



GRANDER
REVITALIZED WATER



GRANDER® COMMERCIAL HEATING

LOOK AFTER THE WATER.

LOOK AFTER THE SYSTEM.

A different approach to cleaner heating circuits, lower operating burden and long-term plant protection.

WATER REVITALISATION FOR COMMERCIAL & COMMUNAL HEATING SYSTEMS

GRANDER® Water UK www.heating.granderwater.co.uk

THE COMMERCIAL PROBLEM & FINANCIAL OPPORTUNITY



THE WATER INSIDE YOUR HEATING SYSTEM MATTERS

A commercial heating system may contain hundreds or thousands of litres of water circulating through boilers, heat exchangers, pumps, valves, radiators and kilometres of pipework. In major hospitals, large estates and district-heating networks, system volumes can extend into tens of thousands of litres or significantly more across multiple circuits.

When that water deteriorates, the consequences can be felt throughout the system.



SCALE

Can restrict heat transfer and increase the energy required to achieve the same result.



SLUDGE & DEPOSITS

Can restrict circulation through pipework, radiators and heat exchangers.



CORROSION

Can attack valuable system components and contribute to failures, leakage and premature replacement.



MICROBIOLOGICAL ACTIVITY

Can contribute to biofilm, deposits and deterioration of system-water quality.

THE CONSEQUENCE?

MORE ENERGY.
MORE MAINTENANCE.
MORE INTERVENTION.
MORE COST.

1°C LOWER
CAN SAVE
5-10%
OF THE ANNUAL HEATING BILL*

SMALL CHANGES CAN HAVE LARGE FINANCIAL CONSEQUENCES

UK Government guidance states that reducing building temperature by just 1°C can save between 5% and 10% of the annual heating bill.

Across documented GRANDER® installations, users have reported maintaining the same perceived level of warmth at lower measured operating temperatures. In some installations, reductions of more than 1°C have been reported.

AND THAT IS ONLY ONE PART OF THE SAVING.

GRANDER® installations have also documented savings associated with improved heat transfer, cleaner system water, reduced deposits, lower chemical use and reduced maintenance.

These benefits can combine across the system. In a number of documented commercial and leisure installations, overall savings have exceeded 10%.

*The 5-10% figure is the UK Government benchmark for a 1°C reduction in building temperature. It is not presented as the maximum potential saving from GRANDER®. Actual savings depend on the system, operating conditions and the improvements achieved.

THE COST OF POOR WATER IS FELT ACROSS THE SYSTEM.



A DIFFERENT APPROACH

WHAT IF WE STARTED WITH THE WATER?

Conventional heating-water management frequently responds to problems by adding something to the circuit — inhibitors, biocides or other chemical treatments.

GRANDER® takes a fundamentally different approach.

NOTHING ADDED.

NOTHING REMOVED.

GRANDER® Water Revitalisation is a passive water-treatment technology installed directly into the heating circuit.

The system water repeatedly passes through the GRANDER® circulation unit as the heating system operates.

There are:

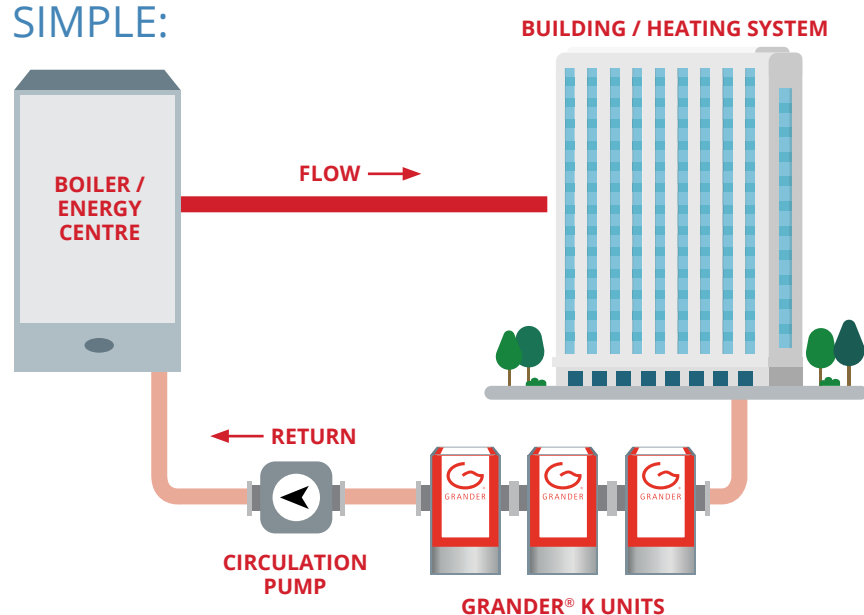
- ✓ **No electrical connections to the GRANDER® unit**
- ✓ **No chemicals added by GRANDER®**
- ✓ **No cartridges to replace**
- ✓ **No moving parts**
- ✓ **No routine servicing of the GRANDER® unit**



THE PRINCIPLE IS SIMPLE:

KEEP THE WATER IN BETTER CONDITION - SO THE SYSTEM CAN DO ITS JOB.

The GRANDER® circulation unit is normally installed in the return flow below 95°C, with sizing determined according to the individual installation.



WHAT GRANDER® IS DESIGNED TO SUPPORT

CLEANER WATER. CLEANER CIRCUIT. BETTER CONDITIONS FOR THE SYSTEM.

GRANDER® commercial heating applications focus on the conditions associated with:



CORROSION

Reducing the tendency towards corrosive conditions and the release of metals into the system water.



SLUDGE & DEPOSITS

Reducing the tendency for deposits and sediment to accumulate and restrict circulation.



BIOFILM

Supporting greater microbiological stability and reducing conditions associated with problematic biological growth.



HEAT TRANSFER

Keeping heating surfaces and circulation pathways cleaner so that the system can transfer heat effectively.



MAINTENANCE

Reducing the operational burden associated with deteriorating system-water quality.

A PASSIVE APPROACH WITH A LOW OPERATING BURDEN

GRANDER® ITSELF REQUIRES NO ELECTRICITY AND ADDS NO TREATMENT CHEMICALS TO THE WATER.

For organisations pursuing lower chemical dependency, reduced resource consumption and more sustainable building operation, that matters.

An empirical University of Graz study of industrial GRANDER® users highlighted that the technology operates without electricity or the addition of foreign substances and is service- and maintenance-free.

14 YEARS. THEN WE TESTED THE WATER.



In November 2025, water was sampled from a UK closed heating circuit that had been operating with GRANDER® Water Revitalisation for approximately 14 years without conventional biocide or corrosion-inhibitor dosing.

A Dynamika UK Limited representative attended the site, drew the water sample directly from the heating circuit and transported it to the laboratory for independent chemical and microbiological analysis.

THE RESULT?

COMPLIANT.

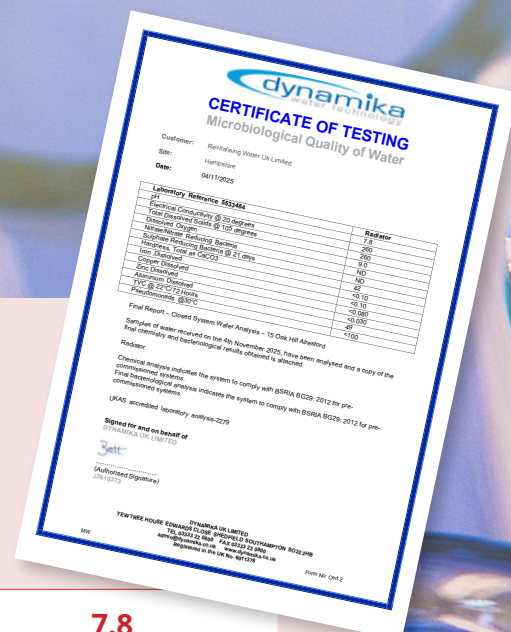
Dynamika's final report states:

“Chemical analysis indicates the system to comply with BSRIA BG29:2012 for pre-commissioned systems.”

&

“Final bacteriological analysis indicates the system to comply with BSRIA BG29:2012 for pre-commissioned systems.”

14-YEAR SYSTEM WATER - ACTUAL LABORATORY RESULTS



pH	7.8
DISSOLVED IRON	<0.10 mg/L
DISSOLVED COPPER	<0.10 mg/L
DISSOLVED ZINC	<0.080 mg/L
DISSOLVED ALUMINIUM	<0.030 mg/L
TOTAL HARDNESS AS CaCO ₃	42 mg/L
TOTAL VIABLE COUNT — 22°C / 72 HOURS	49 CFU
SULPHATE-REDUCING BACTERIA — 21 DAYS	NOT DETECTED
NITRATE/NITRITE-REDUCING BACTERIA	NOT DETECTED
PSEUDOMONADS — 30°C	<100

Laboratory Reference: 5533484. Sample date: 4 November 2025

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LONG-TERM PERFORMANCE IS WHAT MATTERS

Commercial heating equipment is not purchased for a season.

The question is what happens to the system year after year.

NOT JUST ONE SYSTEM.

WIGGER RESIDENTIAL COMPLEX - GERMANY

5 BUILDINGS | 158 APARTMENTS | GRANDER® HEATING CIRCUIT SINCE 2007

A GRANDER® circulation unit was installed across the heating circuits serving this five-building residential complex.

Repeated water analysis documented decreasing iron concentrations, while a 2009 analysis recorded a microbial count of zero. During later refurbishment, water remaining in replaced radiators was reported as clear and removed pipework showed no signs of rust.

No corrosion damage had been reported at the 2021 follow-up.



ENERGIE MÜNCHWILEN – SWITZERLAND

DISTRICT HEATING | GRANDER® IN LARGER NETWORK SINCE 2014

Following microbiological problems and fouling in an earlier district-heating project, GRANDER® Water Revitalisation was introduced into the circuit. Laboratory analyses subsequently reported biological clarification and stabilisation of the circulating water.

GRANDER® was incorporated into the larger district-heating project commissioned in September 2014. The 2024 seminar reports continuing stable operation across subsequent installations, supported by ongoing water monitoring.

LONG-TERM DISTRICT-HEATING EXPERIENCE.



PROVEN AT DISTRICT SCALE



ACSM PRIMIERO – ITALY.

23.6 MW TOTAL BOILER CAPACITY

– 16.1 MW biomass + 7.5 MW gas

47.8 KM – heating network

2,028 – users

1,166 – heat exchangers

22.5 GWh – thermal energy
sold in 2023

5 × K40 / DN100 – GRANDER®
units in the heating circuit

- IRON: 755 µg/L → 41 µg/L
- COPPER: 222 µg/L → <10 µg/L
- TOTAL ORGANIC CARBON (TOC): 3.53 mg/L → <1.5 mg/L
- pH: 9.3 → 9.5



Laboratory analysis approximately ten months after installation showed substantially lower measured iron, copper and total organic carbon, while pH remained within the referenced range.

THE BUSINESS CASE

DOES IT PAY?

A 2007 empirical study undertaken at the Institute for Innovation and Environmental Management at the University of Graz surveyed 32 industrial companies in Austria, Germany and Switzerland using GRANDER® technology.

The study examined effectiveness, economic benefit and user satisfaction.

84%

REPORTED SAVINGS ATTRIBUTABLE TO GRANDER®

27 of the 32 businesses stated that they had achieved savings attributable to GRANDER®.

1.3 YEARS

MEDIAN PAYBACK PERIOD

For the 19 companies where both cost and savings data were available.

The calculated mean payback was 1.8 years.

47%

PAID BACK WITHIN ONE YEAR

84%

PAID BACK WITHIN FOUR YEARS

Among the 19 companies for which payback could be calculated.

100%

SATISFIED OR VERY SATISFIED

Of the 31 businesses that answered the satisfaction question, none reported being dissatisfied.

WHERE WERE THE BENEFITS REPORTED?

The industrial users reported effects relating to:

- Chemical use
- Maintenance and cleaning
- Heat transfer
- Fluid life
- Corrosion
- Limescale
- Sludge
- Bacteriology

Across 74 assessments of operational problems identified by the businesses, 47% of the effects were rated "very good", 46% "good" and 7% "no effect".

SCIENCE, ENGINEERING & APPROVALS

RESEARCHED. TESTED. CERTIFIED.

FROM EXPERIENCE TO MEASUREMENT.

Modern analytical techniques are providing new ways to investigate the physical and microbiological behaviour associated with this form of water treatment — capabilities that were not available when Johann Grander began his work.

PEER-REVIEWED RESEARCH

CALCIUM CARBONATE / DOLLOP FORMATION

A peer-reviewed 2016 study investigated tap water exposed to weak magnetic fields with strong gradients using a water-core magnet system.

The researchers reported measurable changes involving the formation of DOLLOPs — dynamically ordered liquid-like oxyanion polymers — associated with calcium-carbonate nucleation.

The research provides a scientific line of investigation into how physical treatment can influence calcium-carbonate behaviour without chemically removing calcium from the water.

MICROBIOLOGICAL COMMUNITIES

Further peer-reviewed research published in Environmental Research in 2022 investigated the effect of sustainable magnetic treatment on microbiological communities in drinking water.

The experimental system used a GRANDER® Energy Rod Double, current model WDZK (formerly DZKL), producing weak magnetic fields with strong gradients, with microbial populations monitored using flow cytometry.

PRODUCT CERTIFICATION & APPROVALS

KIWA UK REGULATION 4 APPROVAL

CERTIFICATE 2606762

ISSUED: 07 JULY 2026

VALID UNTIL: 07 JULY 2031

Kiwa UK Regulation 4 approval covers the listed GRANDER® inline products under Regulation 4(1)(a) of the UK Water Supply (Water Fittings) regulatory framework.

The certificate appendix includes GRANDER® W and K inline models from DN10 to DN100, including the commercial K circulation range.

INDEPENDENT TESTING & VERIFICATION

DYNAMIKA UK LIMITED

Independent UK laboratory analysis of the approximately 14-year GRANDER® heating circuit.

BSRIA BG29:2012

The chemical and bacteriological results were reported by Dynamika as compliant with BSRIA BG29:2012 for pre-commissioned systems.

ÖNORM H 5195-1:2016

Heating-water quality standard referenced in the ACSM Primiero before/after assessment and other documented GRANDER® heating applications.

ECO CENTER – ITALY

Independent laboratory analysis of heating water from the ACSM Primiero district-heating installation following approximately ten months of GRANDER® operation.

YOUR HEATING SYSTEM IS DIFFERENT.

SO START WITH YOUR SYSTEM.

The business case for GRANDER® starts with the individual system, rather than assuming every building will deliver the same saving.

THE ASSESSMENT CONSIDERS:

- What is in the system now?
- What problems are being experienced?
- What does the system currently cost to operate and maintain?
- Where is there potential for improvement?

For larger or technically complex systems, water analysis can form part of the assessment and provide a baseline against which future changes can be evaluated.

The assessment also considers system configuration, pipe diameter, water volume, flow conditions, operating temperature and existing system condition.



START WITH AN INITIAL ASSESSMENT

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www.heating.granderwater.co.uk



REFERENCES / EVIDENCE

1. **Dynamika UK Limited** — Certificate of Testing, Laboratory Reference 5533484, 4 November 2025.
2. **Kiwa UK Regulation 4 Approval** — Certificate 2606762, issued 7 July 2026, valid until 7 July 2031.
3. **Katrin Zunkovič** — Water Revitalisation Using the Example of Grander® Technology: An Empirical Survey Among Industrial Users, Institute for Innovation and Environmental Management, University of Graz, 2007.
4. **GRANDER® documented heating case material** — Wigger residential complex, Energie Münchwilen AG district-heating installations, ACSM Primiero district-heating plant and Oberpullendorf kindergarten.
5. **Eco Center S.p.A.** — ACSM Primiero heating-water laboratory analysis, Test Report 20241100-01, June 2024; assessment material referencing ÖNORM H 5195-1:2016.
6. **Sammer et al., 2016** — Strong Gradients in Weak Magnetic Fields Induce DOLLOP Formation in Tap Water.
7. **Liu et al., 2022** — Investigation of the Effect of Sustainable Magnetic Treatment on the Microbiological Communities in Drinking Water, Environmental Research 213.
8. **UK Government energy-efficiency guidance** — 1°C reduction in building temperature and associated 5–10% annual heating-bill saving.