

# Magnetic Water Treatment Devices

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Magnet inside a plastic tube, a device sold with claims to treat water problems.

## What is a magnetic water treatment device?

Typically, these devices are permanent magnets or electromagnets that attach to waterlines entering homes and businesses to “purify” or “condition” water supplies. Manufacturers adopt a variety of commercial names for their products from the complex—“patented directional controlled magnet,” “Perm-core,” and “Magnetizer”—to the simple—“metal bar” or “plug-in treatment device.” Typically, the devices purportedly use electromagnetic fields to change the molecular makeup of various water constituents like calcium and iron to other more “inert” forms. The claimed result is a reduction or elimination of water contaminants.

One manufacturer describes the magnetic treatment processes this way, “Water and minerals are subjected to violent intramolecular vibrations and shock at the same time magnetic energy is being added, the mineral’s crystallization is upset and cohesion broken.” Sales representatives often persuade potential customers that they can rely on magnetic treatment devices to provide lifetime, energy-free home water treatment. New terms appear over time, such as “catalytic” water treatment (reviewed by [Lower 2013](#)).

## How much water treatment do magnetic devices provide?

There is virtually no valid scientific data to support any water treatment benefit from magnetic devices. Despite this, companies, sales representatives, and product brochures for the devices may make any one of the following claims:

- “Gives hard water properties of soft water”
- “Prevents water from forming normal chemical reactions that cause hard water scale, rust, and corrosion.”
- “Stops buildup of scale and rust and eliminates or reduces existing rust.”
- “Provides clean clothes, shiny fixtures, better health, and nice skin.”
- “Makes washing machines, dishwashers, and coffee makers run more efficiently thus avoiding costly repairs.”
- “Reduces hydrogen sulfide smells and iron buildups.”

Usually, printed testimonials from “hundreds of satisfied customers” support these claims.

## Is there any scientific evidence supporting manufacturer claims?

The claims put forth by manufacturers and sales representatives of these devices are without validity. They do not refer to standard physical, chemical, or biological water treatment processes. Therefore, several researchers have conducted performance evaluations of the equipment.

As early as 1977, Duffy (1977) concluded in a doctoral thesis that permanent magnets have no effect on the hardness of water or the formation of scales on pipes. The South Dakota School of Mines and Technology performed tests on several magnetic treatment units. Researchers concluded that there



was no change in the physical and chemical properties or the calcium ion concentration of water treated with the devices (Gruber and Carda, 1981).

A third study conducted in 1985 at Purdue University tested six units placed on water supplies for water heaters and tested their effectiveness against a controlled system. Water was tested for temperature, specific conductivity, surface tension, boiling point of depression, pH, alkalinity, total hardness, calcium and scaling effect. The study concluded that no significant variation in the chemical water quality existed between the control and the “treated” systems. The units also produced no measurable effect on calcium deposits on metals (Alleman, 1985).

Supported by this evidence, the Canadian Water Quality Association issued a statement in March of 1987 that magnetic water treatment devices are ineffective in treating hard water or preventing scale. In 2001, a task force established by the Water Quality Association (WQA, a trade organization of water treatment equipment dealers) published a [review of dozens of physical water treatment studies](#), and among their conclusions were the need for performance standards and that tests need to differentiate between industrial recirculating systems and typical home water use.

Many of the claims for physical water treatment relate to [water hardness \(calcium and magnesium content\) and water softening \(hardness reduction\)](#). Changes in scale formation and removal of calcium and magnesium are different issues. There is not a health-based standard for hardness. There is already an independent [certification for ion-exchange \(salt-based\) water softeners](#) (NSF/ANSI 44, which also addresses removal of barium and radium). Some drinking water treatment units are certified to have safe components (i.e., they won’t leach harmful chemicals themselves) but this is not the same as certification for removing a specific contaminant.

Consumers should have their water independently tested by an accredited lab, follow [tips for purchasing water treatment equipment](#), be [careful consumers](#), and test their water upstream and downstream of installed treatment equipment.

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