BASIC HOME MAINTENANCE

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CANADA MORTGAGE AND HOUSING CORPORATION

ABORIGINAL CAPACITY BUILDING

PHOTOS TESSA MACINTOSH

CMHC SCHL

HOME TO CANADIANS

Canada

Acknowledgement

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Notice

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Introduction to Basic Home Maintenance

Why Home Maintenance

With home maintenance often an ounce of prevention is worth a pound of cure. Home maintenance benefits include:

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

What is Home Maintenance

Preventive Maintenance
Preventive maintenance is the act of heading off problems before they occur. Usually preventive maintenance is used to prolong life spans of certain housing components. Flushing water heaters and keeping a good coat of paint on exterior wood surfaces are two examples of preventive maintenance.

General Maintenance
General maintenance refers to repairing small problems before they become large and expensive problems. Sealing water penetrations in walls and leaky roofs and replacing caulking in bathrooms 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.

How to Do a Home Maintenance Needs Assessment

Knowing when and where to do preventative and general maintenance is no easy task. You will find the sample Home Maintenance Assessment Checklist below to be a useful guideline for carrying out an evaluation. By using the checklist to do a yearly maintenance walk through 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 and perform many home maintenance remedies.

Warnings

Safety should be paramount over all activities. Do not attempt any home maintenance activity without the proper safety equipment, the proper tools and materials. Follow Workers' Compensation Board occupation health and safety regulations as well as manufacturers' specifications when using their products and 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.

Home Maintenance Assessment Checklist

Exterior

1. Foundation: soil level at least 6" 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.)
2. Siding/stucco condition (leaks)	(If siding is damaged or penetrated, moisture can leak in.)
3. Exterior paint condition	(Is woodwork protected from weather and UV damage?)
4. Downspout condition	(Downspouts intact, unclogged and draining away from house?)
5. Gutter condition	(Gutters in good condition and clean?)
6. Roofing condition	(Roofing damaged, shingles loose or curled? – check attic also)
7. Chimney condition	(If chimney cracked, call for professional inspection.) (Is chimney clean and cleanout door in place?)
8. HRV, fan hoods and dryer vent conditions	(Clean screens in exterior vent hoods and check flaps.)
9. Door condition - weather-stripping	(Check weather-stripping, hinges and latches.)
10. Other	(Check decks, railings and exterior stairs)

Interior

11. Door & window condition	(Check and adjust or repair if needed.)
12. Bath and kitchen caulking	(Check caulking around tub and sinks, replace if needed.)
13. Moisture problems	(Remove mold safely, use natural or mechanical ventilation to prevent moisture problems.)
14. Drywall damaged	(Repair damaged drywall.)
15. Paint condition	(Repaint where needed to protect surfaces.)
16. Other	(Rodents, termites, etc)

Mechanical Systems

17. Flush water heater / test pressure valve	(Flush water heater every 12 months.)
18. Carbon monoxide alarm - test	(CO alarms needed for oil, gas, propane or wood fired appliances, i.e. furnaces, heaters, stoves.)
19. Smoke alarms on each floor - clean	(Vacuum every twelve months, replace after ten years)
20. Furnace filter - change	(Change furnace filters when dirty.)
21. HRV, bath fan & Rangehood filters and flaps	(Clean inside fans and HRVs, wash filters, check flaps.)
22. Plumbing condition - pipes	(Inspect traps for leaks and tighten if leaking.)
23. Plumbing condition - toilets	(Replace parts or wax seal if needed.)
24. Plumbing condition - faucets	(Replace washers or parts if dripping)
25. Thermostats - working accurately	(Have malfunctioning thermostats replaced.)
26. Insulation - missing or damaged in places. Insulation exposed?	(Replace where missing for energy efficiency.) (Cover where exposed for health protection.)
27. Woodstove - connector pipe	(Is stovepipe in sound condition and screwed together at joints?)
28. Woodstove - exterior	(Are combustibles a safe distance away?)
29. Woodstove - inside fire box	(Are firebricks and gasket in good condition?)
30. Dryer duct and lint trap	(Is lint trap clean and duct undamaged?)
31. Appliance cleaning	(Clean fridge coils, washing machine screens, etc.)
32. Other	

Repairing Vinyl Siding

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. The main intent of siding is to keep rain and moisture from seeping into your walls and insulation.

Tools and Supplies
Hammer, siding replacement tool (zipper tool), flat pry bar, ladder, nails, metal sheers, caulking gun and exterior caulking, measuring tape, pencil.

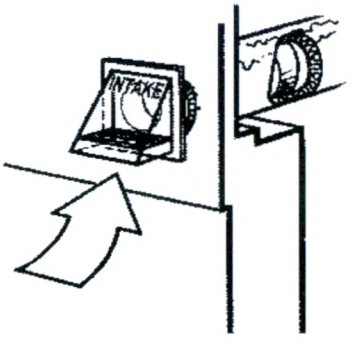
Sealing Penetrations

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.

- Seal wire, pipe and other penetrations by cleaning surfaces, allowing them to dry and then caulking or sealing with fiber gum.
- Wires should have drip loops to prevent water from running down the wire to the wall.

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.
- Check flaps to make sure they still open and close properly. A clothes dryer flap that slicks open will cause heat loss and drafts.
- Clean insect screens if part of hood. Screens mesh should be no finer than 1/8" square openings. Finer openings do not allow proper airflows and will clog quickly.

Replacing Damaged Vinyl Siding Pieces

- 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 on the left.

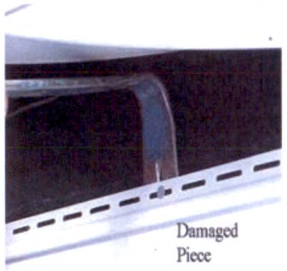
- Pull the upper siding piece away to give you access to the nails holding the damaged lap in place so they can be removed.

- 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.

- Installation of the new siding is basically a reversal of the removal procedure. Use the zipper tool to 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.

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

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



- When repairing a corner post, you may require assistance from an experienced siding applicator for access to proper tools and method.

Tips

- 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.
- Overlap of siding should be at least 1 ½" or as specified by manufacturer's recommendations.
- Vinyl siding can easily be cut with metal sheers. You do not need to cut with a circular saw or other power tools.

Vinyl Siding Cleaning

Vinyl siding is used mainly because of its low maintenance quality. Houses clad with vinyl siding do not require exterior painting. The one requirement for extending the life of vinyl siding is, keeping it clean. Vinyl siding comes in different levels of quality, thickness, profiles and warranties. There are problems associated with vinyl siding. These include; wind blow off if not properly installed, chalking or discoloring from the sun, becomes brittle when cold and is easily damaged, will melt when close to a BBQ or grass fires.

When your vinyl siding becomes dirty, there are some quick methods and products that will help you to clean the siding.

Tools and Supplies
Bucket, brush, car brush, rubber gloves, hose with spray head, ladder, rags, safety glasses.

Moderate Dirt

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

Heavy Dirt

- Mix 1/3 cup detergent, 2/3 cup tri-sodium phosphate (TSP) to one gallon of water. Spray siding with hose, wash with brush - then rinse with car brush and hose.

Mildew

- In a bucket containing 3 quarts of water add the following: 1/3 cup detergent, 2/3 cup tri-sodium phosphate, and 1 quart of bleach. Spray siding with hose to wet first. Wash with brush in high mildew areas - rinse with car brush and hose.
- With TSP alone, which is a type of detergent, you will clean dirt from the siding, but will not kill mildew. In fact, any residue left on the surface will act as a food source for mildew.
- Mix a commercial siding cleaner like Jomax, from Wm. Zinsser & Co. which contains mildewcides, detergent and a special bleach activator. When mixed with water and bleach, the activator magnifies the cleaning power of the bleach while reducing its alkalinity to safe levels so that the solution won't harm the plants. It is sprayed on and hosed off without scrubbing.
- Bilge pump cleaner can be also be used as a siding cleaning detergent.

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 will work. 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 rip the siding out of the slots. **If you plan to use one, make sure you check the siding warranty with the supplier or manufacturer.**
- If you decide to use the high pressure washer, soak the wall down first with clean water, do not get too close to the siding with the tip, always point the wand down and not up towards the siding, and start from the bottom and work your way up.

Tips

- Always start from the bottom and work to the top to avoid streaks.
- Always work on the shade side.
- Wear rubber gloves for bleach and TSP mixtures.
- Rinse windows immediately.
- Rinse off caulking with clear water around windows immediately
- Turn off outside electrical plugs at the electrical panel.
- Watch for Hydro lines.
- Cover plants with plastic if using bleach and TSP mixtures. They will harm your plants.

Eavestroughs and Downspouts

Gutters and downspouts collect and carry away rainwater that would otherwise run off your roof, splash down, erode the soil and stain the siding. More important, gutters and downspouts form 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.

Tools

Ladder, hack saw, hammer, measuring tape, screw gun or drill, scoop, bucket, hose and sprayer, tin snips, caulking gun and 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 new 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 Band maintenance person or a qualified gutter repair person.

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 clips. If not, then re-attach with existing or get new ones and attach.
- Check bottom of downspouts to ensure the bottom is not crushed and there is an elbow forcing the water away from the house or into a drain system. If not, repair or replace.
- Check all straps to ensure they are secured to the downspout and wall.

Tips

- When leaning a ladder up against the gutter, install extra hangers where the ladder is.
- If the downspout is clogged, force water down with a hose. If still clogged, use a plumbers auger from the bottom up.
- Continuous gutters are the best.
- Use short metal screws to attach sections to prevent clogging from leaves and debris.
- Be careful around power lines.
- Always work with a partner to help.

Roofing Repair

Loose, curled or broken shingles are subject to wind damage. Missing singles will cause roof leaks. Wind damage will often spread and can affect large areas if not treated quickly. 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
Sharp knife, putty knife, caulking gun, flat pry bar, hammer, hacksaw blade, roofing nails, roofing cement.

Tabbing Down Loose Shingles

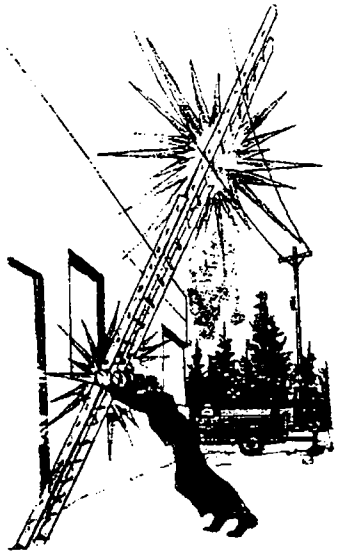
- Locate loose and/or damaged shingles.
- If they do not need replacing, simply raise them and apply an ample amount of asphalt (lap) roofing cement. Press the shingles down firmly. Damaged shingles may also need to be nailed with broad-headed galvanized roofing nails.
- Apply asphalt-roofing cement 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, and rodents, birds or bats.

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 products out in the residential market for homeowners plus special scaffolding and products for the trades people in the construction industry.

Safety first in the use of ladders and working in high locations is very important. The Workers Compensation Board (WCB) has written a book on safety around home. There are also seminars devoted to ladder and scaffolding safety. When you are first looking at tackling 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
Safety ropes, flat blocks of wood, nails, rope, shovel, sledge hammer, stakes.

Stepladders

- 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 hold the ladder while ascending and descending.
- Wear non-slip shoes.
- Never lean over too far away from the ladder, climb down and move your ladder so that you are directly below your work.

Extension Ladders

- Always look up above your head in the area you want to set the ladder on. Check for overhead wires.
- Check the ground to see if it is soft or hard.
- Check the ground to ensure that it is level.
- Check the rungs to see if they are cracked, bent or broken.
- Check the rails of the ladder to make sure they are not bent, cracked or broken.
- Portable, single or extension ladders must have non-slip feet.
- Only use CSA or ANSI Standard approved heavy-duty ladders.
- Ladders must rest against a firm structure.

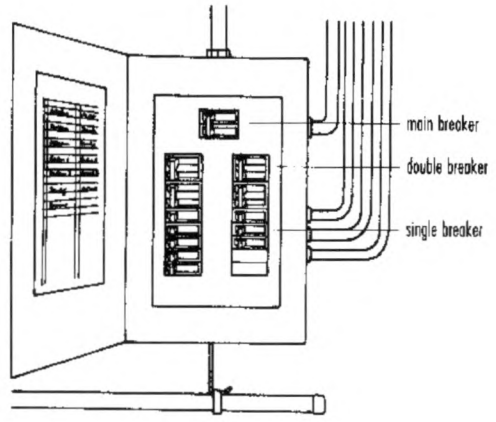
- Ladders must be set up with a 4 vertical to 1 horizontal slope. A rule of thumb is stand at the bottom of the ladder with your feet touching the bottom rails, extend your arms. Your fingertips should be touching the ladder rails at shoulder height.
- Ladders must extend approximately 1 meter (3 ft.) above a safe landing or parapet wall.
- Ladders must 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 a non-slip protection like foam on the tip of the ladder to protect from scratching the siding and from the ladder slipping.
- Always have someone hold the ladder for you when climbing or descending.
- When leaning a ladder against your eavestrough (gutters), install extra spacers in the gutters to avoid 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 lightening. Take extra care when climbing a wet ladder.

Main Shut-off

In an emergency, and when completing any 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.
QUALIFIED ELECTRICIANS MUST DO ELECTRICAL REPAIRS.

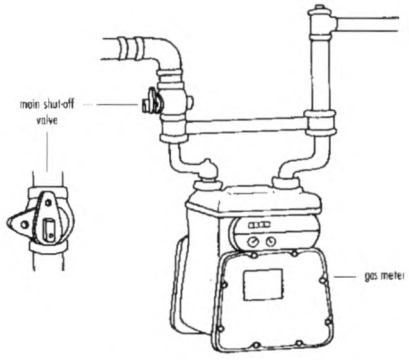


Electrical Panel, Main Breaker

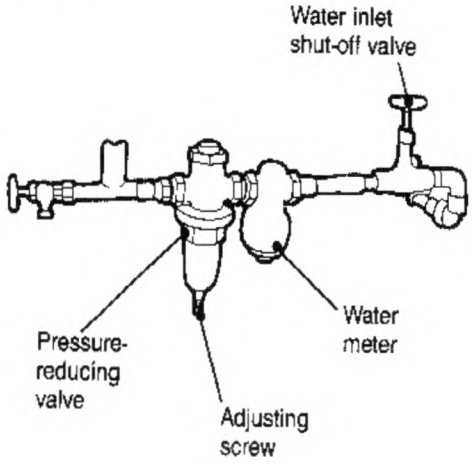
- All new and old housing units have electrical distribution (breaker) panels where the outside source from BC Hydro comes into the house. Each circuit in your house has a breaker or fuse. The electrical panel normally has one main breaker that will shut off all breakers or circuits. The panel is usually located where the power line comes in from the street.

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 and must be turned off with a crescent or pipe wrench. If there is a fire in your home, the fire department will usually turn this off right away. 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 pipe fitter.**



Water Main, Shut-off Valve

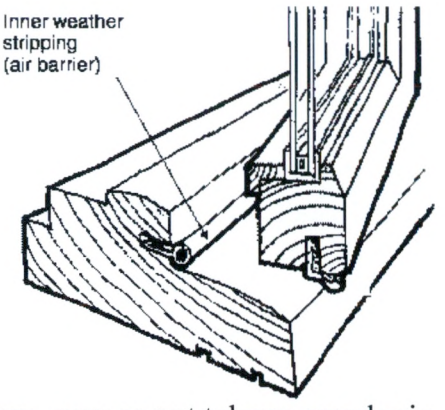


- Each plumbing fixture in your home should be equipped with a shut-off valve. This includes your kitchen and bathroom sinks, toilet, washing machine, laundry tub, bathtub and hot water tank. When you are attempting to do any plumbing repairs, you will need to shut the supply valves off before you start.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

Tips

- Do not block access to electrical panels with furniture or other objects.
- Do not block access to water shut-off.
- Show your babysitter where the shut off valves and breakers are.

Windows



- Check all **weather-stripping** around windows. There are many types. Check for the type on your window and replace with same. Check with the Band Housing Coordinator to find out who the manufacturer is. The manufacturer will let you know what type they use and where to purchase it.
- Sometimes the window manufacturer will warranty wear and tear of weather-stripping, check with the Band Office before you make changes.
- Clean the **slider tracks** for slider aluminum or vinyl windows at least three to four times a year. Use silicone spray, wax or put talcum powder in the tracks for ease of operation. Be careful not to get silicone spray on the glass. Apply spray to a clean rag and then wipe the track with the rag. Silicon 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 will also void the warranty if you use vinegar or ammonia based cleaners on the glass.**

Tips

- Never paint weather-stripping on doors or windows.
- "Fin seal" and "kerf seal" are the best quality weatherstrippings and will last longer than other types.
- Lower cost foam gaskets and metal spring type weatherstrippings will work well for only one or two years if even that long.

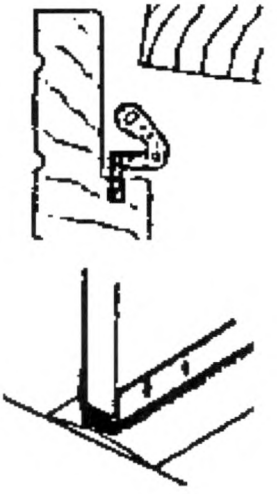
Doors

Weather-stripping Exterior Doors

Proper weather-stripping on doors, 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. Weather-stripping also ensures your house is more comfortable by keeping the wind and rain from coming in through your windows and doors. 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 weather-stripping.

Tools and Supplies

Measuring tape, sharp knife, cutters, hacksaw, screw gun or drill, screw driver, hammer, caulking gun, exterior silicone caulking, mineral spirits and rags.



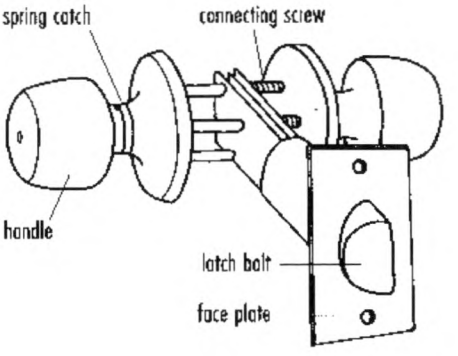
- Check the weather-stripping around the perimeter of the door. Cats and dogs love to scratch at the door when they want to come inside. This will cause damage to the weather-stripping. Usually the newer doors will have a "kerf seal" type weather-stripping. Pull out the damaged old one, measure, cut and replace with a new piece.
- There are "kerf seal" kits with a metal holder and screws that can be applied to older doors, which do not have the built-in "kerf seal". Fasten the new weather-stripping 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.

Swing Type Doors

Interior 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. There are many different types of doorstops on the market. The most common one is the small spring type with a rubber tip fastened at the baseboard level. This type 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 the poor doorstop or the doorstop has been removed.

Tools and Supplies

Screwdrivers, small crescent wrench, glue, clamps, hammer, screw gun or drill.

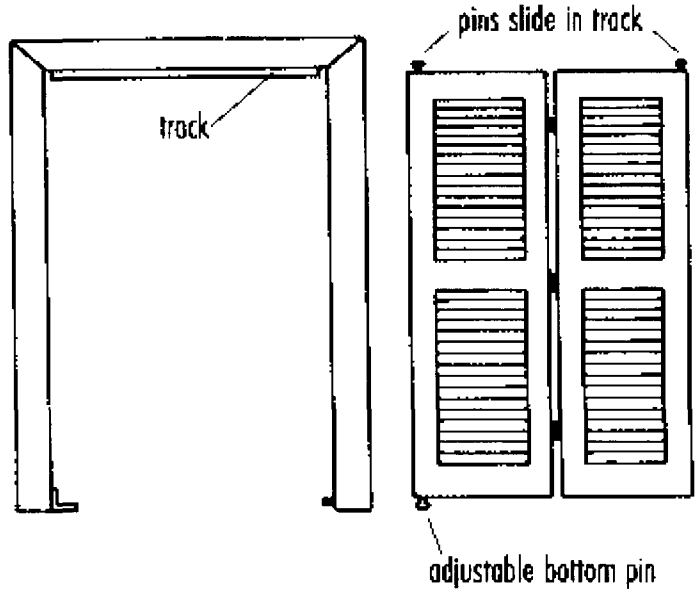


- Check hardware on all interior and exterior doors on a regular basis for loose knobs and hinges. A simple quick tightening of the doorknob will extend the life of the hardware. Tighten loose hinges.

- If the screws on the hinges have pulled out completely away from the doorjamb or from the door, it is fairly simple to repair. Fill the old screw hole with carpenters wood glue, plastic cement, epoxy glue mixed with a small amount of sawdust, or 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 the wall or damage the wall. A more solid, commercial grade doorstop is recommended. This type can be fastened to the floor with the spring type fastened to the wall at the top of the door level, preferably on a stud behind the drywall. If this is not possible, then a small ½" piece of plywood cut into a 10" x 10" 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.

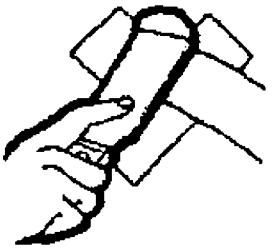
Bifold Doors

Bifold doors are notorious for dislodging off of their hardware and for coming out of alignment. Most bifold doors are a hollow core with a 7/8" wood frame around the perimeter and a thin veneer on both sides. Cardboard is spaced in between. The most common problem with the bifold door is on the bottom vertical adjusting bolt. In some cases the slide guide on the top will jump out of the plastic socket on the channel at the top of the door. In some instances, the adjustment screw on the pivot bracket comes 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 until glue is dry. Nail small finishing nails through the frame to hold in place. Re-install the vertical adjusting bolt. In some cases if the hole has become too large, it may be advisable to replace the door to match existing or change to solid core bifold doors.
- If the plastic socket has become damaged, you can find a replacement part at most home supply stores. All replacement parts for the bifold door are available to 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 ½" and ¾".

Repairing Drywall



Repairing damaged drywall is easy with the right tools and products. Follow these simple steps to repair virtually any wallboard damage.

Tools and Supplies
Different width joint finishing knives, repair clips, drywall (keyhole) saw, utility knife, drywall tape, patch material, sponge, fine sand paper, drywall screws, screwdriver or screw gun, drop cloth, drywall compound, mask, bucket, hock, measuring tape, pencil.

Dents

- Simply sand over the dent and fill with joint compound. Add a second coat if necessary. Sand and apply primer paint when dry.

Small Holes and Cracks

- Wipe the area clean and remove all loose material, fill with joint compound. Add a second coat if necessary. Sand and apply primer paint when dry.

Popped Nails

- Drive and dimple a new nail 38 mm (1 ½") from the popped nail. Drive and dimple the popped nail. Remove all loose material. Cover with joint compound, then sand and apply primer paint when dry.

Medium Holes

- Apply generous amounts of joint compound around the edges and coat the perimeter of the hole. Crisscross two or three strips of joint tape over the opening and embed the tape in joint compound. Let harden. Apply a coat of joint compound over the taped area. Let harden, sand if necessary and apply a second coat. Sand and apply primer paint when dry.

Large Cracks (3mm or larger)

- Apply compound to crack with a 125 mm (5") finishing knife.
- Embed tape in compound to bridge the crack. Draw knife firmly over crack to tightly embed tape. Let compound harden.
- Apply compound over tape with knife. Let harden and apply second coat of compound if necessary. Sand and apply primer paint when dry.

Large Holes (over 50 mm) or Water Damaged Areas

CAUTION: Check for wires and pipes before cutting into walls.

Option 1

- Cut out a square opening around the damaged drywall with a utility knife and drywall keyhole saw. Insert pieces of 1x4 or 2x4 in behind drywall and screw in place. Insert new piece of drywall and screw to wood pieces. Spread compound where new drywall meets old, attach tape and feather out. Apply an additional coat(s), waiting for compound to dry and sand between each coat if needed. Apply primer paint.

Option 2

- Cut out a square opening around the damaged drywall with a utility knife and drywall keyhole saw. Take a piece of new drywall and cut into a square 4" larger in width and height than the opening you have just cut. With the back side of the drywall facing up, scribe the backing paper with the utility knife into a square which is the same dimension as the square hole in the wall. Bend the edges away from you, leaving the face paper still attached on the front of the drywall. Dry fit into the opening first, adjust opening if required. Apply a generous amount of compound 2-3" around the perimeter of the hole in the wall. Place the new piece in the hole and feather out the compound using the face paper as drywall tape. Apply two more coats, drying and sanding in between. Apply primer paint.

Option 3

- Purchase a metal with sticky fiber tape patch kit. Clean off any rough edges around the hole in the wall. Check to make sure the patch will cover the hole. 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 Gypsum Panel Face Paper

- Peel and remove all loose face paper. Apply a skim coat of joint 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. Sand and apply primer paint when dry.

Tips

- If you cannot find a drywall repair kit or special repair clips, 1x4 strips of wood can be substituted.
- There are metal repair patches that fasten to the wall using nylon sticky tape, after which joint compound is applied.
- 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.
- 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.

- 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.
- Always cover your compound in between jobs or if you are taking a break.
- Dispose of excess drywall compound safely and with respect for the environment. Most land fill sites now require drywall waste to be separated.

Painting

Painting can be an intimidating challenge for any home occupant. There are a myriad of 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.

Tools and Supplies

Bucket, can key, canvas drop, cloth, paintable caulk, caulking gun, extension pole, mineral spirits, painters tape, putty knife, sandpaper, screw driver, rags, goggles/gloves (if using solvents), 3" brush, 2" sash brush, roller handle, roller covers and a roller tray, tack cloth, stir stick, primer, paint, drop cloths.

Preparation Precedes 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, window treatments, electrical switch plates, and hardware. Loosen the ceiling plates of hanging light fixtures and cover the fixtures.
- Surface dirt can result in poor adhesion. Use a light detergent solution and wash surfaces that are dirty and touched frequently, or that may have any 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 drying before painting. It is important not to leave a residue from the detergent.
- **Special note on marking pens, crayons marks, and water stains: Remove as much of the markings as possible using a liquid detergent, then wipe with clean water. Spot prime remaining marks with special primer paint to prevent "bleeding" through the finish coat.**
- Sand glossy surfaces with a fine sandpaper to ensure proper adhesion. 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 spackling compound into the crevices and smooth until flush with surface. Fill mitered trim joining (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 drying and then sand lightly. Since patching compound shrinks as it dries, 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 paint edges for a smooth surface. This will marry 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.

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. A common myth is that walls that have been painted many times do not need priming. On the contrary, many layers of latex paint can actually result in a very absorbent surface that requires priming. 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 2" or 2 ½" trim brush, 'cut in' by applying a 3" - 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

- 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 and mask off the edge with low-tack painters tape. Let dry for a minimum of 24 hours before applying low-tack tape to fresh latex paint (otherwise, paint can pull off); certain drying conditions, such as high humidity, will increase this recommended drying time.
- Coat 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.

Exterior Painting Sequence

- 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.
- Regardless of the surface, always start at the top and paint downward.

Cleaning Up

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 scrape out as much of the paint as possible back into the can. 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.

Water-Thinned (Latex) Paints

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

Disposal of Leftover Paint

With landfills rapidly reaching capacity the disposal of waste is a major environmental concern. There are several guidelines which 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 paint project.
- 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 neighborhood group, which is assisting the Elders, disabled or disadvantaged. 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 the drain – neither 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. 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. Hold for a "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, which can be reused. Add an absorbent (i.e. cat litter) to the remaining residue and let dry completely. Contact your local or provincial government environmental control agency for guidance on disposal.

Tips

- Paint the back of switch plates as a future color reference, or use a marker to record color names and numbers.
- Never store paint products close to open flames, heat or where children 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.
- Brushes come in various shapes, contours and bristles. There are special purpose brushes for almost any surface. Brushes with China bristles are designed for oil-based products, varnishes and stains; 100 percent 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. To give your room a professional glow, scrape windowpanes with a razor.
- Line the tray with aluminum foil before filling it. When done, pour out 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. Then store the brush by laying it flat or hanging it up.
- 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, 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 it out of the refrigerator but

do not unwrap it for at least two hours before you're ready to resume painting. 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, Alkyd or Super Adherent
Bare Wood, Wallpaper	Alkyd Primer
Knots, Graffiti, Water and Smoke Stains	Stain Barrier Primer
Old Plaster	Alkyd Primer
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
Scrubbability	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

Where to and What to Use

	Latex			Alkyd		
			(Eggshell – Pearl)			
	Flat	Low Lustre	Semi-Gloss	Flat	Semi-Gloss	Gloss
Living/Dining Room	X	X				
Adult Bedroom	X	X				
Trim/Doors		X	X		X	X
Bathroom			☛*		X	X
Hallway		X	X		X	
Kitchen			☛*		X	X
Furniture					X	X
Ceiling (non-stucco)	X					
Stucco Surfaces				X		
Kid's Room		X	X			
Family Room		X	X			

X Recommended

☛ * Clean painted surfaces with TSP and prime with alkyd primer or 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

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, instead use rags or a soft pad and non-abrasive soap. Thoroughly rinse after each cleaning.

Most **sinks** are either enamel coated metal, porcelain or molded countertop (imitation stone).

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.
Fibreglass – clean with mild liquid household detergent, soap and water, or foaming cleansers. Cleaners like Fantastik can be used on problem stains. Once per year a fiberglass cleaner/wax should be used to restore the finish. These products are available at marine suppliers. A common fibreglass cleaner/wax is Mequiar's Mirror Glaze #50.
Acrylic – keep it bright and smooth with mild liquid household detergent, soap and water, or foaming cleansers. Cleaners like Fantastik 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, soap and water, or foaming cleansers. Cleaners like Fantastik 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, remove the drain and use a small plumbing snake to unplug it. If chemical drain cleaners must be used, use a funnel and proceed cautiously. If the drain cleaner comes in contact with the liner, it will cause permanent discoloration and/or damage to the fibreglass or acrylic surface.

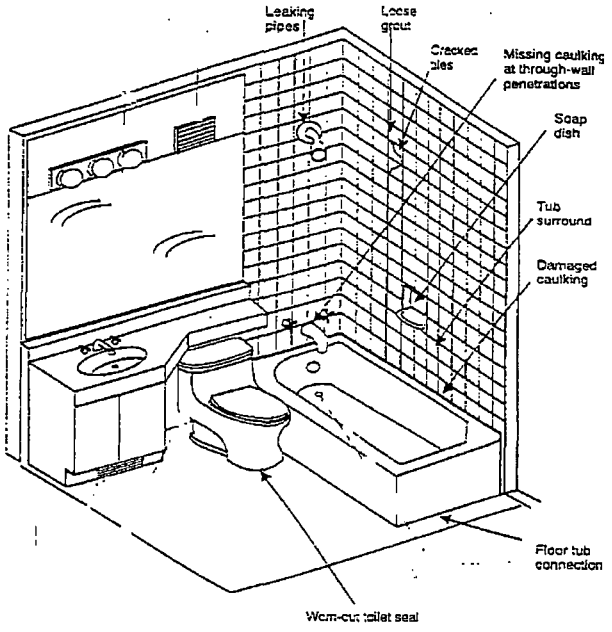
THE USE OF UNAPPROVED PRODUCTS MAY VOID YOUR WARRANTY AND MAY DAMAGE YOUR PRODUCTS.

Replacing Caulking in Bathrooms and Kitchens

Proper caulking around your bathtub and toilet is needed to ensure the water and moisture does not get into the drywall and the plywood floor. Moisture in drywall will 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 will cause rot and mildew which will be very expensive to repair. Proper caulking between kitchen cabinets and walls will prevent water and moisture from getting in behind your cabinets and damaging the walls and floor below. Some caulking or tub and tile sealant are *not* mildew resistant.

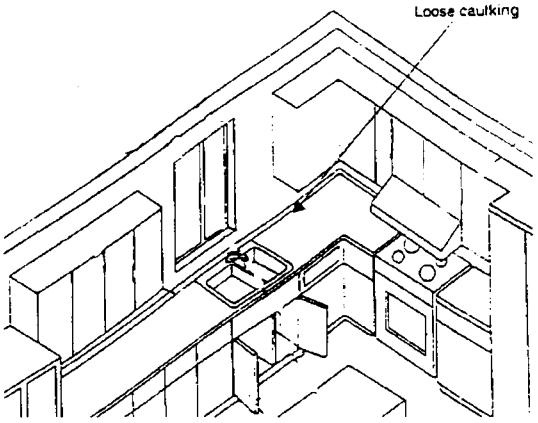
Tools and Supplies
Caulking gun, mildew resistant caulking, scraper, flat knife, Silicone-be-gone, mineral spirits, rags, knife, nail or probe, detergent and water, rubber gloves, bucket.

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 Band Office first.)
- If the wall is sound, then remove the mold first with bleach and warm water. Use rubber gloves and a facemask. Sometimes, the mold will be rooted right into the old caulking.
- Scrape the old silicone off with a flat knife being careful not to scrape or scratch the enamel on the tub. Apply the Silicone-be-gone and remove the old silicone. Clean with warm water and bleach. Let the area dry.
- Fill the tub with warm water. The weight of the water in the tub will open the space a bit and will ensure the caulking will be forced in. When finished caulking, let the water out.
- Using interior "mildew resistant" silicone 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, but with a little practice, you will get the hang of it.
- Caulk between the tub and the wall on the outside of the tub as well. Remember to caulk between the tub and the vinyl flooring.
- Caulks around the base of the toilet bowl after you have cleaned with bleach and water and have let it dry first.

Kitchen



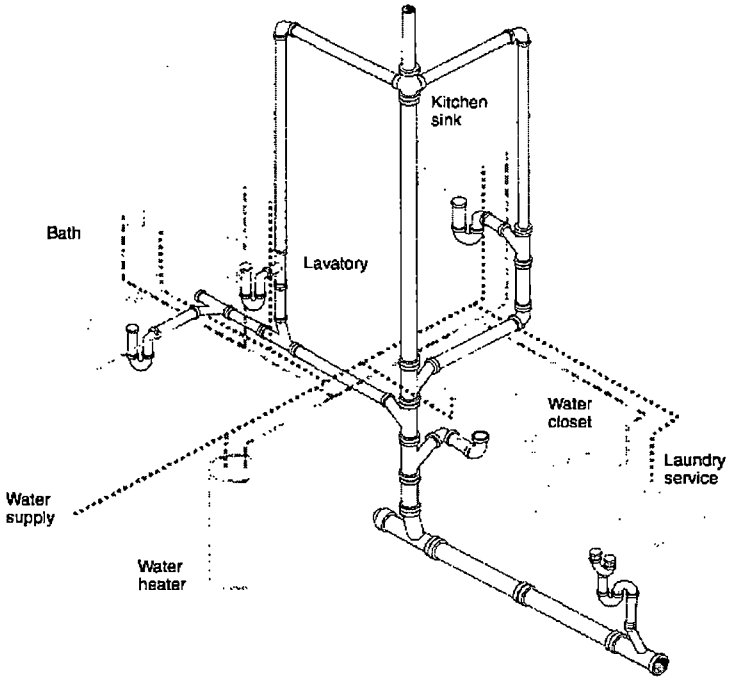
- Clean off old silicone as above and repeat the same caulking procedure between the top of the splashguard and the wall of the kitchen counter tops.
- Check around the sink and re-caulk if required.

Tips

- Practice caulking on a hidden location to get the feel of the caulking gun.
- Start with the narrow tip in small spaces first, then cut off tip 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.

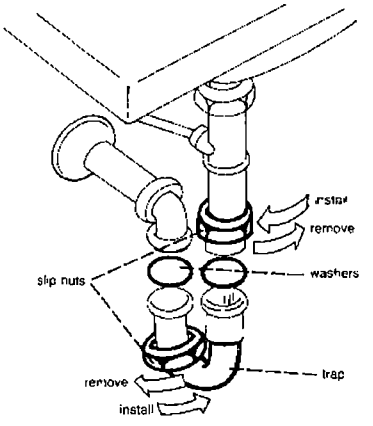
Fixing Leaks in Waste Plumbing

Waste plumbing under sinks expands and contracts as hot and cold wastewater drain down them. 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.

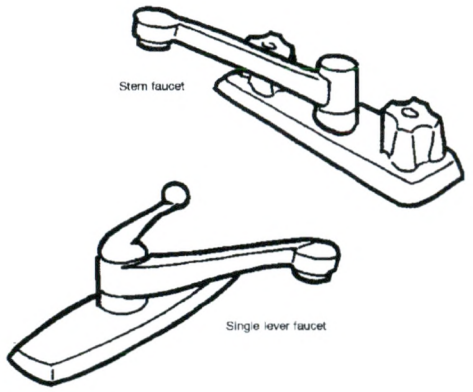


- Leaking joints at sink baskets, tailpieces and metal drain fittings should be resealed to sinks, showers and tubs with plumbers' putty.
- Plastic plumbing connections have tapered plastic compression washers that seal as the connection is tightened.
- Traps are used to prevent sewer gas from entering the house through plumbing drains. Except for traps, waste plumbing should be level or sloped down. 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 will 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.



Repairing Faucets



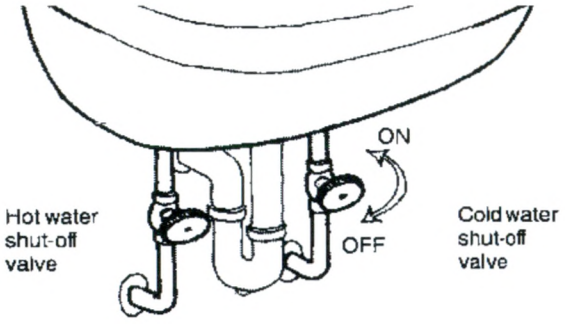
Worn parts are the main cause of faucet problems. Most of these parts are easily replaced. The most common problem is a dripping faucet. Other common problems include leakage around handles or spout. There are three types of faucets; seat faucets, diaphragm faucets and ceramic disk faucets. The seat type is the most common for faucets with separate hot and cold handles. If the faucet has a single handle then it will most likely be a ceramic disk type. The two handle washer less type faucets are usually the diaphragm type.

Tools and Supplies

Screw drivers, crescent wrench, pliers, seat wrench or large hex wrench, and washers, O-rings, replacement cartridges, lubricant.

Replacing Seat Washers

The washer in a seat-and-washer stem faucet becomes worn after years of service. Usually when worn there is a depression running in a ring around the washer, or the washer has begun to crumble with old age. If a washer has worn out quickly, the seat is most likely damaged and nicks the washer every time the water is shut off.



- 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.
- Remove the faucet handle.
- With a wench, remove the stem assembly.
- Examine your 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 exact 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 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.
- Replace washer and tighten the screw.

- When reinstalling the stem make sure the stem is in the open position, so that the washer will not get squished and damaged when the stem assembly is tightened.

Repairing Diaphragm and Cartridge Stem Faucets

Diaphragm and cartridge stem faucets are just as easy to repair as seat-and-washer stem 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.

Replacing a diaphragm
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.

Replacing seal, O-ring and spring
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 the sharpened end of a pencil; 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 heatproof grease after you install them.

Repairing Ceramic Disk Faucets

- 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 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 heatproof grease before reassembling.

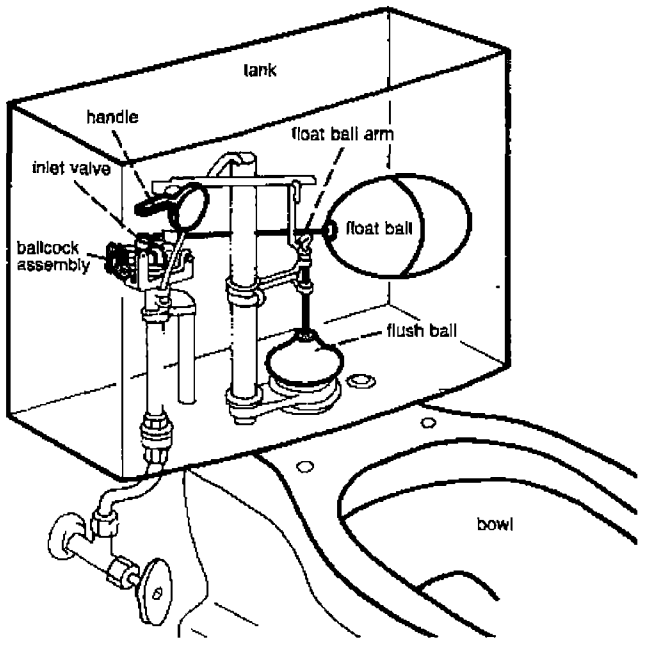
Tips
- Check water shut-off's for leaks after working on faucets.
- Handles that have not been removed for years may be difficult to loosen. Once the screw has been removed, pry gently and equally from opposite sides to loosen.

- It is sometimes easier and better to replace the entire stem assembly than to only replace washers.
- When working on faucets always put the stopper in the drain to prevent loosing small parts.
- 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 metal, as metal is harder to bend without kinking or crimping.

Repairing Toilets

Anatomy of a Toilet

The inner parts of a toilet are fairly simple.



- When someone pushes the flush handle, a chain of events start.
- The handle lever pulls a chain that lifts the tank flapper 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 and as the tank nears 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 ballcock. Water enters through the ballcock 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 ballcock shuts the water off.

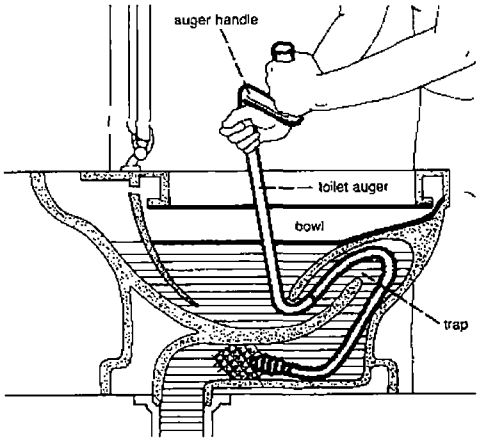
A wax ring seals the toilet bowl to a flange on the closet bend and keeps water from leaking out onto the floor. A gasket seals the tank to the bowl.

Tools and Supplies
Two large adjustable wrenches, screw driver, replacement parts if needed, toilet plunger, toilet auger, wax seal.

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 set screw on ballcock, or replace leaky float.
- Cause 2: Flapper or tank ball 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.

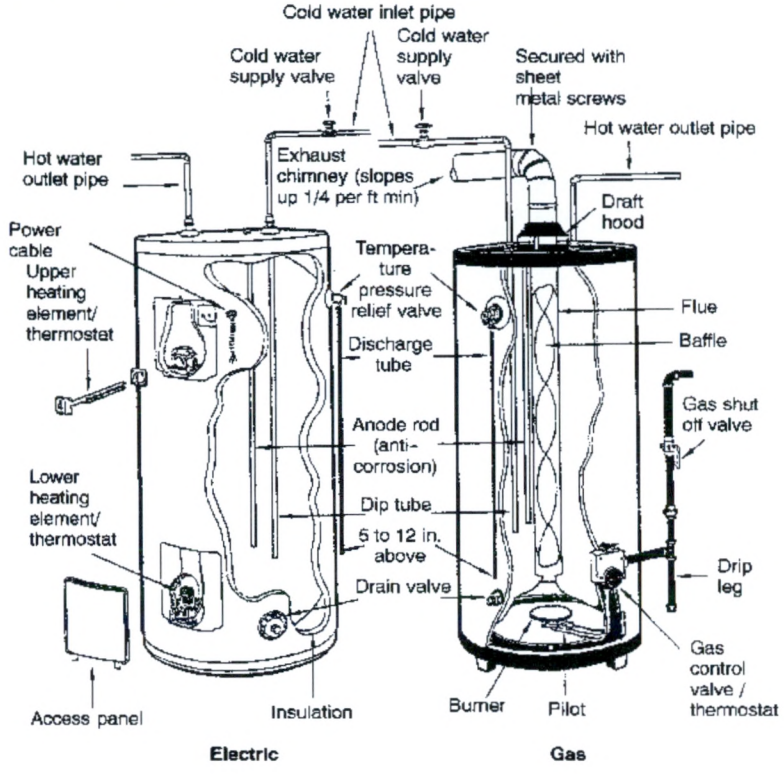
Symptom 3: Tank **leaks**
Problem: Tank or bowl leaks. Leak appears as a wet spot on the floor.

- 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 the gasket.
- Cause 3: Tank is cracked.
- Cure: Replace the tank.
- Cause 4: Wax ring is not sealing.
- Cure: Pull up the toiler ant replace the wax seal.
- Cause 5: Bowl is cracked.
- Cure: Replace the bowl.

Tips

- Do not over tighten. 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.

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.

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 does not. It's similar to adding zinc to boat hulls for preventing electrolysis. When there is no sacrificial metal left on the anode, the tank rusts out. All metals fall somewhere on the galvanic scale, and the "nobler" ones will remain intact while the lesser ones corrode. Magnesium and aluminum are less noble than steel, which is why they are used for anode rods. 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 rods generally last about five years depending on water conditions.**

Pictured above, a new anode is compared to one that had been in use for seven years.

CAUTION: Before servicing the water heater, DISCONNECT/TURN OFF the main electric power breaker feeding the water heater.

Tools and Supplies
Garden hose, bucket, adjustable wrench, pipe wrench, slip-joint pliers, voltmeter, screwdriver Teflon tape, gasket sealant.

Flushing Your Water Heater

- 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.

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.

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.

You'll find a relief valve either on top or high on the side of the water heater that opens if the temperature or pressure in the tank gets too high.

- Test it 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 it still does not shut or if no water comes 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 ¾" 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 joint compound to the male threads when you install the new valve.

Replacing an Element

CAUTION: For qualified persons only.
Before servicing the water heater thermostat or elements, verify with a voltmeter, that voltage/power has been disconnected to the water heater. For replacement, be sure you have selected the **identical** thermostat / element type as on the water heater.

- Drain the water heater.
- Remove the element by using tongue-and-groove pliers to unscrew the element, (some types get unbolted) then pull it out.
- Remove the gasket if there is one.
- Take the old element with you to your supplier to make sure you get the correct replacement.
- If the replacement element has a gasket, coat both sides of the gasket with a sealing compound, and slide the gasket onto the new element.
- Slide the element in, and screw it in place.
- Tighten with tongue-and-groove pliers.

Note - Upper elements and thermostats are usually different than the lower ones.

Problem Solving

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).

Symptom 2: Water **not hot enough or takes too long to recover**
- Cause: Upper element burned out (electric).
- Cure: Replace upper element.

Symptom 3: Hot **water runs out quickly**
- Cause 1: Thermostat set too low.
- Cure: Turn thermostat up (use candy thermometer at nearby sink, temperature should be around 145° F., under 130° is unhealthy, over 155° is a safety hazard).
- Cause 2: Hot water must travel a long way to get to faucets.
- Cure: Insulate hot water pipes.
- Cause 3: Sediment buildup in tank.
- Cure: Flush, drain and refill tank.
- Cause 4: Lower element burned out (electric).
- Cure: 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.
- 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.

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.

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 at right, the serial number 1193J68289 shows the tank was made in the eleventh week or month of 1993 (the 1193 leading digits).

Tips

- Water conditions vary by location. This will affect how long water heaters and anodes last and how often flushing is required.
- 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 normally lasts around 12 years. Proper maintenance can double the lifespan.

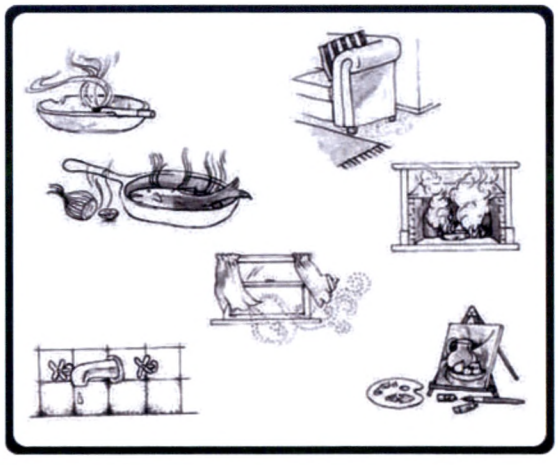
Healthy Housing Information

"Poor indoor air quality is a growing concern in all new houses and can be especially serious in airtight houses. In 1990, the Environmental Protection Agency in the United States put indoor air pollution at the top of a list of the 18 most dangerous potential causes of cancer - higher than low-level radiation, higher even than cigarette smoking. And the risk is greatest in new houses: studies comparing the concentration of organic gases and vapours in old and new houses found that the average in brand-new houses was more than 15 times higher than in houses more than three years old and, for some cancer-causing pollutants, as much as 1000 times higher than the U.S. standard for *outdoor* air.

Excerpt from: Wayne Grady, *Green Home, Planning and Building the Environmentally Advanced House*, Camden House 1993 ISNB 0-921820-69-0

"In recent decades, most of us have become more aware how polluted the air is outdoor. And to many of us it has come as something of a surprise that the air quality indoors is far worse. Many scientific studies document this: Indoor air pollution is almost always at least five to ten times more severe than outdoor air pollution; it isn't unusual for it to be a hundred to a thousand times worse. This frightening discovery is true everywhere, from rural areas to major cities. The reasons are sometimes simple, sometimes very complex, but the good news is that answers are available for improving the air you breathe indoors. That is what this book is all about."

Excerpt from: John Bower, *Healthy House Building, A Design and Construction Guide* Healthy House Institute 1993 ISBN 0-9637156-2-3



"The major pollutants from indoor materials are volatile solvents, formaldehyde, and other long-term volatile emissions, biological particles (molds and bacteria), and other particles (mineral fibers, dusts). These are found, to some degree, in most everyday materials, either due to their composition or their condition as they become contaminated or wear out. Their long-term effects can be varied, and include such complaints and illnesses as chronic respiratory and eye inflammation, asthma, skin rashes, fatigue, depression, excessive colds and flu. These are conditions which seem to afflict us more and more frequently, probably for a number of reasons, and exposure to poor indoor air is one we can do something about."

Excerpt from: Kim LeClair and David Rousseau, *Environmental by Design Volume I: Interiors, A Sourcebook of Environmentally Aware Material Choices* Hartley & Marks, Inc. 1992 ISBN 0-88179-085-0

Causes of Unhealthy Housing

Poor air quality is a leading cause of unhealthy housing. It is directly linked to causing asthma and respiratory ailments and to the weakening of immune systems. Air quality is severely impacted by airtightness, which in turn is caused by lack of natural and/or mechanical ventilation. Following are some causes of poor air quality.

Indoor Air Pollutants, What They Are and Where They Originate

- Volatile organic compounds (VOCs) – from paint, drywall, lumber, fungicides
- Formaldehyde – from plywood, OSB, particle board, cabinets, furniture
- Solvents – from paint, varnish, glues
- Household cleaners – ammonia, sodium hydroxide, hydrochloric, oxalic and sulfuric acids
- Dust – the average adult breathes two heaping teaspoons daily
- Electrical fields – from transformers, waterbed heaters, electric blankets, electrical appliances
- Combustion products – particulate and gases such as carbon monoxide, nitrous oxide, oil and carbon particles from oil, gas and wood heaters, and combustion appliances such as gas water heaters, stoves and dryers. Combustion spillage can cause cardiovascular and respiratory problems
- Microbiological such as moulds, fungi, viruses, and bacteria – caused by humidity lack of air movement and low temperature levels
- Outside air pollution – from smoke, automobile exhaust, farming, industry, and even pollens from natural sources
- Carbon dioxide and oxygen levels – from many occupants in a stuffed up house

Tips

- 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.

The Three Keys to Healthy Housing

1. **Eliminate** materials that are unhealthy for you such as some types of carpets, paints and other materials when remodeling. Use safe non-toxic materials when cleaning your home. Have combustion appliances serviced regularly. Reduce humidity sources where possible by fixing leaks, not drying clothes indoors or stacking firewood indoors.

2. **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. Do not store toxic cleaners, garden chemicals or fuel indoors.

3. **Ventilate** to remove chemicals, gases and toxins from the indoor air that you breath and to stop mold growth by reducing moisture levels. Opening windows is a simple way to ventilate. Kitchen and bathroom fans and whole house ventilation systems can also be effective.

Recommended Sources for Further Information on Healthy Housing

The following books are excellent sources of information for those who wish to make their indoor living environments healthier. *Healthy by Design* is an excellent source for choosing people friendly carpets and other flooring, paints, glues, caulking, etc. that are available in British Columbia.

Building Materials for the Environmentally Hypersensitive - CMHC
Healthy by Design - Kim Leclair & David Rousseau
Healthy House Building - John Bower
Healthy Housing Renovation Planner - CMHC

Controlling Humidity

Moisture Sources

Quantity of Moisture Added to the Air Through Various Household Activities		
Activity (for a family of four)		**Moisture liters per week**
Cooking	(3 meals daily for 1 week)	6.3
Dishwashing	(3 times daily for 1 week)	3.2
Bathing	(0.2 liters per shower) (0.05 liters per bath)	2.4
Clothes washing	(per week)	1.8
Clothes drying indoors, or using an unvented dryer	(per week)	10.0
Floor mopping per 9.3 m^2	(100 $ft.^2$)	1.3
Normal respiration and skin evaporation from occupants		38.0
Total moisture per week from these sources		63.0

Moisture is continuously being released inside a house. Every day 2 to 10 gallons is released, in a heating season of 200 days, that adds up to 400 to 2000 gallons!

Preventing excess humidity is important. Leaky basements, wet crawlspaces, roof leaks and leaky plumbing should all be fixed. Activities such as hanging clothes indoors to dry and storing firewood indoors should be avoided. Houses suffer from the burden of too much humidity even without these extra sources.

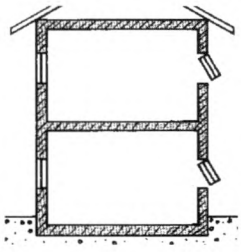
Ventilation

Forty years ago houses leaked an entire air change every 30 minutes on a cold day. Houses built in the last ten years are much tighter and it may take four hours for this to happen. 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 on fans.**

Forty years ago, nature and construction techniques made ventilation automatic and chaotic. Some days you might have an entire air change every ten 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.

Humidity is relative to temperature. The colder air is, the less moisture it can hold. Thus, outside air on a cold rainy winter day becomes relatively dry air when brought indoors and warmed. However, when relative humidity reaches 100% condensation forms. If warm air at 75% humidity hits a cold surface like a window, toilet tank, glass of ice water, etc., it will cool and reach 100% relative humidity causing condensation. Indoor relative humidity should be maintained between 40% and 60% in order to minimize bacteria and virus growth.

Natural Ventilation

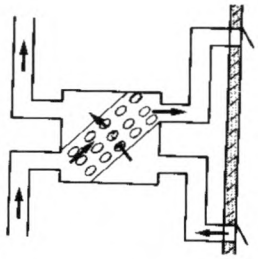


Natural ventilation does not require electricity. The common types are:

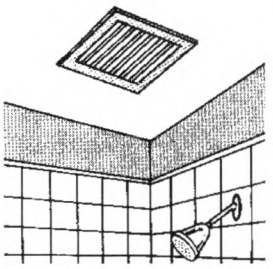
- Air exhausted through open windows
- Air leakage from cracks and gaps (wind and stack effect)
- Air lost from opening and closing doors
- Air lost up chimneys

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.



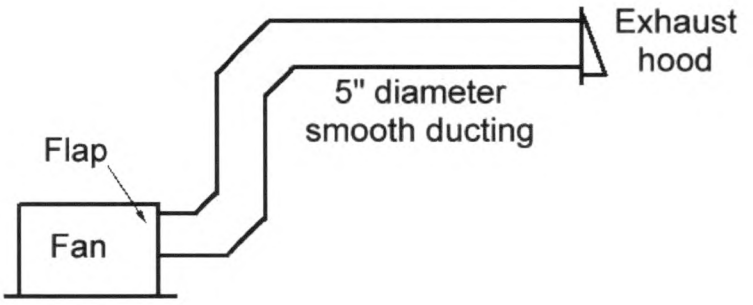
HRV maintenance is usually described in the unit's owner's manual, but should always include cleaning the hoods, filters, core and grills every 6 to 12 months. The outside hoods are easily clogged with dandelion and thistle down, but this is easily removed with a toothbrush. Filters and grills can be washed in a sink, but care should be taken not to change the adjustment settings on the grills or mix them up as the grills are set by the HRV installer to allow the correct airflow for each room. HRV airflows should be balanced about every five years by an HRV technician.



- **Bathroom Fans** - Many bathroom fans are ineffective. They make noise but exhaust very little air. 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 from an inch away or even hold it when the paper is pressed against the intake, then the fan is not effective.

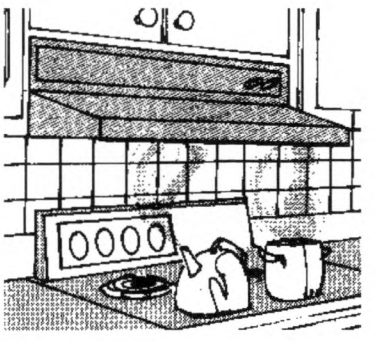
For a bathroom fan to work effectively it must be the centrifugal (squirrel cage) type and not an axial (propeller) type. It should be rated 80 to 100 cubic feet per minute (cfm) and have 5" diameter smooth exhaust ducting to function properly. More powerful fans can be more effective, but may cause 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.



Fan maintenance should include cleaning the fan, checking the flap and cleaning the exhaust hood.

- **Rangehoods** - Many rangehoods 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, rangehoods must be the centrifugal (squirrel cage) type, rated 200 to 250 cubic feet per minute (cfm) and have 7" diameter smooth metal ducting (or 4" x 10" rectangular). Rangehoods 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, checking the flap and cleaning the exhaust hood.**



Tips

- Most fan cleaning can start with a vacuum cleaner.
- Flaps (dampers) often get stuck open or closed. Using a flashlight you can watch the flap behind the fan open 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.
- Screens on exhaust hoods need cleaning and should never be finer mesh than 1/8" square openings.
- Check to see if your fan system is working properly by holding two squares of toilet tissue near the grill of your fan. The fan should be able to suck the tissues tight to the grill. If it doesn't, the fan, flap, ducting or hood may be at fault.

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 60% and the relative humidity level rises to 61%, the fan will come on and provide ventilation to reduce moisture levels. Once the fan has reduced the humidity to 60%, 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, ideal settings range from 40% – 60% during the heating season, and 80% during the summer.** 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. For most homes, a 60% setting during the Fall, a 50% setting during the coldest part of Winter, and back to 60% in the Spring works well.

When the settings on dehumidistats are correct, you can expect about one centimeter 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 one centimeter 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 on the dehumidistat down slightly**. Monitor the condensation on the windows weekly to ensure the % Relative Humidity is set correctly.

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**. To fix this **turn the % Relative Humidity up slightly**.

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 centimeters 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 that one centimeter 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.

Manual 24 hour timer

Electronic 24 hour timer

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. 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.

First Nations Occupants' Guide to Mold

Produced by Indian and Northern Affairs Canada,
Health Canada, and CMHC

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 pamphlet 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 half a 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.

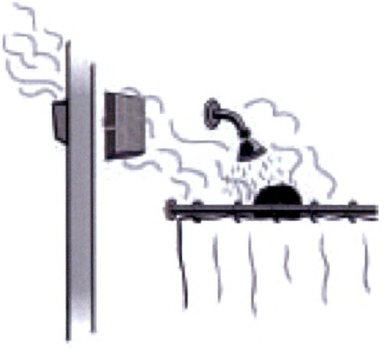
Furnace

- 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 (**H**igh **E**fficiency **P**articulate **A**ir) 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.

Bad Good

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

Mold areas less than the size of a standard garbage bag folded in half are considered small. You can clean small areas 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.

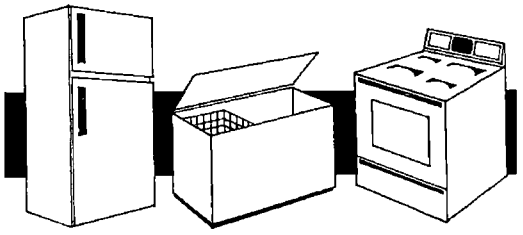
If mold comes back after cleaning, or you think your house has lots of mold, contact your housing department for more information.

Caution: Anyone who has any sort of immune suppression, asthma or mold allergy should not work at mold clean up. Anyone who has recently had a severe cold or flu should delay working in moldy areas until fully recovered.

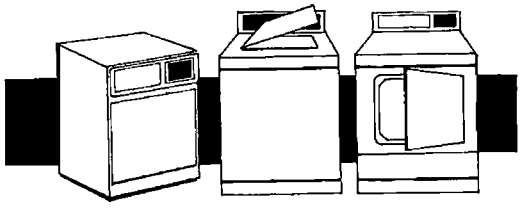
Tips

- 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. Windows should only be washed with a mild detergent. Using vinegar or ammonia cleaners to clean window glass will void the window warranty.
- Call your Band Office if you think the mold problem in your house is too big (larger than 3.2 sq. ft.) for you to attempt to clean up yourself.
- Dispose of all rags and contaminated materials into a garbage bag and remove from your house immediately.

Appliance Preventative Maintenance



Refrigerator Freezer Range

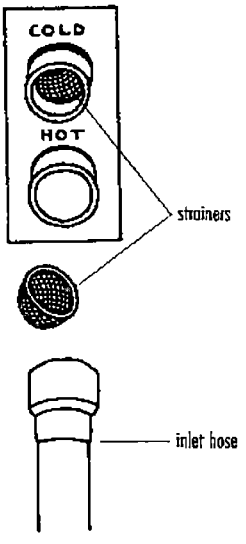


Dishwasher Washer Dryer

You have a number of appliances in your home that require regular maintenance. Usually, the appliances will not receive any attention until something breaks down. This sheet will provide you with some tips on how to attend to some minor preventative maintenance activities that will help to extend the life of the appliance and will hopefully reduce downtime.

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're 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.



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 it 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.
- Keep ducting as short and straight as possible to reduce drying time and prolong the life of your dryer. Do not allow sags in longer runs if you have to use them. 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.

Fridge

- Keep the top of the refrigerator (fridge) clear and make sure there is at least a ½" 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 door gasket with 1 tsp. 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 grill 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 budges, 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.

Range (Stove)

- Wipe down the range top. A clean surface prevents scratches and stops acidic food from eating away at the appliance finish.
- 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)**
    - Run the self-cleaning cycle after removing racks (they will discolor at high temperatures). Clean around the door and its gasket first. These areas often don't receive enough heat to thoroughly burn off grease splatters. Sweep out crumbs to cut down on smoke during cleaning. The minimum duration 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 850° setting. After the cycle has completed and the oven has cooled, wipe out ashes with a clean damp rag.
- **Once a Year**
    - Inspect the oven door gasket. It should be soft and pliable. If it is hard, it may leak heat, which taxes the element in electric ovens and affects the performance. What's more, it will cost you energy dollars. If it needs to be replaced, call the Band Office or an experienced appliance repair person.

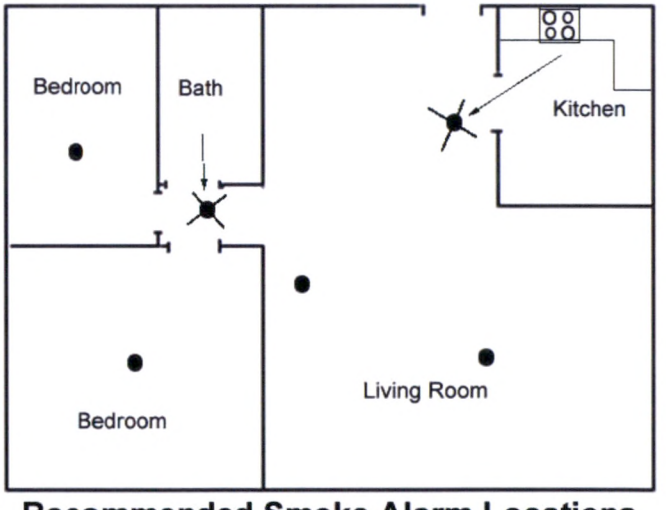
Smoke Alarms

Smoke alarms can be battery operated or hardwired to your household 120-volt wiring. Models are now available that are 120-volt with a 9-volt battery backup. 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. First Alert now has a battery-operated alarm that has a ten-year battery, good for the life of the alarm. It also has a button for temporary 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.

The alarms should be placed where people can hear the alarm loudly enough to wake them from a sleep. Units with flashing lights are designed be used by people with hearing problems. The alarms should be placed on or near ceilings, as smoke rises. Most alarms now come with instructions for do's and don'ts of where to install them.

Here are a few typical places not to install a smoke alarm

- In or near areas where combustion particles are present (garages, keep at least 20 feet away from furnaces, gas or oil-fired water heaters, woodstoves, and fireplaces)
- 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 12" of a florescent light
- Near a ceiling fan



Recommended Smoke Alarm Locations

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 more dense, the imbalance increases. When the imbalance reaches a certain threshold, the alarm will sound to alert you.

Photoelectric Sensors

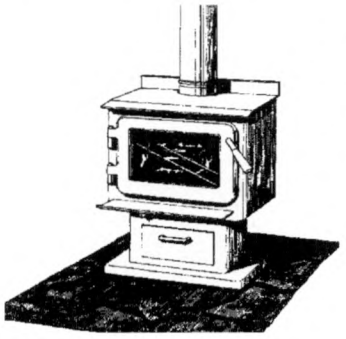
The photoelectric sensor is named so because it uses a light source to measure smoke density. The light source is constantly on. A light receiver is also in the sensor but positioned so that the light source will not shine on it. When smoke enters the sensor, the particles deflect the light toward the 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

- 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.

Wood Heat and Chimneys



Wood heat 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.

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 regularly into a **metal** bucket and remove bucket immediately to outside of home. Do not leave the bucket on a porch or deck.
- 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 is toxic and corrosive, so follow the safety instructions that are supplied with the cleaner.

Connector Pipes

- Connector pipes are sometimes called stovepipes or flue pipes. They connect the woodstove to the chimney. All pipe connectors 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.

Chimneys

- Chimneys should be cleaned at least once each year. This can be done by the home occupant using a chimney cleaning brush available at hardware stores or by a commercial chimney cleaning service.
- After cleaning, the interior of the chimney should be inspected by lowering a light down the chimney.
- 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. Do not put water down the chimney as the stream can seriously burn you and this 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.

- **Too much fuel causes runaway fires.** Too much air supply to the fire and too much chimney draft. Close off the air supply to the fire.

- **Creosote** fires are caused when excessive build up of creosote forms inside the chimney. When this creosote gets super heated, it catches fire, then starts bubbling and dripping, spreading the fire to the base of the chimney. 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 and burning properly.

Firewood

Creosote is condensed smoke. 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 be no creosote build up. Not only is creosote a fire danger, but it is a health risk as well.

- Dry wood produces more heat and less creosote than wet wood
- Wood dries faster 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.
- Burning salt-water driftwood will corrode stoves, pipes and chimneys.

Thermostats

The thermostat's main job is to turn the heat on and off. It functions similar to a carburetor on an automobile engine. The carburetor has a large impact on fuel efficiency and engine performance. The thermostat has a large impact on energy efficiency and how well the heater performs, which equals comfort.

To function effectively, thermostats must be located on interior walls, away from drafts, away from direct sunlight and in a location 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. However if one of your thermostats is not performing properly, contact your Band 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 as they operate on 24-volt electric current. They usually have 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 on and off. For oil and gas furnaces, a wider swing between on and off temperatures will improve energy efficiency, as less heat will be lost up chimneys. For electric heat, the opposite is true as heat is not lost up chimneys and 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 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. White-Rodgers makes an oil diaphragm type (model 1A65) that is very accurate and provides improved comfort and energy savings compared to the bimetal type.

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 must read the manual and articles pertaining to your furnace before attempting any maintenance activities. Always leave adjusting flames and controls to qualified furnace technicians.

Tools
Trouble light or flashlights, new furnace filter, electric motor oiling can or bottle, rag, vacuum cleaner, wrench and stiff brush.

- **Once a Month**
  - Change or clean filters during the heating season. To determine how dirty the filters are, hold them up. If you can easily see light through them, then they're still clean enough to use. Vacuum out return air grills.
  - 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.
  - 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 preventative maintenance check (about $130) 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 to see if your air intake vent outside is clean and not plugged with bugs, dandelion seeds, 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 on the floor. Make sure the bucket is still attached (northern areas).

- **Once Every Two to Five Years**
  - Get the furnace and ductwork cleaned by a vacuum truck (about $125). This may be required more than once every two years if you have pets inside or you are in a gravel road area. Furnace duct cleaning should be done directly after new construction or major renovations to the house. Checking for cleanliness should be included during the annual inspection.
  - Check furnace exhaust vent on the roof for rust, blockage from birds nests, bees nests and wind damage.

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- Safe Work Practices for House Construction
- Safety Around the Home
- Ladder and Scaffolding Safety
- Occupational Safety

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Michigan State University Extension - Home Maintenance and Repair
http://www.msue.msu.edu/imp/mod02/master02.html

Better Homes and Gardens Home Improvement Encyclopedia
http://www.bhglive.com/homeimp/index.html

How to Replace a Water Heater
http://www.csz.com/hih/howtos/water_heater/wheater.html

Rheem Manufacturing Company - Water Heater Division
http://rheem.com/index.html

CMHC—HOME TO CANADIANS

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