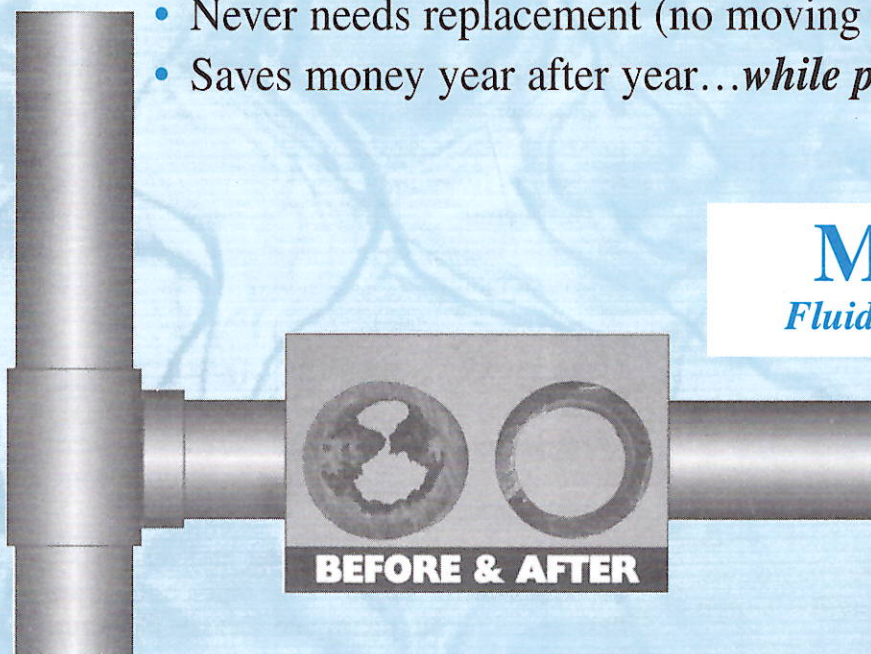


HARD WATER PROBLEMS?

BOILERS
COOLING TOWERS
HEAT EXCHANGERS
SPRAY EQUIPMENT
DOMESTIC WATER LINES

Magnetic Fluid Conditioning

- Prevents formation of scale build-up
- Removes existing scale
- Totally maintenance free
- Protects valuable equipment
- Saves energy with scale-free heat transfer
- Portable, easy to install (no plumbing or cutting of pipes)
- No electricity or maintenance to operate
- Never needs replacement (no moving parts to wear out)
- Saves money year after year...*while protecting the environment*



Magna-Tek
Fluid Conditioning Systems

THE HARD WATER PROBLEM

When hard water is heated or cooled, calcium / lime precipitates out of the water. Crystals from this precipitation are deposited in pipes and process equipment in the form of "Scale". Calcium and Magnesium salts primarily cause this Scale when the bicarbonate precipitates as calcium carbonate.

Scale build-up causes many serious problems to piping and related equipment in industrial, commercial, residential and agricultural applications. Scale problems greatly reduce operating efficiency and increase down-time.

HISTORY OF MAGNETIC FLUID CONDITIONING

The concept of magnetic fluid conditioning MHD (MagnetoHydroDynamics) is not new. The theory and practice have been used throughout Europe and Asia for over half a century. Industries and governments worldwide continue to study the effects of MHD.

Until recently, in spite of its elegance and simplicity, MHD technology has not enjoyed wide acceptance for several reasons:

1. Early magnets were not powerful enough
2. Magnetic effects on fluid dynamics were not clearly understood (*you can not optimize what you do not understand*)
3. Regardless of earlier design deficiencies, MHD products were marketed for fast profits with misleading claims.

Today, this simple, ecological and economical alternative to water treatment continues to gain popularity in Canada. When installed properly, Plant Engineers and maintenance professionals are amazed with the results they see within 30 - 60 days.

MAGNA-TEK'S DESIGN TECHNOLOGY

What's new?

Magnets: The use of high-technology, permanent, aerospace-quality, barium and strontium ferrite ceramic magnets are many times more powerful than previous magnetic systems.

Configuration: The configuration has been designed to 1) *strengthen the south pole (positive) field* which reduces and removes scale and 2) *eliminate the effect of the north pole field* which exhibits a negative, retarding influence that creates scale. All of our magnets are aligned with the **North pole away from the pipe and South pole contacting the pipe**. The South Pole provides a very strong positive charge so the water will not drop out the dissolved minerals to crystallize and form scale. In comparison, the North Pole

exhibits a negative, retarding influence that creates scale. Early users of bi-pole magnets to enhance water and fluids did not understand this concept and ended up using the wrong magnets and the wrong poles.

EFFECTS ON WATER AND SIMILAR FLUIDS

Prevents Scale Formation: When dissolved solids precipitate from the fluid, they form crystals of very low physical strength; a light powdery film forms rather than the hard scale from a tight lattice structure.

In the case of calcium carbonate, the crystal form becomes delicate aragonite rather than hard calcite. Both crystals have the same empirical formula, but their internal bonding and physical strengths are very different.

Removes Existing Scale: When the surface-charged particles are carried downstream into a scaled area, they collide with the scaled surfaces and progressively transfer their charge to the scale. This charge transfer interferes with the lattice bonding of the scale, converting it from a hard-as-rock material into a soft deposit with the consistency of peanut butter. This soft deposit is easily eroded by the passing fluid.



Surface Tension and Viscosity Reduced: Tests have shown that hard water, *after magnetization*, will have a lower "surface tension". This results in an immediate increase in flowability and water pressure, and it makes the water wetter. Magna-Tek systems accelerate reagent diffusion, making chemicals such as disinfectants, biocides, corrosion inhibitors, etc., more efficient and effective.

Density & Solubility Increased: Immediate better (silky) feel & *greater soapability* when washing. And *better taste* because the magnetic effect de-gasifies water, meaning it releases gases such as chlorine and sulfur, thus making for better taste.

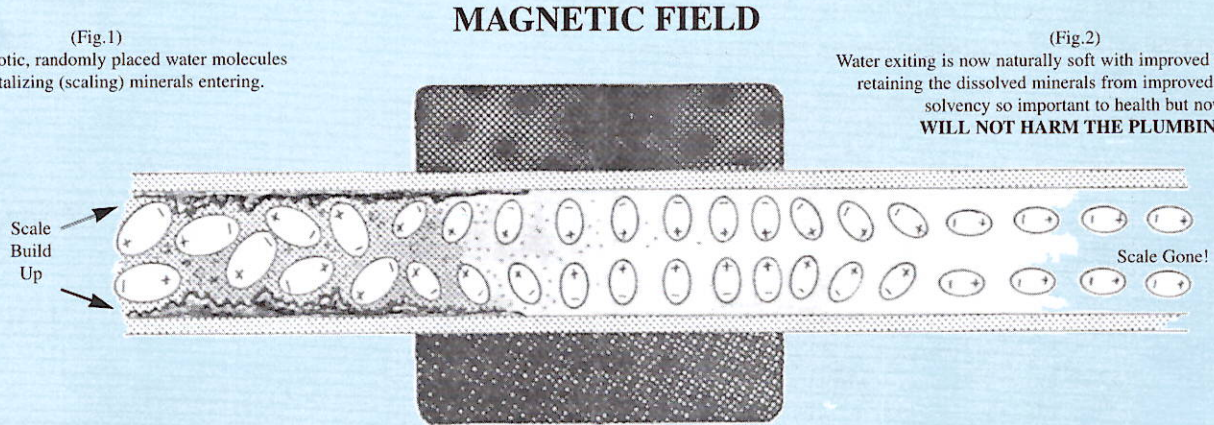
The magnetization of the water also reattracts the mineral deposits from the surface of the pipes, as described in above, thus descaling the pipes, and locking the natural minerals into the water for healthy consumption.

HOW DOES IT WORK?

When a conductive fluid passes through a magnetic field, an electromotive force is induced through the fluid perpendicular to the direction of fluid flow and the flux field. Polar water molecules are aligned along the flux or magnetomotive force vector, thus affecting the kinetics of crystallization of the minerals in the water. **Scale forming minerals stay in suspension. They no longer precipitate out of solution and form "hard" scale on the walls of pipes and equipment.**

(Fig.1)
Natural, chaotic, randomly placed water molecules with crystallizing (scaling) minerals entering.

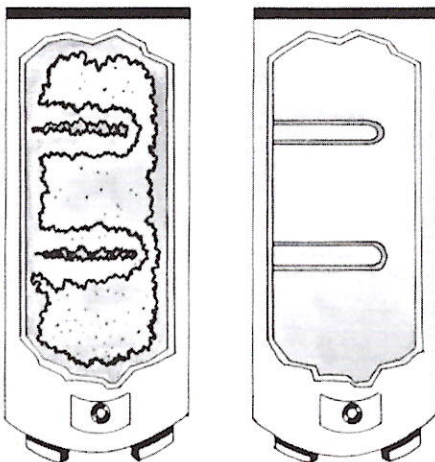
(Fig.2)
Water exiting is now naturally soft with improved flavour while retaining the dissolved minerals from improved molecular solvency so important to health but now **WILL NOT HARM THE PLUMBING**



Water is a "carrier vessel" of hard water minerals due to the naturally equal ionic (electric) charge between the minerals and the water. The minerals dissolve in the earth and are transmitted by the water to all parts of the internal surface of the plumbing where they scrape along to re-crystallize and reform the hard rock scale. (Fig. 1) This scaling is naturally progressed at all heating surfaces in the water heater. When water is magnetically charged, it electrically takes on a greater ionic charge than the minerals which creates a natural magnetic attraction between the two. The magnetization then attracts and locks the dissolved minerals into the water creating healthy and cost-free descaling. (Fig. 2)

Natural softening and better taste occurs from an actual reduction in the size of the water molecule. It is similar to a bucketful of rocks the size of pebbles versus the size of sand. The pebbles will bang around like rocks while the sand will pour like water. The small magnetized water molecule has a greater solvency and a magnetic attraction that results in cleaner bathing and washing which cleans and washes like soft water. This saves on soaps, shampoos, and detergents. The smaller molecular size also has less evaporative surface area which magnetically and dramatically reduces the gases and foul taste of sulfur, chlorine and fluoride, etc.

HARD WATER SCALE ROBBS YOU



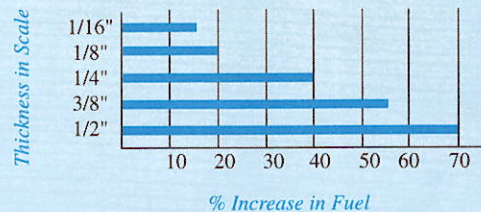
HOT WATER HEATER WITH HARDWATER SCALE BUILD-UP

HOT WATER HEATER AFTER MAGNA-TEK TREATMENT

SAVE MONEY

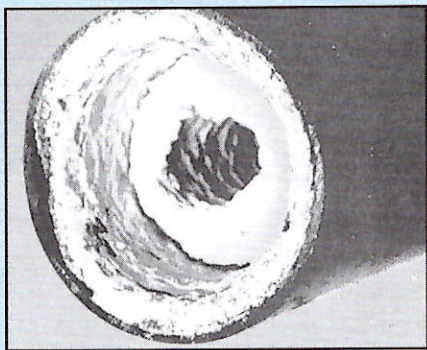
Hard water scale, coating and insulating the inside of your hot water heater or boiler is robbing you of **HUNDREDS OF DOLLARS YEARLY**, on your hot water heating bills...and thousands on your scaled home hot water radiator heating systems.

Scale Build-Up Costs

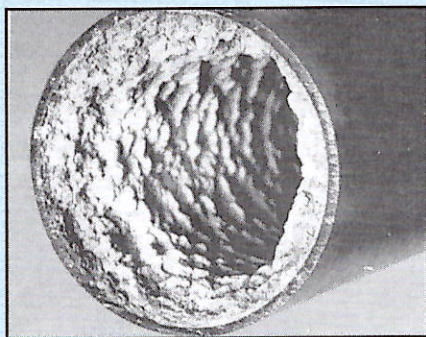


MHD SCALE CONTROL TECHNOLOGY

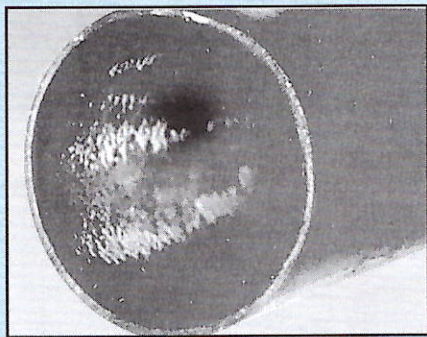
Proper Treatment can gradually remove existing scale from many systems



Typical scale and calcium build-up has almost closed this pipe



Effect of magnetically treated water a short time after installation



After continual treatment, most scale is removed

 *Increase system efficiency*

 *Reduce operating costs*

 *Protect the environment*

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Member of:

ORFA Ontario Recreation Facilities Association

PEMAC Plant Engineering and Maintenance Association of Canada