

SECTION 1

The ABC's of Plumbing

Funny, It Didn't Look Broken

WATER METERS - HOW TO DETERMINE IF YOU HAVE A LEAK

The Two Common Meter Types

Your water meter keeps track of how much water your household uses. The meter is usually located on your property near the street inside a concrete box marked "WATER METER." It may be a bit dark inside the meter box, so bring a flashlight along!

In some homes the water meter is located in the basement. Note that some water providers have been replacing older analog meters with digital models and most newly-constructed homes are equipped with digital meters.

Meters measure water in cubic feet, gallons, cubic meters, or other units. One cubic foot is equal to 7.48 gallons. For example, if your meter says you used 41 cubic feet in a day, you would multiply 41 by 7.48 to find that 306 gallons were used. In the U.S., units may be measured as 100 cubic feet or 1,000 gallons. In Canada, the measure is in cubic meters. Digital meters will often alternate between the units read and the flow rate in gallons or liters per minute.

You can check for leaks on individually-metered residences by using your meter. Simply turn off all

Example - Analog meters



Example - Digital meter



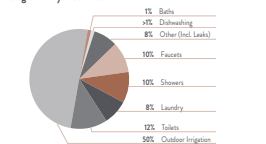
water uses on the property. If the flow indicator (triangle or star) is turning, you've got a leak. If not, note the location of the pointer and the last two numbers on the far right windows. Do not run water for 30 minutes. If the pointer has moved and/or the numbers have rolled higher, there is a leak. Turn off your home's main shut-off valve. If the pointer is still moving, then the leak is somewhere in the supply line from the meter to the shut-off valve. If the pointer stops rotating, then the leak is inside the house.

It is important to note that very small leaks might not be detectable at the meter, depending upon the type and age of meter. Even if there is no movement, you will need to check individual fixtures, fittings and appliances for possible leaks.

Digital meters will indicate leaks in various ways depending upon what type of meter model you have. The easiest way to detect a leak is by observing the flow indicator valve after all water to the property has been shut off.

If the flow indicator displays positive flow, you have a leak. Some digital meters might also indicate leaks by displaying a leak indicator icon, the term "reverse" ("forward" indicates normal operation), or a left-pointing arrow. Read on to determine the possible cause.

Single Family Water Use



Consider these 15 STEPS before you purchase a toilet

Developed by MAP D'Arcy, www.map-testing.com

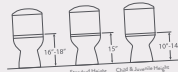
Before you ever leave the house to shop for a toilet, get out your tape measure and gather the information you need!

Rough-in

Know the rough-in dimension of your toilet installation. The distance from the flange bolt that anchors your bowl to the floor, usually covered by a small plastic cap to the wall behind your toilet is the rough-in. In most North American homes that dimension is either 10, 12, or 14 inches, the most common in today's homes being 12 inches.

Bowl Height

The distance from the floor to the top rim of the bowl (not including the toilet seat). In North America, that distance has traditionally been about 15 inches. However, the trend for many families today is to install bowls with a height of 16 to 18 inches. Manufacturers use terms such as "Comfort Height," "Chair Height," "Easy Height," "Knee Height," "Highboy," "Smart Height," "ADA Height," "Knee Height," "Highboy," "ADA Height," "ADA Height," or some other similar description. The elderly or infirm, but many younger persons have also discovered the benefits. Decide whether or not you want a toilet with a taller bowl.



Appearance. Decide on one.



Seats may be found on the



large tank AND

inched or unimpaired, and of many of today's kits. As such, you may be entire bathroom.



The round-front bowl is ideal for compact bathroom spaces. Elongated bowls have a longer rim dimension (as much as 2 inches longer). They are more comfortable for adult use and they help improve hygiene. Be sure to measure the dimensions of your existing bowl and consider the size of the toilet space in your bathroom before replacing a round-front model with an elongated model. There have been cases where doors and drawers could not be opened when the old round front bowl was replaced with an elongated model! Check manufacturer websites for the dimensions of bowls and tanks. Decide on the bowl shape.

Water Shut-off Valve and Hose

Check the condition of your existing shut-off valve (called the 'single stop') that supplies water to the toilet and the supply hose connecting that valve with your toilet tank. If you need to replace the supply hose, consider one constructed in stainless steel mesh for long-term durability. If the shut-off valve needs replacing, it may be necessary to call your plumber.



Flush Handle Location

Manufacturers place flush handles at various locations on the tank: right side, right front, left side, left front, and at the top-center of the tank lid. You should determine if the handle's location is important.



SECTION 2

Repairs & Preventative Maintenance

INDOORS

Leaks

Leaks Waste Water, Cost Money

Leaks: through an opening, pressure 60 lbs.

Leak size	1/4"	3/16"	1/8"	1/16"	1/32"
Gallons per month wasted	400,000	225,000	80,000	25,000	6,300

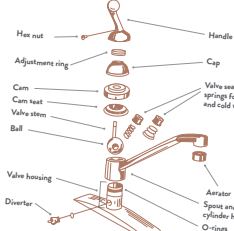
Leaks: drops



Leaks: smooth streams



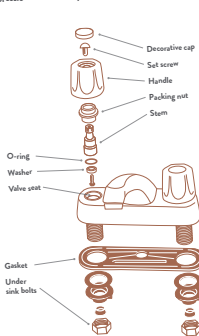
Kitchen Ball-Valve Unilever Faucets, Delta and Peerless are common brands



Shower Ball-Valve Unilever Faucets, Same parts as kitchen ball valve faucet



Compression or Washer Type Faucet



SECTION 3

Resources

GUIDES/BOOKS

- Compliant Techniques for DIY
Creative Homeowner, January 2017
https://www.amazon.com/Ultimate-Guide-Step-Step-Datep/dp/1580177801/ref=sr_1_1?pf_rd_r=...
- Black and Decker, The Complete Guide to Plumbing, Updated 7th Edition
Cool Springs Press, January 2019
https://www.amazon.com/Black-Decker-Complete-Guide-Plumbing/dp/1519866593/ref=sr_1_1
- Sunset You Can Build Plumbing
Sunset Publishing Corporation, January 2010
https://www.amazon.com/Sunset-You-Can-Build-Plumbing/dp/0376046687/ref=sr_1_1
- Sunset Western Go
Sunset Publishing
https://www.amazon.com/dp/0376030100/ref=sr_1_1

Water conservation is not something that should be considered only during a drought. Conservation and water efficiency should be a way of life.

TOP TEN WAYS TO SAVE WATER AT HOME

- Check your home's water meter to see if you have a leak. **page 4**
- Fix leaky faucets. **page 11**
- Install a "high efficiency" rather than "low flow" showerhead if you have a pre-1994 model. **page 23**
- Replace pre-1994 water guzzling toilets with new high efficiency models. **page 22**
- Fix leaky water supply tubing. **page 43**
- Buy a high efficiency washing machine. **page 46**
- Run your washing machine and dishwasher only when they are full. **page 47**
- Check your sprinkler system frequently and adjust sprinklers so they water only your lawn, and not the sidewalk or street. **page 53**
- Adjust your irrigation system controller (sprinkler timer) to apply just the right amount of water to your landscape, or install a "smart" irrigation controller. Remember to set your controller to water less in the wetter months (or turn off the irrigation altogether). **page 53**
- Water during early morning hours when temperatures are cooler to minimize evaporation. **page 55**

DAILY WATER USE: CONSERVING VS. NON-CONSERVING

The table compares reasonable estimates of efficient vs. non-efficient water use for residential applications.

Category	Water used per day	Conserving per day	Non-conserving per day
Shower	1.26 gallons per minute (GPM) x 10 minutes = 12.6 gallons	2.0 gallons	6
Flush 1992 compact toilet	2.8 gallons	1.6 gallons	8
Pre-1992 hygiene toilet	3.5-10 gallons	1.6 gallons	25
100% efficient showerhead	1.8 gallons	1.6 gallons	14
1992 efficient showerhead	2.0 gallons	1.6 gallons	16
1992 1.6 GPM compact showerhead	2.5 gallons	1.6 gallons	20
Pre-1992 hygiene and 100% efficient showerhead	5.0-7.0 gallons	1.6 gallons	48
High efficiency washer (90% e. w.)	16 gallons	6 gallons	6
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	9
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	10
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	14
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	1
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	2
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	4
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	10
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	13
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	20
Conservative estimate	40 gallons	10 gallons	40
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	53
1992 1.6 GPM compact toilet	2.8 gallons	1.6 gallons	55

All use approximations, average household use. Water use will vary with individual habits. 1 gallon = 128 fluid ounces. 1 cubic foot = 7.48 gallons. 1 cubic foot of water weighs 62.4 pounds.

Water during early morning hours when temperatures are cooler to minimize evaporation.