determine whether magnesium or aluminum is the preferable choice.
- When buying a replacement water heater, look for a model that has an easily replaceable anode.
- Under normal water conditions, with little to no maintenance, a water heater usually lasts around 12 years. Proper maintenance can double the lifespan.
- It is normally more economical to repair a water heater than to replace it unless the tank is getting near the end of its lifespan. If tanks in your community generally last 12 years, the cutoff point for doing repairs such as replacing elements would be about 8 years.

Maintaining Septic Systems

Most homes in urban areas are connected to a municipal sewage treatment system.

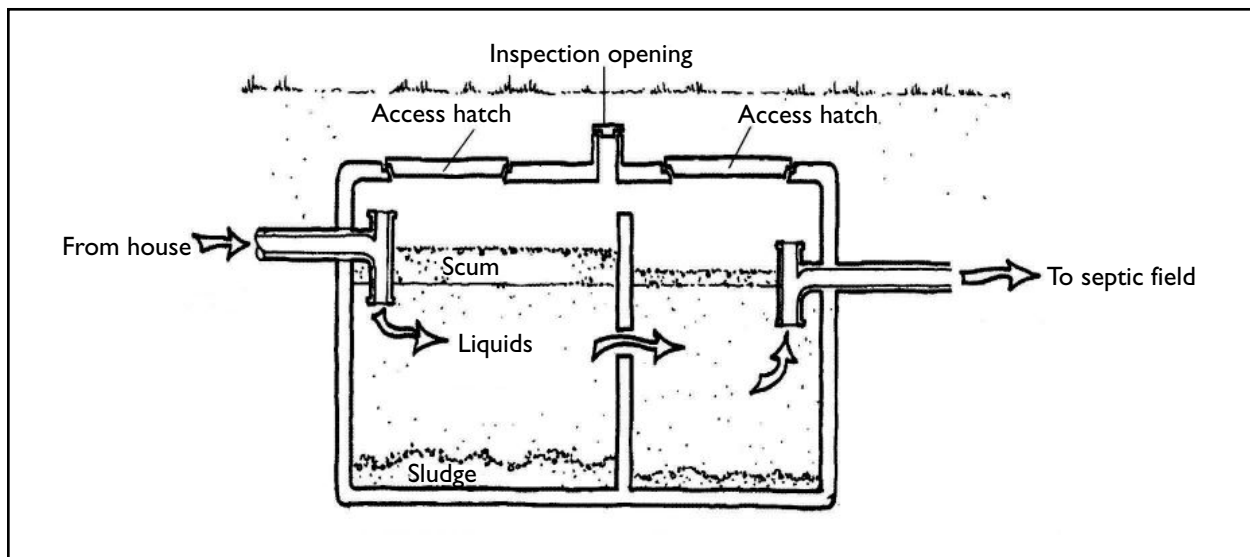
In rural areas homes are often connected to a community sewage treatment system or have individual septic systems.

A septic system is a sewage treatment plant that usually services only one home.

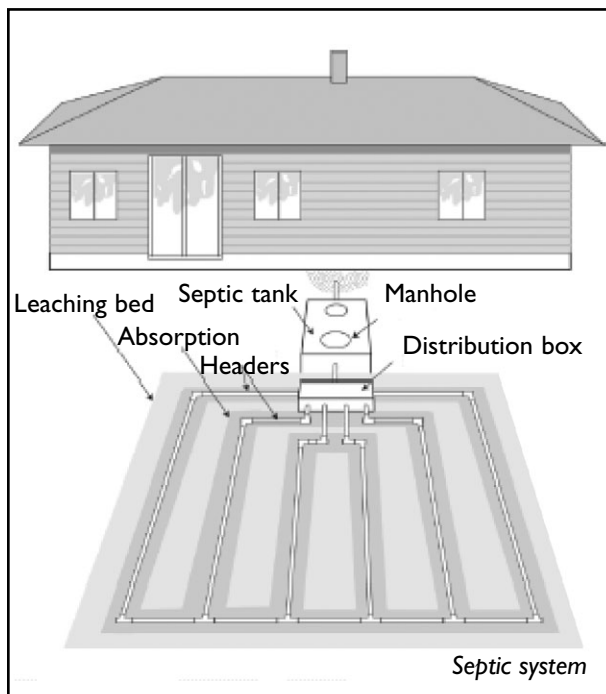
It contains a tank and a distribution network of perforated pipes called a tile bed, leaching bed, or field. These parts are buried underground so you may not even be aware of them. Your septic system receives all of the waste water from your house, including toilets, showers, sinks, dishwasher, washing machine, etc. and purifies that water so it is safe to reenter the groundwater system.

The purpose of the septic tank is to separate the solids from the liquids in the wastewater stream and to begin the process of breaking down the solids and contaminants. The septic tank typically has two interior chambers. The wastewater from your house, called “influent,” enters the first chamber and its velocity slows so that the heavier solids can settle out of the water into the bottom of the chamber, and lighter materials can float to the surface. The accumulation of settled solids at the bottom of the tank is called “sludge” and the lighter solids (greases and fats) which form a mass on the surface of the liquid in the septic tank is called “scum.”

In between the sludge and the scum is liquid waste. Microorganisms, like bacteria, and other natural processes act to decompose the waste materials in the liquid waste. Sludge and scum are also digested and compacted into a smaller volume.



The purpose of the leaching bed is to further treat the wastewater. A gridwork of perforated pipes or clay tiles in the leaching bed area evenly distributes the effluent over the natural soil or imported fill. Sometimes a distribution tank is used at the head of the pipes to more evenly distribute the effluent to the pipes. The perforations in the pipe allow the effluent to escape to the soil. As the effluent filters through the soil, microorganisms in the soil digest and remove the remaining impurities (such as suspended solids, organic chemicals and viruses and/or bacteria). Eventually, the purified water reaches the groundwater.



Preventive Care and Maintenance

- Sludge will build up in the bottom of your septic tank. The rate of the buildup will depend on the size of your tank, volume of solids in the wastewater system, and the number of people in your home. If sludge is allowed to accumulate to the height of the outlet pipe, it could flow into the tile bed.

This will result in a blocked pipe, possible sewage backup into the home, and an expensive repair to your tile bed as the bed will require digging up and replacement of the drain field. **To prevent clogging of the system, a licensed sewage disposal contractor should be hired to pump out the tank to remove the sludge every two to five years.** In colder climates this should be done in late summer or early fall, when the ground is no longer frozen.

This will allow biological activity in the tank to quickly reestablish itself. In the spring, a high water table can sometimes create sufficient pressure on the underside of an empty tank to push it out of the ground.

Warning: Never inspect or try to pump out a septic tank yourself, there may be deadly gases that can kill you in just a few seconds.

- Because septic systems rely on microscopic organisms to break down the waste material, it is important that you not “poison” these organisms. Even small amounts of paint, *solvent*, thinner, nail polish remover and other common household compounds flushed or poured down the drain can kill the organisms that break down organic material. Laundry bleaches, toilet bowl cleaners and caustic drain openers can also slow the treatment process, allowing sewage to pass through to the leaching bed without proper treatment. However, moderate use of these materials should not interfere with the operation of the septic system.
- You should avoid putting anything into the septic system that doesn't break down naturally or anything that takes a long time to break down. Materials such as oils, grease, fat, disposable diapers, tampons and their holders, condoms, paper towels, facial tissues, cat box litter, plastics, cigarette filters, coffee grounds, egg shells, and other kitchen wastes, should never be put into the septic system. You should also avoid the use of in-sink garbage disposal units (“Garburators”).

- The area over your leaching bed should have a good grass cover, good ventilation and adequate sunlight to promote evaporation. Trees and bushes should not be allowed to grow over or near the leaching bed as their roots may possibly clog the tiles.
- Do not park vehicles over the tank or field areas as the weight of the vehicles may cause damage. If soil over the pipes becomes compacted it will be less able to absorb the wastewater.
- Do not cover the leaching field with decks, piles of firewood, old cars or other debris as this could prevent oxygen from getting into the soil. The microorganisms responsible for digesting the waste material need oxygen to survive and function.

Recognizing Septic Problems

Some of the warning signs that your septic system may be failing include the following.

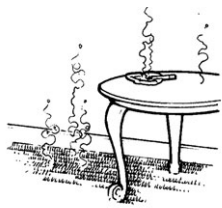
- The grass over the leaching bed may be much greener and lusher than other areas of the lawn.
- The ground around the septic tank or over the leaching bed may be soggy or spongy to walk on.
- Toilets, showers and sinks may back up or may take longer than usual to drain.
- Occasional sewage odours may become noticeable, particularly after a rainfall.
- Gray or black liquids may be surfacing in your yard or backing up through fixtures into the house.
- You may notice significant algae growth in or around nearby lakes or water bodies.

TIPS

- Some manufacturers promote the use of septic tank “cleaners,” “starters” or “enhancers” to aid in the digestion of the waste. These products are typically of little value, and in some instances may actually kill essential bacteria, so they are not recommended.
- You can also prolong the life of the septic system by controlling the amount and timing of wastewater you put into the system.
- Reduce the use of phosphate-based detergents, soaps and cleaners. The phosphorus in detergents doesn't break down in a septic system. When the phosphorus leaches into the ground and into nearby bodies of water, it can promote algae growth and can impair water quality and fish habitat.
- Septic systems will function better if the lawn over the field is not watered. Also, surface runoff and roof water should be directed away from the septic field area.
- Do not drive on a septic field, plow the snow off or stockpile snow on a septic field.

Healthy Housing™ and Indoor Air Quality

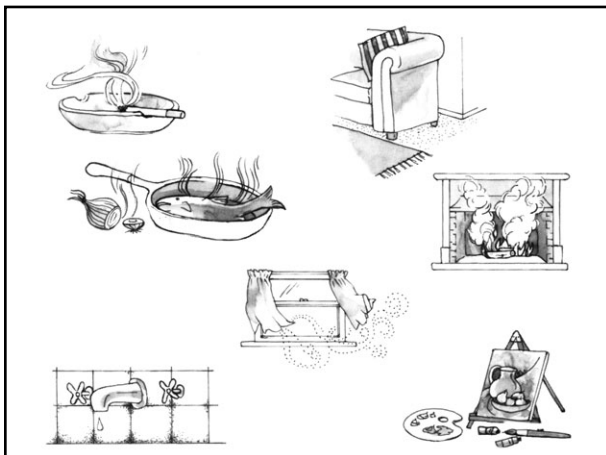
Housing should provide a healthy living space for its occupants. We should also build and operate our homes in a manner that is healthy for the environment. This includes being water, energy and resource efficient. There is a strong interconnection between healthy housing, mold, *relative humidity* and ventilation. This section of the book will focus on health for the occupants.



Poor indoor air quality has been recognized as a serious health risk. What is alarming is that many houses suffer from this problem. Linked to cancer, allergies, weakened immune

systems, asthma and other respiratory ailments, our houses are seriously impacting our health.

Fortunately, there are solutions. We needn't step outside for a breath of fresh air. The air in our homes can be as fresh as it is outside. The answers lie in making wise, informed choices and in how we operate our homes. The first step is to understand the problem.



Sources of indoor air contaminants include smoking, cooking, formaldehyde, combustion by-products, radon, hobbies, dust and mold and mildew.

Why Homes Can be Unhealthy

Building materials, finishings (paint, flooring, cabinets, etc.), furnishings, cleaning products and even the occupants themselves pollute our indoor air. Add to this outside pollution filtering in along with microbiologicals such as mold, and the potential is there for very unhealthy living conditions. Most indoor pollution is either caused by materials gassing off, or from elevated moisture levels.

Volatile Organic Compounds (VOCs) are emitted from paint, drywall, lumber and *fungicides*. Gases from plywood, OSB, *particleboard*, cabinets, and furniture can contain formaldehyde. Paint, varnish and glues can gas off *solvents* into your breathing space. Modern homes contain thousands of chemical compounds. Although not all have odours, many do. If you can smell a product, then it is gassing off. Gassing off is worse in new homes and recently renovated homes—as much as 15 times higher than in houses more than three years old and, for some pollutants, as much as 1,000 times higher than standards for outdoor air.

Elevated moisture levels (humidity) result in *condensation* on windows, toilets, cold water pipes, walls and ceilings. This breeds microbiologicals such as molds, fungi, viruses and bacteria. Left unchecked, these can grow rapidly and are such a serious health problem that they can make a building uninhabitable.

Other indoor air quality concerns include:

- combustion gas and smoke spillage from heating and cooking
- cigarette smoke
- dust—the average adult breathes two heaping teaspoons daily
- household cleaners—ammonia, sodium hydroxide, hydrochloric, oxalic and sulfuric acids

- high carbon dioxide and low oxygen levels—from many occupants in a stuffed-up house

Three Keys to Making Homes Healthier (Eliminate, Separate and Ventilate)

Eliminate materials that are unhealthy for you

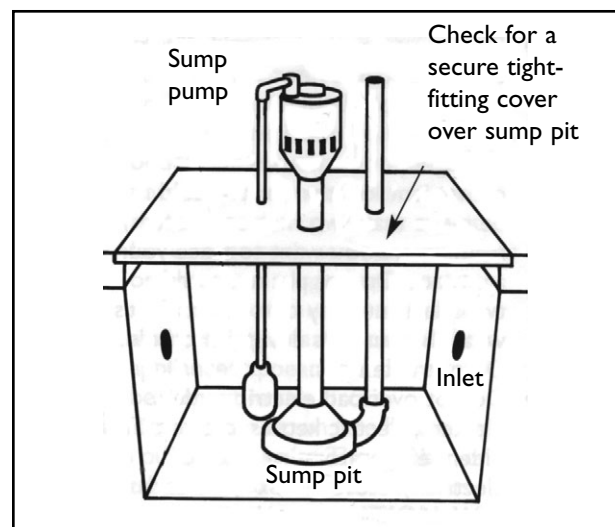
- Avoid using products and materials with high levels of volatile organic compounds (*VOCs*). Use paints, stains, *sealants* and adhesives that don't emit *VOCs*.
- Avoid using synthetic carpets. Area rugs are preferable where dust allergies or asthma are a concern since they can be removed for proper cleaning. Carpeting and underpadding made from natural fibres do not outgas. Consider durable, inert flooring. Hardwood is another option and can be finished and maintained with low-*VOC* materials. Use pre-glued or water based adhesives for vinyl composition flooring tiles or non-porous *ceramic* flooring.
- Cabinets and furniture made from solid hardwood or softwood have few of the toxic characteristics of composite or synthetic materials. Some plywoods and *particleboards* are available without formaldehyde.
- Minimize use of wallpaper, textured finishes and fibrous materials if dust allergies are a concern. Natural fibre fabrics for soft furnishings are preferred.
- Use safe non-toxic materials when cleaning your home.
- Have *combustion appliances* serviced regularly. Make certain that your *furnace* is properly vented. Ensure there is an adequate supply of combustion air to gas or oil-fired; water heaters, *furnaces* and space heaters, as well as to wood stoves and fireplaces. This combustion air should be supplied via a dedicated duct from the exterior. Relying on indoor air for this purpose will result in poor performance and the potential for combustion gases to spill into the living space. Consider using sealed

combustion appliances. These appliances will reduce the possibility of combustion gases spilling into the home. To be on the safe side, install a carbon monoxide (CO) detector.

- Reduce humidity sources where possible by fixing leaks, not drying clothes indoors or stacking firewood indoors.
- Avoid using pesticides, herbicides and chemical fertilizers for landscaping and gardening outside the home.

Separate insulation and other unhealthy material from the living space using an *air barrier*

- Do not allow materials like uncovered insulation in your living and breathing space.
- If formaldehyde-based material is used, laminate or seal all edges and surfaces to reduce outgassing.
- Do not store toxic cleaners, garden chemicals or fuel indoors.
- Protect against soil gases and vapour. Provide an effective *air barrier* on the interior face of the basement walls to isolate the living area from soil gases. Seal around all openings and joints in the slab. In areas with high radon levels, install a sealed floor trap. Ensure an effective seal over *sump* pits.



Ventilate to Have Good Indoor Air Quality

- All the air in your home should be replaced with fresh outdoor air every three to four hours. This will help remove chemicals, gases and toxins from the indoor air that you breathe and to stop mold growth by reducing moisture levels. Kitchen and bathroom fans and whole house ventilation systems can be effective methods of achieving this comfortably and without excessive heat loss. Opening windows is also a simple way to ventilate, especially in milder climates.
- Along with ventilation, low-level air movement is needed within the home to help eliminate pockets of “dead air” behind furniture and in corners. These pockets can have high levels of pollutants and humidity. *Forced air* heating systems improve air movement, however airborne dust levels also increase as you increase air movement. The key here is to move air gently. Even *baseboard heaters* move air using convection air currents when not blocked by furniture.
- Consider using controls such as timers or dehumidistats to ensure ventilation is provided automatically when needed.

TIPS

- Healthy housing requires initiative on the part of the occupants. *HRVs* are not effective when turned off, mold will grow if spills are not wiped up and leaks are not fixed. Smoking, using harsh cleaning chemicals, and storing poisons (including fuel) indoors will pollute your air.
- *Condensation* on windows is an indication of poor air quality and lack of ventilation.
- Houses that make a person feel sleepy often have poor air quality.
- If house occupants are often ill, this can be a sign of unhealthy housing as unhealthy housing negatively impacts people's immune systems.
- Mold growth indicates high moisture levels and poor air quality.
- Maintain higher heat levels in bathrooms and bedrooms. Better air circulation will be created to the rest of the house if bathrooms and bedrooms are kept at a higher temperature. This will help to reduce moisture problems in these two areas.
- High quality furnace filters can help minimize dust.
- Furniture can block convective airflows. This is particularly a problem with *baseboard* type heating. Avoid placing furniture directly in front of, or over heaters or heat registers.
- Keep animals outside to reduce dust and pet dander.
- When shopping for cleaning products, choose nontoxic and fragrance free products.

Controlling Humidity

High humidity levels cause *condensation* and lead to mold growth. Very low humidity levels can also be unhealthy. Humidity can be controlled by natural and *mechanical ventilation* and by reducing moisture at its sources.

Climatic conditions across Canada directly impact moisture levels and *condensation* problems within homes. In some areas occupants experience very little to no moisture problems whereas other areas of Canada present severe challenges in dealing with moisture problems. In cold, dry climates, occupants often have to introduce moisture to the air to maintain a comfortable level of indoor air humidity. In coastal and maritime communities, keeping indoor humidity levels low enough to prevent *condensation* and mold growth requires not only effective ventilation but also reduction of moisture at the sources.

Relative Humidity

Understanding that humidity is relative to temperature allows us to comprehend why houses have moisture problems in certain areas and how to deal with this problem. Warm air can hold more moisture than cool air. When *relative humidity* reaches 100 per cent, water falls out of the air, causing *condensation*. During a summer day, outdoor air can hold large amounts of humidity. The cooling of air at night causes moisture to fall out of the air, resulting in dew forming on the ground.

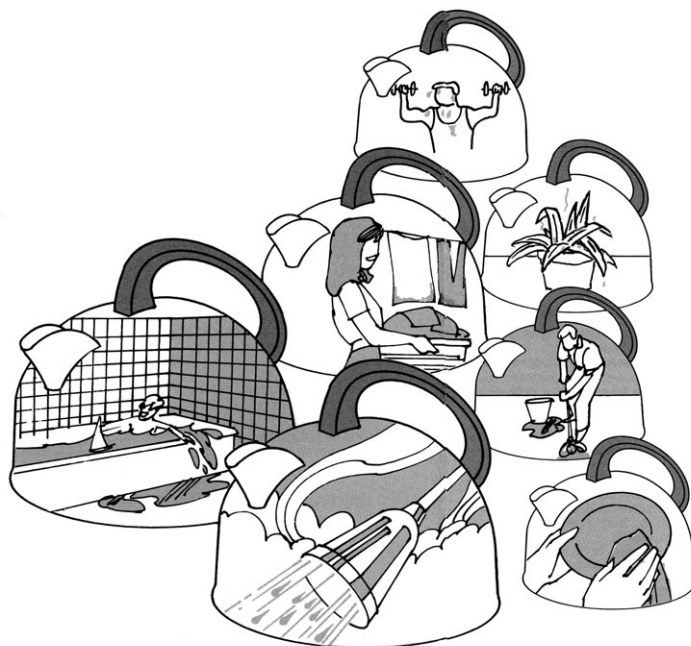
At 22° C (71°F) and 60 per cent *relative humidity*, an average size house holds about 12 L (2.6 gal.) of moisture in the air. If this house cooled to 9° C (48° F), even at 100 per cent *relative humidity*, it could only hold 8 L (1.7 gal.) of moisture in the air. In that case, 4 L (141 oz.) of *condensation* would occur.

When warm household air at 22° Celsius hits a cold surface (9° Celsius) such as a toilet tank, window, or cold water pipe, *relative humidity* will change, often causing *condensation*. To minimize this, and for health reasons, it is recommended that indoor *relative humidity*, be maintained between 30 and 45 per cent. This is not always possible in a coastal or maritime environment where keeping *relative humidity* below 60 per cent can be quite difficult to achieve.

Relative humidity may cause *condensation*, but we can also use it to our advantage. Because cool air holds less moisture than warm air, we can exhaust warm air from our homes to get rid of moisture and bring in cool, dryer air to replace the warm air we exhausted through natural and *mechanical ventilation*.

Moisture Sources

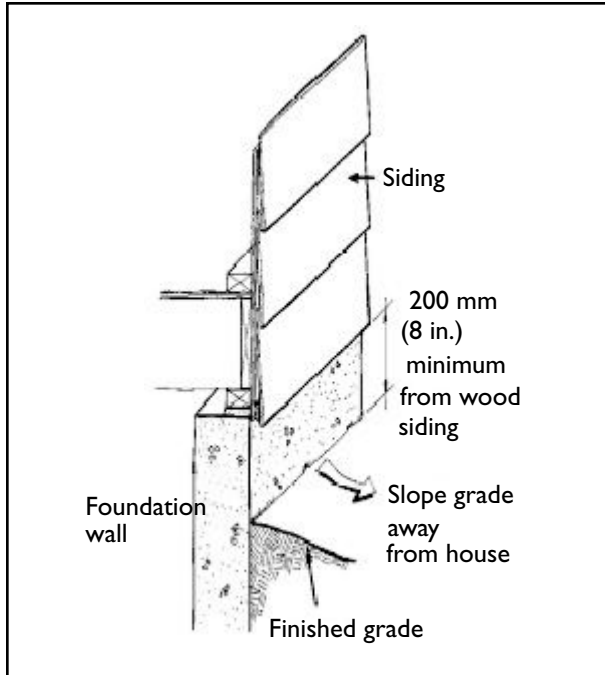
One way of reducing indoor humidity is to reduce moisture sources. Through daily activities, the average family of four produces 10 to 50 L of airborne moisture per day (2 to 10 gal.). In a heating season lasting 200 days that adds up to 2,000 to 10,000 L of moisture (400 to 2,000 gal.). The following are some of the more common sources of moisture based on a family of four.



Normal respiration and skin evaporation from occupants	38 L (8.3 gal.) per week
Clothes washing	1.8 L (63 oz.) per week
Clothes drying indoors, or using an unvented dryer	10 L (2.1 gal) per week
Cooking three meals daily	6.3 L (1.3 gal.) per week
Dishwashing three times daily	3.2 L (112 oz.) per week
Bathing (0.2 L per shower) (0.05 L per bath)	2.4 L (85 oz.) per week
Floor mopping per 9.3 m ² (100 sq. ft.)	1.3 L (46 oz.) per week

Preventing additional humidity is important. Leaky basements, wet crawlspaces, roof leaks and leaky plumbing must all be fixed. Activities such as hanging clothes indoors to dry and storing firewood indoors should be avoided. Use covers on fish tanks. Keep the number of houseplants down to a reasonable amount. Every litre of water you use for your houseplants ends up in the air. Houses suffer from the burden of too much humidity even without these extra sources.

When inspecting the outside of your home, make sure *downspouts* take roof water away from the foundation. The ground all around the home should slope away from the building for at least 1.5 metres (5 feet). **There should be at least 20 cm (8 in.) of clearance between the bottom of wood siding and the finished ground level** (15 cm (6 in.) for vinyl siding). If the ground level is too high, the capillary action of the foundation concrete can bring moisture into your home and cause rot and mold.

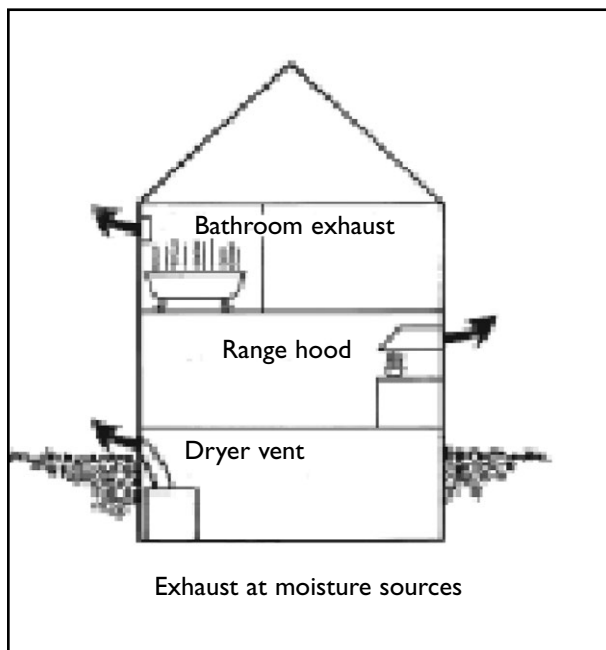


TIPS

- Crawlspaces should have a ground moisture barrier, or concrete skim coat.
- Minimize piles of laundry, cardboard, newspaper and carpeting scraps as these act as moisture sinks and can facilitate mold growth.
- Make sure roofing and siding are functioning properly.

Ventilation

Not all moisture can be controlled at the source. Daily human activities create moisture, and ventilation is needed to keep indoor air humidity at a safe level. High moisture levels cause condensation, which in turn can cause mold growth. Ideally, all moist stale air should be replaced with fresh air every three to four hours.



Houses built many years ago leaked an entire air change every 30 minutes on a cold day. Houses built during the last few decades are much tighter and it may take four hours or longer for this to occur. These tighter homes are comfortable, easy to heat and have few drafts, but they are also prone to moisture problems and are sometimes unhealthy to live in. There are many good reasons for building an airtight house. ***Houses are never too tight unless the occupant fails to create ventilation by opening windows or turning fans on.***

In the past, nature and construction techniques made ventilation automatic and chaotic. Some days you might have an entire air change every 10 minutes if the wind was blowing hard.

Today's homes put the occupant in charge of ventilation, allowing you to choose where and how much your home will be vented each day.

Tools and Supplies

- two squares of toilet tissue
- small brush or toothbrush
- vacuum cleaner
- mild detergent and cleaning rags
- screwdrivers
- lubricant

Natural Ventilation

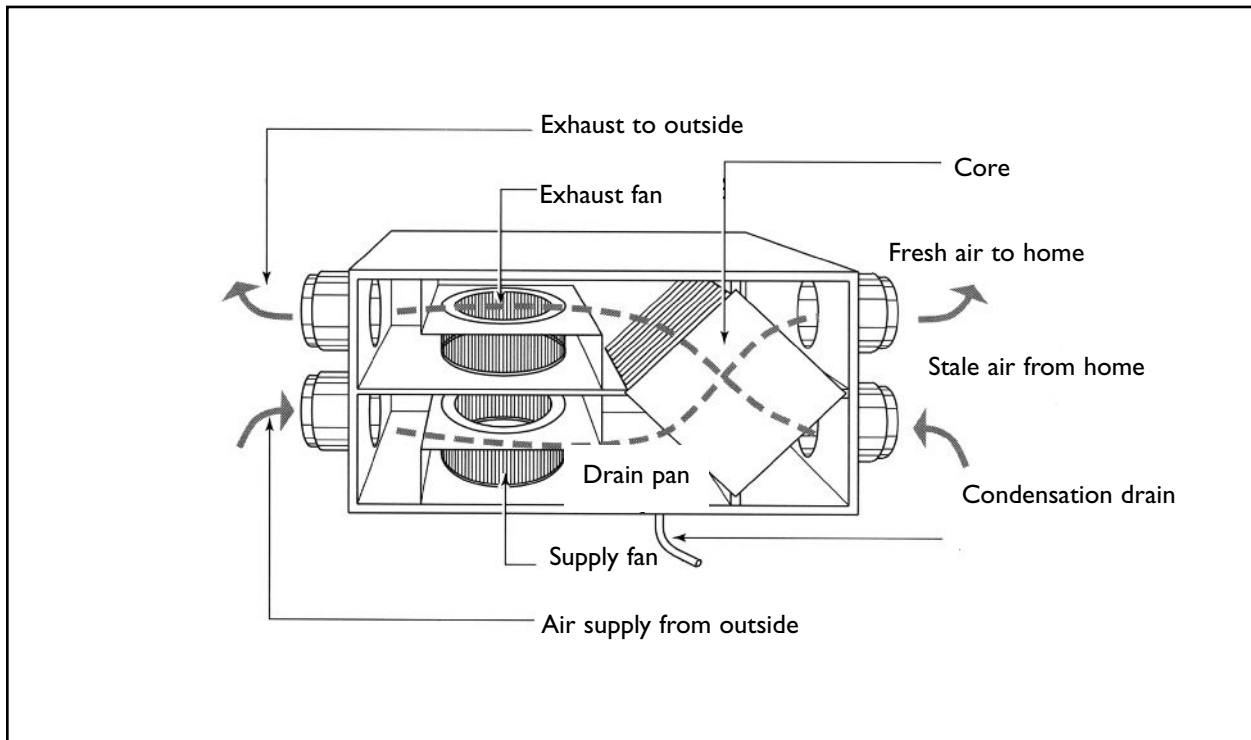
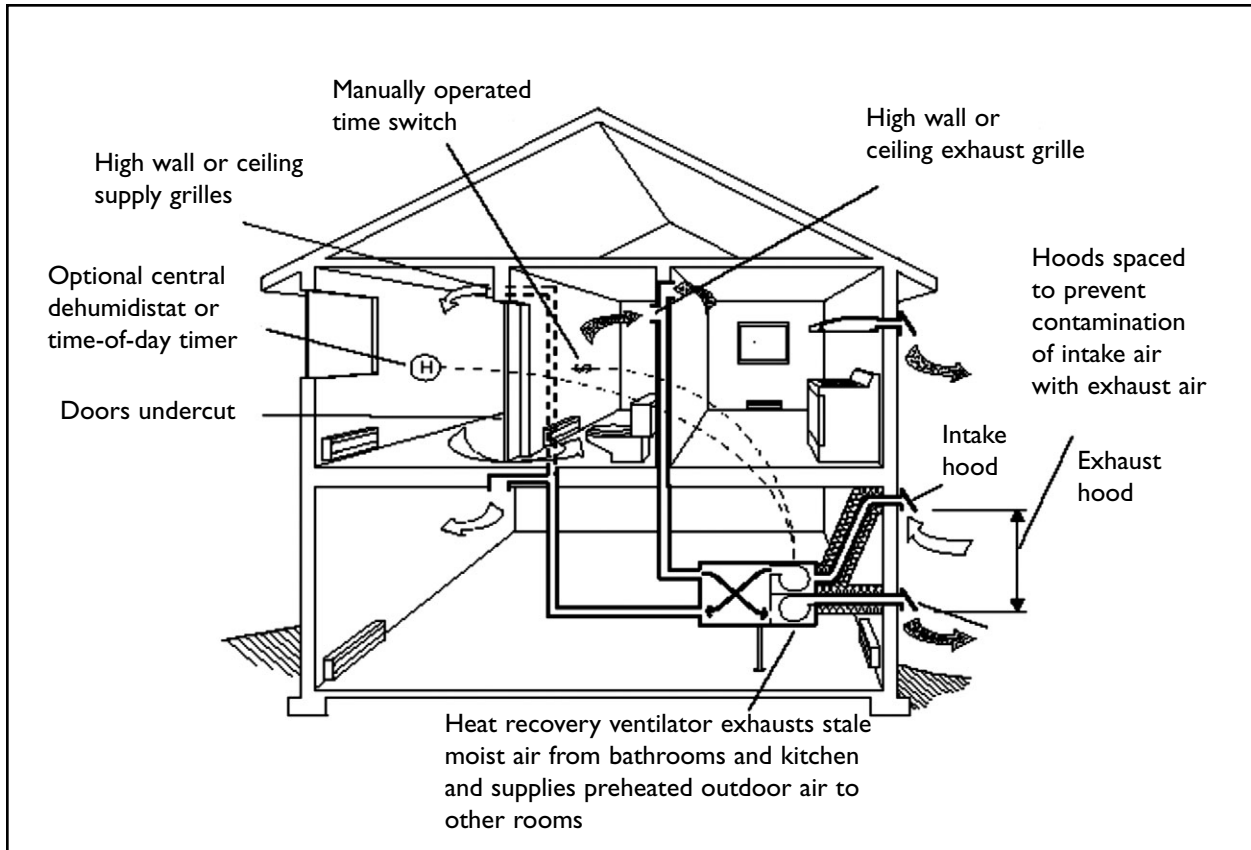
Natural ventilation does not require electricity. The common types are:

- Air exhausted through open windows
- Air leakage from cracks and gaps (wind and stack effect)
- Air lost from opening and closing doors
- Air lost up chimneys

Mechanical Ventilation (Fans)

• Heat Recovery Ventilator (HRV)

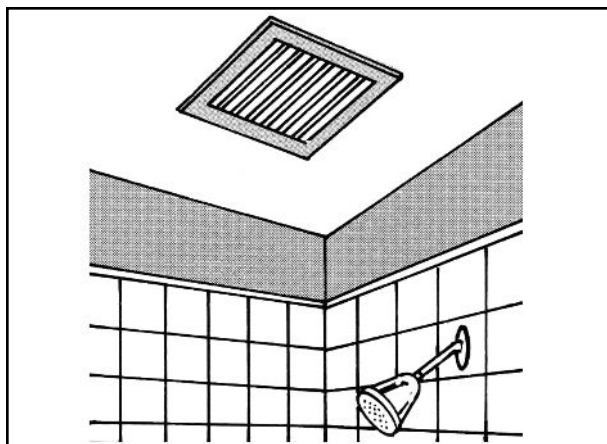
These are whole house systems that exhaust smelly and moist air from bathrooms, kitchens and laundry rooms. The heat is transferred through a heat exchange core from the exhaust air to fresh incoming outdoor air and then the tempered fresh air is delivered to bedrooms and living areas. The amount of exhaust air matches the incoming air, creating balanced ventilation.



HRV maintenance is usually described in the unit's owner's manual, but should always include cleaning the hoods, filters, core, drain pan and grilles every 6 to 12 months. The outside hoods are easily clogged with dandelion and thistleseed, but this is easily removed with a toothbrush. Filters and grilles can be washed in a sink, but care should be taken not to change the adjustment settings on the grilles or mix them up as the grilles are set by the HRV installer to allow the correct airflow for each room. The core can be blown with compressed air, vacuumed or washed. The drain pan is a location that is subject to mold growth and should be inspected and cleaned. HRV airflows should be balanced approximately every five years by an HRV technician.

- **Bathroom Fans**

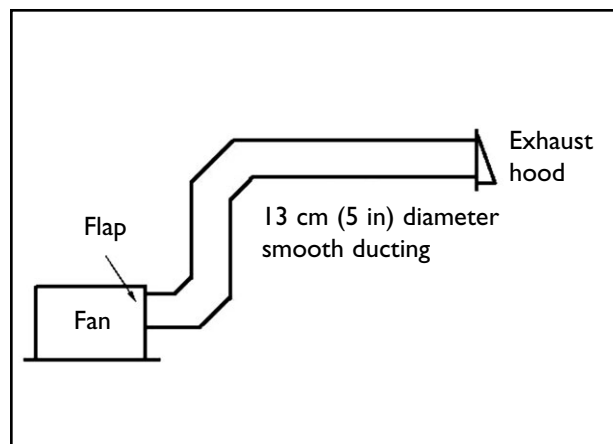
Bathroom fans can only be effective if they are working properly. A simple test of your bathroom fan's effectiveness is to hold a two-square strip of toilet tissue up to the fan when it is running. You can judge if the fan is moving much air by the way the fan pulls and holds the toilet paper. If the fan will not pull the paper up to it when it is being held 2 to 4 cm (1 in.) away, or if the fan won't even hold it when the paper is pressed against the intake, then the fan is not working effectively.



Bathroom fan systems may be ineffective due to being the wrong type, poor installation, or being in need of cleaning. For a bathroom fan to work effectively it must be the centrifugal (squirrel cage) type and not an axial (propeller) type. It should be rated 40 to 50 litres per second (80 to 100 cubic feet per minute) and have 12.5 cm (5 in.) diameter smooth exhaust ducting to function properly. More powerful fans can be more effective, but may cause too much negative pressure in the home and cause fireplaces, wood stoves, furnaces and other combustion appliances to backdraft combustion gases into the home.

Fans are rated for noise levels and when installing a new fan, select a unit with 1.5 sonnes or less noise rating. Timer switches and dehumidistat switches are preferable to using light switch type controls for controlling fans. Timer switches allow fans to run longer than the amount of time someone is in the bathroom. Dehumidistat switches are set for humidity levels and cause fans to run when humidity in the home exceeds the selected level. Preprogrammed timer switches turn fans on at certain times of the day.

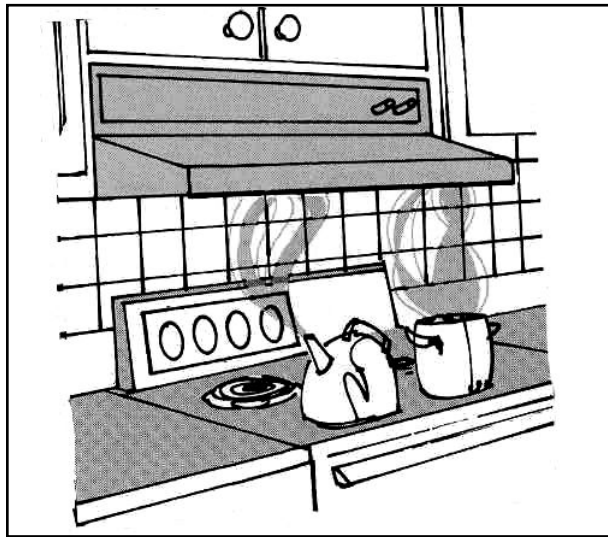
Fan maintenance should include cleaning the fan, checking the flap and cleaning the exhaust hood. If hood is equipped with a screen, remove screen, soak in warm soapy water, and then rinse.



Normally the faceplate of the fan can be pulled down and the two bent wire clips can be squeezed to completely remove the faceplate. After this is done, remove the fan unit if possible. Many models have an electrical plug that can be pulled, then a screw gets removed, and the fan unit will drop down.

- **Rangehood Fans**

Many rangehood fans are the recirculating type and therefore are not vented to the outdoors. These rangehoods do not ventilate. Axial (propeller) type rangehoods, unless mounted on an exterior wall and vented directly out without the need for ducting, are ineffective for ventilation.



To be effective and function properly, rangehood fans must be the centrifugal (squirrel cage) type, rated 100 to 125 litres per second (200 to 250 cubic feet per minute) and have 17.5 cm (7 in.) diameter (or 4 in. x 10 in. rectangular) smooth metal ducting. Rangehood fans are powerful enough to create backdrafting in some situations and relief air vents may need to be installed in these situations.

Rangehood maintenance should include cleaning the hood and filters, checking the flap and cleaning the exhaust hood. If the hood is equipped with a screen, remove screen, soak in warm soapy water, and then rinse.

Most rangehoods have filters that can be removed by either sliding the filters up and then out or the filters are removed by swiveling a small latch.

Dehumidistats and Timers

Dehumidistats in your home are *humidity-activated switches* that turn your bathroom fan(s) on and off automatically when humidity (moisture) levels are higher than the switch setting. For example, if you set a dehumidistat to 45 per cent and the *relative humidity* level rises to 46 per cent, the fan will come on and provide ventilation to reduce moisture levels. Once the fan has reduced the humidity to 45 per cent, the dehumidistat will shut the fan off.

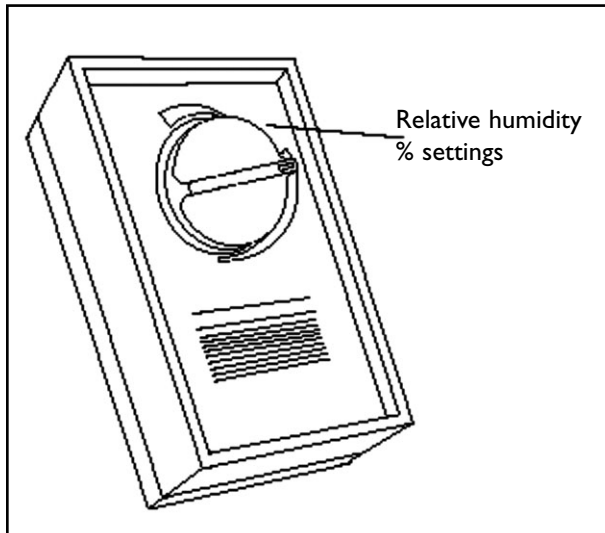
Most bathroom fans are also equipped with a manual on-off switch and some have a 24-hour timer switch. These additional switches do not affect the operation of the dehumidistats. Manual on-off switches are for use when showering and/or for controlling odors.

If the humidity in your home is too high, mold growth may become a serious problem. To help prevent mold growth, dehumidistats need to be adjusted as seasons and weather conditions change. For Vancouver Island and other coastal and maritime locations ideal settings range from 40 per cent – 60 per cent during the heating season, and 80 per cent during the summer. For much of the rest of Canada heating season settings will range from 30 per cent – 45 per cent. If the setting is too low, the fan will run all the time. If the setting is too high, condensation will form and mold growth will follow. Dehumidistats require adjusting as seasons and temperatures change.

When the settings on dehumidistats are correct, you can expect about 1 cm (0.4 in.) of condensation (water) to form on the lower edge of your windows in the morning. Once a week, in the morning, you should check the amount of condensation on your windows.

If there is more than 1 cm (0.4 in.) of condensation on your windows, this indicates there is too much moisture in the air and mold may grow. To fix this turn the Relative Humidity percentage setting on the dehumidistat down slightly. Monitor the condensation on the windows weekly to ensure the per cent Relative Humidity is set correctly.

In most cases fans can control humidity, however in some cases additional ventilation is required. If your fans run more than 12 hours per day and do not sufficiently control condensation, then addition ventilation will be required. Usually opening windows 1 – 2 cm (1/4 - 3/4 in.) will solve this problem.

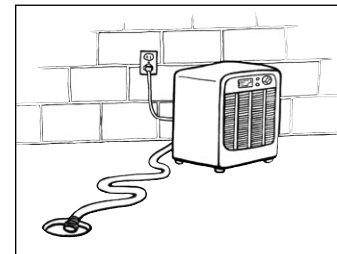


Throughout the year, the dehumidistat should be set so condensation on the windows in the mornings is just forming and there is not more than one centimeter (0.4 in.) of condensation on the window.

Timers in your home are **automatic switches** that turn your bathroom fan(s) on and off automatically. They are programmed to come on twice every 24 hours and run for 4 hours. Some bathroom fans may have manual crank-type timers that allow the occupant to turn on the fan for up to 30 minutes for control of moisture or odors.



Dehumidifiers should only be used as a last resort in dealing with moisture. A dehumidifier is a device that has a very cold surface, causes condensation and collects the condensation. They use large amounts of energy and do not exhaust air from your home. In many cases they mask poor air quality problems and that can negatively affect the occupants' health. Dehumidifiers need to be cleaned regularly.



Because the terms **dehumidistat** and **dehumidifier** are similar, many people confuse these two devices. Dehumidistats are switches that control fans, dehumidifiers are appliances that remove moisture from air. Read CMHC's *About Your House CE 27, Choosing a Dehumidifier* for more information about dehumidifiers.

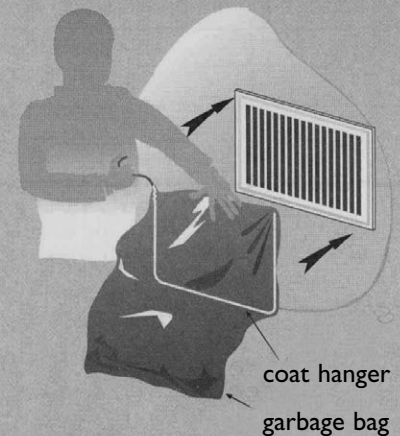
TIPS

- Most fan cleaning can start with a vacuum cleaner.
- Flaps (dampers) often get stuck opened or closed. Using a flashlight you can watch the flap behind the fan opened and close as the fan is switched on and off.
- For checking exterior flaps built into exhaust hoods, have someone turn the fan on and off while you watch the flap outside. Flaps can be lubricated and protected from freezing with silicone spray.
- Screens on exhaust hoods need cleaning and should never be finer mesh than 6 mm (1/4 in.) square openings.
- Check to see if your fan system is working properly by holding two squares of toilet tissue near the grille of your fan. The fan should be able to suck the tissues tight to the grille. If it doesn't, the fan, flap, ducting or hood may be at fault.
- If there is no condensation on your windows in the morning, your house may be too dry, which is also not desirable for health reasons.

TESTING YOUR AIR FLOW

You can use a simple test to make sure the air ducts in a forced-air system are open and functioning.

- First, turn on the circulation fan using the thermostat, or turn up the heat to get the furnace going.
- Then, use a tissue to determine whether the grilles are blowing air out (supply grilles) or sucking it in (return air grilles).
- Another test you can try uses a wire coat hanger and a garbage bag (approximately 66 x 91 cm, or 26 x 36 in.) to measure air flow.
- Bend the wire coat hanger until you have a square shape.
- Then tape the open end of the garbage bag around the wire; the device should look like a big, plastic butterfly net.
- Crush the bag gently to deflate it and hold it tightly to the floor over the supply air grille while the furnace is running. Time it to see how long it takes for the bag to inflate. (It doesn't have to be fully inflated, just up and wrinkly.)
- If the bag inflates in three seconds, the air flow is about 25 litres per second (50 cubic feet per minute). If it inflates in five seconds, the flow is around 15 L/s (30 cu. ft./min.). If it takes 12 to 13 seconds, the flow is around 5 L/s (10 cu. ft./min.).
- A properly functioning supply air duct should deliver 20 to 40 L/s (40 to 80 cu. ft./min.). That means if the bag takes five seconds or more to inflate, your duct may be blocked or the fan may not be delivering enough air.



Occupants' Guide to Mold

In partnership with Assembly of First Nations (AFN), Canada Mortgage and Housing Corporation (CMHC), Health Canada and Indian and Northern Affairs

Mold can cause allergies. It can make it hard for some people to breathe. Mold can make it harder for your body to fight off infections. Mold can even cause serious illness.

Mold can grow in your house. You can prevent it from growing. If you have a little mold in your house, you can clean it up.

This Guide Tells You

- how to prevent mold from growing
- how to find out if mold is growing in your house and
- how to clean up small amounts of mold

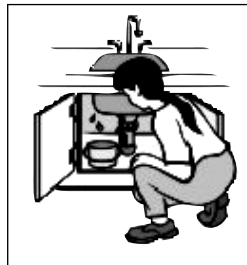
How to Prevent Mold from Growing

Mold needs moisture to grow. Controlling the moisture and keeping the house dry prevents the growth of mold.

Check your house for signs of moisture or molds. Find out if water is coming in from the outside or if lots of moisture is produced inside the house.

Check your house foundation, walls and roof for leaks. Check for plumbing leaks. If you find any, fix them.

Think of the different ways moisture is produced inside the house (for example, cooking, bathing). Remove the moisture as it is produced by opening a window or using exhaust fans.

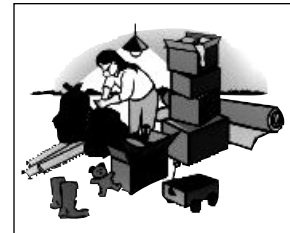


Reduce the amount of stored materials, especially items that are no longer used. Fabrics, paper, wood and practically anything collect dust and hold moisture.

Mold-Proofing Your House, Room-by-Room

Basement or Crawl Space

- Get rid of clothes, paper and furniture stored in the basement. Keep only the items you can wash. Throw out wet and badly damaged or musty smelling materials. Keep the basement tidy so air can move around more easily.
- Store firewood in a shed or garage, not inside the house.
- Avoid having carpets on the basement floor.
- Periodically clean the drain in your basement floor. Use 118 ml (1/2 cup) of bleach, let it stand for a few minutes, then flush with plenty of water. Keep the drain trap filled with water.
- A dehumidifier helps to reduce moisture in the basement during the warmer months. Close the basement windows when the dehumidifier is running.
- Avoid standing water. Keep your *sump* pit covered. Use a piece of metal or you can make a good cover by wrapping plywood in plastic.



Furnace

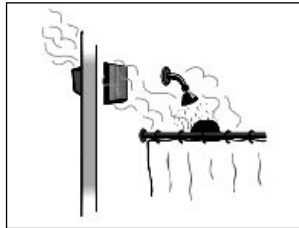
- Regularly clean and replace the furnace filters. Use a pleated, one-inch filter, not a coarse filter.
- If you have a heat recovery ventilator (HRV), clean the filter inside the HRV often.
- If you notice mold or signs of dampness, such as water on your windows or wet spots elsewhere, do not humidify. Disconnect furnace humidifiers that are no longer used.

Laundry

- Connect your clothes dryer to an exhaust ducted to the outside.
- Remove lint every time you use the dryer.
- Avoid hanging laundry indoors to dry.
- Dry your laundry tub and washing machine after you use them.

Bathroom

- Check the bathroom fan to make sure it exhausts to the outside, not to your attic.
- Turn the bathroom fan on when you shower. Keep it running for a few minutes after you finish your shower.
- Take short showers if possible.
- Keep surfaces that get wet, such as the walls around the bathtub and shower, clean and dry.
- If there is a carpet in your bathroom, remove it.
- Keep drains in good shape by removing debris from them. To clean a drain:
 - pour a handful of baking soda into it;
 - add a cup of vinegar;
 - put the plug in the drain;
 - let the vinegar and baking soda work for about 20 minutes;
 - run fresh water into the drain;
 - if the drain is still plugged, use a small plumbing snake to unplug it.



Kitchen

- If the fan over your stove exhausts outside, use it when you cook.
- Minimize prolonged boiling.
- Keep your drains in good shape. Follow the steps in the Bathroom section, above.



- There's a drip pan at the back of your refrigerator. Pull the refrigerator out to clean the drip pan. At the same time, vacuum dust from the coils at the back of the refrigerator.
- Check under the kitchen sink to make sure there are no leaks.
- Take out the garbage daily to prevent odours and spoiling.

Closets and Bedrooms

- Get rid of clothes or other stored items that you don't use. Keeping your closets and bedrooms tidy makes it easier for air to circulate and harder for mold to grow.

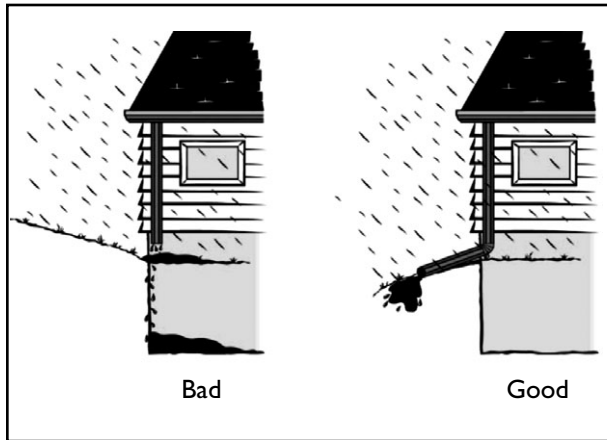
Other Parts of the House

- When family and friends come into the house, have them take off their shoes.
- Vacuum often. If you are buying a vacuum cleaner, try to get one with a HEPA (High Efficiency Particulate Air) filter. A HEPA vacuum cleaner is more efficient in removing small particles of dust and molds.
- Clean hard floors with a damp mop.
- Remove unnecessary furniture that collects dust.
- Do not bring furniture that has been stored in a moldy place into your house.

- Cut down the number of potted plants in the house—soil is a good place for mold.

Outside the House

- Install *downspout* extensions to take rainwater and melted snow away from the house.
- Make sure that *eavestroughs*, *downspouts* and *downspout extensions* are connected and working.
- Grade the soil so the ground slopes away from the house.
- Fix problems as quickly as possible.



How to Tell if There Is Mold in Your House

Mold grows in damp places. The best places to look for mold are the basement, under or behind stored items, under the kitchen or bathroom sink, on the wall or floor next to the bathtub, at the bottom edge of windows or in closets.

Mold can be black, white or almost any colour. It often looks like a stain or smudge. It may smell musty. To find out if a stain or a smudge is mold, carefully dab the mark with a drop of household chlorine bleach. If the colour of the stain or smudge changes or disappears, it is probably a mold.

How to Clean Up Small Mold Areas

You can clean up “small areas” of mold (fewer than three patches, each smaller than a square metre (10.7 sq.ft.)) yourself. For moldy areas that are larger, consult your housing department.



Wear rubber gloves, glasses or safety goggles, a dust mask and a shirt with long sleeves.

Washable Surfaces

- scrub with a detergent solution; then
- sponge with a clean, wet rag and dry quickly.

Moldy Drywall

- clean the surface with a damp rag using baking soda or a bit of detergent. Do not allow the drywall to get too wet.

If mold comes back after cleaning, or you think your house has lots of mold, contact your housing department for more information.

Caution: Infants and other family members with asthma, allergies or other health problems should not be in the work area or adjacent room during the cleaning.

TIPS

- Windows should only be washed with a mild detergent. Using vinegar or ammonia cleaners to clean window glass may void the window warranty. When working around windows, be sure not to get the solution on the edge of the glass. This can cause the seal between the two panes of glass to fail prematurely.
- Call your housing office if you think the mold problem in your house is too big (more than three patches or a patch is larger than one square metre (10.7 sq.ft.)) for you to attempt to clean up yourself.
- Place all rags and contaminated materials into a garbage bag for disposal and remove from your house immediately.

Appliance Preventive Maintenance

You have a number of appliances in your home that require regular maintenance. Usually, appliances receive little attention until something breaks down. This section will provide you with some tips on how to attend to some minor preventive maintenance activities that will help to extend the life of the appliance and will hopefully reduce downtime.

Tools and Supplies

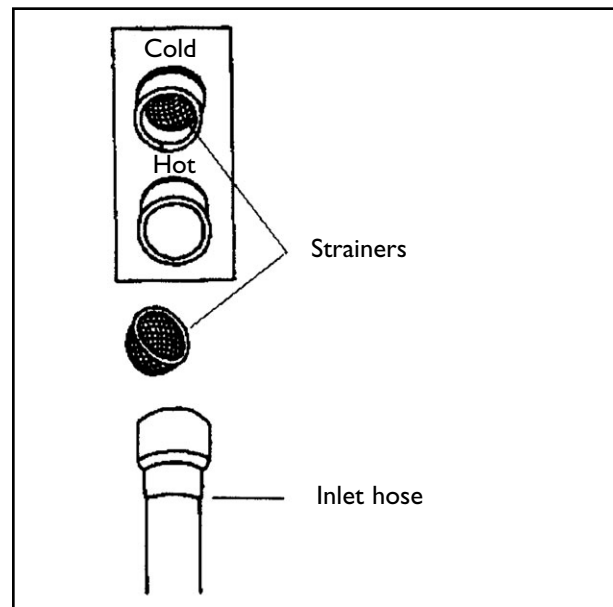
- pliers
- screwdrivers
- toothbrush
- condenser coil brush
- vacuum cleaner
- mild detergent
- baking soda
- cleaning rags
- bucket
- hose washers with screens

Washing Machine

- Fabric softeners are waxy and can gum up in the washer if introduced undiluted. Mix them with water before use. If there is a fabric softener dispenser on your machine, add the recommended amount and then top off with water. If you are pouring from a cup, use a 3-to-1 ratio of softener to water.
- Avoid overloading the washer. Add clothes until the unit is filled to just below the top of the agitator axle without packing down the clothes. An overloaded washer strains the motor and transmission, shortening their lives.

Once a Year

- Remove and clean intake screens at both ends of the supply hoses. The screens get clogged with sediment and or/mineral buildup. They can be difficult to re-seat and if improperly installed, they can jam open internal valves. Be extra careful when removing and replacing hoses, as the plastic threads on the intakes at the back of the washer are easily stripped. There are screens in the inlets inside the machine that can get plugged as well.

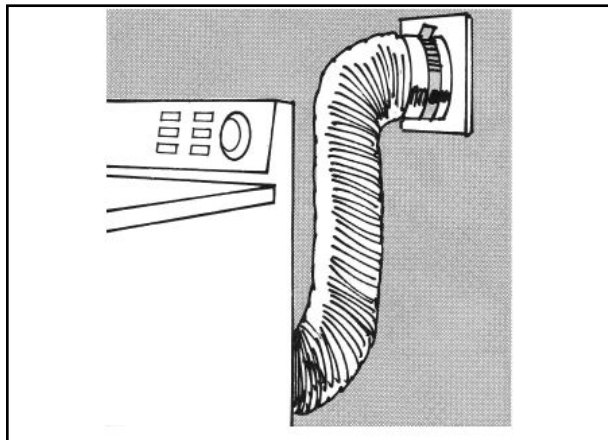


Every Five Years

- Replace rubber water-supply hoses if they're splitting, cracking or are losing flexibility. Rubber replacement hoses last five years, but hoses that use a braided jacket of stainless steel, although more expensive, last at least twice as long.
- Replace pinch type hose clamps with more reliable worm driven clamps. Check tightness every five years.

Dryer

- Clean the lint filter after every dryer load.
- Replace the door seal if it is loose, worn, damaged or hardened. If you do not, the warm dryer air will escape, forcing the unit to work harder. Check the seal by holding a tissue near the door while the dryer is running. If the tissue is sucked toward the door, replace the seal. Order seal and adhesive (\$7 to \$20) from the manufacturer or an appliance store.
- Replace flexible plastic exhaust ducting with aluminum or steel. Smooth metal ducting is more efficient and reduces the risk of fire. Tape all joints—never use lint-trapping screws.
- Keep ducting runs as short and straight as possible to reduce drying time and prolong the life of your dryer. Do not allow sags in longer runs. They collect lint that can restrict or even block the flow of exhaust air.



Two Times a Year

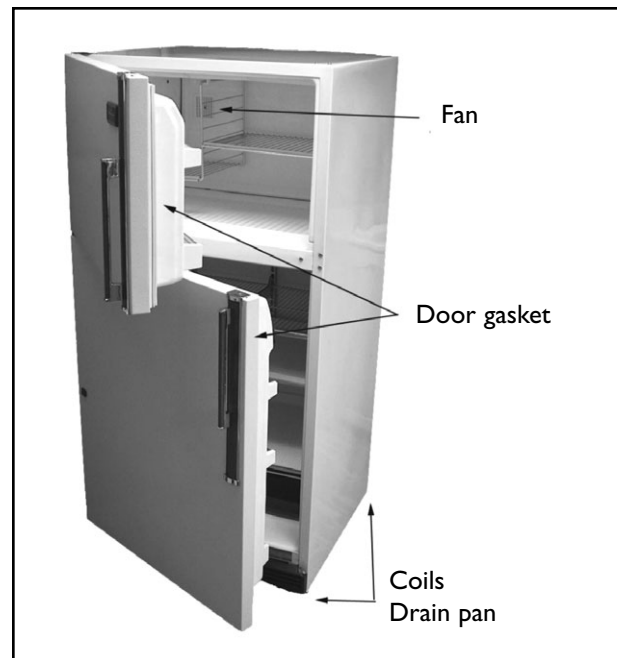
- Clean the lint filter with soap and water to remove built-up soap and fabric softener.
- Clear the outdoor vent with a stiff bristle brush.

Once a Year

- Vacuum lint from the dryer heater box. To get to this area, remove the access panel at the back. Always unplug the dryer from the wall before doing this.
- Disconnect the exhaust duct from the dryer and remove accumulated lint. Inspect for crushed or clogged ducts.

Fridge

- Keep the top of the refrigerator (fridge) clear and make sure there is at least a 13 mm (1/2 in.) clearance on the sides as well as the back.
- Make sure the fridge is level or tilted back slightly so the door closes completely.



Once a Month

- Clean the door gasket with one teaspoon of baking soda dissolved in a quart of warm water. Besides cleaning the gasket, it will keep it soft and pliable.

Twice a Year

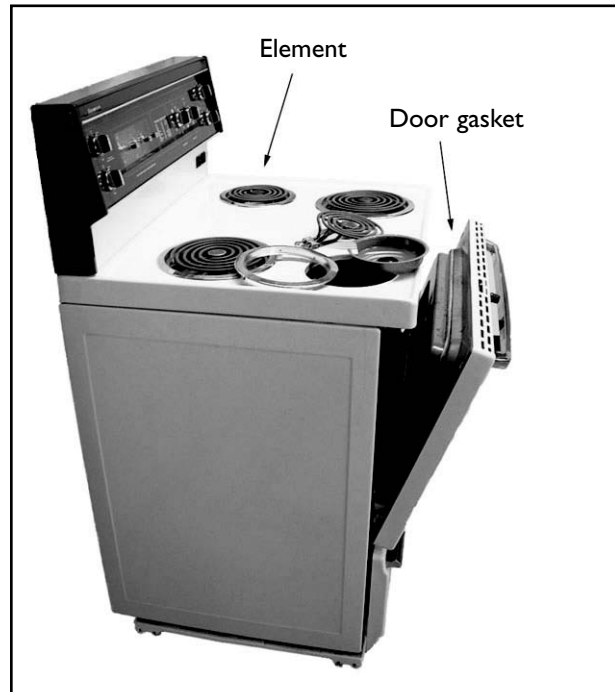
- Clean coils with a condenser coil brush (\$6), available at an appliance dealer. The coils are usually behind the snap-out grille at the front bottom of the fridge. On older models, they are located in the back and are partially covered by cardboard. Unplug the fridge first so you don't strike the moving fan. Even when the fridge is unplugged, avoid disturbing the insulation or bending the fan blades, which could damage the fan. If you have pets, you may have to do this more often.
- Test the door gasket. A leaky gasket wastes energy and shortens the life of the compressor. Close the fridge door on a piece of paper at various places along the door, and pull lightly. If the paper is easily pulled out, replace the gasket (about \$60). Peel back the gasket enough to loosen the retainer strip screws and slip a new one in place. Consult the fridge manual that came with the fridge.

Once a Year

- Slide the fridge out and vacuum around and beneath it. Left unattended, this dirt will end up on the coils.
- Wash the condensation drain pan.

Range (Stove)

- Wipe down the range top. A clean surface prevents scratches and stops acidic food from eating away at the appliance finish. Regular cleanup will help prevent food matter from hardening and becoming difficult to clean. Built up grease can become a fire hazard.
- Clean up thoroughly after a boil-over. If necessary, unclog burner ports on a gas range with a straight pin. Do not use a toothpick, which can break off in a port.



Four Times a Year (at least)

• Self-cleaning Ovens

Clean around the door and its gasket. These areas often don't receive enough heat to thoroughly burn off grease splatters. Sweep out crumbs to cut down on smoke during cleaning. Run the self-cleaning cycle after removing racks (they will discolor at high temperatures). The minimum length of the cycle should be two and a half-hours; some manufacturers recommend three or more hours. The self-cleaning cycle burns off residue with an automatic setting of 577° C (850° F). After the cycle has completed and the oven has cooled, wipe out ashes with a clean damp rag.

• Non Self-Cleaning Ovens

Remove racks and wipe inside walls of the oven with a hot, soapy cloth. Rinse and dry. For stubborn, baked-on deposits, on the floor of the oven, apply a commercial oven cleaner as per product instructions. Replace racks.

Once a Year

- Inspect the oven door gasket. It should be soft and pliable. If it is hard, it may leak heat, which makes the element in electric ovens work harder and affects the performance. What's more, it will cost you energy dollars. If it needs to be replaced, call the housing office or an experienced appliance repairperson.

TIPS

- New appliances should have the installation date written on the back with a felt pen.
- Appliances operate best when level. Most have adjustable feet for this purpose.
- Washers—A thumbnail or large sewing needle is usually sufficient to dislodge the washer hose screens.
- Dryers—To remove a light film of lint from the lint screen, moisten your fingertips and rub lightly.
- Range—Do not use tinfoil element liners as these will tend to burn out elements prematurely.
- Fridge and Range—Placing appliance wheels (available at most hardware stores) under these appliances makes them easy to pull out and clean behind.

Fire Safety

House Fires Kill People

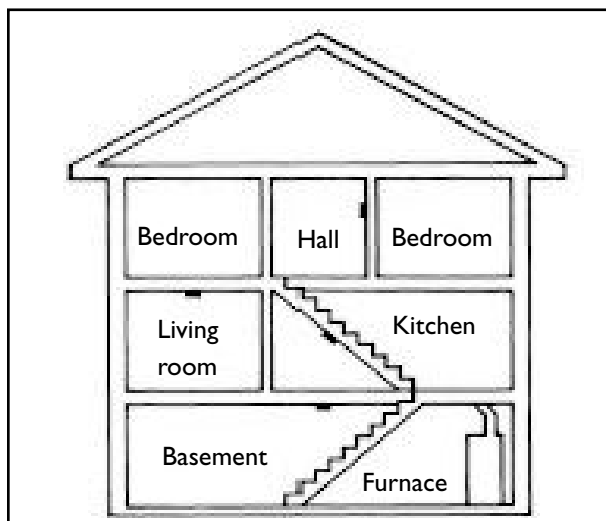
Hundreds of people die every year from house fires. Over two-thirds of all fires in Canada occur in the home. There are almost 1,000 residential and apartment fires a week, more than 50,000 a year.

What Causes Fires

Carelessness and untidiness are the most frequent causes of home fires. Cigarette smoking, electrical wiring, appliances and combustible materials start fires that could have been prevented.

What Can I Do to Keep my Family Safe?

- Install smoke alarms. Locate them on each level of your home (including the basement), at the top of every stairway and in hallways between the bedrooms. Test the alarm monthly by pressing the test button. If the alarm is battery operated, change the battery on a set day, every six months. The days that the time changes between standard time and daylight saving time are easy days to remember.



- Keep fire extinguishers handy and charged. Train everyone in your home to use a fire extinguisher properly.
- Have a family fire safety plan and practice it regularly.
- Make your home a no-smoking zone.
- If smoking is allowed in the home, always empty ashtrays in a metal ash can. Keep matches and lighters out of reach of children.
- Check that appliances are turned off before leaving your home.
- Use only appliances that are approved by the Canadian Standards Association (CSA) or Underwriters' Laboratories Canada (ULC). An approved appliance will have a label or sticker that shows it is CSA- or ULC-approved.
- Keep appliances in good working order. Replace or repair damaged plugs or cords.
- Keep stoves clean from grease that can start a serious fire.
- Keep areas around cooking and heating equipment clean and free from combustible materials. Remove curtains from windows close to the stove. Blowing curtains on an open window can easily catch on fire.
- Have heating equipment inspected and cleaned once a year.
- Clean chimneys and stove pipes at least once a year.
- Safely dispose of unneeded items or rubbish that could cause a fire.
- Keep the area under stairways clear of stored materials. A fire that starts in a stairway spreads quickly and could destroy your way out of the building.

- Store paint, gasoline and other liquids that can burn or explode in safety containers, outside and away from the house.
- Keep the grass around your home cut to prevent grass fires that can spread to your home.

Your Family Fire Safety Plan

- Sit down with your family and work out ways to get out of the house and where to meet outside.
- Review and practice the plan twice a year, for example, when the time changes between standard time and daylight saving time. These are also good times to check your smoke alarm to ensure it operates properly, and to change the battery if it has one.
- Keep all pathways and areas around outside doors clear so that you can escape quickly.
- Make sure all windows can be opened easily so they can be used to escape.
- Know whom to call if there is a fire. In many places you can call 9-1-1, but in some places you need to call the fire department. Everyone in your household should know the number to call. Post emergency numbers beside every phone in your house. If your phone has a speed dial feature, consider programming the number into it.
- Have at least one smoke alarm on each storey in your home. Most fire victims suffocate from smoke and poisonous gases. A smoke alarm could save your life once a fire has started.
- Make sure that your house number is large and easy to see from the street, especially when it is dark outside. Every second counts when help is needed. Install numbers at entrances or on both sides of a street mail box so that you can be found quickly. Reflective numbers are a good choice because they are weather resistant and can be applied on almost any surface.

How Do I Fight a Fire in my Home?

The first five minutes of a fire are critical. If a fire starts in your home, you may be able to do something when it's small and before it turns into a big fire. Each fire is different and every fire is dangerous.

Here Are Some Helpful Fire Safety Tips

NEVER TAKE CHANCES. If the fire is large or too much for you to handle, get out, close the door behind you and call for help.

Clothing Fires

- If clothes catch on fire, smother the fire quickly.
- Lay the victims down on the floor and roll them in a rug, coat or blanket to smother the fire while keeping their head exposed.
- Gently beat the fire out. Give the victims burn or shock first aid and get help immediately.

Cooking Fires (Involving Fat, Grease or Oil)

- Turn off the stove or appliance and cover the pan or close the oven.
- Pour baking soda on the fire or use an ULC-approved, Class B fire extinguisher.
- Never use water! It will spread the flame.

Electrical Fires (Motors, Wiring and So On)

- Unplug the appliance if possible or turn off the power.
- Use an ULC-approved, Class C fire extinguisher or pour baking soda on the fire.
- Never use water on live wiring as you may get an electric shock.

Fires in Ordinary Combustibles Such As Wood or Paper

- Stay low out of heat and smoke.
- Aim the ULC-approved, Class A extinguisher at the base of the fire. For floor fires, sweep from the edges in. For wall fires, sweep from the bottom up.
- Stay outside closets and attics. Shoot the stream from the extinguisher in.

Fire Extinguishers

Fires are divided into three classes







Class A: ordinary combustibles such as wood or paper

Class B: flammable liquids such as cooking grease or gasoline

Class C: electrical

Your fire extinguisher will have a symbol on it that shows what class of fire it can fight. Familiarize yourself with the symbols and know what type of fires your extinguisher can fight. In your home, multi-purpose extinguishers that can be used for Class A, B, and C fires are usually the best types to have.

Inspect your fire extinguisher monthly. Check the gauge to ensure that the extinguisher is properly charged. Extinguishers need to be recharged or replaced periodically. The nozzle should be clear of any obstructions and the seal should be intact. Follow maintenance instructions on the extinguisher.

Class of Fire	Extinguisher to use	Symbol
 <p>Ordinary combustibles—wood, paper, textiles, rubbish</p>	<p>Water, multi-purpose dry chemical or foam type.</p> <p>Hang extinguisher on brackets supplied by the manufacturer so that the top of the extinguisher is not more than 1,500 mm (5 ft.) above the floor.</p>	 <p>This symbol indicates that the extinguisher is for use on Class A fires. The background of the symbol will be metallic or green.</p>
 <p>Flammable liquids—oils, grease, paints</p>	<p>Multi-purpose dry chemical, carbon dioxide (CO₂) or from type</p> <p>Hang on brackets supplied by the manufacturer so that the top of the extinguisher is not more than 1,500 mm (5 ft.) above the floor.</p>	 <p>This symbol indicates that the extinguisher is for use on Class B fires. The background of the symbol will be metallic or red.</p>
 <p>Live electric equipment, motors, wiring</p>	<p>Multi-purpose dry chemical, carbon dioxide (CO₂)</p> <p>Hang on brackets supplied by the manufacturer so that the top of the extinguisher is not more than 1,500 mm (5 ft.) above the floor.</p>	 <p>This symbol indicates that the extinguisher is for use on Class C fires. The background of the symbol will be metallic or blue.</p>

Smoke Alarms

Smoke alarms can be battery operated or hardwired to your household 120-volt wiring. Various models which operate on 120-volt with a 9-volt battery backup are now available. The building code calls for hardwired interconnected smoke alarms on every floor where people sleep. Batteries tend not to be replaced and that is why hardwired alarms have been required. There are now battery-operated alarms available that have a 10-year battery, good for the life of the alarm. Some also have a button for temporarily silencing false alarms for those rare moments that cooking fills the house with smoke. There are two kinds of smoke alarm sensors available, the ionization type and photoelectric type.



Most alarms now come with instructions for do's and don'ts of where to install them. The following are general recommendations for placement of smoke alarms.

Tools and Supplies

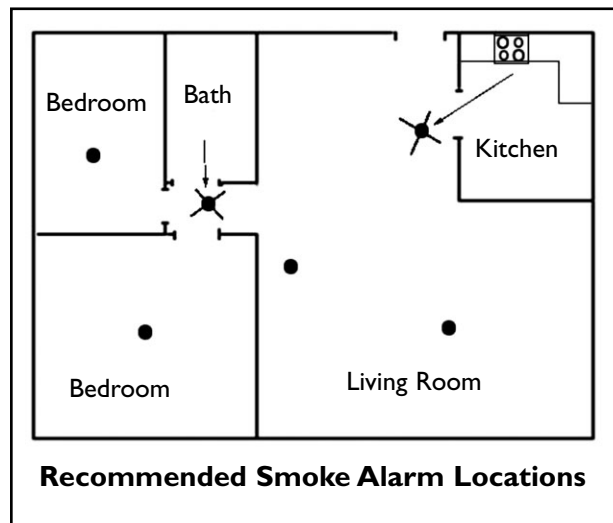
- replacement smoke alarms (if existing are over 10 years old)
- replacement batteries

- ear protection
- vacuum cleaner

Smoke Alarms Should Be

- placed on all floor levels where people sleep
- placed where people can hear the alarm loudly enough to wake them from a sleep
- located on or near ceilings, because smoke rises
- normally placed in hallways near bedroom doors, but for extra security, they can also be placed in bedroom areas

Note: Units with flashing lights are designed to be used by people with hearing problems



Smoke Alarms Should NOT Be

- in or near areas where combustion particles are present (keep at least 6 m (20 ft.) away from *furnaces*, gas or oil-fired water heaters, woodstoves and fireplaces)
- in air streams passing by kitchens
- in damp or very humid areas, or next to bathrooms with showers
- in very dusty or dirty areas
- near fresh air vents, or very drafty areas

- in dead air spaces (behind furniture, corners, peak of vaulted ceilings)
- in insect infested areas
- within 30 cm (12 in.) of a florescent light
- near a ceiling fan
- in a garage

Ionization Sensors

The ionization sensor gets its name because it measures the electrical balance in the air between positive and negative charges, or ions. A tiny piece of radioactive material creates a small electrical current in the air that flows through the sensor chamber. A computer chip on the circuit board monitors the current level. When smoke particles enter the sensor chamber they upset the balance between the positive and negative electrical charge. This changes the current flow. As the smoke gets denser, the imbalance increases. When the imbalance reaches a certain threshold, the alarm will sound to alert you.

Photoelectric Sensors

The photoelectric sensor is so named because it uses a light source to measure smoke density. The light source is constantly on. A light receiver is also in the sensor but positioned so that the light source will not shine on it. When smoke enters the sensor, the particles deflect the light toward the receiver. As the density increases, more light hits the receiver. When the amount of deflected light reaches a certain threshold, the alarm will sound to alert you. Photoelectric is the recommended type to use in rooms that contain *combustion appliances*. They are not the type to use near bathrooms or kitchens as they can be fooled by steam, nor should they be used in dusty areas.

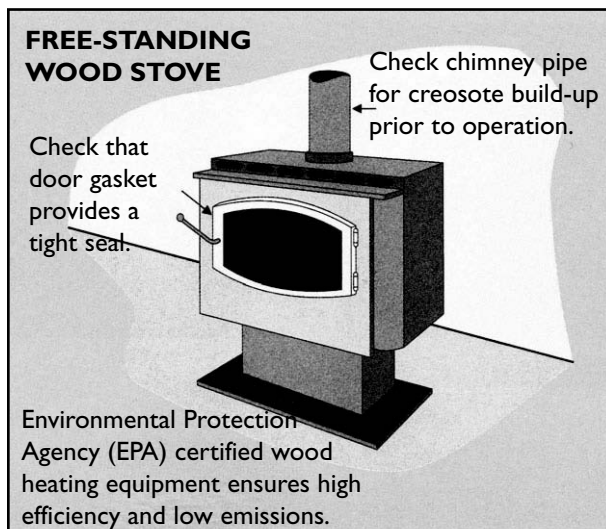
Both types of sensors pass the tests required by Underwriters Laboratories for residential smoke alarms, but they do differ in their sensitivity to certain kinds of smoke.

Maintenance and Replacement

- For battery-operated alarms and battery back-up alarms, replace batteries as per manufacturer's recommendations (normally every six or twelve months). Most of these units have an audible device for warning of low batteries as well as a test button. Replace batteries immediately if this warning device sounds, or if the test button fails to sound the alarm.
- Vacuum smoke alarms at least once a year. Dust can cause false alarms or alarm failure.
- Smoke alarms that are *10 years old* are near the end of their service life and should be replaced. Some people think that their smoke alarm sits idle until there is smoke present. Actually, it is working every minute, constantly monitoring the air 24 hours a day. An ionization smoke alarm, for example, goes through 3.5 million monitoring cycles in 10 years. In a photoelectric alarm, a light is on constantly to look for smoke coming into the sensing chamber. Just like any electrical appliance, the working components of smoke alarms wear out over time. When the smoke alarm reaches 10 years of use, the potential of failing to detect a fire increases. Replacing them after 10 years reduces the likelihood of failure. **(Note: The test button will still sound the alarm even if the sensor is worn out.)**

Wood Heat and Chimneys

Wood heating appliances and chimneys take a lot of abuse from high temperatures and combustion by-products. Wood heat has been responsible for many house fires. To be considered safe, wood heating components require a high level of maintenance and care in their use. Homes with wood heat should have a carbon monoxide alarm. The alarms have a lifespan of about five years and need to be replaced accordingly.



Tools and Supplies

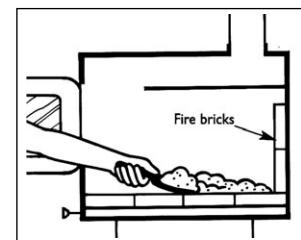
- metal bucket
- small shovel or large trowel
- vacuum cleaner
- flashlight
- glass cleaner
- oven cleaner
- screwdriver
- chimney cleaning brush
- trouble light or flashlight

- extension cord
- dust mask
- gloves
- ladder
- rope
- safety equipment
- protective clothing
- small mirror

Woodstove

- Most woodstoves now have a label showing that they have been certified safe by a Canadian Standards testing laboratory. The label also lists safe distances to *combustibles*. Occasionally furniture gets moved too close to the stove creating a fire danger. **Keep combustibles at least the listed distance away from the stove.**

- Clean ashes out of the stove when 5 cm (2 in.) deep. Place into a **metal** bucket and remove bucket immediately to outside of home. Do not leave the bucket on a porch or deck as buckets of seemingly cold ashes have caused house fires.



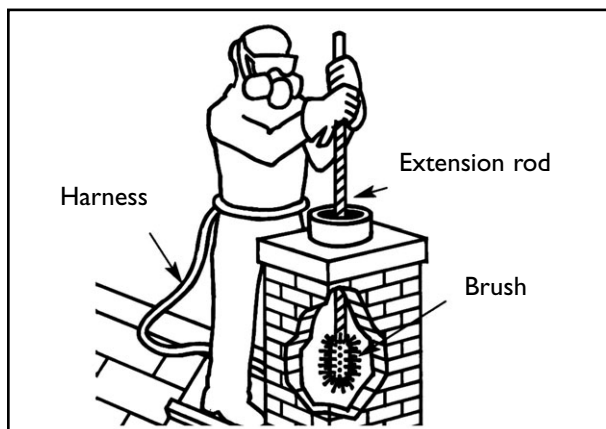
- Check the condition of the firebricks inside the woodstove regularly. Damaged or missing firebricks can affect safe clearances to *combustibles*.
- Check the door gasket every few months. If damaged, it can be fairly easily replaced.
- Door glass can be cleaned with glass cleaner. For stubborn baked on films, oven cleaner can be used but keep in mind that oven cleaner is toxic and corrosive, so follow the safety instructions supplied with the cleaner.

Connector Pipes

- Connector pipes are sometimes called stovepipes or flue pipes. They connect the woodstove to the chimney. All pipe connections should have three screws creating a mechanical connection between the pipes.
- Pipes should be cleaned at least once per year. This is usually done when the chimney is cleaned. The woodstove exhaust outlet should also be cleaned when the pipe is being cleaned.
- Check the condition of the pipes when cleaning, as the pipes have a limited lifespan and should be replaced before becoming unsafe. Single walled pipes can be squeezed to test their integrity. If the pipes feel thin or flimsy, then they need to be replaced. Thin connector pipes may rupture, allowing flue gases to spill in the home creating a health and safety hazard.

Chimneys

- Chimneys should be cleaned at least once each year. Normally a commercial chimney cleaning service is hired to do this job. They will also do a safety inspection of the chimney. This job can be done by the home occupant or community maintenance person using a chimney cleaning brush (same size and shape as the chimney flue) available at hardware stores.



- After cleaning, the interior of the chimney should be inspected by lowering a light down the chimney. Chimney walls will still be black but should have no more than a thin layer of *creosote* buildup. If *creosote* layer appears to be thick in places, further cleaning is required.
- Remove soot through the clean-out door. Make sure the door cover gets put back in place, as a missing clean-out door will severely affect draft, *creosote* buildup and possibly fire safety.
- Inspect the exterior of the chimney for cracks, loose *mortar* and *creosote* staining. If any exist, have the chimney inspected by a chimney service.
- The exterior of concrete block chimneys should have a sealer applied to stop moisture from penetrating the concrete and causing frost damage. This can double the lifespan of a chimney.

Chimney Fires

There are three main types of chimney fires, **soot, runaway and creosote** fires. It is not uncommon to have two or all three at the same time. Call the fire department (if one exists locally) and shut down the air to the fire by closing the air intake mechanism. Do not put water down the chimney as the steam can seriously burn you and can also destroy the chimney.

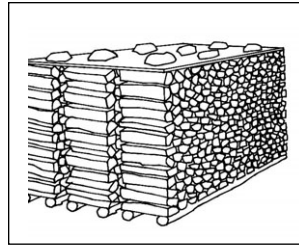
- **Soot** can build up at the base of chimneys and in connector pipes. Should a soot fire occur, close off the air supply and for wood *furnaces*, make sure the barometric *damper* stays closed. *Barometric* dampers are located on a Tee section of the connector pipe and their purpose is to relieve excess draft pressure caused by winds passing over the chimney opening.

- **Runaway** fires are caused by too much fuel, too much air supply to the fire and too much chimney draft. When this happens, close off the air supply to the fire.
- **Creosote** fires are caused when an excessive buildup of *creosote* forms inside the chimney. When this *creosote* gets superheated, it catches fire, then starts bubbling and dripping, spreading the fire to the base of the chimney. To stop this type of fire, close off all air supply to the chimney, including the *barometric damper* if there is one.

Chimney fires are easily avoided by burning proper fuel, cleaning the chimney and pipes regularly (at least once a year) and using responsible burning practices.

Firewood

Creosote is condensed smoke that hardens and attaches itself to the inside of the chimney and connector (stove) pipes. Because *creosote* can easily catch fire, it is important to minimize its creation.



Burning wet wood or not allowing enough air for proper combustion causes *creosote*. With dry fuel and proper combustion air, fire burns with very little

smoke. If the small amount of smoke travels fast enough not to condense in the chimney, there will not be any *creosote* buildup. Not only is *creosote* a fire danger, but it is a health risk as well.

To avoid creating *creosote* remember the following:

- Dry wood produces more heat and less *creosote* than wet wood.
- Wood dries faster when it is stacked.
- Wood should be stored out of the rain or under a tarp or plastic. The top of the stack should be covered but not the sides. This allows air to flow through the stacked wood, to assist in drying.
- Burning saltwater driftwood will corrode stoves, pipes and chimneys.

TIPS

- Most modern wood stoves burn more efficiently and produce less smoke than stoves made 20 or more years ago. Consider replacing old wood stoves with more modern ones.
- Dampen ashes slightly and allow to sit for 30 to 60 minutes in order to minimize the amount of airborne ashes when removing ashes from a woodstove.
- Double wall connector pipes help prevent *creosote* by minimizing heat loss from flue gases.
- Connector pipes should be as short and straight as possible.
- If home occupants suffer from asthma or other respiratory illnesses, using wood stoves and fireplaces may aggravate their condition.
- Damaged masonry chimneys can be lined with stainless steel liners, making them safer and easier to clean.
- Burning plastic garbage, painted wood, treated wood, wet wood and rotten wood is not only hard on the environment but can impact your and your neighbours' health.

Thermostats

The thermostat's main job is to turn the heat on and off in your home. It functions similarly to a carburetor on an automobile engine. The carburetor has a large impact on fuel efficiency and engine performance. The thermostat also has a large impact on energy efficiency and how well the heater performs. Good heater performance ultimately leads to personal comfort.

Setting the thermostat at between 20° C and 22° C (68° F and 71° F) when people are sitting inactively should provide sufficient comfort. Settings between 18° C and 20° C (64° F and 68° F) are recommended for when people are active. At night, or when no one is home, temperatures can be set back to between 15° C to 17° C (59° F to 62° F). Setting temperatures back further does not normally achieve much extra energy savings and requires a longer time to bring temperatures up to a comfortable level. Warm wall, floor and other surfaces are what provide comfort. Warm air alone, if surfaces and furniture are cold, will not provide comfort.

To function effectively, thermostats must be located

- on interior walls;
- away from drafts;
- away from direct sunlight; and
- somewhere that it can accurately sense room temperatures.

Having a thermostat behind furniture, in a corner or by a doorway may not provide the right conditions for sensing heating needs.

Caution: Do not attempt to change a thermostat yourself. If one of your thermostats is not performing properly, contact your housing office, an electrician or heating technician.

Low Voltage Thermostats



Low voltage thermostats are used to control *furnaces*, *heat pumps* and *whole house heating systems*. Sometimes they are used with *relays* to control several *baseboard heaters*. Most low voltage thermostats are very accurate. They are called low voltage because they operate

on a 24-volt electric current. They usually contain a mercury bulb or are electronic. The easiest way to recognize low voltage thermostats is by the thin wires that attach to the thermostat.

There are a variety of types of low voltage thermostats due to the different tasks some have to perform. Some work to control fans connected to the heater, some work with *anticipators* and some have adjustable ranges between the on and off settings.

For oil and gas *furnaces*, a wider swing between the on and off settings will improve energy efficiency, as less heat will be lost up the chimney. This is because some heat is lost up the chimney every time the *furnace* comes on and shuts off (during warm up and cool down). When there is a wider swing or range between the on and off temperature, the *furnace* will run longer and not cycle as often.

For electric heat, the opposite is true as heat is not lost up chimneys (because electric furnaces are not connected to chimneys). Having a more even temperature means more comfort and less heat wasted on the upper end of the temperature swing.

There are many low voltage programmable thermostats available. These can be set to automatically turn the heat up and down at preset times. For people with fixed daily routines these thermostats can provide extra comfort and heating cost savings.

Line Voltage Thermostats



Line voltage thermostats are used to control electric *baseboard*, wall and floor heaters. They operate on a 240-volt electric current. One way to recognize a line voltage thermostat is by the heavy gauge wires that attach to the thermostat. Most line voltage thermostats have bimetal sensors, which allow wide temperature swings, provide poor comfort and waste electricity. Line voltage thermostats that use an oil diaphragm, vapour diaphragm, or electronic sensor provide improved comfort and energy savings compared to the *bimetal* type.

TIPS

- Conversion from a *bimetal* type to an oil diaphragm type will normally save enough energy within one to two years to pay for the cost of the conversion.
- Most thermostats, even when turned off, will turn the heat on when the temperature gets close to freezing.
- Some thermostats can be installed with an upper temperature limit so that occupants cannot set the heat higher than this limit.
- Furniture can block convective airflows. This is particularly a problem with *baseboard* type heating. Avoid placing furniture directly in front of, or over heaters or heat registers.
- Thermostats located on *baseboard heaters* are usually very inaccurate, consider upgrading to remote wall mounted thermostats.
- Remember to switch crawlspace heaters off during the warmer months of the year.

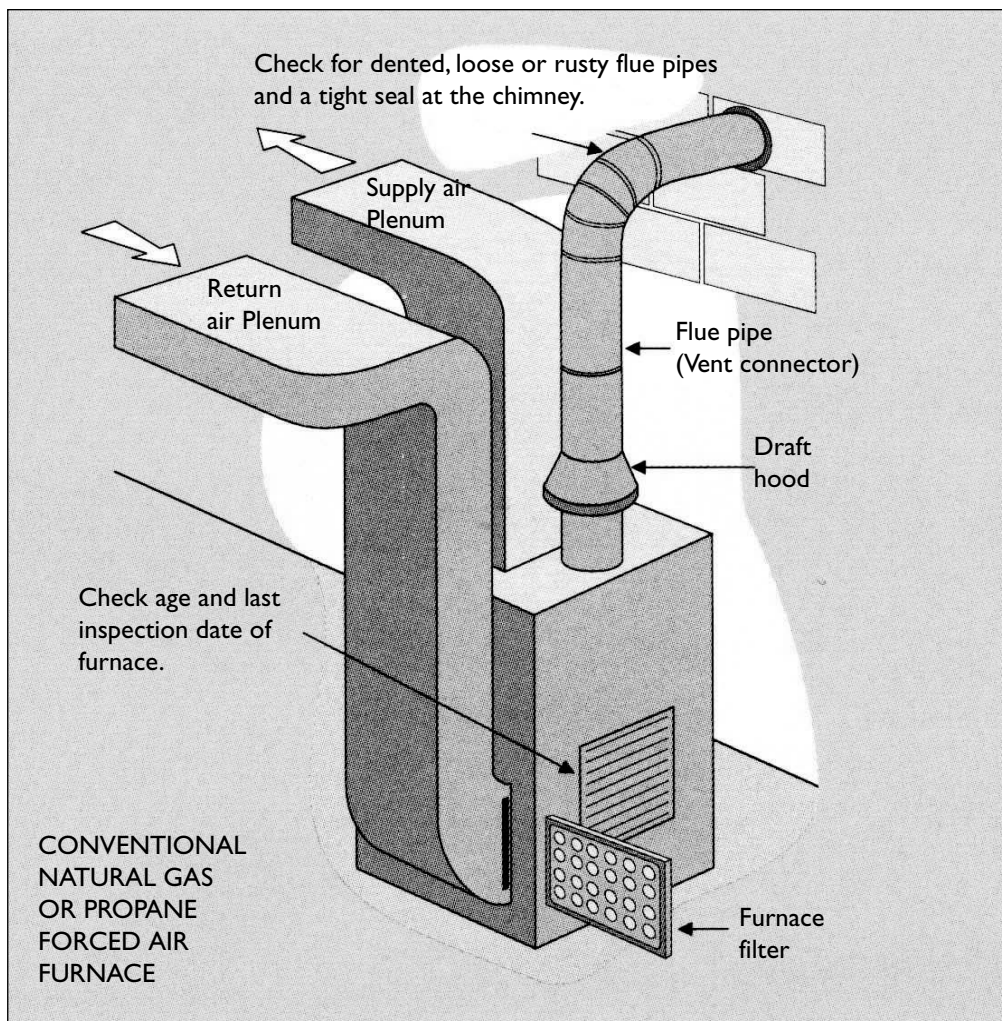
Forced Air Furnace Maintenance

Maintaining your *forced air furnace* will improve your indoor air quality, prolong the life of the *furnace* and save on expensive repair bills later. Safety around the *furnace* is very important. You should read the manual pertaining to your furnace before attempting any maintenance activities. Always leave the adjustment of flame levels and controls to qualified furnace technicians.

The most common *forced air furnace* maintenance activity is changing the filters. Furnace filters were traditionally designed to protect the *furnace* and fan.

With increased air quality awareness, some filters are now being installed to reduce exposure to particles that can affect your health.

High efficiency *furnaces* need a steady supply of air to keep cool. If the filter is plugged, the *furnace* will get too hot and the thermal limit switch will turn off the *furnace*. This may result in an expensive service call to diagnose why the *furnace* is not functioning.



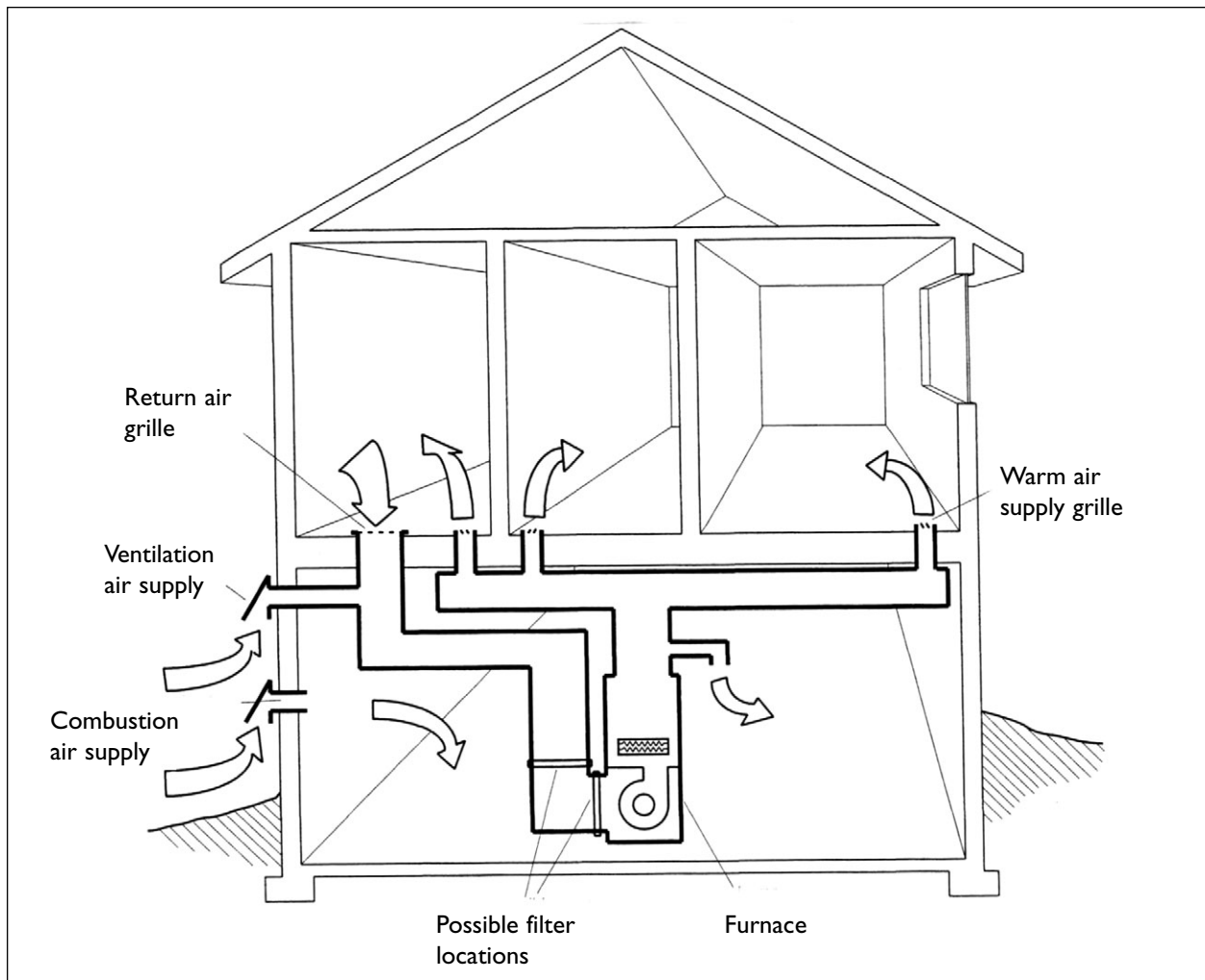
Tools

- trouble light or flashlights
- new furnace filter
- vacuum cleaner
- stiff brush

Once a Month

- Change or clean filters during the heating season. To determine how dirty the filters are, hold them up to a light source. If you can easily see light through them, then they are still clean enough to use. Vacuum out return air grilles.

- If you have a 2-speed continuous operating fan, you may want to check filters during the summer months. Gravel roads will produce plenty of dust during the summer. Homes located near gravel roads may require filters to be checked more frequently. A *furnace* with a 2-speed continuous operating fan will run at a low speed to circulate air when the heat is off. The fan runs at a higher speed while the *furnace* is in heating mode.
- Inspect the *furnace* for worn, shiny and sagging belts. They cause undue stress on the fan motor. If belt is worn or loose, **have a qualified furnace technician service or replace the belt.**
- Look for oil leaks (oil *furnaces* only).



Once a Year

- Get a yearly preventive maintenance check (about \$100 – \$150) from a service company. At a minimum, the technician should check the fan controls, air filters, blower belt, belt alignment and ducts. He should also check and adjust the burner flame and if necessary, lubricate moving parts.
- Check *furnace* exhaust vent on the roof for rust, blockage from bird nests, bee nests and wind damage. Repair or clean as necessary.
- Check to see that your air intake vent outside is clean and not plugged with bugs, dandelion down, cottonwood seeds and other debris. If necessary, clean with stiff brush.
- Check to ensure your combustion air supply is not blocked outside or where it enters your furnace room. In colder climates the combustion air duct may terminate into a bucket, make sure the bucket is still attached.

Duct Cleaning

In some cases you may benefit from having your heating ducts cleaned.

- If you have a problem with water in your ducts, this may result in mold growth in the duct. In this situation, solve the water problem first, clean and disinfect the ducts where mold growth has occurred, and have the rest of the ducting system cleaned as well. In some cases, it may be necessary or more cost effective to simply replace the affected duct areas.
- If you are moving into a newly constructed house, and have doubts about the diligence of the construction crew, duct cleaning can be useful. Drywall dust, *fibreglass* pieces, and sawdust have no place in ducts. Duct cleaning will also catch the odd occurrence where lunch bags or soft drink

cans have fallen or been swept into ducting. For similar reasons, duct cleaning may be advisable for older houses following major renovations.

- If you are having trouble with *furnace* airflow, a duct cleaning could reveal significant blockages. Have the ducts cleaned before you embark on more expensive duct replacement or rerouting to solve an airflow problem. Cleaning of *furnace* and air conditioning components (for example, furnace fan blower, air conditioning coil, humidifier, furnace heat exchanger, and so on) has been shown to make some difference in duct air flow.
- If you look in the return air registers and see an accumulation of debris in the duct below, you may want to have it removed. CMHC research showed that return air ducts, which are relatively big and have slow moving air, are generally far dirtier than the supply ducts. You should be able to accomplish much of the return air duct cleaning with a household vacuum cleaner after removing the register grill. For example, households with hairy pets or forgetful young children may find it necessary to inspect their return air ducts more frequently. Do not expect any difference in airflow or house air quality after this cleaning.

How Should Your Ducts Be Cleaned

There are various duct cleaning procedures available. Reputable duct cleaners will be familiar with different techniques and their effectiveness. Duct cleaners affiliated with heating and air conditioning firms may be able to provide a more thorough system tune-up. Check to see if the duct cleaners are affiliated with trade organizations. They should also be able to offer references from satisfied customers. Some duct cleaners visually inspect the ducts after their work, either through duct access panels that they cut into the sheet metal or by in-duct cameras. This allows some proof of the effectiveness of the cleaning.

Do not accept offers from duct cleaners to spray or fog the ducts upon completion of the work, ostensibly to get rid of residual bacteria or mold. There are no products registered under the *Pest Control Products Act* in Canada for residential duct cleaning. Registered products, if they existed,

would have been tested for effectiveness and human safety. A proper duct-cleaning job does not require the use of a biocide to clean up missed areas. Based on current research, broadcast spraying of biocides through houses is considered inappropriate if you wish to maintain good indoor air quality.

TIPS

- Never allow your return (cold) air registers to be blocked by furniture or any other object. This can severely impact the operation of your *furnace*, and in the case of *combustion* type *furnaces* (oil and gas), can cause a safety hazard.
- Supply (heat) registers should not be blocked by furniture as this will affect the efficiency of the *furnace* and may lead to *condensation* and mold problems.
- Carbon monoxide alarms and gas alarms are readily available. For those with *combustion* type *furnaces*, these alarms will provide an added measure of safety.
- For oil burning *furnaces*, if the chimney is producing more smoke than normal, then the burner will need adjusting or repair by a trained technician.
- For gas burning *furnaces*, if combustion produces an odour or the flame is mostly yellow/red instead of blue, then the burner will need adjusting or repairing by a trained technician.
- Unusual noises produced by the *furnace* can be a cause for concern. Have your *furnace* checked if it is making a squeaking, chirping or other new noise.
- If air flows from your heat registers (heating vents) decrease or seem cooler, filters may be clogged or a ducting run may have come apart.
- Furnace filters come in a variety of types and qualities. They may be fibre, or pleated or other configurations. Premium pleated filters are generally more efficient than fibre filters. Some filters are reusable (washable). There are specialty filters such as HEPA filters and electrostatic filters for removing pollutants such as pollen and dust from the air circulated through the *furnace*.
- When installing a furnace filter make sure that the airflow arrow on the filter matches the airflow of the *furnace*. If a furnace filter is installed in a reversed position, the core of the filter can be sucked into the fan. Filters normally come with an arrow; it is recommended that you draw an arrow, with a permanent felt pen marker, on your *furnace* indicating airflow direction so that the two arrows coincide.
- Furniture can block convective airflows. This is particularly a problem with *baseboard* type heating. Avoid placing furniture directly in front of, or over heaters or heat registers.

Getting More Help

Maintenance and repair jobs require a variety of skills and training. Not every home occupant and homeowner has the time or skills to do every job around the house. Luckily, there are maintenance people and qualified professionals who can give you the help that you need.

For a full checklist of all the steps included in hiring a contractor or a home inspector, refer to the CMHC About Your House factsheets, *Hiring a Contractor*, 62277 and *Hiring a Home Inspector*, 62839.

TIPS FOR HIRING A PROFESSIONAL

- Decide what type of professional you need to hire. If you need someone to inspect your home to find the source of problems, you can call a professional home inspector. If you have a specific problem with a part of your house, you'd need to call a specialist in that field. For example, a problem with your *furnace* would require a qualified furnace technician. If the problem is related to poor indoor air quality, you can call an Indoor Air Quality professional who has completed the CMHC Residential *IAQ* Investigator Program. (Your local CMHC office keeps a listing of people in your area who've completed the Residential *IAQ* Investigator Program).
- Check with your housing office and maintenance department. If they are not able to provide the service you need or the name of a professional, get referrals from family, friends and neighbours.
- Choose someone with experience and who is a member of a professional association for his industry. Depending upon the industry and the province, the professional may need to be licensed or registered to legally carry out his work.
- Get estimates from at least three contractors.
- Get this estimate in writing. For any work, getting a written agreement that explains the details about the job and everyone's responsibilities is essential. In many cases, such as home inspections or indoor air quality inspections, you should expect a final written report. You'll need this important documentation for reference as you proceed with further repairs.

Glossary of Housing Terms

ABS	Acronym for acrylonitrile-butadiene-styrene. A type of rigid plastic used in plumbing pipes for drain, waste and vent systems. Can also be used for potable water.
Air barrier	Material incorporated into the house envelope to retard the movement of air. Called air-vapour barrier when it retards air and moisture.
Air sealing	The application of weatherstripping such as caulking and expanding foam to close off small cracks and spaces at windows and doors and on walls and ceilings to reduce air leakage and consequent heat loss.
Ampere	The unit of electrical current equivalent to the steady current produced by one volt applied across a resistance of one ohm.
Anticipator	A device within a thermostat that helps to prevent temperature overshoot. Overshoot is caused by the delay of heat from a furnace or other source in reaching the thermostat.
Backdrafting (flow reversal)	The reverse flow of outdoor air into a building through the barometric damper, draft hood or burner unit as a result of chimney blockage or a pressure differential greater than can be drawn by the chimney. Backdrafting causes smell, smoke or toxic gases to escape into the interior of a building. “Cold” backdrafting occurs when the chimney is acting as an air inlet but there is no burner operation or just a smoldering fire in a fireplace. “Hot” backdrafting occurs when the hot flue gas products are prevented from exhausting by flue reversal.
Baseboard heater	A radiator shaped like a baseboard having openings at top and bottom through which air circulates.
Bimetal sensor	Temperature sensitive metal coil or strip. Bimetal elements move the contacts of switches together and apart to close and open the circuit in response to temperature changes.

Brads	Thin nails with a small head, used for small finish panel-moulding and so on.
Breaker	See circuit breaker.
Bridging	A method used to resist twisting of joists and for stiffening floor construction by fitting either crossed pieces or solid blocks between the joists.
Cap flashing	Sheet metal or other material used above a window or door to shed water.
Caulk	To make tight with a sealing material.
Caulking	Material with widely different chemical compositions used to make a seam or joint airtight or watertight.
Ceramic tile	Decorative ceramic tiles of various shapes and size, normally used where durability is important and excessive exposure to moisture could occur.
Circuit breaker	An electromechanical device designed to open a current-carrying circuit, under overload or short circuit conditions, without injury to the device; serves the same purpose as a fuse, that is to prevent overheating in a circuit through overloading. Unlike a fuse, a circuit breaker can be reset, rather than replaced.
Combustibles	Any materials which burn within the range of temperatures that may occur in a building either normally or under fire conditions.
Combustion appliance	A fuel-burning heating or cooking appliance such as an oil or gas furnace, wood burning stove, oil or gas space heater or a gas range.
Condensation	The transformation of the vapour content of the air into water on cold surfaces.
Convactor	A heating device, in which the air enters through an opening near the floor, is heated as it passes through the heating element and enters the room through an upper opening.

Creosote	(1) An oily liquid distilled from wood or coal tar used in preserving wood in damp or wet places. (2) Unburned or partially burned hydrocarbons which are byproducts of wood combustion (condensed smoke).
Cross-bridging	Small wood planks or metal pegs that are inserted diagonally between adjacent floor or roof joists.
Cut in	A painting term describing painting a strip on the perimeter of the surface before painting the remainder of the surface.
Dampproofing	(1) The process of coating the outside of a foundation wall with a special preparation to resist passage of moisture through the wall. (2) Material used to resist the passage of moisture through concrete floor slabs and from masonry to wood.
Dimple	To make a slight depression the size of a hammer head, usually to countersink a nail or screw in wallboard to allow for filling and finishing.
Doorstop	A device fitted to a door, or on the floor or wall near a door, to hold it open as far as may be required, or to prevent the door from being opened beyond a certain amount; the strip against which a door closes on the face of a doorframe.
Downspout	A pipe, which carries water from the eavestrough to the ground or the storm drainage system.
Drywall compound	A type of plaster used to seal the joints between sheets of drywall.
Eave	The part of the roof that projects beyond the face of the wall.
Eavestrough	A trough fixed to an eave to collect and carry away the run-off from the roof. Also called gutter.
Efflorescence	Formation of a white crystalline deposit on the face of masonry walls.

Electrolysis	An electrochemical reaction between two dissimilar metals, such as copper and galvanized steel, causing corrosion of a joint where the two materials are in contact with each other.
End nailing	Fastening two pieces of lumber together by nailing through the surface of one piece and into the end grain of the other. For example, solid floor framing blocking can be end-nailed by nailing through the side of the joists and into the end grain of the block.
Entrained air	Trapped air bubbles.
Exfiltration	The uncontrolled escape of air through cracks and pores of a building.
Fascia	A finish board around the face of eaves and roof projections.
Feather out	A term referring to reducing the thickness of the patching compound on the edges of a repair. Normally the repair is done in layers and each layer covers a wider area than the previous layer.
Fibreglass	(1) A compound consisting of glass fibres drawn or blown directly from a glass melt; commonly used in a composite with a plastic polymer. (2) Fine strands formed by a blowing or drawing process during the melting of glass. Often used as insulation.
Flashing	Sheet metal or other material used in roof and wall construction to shed water.
Forced air	Air circulated through ductwork within a house by means of a circulating fan located in the furnace housing.
Fungicide	A chemical that stops or inhibits the growth of fungi (mold and mildew).
Furnace	An enclosed structure in which heat is produced.

Fuse	A device capable of automatically opening an electric circuit under predetermined overload or short-circuit conditions by fusing or melting; an overcurrent device.
Gable end vent	A sheet metal or plastic vent in the end of a gable or dormer roof on a house.
Glazed unit	That part of a window, which includes more than one glazing layer sealed around the outside edge to prevent air or moisture from entering the airspace and eliminating dirt and condensation between glazings.
Glazing	A generic term for the transparent, or sometimes translucent, material in a window or door. Often, but not always, glass.
Ground fault circuit interrupter	A device designed to interrupt, almost instantaneously, an accidental connection between a live part of an electrical system and ground (a short-circuit or a shock) when the current exceeds a very small predetermined value. This device will react to a dangerous situation before a fuse or circuit breaker, and before a person can be harmed by the shock.
Grout	A thin mixture of cement mortar and additional water.
Gypsum panel	Wallboard made from gypsum plaster, with a covering of paper. Also referred to as drywall.
Heat pump	A heating device that extracts usable heat from a medium like air or water by raising (pumping) its temperature. In its reverse mode, it can be used for cooling. Normally works by compressing and decompressing a gas similar to the operation of a refrigerator.
HRV	Acronym for Heat Recovery Ventilator. A ventilation system that provides fresh outdoor air to the house while extracting heat from the stale outgoing air. HRVs help keep indoor humidity levels under control, improve indoor air quality and may keep heating costs down.

Hydraulic cement patch	A cement material that will harden under water. Quick setting, hydraulic cement patching materials are used to quickly patch small water leaks in concrete structures.
Hygrometer	An instrument designed to measure the relative humidity of the atmosphere.
IAQ	Acronym for Indoor Air Quality. A general term relating to the presence of chemical and biological contaminants in the air within a building, and their potential health effects.
Infiltration	The uncontrolled admittance of air through cracks and pores into a building.
Joint compound	See drywall compound.
Joist	One of a series of horizontal wood members, usually 5 cm (2 inches) nominal thickness, used for support in floors, ceilings or roofs.
Kerf	A groove or cut.
Load-bearing	Subjected to or designed to carry loads in addition to its own weight (as applying to a building element).
Lockset	A doorknob assembly that includes knobs or level handles, a latch bolt assembly and trim.
Loose-pin hinge	A type of hinge in which the pin can be pulled from the barrel so that the two hinge leaves separate.
Marrette	A type of twist-on wire connector used to secure and protect the twisted ends of two joined wires.
Mastic	Any of various pasty materials used as a protective coating.
Mechanical ventilation	The control of a house's ventilation through the use of a mechanical system. Normally includes bathroom fans, rangehoods, heat recovery ventilators (HRVs) and other similar devices.

Metal ferrule	The metal portion of a paintbrush that joins the handle to the brush bristles.
Mildew	A variety of fungi that survives and grows on damp materials, including porous building materials, plants, paper, etc.
Mitered trim	A joint between two pieces of material on a line bisecting the angle of their junction.
Moisture barrier	Any material that is used to retard the passage or flow of vapour or moisture into construction and prevent condensation.
Mortar	A substance produced from prescribed portions of cementing agents, aggregates, and water that gradually sets hard after mixing.
Mortise	The cut-out in a board or unit to receive a tenon lock, hinge and so on.
Muntin	A horizontal member that divides panes of glass, windows, or doors.
Nap	A soft or fuzzy surface of a paint roller.
Nosing	The rounded and projecting edge of a stair tread, window, sill and so on.
Oriented strand board, or OSB	Structural wood panel manufactured from wood strands that are oriented in the same direction and bonded together with glue. It is a high strength product made from low-grade (waste) material.
Parapet wall	That part of an exterior wall, party wall, or fire wall extending above the roofline.
Parging	A coat of plaster or cement mortar applied to masonry or concrete walls.
Particleboard	Generic name for products made by gluing wood particles together to form a panel.
Passage set	Doorknobs or levers, latch bolt assembly and trim that does not have any locking mechanism.

Patching compound	Material used for patching and repairing surfaces such as stucco and drywall. See drywall compound.
Popped nail	A previously covered nail head that is showing on a finished drywall surface. Often caused by wood shrinkage or settling of a building.
Pressure tank	A water supply holding tank in which the incoming water pushes a cushion of air to the top of the tank until it reaches a pre-set pressure, causing the pump to shut off. The pressure in the tank allows water to be drawn off until the pressure reaches a lower pre-set level and the pump comes on. The pressure tank allows water to be used without the pump coming on each time.
Priming	The first coat of paint (base coat), usually of neutral colour, applied to a new surface that prepares the surface for a final coat.
Profile (siding)	Contour or face shape.
Radiator	That part of the system, exposed or concealed, from which heat is radiated to a room or other space within the building; heat transferring device.
Relative humidity (RH)	Humidity relative to temperature. The percentage of the existing partial pressure of water vapour in a space to the saturation pressure at the same temperature; for example, air containing one half the amount of moisture it is capable of holding at a certain temperature has a relative humidity of 50 per cent for that temperature.
Relay	A device that responds to a small current or voltage change by activating switches or other devices in an electric circuit.
Ridge vent	A special sheet metal or plastic vent that is installed along the ridge of the roof.
Riser	(1) The vertical board under the tread in stairs. (2) In plumbing, a supply pipe that extends through at least one full storey to convey water.

Roof boot	A pre-formed rubber flashing that fits around a plumbing vent stack to be integrated with the roofing to provide a watertight seal.
Roof spot vent	A roof vent designed to be installed on the surface of the roof and integrated with the roofing to provide a watertight seal while allowing the passage of air.
Sacrificial anode	A rod, made of magnesium or aluminum, which is wrapped around a steel core wire that is screwed into the top of a hot water heater tank to prevent the tank from rusting.
Sash	A light frame of wood, metal, or plastic either fixed or movable, which holds the glass in a window.
Sealant	A flexible material used on the inside (or outside) of a building to seal gaps in the building envelope to prevent uncontrolled air infiltration and exfiltration.
Shim	A thin piece of material (sometimes tapered) used to fill in space between objects.
Silicone sealant	A solvent-free silicone compound that is highly durable and excellent for sealing large moving joints. Ventilation is required during application and curing.
Soffits	The underside of elements of a building such as staircases, roof overhangs, beams and so on.
Solvent	A substance, usually liquid, having the power of dissolving the base material of a paint.
Splashguard	The raised portion at the back or side of a countertop designed to protect walls from moisture.
Spot prime	Priming of small repairs before painting. See priming.
Stack effect	A phenomenon caused by gravity where warm air rises in a house and exfiltrates through the upper half of the house, causing infiltration through the lower half of the house.

Stringer	(1) A long, heavy horizontal timber that connects upright posts in a structure and supports a floor. (2) The inclined member that supports the treads and risers of a stair.
Stucco	Any cement-like material used as an exterior covering for walls and the like; it is put on wet and dries hard and durable.
Stud finder	An electronic device used to detect changes in wall density or a magnetic device used to locate hidden nails or screws. Either way, structural support present in walls or ceilings can be detected.
Subfloor	Boards or sheet material laid on joists to support the finished floor.
Sump	A watertight tank that receives the discharge of drainage water from a subdrain or a foundation drain and from which the discharge is ejected into drainage piping by pumping.
Sump pump	A pump, usually electrically operated, to remove water that collects in a sump.
Swale	A small landscaping channel that is usually grassed and is wider than deep.
Tread	The horizontal part of a step, as opposed to the vertical riser.
Trim	The finish materials in a building, such as moulding applied around openings (window trim, door trim), or at the floor and ceiling of rooms (baseboard, cornice, picture moulding).
Turbine vent	A roof spot vent with a mushroom shaped top composed of wind vanes that pull attic air up through the roof (and possibly pull warm, moist air up into the attic from the living space).

VOC

Acronym for volatile organic compound. One of a group of organic chemicals that can be a gas or vapour at indoor temperature. They are found in many common products such as oil-based paints and varnishes, caulking, glues, synthetic carpeting and vinyl flooring and so on. They contribute to poor indoor air quality.

Water vapour

Water in a gaseous state and present in the atmosphere in varying amounts.

Waterproofing

Control of liquid water to prevent it from entering a building. Regarding foundations, “dampproofing” is designed to control soil moisture in the form of capillary water or water vapour, whereas “waterproofing” is designed to resist ground water in situations where the water table in the vicinity of the foundation may rise higher than the foundation floor with no guarantee that it will drain away successfully.

Wet edge

See cut in.

Whole house heating system

A heating system in which a number of rooms are heated from a central source. Also known as central heating. Common forms are forced air furnaces and heat pumps.

Wind effect

A condition that exists when wind blows against a house, creating a high pressure area on the windward side forcing air into the house. Simultaneously, a low pressure area is present on the leeward and sometimes other sides of the house. Normally causes an infiltration and exfiltration.

HOUSING QUALITY MATTERS FOR FIRST NATIONS

Basic Home Maintenance – Home Occupants' Guide

Housing Quality Matters

Canada Mortgage and Housing Corporation (CMHC) has, over the past few years, compiled a comprehensive series of information and training sessions having the objective of enhancing skills and knowledge with respect to housing quality. While there is a focus on Indoor Air Quality (IAQ) including mold prevention and remediation, the sessions cover better building techniques, inspecting existing dwellings, property management and basic home maintenance. The series reaches all audiences involved with or impacted by housing and who can influence the quality and durability of housing e.g. Chief and Council; housing department staff; inspectors, builders and renovators and home occupants. CMHC is also supporting the development of Aboriginal trainers to deliver the suite of sessions. The development and delivery of this initiative is supported by Health Canada, Natural Resources Canada and Indian and Northern Affairs Canada.

Basic Home Maintenance (two days)

This workshop includes a guide for First Nations' home occupants on preventative and general maintenance; trainers' materials plus train-the-trainers sessions. The training includes indoor air quality, moisture and mold management aspects that are within the capabilities of typical occupants.