

HARDNESSTRAPP®

INTELLIGENT HARDNESS CAPTURE TECHNOLOGY

INTRODUCING HARDNESS TRAPP®

STOP SOFTENING WATER. START CAPTURING HARDNESS.

HARDNESSTRAPP® is an advanced, high-capacity hardness capture medium developed exclusively by **Watch Water®** – engineered from the ground up to selectively capture calcium and magnesium with exceptional efficiency, long service life, low pressure loss, and reduced regeneration costs.

THE SCIENCE OF HARDNESS

WHAT HARDNESS REALLY COSTS YOU

Water hardness is caused primarily by dissolved calcium (Ca^{2+}) and magnesium (Mg^{2+}) ions. When hard water is heated or concentrated, these minerals precipitate as calcium carbonate (CaCO_3) and magnesium hydroxide ($\text{Mg}(\text{OH})_2$) - forming hard scale on every surface the water touches.

THE SCALING REACTION



Dissolved calcium bicarbonate precipitates as hard, insulating scale

WHAT SCALE DESTROYS

- Scale formation
- Pressure loss
- Equipment failure
- Higher energy consumption
- Reduced heat transfer
- Membrane fouling
- Boiler damage
- Cooling tower fouling

THE HARDNESS INDICES

PREDICTING SCALE BEFORE IT FORMS

Hardness damage is not random - it is predictable. Water treatment engineers use established stability indices to predict whether a given water will form scale or remain stable, allowing treatment to be designed before damage occurs.

**NOT A WATER SOFTENER.
A NEW GENERATION OF
HARDNESS CAPTURE ENGINEERING.**

SCALING & STABILITY INDICES

Langelier Saturation Index (LSI)

predicts calcium carbonate scaling tendency

Ryznar Stability Index (RSI)

quantifies the degree of scaling or corrosivity

Saturation Index

measures how far water is from calcium carbonate equilibrium

Both temporary hardness (carbonate hardness, removable by heating) and permanent hardness (non-carbonate hardness) contribute to the total hardness load. **HARDNESSTRAPP®** is engineered to capture both - protecting every downstream system regardless of the hardness chemistry present.

HARDNESSTRAPP



PREMIUM QUALITY
MADE IN GERMANY

**FILTERSORB
FILTRATION
ADSORPTION
INSTANT PRODUCTS
OXY TREATMENT
SYSTEMS**



THE TECHNOLOGY

INTELLIGENT HARDNESS CAPTURE MEDIA

HARDNESSTRAPP[®] is not a conventional water softener and not a commodity product. It is a purpose-engineered Hardness Capture Technology - built on exceptionally uniform spherical bead geometry that optimises every aspect of performance that matters in a working system: water distribution, capture efficiency, hydraulic performance, regeneration efficiency, pressure loss, and salt consumption.

Manufactured solvent-free for a cleaner production footprint, **HARDNESSTRAPP[®]** delivers the exceptional capacity, mechanical stability, and chemical resistance demanded by both drinking water and heavy industrial applications.



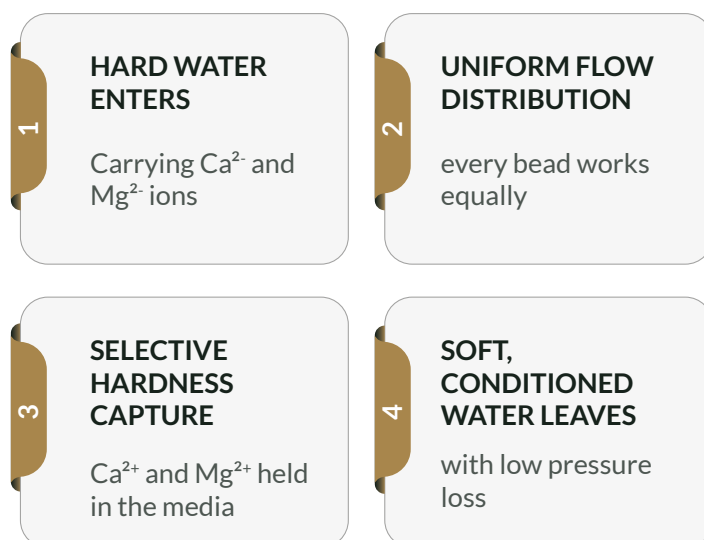
WHAT THE UNIFORM STRUCTURE PROVIDES

- ✓ Extremely high hardness capture efficiency
- ✓ Fast capture kinetics
- ✓ Long operating cycles
- ✓ Low hardness leakage
- ✓ Reduced salt consumption
- ✓ Excellent hydraulic performance
- ✓ Outstanding mechanical stability
- ✓ Superior chemical resistance
- ✓ Excellent resistance to repeated sanitization

HOW IT WORKS

THE HARDNESS CAPTURE MECHANISM

HARDNESSTRAPP[®] selectively captures hardness ions (Ca^{2+} and Mg^{2+}) while allowing clean, conditioned water to flow through. The functional capture sites within the cross-linked polymer matrix hold calcium and magnesium, releasing sodium (Na^+) in their place - delivering consistently soft, conditioned water.



During regeneration, captured hardness is released and the media is fully restored for the next service cycle - using less salt and less rinse water than conventional media.

WHY THE MECHANISM PERFORMS

- ✓ **Even flow distribution**
uniform beads prevent channeling
- ✓ **Strong capture sites**
high-capacity selective calcium & magnesium hold
- ✓ **Uniform utilisation**
the complete media bed works, not just part of it
- ✓ **Stable performance**
excellent kinetics and mass transfer
- ✓ **Clean water outlet**
conditioned water with minimal pressure drop
- ✓ **Extended service cycles**
high usable capacity reduces regeneration frequency and operating costs

PARTICLE ENGINEERING

WHY UNIFORM BEADS WIN

HARDNESSTRAPP® is manufactured to an exceptionally tight particle specification - a mean particle size of 0.60 ± 0.05 mm with a uniformity coefficient of ≤ 1.1 . This precision is what separates an engineered capture technology from a commodity medium.

- Reduced channeling
- Better flow distribution
- Consistent regeneration
- Controlled bed expansion
- Lower pressure drop
- Higher capture utilisation
- Lower hardness leakage
- Minimal fine migration

**UNIFORM BEADS.
BETTER PERFORMANCE.
LOWER LIFETIME COST.**

WHY IT'S DIFFERENT

ENGINEERED TO OUTPERFORM

Conventional softening media were designed for a simpler era. **HARDNESSTRAPP®** is engineered against every limitation of commodity media - delivering measurable advantages that compound over the full service life of the system.

Parameter	Conventional Media	HARDNESSTRAPP®
Capture Efficiency	Variable	Exceptionally high
Hardness Leakage	Higher	Extremely low
Salt Consumption	High	Reduced
Hydraulic Performance	Inconsistent	Superior
Uniformity Coefficient	Wide (≥ 1.4)	Tight (≤ 1.1)
Pressure Drop	Higher	Low
Service Life	Shorter	Long
Mechanical Strength	Variable	Excellent
Regeneration Efficiency	Lower	Optimised
Manufacturing	Solvent-based	Solvent-free

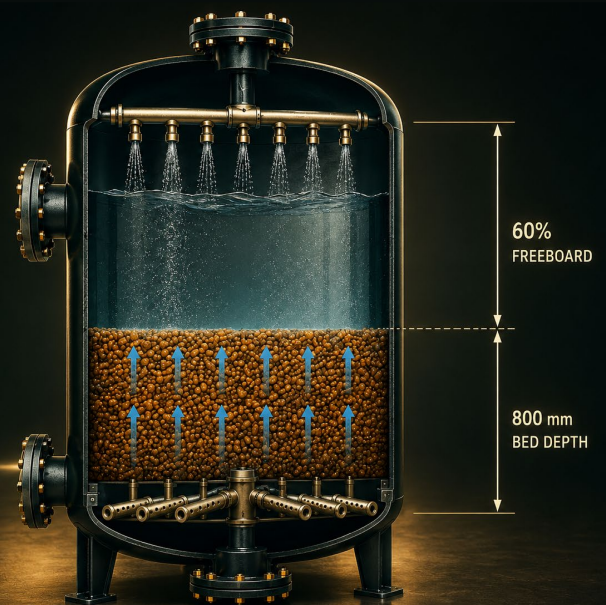
ENGINEERING ADVANTAGE

WHY ENGINEERS CHOOSE IT

Specifiers and system builders choose **HARDNESSTRAPP®** because every performance characteristic has been optimised for real-world operation - from the capacity that determines run length to the mechanical strength that determines service life.

- ✓ High capture capacity
- ✓ Extremely low hardness leakage
- ✓ Uniform beads
- ✓ Excellent mechanical stability
- ✓ Low osmotic shock resistance
- ✓ Excellent chemical & oxidation resistance
- ✓ Low salt consumption
- ✓ Low rinse water requirement
- ✓ Rapid capture kinetics
- ✓ Compatible with automatic valve systems

BUILT FOR PERFORMANCE DESIGNED FOR EVERY SYSTEM



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APPLICATIONS

BUILT FOR EVERY APPLICATION

From a single residential system to a municipal plant or a demanding industrial process loop, **HARDNESSTRAPP[®]** delivers the same reliable hardness capture performance - making it the medium of choice across the full spectrum of water treatment applications.

- | | | |
|-----------------|-------------------|--------------------|
| Drinking Water | Food & Beverage | Hotels & Resorts |
| Hospitals | Boiler Feed Water | Cooling Towers |
| Laundry Systems | Car Washes | Industrial Process |
| Municipal Water | Power Plants | Semiconductor |
| Textile | Chemical Industry | Mining |
| RO Pretreatment | Water Vending | |

SYSTEM SCALES

HARDNESSTRAPP[®] scales seamlessly across every system size and configuration:



Residential

homes, apartments,
well water, municipal
supply



Commercial

restaurants, hotels,
schools, offices



Industrial

boilers, cooling towers,
food & beverage,
manufacturing



Large systems

duplex, triplex, continu-
ous, and PLC-controlled
installations

ENGINEERING ADVANTAGES

THE COMPLETE ADVANTAGE SET

Ten engineering advantages, one medium - the reasons **HARDNESSTRAPP[®]** belongs on the desk of every engineer, consultant, OEM, and EPC contractor specifying hardness removal.

- | | |
|-------------------------|------------------------|
| ✓ High Capture Capacity | ✓ Oxidation Resistance |
| ✓ Low Hardness Leakage | ✓ Low Salt Consumption |
| ✓ Uniform Beads | ✓ Low Rinse Water |
| ✓ Mechanical Strength | ✓ Low Pressure Loss |
| ✓ Low Osmotic Shock | ✓ Long Service Life |

SELECTIVE CAPTURE
TECHNOLOGIES ENGINEERED BY
WATCH WATER[®]



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TECHNICAL SPECIFICATIONS

PROPERTY	SPECIFICATION
Product Name	HARDNESSTRAPP®
Technology	Intelligent Hardness Capture Technology™
Functional Chemistry	Sulfonic Acid Functional Groups
Matrix	Cross-linked Polystyrene
Structure	Uniform Spherical Beads
Ionic Form	Sodium (Na ⁺)
Appearance	Dark Amber / Dark Brown Beads
Mean Particle Size	0.60 ± 0.05 mm
Uniformity Coefficient	≤ 1.1
Bulk Density	840 g/L
Density	1.28 g/cm ³
Moisture Content	42 – 48 %
Total Capture Capacity	≥ 2.0 eq/L
Volume Change (Na ⁺ → H ⁺)	Max. 10 %
Operating pH	0 – 14
Max. Operating Temperature	120 °C
Shelf Life	2 Years
Storage Temperature	-20 °C to +40 °C

OPERATING CONDITIONS

Parameter	Recommended Value
Minimum Bed Depth	800 mm
Service Velocity	Up to 60 m/h
Backwash Velocity	10 – 12 m/h
Minimum Freeboard	60 %
Maximum Pressure Drop	200 kPa
Regeneration Type	Counter-current (preferred)
Regeneration Salt	Sodium Chloride (NaCl)
Salt Dosage (counter-current)	70 – 120 g/L
Regenerant Concentration	8 – 10 %
Regeneration & Rinse Flow	Approx. 5 m/h
Rinse Water Requirement	Approx. 4 bed volumes

THE TRAPP® TECHNOLOGY PLATFORM

ONE FAMILY. ONE PHILOSOPHY.

HARDNESSTRAPP® is part of the **TRAPP®** Technology Platform - Watch Water's family of advanced capture technologies, each engineered to selectively remove a specific contaminant. Every **TRAPP®** product follows one philosophy: capture the contaminant, protect the process, preserve the water.

HARDNESSTRAPP®
Captures Hardness

NITRATETRAPP®
Captures Nitrate

ACIDTRAPP®
Captures Acidity

SILICATRAPP®
Captures Silica

BORONTRAPP®
Captures Boron

AMMONIATRAPP®
Captures Ammonia

SUSTAINABILITY

- ✓ Reduced salt consumption & lower rinse water
- ✓ Lower wastewater generation & pumping energy
- ✓ Long operating life & lower carbon footprint



Standard Packaging

Packaging	Bag	Drum	Bulk Bag	Big Bag
Net Weight	25 kg	50 kg	500 kg	1,000 kg

★ Other packaging can be considered on request

