

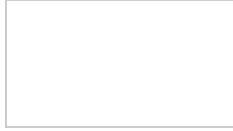
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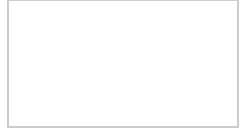
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GOOD THINKING

## Ultrasonic nozzle promises better cleaning with less water

By [Ben Coxworth](#)

[13 Comments](#) 

10:50 November 14, 2011



Prof. Tim Leighton and Dr. Peter Birkin with their ultrasonic nozzle

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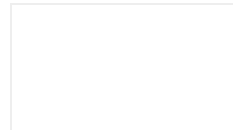
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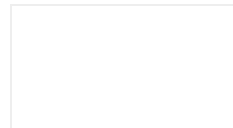
In many industries, such as [health care](#), food preparation and electronics manufacturing, cleanliness is of the utmost importance. It's important enough that huge quantities of water are used - and left tainted - in order to remove contaminants. While some groups have concentrated on creating better cleansers, a team of scientists from the University of Southampton have taken a different approach. They've created an ultrasonic tap nozzle, that allows the water itself do a better job at cleaning. The better that a given amount of water is able to clean, the less of it that needs to be used.

Developed by Prof. Tim Leighton and Dr. Peter Birkin, the nozzle generates ultrasound and bubbles, both of which travel down the water stream and onto the surface being cleaned. There, the bubbles enter nooks and crannies in that surface, removing extra material through shear forces. A high power setting can be used on harder surfaces, while a low power setting is better suited to the washing of softer things, like hands or foodstuffs.

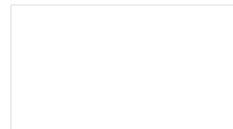
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When compared to a conventional pressure washer, the nozzle is much more efficient. It uses just 2 liters (half a U.S. gallon) of water per minute, as opposed to the 20 liters (5.28 gallons) used by a pressure washer, and 200 watts of power as opposed to 2 kilowatts. It is also gentler on surfaces, with a stream pressure less than one-one hundredth as strong as that of a pressure washer. Additionally, it generates a lot less airborne water droplets, that can carry contaminants to other surfaces.

Because the nozzle works with cold water, energy that would otherwise go into the heating of water is also saved.

Ultrasound is of course already used to clean items, in the [form](#) of ultrasonic water baths that items are immersed in. These baths can only clean objects that are small enough to fit into them, however, and leave those objects surrounded by the contaminants that have just been removed. They also cannot be used on delicate materials.

The [Southampton](#) ultrasonic nozzle has already been licensed to partners in a number of industries. A version designed for home use could be on the way.

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### About the Author



#### Ben Coxworth

An experienced freelance writer, videographer and television producer, Ben's interest in all forms of innovation is particularly fanatical when it comes to human-powered transportation, film-making gear, environmentally-friendly technologies and anything that's designed to go underwater. He lives in Edmonton, Alberta, where he spends a lot of time going over the handlebars of his mountain bike, hanging out in off-leash parks, and wishing the Pacific Ocean wasn't so far away.

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A classic Lefty myth is that water is 'used', and that we must all 'save water'. Apparently the water cycle has been left out of public school [science](#) curricula.

Manufactured guilt does not equal [environmental](#) responsibility. Greenies can have widespread support if they stay with actual concerns like disease or toxicity. These issues are real, don't have to be made up, and don't fly in the face of science like the 'water conservation' movement.

Water's abundance on the planet is as limitless as its ability to clean and purify itself. It is perpetual and is reused countless times. Flushing your toilet or washing dishes with half as much may fill some with pride, but it is merely a ritual to sell greenwashed crap like this.

The fallback argument is '...but the Third World has limited access to water!' Which is of course solved by something called infrastructure, not 'conservation' of our water on the other side of the globe. Duh.

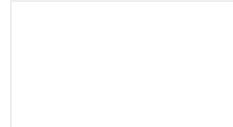
**Todd Dunning** - November 14, 2011 @ 11:56 am PST

@Todd

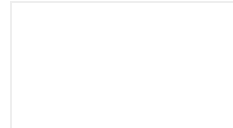
While high school science describes the water cycle and an endless loop, college level science teaches us that a given area has a limited quantity of water that is returned as fresh water that is usable by people. This fact is not



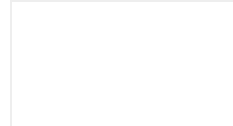
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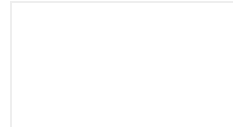
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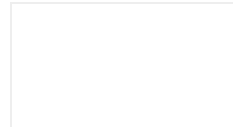
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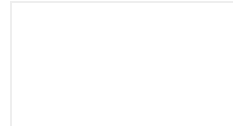
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contingent upon a nations development. The USA, China and Russia are all running into water shortage issues and if a shortfall occurs like a drought then water becomes very short. Some parts of the USA are water scarce to start with so wasteful water usage is just foolish.

I could regale you with tales of watching our reservoirs and lakes dry up and die during drought years but in the end what matters is that fresh clean water is a resource. Even if the water source were infinite it still costs money to build the water infrastructure to provide clean drinkable water, more money to purify each gallon or liter and deliver it to the consumer. This means that saving water is saving money and who couldn't use a little extra money?

 **VirtualGathis** - November 14, 2011 @ 12:49 pm PST

Todd Dunning: There are some places in the planet where water is indeed rare. Ever heard of a desert?

For those of us who are lucky enough to live in wet climates, water may not be rare, but CLEAN water is. While given time, nature can clean up after our mess, we humans have not been giving nature the adequate time and space to do so.

Oh, and solving the planet's water problems with 'infrastructure' takes another precious resource - energy.

 **Karen** - November 14, 2011 @ 12:59 pm PST

@Todd: Tell that to people in drought areas where water restrictions apply. And it's not just third-world countries - we had water restrictions in Sydney that lasted for about a year or more, due to low dam levels.

 **kufu** - November 14, 2011 @ 02:15 pm PST

@todd

Apparently, you don't live in California or anywhere with a worsening water shortage. It's easy to think that water is a limitless resource when you live in a wet place, but a lot of places are not wet.

The reality is that, once water is salty, it's very, very hard to make it into something humans can consume. Just ask an Israeli or anyone in Saudi Arabia how much effort that takes.

 **Chris Maresca** - November 14, 2011 @ 04:18 pm PST

They've housed it in a tin can with what looks like half of a rectal enema syringe hot glued to it. The guts are probably just pulled out of a \$20 ultrasound jewelery cleaner.

While this may be a fantastic idea and really work wonders...it seems like it would also make a great and easy DIY project!

 **Byron Brummer** - November 14, 2011 @ 06:34 pm PST

@Todd, I agree with everyone here but you, clean water is finite, keep listening to Faux news, lush limbaugh, anne coulter ad naseaum,, let me know how rinsing out your mouth with polluted water works for you, brake dust, salts, cow poop, pig farm runoff

 **Bill Bennett** - November 14, 2011 @ 07:27 pm PST

It's a Campbell's Soup tin hot-glued to a funnel and connected to a hose.

I guess the ultrasound vibrations conduct through the flowing water?

 **Grunchy** - November 14, 2011 @ 08:19 pm PST

The pressure washers I'm familiar with use 6 to 7 litres a minute, not 20 litres as stated in the article, however the 2 kW power figure is about right.

 **Wombat56** - November 14, 2011 @ 09:34 pm PST

@Todd

You must be getting paid to troll boards and talk political trash because that is one of the silliest things I have ever read.

Once we have vast abundant renewable energy, a large scale way to efficiently and cheaply desalinate and purify ocean water, than parts of what you wrote will be reasonable. Until then, learn something or troll elsewhere (whichever is proper.)


@Grunchy

It makes very small bubbles and propels them over the surface. I am not sure, but I would bet that the ultrasound is causing those bubbles to oscillate very quickly over the surface, turning them into micro-sponges.

 **chards** - November 14, 2011 @ 09:42 pm PST

6 comments and every one missed the point. Water purifies itself. Period. No need to 'conserve'. It always goes back into the ground or the atmosphere to purify itself again. But it does sell greenwashed products to OWS protesters to make them feel like they contribute something.

Besides, the oceans are all going to rise and drown us all in just a couple years due to capitalism.

 **Todd Dunning** - November 15, 2011 @ 12:44 pm PST

Todd said "Water purifies itself. Period. No need to 'conserve'. It always goes back into the ground or the atmosphere to purify itself again."

There is no magical 'purification' you speak of; the water cycle is the water cycle, and contaminants accumulate in large portions of it (rivers, silt, oceans, fish). While the duration of the water supply is effectively infinite, its rate, quality and availability is not predictable or consistent. At any given place and time, there is a finite amount of water available; to draw a parallel, there is (as far as any individual is concerned) an infinite supply of petrol/gas, but you can only drive so far on one tank. There are plenty of places where drinking river or rain water will make you ill if not kill you; so much for purification. Fresh water constitutes less than 0.3% of the available water we have, and over 1 billion people don't have access to clean drinking water, yet water usage has tripled in the last 50 years. It's the very infrastructure you're asking for that's causing the problem, yet you're suggesting more of it is the answer. 70% of fresh water is used by agriculture and industry, so a good way to improve the availability of drinking water is to reduce its consumption elsewhere, thus this invention is a good thing. While atmospheric water provides a large supply, ground water only provides a small amount - witness Cyprus (which doesn't get much rain) where aquifers were drained completely and water had to be brought in by ship from Turkey, with mains water being rationed to 1 day a week. Now tell me that's not a massive waste of resources that could have been avoided by lower consumption.

I can't think of any situation where using fewer resources to achieve the same result is a bad thing, yet you seem convinced otherwise. Your attitude is very much a clueless "let them eat cake". You probably drive a hummer too.

 **Synchro** - November 16, 2011 @ 12:58 am PST

Wrong again Synchro. I won't take the time to refute point by point and I also won't insult you personally.

The practically unlimited water on the planet, vast beyond comprehension, doesn't care how often you use it or how far you transport it. It can't be destroyed and it never goes away.

Hippies hope that adding water to their list of dwindling resources will give them additional ammunition against evil civilization, but water is the last thing that would qualify as a dwindling resource. You'll need a particle accelerator to destroy it.

If you lack water, you go to where it is or put some pipes in the ground. It's not as glamorous as posturing like a Greenie, but it gets the job done.

 **Todd Dunning** - November 16, 2011 @ 09:25 am PST

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