

How to Choose a Water Bottle

<http://www.rei.com/expertadvice/articles/water+bottles.html>

By T.D. Wood

All water bottles (and food containers) offered at REI are constructed without the use of bisphenol A (BPA), a chemical that has raised health safety questions. Our BPA-free water bottle assortment includes a variety of bottle material options. See our bottle comparison chart below to quickly compare the attributes of each material.

Water Bottle Materials

Copolyester (Common Brand Name: Tritan)



Essentially, this material is the "new polycarbonate." Like polycarbonate (discussed below), it is light, tough, translucent and very durable—just not as invincibly shatterproof. Unlike polycarbonate, it does not contain bisphenol A (BPA). Well suited for challenging outdoor conditions.

- To identify: Bottle may be clear, colored, frosted or feature artwork. Rigid construction.
- Recycling number: None or No. 7. (Note: In the recycling industry, No. 7 is the resin identification code that serves as a miscellaneous, catch-all category for plastics still awaiting a broadly accepted recycling technology. No. 7 is not synonymous with bottles containing BPA; only polycarbonate bottles contain BPA.)
- Pros: Low weight; durable; retains few, if any, odors if used to transport flavored liquids; easy to view contents (if clear or colored). BPA free.
- Cons: May crack or break if dropped from some height on very sharp, hard or ragged surfaces.

High-density Polyethylene (HDPE)



A semi-rigid plastic used in milk jugs and some water containers. Appropriate for outdoor pursuits such as hiking and backpacking.

- To identify: Traditionally, HDPE is often a cloudy white color; colored versions are available. Exterior is firm yet slightly pliable.
- Recycling number: No. 2.
- Pros: Low weight; durable. Bottle's content level is viewable. Less expensive than copolyester or polycarbonate. BPA free.
- Cons: With force, could be punctured. May retain or convey some odors or tastes.

Aluminum

Lightweight, rugged material. Can't shatter. Appropriate for most outdoor pursuits.

All aluminum bottles use a lining that resists tastes and odors. REI requires third-party documentation from bottle vendors that bisphenol A (BPA) is not used in the production or application of the liner. BPA is explained in more detail in the polycarbonate section of this article (found below).

One of the best-known makers of aluminum bottles, SIGG, made headlines in September 2009 when it acknowledged that, unknown to retailers and consumers, the epoxy-based liners used in its bottles prior to August 2008 contained BPA.

Since August 2008, SIGG says its bottles use a new taste-neutral, food-compatible "EcoCare" liner that it states is made from a powder-based copolyester and is free of BPA.

- To identify: Lightweight metal; often in a narrow profile; available in many colors.
- Pros: Low weight; very durable; retains few, if any, odors or tastes. Some models offer interesting exterior art. BPA free.
- Cons: Can dent (though without damaging lining in most cases). Transfers temperature of contents to its exterior. Not recommended for freezing or for accepting boiling water. Not for use in microwave ovens.

- Notes: Hand-washing is recommended due to narrow shape. Dishwasher use does no damage other than causing exterior to fade. SIGG recommends consumption of fruit juices within 12 hours to prevent fermenting.

Low-density Polyethylene (LDPE)



A more flexible version of polyethylene commonly used in squeezable water bottles, hydration reservoirs and some collapsible water containers. Popular with cyclists and day hikers.

- To identify: Semi-opaque to opaque; available in many colors; squeezable.
- Recycling number: No. 4.
- Pros: Low weight; durable; flexible; less expensive. BPA free.
- Cons: Susceptible to punctures. Could melt if too close to a fire. May retain or convey some odors or tastes (though some manufacturers use proprietary techniques to negate this). Opinions vary on suitability for use in microwaves; use with caution.

Stainless Steel



Tough, durable material. Usually constructed without liners. Stylish exterior. Most commonly used for day trips or urban use.

- To identify: Silvery, metallic exterior; slight hefty feel.
- Pros: Very durable; retains few, if any, odors or tastes. Suitable for acidic beverages. BPA free.
- Cons: A touch heavy. Can dent if forcefully struck. Most models transfer temperature of contents to their exteriors. Not recommended for freezing or

boiling water; not for use in microwave ovens. (For hot beverages, choose a vacuum bottle, which is an insulated stainless-steel container.)



Polypropylene



A plastic used in a wide variety of products and textiles. Appropriate for rugged outdoor pursuits.

- To identify: Semi-opaque; medium- to dark-colored versions are available. Exterior is firm.
- Recycling number: No. 5.
- Pros: Ultralight; durable. Bottle's content level is viewable in medium colors. Dishwasher safe; fully recyclable. BPA free.
- Cons: With force, could be punctured. Bottle walls become semi-pliable when exposed to hot liquids. May retain or convey some odors or tastes (though manufacturer says they use proprietary techniques to reduce this).

Bottle Comparison Chart

Bottle Material	Impact Resistance	Odor Resistance	Visual Clarity	Bottle Feel	Resin Code
Tritan copolyester	★★★★	★★★★★	Clear	Rigid	 OTHER
Polyethylene (HDPE)	★★★★★	★★★★	Cloudy	Semi-rigid	 HDPE
Polyethylene (LDPE)	★★★★★	★★★★	Semi-opaque	Squeezable	 LDPE
Polypropylene	★★★★★	★★★★	Semi-opaque	Rigid	 PP
Stainless steel	★★★★★	★★★★★	Opaque	Rigid	N/A
Aluminum	★★★	★★★★★	Opaque	Rigid	N/A

Scale: 1-5 stars, with 5 offering the best resistance.

Polycarbonate

In April 2008, REI halted the sale of polycarbonate water bottles. Polycarbonate is a tough, translucent plastic that gained much of its rigidity from the addition of the chemical bisphenol A (BPA). Questions about the suitability of BPA in beverage containers led REI to offer the variety of BPA-free water bottle alternatives described above.

If you're wondering if any of your existing water bottles are made from polycarbonate, here are some clues:

- To identify: Bottles may be clear, colored or frosted. Rigid construction.
- Recycling number: None or No. 7. (As noted earlier, No. 7 is the resin identification code that serves as a miscellaneous, catch-all category for plastics still awaiting a broadly accepted recycling technology. Until one is achieved, most recyclers discard No. 7 items (sometimes also stamped with the word "Other"). Some recyclers, however, will accept No. 7 items. Note: Not all plastic bottles bearing a No. 7 imprint contain BPA.

Cleaning of Bottles Listed Above

Follow manufacturer recommendations for dishwasher use. Many manufacturers of the styles described above claim their products are dishwasher-safe (if placed on the top rack). Yet hand cleaning (and thorough drying) is often recommended for the most effective results. For details, see the REI Expert Advice [Cleaning Your Water Bottle](#) article.

Hydration Reservoirs



Nearly every brand of reservoir will claim some sort of proprietary composition. Reservoirs are very flexible; all are BPA-free. BPA's chief attribute is its ability to create a very hard, rigid version of plastic.

Some reservoirs are quite sophisticated in their efforts to combine durability, taste-free environments and safe materials. One model bonds a tough polyethylene exterior to 2 super-thin liner layers that put the water in contact with metallocene LLDPE, an "ultralow" version of low-density polyethylene (LDPE) and a high-grade material used in food packaging. Many reservoirs use a food-grade polyurethane as a liner, another good material.

Any reservoir and sip tube should be emptied immediately when a trip is complete and be allowed to air out and dry. For detailed instructions, see the REI Expert Advice article on [hydration reservoir cleaning](#).

Bottle Design

While some arty exceptions exist, most water bottles offer a cylindrical shape so the bottles slide smoothly into side pockets on packs. Smaller cycling bottles are sized to fit frame cages.

The chief variant in bottle design is the size of the opening. Which is best? Let your personal preferences be your guide. Basically, you will choose either a wide opening that accommodates a big gusher of a flow rate or a restricted opening that minimizes your risk of spills.

Wide Mouth

Very popular. Many offer a 63mm opening, a width that:

- fills quickly and easily;
- most closely mimics a standard drinking glass, proving a high flow rate;
- easily accommodates ice cubes;
- matches the threads found on many water filters so you can forge a no-spill, filter-to-bottle connection while pumped water flows through the filter. It's a nice feature.

Narrow Mouth

If tipped, contents don't flood out of the bottle so rapidly. Some backcountry gourmets find narrow mouths allow them to more easily control a bottle's pour rate. (Optional pour spouts are also available for some bottles.)

Push-pull Valve

Commonly found on cycling bottles; also used on larger bottles. Pull to open, push to close. Some people love this valve's spill protection; others weary of the pulling and pushing. However, if you remember to close the valve, water won't spill if the bottle is tipped.

Bite Valve

Often attached to a straw-styled tube that sits inside the bottle. Same bite-to-drink methodology as found on many hydration systems, which to some is an acquired taste. Valve automatically closes after each use, so a tipped bottle causes no spills.

Extras

- Arty designs are cool, though pragmatic types may find bottles with markings such as measuring indicators (4, 8, 12, 16 fl. oz.) are more useful.
- Add a belt bottle holster to keep a bottle within easy reach.
- Fabric bottle insulators can extend the desired temperature of the liquid in your bottle.
- Bottles (or reservoirs) with openings that are compatible with a filter you own are very handy. The standard width is 63mm.

Bottle Volume

Many water bottles are quart-sized (32 fluid ounces). This standard volume simplifies the treatment of backcountry water. One chlorine dioxide tablet, for instance, is recommended for disinfecting a quart of water; the Steri-PEN is programmed to work best with 16 or 32 fl. oz. of water. Other bottle sizes exist, primarily for the sake of a distinctive look.

A quart of water weighs a touch more than 2 pounds. You can choose a smaller bottle to save weight. Just know your route well enough so you don't run out of water during a long ridge walk or other prolonged dry stretch.

Large-volume Containers

Most, if not all, large storage containers (3 quarts and larger) are constructed with BPA-free polyethylene. Some have rigid sides and are designed for campground use. Foldable models can hold a couple of gallons yet weigh just a few ounces, making them suitable for multiday backcountry use where a basecamp will be established.

A Parting Thought

A 2007 New York Times article reported that Americans consume more than 30 billion single-serving bottles of water annually. (Wow.) The nonprofit Consumer Recycling Institute estimates at least half, and probably closer to 75%, of these bottles turn into waste. That means they wind up in landfills, get incinerated or turn into litter. (Double wow.)

Those figures do not take into account the materials (petroleum being chief among them), production costs and transportation costs associated with plastic bottles. It all provides more incentive to find a reusable water bottle to carry with you on and off the trail.