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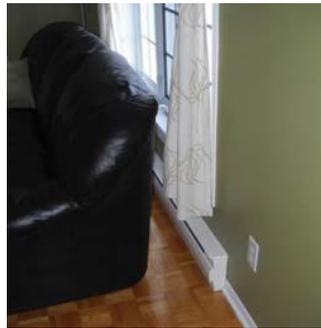
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Seasonal Maintenance Checklist

Winter

- Keep exits clear to allow occupants an escape route at all times
- Remove snow from basement windows and from inside window wells
- Clear snow from air intakes and exhaust vents
- Clear large accumulations of snow from roof or deck roofs
- Check the attic (roof space) for snow and remove it
- Check that detectors (smoke or carbon monoxide) are operating properly
- Clean the range hood filter
- Check condition of air intakes and exhaust vents and clean them if necessary
- Clean the filters in the ventilation system
- Check the filters in your heating system and maintain its accessories (if applicable)

Fall

- Check window wells and clear them of leaves and debris if necessary
- Inspect your roof
- Check the condition of your rain gutters (eaves troughs), clean them out if necessary and remove downspouts or splash blocks underneath downspouts
- Check exterior claddings
- Check exterior sealants (around doors and windows, air intakes, exhaust outlets and mechanical outlets)
- Check condition of doors and windows
- Remove window screens for the winter (once winter heating period has started)
- Check and clean detectors (smoke and carbon monoxide)
- Check sump pump to ensure proper operation
- Clean range hood filter
- Check condition of air intakes and exhaust outlets and clean if necessary
- Clean your ventilation system filters
- Clean the ventilation system's heat recovery core (if there is one)
- Have chimney and flue swept
- Check filters in your heating system and maintain its accessories (if applicable)
- Store garden hoses and drain water pipes, as necessary
- Examine attic (roof space)

Summer

- Check the condition of your air intakes and exhaust vents and clean them as needed
- Clean your range hood filter
- Clean your ventilation system filters

- Check your air conditioning system (if you have one)

Spring

- Check the grading around your house and re-grade if necessary
- Check the condition of your window wells and clear them as needed
- Inspect your roof
- Check the condition of your gutters and where they empty
- Check exterior claddings
- Check exterior sealants (around windows and doors, air intakes, exhaust outlets and mechanical outlets)
- Check the condition of paint, stain and exterior varnish
- Check the condition of your doors, windows and screens
- Check and clean your detectors (smoke or carbon monoxide)
- Check your sump pump to ensure it is operating properly
- Clean the filter in your range hood
- Check your air intakes and exhaust outlets and clean as needed
- Clean the filters in your ventilation system
- Clean the heat recovery core in your ventilation system (if you have one)
- Clean the housing of your ventilation system
- Check the filters in your heating system and maintain its accessories (if applicable)
- Clean your air conditioning system (if you have one)

Foundation

Parging

A finish coating (parging) may be applied to the exterior aboveground portion of the foundation. This finish may already have been applied to your foundation when you purchased your property, but this is not always the case. It should be noted that parging has no technical function, and is purely aesthetic.

Being brittle and reacting easily to every freeze-thaw cycle, the coating may, over the years, become cracked and even detach from the foundation wall. It is also possible that, as the foundations dry out, certain minerals (salts) will raise to the surface of the concrete, thus reducing the adherence of the parging.

You will periodically need to monitor the appearance or progression of these micro-cracks. Apply an appropriate sealant as needed to prevent water from infiltrating beneath the parging, which would accelerate detachment and accentuate the cracking of the parging.

The coating applied to the sides of concrete balconies and stoops can also crack.

Contrary to popular belief, parging the foundation is not a requirement of the Building Code, as it mainly plays an aesthetic role. It is common for parging to be excluded from building contracts.

Foundation Walls

As it cures, concrete ripens and dries. A lot of the water evaporates, producing a certain amount of shrinkage. This phenomenon is normal given the nature of concrete, and it causes small vertical hairline cracks.

Generally, this slight cracking is of no consequence. Cracks can easily be 3.2 mm (1/8 in.) wide with no problem.

However, if you notice horizontal cracks, or if they are wider than 3.2 mm (1/8 in.), we urge you to contact your builder to have him conduct a more thorough inspection.

For reference purposes, 3.2 mm (1/8 in.) is the thickness of two quarters.

Caution! Whatever the case, if a hairline crack causes water infiltration; please remedy the situation quickly by filling in the crack. Also take care to measure the crack regularly to keep track of whether it is growing longer or wider. Shrinkage cracks should remain stable.

As a preventive measure, you can apply a concrete sealant to the crack to prevent water from infiltrating and aggravating a situation that started out as inoffensive.

While constructing your home, the builder took care to waterproof the foundation before backfilling it. Looking at the plans, he figured out the ground grade around your foundation and applied the coating up to that level.

Caution! It is possible that you will want to change the ground level around the perimeter of your house. If you plan to raise the ground level above the waterproofing line, you will need to waterproof the concrete surface that will come in contact with the soil. Otherwise, you would be encouraging water infiltration and greatly increasing the amount of humidity entering your home.

Slab Floor

Like your house foundation, the concrete slab that forms the floor of your basement or garage can also develop cracks and fissures. These openings, known as shrinkage cracks, are, just like the foundation, of no consequence, and it is difficult to keep them from forming.

These fissures frequently appear the month after the slab is poured. Their starting point is often an opening in the slab (posts, sump, etc.) and they work their way out towards one of the corners of the foundation.

It is normal for a hairline crack starting from an opening in the slab to lengthen towards a corner for a certain period of time, which varies depending on numerous factors. However, the crack should not get any wider; so, if the latter occurs, contact your builder. Similarly, if you observe a difference in level between the two parts of the slab (one side higher than the other), this situation also merits further analysis. For aesthetic reasons, and in order to close up these openings, it is recommended that they be caulked with an appropriate sealant.

You may also notice that your concrete slab is not perfectly flat or straight, and some portions may be rougher or of a different shade; that is normal. There may be intentional changes in level, sloping towards a floor drain, for instance, but planned slopes aside, the surface of the slab may not be perfectly straight.

Shrinkage cracks in a concrete slab are frequent and normal, but they must be caulked if your house was designed to prevent infiltration of underground gases, such as radon. Talk to your builder to find out more about this subject.

Surface Drainage

Because your foundation perimeter was backfilled with un compacted material, you will notice, even in the first year, that the soil level nearest your building will have dropped. This compacting is also caused by water dripping from the roof, especially if your home does not have rain gutters.

If you do not remedy this situation by adding more earth, the accumulation of water in this spot may over saturate the soil around your home and lead to water infiltration. This measure is part of your routine maintenance. Inspect the situation every year and correct as needed.

For the property as a whole, the recommendation is a slope of approximately 2%, but it may be appropriate to have a steeper slope nearer the building, namely 10% over a distance of 2 m (6 feet). Always leave at least 200 mm (8 inches) of space from the top of the foundation.

It is possible that you will need to weatherproof the upper part of the foundation if the grading you have planned for your property will cover the foundation above the waterproofing line initially planned by your builder.

In addition, in the case where your property was delivered to you with only rough landscaping (without topsoil or grass), it may be appropriate to inspect the property's drainage slopes and to correct them, as needed, before putting down topsoil and seeding a lawn. Adequate leveling will allow effective drainage of rainwater and carry runoff away from your building.

Caution! You must never alter the grade on your property in any way that will cause drainage problems on neighbouring properties.

Heating

Temperature Control

Your residence is equipped with a heating system and temperature control devices. The thermostats read the ambient temperature and activate or stop the heating systems to reach the desired temperature. Your system was designed and installed to enable you to live through winters in your region in comfort, based on the dimensions of your home and the components of its envelope.

Electronic Thermostats

Electronic thermostats work the same way, with the difference that they are more precise and that those intended for electric baseboard heaters can modulate the power transmitted to them. In other words, the thermostat can send a reduced percentage of electric power (25%, 50%, 75%, etc.) to a baseboard to prevent a room from overheating or to prevent the actual room temperature from being reduced too much in relation to the desired temperature. The key to energy conservation related to electronic thermostats largely depends on the precision of reading and management of the power used.

Lowering the Temperature

To save energy, you can lower the temperature in certain rooms or in your entire home. If you have a central heating system, it will be sufficient to establish a new set point temperature on the central thermostat. If you have a zone heating or electric baseboard heating system, you must set each thermostat in your home. If you have programmable thermostats that let you program time slots in which the temperature will be reduced, it is recommended that you not overdo it. If the temperature is too low for a prolonged period, your system will have to compensate to restore the temperature to normal and your savings will be reduced considerably. This will also interfere with your comfort and you will expose yourself to risks of condensation and mold. In general, you will obtain appreciable energy savings by lowering the temperature by 2 to 3°C (4 to 6°F) for a period of at least 6 to 8 hours, without exposing yourself to the risks described above. It is recognized in the industry that the normal temperature inside a residence during the heating period is between 20 and 21°C (68 to 70°F).

Although this is a widespread trend, a builder is not obliged to install electronic thermostats or to supply programmable electronic thermostats. It is thus possible that your residence is not equipped with such devices.

Standard Thermostats

Your residence may be equipped with standard thermostats, which are less precise than the electronic models. If you feel that the room temperature is different from the temperature shown on the thermostat, this may be due to poor calibration. You can then place a thermometer next to the thermostat and compare the actual temperature with the one indicated on the thermostat.

If you lower the temperature too much, you increase the risk of condensation appearing on the windows or on other cold surfaces in your home. The feeling of dampness will increase and your comfort will be greatly reduced.

Moreover, maintaining a uniform temperature in all rooms will ensure you greater comfort, while reducing drafts, dampness and condensation.

Avoid placing furniture in front or on top of heating sources. You will have difficulty achieving a uniform temperature and the device will consume more energy trying, unsuccessfully, to reach the requested temperature.

If your home has a room over a garage, make sure to maintain a higher temperature than you would normally in the garage, to avoid the discomfort of an excessively cold floor.

Central heating

If your residence is heated with electric baseboards, see the info sheet, *Electric Baseboard Heaters*. Central heating systems offer efficient and uniform heating while allowing the addition of other devices, such as filters, fresh air distribution from an air exchanger, or the option of air conditioning.

Components and Operation

Heating systems consist of three parts, mainly:

- An energy source (frequently electricity, natural gas or heating oil);
- A heat generating unit;
- A distribution system (air or water).

Most residences with central heating have a forced-air system. It carries the heated air through a network of ducts that distribute it to all rooms. Another group of ducts takes the air from the dwelling and returns it through the system to the heat generating unit. If you find that some rooms are hotter or colder than others, you can try regulating the air flow at the supply grilles. The system is generally designed to thoroughly distribute the air according to the heating needs of each room, but sometimes adjustments are needed. If the problem persists, however, contact your heating specialist.

Maintenance

Your system has a filter to clean the air circulating in the network of ducts. This filter must be cleaned or replaced every month during the heating season. Some systems have electronic filters or higher-performance filters. It has been shown that the use of higher performance filters reduces the number of airborne suspended particles. If you or a member of your family is more sensitive to indoor air quality, you can procure a better filter. Look for a filter with a high rating on the MERV scale. You will find your filter element upstream from the heat generating unit, typically in a rectangular box.

Some systems come with a variety of components and must be maintained to ensure optimum operation and adequate performance.

Cleaning the Ducts

You may wonder whether it is necessary to clean the ducts of a forced-air system. Unfortunately, few studies are available on the subject. In general, it has not been proven that cleaning the ducts would improve the indoor air quality. In fact, the ducts only transfer ambient air and do not generate noxious particles or dust. However, cleaning the ducts could dislodge accumulations of dust and thus improve the heat generating unit's performance and air flow. On the other hand, in the wake of mold problems or water damage that may potentially have affected the ducts, cleaning the ducts is a must. In general, it is considered that cleaning the ducts every 7 to 10 years could be beneficial, but would have no major impact.

No maintenance of the heating system replaces regular maintenance of your home. Take off your shoes, brush your pets regularly, and sweep and vacuum regularly.

Combustion Appliance

If your home has combustion appliances such as a central heating system or gas fireplace, you need to know what to do to keep them in good working order. The performance of your appliances will depend on it.

Central Heating Systems

This maintenance is essential to ensure that your system is working efficiently and has been safely installed. Do not do the maintenance yourself; entrust this job to a professional who will know how to detect wear on parts, prevent malfunctions, and make the necessary adjustments.

This will free you from worries and help prevent nasty surprises when winter arrives.

Gas Fireplaces

Gas fireplaces are an excellent source of supplementary heating, but they rarely have the capacity to heat a home all by themselves.

Furthermore, the combustion by-products of gas produce a white film on the fireplace glass. Wipe it off regularly so that it does not bake on and become difficult to clean. Read the manufacturer's recommendations for the type of cleaner to use. Giving it a regular wipe with a damp cloth should be sufficient.

The burners, heat exchangers, and pipe fittings should be inspected and maintained periodically by a professional.

With combustion appliances, a phenomenon called back drafting can occur if there is a malfunction or improper adjustment. This could cause carbon monoxide (CO) to be produced, a gas that is harmful to your health and can even be deadly if you are exposed to it for a long

period of time. Although recent appliances are almost all combustion-sealed, always make sure to check the state of your carbon monoxide detectors. See the Safety section, page 107.

If your detector sounds, close your gas inlet valve. Ventilate by opening windows, and then contact a heating specialist. Furthermore, if you have symptoms of CO poisoning such as headache, nausea, and dizziness or vomiting exit your home immediately and call 9-1-1.

Wood-Burning Appliances

Your home may be equipped with a solid-fuel-fired appliance such as a fireplace or a woodstove. These appliances provide a warm and cozy atmosphere but there are some rules to follow for safety and efficiency reasons:

1. Use the air intake control (if there is one) to give the fire the air it needs for good combustion. You can open a window slightly near the appliance when starting a fire.
2. Place a fire screen in front of your appliance.
3. Always check the state of your detectors to keep yourself safe.
4. Inspect your firewood before bringing it indoors to prevent small mammals or insects from entering your home.
5. Have your chimney swept regularly.
6. At the end of every heating season, check the seals and replace those that are no longer forming a tight seal around the combustion chamber. Air leaks will reduce your appliance's efficiency.
7. Clean the glass once the fire is out and the heat has dissipated. A damp cloth will remove ash and light stains but you can also use a product specially designed for this purpose to remove larger, darker stains.
8. Check your appliance manufacturer's instructions for all of its recommendations for maintaining your appliance. The CMHC has also produced a document on this topic entitled *A Guide to Residential Wood Heating*.

Here are some things to avoid when you have a solid-fuel-fired appliance:

1. *Avoid running powerful air exhaust devices at the same time as your solid-fuel-fired appliances. Otherwise, back drafting could occur. Always check the condition of your detectors.*
2. *Do not place flammable items near the opening to your appliance or too close to it.*
3. *Do not touch the glass. You could incur serious burns.*
4. *Close the doors to the appliance before going to bed.*
5. *Do not spray glass cleaner directly on the glass, as it could damage the gaskets if it drips onto them.*
6. *Do not burn very dry wood such as wood flooring remnants or pieces of furniture. The heat is very intense and could damage your appliance.*

NB: The City of Montreal no longer gives a permit to install a wood fireplace and the city fire department check the compliance of existing wood fireplace, also give the right to use the fireplace and notice the owner to replace that fireplace wood.

Chimney

If your home is equipped with a combustion appliance, you might have a chimney for exhausting the combustion gases. Most recent gas appliances are equipped with a flue pipe that exhausts the gases to the outdoors. Wood-burning and some fossil-fuel-burning appliances have standard vertical chimneys.

Maintenance and Sweeping

If you have wood fires regularly and your chimney is used a lot, the creosote will not build up as much because it will be consumed as it is created. Your chimney should be swept at least once a year. In some cases, if you notice that creosote builds up a lot, a second sweeping might be necessary. Check the interior of your appliance and chimney regularly.

Some tips for maintaining and using the chimney:

1. Warm your chimney well to create an upward draft when starting a fire.
2. Opening a window slightly when starting a fire can improve the upward draft and enable proper combustion.
3. Regularly inspect the chimney from inside the combustion appliance as well as from outside.
4. If your chimney is masonry, inspect it every year to check its condition and look for any cracks or black or white stains that could be evidence of deterioration or of some problem that needs fixing.
5. A chimney creates a depressurization effect in your home. The damper should be closed when the chimney is not in use to prevent energy loss and drafts.
6. Have your chimney swept at least once a year.

Combined Ventilation and Forced-air System

If your ventilation system is combined with your forced-air system, see the section on *Ventilation*, for more information on how this system works and how to operate it to maintain a comfortable and adequate indoor climate.

Humidifier Combined with a Forced-Air Heating System "Humidifier"

Your home may have a humidifier combined with a forced-air heating system. This device prevents humidity levels from getting too low. It is connected to a humidistat, and it is recommended that it be set at 30% to 35% to ensure a minimum humidity level indoors.

Once a year, the humidifier will require cleaning, filter replacement, and inspection of the float and level, and of the drain to prevent obstruction. Read the manufacturer's instructions.

Make sure the ventilation system does not conflict with the humidifier. The ventilation system will operate nonstop if the requested humidity level is too high, while the humidifier will attempt to re-humidify the indoor air.

A humidifier is an auxiliary apparatus that can be added to a furnace when the indoor humidity level is difficult to maintain. Your house might not have one.

Electrical Baseboard Heaters

If your residence has a central heating system, see the info sheet, *Central Heating*, Electric baseboard heaters are very simple devices that take up a certain amount of space but require minimal maintenance and have a very long service life.

The electric baseboard heats the air through multiple small plates arranged side by side, which transmit heat to the air circulating between the plates. Before the heating season, vacuum the inside of the baseboard heaters; this will reduce the scorched odour you smell when the heaters come on after a prolonged shutdown. Also check that the small plates are completely straight and aren't touching each other. You can easily straighten the plates with your fingers, but wait until the baseboard heater is cold so you don't burn yourself.

Small crackling noises can be heard when a baseboard heater starts operating after a prolonged shutdown. These noises are normal, but can be reduced by loosening the baseboard heaters fastening screws.

Avoid placing furniture in front of electric baseboard heaters. Blocking a baseboard prevents the air flow necessary for the optimal performance of this type of system. You also may have difficulty achieving a uniform temperature, or even reaching the desired temperature.

Ventilation

Range Hood

When cooking, it is important to run the range hood fan to properly exhaust pollutants. Cooking produces pollutants, odours and grease, and venting them at the source will prevent them from contaminating your home's indoor air.

Range hoods come in many shapes and they can vary greatly in power. Choose the appropriate fan speed for your needs; over ventilating is unnecessary. Opening a window slightly near your hood is a simple trick that can increase your ventilation efficiency.

Range hoods generally have a removable and washable grease filter that must be cleaned regularly.

Refer to the information provided by the range hood manufacturer in its user manual for cleaning frequency and appropriate products to use. Your builder probably gave you a copy of the user manual or it can be downloaded from the websites of most manufacturers. The filter can also be replaced. Some manufacturers may also allow easy removal of other parts of the appliance for cleaning.

Dryer

A dryer is a water extraction machine that vents air and moisture outdoors during the drying process. It is important that the exhaust venting system remain intact and direct the air outdoors. Hot moist air, if vented inside a building, can contribute to mold, mildew and bacterial growth.

To ensure that your dryer is operating properly and to dry your clothes quicker, it is important to clean out the lint trap before every load. This will make the drying more efficient and faster, and therefore more economical.

It is normal for the interior of the dryer to be cold in winter. However, if you feel cold air drafts around your dryer and the interior of the dryer is very cold, it may be that the exterior damper is not closing completely.

Over time, lint can clog the damper. This can cause your dryer to work inefficiently and greatly increase your energy consumption.

Caution! Be careful not to crush the flexible connecting hose behind the dryer. Do not install too long of a hose or fold it over on itself, as this could restrict the air flow, as well as reduce the performance and durability of your machine.

Primary Ventilation System

Your home is equipped with a ventilation system that is designed to renew the indoor air by removing odours, volatile organic compounds (VOCs), and other chemical pollutants. It allows you to maintain satisfactory air quality for you and your family.

These systems can vary widely in look and design. Since regulations differ from one municipality to another, several types of systems exist, including:

- Exhaust fans;
- In-line fans;
- Air exchangers;
- Heat recovery ventilators (HRV);
- Heat recovery cores combined with a forced air system.

All homes in Québec must be equipped with a mechanical ventilation system. Municipalities can, however, prescribe the type of system, as well as the related requirements. So it may be that your home is equipped with a primary ventilation system consisting of an exhaust fan, as found in bathrooms, and not an air exchanger. This situation is compliant, and you simply turn on this device as needed (e.g., gathering of people, condensation on the windows, air polluting activity in your home, high humidity, etc.).

Exhaust fans are often bathroom fans, whereas in-line fans are often concealed in the ceiling space or attic space (roof space).

Air exchangers mix a large amount of indoor air with a small amount of fresh outdoor air and simultaneously expel a small amount of stale air.

HRVs expel stale air and bring fresh air into your home, but without the contaminated air coming into contact with the fresh air. They often provide several control methods and have the feature of extracting some of the heat from the stale air and transmitting it to the fresh air in order to lower heating costs.

Heat recovery cores operate basically like HRVs but they are not equipped with a motor, since they use a furnace blower to exchange the air. The controls are generally more limited.

Why ventilate?

Today, buildings are designed to be more airtight and it is essential to be able to expel pollutants from indoor air while bringing in fresh air.

The small openings in a building's envelope cannot be counted on to provide sufficient ventilation during many periods of the year and can cause draft-related discomfort problems, high power bills, and dry air issues that are detrimental to your health and your building's materials. Plus, natural ventilation cannot be controlled since Mother Nature is managing the ventilating.

It is a sound idea to build efficient and airtight buildings while equipping them with suitable, appropriately-sized mechanical “lungs” that can be activated on demand and as needed.

Principle and Operation

The main thing to understand is that ventilation needs vary with the seasons and weather conditions (wind, atmospheric pressure, etc.). For example, mechanical ventilation needs in the fall are similar to those in the spring, but are different from needs in the winter and summer. Unfortunately, there are no automatic systems. You have to adjust the ventilation to suit your needs and this should be as natural as adjusting your thermostat or switching lights on and off. Some systems have controls with multiple operating modes and adjustments are easy to make. Refer to the documents that your builder gave you on the subject.

Ventilation **needs** can be broken down by season:

- **In summer**, no mechanical ventilation is needed
Unless your home has an air conditioning system or unit, ventilating by opening your windows is sufficient. Running your mechanical ventilation system will only bring needless humidity into your home.
- **In fall and spring**, mechanical ventilation is needed more frequently
During these seasons, the indoor temperature is closer to the outdoor temperature and there is less of an air pressure effect on your building. With this pressure reduced, there is less air moving through the small openings in the building’s envelope. The mechanical ventilation system therefore needs to be used more often.
- **In winter, in general**, mechanical ventilation is needed less often
Natural air exchanges are *stronger* and the air exchanger may not need to be used as much.

The indoor relative humidity level is not the only indicator of the quality of indoor air, but it is a good one. If the humidity level rises, it is often an indication that there is not a lot of ventilation. If it drops, it is an indication that there is sufficient ventilation. However, if the humidity keeps on dropping, there might be too much ventilation. Adjust the ventilation speed or time accordingly.

It is recommended that you keep your indoor relative humidity level between 30% and 50%. The colder it is outside, the closer to 30% you should maintain your humidity level, to prevent condensation from forming on your windows. Keeping your humidity level too low is not recommended, however, since excessively dry air can cause respiratory problems and alter the materials in your home, such as wood floors.

Caution! If it is very cold out, it is normal to have some condensation on your windows. Do not over ventilate. Once the air is too dry, it will be enormously difficult to re-humidify your home. Buy a good quality hygrometer to properly measure your indoor humidity level.

Avoid running your ventilation system in the summer when it is very humid out. This could damage your floors, which could swell, and could also cause condensation to form on the colder parts of your house, such as at the base of foundation walls or on basement floors. Recurring condensation could lead to the development of mold, or the smell of damp.

Recommendations Regarding Usage Frequency

Besides ventilating according to the season, we recommend ventilating based on the presence or absence of occupants in your home. Twelve to eighteen months after the construction of a new home, the indoor humidity level will stabilize and ventilation will be needed to expel pollutants and humidity created by the occupants rather than by the building. We recommend ventilating based on three scenarios:

- **Presence of occupants** (normal activities and occupancy) = minimal ventilation (at low speed or a few minutes per hour)
- **Special activity** (gatherings, cooking that creates a lot of steam, etc.) = ventilation at high speed
- **Absence of occupants** (while at work or away) = system off (or in recirculation mode)

Caution! When you are out, it is highly recommend that you turn off your ventilation system. If your system has a “recirculation” mode, you can use that when you are out to “mix” your indoor air.

Controls

There are a variety of ventilation control devices on the market that come in many forms and offer multiple features. From a simple on-off switch to a control device with “smart” features that adjusts to your lifestyle and indoor conditions, every control device should be used carefully and diligently. Unfortunately, no fully automatic control devices exist and, as a homeowner, you need to get into the habit of managing your home’s ventilation requirements in order to keep it in good condition and enjoy good indoor air quality.

All ventilation system manufacturers provide instructions for operating their systems and their control devices. With the previously mentioned usage recommendations and the options provided by the control device installed in your home, you will be able to operate your ventilation system appropriately. For further information, contact your builder or the manufacturer of your system.

Maintaining Your Ventilation System

All ventilation systems are designed to be durable, but they must be maintained regularly to keep them operating properly.

Refer to the manufacturer's specifications on the maintenance of your system. Generally, manufacturers recommend the following maintenance:

Several times a year (four to six times)

- Vacuum the filters protecting the heat recovery core, or wash them with water.

Twice a year

- Vacuum the heat recovery core, or wash it with soapy water.

Once a year

- Clean the interior of the ventilation system housing with a clean damp cloth and then dry it with a clean dry cloth.
- Clean the condensate drain (some systems do not have one) by pouring warm soapy water into the neck of the drain inside the system. The tubing may need replacing if it is too hard to clean or shows signs of aging.

See the following pages for illustrated steps for maintaining a ventilation system.

As mentioned at the beginning of this section, your home may be equipped with a primary ventilation system consisting of an exhaust fan, such as found in bathrooms, or an in-line ventilator. Refer to the manufacturer's documents for recommendations regarding the maintenance of these types of systems.

General steps for maintaining a ventilation system:*

1. Open the system access door by pulling on the back side of the handle.
2. Flip it forward to disengage the latch.
3. Then, pull on the front of the handle to release the latch completely.
4. Open the door all the way. Some doors can be removed completely making it easier to work.
5. Slide out the filters to clean them.
6. Also remove the heat recovery core by pulling outward on slide-out rails.
7. Clean the components according to the system manufacturer's recommendations.

Most heat recovery ventilation systems have a drain for evacuating the liquid produced from the condensation of the humid exhaust air when its heat is transferred to the incoming fresh air. There must be a loop in the drain tubing creating a water seal (as in a sink trap). The water in this trap can stagnate and turn brown if the system is not operated often. To clean the drain, regularly pour the equivalent of a bottle of bleach-and-water solution into the bottom of the module to clean out the tubing and the water seal.

Air Intakes and Exhaust Vents

Ventilation devices and exhaust systems such as your dryer and bathroom fans have exhaust outlets to expel pollutants outdoors. These exhaust vents are equipped with a damper to prevent air from entering or leaving when the systems are not in use. In addition, primary ventilation systems such as air exchangers or heat recovery ventilators have an exterior air intake that allows fresh air to enter the building.

These vents must be cleaned regularly. Air intakes create a suction effect that causes dust and particles to adhere to the screen that keeps rodents out. You must remove accumulated debris regularly in order not to impede the air flow through your ventilation units. Clogged intakes could impact your air quality, your system's energy consumption, and even the service life of your equipment.

With exhaust vents, the dust in the expelled air, such as from your dryer, can eventually obstruct the airflow and reduce the efficiency of the devices or increase their energy consumption.

A hole must be cut in your home's exterior cladding when the air intakes and exhaust vents are installed. The air intake and exhaust hoods then have to be sealed onto the exterior cladding to prevent water from infiltrating. The expansion and contraction caused by heat and cold cause the sealant to age and it can dry out or split. You therefore need to check the sealant every year and re-caulk as necessary.

In general, the exterior units are exhaust vents that expel air to the outdoors. So the risk of contaminants entering through these openings is low. Air intakes on the other hand suck in the air in their vicinity and you need to be careful not to store trash or gasoline-powered machines near these intakes. Furthermore, avoid any activity such as painting, sawing or sanding near these openings to avoid dirtying your ventilation system and reducing your indoor air quality.

In winter, it is also important not to let snow pile up and cover your air intakes and exhaust vents. As well, make sure these openings are not buried during snow clearing operations; if need be, point them out to the person doing your snow clearing.

If you are planning to add or enlarge a balcony or porch, make sure you do not cover the exhaust outlets or air intakes, as it could impair their operation and reduce their efficiency.

Bathroom Ventilation

You will find a ventilation unit in your home's bathrooms or shower rooms. Generally, it is an exhaust fan that expels pollutants outdoors. This device is one of the key elements in the ventilation of your home, and it is important that you turn it on when using the bathroom. It helps clean the air and remove odours and excess humidity. Too much humidity can lead to the growth of mold which can compromise your family's health.

Instead of, or in addition to, an exhaust fan, you may have a control device for a central ventilation system, one of the ducts of which exhausts air from the bathroom. Unlike the fan,

which is operated by a switch, the control for a central system is often a pushbutton that acts as a timer and will turn on your central system for a set period of time.

A seasonal cleaning of the fans is recommended (grill, flap, blades, back draft dampers, etc.). Dirt accumulates on the grill and the other components of the fan due to the static electricity it generates when operating. The dirt restricts airflow and can encourage the growth of mold. In general, gently pulling down on the grill will give you access to the clips holding it in place. After removing the grill, you will be able to reach and unplug the power supply to the fan while you clean it. See the following general cleaning steps.

General steps for cleaning an exhaust fan:

1. Gently pull down on the grill.
2. Squeeze the clips together.
3. Slide the clips out of their grooves (one side at a time) to remove the grill completely and clean it.
4. Disconnect the power.
5. Vacuum your fan's components or clean them with a damp rag.

Electricity

Electrical Outlets

All the electrical outlets in your dwelling were installed by a master electrician according to strict criteria. In particular, as the Electrical Code requires, the electrician installed safe GFCI/ELCB (Ground Fault Circuit Interrupter (GFCI) or Earth Leakage Circuit Breaker (ELCB) receptacles in the kitchen and bathrooms of your home. This type of outlet protects against electrocution.

If a standard outlet in the room you are in or an outlet in another bathroom isn't working, it may be connected to a GFCI/ELCB outlet with a tripped breaker. To restore the current, you must push the "RESET" button on the GFCI/ELCB outlet.

If that doesn't work, the circuit may be the problem. Check the electrical distribution panel to see if a breaker is tripped. See the info sheet, *Distribution Panel*, page 63.

Electricity can be very dangerous. Do not attempt electrical repairs on your own; call a master electrician.

Distribution Panel

The electrical installation work in your residence was performed by a master electrician in accordance with the standards of the Quebec Construction Code, Chapter V, and Electricity.

When power is interrupted to a sector of your residence, so check whether too many appliances are plugged into that circuit.

Then look inside the electrical panel and reset the breaker for this sector if it is tripped. If these steps are not enough to solve the problem, consult an electrician.

The electrical panel must remain permanently accessible. Leave adequate space in front of the panel at all times (minimum 1 metre).

Ground Wire <<Ground>>

The primary purpose of an electrical system ground is to ensure your safety and that of your equipment in the event of an electrical malfunction or a direct lightning strike to your home. The ground connects your home's electrical panel to earth through a wire. It also maintains certain points of the electrical system at a constant potential (equipotential) to minimize interference among the systems and ensure that your appliances work properly.

Often, electrical grounding will be to the municipal water main. However, depending on the electrician's preference or if your home has a well, electrical grounding may also be provided by plates or rods inserted in earth.

Plumping

Plumping Accessories

A home's plumbing is a complete and complex system. Many components and accessories were installed to serve you well, and to ensure efficient operation of the system, as well as enable access for maintenance or repair should you encounter minor glitches.

Sink, Washbasin and Bathtub

The sinks, washbasins and bathtubs in your home were installed by a professional plumber so that they will work well for a long time. However, you must follow certain rules to ensure your system's longevity.

Sink

When you use the sink, it is recommended that you always leave the strainer in place and throw the accumulated detritus in the garbage. The sink will remain clear if you intercept pieces of food or any objects that are a little bulkier.

Unclogging a Clogged Sink

To avoid damaging your pipes and releasing chemicals into the water unnecessarily, you can generally get good results by using a simple recipe:

- Sprinkle about 6 tablespoons of sodium bicarbonate (baking soda) down the drain of the clogged sink;
- Then add a cup or more of hot white vinegar;
- Plunge as needed and repeat 15 minutes later, if necessary.

In some cases, however, products specifically designed to unblock pipes may be necessary.

Draining the Traps

Every drain in your house has a trap. A trap is a U-shaped section located under a drain outlet. Its shape allows it to maintain a water seal that prevents sewer odours, gases and bacteria from penetrating your home. These traps can be drained a few times a year or if you find that the drain is not working as well as it should.

Bathtub

The bathtub drain can become blocked or the water may not drain out as well when hair accumulates in the drain. If you or a family member has long hair, you can install a small strainer designed to snag hair, which will be easy to clean out on a regular basis.

Drain Odour Problems

If a plumbing fixture (sink, washbasin, shower drain, etc.) is used infrequently, the water in the trap can evaporate or drain away, allowing sewer odours to escape. You should run enough water down the drain to fill the trap and thus prevent odours from circulating. It is recommended that you periodically run water down the drains of fixtures that are used less frequently.

The same phenomenon can occur in floor drains.

Similarly, you should pour water into the drain trap on a regular basis, and this will solve the problem. One tip to prevent evaporation in a floor drain is to pour some mineral oil into the drain. The oil, which does not mix with water, will form a protective layer on top of the water, reducing evaporation.

Particularly if your residence has a septic system to treat your wastewater, do not pour oil or grease or chemicals down sinks and washbasins, as these can harm the plastic components of the plumbing system under the drains, as well as hinder the operation of the septic system.

Toilet

Toilets are fixtures that require regular maintenance inside the tank, but little maintenance for the other components. It is nonetheless recommended to replace the seal applied to the base of the tank when it becomes old and blackened. Maintenance of the floor around the toilet will be facilitated and mold will not adhere as easily to the seal.

Adjustments

Over time, the wax ring on which the toilet is seated can settle.

The toilet may then move when someone sits on it. This situation is normal and you can remedy it easily by tightening the screws on either side of the toilet base. However, do not over tighten the screws, as this could shatter or crack the ceramic tiles under the toilet.

If you find that the toilet runs continuously, it is possible that the flapper is not closing properly. Lengthen the chain to keep it from staying open. You will be wasting less potable water and reducing the risk of condensation. Water that is circulating constantly will cool the tank more and encourage condensation. It is also possible that the water level in the tank is too high and that the water is flowing out the pipe to which the flapper is connected. Adjust the float by screwing the rod connected to it clockwise. This will lower the water level in the tank. On the other hand, if you have to hold the flush handle down to flush the toilet properly, you may need to shorten the chain.

Outdoor Faucet

Most of today's homes have a frost-free outdoor faucet. This type of faucet, while it looks like a standard faucet, is designed and installed so that the water is shut off inside the envelope of the heated building and any water remaining in the faucet drains out. This prevents the cold from reaching the water on the warm side of the building envelope.

In the fall, before the outdoor temperature drops to the freezing point, make sure to turn off the faucet by turning it clockwise. Remove the garden hose and, if possible, store it in a warm place for winter. It will last longer this way.

If your residence is equipped with a standard faucet, shut off the indoor valve provided for this purpose and purge the faucet before covering it for the winter.

Never leave the hose in place when the outdoor temperature approaches the freezing point or falls below zero. The risk is that the water will remain inside the faucet and damage it. Also, NEVER leave the faucet turned on with water inside the hose. If the water freezes, damage is almost inevitable.

Hot-Water Heater

Your home is equipped with a system that allows you to have hot water when you need it. There are combustion systems that heat water instantly, i.e., on demand, and these have no tank. However, the majority of residences have a water heater with a tank. The hot water is stored pending demand. To prevent the proliferation of bacteria, including legionella, do not lower the temperature of the tank below 60°C (140°F). In general, tank manufacturers set their appliances at this temperature in the factory before delivering them. Today, homes are equipped with mixing valves that add a little cold water to the water coming from the water heater in the tank to reduce the water temperature and thus avoid very sudden burns.

If you find that you have less hot water during your usual activities, it is possible that one of the heating elements is defective or needs to be replaced.

If your water heater is a combustion system, it is important to leave clearance around the system to avoid hindering the air intake necessary for good combustion.

Septic System

When you flush the toilet or run the water in a washbasin, do you know where the water goes? For homes in urban areas, the wastewater is discharged into a municipal sewer system. However, for many homes in more rural regions or in smaller municipalities, the wastewater is often treated by a septic system located on the same land as the house and returned to the groundwater after treatment. This may be the case for you.

Principle and Operation

A septic system can be constructed in different ways, but it generally has two main components: a septic tank (1) and a filtering system, often called a leaching bed (2).

When a household produces wastewater (by using the toilet, shower, sink, washing machine, dishwasher, etc.), the water is routed to the septic tank. In the tank, the solids contained in the

incoming water slow and settle. The lighter liquids continue to flow to the leaching bed for further treatment.

The leaching bed generally is composed of a network of lines that distribute the water from the septic tank to several pipes to spread it over a larger surface. This surface is designed according to the number of occupants of the dwelling. The lines rest on a soil filter and the bottom part of the lines is colonized by bacteria that feed on the solid and dissolved organic materials contained in the water. This process cleans the water before it is returned to the groundwater. The composition of the soil filter and the diameter and length of the lines are designed to hold the water long enough to allow the bacterial purification process, but also to allow the water to penetrate the soil within an adequate time to prevent overflows.

Recommended Practices

To function, the leaching bed needs microorganisms for decomposition of waste. To avoid “destroying” this biological system, you must not discharge certain substances that will have this effect, such as solvents, paint, strippers, nail polish and cleaning products in high volume. You must also ensure that the leaching bed receives the required level of sunlight and oxygenation, as well as the necessary drying time. You should therefore never install a deck, a garage, a tennis court or any other facility on this surface.

Maintenance and Replacement of the Septic Tank

You must maintain permanent access to the septic tank. Most systems require annual inspection. In addition, the tank must be pumped out every two years or more often, depending on your household’s use. Most septic systems will need to be replaced or moved and rebuilt every 15 to 20 years. In Québec, the Ministère de l’Environnement regulates septic systems by way of Regulation Q-2, r.8.

Never pump out a septic tank by yourself. The lack of oxygen and the noxious gases it contains could kill you in seconds.

Several things must be avoided to ensure that the system works properly:

- *Avoid dumping materials that decompose very slowly or unnaturally, such as oils, greases, disposable diapers, tampons, condoms, paper towels or facial tissues in large quantities, kitty litter, plastics, cigarette or coffee filters, eggshells and other kitchen waste.*
- *Ensure that gutters release their water far away from the leaching bed.*
- *Do not plant trees near the leaching bed. The roots, seeking water, could damage the lines.*
- *Do not water the leaching bed. The wetting-drying cycle must be maintained naturally.*
- *Do not walk on the leaching bed in winter. Packed snow provides less insulation and will not protect the leaching bed against frost.*
- *Never allow vehicles on the leaching bed. The weight could damage the network of lines.*

- *Ensure that the leaching bed has a cover of sod or seeded grass to prevent premature erosion, especially on hillsides.*

Area Drain <<Floor Drain>>

In the basement, near the water heater, or wherever there is a slight depression built into the floor, you will find an area drain (more commonly known as a "floor drain"). This drain is designed to drain off water should the water heater or washing machine overflow, for example.

Always keep the area drains in your home accessible and free of debris or particles that might clog them (if located near the workbench, for instance).

If you have a central heating system, you may see a pipe that funnels condensation to an area drain. Be careful not to move or crush this pipe.

Shutoff Valve on Water Service Pipe <<Water Intake Valve>>

Your house has a valve that allows you to shut off the water supply from your municipal water main. If you plan to be away for an extended period, we suggest that you shut off your water supply by turning off the tap, or turning the valve handle so that it is perpendicular to the pipe.

If you are shutting off the water supply for a long period, turn your water heater off as well, as it could get damaged. Also, do not place anything in front of this valve; it must remain accessible at all times.

If your water comes from a well, you will find the main intake valve next to the pressure tank.

Clean Out <<Clean-Out>>

To allow maintenance of your plumbing system, a cleanout must be installed near the base of the soil stack (the vertical pipe that receives the wastewater from your fixtures).

The cleanout is capped with a screw plug and you must make sure it is always accessible.

Cleanouts must be accessible at all times. You may notice access hatches in the finished walls of your home. Do not block these accesses to the cleanouts, and be sure to plan access hatches if you will be finishing your basement yourself.

Domestic Meter <<Water Valve>>

Your home may have a water meter that records your domestic water consumption.

Contact your municipality to find out more about the billing and statements associated with your consumption.

Installation of a water meter is only required by some municipalities; it is therefore possible that your residence does not have one.

Sump << Sump Pump Pit>>

Your residence is probably equipped with a sump basin, or sump. It captures the water from the foundation drain that surrounds your house and reroutes it to the municipal storm water sewer.

The sump should always contain a certain amount of water. Depending on the soil type and the amount of time between periods of wet weather, it is possible for the sump to dry up.

You should maintain enough of a water level to cover the mouth of the pipe to prevent odors from seeping back into the house.

The sump is equipped with a pump to prevent overflow. This pump reroutes any excess water from the basin to the storm sewer, to a retention basin or drainage ditch, or to the surface of the ground (depending on the requirements of your municipality). It is possible that this pump will operate only rarely.

You should check it regularly to make sure it still works.

To activate the pump, just pull up on the rod as though the float were being lifted by the rising water level in the pit.

On the other hand, it is also possible that the pump may come on very often. If so, the float can be adjusted a little higher in order to regulate the situation. However, it could also be normal for the pump to operate often if the soil around your residence contains a lot of water. Consult your builder for advice.

Installation of a sump basin falls under municipal jurisdiction. Your house may not have a sump, depending on the configuration of your land and the municipal bylaws. If you do, it will often be found under the stairs or near the mechanical equipment.

The sump must be accessible at all times for periodic checks.

Preventive Draining of Water Heater <<Water Heater Drain Valve>>

Depending on the quality of the water supply to your home, a certain amount of sediment will deposit at the bottom of your hot water storage tank. As a preventive measure, you should annually drain off the equivalent of a bucket full of water to remove accumulated sediment.

This will help protect the efficiency and service life of your hot water heater. Check the manufacturer's instructions for the exact procedure on how to do this (Procedure 1).

Test the pressure relief valve at the same time (Procedure 2).

Procedure 1 – Drain the water heater*

- Shut off the power.

- Shut off the main water supply (or, depending on your installation, the tap on the cold water pipe leading to the water heater).
- Connect a hose to the drain valve and make sure that the far end of the hose is draining into the floor drain or the sump basin.
- Open the valve by turning it counter clockwise.
- Turn on the hot water faucet on one of your sinks or tubs to let air into the system.
- Allow the equivalent of a bucket full of water to drain out of the water heater.
- Close the drain valve by turning it clockwise.
- Leave the hot water tap in the sink or tub open.
- Turn the main water supply back on (or depending on your installation, the tap on the cold water pipe leading to the water heater).
- Let the hot water drain out of the tap in the sink or tub until it is running freely.
- Turn off the tap at the sink or tub.
- Restore the power.

*Always check the manufacturer's instructions before proceeding.

Procedure 2 – Test the temperature and pressure relief valve*

Before you start

- To avoid burns and splashing, make sure the end of the discharge pipe drains into a container or the sump basin.

Pressure Relief Valve Test

- Lift up on the handle of the pressure relief valve slightly.
- Hold the handle in the up position for a few seconds and then release it.
- Once the handle has been released, the water should not continue to run. If the water continues to run after the handle has returned to the normal position, or if the handle stays up, turn off the hot water heater and call your plumber.

Your home may be equipped with a fuel-burning (gas) water heater. The same operations apply, but we recommend that you check your water heater manufacturer's instructions for the exact procedure, especially with regard to turning the heater on or off.

Caution! The water in your hot water tank is stored at a very high temperature – and can cause severe burns.

* Always check the manufacturer's instructions before proceeding

Backflow Prevention Device <<Check Valve>>

Your house is equipped with a check valve that prevents storm water and wastewater from the municipal sewer from back flowing into your basement during heavy rains. If your basement is

unfinished, you will see a round trap, often black, that gives access to this valve. To access the valve, simply unscrew the cap covering it.

Inspect it annually to make sure it is not stuck open. If there is a problem, call a plumber.

Plumbing waste pipes can occasionally become clogged or require cleaning out. They must therefore be permanently accessible. If you plan to finish any areas where this type of valve is located, remember to plan for an access hatch so that the valve is accessible at all times.

Trap <<P Trap>>

Every drain in your house has a trap. A trap is a U-shaped section located below the drain opening. Its shape allows a water seal to be created to prevent odours, sewer gases and bacteria from flowing into the house.

Every time you use a fixture (sink or other), the trap fills with water that "pushes" out the old water.

Check the drain and trap regularly, as part of your routine maintenance, or whenever you notice that the drain is emptying more slowly.

Hair and other residue can eventually clog the drain. It is also possible for an object of value to accidentally fall down the drain, and you will want to retrieve it from the trap.

Removing the trap

- Place a container under the trap to capture the water in it.
- Next, unscrew the two threaded collars (see photo opposite) to remove the trap. Some traps have a screw cap at their lowest point to facilitate maintenance. (See second photo opposite).
- After removing and emptying the trap, clean it with a stiff brush.

Gloves are recommended, especially if you tried using chemicals to unclog the pipe first.

It is recommended that gloves be worn for such tasks, especially if you remove the trap or open the cap at the bottom of the trap after you used chemicals to try to clear the drain.

Main or Terminal Temperature Sensing Valve <<Mixing Valve>>

As with showers, the Plumbing Code now provides for the installation of temperature sensing valves on bathtubs. The mixing valve protects you from scalds by mixing a quantity of cold water with the hot water exiting the water heater. Indeed, to prevent the proliferation of bacteria in the hot water storage tank, the water must be kept at a very high temperature. But at that temperature, the water can cause burns in a matter of seconds.

The water must therefore reach your bathtub at a temperature of 49°C (120°F).

The plumber can install either a "main" mixing valve near the hot water heater, or he may choose to install a "terminal" mixing valve, located near the end of the system, close to the tub. In either case, mixing valves must always be accessible.

Municipal Main Shutoff Valve <<Curbside Shutoff>>

When supplying a house with potable water, the municipality conveys the water from the water utility to the dwelling. You can see on your land the conical end of a pipe, which is the valve between your house and the municipal water main.

This valve must be accessible at all times.

Once your landscaping is complete, including the lawn, this valve must always be visible and accessible. Only the municipality can shut off the water from this valve. In some cases, it may be possible to sink the valve in the ground, but you must consult your municipality to see if this adjustment is possible.

Make sure to protect this valve during excavations and other earthmoving work.

Water Hammer Arrestor <<Air Chambers>>

Water circulating inside a plumbing system becomes charged with energy. When the tap is turned off, the rushing water comes to a sudden stop, causing a shock wave and a loud knocking sound known as "water hammer".

The shockwave puts pressure that is many times greater than normal on the system. In the long run, this high water pressure can damage pipes and plumbing fixtures. Water hammer arrestors are installed on the system to avoid the phenomenon.

There are several methods of counteracting water hammer. You will probably see water hammer arrestors, which look like tiny gas canisters, in different spots on the plumbing system.

Interior Finishing

Wood Floors

Wood tongue-and-groove floors (solid hardwood or laminate) are sensitive to your dwelling's interior conditions. You must consider a certain number of criteria to prevent excessive or inadequate humidity from affecting your floors. For example, you may notice changes in your floors, according to the seasons and changing temperatures.

During the heating season, the humidity rate is often lower, causing the floors to dry out and creating gaps between the floorboards. In summer, the humidity increases and the floor boards expand.

The gaps between the floorboards thus will tend to disappear. To find out more about adequate indoor relative humidity conditions and how to manage them, control inside humidity.

To maintain adequate conditions to protect your floors, the manufacturers recommend that you aim for a relative humidity of 37% to 45%.

Unfortunately, maintaining a slightly higher relative humidity in winter to minimize the gaps between your floorboards could encourage condensation on the windows. There is no one solution that combines the best conditions for avoiding both phenomena. You will therefore have to choose between maintaining a slightly higher humidity level, with the risk of condensation, and maintaining a slightly lower humidity, which increases the possibility of gaps between the floorboards.

Caution! If you maintain too low a humidity level for a long period, you risk a loosening of the fasteners, which could result in cracking, and the gaps between the floorboards could become permanent.

Maintaining Wood Floors

Wood tongue-and-groove floors are relatively delicate. It is recommended that felt pads be placed under furniture legs and that you avoid sliding objects or furniture to reduce the risk of scratches. Vacuum regularly to remove dust and small abrasive particles. When you wash the floor, use a detergent designed for this purpose and a rag or mop that is damp, but not wet. It is recommended that you scrub with the grain of the wood.

Do not use glass cleaners, since they contain abrasives. Avoid excessive use of water, even when cleaning, because you risk damaging the wood fibres.

Laying a Wood Floor

As is often the case, your residence may not have a fully finished basement. You may have a project to add a wood floor. Although there are different methods for obtaining adequate support, we recommend that you install a false floor under the wood finish. This way you can level the

floor and limit the humidity intake by installing a vapour barrier. Consult a professional for more details or for alternative solutions.

Suggestions for a false floor:

- Concrete;
- 15 lb asphalt paper;
- Floor furring strips;
- Tongue-and-groove plywood;
- False floor membrane;
- Laminate or other flooring (see *Caution*).

In general, it is recommended that the installation surface and the tongue-and-groove have no more than a 4% difference in their moisture content. If you install a floor on a concrete slab, make sure to wait at least two months to allow adequate drying.

There is a simple trick to find out if a concrete slab is dry enough:

1. Cut out a piece of polyethylene about 300 mm square (12 in by 12 in);
2. Lay it on the concrete surface;
3. Tape down all the edges to make it airtight;
4. Wait 24 hours;
5. If the polyethylene is dry, the surface is adequate. Otherwise, wait another few weeks.

Some hardwood floor manufacturers will not warranty their products if they are installed in a basement. Since the relative humidity conditions are difficult to control, laminate or other flooring products are recommended instead.

Execution

Although floors must be flat and level, it is possible and normal to observe slight surface height variations or bumps in the floor surface.

The wood flooring industry considers a floor straight and well executed as long as their regularities do not exceed 5 mm per 1.83 m (3/16" per 6' area).

Drywall and Paint

The materials that were used to build your home contained a certain quantity of water when they were installed. Think of concrete, plaster joints and paint. It is therefore normal for this moisture to evaporate. This drying period lasts about 12 to 18 months after the end of construction, and this normal process can result in:

- hairline cracks in mortar joints;
- a gap in the moulding joints;
- cracks in drywall panels;
- cracking of metal corners;

- a gap in the joints between the counters and the walls;
- the appearance of small bumps over fasteners (nail or screw heads).

It is recommended that you wait at least one year (12 months) before proceeding with remedial work, to allow the materials time to reach a stable humidity level. It is normal for certain flaws to be visible from certain angles or under specific lighting.

Execution

Finished walls should present a uniform appearance without visible flaws. However, it is impossible for plaster joints, angles and paint to have a perfectly flat, uniform surface. This is why it is recognized in the industry that surfaces must be observed in daylight, from a distance of 2 m (6.5 ft) and at eye level.

All the consequences associated with the normal drying of the building can be amplified, and even brought on, if you over-ventilate your home. To find out more about appropriate indoor relative humidity conditions and how to manage them, control the humidity.

Ceramic Tile

Ceramic tile floors offer a durable surface that is easy to maintain. As the structure of your residence dries, you may see slight cracks in the mortar joints (also called “grout”). This situation is normal and does not harm the overall solidity of the tile work. You can apply a sealant of a similar colour or a clear sealant to the joint where the vertical and horizontal planes meet to protect them from water, if applicable.

In general, ceramic tile will not be damaged by water, but do not allow water to puddle on the floor, for instance when you step out of the shower or tub. Grout is not impermeable and it is preferable not to leave it sitting in water. In the long run, this could cause the grout and, eventually, the subfloor to deteriorate.

If you accidentally spill a coloured liquid on your ceramic floor (such as wine or juice), clean it up immediately with a copious amount of water and then wipe it dry. The grout between ceramic tiles is a relatively porous material and could be permanently stained.

Execution

A ceramic tile floor should present a flat surface with no perceivable differences in level between tiles. However, the fact remains that tiling is done by hand, and it is tolerable to have surface height variations of no more than 1.2 mm (3/64 in), the thickness of a dime. Obviously, this does not apply to irregular slate or handmade tiles.

Cleaning the Grout

You can clean the joints with a degreaser in the case of cooking stains, or a 50% solution of Javel water (or bleach), and water for all other stains. Rinse with running water and then dry.

It is recommended that you test a hidden surface to ensure that the grout doesn't lose its colour.

Cabinets

Bathroom or kitchen cabinets and counters are among the most used surfaces in a home. Their frequency of use requires a durable design, but like all the other finishes in a house, one of the keys to preserving their longevity is how you maintain them.

A mild soap and water solution remains the surest method of maintaining cabinets. Don't use too much water, as this could damage the finish of the surfaces. Instead use a damp cloth for regular maintenance and dry the surfaces afterwards.

If your cabinets do not reach to the ceiling, it is recommended that you line the tops with wax paper or newspaper. Grease and dirt will adhere to the paper instead of the surface, so that when you clean the top of your cabinets, all you will have to do is replace the paper, making cleaning a cinch.

Adjustments

It is possible that, over time, the cabinet doors will slip out of alignment. Most hinge mechanisms are adjustable so cabinet doors can be re-aligned.

Since cabinets and counters get a lot of use, you should avoid certain practices to protect surfaces and generally keep them in good condition:

- 1. Always use hot pads and placemats. Although counter surfaces are durable, they can be permanently damaged if you place hot receptacles on them.*
- 2. Never cut directly on the counter surface. Use cutting boards instead.*
- 3. Never allow liquid to stagnate on a counter surface, particularly on joints or if you have tile counters.*
- 4. Do not allow water to run down cabinet doors or get inside cabinets. Store damp or wet items in sealed containers so that moisture doesn't cause edging to come unstuck or damage interior surfaces.*
- 5. Do not boil liquids near cabinets. The hot wet steam from cooking, or from a kettle or a coffee maker, could damage the finishes or cause door edges to come unstuck. Use the range hood when you boil liquids. Using a toaster underneath cabinets finished in plastic materials may also cause distortion.*
- 6. Do not climb on counters to retrieve high objects or do maintenance. You risk dislocating surface joints, which would enable water to infiltrate between the counter surface and support, causing the surface to separate and blister. Use a steps tool or a small stepladder.*
- 7. Since sunlight can alter finishes, the use of drapes, sheer curtains or blinds can reduce the sun's effects if the orientation of your home is such that cabinets or counters receive a lot of sun exposure.*

Interior Doors, Stairways and Woodwork

Finish Moulding and Crown Moulding (Ogees)

The interior finishing elements of a dwelling, including doors and moulding, will be affected by conditions indoors. They can be altered by indoor humidity and will also follow the movements of the structure. Sections of moulding may therefore separate slightly, or fine cracks may appear at their junction with finished surfaces. It is recommended to wait at least a year (12 months) before proceeding with any remedial work.

Interior Doors

You may also notice that some doors are more difficult to open and close in summer when the indoor humidity is highest. This situation is normal and should lessen over time, after the building's normal drying period, and in winter.

Wooden Staircases

Wooden staircases, like floors, are subject to intense use. It is recommended to take the same precautions as with wood floors (see info sheet, *Wood Floors*, page 52). Lift objects that you are carrying on the stairs, avoid hard-soled shoes, and vacuum regularly to remove dust and small abrasive particles.

Doors, windows and Wells

The doors and windows on your residence were manufactured and installed to last for years, as long as you maintain them regularly and adequately.

Your builder was careful to apply sealant around the openings to waterproof them where they meet the exterior cladding. This sealant will be exposed to harsh weather, to UV rays, and to the minute movements of the structure. Over time, it will tend to lose its elasticity, to split or peel away. So, twice a year, you need to inspect the condition of the sealant and add to it or replace it if it is damaged or no longer doing the job to prevent any risk of water infiltration.

Wood frame construction undergoes some settling in the first few years. Expect approximately 3 to 6 mm (1/8 to 1/4 inch) of settling per story. This normal "shrinkage" can affect the sealant, and it is possible that you will have to re-caulk some of the joints.

Maintenance of Mechanisms

Annual cleaning and lubrication of the opening and closing mechanisms, tracks, hinges, handles and other parts of the building openings are important basic maintenance tasks that will protect the life and performance of your doors and windows.

Also pay attention to the caulking and weather strip, as these may require replacement after a while, depending on how frequently they are used. It is recommended that they be cleaned and lubricated at least once a year.

Some handles may become difficult to operate over time. Apply a little lubricant (silicone or graphite) to the lock to keep the mechanisms functioning smoothly.

Condensation

In certain circumstances, you may possibly see condensation form on the windows of your house. Contrary to what one might think, this may be a sign of good quality construction. Indeed, a well-designed and well-executed building envelope will hold humidity in, which may promote condensation.

While condensation on windows is normal on very cold days or during certain household activities (food preparation, multiple showers, party, meeting, etc.), it should be a transient phenomenon.

Winter

In winter, it is important to keep the doorway and threshold free of snow, first of all to allow access to your home, but also as a means of egress. In addition, if you allow snow to accumulate, it can turn into a pile of ice as a result of the heat given off by the house and the subsequent

refreezing when temperatures drop. This mound of ice could, on milder days, cause water to accumulate between the ice and the threshold, increasing the risk of water infiltration.

In very cold weather, the lock can freeze, and it may even be difficult or impossible to insert the key. This is most often the case in well-built homes where the indoor humidity level is higher. This situation should occur only occasionally, and you can simply use a lock de-icer. However, should such occurrences become more frequent, check the humidity inside your home (see the info sheet, and turn up the temperature in the entrance hall. Consult your builder if the situation persists.

In cold weather, you may find your front door harder to open, as if the weatherstrip is sticking. You can reduce the sticking by spraying the weather strip on your exterior doors with a silicone-based lubricant.

Replacing Weather stripping

The weather stripping on doors and windows may need replacement over the course of the normal life of your doors and windows. Depending on the frequency of use, some weather stripping can lose effectiveness, resulting in heat loss, drafts and discomfort, along with localized frost and condensation problems.

There are many types of weather stripping on the market: glue-on, screw-on, or kerf-mounted. Any good hardware store should carry a range of weather stripping, so you can find the type you need. However, we recommend that you check with the manufacturer of your doors and windows for the weather stripping that will work for you. You can do the replacement yourself; however, this is a very important task and it might be to your advantage to hire a professional if you want optimal performance.

Warping of Exterior Doors

Depending on the geographical orientation of your home and the sun exposure on your doors, you may notice your exterior doors swelling on occasion. This is normal and is caused by expansion of the steel cladding on your entry door. The phenomenon should fade as the temperature and sun exposure diminishes.

You may also notice temporary warping of exterior doors due to the difference between indoor and outdoor temperatures. The very cold outdoor temperatures cause steel to contract, while the warmer indoor temperatures cause it to expand.

Window Wells

To avoid the risk of water infiltration through basement windows, it is important to allow at least 200 mm (8 inches) of space between the finished landscape surface and the bottom of the window.

Your house may already have window wells, or perhaps your landscape design and the height of your foundation make it unnecessary. A window well is a barrier of steel, stone, concrete or wood attached to the foundation and acts as a retaining wall, allowing a higher ground grade on either side and in front of the window, while at the same time ensuring adequate clearance under the window.

Depending on the type of landscaping that you are planning, and the height of your basement windows, you may need to install window wells.

Installing a Window Well

If you must install a window well, it must be sufficiently deep and wide to ensure enough space in front of the window to allow egress in an emergency. In such case, you must provide for a depth of at least 550 mm (22 inches) in front of the window.

The bottom of the window well should be dug down at least 400 mm (16 in) below the base of the window. The well should then be filled with granular fill to a thickness of 150 to 200 mm (6 to 8 inches). Always leave 200 mm (8 inches) of clearance below the window.

You must also dig a hole to the top of the French drain that encircles your foundation. You will then position perforated drain tile vertically to route the water to the French drain. Buttress the tile with a large rock when you backfill the window well, to hold the pipe securely in place. Next, add a perforated end cap to the drainage tile to prevent large debris or objects from clogging it (see photos below).

Always make sure to shovel out the window wells in winter, to ensure the safety of the occupants, as well as to prevent water infiltration. Also, always remove debris, leaves and grass clippings, and keep the drain opening clear to ensure adequate drainage.

Roof and gutter

The roof is an important part of your home, especially the roof covering. Routine maintenance from the start will prevent unfortunate problems. Your builder designed your roof to last, but it remains subject to numerous stresses: wind, sun, rain and cold. It therefore needs regular attention.

Maintenance

A sealant provides weatherproofing between the flashing around openings (plumbing stack, chimney, ventilation openings, etc.) and the shingle. It should be inspected in the spring and the fall to make sure it is in good condition. Any water infiltration will generally occur in these more fragile zones.

In addition, if some of the shingles have curled or split, think about sealing them down again with more sealant, or replacing them.

Appearance

Roof shingles can occasionally present slight variations in colour from one manufacturing lot to the next. It is normal to perceive subtle variations in colour depending on the angle of the sun and the amount of light. This situation does not affect the performance of the roofing material.

Depending on the time of day and the sun's angle, one may also perceive depressions between the roof trusses. This is normal and may be accentuated by the viewing angle or a rime of frost on the roofing surface. The roof's durability and performance will not be affected unless the depressions exceed 9 mm (3/8 of an inch) between trusses installed 600 mm (24 inches) on center.

Weather Phenomena

You may also notice accumulations of ice or icicles forming along a roof overhang. This can vary according to the orientation of the sun or weather conditions, as well as roof design. It is normal and should only occur for a limited time. If the situation persists, however, contact your roofer.

Over the course of its life, your roof will be subjected to extraordinary stresses, and some of the components may not hold up. After a windstorm or other extreme weather event, inspect the condition of your roof. If you notice any damage, inform your insurance company without delay.

Also, in winter, it is important to monitor the accumulation of snow on your roof and to remove it if it begins to pile up. Excessive accumulations of snow may add weight in excess of the rated load for your roof design. To avoid the risk of injury, consider hiring a professional.

Snow can also infiltrate through the ridge vents. We recommend that you inspect the attic space after a major snowstorm and when the snow piles up near the vents. Remove any snow that may

have entered through the ridge vents and accumulated on the insulation to avoid water damage during a thaw.

Watch your step! If you climb into the roof space, be aware that you should only rest your weight on the roof trusses. These framing members are generally located every 600 mm (24 in). If you step between the trusses, you could go through the ceiling.

You may also notice accumulations of ice or icicles forming along a roof overhang. This can vary according to the orientation of the sun or weather conditions, as well as roof design. It is normal and should only occur for a limited time. If the situation persists, however, contact your roofer.

Soffits and Fascias

Fascias primarily have an aesthetic function by covering the roof edge. Depending on their width and their exposure to sunlight, you may notice some warping, which is normal and difficult to avoid. The situation will resolve itself when the temperature drops.

Soffits prevent small rodents and birds from seeking shelter inside the roof space. You will notice numerous tiny orifices in the soffit that ensure ventilation of your home's roof space.

If you pressure wash the exterior surfaces of your residence, avoid damage by taking care not to let the water infiltrate through the soffits.

Rain Gutter

As is common practice, your builder may have delivered your home to you without rain gutters (eaves troughs) or downspouts. Contrary to what one might expect, the installation of rain gutters is not a requirement of the Building Code. Nevertheless, it is a good way to direct rainwater to desired locations and reduce the erosion that can be caused by water around your home. We consequently recommend that, if you do not already have rain gutters, that you install them.

Installing rain gutters and downspouts

First, rain gutters must be installed with adequate slopes to allow the water to run out. According to manufacturers, you should plan for a slope of 3 to 6 mm per meter (1/8 to 1/4 of an inch every 3.3 feet). The depth of the gutters will be determined by the slope of the roof, although most residences will be well served with 125 mm (5-inch) gutters.

At the base of the downspout, the water must be directed away from the foundation. Otherwise, the water might create depressions where it would accumulate, with the resulting risk of infiltration. It is therefore important that the base of downspouts be equipped with elbows and, depending on the slope of your land and the area to which the water is being directed, you may also need to install extensions and/or splash blocks

Also, it is important to install your gutters below the roof overhang (beneath the drip edge), to reduce the accumulation of snow and ice at the drip edge, which would promote water infiltration and possibly damage your rain gutters.

It is preferable to clean your gutters in spring and fall. Remove leaves and debris and then use a garden hose to flush the gutters beginning at the highest point. This will allow you to check that the flow is adequate and whether your gutters have any leaks. Be sure to set up your ladder so that it is squarely positioned and don't take any unnecessary risks. Hire a professional if you do not feel up to the task.

In your gutters, or at the foot of the downspouts, you will notice small bits of shingle that have detached from the roof. This is a normal function of the design of roof shingles and will lessen over time.

Leave a gap between the ends of the downspouts and the ground. Frost can heave the soil, which would damage the downspouts if they were right up against the ground.

Don't connect your downspouts to the French drain. Leaves, objects or debris could accumulate at the mouth of the drain and prevent it from operating properly. The water must be directed away from the foundations.

Building Envelope

Exterior Cladding

With so many shapes, colours and textures, exterior claddings can vary the look and appearance of any building to suit its environment and the surrounding neighbourhood, as well as the urban development requirements of municipalities. In addition to their aesthetic function, they also provide a wearing surface, along with protection against harsh weather and UV rays. Most claddings on the market have a useful life similar to that of the building, and will require little maintenance. Nevertheless, it is essential to inspect exterior claddings at least twice a year and to re-examine the sealants that are applied at the joints where different types of siding meet, and around doors and windows and openings for mechanical fixture outlets (faucet, exhaust openings and air vents, electrical receptacles, light fixtures, etc.)

Masonry

In masonry (brick or stone) siding, you may see intentional openings, known as "weep holes", near the bottom of walls. Weep holes can also be observed above windows, or in other locations, such as at the base of balconies. These outlets vent the airspace between the building wall and the masonry siding. Indeed, when masonry becomes soaked during a prolonged rainfall, the water migrates, penetrating behind the siding, a bit like water being absorbed by a sponge. This phenomenon is known as "capillarity". The water that seeps behind the masonry must be drained, and weepholes provide a route for this water to escape. For this reason, these openings should never be obstructed.

Check annually to make sure the weep holes are clear, and clean them out if necessary. Insects, such as bees and wasps, will sometimes nest in weep holes. If it looks like a significant problem, for your safety, it is recommended that you hire a professional exterminator. If it is a recurring problem, you can install screening that will allow the water and air to escape, while providing a barrier against insects.

You may notice whitish stains on your brick siding. This phenomenon is known as "efflorescence". It is caused by the evaporation of chemical substances in the brick and mortar. The effects tend to disappear with time. If you wish, you can wash off the stains with soap and water.

Masonry walls are built by hand and therefore cannot claim to have surgical precision. There may be variations in joint thickness, nuances in the colour of the mortar, or cracks and stains in the brick or stone, all of which are considered acceptable.

To determine whether the workmanship is consistent with industry standards, you should examine the wall in the light of day and from a distance of 6 m (20 ft). If defects are apparent at that distance, they may be considered as requiring modification or repair. If that is the case, we recommend that you contact your builder.

Wood Fibre

Wood fibre cladding is durable and requires very little maintenance.

Twice a year, you should make sure that the wood fibre is fully protected by the paint that covers its surface. Should certain areas become exposed, following an impact of some kind, or by scraping from something rigid such as the shoes of a ladder, you should retouch the paint. Wood fibre must not be exposed or the cladding could swell or deteriorate.

Just as frequently, inspect the condition of the sealant between the clapboard joints. Wood fibre reacts to heat and expands and contracts under the effect of temperature changes. The sealed joints are subject to these movements and need to be retouched on occasion. The conventional wisdom is that joints should be redone every two years.

You can clean this type of cladding with water and a nonabrasive detergent. If you are unable to remove certain stubborn stains, you can use a pressure washer.

If you clean your wood fibre siding with a pressure washer, make sure you adjust the pressure by testing the spray on a non-visible surface first. Some manufacturers specify the maximum pressure that their product can withstand without risk. See your siding manufacturer's instructions.

It is possible to replace individual clapboards, but the repairs may show.

Vinyl

Vinyl sidings are exterior claddings that require almost no maintenance. If you need to make modifications to vinyl siding, or to pierce it, avoid doing so in very cold weather, as the vinyl will be more brittle.

You may notice a slight waviness in the siding on hot sunny days, and that is normal. The waviness will disappear as the temperature and sun exposure lessen. Vinyl is a material that is relatively sensitive to temperature changes, expanding and contracting under their effect.

Stucco or Other Exterior Coatings

Stucco and other exterior coatings are low maintenance, but it is very important to inspect their condition twice a year.

If you notice any hairline or larger cracks, it is important to fill them in to prevent water from infiltrating behind the cladding and causing it to pull away from or damage the underlying structure. It is also very important to inspect the waterproofing of joints between the finish and other components, such as doors and windows or mechanical openings. These exterior coatings can be cleaned with a soap and water solution.

Annual Inspection of Exterior Cladding

You must inspect your home's exterior cladding annually to make sure that everything is in order. Among other things, be sure to check:

- sealant joints around openings (doors and windows);
- joints between different types of siding;
- Water tightness of joints around mechanical openings (faucet, exhaust openings, air vents, etc.).

Insulation

Thermal Insulation

There are many ways to insulate a building. A building's insulation is comparable to a wool sweater. All materials resist the passage of heat, and their assemblage determines the sum of the insulating value of the building components (exterior walls, roof, foundation walls, etc.). In Quebec, the Regulation respecting energy conservation in new buildings prescribes the minimum insulation values that builders must observe.

Air tightness

Air tightness is an entirely different property from insulation. A building's air tightness can be compared to a windbreaker. A building thus can be insulated without being airtight, and vice versa. A myth exists that a building should not be too airtight. In fact, a building should be airtight, but well ventilated, so as to avoid uncomfortable drafts, reduce the transfer of humidity to the building envelope, or simply take advantage of energy savings. In Quebec, although there are no specific building air tightness standards, construction methods have improved greatly in the past few years, with the consequence that buildings are more airtight. It is therefore important to ventilate them well.

Future Modification

You chose your residence according to different criteria and based on your needs. However, for various reasons, some homeowners decide to modify their residence. The modifications may be aesthetic, but may also involve changes to the building envelope. This is the case for an enlargement or alteration of the door or window openings. It is important in such situations to respect the initial construction method in order to marry the new components well and avoid introducing weaknesses to the envelope or creating technical problems (air tightness, insulation, resistance to condensation, resistance to water infiltration, etc.).

Your home may even have received Novoclimat or LEED performance certification. It would be unfortunate not to take this into account and lose the essence of the initial efforts during subsequent modifications.

We thus recommend that you consult your builder, or a building professional, so that the modifications are properly designed and the new components are well suited to the old ones. Since a residential building is a system in equilibrium and each change will have repercussions on the other components, avoid problems by not overlooking the initial analysis.

Balconies, Porches and Stoops

Pargeting on stoops

In many cases, the cement parget applied to the rim board on a concrete stoop or balcony will be extended to the supporting walls (step supports) to provide continuity throughout the structure. It is probable that, in the short and medium term, hairline cracks will appear in the joints where tread and riser meet, and between the supporting wall and the steps and landing. Unfortunately, these cracks are normal and difficult to avoid.

The phenomenon occurs at this spot, because the stoop is the result of two concrete pouring done at different times. Indeed, concrete stoops are built in two stages: first, supporting walls are poured at the same time as the house foundation, and later on, the landing and steps are added on top. The seam between the two pourings is called a "cold joint" and the gap between these two concrete components creates a natural weakness in the parget, which quickly cracks at this spot.

The finish coatings generally applied to house foundations can also crack.

Balconies and Porches

Balconies or porches are important parts of your dwelling. They are subjected not only to repeated traffic, but to bad weather and the sun's rays. Their maintenance is essential to keep your residence inviting and accessible in total safety.

Wood

Because wood is a living material, it shifts and changes according to its moisture content. Humidification and drying cycles cause twisting and cracking, which is completely normal. It is important to review the fastenings of the steps, handrails and floorboards of balconies and porches. Some nails or screws might have to be driven in or adjusted with the passing seasons. You may also notice cracks and splits of varying size in the wood members. Don't worry about this: it is normal for wood to split, and if the split doesn't run the entire length of the board, the wood will maintain its strength. Just make sure that there are no raised sections that could hinder free passage or cause injuries.

If you plan to clean your wooden porch or balcony, beware of pressure washing. The pressure could be so strong that you could mar the wood surface or strip off the paint or stain. Make sure to adjust the pressure by testing the water jet on a hidden surface. There are also cleaning solutions on the market, formulated to eliminate blackening and stains on boards, but be careful, because these products can bleach the wood if they are improperly mixed.

Fiberglas

Fiberglas balconies offer a relatively robust and durable surface that should not be too sensitive to bad weather and UV rays. These balconies are built with a wood deck covered in fiberglas.

Check the Fiberglas for cracks regularly, or for any opening that could allow water to penetrate and cause the wood to swell and, in the long run, rot.

Never drill into a Fiberglas surface to fasten members or install anchors. If water manages to infiltrate through a hole, the wood deck under the Fiberglas could rot.

Concrete

Concrete balconies offer a robust and durable surface, but certain products and the impacts of tools like metal shovels can damage them. Take precautions when maintaining them.

In winter, do not use de-icing salt on concrete surfaces. De-icing salts made with sodium or calcium chloride are harmful to the environment. They contain oxidizing agents that accelerate corrosion and can rust the steel reinforcing bars (rebar) inside the structures. In addition, the product's action exponentially accelerates the freeze-thaw cycle, causing the surface concrete to crumble prematurely. Use sand or gravel instead. There are some potassium chloride-based products that will not damage plants or lawns, and leave no residue, but they can still damage surface concrete.

Also watch out for frost heaving of concrete stoops. As is common practice, your builder may have delivered your residence with rough landscaping. When you finish the grading in front of the stairs of your stoop, be careful not to fill in the space that is generally left under the last step. The frost could heave the soil enough to break the concrete stairway

Keeping the Exits Clear

Ensure that the exits are always kept clear. Especially in winter, maintain free access to the doors and all the way to the mouth of the driveway. We also recommend that you keep the basement windows clear. In case of emergency, you must be able to exit your residence and get to the driveway safely.

Humidity, Condensation and Air Quality

Condensation

You may find condensation on your home's window panes under certain circumstances. Contrary to what you might think, this may be evidence of good construction quality. Indeed, a well-designed and -constructed building envelope will retain humidity indoors and, when the humidity gets too high and comes in contact with a colder surface, such as windowpanes, condensation will form.

Condensation is a phenomenon that occurs in many places. A simple example that most of us have experienced is water droplets forming on a glass containing a cold beverage on a hot summer's day.

When moisture-laden air comes in contact with materials inside your home that are colder than others due to their insulation value or composition, this water vapour transforms into liquid water, which is called "condensation".

Excessive condensation can lead to the deterioration of these materials and the growth of mold over time. Such wet areas must therefore be dried when there is excess condensation.

Condensation on Windows

Although, it is normal to find condensation on your windows on a very cold winter's day or during certain activities inside your home (meal preparation, several showers taken in a row, a large gathering, etc.), it should be a temporary phenomenon.

If you regularly find condensation, it is likely that your home does not have sufficient ventilation. Increase the ventilation, but don't overdo it. Excessively dry air can lead to a lot of problems, and drastic changes should be avoided.

Condensation on Cold Walls

During the summer, the relative humidity is very high and the soil along the edge of your foundation is cool. Condensation may form on your basement walls or even basement floor. For example, on a hot summer day when humidity is 70% and the temperature 30°C, the dew point (when condensation forms) would be 23°C. This means that, when air comes in contact with a surface the temperature of which is below 23°C, the water vapour will transform into water droplets.

You might also see condensation on other surfaces such as toilet bowls or some plumbing pipes. This is normal on hot, humid days but should not occur on a regular basis. If this is the case, you should insulate these components or take the necessary corrective action.

To prevent condensation problems on your walls or windows, here are some precautions you can take:

In winter (and on cold days in spring and fall):

- *Keep your curtains open during the day. This will allow the air to circulate and condensation to dissipate.*
- *Removing your window screens is also recommended.*
- *To prevent air from being trapped in colder areas, do not place large furniture and boxes against walls; leave adequate clearance.*
- *Also do not overfill closets installed against outside walls.*

In summer:

- *Do not open basement windows on humid days.*
- *To prevent air from being trapped in cooler areas, do not place large furniture along the basement walls; leave some clearance.*
- *Also do not overfill your closets.*

Controlling Indoor Humidity

Humidity

The air contains a certain amount of water in the form of vapour and we use relative humidity (RH) to measure this quantity.

Scientifically speaking, relative humidity is the percentage of water vapour that a given volume of air contains at a given temperature as compared to the maximum amount of water vapour that this same volume of air can hold at this same temperature.

In other words, the warmer the air, the greater the amount of water it can hold in the form of vapour. Warm air is a good sponge, whereas cold air cannot hold much water vapour.

Humidity Levels in Your Home at the Start

When your house was built, the materials used had certain water content. Think of the concrete that was poured, and the timber, plaster and paint. After construction, the building's humidity stabilizes as these materials dry, returning to their normal water content level. This drying process increases the relative humidity of your indoor air and this is why ventilation and dehumidification needs will be higher in the first 12 to 18 months of a new home.

Using a dehumidifier is recommended during this "drying" period. Be careful not to overdo it however! Once the air is dry, it may be difficult to restore the humidity to a pleasant and adequate level.

Sources of Moisture

A home's occupants produce an enormous amount of moisture. You and your family could produce up to 63 L of water per week. This water, in the form of vapour, gets into the air and increases the ambient humidity level.

Moisture can also come from several other sources such as plants, pets, and water in the soil near your house, or simply the hot, humid air that comes in through your windows in the summer.

Under certain circumstances, such as when your home is vacant, no or very little moisture or pollutants are produced and it is therefore not recommended to ventilate or dehumidify your home during these periods. Otherwise, you run the risk of needlessly drying out the air in your home.

Recommended Humidity Level

It is recommended that you maintain your indoor relative humidity at between 30% and 50%. The ideal range would be between 35% and 45%. Too much humidity can lead to condensation problems and the proliferation of bacteria, viruses, fungi, etc. On the other hand, air that is too dry can also trigger the growth of bacteria and viruses and lead to respiratory problems. Let alone the damage this can cause to your home.

Know Your Humidity Level

It is important that you get into the habit of monitoring the humidity level in your home. Like the room temperature, the humidity level also affects your family's comfort level. We recommend that you purchase a hygrometer so that you can check the humidity level regularly and adjust it as needed. This way, you will be able to find a good balance between too dry an environment for yourself and the materials in your home, and one that is too humid and can cause condensation or mold. Mechanical and electronic hygrometers are available.

Controlling Excess Humidity

You should adjust your home's indoor humidity according to the outdoor humidity, the temperature, the humidity being produced indoors and the condensation that may appear in certain spots (windows, base of walls, etc.). The interior and exterior of your home will interact with each other and in relation to varying humidity levels over the seasons, and sometimes even over a few days.

In summer, materials absorb moisture; in fall, they dry out. In winter, the air will tend to be drier; whereas, in summer, the interior will slowly re-humidify itself.

Controlling indoor humidity is therefore essential and can be done in various ways. Here are the three main ones:

1. By ventilating;

2. By dehumidifying;
3. By heating.
4. Reducing humidity by ventilating

Why does ventilating dry the air? Here is an example:

(-20 C° and 80% RH): If we take a cubic foot of air outside of your home in the winter at -20°C and it contains 20 water droplets out of a maximum capacity of 25 droplets, the relative humidity is said to be 80 %.

(+20 C° and 20% RH): If this same cubic foot of air is heated and introduced into your home, it will still contain 20 water droplets. However if, once heated, it has a capacity of 100 droplets, then the relative humidity is said to be 20%.

So, introducing X cubic feet of cold air into your home will dilute the amount of humidity in the ambient air, because it is drier and, over time, the overall humidity level will decrease. Ventilating your home is therefore a practical way of lowering the humidity in your home.

Reducing Humidity by Dehumidifying

As already mentioned, humidity can come from various sources. After the dehumidification that immediately follows construction, using a dehumidifier can be a very efficient method of controlling humidity, especially in more humid basements. Be careful though, because while a dehumidifier removes water from the air, it does not introduce any fresh air. For this reason, we recommend using your ventilation system from fall through spring to control humidity, as recommended in the *Ventilation* section.

Reducing Humidity by Heating

Raising the temperature in your home may be a solution for reducing relative humidity. Although this method may be somewhat inefficient energy-consumption wise, if you keep the temperature in your basement higher, both summer and winter, you will reduce your relative humidity.

WHAT TO AVOID

There are some activities that add a lot of moisture to your indoor air. If you wish to reduce your interior moisture input and prevent problems, do not hang laundry to dry indoors. Also do not store firewood indoors or open basement windows in the summer.

Furthermore, if you are handling the landscaping around your home, make sure that water is directed away from your foundation through proper grading. See the Landscaping & Surface Water Management section.

Dry Air Problem

If your indoor humidity gets too low, review how you are managing the ventilation of your home, because over-ventilating can cause drying. See the *Ventilation* section, page 81, for our recommendations regarding ventilation. If the air in your home gets too dry, you will have to let the building re-humidify itself. This can be done by reducing ventilation and allowing the water vapour from such activities as showers to re-humidify the air. You can also use a portable humidifier or, if you have a forced air furnace, use the central humidifier or consider installing one.

Do not allow your ventilation system and your humidifier to work against each other. Your ventilation system will run non-stop if the humidity is too high, thus causing your humidifier to try to re-humidify your indoor air.

Mold

What Is Mold

Mold is part of your everyday environment. It is in the air and in the soil. It is mold that allows wood to decompose and causes food to spoil.

If it does not grow, mold is not a problem. The problems arise when mold is allowed to grow by feeding it.

Mold feeds on moisture. The black, velvety stains that you may have observed on window sills are mold that develops on the fine dust there, when it comes in contact with condensation. Without moisture, mold cannot develop. Therefore, you should always take the appropriate action and manage your home's indoor environment so as to keep materials dry.

How Do You Know When You Have a Mold Problem?

Mold will not be a problem if it does not grow. You might find traces of mold in certain spots or at certain times, but it isn't necessarily anything you should worry about.

Mold can be different colours and sometimes has a characteristic earthy or moldy smell about it. The situation warrants investigation by an expert when there are three different areas involved or when the surface affected is roughly one square metre in size (approximately 3' x 3').

Often, the amount of humidity in the air will be the cause. Check your relative humidity level and refer to the info sheet, *Controlling Indoor Humidity*, page 104, for how to maintain proper humidity in your home. When the humidity is too high, mold can feed directly on the moisture in the air.

If you are wondering whether or not a stain is in fact mold, put a drop of bleach on it; if the stain changes color, then it is mold.

Main Causes of Proliferation

Since mold feeds on moisture, you will have to find the source of this moisture if you encounter mold.

Water might be seeping into your building envelope. If this is the case, remedy the situation promptly, allowing sufficient time for the affected areas to dry out before covering them.

Moisture can also come from condensation. Condensation, as mentioned in the *Humidity, Condensation and Air Quality* section, can result from indoor humidity that is too high or exceptionally cold temperatures outside. So, you may see some mold on certain windows after a period of very cold weather in winter during which you have had several episodes of condensation. This would be a temporary, and therefore normal, situation and would not harm your home or its occupants given the small surface affected. However, clean your window sills as soon as possible to prevent the mold from growing any further and spreading to other parts of the building.

Preventing Proliferation

Generally speaking, you can prevent any form of mold growth if you follow these instructions:

- Keep your home dry;
- Fix any kind of water leaks immediately;
- Avoid storing too many things along walls or in closets, particularly in the basement;
- Clean and maintain your home regularly;
- Adopt lifestyle practices that help prevent the relative humidity from increasing.

Cleaning Affected Areas

You can clean small areas yourself. You should use different products depending on the type of surface affected.

- For washable surfaces (metal, plastic, etc.), use an unscented detergent solution and wipe dry with a clean rag.
- For drywall (gypsum wallboard), clean with a damp rag using baking soda or a bit of detergent. Do not allow the drywall to get too wet. Sometimes the affected surface will have to be removed and replaced.
- For wood surfaces, vacuum them first (with a central vacuum system that has an external exhaust or a vacuum with a HEPA filter). Next, clean with detergent and water. Rinse with a clean, damp rag, and then dry quickly with another clean, dry rag. If the stain does not come off, sand and vacuum the surface of the wood with a vacuum/sander combination.

- For concrete surfaces, once again, vacuum (with a central vacuum system that has an external exhaust or a vacuum with a HEPA filter) and clean surfaces with detergent and water. Dry well. If the surfaces are still visibly moldy, there are other products you can try, such as TSP (trisodium phosphate). For more information on this method, consult an expert or see the CHMC recommendations.

For moderate or large areas, contact your builder or air quality expert.

Contrary to popular belief, using bleach to clean mold is not recommended. The water in the solution could feed the mold and the fumes are harmful.

Furthermore, painting moldy surfaces only masks the problem and the mold will quickly reappear. You can, however, find types of paint that are more mold-resistant.

Always wear safety glasses, a disposable dust mask, and rubber gloves when handling affected materials and cleaning moldy surfaces.

Safety

Smoke Detectors

Your home is equipped with smoke detectors, generally connected to your building's electrical system or, in some cases, battery-operated. A smoke detector is one of the most important safety measures you can take. It is designed to detect particles of smoke in the air. It can warn you of a fire in its early stages so you have time to escape.

Remember to vacuum the inside and cover of your smoke detector every month using the soft bristle brush. Do not allow dust to build up and never paint your smoke detector.

To make sure your smoke detector is working, replace the batteries twice a year or when you hear an intermittent beep. We suggest that you replace the batteries when you turn your clocks ahead or back. It's a good way to remember.

Some smoke alarms carry the manufacturer's suggested replacement date. Others carry the date they were manufactured inside the cover. Health Canada recommends replacing any smoke detector that is more than 10 years old.

Carbon Monoxide (CO) Detector

Carbon monoxide (CO) is a toxic gas that can be deadly. Contrary to many gases, carbon monoxide is invisible, odourless, tasteless and non-irritating, which makes it undetectable.

Only a carbon monoxide detector can detect and warn you when there are dangerous concentrations of this toxic gas in the air.

Cleaning your carbon monoxide detectors every six months is recommended. Gently vacuum around the openings with a soft brush. Caution! Make sure you do not touch the sensors with the vacuum head.

CO detectors have a limited lifespan beyond which they may not be able to detect gas properly. Some carbon monoxide detectors currently available on the Québec market carry a replacement date. Look for one on your detector. If there is no replacement date indicated, replacing your device after 5 to 7 years is recommended.

If your home is not equipped with a combustion appliance or an attached garage, you do not need this type of detector. In such case, it would be normal for your home not to have one.

Landscaping

Trees

Before landscaping your property, it is important to check with your municipality for any restrictions that may apply. On the plan attached to your building location certificate, you will see the servitudes (rights-of-way and/or subsoil easements) dedicated to the public utilities. These servitudes, granted to Hydro-Québec or to the cable TV and phone companies, are zones where you may not install buildings or permanent structures (garden shed, pool, trees, etc.). These zones are for the passage of overhead or underground wires, as well as the companies' personnel and maintenance equipment. Your municipality may have special restrictions and you need to take these into account, otherwise you might be forced to alter your landscaping.

Your municipality may also exercise some control over the types of trees that you will be allowed to plant. It is essential that you make sure that the trees or shrubs that you wish to plant do not have root systems that could damage your home's foundations or your storm water or sanitary drainage system.

