

RESIDENTIAL WATER LEAK DETECTION GUIDE



Hamilton

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LOWER YOUR WATER BILL, PROTECT YOUR HOME AND HELP THE ENVIRONMENT.

It may seem like we have an endless amount of fresh water but some local communities are beginning to struggle with high demands on the water supply. With some simple changes to how we think and act, we can all reduce our water usage and our water bills.

Is your household water efficient? Trying to understand your water bill or meter can be confusing. You may be using more water than you think. This guide will help you understand your water usage and see how your household compares to others in Hamilton.

Once you know how much water you're using, this guide will help you uncover common leaks and inefficiencies around your household. The suggestions are simple and inexpensive to complete but could have a big impact on your water bill and the environment.

ON AVERAGE 10% OF HOMES HAVE LEAKS *

Without an obvious puddle, most leaks will go unnoticed until you receive a shockingly large water bill. You don't need to be a plumber to check out many common problem areas in your home.

This guide will help you spot and fix leaks before your home and wallet are impacted.

BE IN THE KNOW

Work through this guidebook to see how water efficient your household is.

* SOURCE: EPA WATERSENSE

Remember, just because you can't hear a leak, doesn't mean it's not there.

Calculating your water usage is easy!
You can use either your water bill or water meter to calculate your household water usage

UNDERSTANDING
YOUR WATER BILL

The easiest way to know how much water you use is to calculate it from your water bill.

Your water is measured in cubic metres (m³).

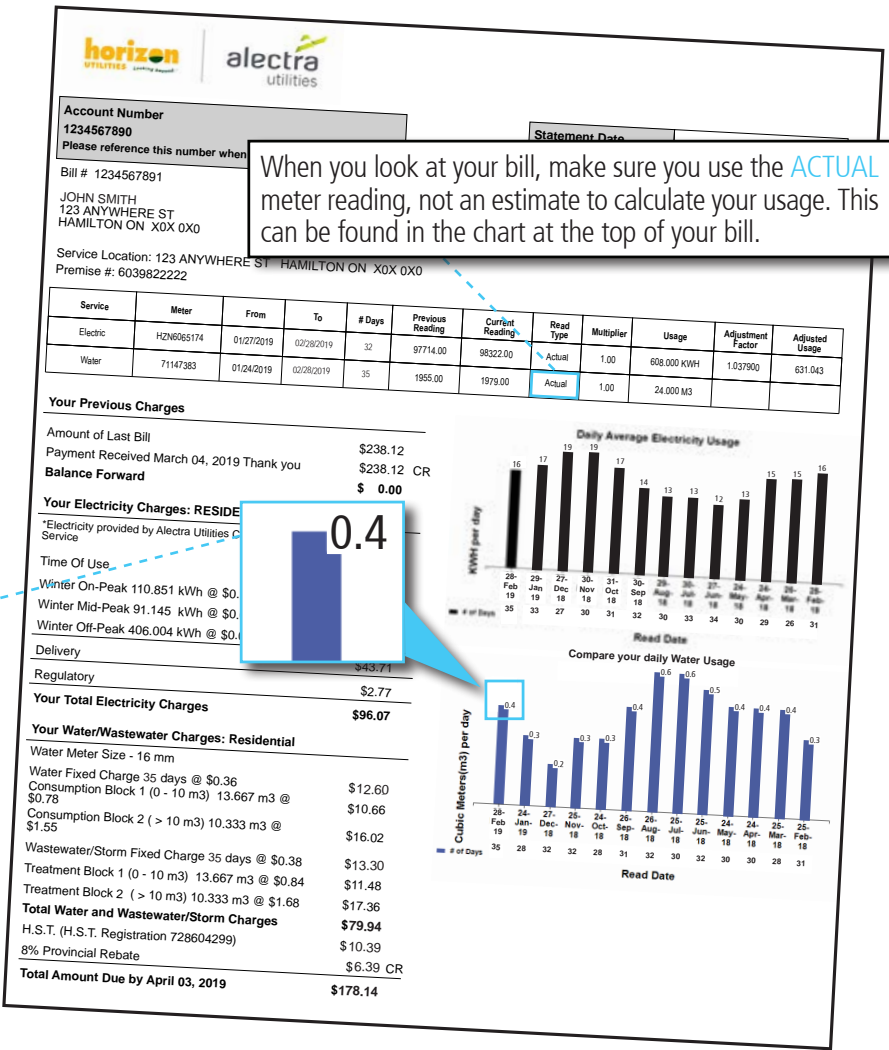
One cubic metre (m³) = 1000 litres of water.

A yearly comparison of your average daily use is shown on the right hand side of your Alectra/Horizon bill in the “Compare your daily Water Usage” graph. Look at the line that reads Cubic Meters (m3) per day.

This residence has the average daily usage of 0.4 cubic metres (m³) which is 400 litres per day.

If two people live in the house we will divide the 400 litres by two. This means each person uses on average 200 litres of water per day.

The chart on the next page shows how your water efficiency measures up. In this case, this household is EFFICIENT and they are using water wisely.



DID YOU KNOW?

You can reduce your water bill up to 10 per cent by fixing simple leaks such as worn toilet flappers, dripping faucets, and other leaking valves.*

* SOURCE: EPA WATERSENSE

EFFICIENT WATER USE
AND YOUR WATER BILL

HOW DO YOU MEASURE UP?

Are you super efficient, efficient, average or inefficient?
The answer may surprise you.

Calculate your daily usage from your water bill by filling out the following:

_____ m³ x 1000 = _____ L divided by the number of people in your home _____ = _____ litres per person per day.

Example 0.26 m³ x 1000 = 260 / 2 = **130 litres per person per day.**



HOW DO YOU COMPARE TO THIS CHART?

RATING LEVEL	WATER USAGE		WHAT TO DO
SUPER EFFICIENT	Fall/Winter/Spring: Less than 150 litres per person per day	Summer: Less than 200 litres	You are incredibly water efficient! Be sure to share your tips with friends and neighbours.
EFFICIENT	Fall/Winter/Spring: 150 litres to 200 litres (175 +/- 15%)	Summer: 200 litres to 250 litres	You are using water wisely! Keep up the water efficient work!
AVERAGE	Fall/Winter/Spring: 205 litres to 250 litres (229 +/- 10%)	Summer: 250 litres to 325litres	Learn how to become more efficient and reduce your water bill with this guide.
INEFFICIENT	Fall/Winter/Spring: Exceeds 250 litres	Summer: Exceeds 325 litres	You are using a lot of water. Do you know why? Do you have a leak?

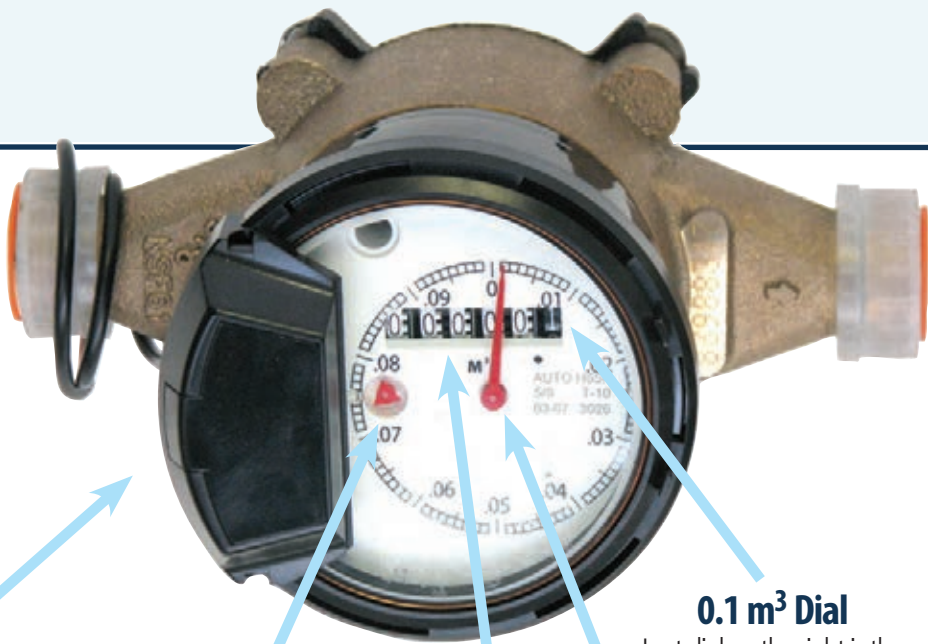


UNDERSTANDING YOUR WATER METER

Another way to calculate your water usage is to take a look at your water meter. You can find your water meter located near the front of your residence, either in the basement or crawl space where your water line comes into your home. This is also where you'll find the home's main water shut off valve.

The water meter looks like this:

Just like a car, the water meter has an odometer. Instead of showing how many kilometres you've driven, the meter shows your water usage in cubic metres (m³).



Low Flow Indicator
When all water is turned off and the dial continues to spin, it indicates a low flow leak

Odometer
Tracks each cubic metre (m³) of water used

0.1 m³ Dial
Last dial on the right is the 0.1m³ (100 litres) dial

Sweep Hand
0.1m³ (100 litres) per revolution



DID YOU KNOW?

Every 100 litres of water used causes the sweep hand to make one complete turn. How fast is your sweep hand spinning?

WHAT DOES YOUR WATER METER TELL YOU?

Easy steps to determine your water usage

READ YOUR METER AT THE SAME TIME ON TWO CONSECUTIVE DAYS

	Example Meter	Your Home's Meter
Date & Time of Initial Read:	Mar 21 6:20 p.m.	
(1) Today's meter read:	05247.8	
24 hours later	Mar 22 6:20 p.m.	
(2) 24 hours later meter read:	05249.2	

CALCULATION:

Your Meter	(2) Meter Reading	– (1) Meter Reading	= Total Cubic Metres Used (m ³)	x 1000	= Total Litres per Household	÷ Number of People Living in the Home	= Total Litres of Water Used per Person / per Day	Efficiency Standards
		–	=	x	=	÷	=	Super Efficient less than 150 Litres
								Efficient 150-200 Litres
								Average 205-250 Litres
Example Meter	05249.2	– 05247.8	= 1.4	x 1000	= 1400	÷ 4	= 350	Inefficient above 250 Litres

How do you measure up?

This is an example of an inefficient, high water use household. If you ranked as average or inefficient, you could have a leak and should look at your water habits.

10

COMMON INDOOR WATER LEAKS

Most leaks are the result of worn out water fixtures such as deteriorating toilet flappers and rubber washers inside faucets. This part of the guide will help you check out and fix the 10 most common problem areas in the home. Monitoring these areas will help you save money and become more water efficient.

- 1 Toilets
- 2 Dripping faucets
- 3 Bathtubs and showers
- 4 Dishwashers
- 5 Refrigerator ice-making units
- 6 Humidifiers
- 7 Washing machines
- 8 Water heater tanks
- 9 Boilers
- 10 Water softeners

1 TOILETS

Leaky toilets are expensive

Toilet leaks can be tricky; they can range from small to large, be constant or appear randomly, make noise or be completely silent.

A small, more common toilet leak can waste up to 547 litres per day, equaling 200,000 litres a year. This adds up to an extra \$55 on your monthly water bill. A constantly running toilet can leak 3.78 litres of water per minute, which adds up to 5,450 litres per day and almost 163,500 litres in just 30 days.

Not only is that a lot of water, it can add up to an extra \$526 on your monthly water bill based on 2019 rates.

HOW TO CHECK FOR TOILET LEAKS:

Place toilet dye tablets, strips or a few drops of food colouring into the toilet tank and do not flush or use the toilet for 20 minutes.

If the water in the toilet bowl becomes coloured from the dye, the toilet definitely has a leak.

TIME TO RETIRE YOUR TOILET?

If your home was built before 1994 and the toilets are original to the house, you could be wasting water and money. Older toilets can use as much as five times more water than newer toilets.

* SOURCE: EPA WATERSENSE

MONEY DOWN THE DRAIN!

If your leaky toilet was installed before 1994, or you are unsure of its age and water consumption, you may want to consider purchasing a new, more efficient toilet.



Environment Canada

Toilets account for 30% of all indoor water use in a typical residence

PUT YOUR TOILET TO THE TEST

Follow these steps to calculate how much water your toilet uses

1. Carefully shut off the valve to the toilet tank supply line.
2. Then mark the water level with a pencil or marker in the tank reservoir.
3. Flush the toilet.
4. Now refill the tank reservoir to the marked level using a measured container such as a measuring cup, or two litres bottle to determine how much water is needed to flush the toilet.
5. How many litres did it take to fill the water back up to the line? If it was more than 4.8 litres, there is a more efficient way!

Once you've completed this task, don't forget to open the valve under the toilet.

EASY LEAKY TOILET FIXES

If you find a leak, there is an easy way to determine which part is the problem. Draw a line on the tank at the water level and turn off the water supply to the toilet.

Wait 30 minutes and then check the tank.

If the water level stays the same, the leak is from the float rod and overflow tube. If the water level drops below the line, the problem is from the flapper.

When turning water valves off and on, check for any signs of a water leak on the wall or on the floor behind the toilet.



Mark the water level in the tank reservoir before flushing.



HOW MUCH WATER DOES YOUR TOILET USE?



As of January 1, 2014, the Ontario Building Code states that all new residential properties are required to install 4.8 litre toilets.

DID YOU KNOW? Older toilets use more water

Year Manufactured	Litres per Flush
2009 - Present	6 / 4.8 / 3
1994 – 2009	13 / 6 / 4.8
1980 – 1994	17 / 13
1930 – 1980	30 / 19

If your toilet uses more than 4.8 litres per flush (Lpf) you could
SAVE 50-90% BY INSTALLING A NEW TOILET
The savings could pay for the new toilet within one year

TOILET LEAK?

Follow these steps to diagnose common problems

Step 1: Check for float arm problems

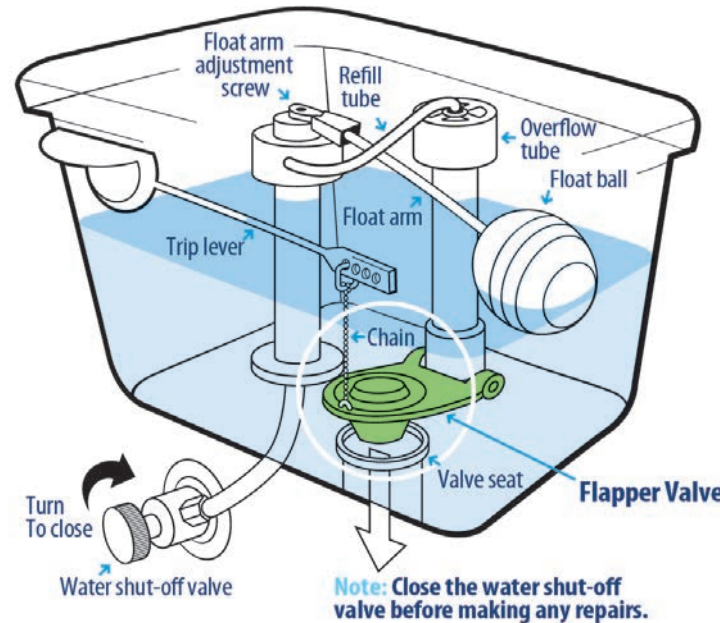
To check if the overflow tube and float ball are working properly, first remove the toilet lid from the tank. Flush the toilet, listen and watch the tank mechanism. You should hear the water stop running. If it doesn't, check the water level to see if it is above the overflow tube. If it is, gently adjust the float arm down and flush again.

Step 2: Check for holes

A pinhole opening in the overflow tube could produce an invisible leak. Check for this by shining a flashlight down the overflow pipe. If you see running water, you have a leak that can be repaired by replacing the overflow tube.

Step 3: Check the chain

If you have to jiggle the handle to stop the toilet from running, it may be a misaligned flapper, a loose handle or an incorrect length of chain. Clean and adjust the chain to ensure it's not too long or short. Tighten the nut that holds the toilet handle to the tank. If that doesn't work, the handle may have to be replaced.



Step 4: Check the flapper valve problems

Add a few drops of food colouring, toilet dye strips or tablets into the toilet tank and check back in 20 minutes. If a leak exists, the bowl will have dye-coloured water. To fix this silent leak, the flapper valve should be replaced, cleaned or realigned.

2 DRIPPING FAUCETS

Even a slow drip can waste up to 75 litres of water a day

● — 1/16" Leak

A mere 1/16-inch steady stream leak, as shown above, wastes 387 litres of water each day. With that much water and money going down the drain, it's important to repair leaky faucets as soon as possible.

If you notice that a faucet is dripping, first try closing it tightly. If it continues to drip, the most likely cause is a worn or wrong-sized seat washer. With just a little effort, you should be able to fix the faucet yourself. If the faucet is washerless, it may be more economical to replace the faucet instead.



A leaky faucet that drips at the rate of one drip per second can use more than 11,600 litres of water per year!*

How to fix a washer

Before you start, turn off the water supply to the faucet by closing the fixture's shut-off valve, which is likely located under the sink. Turn the shut off valve clockwise until it's tight. This shuts off the water to the sink only and does not affect any other part of the house. If there is no shut off valve under the sink, you will need to locate the main shut-off valve.

Be certain that the replacement washer is the same size as the worn one. It is often best to bring the worn washer to the plumbing supply or hardware store to match its replacement.



3 BATHTUBS & SHOWERS

Beware of leaky spouts and inefficient showerheads

If you notice dripping water, the faucet may need new washers. You can replace these yourself. Before doing this repair, be sure to turn off your home's main shut-off valve and replace washers with ones of the same size.

An old showerhead may be costing you money. Consider putting in a new water efficient model. Use the showerhead efficiency test on the next page to determine whether a replacement would benefit your home and lower your water bill.



Showerhead Efficiency

This test will identify inefficient showerheads

You'll need:

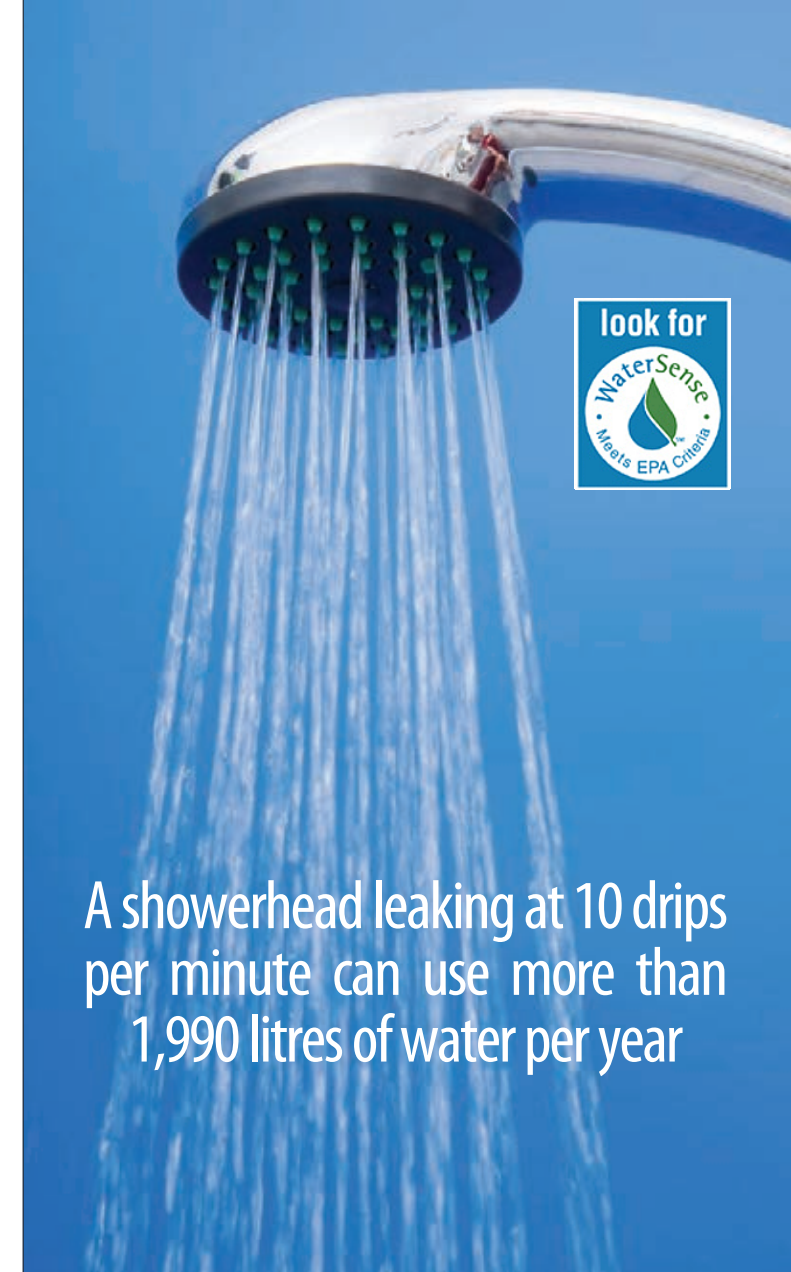
- a bucket
- a measuring cup
- a watch with a second hand or a digital watch
- a calculator

Place the bucket in the shower so it catches the entire water stream. Turn the water on full for exactly five seconds and ensure all the water is collected in the bucket. Measure the amount of water collected and use the formula below to determine its efficiency.

How much water do you have? (i.e 2.5 cups, 3.5 cups, 4.2 cups) Enter that value here and do the calculation:

_____ x 0.23658 = _____ X 12 = _____ Lpm (litres per minute)

If your showerhead uses more than 7.6 Lpm, replacing it with an efficient WaterSense lowflow showerhead will save you money. These efficient showerheads use less water by mixing it with air. While still feeling like a high-flow showerhead, the amount of water used is much less.



A showerhead leaking at 10 drips per minute can use more than 1,990 litres of water per year

DID YOU KNOW?

You can use the same process and calculation to check how well your bathroom, kitchen and other faucets function. If your faucets use more than 7.5 Lpm, you may want to change the aerator if possible, or replace it with a more efficient faucet.

4 DISHWASHERS

Is your dishwasher costing you money?

Not overloading the dishwasher and using the correct dish soap can easily correct some water leaks. Be sure that the door latch is tightly secured, the dishwasher door fits tightly and that the door seal is not worn or damaged.

If you are unsure where the leak is coming from or how to fix it, be sure to call a qualified professional.



DID YOU KNOW?

A family that runs a 45 litre per load dishwasher four times a week and replaces it with a 22 litre per load machine will save over 4,700 litres of water a year.*

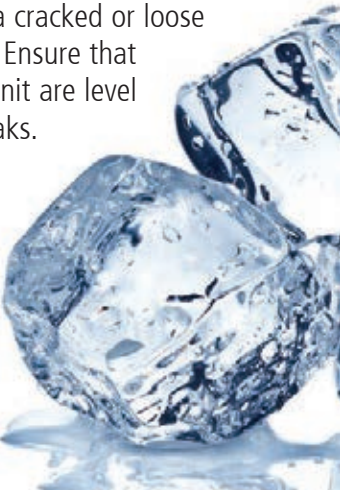
* SOURCE: EPA WATERSENSE

5 REFRIGERATOR ICE-MAKING UNITS

Leaks can cause excessive ice accumulation and a wet floor

If your icemaker is making puddles, a cracked or loose water supply line may be the culprit. Ensure that both the fridge and the ice-making unit are level and square to avoid any potential leaks.

If you are unable to find the leak or are unsure where to look, call a qualified professional.



6 HUMIDIFIERS

Running water tells the tale

While water accumulation under the unit is a sure sign of a leak, it can still go unnoticed if the overflow discharge is piped directly into a sewer or drainage line. If the humidifier is running when the furnace is off, then the humidifier's float valve or solenoid could be stuck in the open position. This would waste enormous amounts of water without any visible signs of a leak. Even something as simple as having a humidifier set too high will also waste a lot of water.

In the summer months when the furnace is off don't forget to turn off your humidifier and the water line that runs to it.



7 WASHING MACHINES

What to do if you find water near the washer

If you notice a leak around your washing machine, check the connection to the water supply and drainage hoses. In front loading washers, leaks can be caused by soap scum build-up on the door seal. If you are unsure of where the leak is coming from, call your washing machine repair service.

An older, inefficient washer uses an average of 155 litres of water per load. New, efficient washers use on average 91 litres per load – a savings of 64 litres per wash!

Some laundry tubs have self-priming faucets to prevent sewer gas from coming up the floor drain. If the priming function isn't working, it can continue to leak water into the drain unnecessarily. Typically, the priming hose is transparent so if the laundry tub faucet is off, no water should be running through the hose.



DID YOU KNOW?

New water efficient washers....

- Use up to 35% less water and use 20% less energy
- Are gentler on clothes, while getting them cleaner and using less detergent
- Help the environment through reduced water pollution and greenhouse gas emissions

* SOURCE: ENERGY STAR

WHAT TO LOOK FOR IN A NEW WASHER

Ensure the model is WaterSense and Energy Star certified

Water Factor (WF) is the number of litres or gallons needed for each litre or cubic foot of laundry. A lower number indicates lower consumption and more efficient use of water.

Modified Energy Factor (MEF) measures energy consumption of the total laundry cycle. It indicates how many litres or cubic feet of laundry can be washed and dried with one kWh of electricity (the higher the number, the greater the efficiency).

The washer will have a...

- Water Factor (WF) of **0.8 L/cycle/L (6 gal/cycle/ft³) or lower.**
- Modified Energy Factor (MEF) of **56.6 L/kWh/cycle (2.0 ft³/kWh/cycle) or higher.**



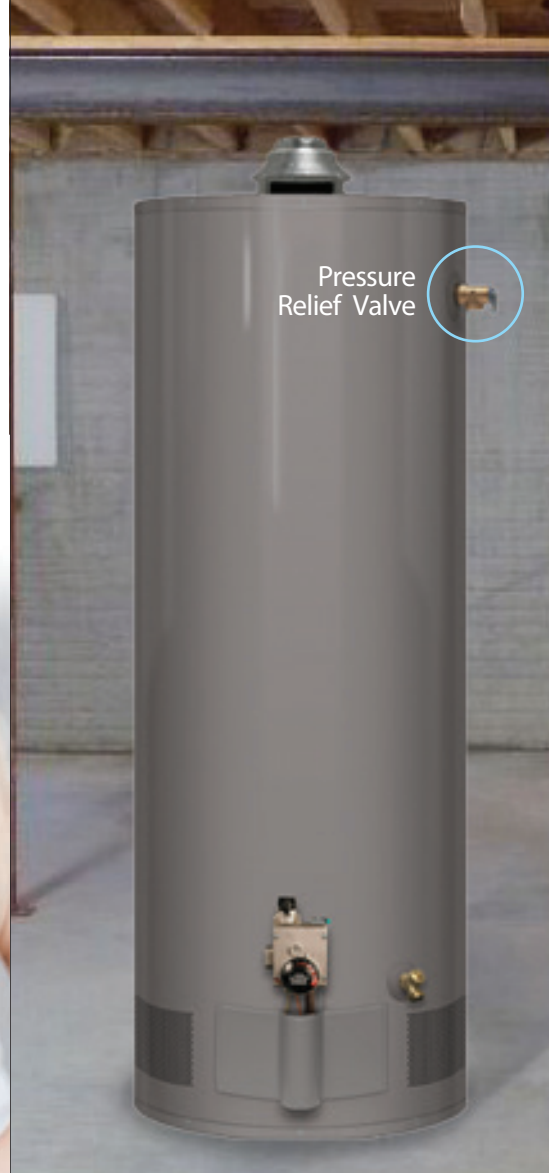
8 WATER HEATER TANKS

Leaks can go unnoticed

Leaks can go undetected if the temperature and pressure relief valve pipe on your hot water heater connects directly to a floor drain.

If you see water near the bottom of your hot water heater, the temperature and pressure relief valve could be stuck. This large brass threaded fitting is most often found near the top of the water heater. When not working properly, water can leak from it and drip down the side of the tank.

Never attempt to fix a water heater tank on your own.
Be sure to always call a qualified professional.



10 WATER SOFTENERS

Listen for the sound of running water

If you have a water softener that is not recycling properly, you could be wasting water. Check that you haven't left the unit on "Backwash", this simple mistake can be enormously wasteful.

If you constantly hear running water from the water softener, there is likely a problem that requires a check-up by a qualified technician.



9 BOILERS

Listen for the sound of running water. If it is continuous and does not stop and start periodically, your boiler system may have a leak.

Never attempt to fix a boiler on your own.
Be sure to always call a qualified professional.



LOOK FOR WATER DAMAGE

Hidden Leaks

Water marks on floors, walls, ceilings or signs of mold can indicate indoor pipe leaks.

Fire suppression systems

Newer homes and businesses have fire suppression systems. Periodically check to make sure the sprinkler heads are tight and not leaking.



3

COMMON OUTDOOR WATER LEAKS

- 1 Sprinkler systems
- 2 Outdoor faucets
- 3 Swimming pools

During the warmer months, outdoor water use is the most common reason for a high water bill. In this section, we will go over three common outdoor water leaks and water efficient tips to save this summer.

1 AUTOMATIC LAWN-SPRINKLING SYSTEMS

Soft spots on your lawn or standing water on the ground may indicate a broken underground sprinkler system pipe. Using the leak indicator included with most sprinkler systems can assist in locating leaking pipes and sprinkler heads. Fixing these leaks will ensure the system is working efficiently and not wasting water.

An irrigation system with pressure set at 60 pounds per square inch that has a leak 1/32 of an inch in diameter can waste around 23,800 litres of water a month.



DID YOU KNOW?

As much as 50 percent of water used for irrigation is wasted due to evaporation, wind or runoff*. Check the sprinkler system's automatic timer and rain sensor to ensure the lawn is being watered only when necessary.

* SOURCE: EPA WATERSENSE



2 OUTDOOR FAUCETS

Check your garden hose for leaks at its connection to the spigot. If it leaks while you run your hose, replace the nylon or rubber hose washer and ensure a tight connection to the spigot using pipe tape and a wrench. Make sure outdoor faucets are closed when not in use.

During the winter, inside shut-off valves should be closed to prevent freeze-ups. Frozen water taps can cause major damage and waste large volumes of water. Be sure to open the outside faucet after you have shut the inside valve, so that any water left in the pipe will drain out. These shut-off valves are usually in your basement. One shut-off valve may control all the outdoor faucets.



3 SWIMMING POOLS

If the water level stays higher than normal or the pool overflows when people are using it, your automatic shut-off valve may need some attention. If this part is malfunctioning, a continuous cycle of water will be pumped into the pool and then drained out.

Are you always topping up your pool because it's losing water?

Using a swimming pool cover reduces evaporation by 90 to 95%. Without a cover, an 18'x36' pool loses about 1" of water per week in the summer. Annually, this can add up to a water loss of over 26,400 litres.



HOW MUCH WATER IS LOST?

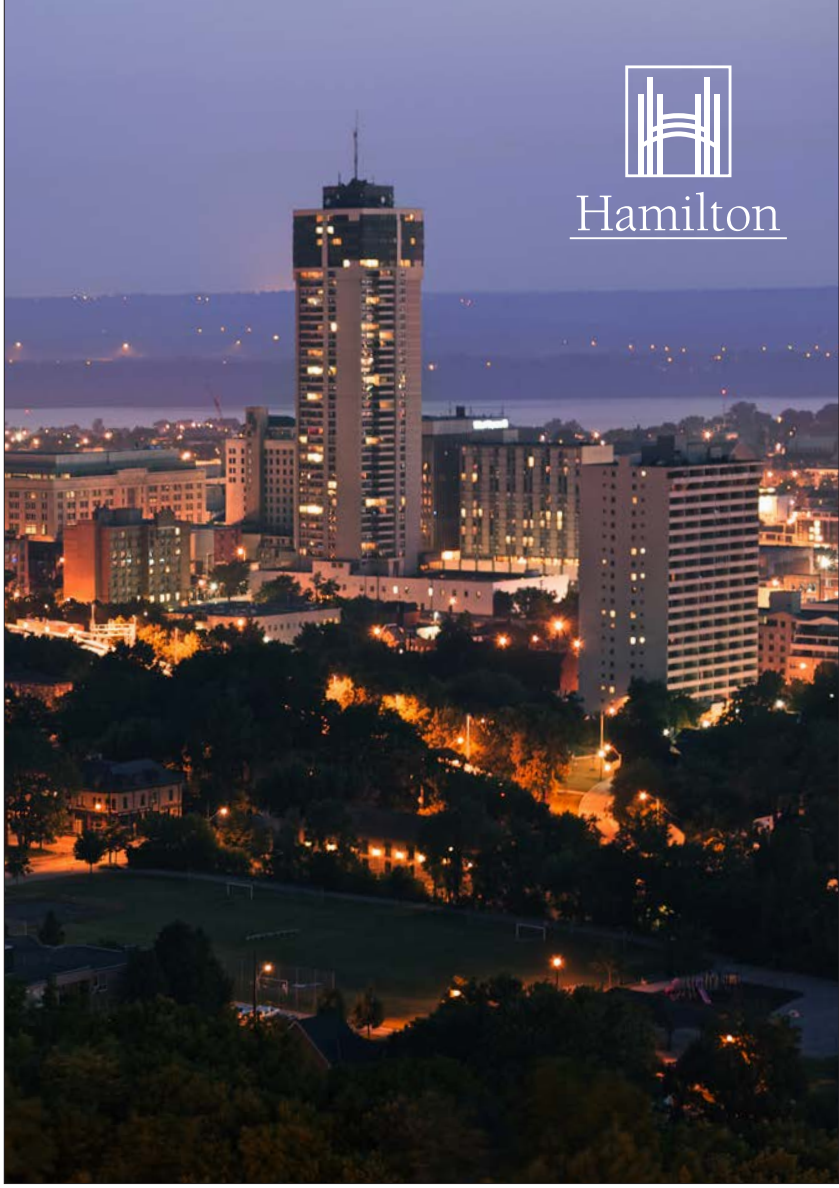
Small household leaks left unrepaired can lead to big trouble over time

Leak Source	Typical Leakage	Litres/Day Used	Litres/Month Used (30 day)	Litres / Year Used	Cost of Leak / year	Cost of Leak / bill (monthly)
Running toilet	3.78 litres/minute	5,443	163,290	1,986,768	\$ 6,418.01	\$ 534.83
Flow-through Humidifier (Cold weather months: November - March)	8.3 litres/hour	200	6,000	73,000	\$ 235.79	\$ 19.65
1/16" steady stream leak	16.1 litres/hour	387	11,610	141,255	\$ 455.43	\$ 37.95
In-ground irrigation Warm weather months May - September	1/32" in diameter	794	23,820	120,688 Based on 5 months May - September	\$ 390.83 Based on 5 months May - September	\$ 78.17 Based on 3 bills during warm weather months

Based on 2019 City of Hamilton Consumption Block 2 Water and Wastewater Rates.

HAMILTON IS A WATERSENSE PARTNER

The City of Hamilton and the EPA WaterSense program have partnered to promote water efficient products in our community. We encourage you to look for the WaterSense label when replacing or upgrading your water fixtures and appliances. WaterSense products are now available in Canada.



So what does the WaterSense® label really mean for you?

It means that the toilets, showerheads, faucets and accessories that earn the WaterSense label meet the following guidelines:

- The product performs as well or better than their less efficient counterparts.
- The WaterSense® labeled product is at least 20% more water efficient than average products in that category.
- The product provides measurable water savings results.
- The product achieves water efficiency through several technology options.
- The product and manufacturer obtain independent, third-party certification and verification of the above criteria.

BE PROACTIVE TAKE THE TEST

Each March in North America, FIX A LEAK WEEK takes place. This week is a reminder for everyone to review their water usage and to look for costly leaks.

Save our precious water resource and your money!



WHY CONSERVE WATER? IT JUST MAKES SENSE

We all know that conserving water is the right thing to do. Preserving our water sources, reducing the use of chemicals and hydro as well as protecting the environment just makes sense.

