

HEATING SYSTEM PROTECTION AND COSY NATURAL WARMTH



GRANDER® IMPROVES HEATING

With GRANDER® the water in the heating system is better protected against corrosion – This benefits the environment and creates a cosy atmosphere in the living rooms.

Water is the source of life.

Water in its original form is the bubbling source of vitality and life force. However, when it is pumped at high pressure in closed pipes over long distances, it loses its power and life.

GRANDER® water revitalization restores water to its original structure and energy – with all its multiple positive effects on drinking and process water. Water encounters very difficult and unnatural conditions in heating circuits with rust formation being a major problem in the heating system. Oxygen-rich heating water often has a corrosive effect on heating pipes, boilers and fittings. The consequences of which are pitting corrosion, leakage and the formation of deposits. The heating water itself becomes brown or black and foul smelling.

Lime-scale deposits impair heat transfer. **A single millimetre of lime scale on the heat exchanger increases the energy consumption by approximately 6%.**

Out-gassing due to temperature increases, bio-film formation and oxygen intake are responsible for disturbing noises in the heating pipes. Fittings are waterproof, but not gas-tight.

Bio-film and sludge formations consist of a thin layer of slime in which bacteria, fungi, algae and dirt are embedded. Especially in underfloor heating systems where they lead to an overgrowth within the heating pipes and reduction in efficiency.



*The GRANDER® -
Effect*



GRANDER® BRINGS A BETTER QUALITY OF LIFE TO YOUR HOME THROUGH HEATING

The quality of our water influences both our equipment and the feeling of warmth.

The “chemical malaise”

By adding chemicals and various processing methods, an attempt is made to reduce technical difficulties. This has the unfortunate result of taking the last “spark” of vitality from the water. Generally poor water quality in heating systems not only has a negative influence on the equipment itself, but also on the living climate in the rooms heated. The warmth tends to be perceived as dull and uncomfortable.

GRANDER® works “naturally”

GRANDER® water revitalization restores the load-bearing capacity, vitality and self-cleaning power to the heating water. This results in the contaminated and usually foulsmelling heating water becoming clear and largely odourless again within a few months due to its regained self-purification power. This is associated with an economic benefit and noticeable positive changes in the personal living area.





Fotolia © Monkey Business

*GRANDER® effect:
is clearly visible
as in heating water*

- > GRANDER® devices work without electricity and without chemicals
- > Clean and odourless heating water
- > Decrease in the tendency to silt up through a significant reduction of bio-film formation
- > Reduction of microbial susceptibility
- > Reduction or stabilisation of corrosiveness
- > Reduction of the sedimentation tendency
- > Heating pipes, radiators, floor and wall heating are again free and continuous
- > Reduction of out-gassing as a result of reduced gas formation

*GRANDER® pays off
from the first hour*

- > Energy saving
- > Increased operational safety
- > Optimization of the operating parameters
- > Improvement in the degree of efficiency
- > Increased protection of the boilers with regard to technical problems
- > Optimisation of the current operating and maintenance costs

*Increased well-being through
natural warmth*

> The renewed vitality of the heating water ensures a naturally pleasant and cosy room climate.



GRANDER® MAKES YOUR HOME REALLY COMFORTABLE

*Increased well-being through a natural
and comfortable indoor climate.*

Revitalizing the heating water has a very positive effect on the indoor climate. The room climate is perceived as very pleasant and the warmth as comfortable. Customers say they feel totally wrapped up by the revitalising warmth and feel a natural soft luxury living in a home where the heating water is full of life and energy.

Just like air is present in water, water is in the air, which is heated and revitalised by radiators or under floor heating.

Cost saving by lowering the room temperature

Long-term users of GRANDER® heating revitalization report that the heating temperature can also be lowered by several degrees due to the more intensive heat sensation and its lingering capacity. This has enabled energy savings. Because: 1°C temperature reduction means about 6% energy savings.

The heating system usually accounts for about 80% of the energy costs in a home. Therefore, it makes sense to include all possible savings steps, such as installing GRANDER® water revitalisation in the heating system.



INSTALLATION AND DIMENSION GUIDELINES

Heating systems are closed water circuits, where, depending on the degree of utilization, the entire water volume circulates through the system several times a day.

As a rule, GRANDER® heating systems should be installed in the return flow ($T < 95^{\circ}\text{C}$).

Dimensioning depends on the individual structural conditions and is determined by the GRANDER® expert consultant during a personal visit.

Note :

Even when using GRANDER® water revitalization, the basic technical rules of the heating system must be observed: Possible additional technical measures may be necessary in individual cases. GRANDER® is also successfully used in large-scale projects, where the savings often pay for the investment in as little as 1–3 years.

GRANDER® Water and
Circulation Revitalization
for home and garden

On-site consultation

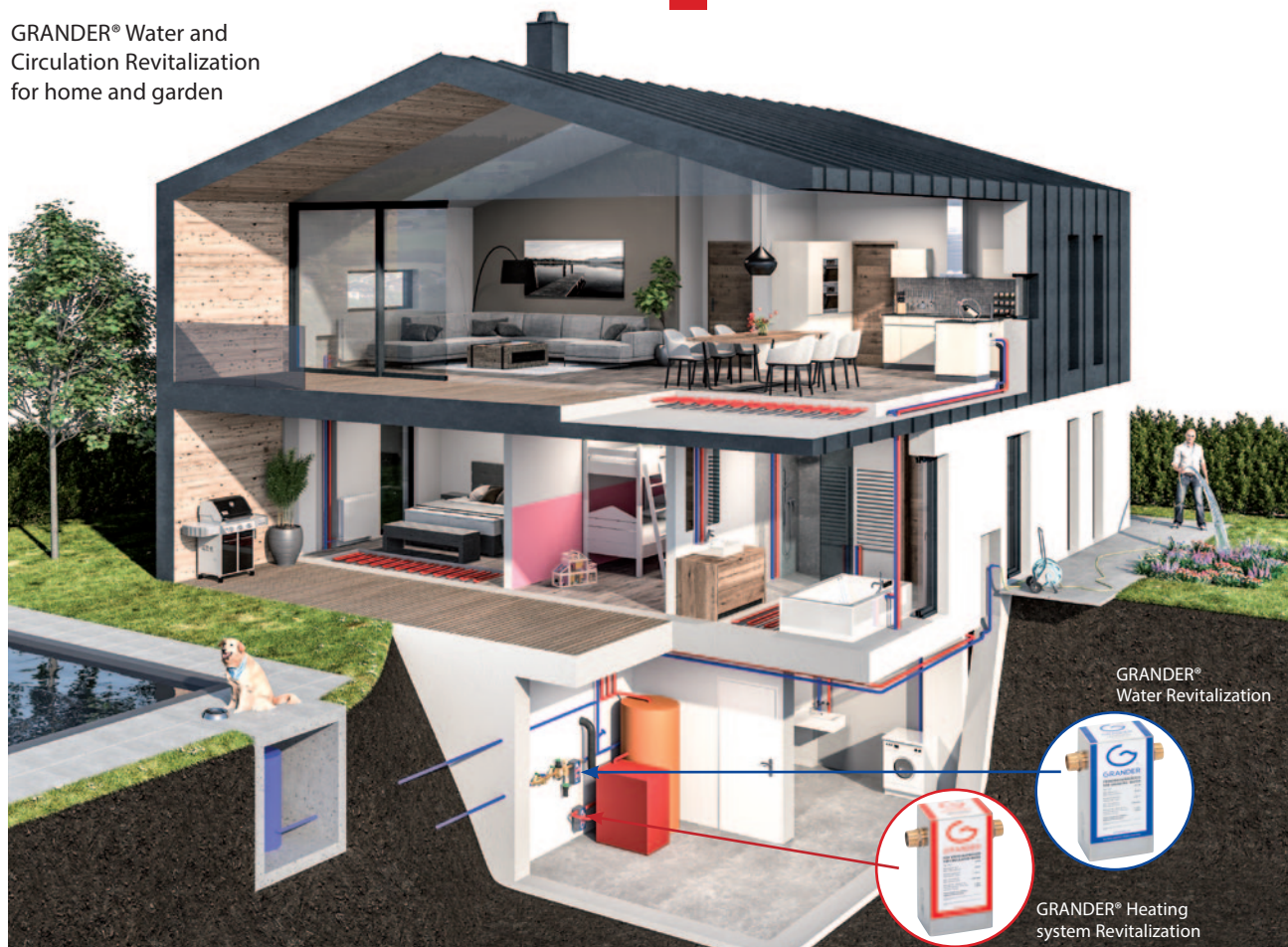
To optimise your heating system, you are welcome to receive a non-binding and free on-site consultation with a welltrained and competent GRANDER® expert advisor.

For complex technical problems, a chargeable analysis of the heating water can be carried out by an official research laboratory.

**Technical safety and reliability of
the heating system**

Increased well-being through revitalized heat

Cost reduction through energy saving



Garmisch-Partenkirchen/DE

HEATING IN THE WIGGER RESIDENTIAL COMPLEX

The heating circuit has been revitalized by GRANDER® since 2007

Already in 2001, GRANDER® Inline Units were installed to revitalize the drinking water in all five buildings of the Wigger residential complex in the German town of Garmisch-Partenkirchen. As the inhabitants' feedback was so positive, a further unit was installed to also revitalize the complex's heating system in 2007.

When so many people living in the residential complex reported back about the outstanding quality of their drinking water ever since the installation of GRANDER®, in 2007 a decision was made to invest in a four-inch GRANDER® Circulation Unit to revitalize the heating circuits of the complex's five buildings with overall 158 apartments.

In the following years, water samples were taken and analyzed several times to check and document the heating water's quality. The analyses found that throughout the observation period, the iron concentration continuously decreased, which has had a positive impact on corrosion protection. An analysis in 2009 furthermore revealed that the heating system's microbial count was zero. This also means that there were zero E. coli or coliform bacteria in the heating circuit.

Years after its installation, property manager Christian Wackerle is still full of praise for the circulation unit when asked about its effects in spring of 2021: 'Getting a GRANDER® Circulation Unit for our heating circuit has really paid off. As the system is now less susceptible to deposit formation, there is less rust and lime, which damage the facilities in the long run. As a result, the heating circuit operates effectively and reliably, saving the apartment owners quite a bit of money and ensuring their peace of mind.'

This is also the case because several radiators were exchanged for new models in the past years. During the replacement, it was found that the heating water remaining in the radiators was clear and free of any contamination. Also some heating pipes were exchanged because of refurbishment work, and none of them showed signs of rust. In fact, there has not been a single report of damage to the heating system due to corrosion throughout the whole residential complex so far. The revitalized heating water has also markedly improved the atmosphere in the apartments. The inhabitants of the Wigger residential building say that the atmosphere is very comfortable and the warmth provided 'extremely cozy.'



Oberpullendorf/AT

INDOOR CLIMATE IN THE KINDERGARTEN IMPROVED

Thanks GRANDER® drinking water quality in the heating

The parish kindergarten in Oberpullendorf, having relied on GRANDER® water revitalization for many years now, reports: thanks to GRANDER®, the heating water has been crystal clear and has met drinking water quality requirements since 2004!

The conditions in heating systems put a strain on the water used in them, and this is particularly true for floor heating systems. Slimy deposits often accumulate in the loops installed in the floor or the walls. What is more, the water is rarely heated above 40 °C in such systems. These are perfect conditions for bacteria to thrive: heating water turns murky and foul-smelling and accumulations reduce the throughput of the pipes. As a result, heat emission is reduced and in extreme cases the whole heating system can break down.

To protect the facilities, save energy, and improve the room climate, the heating system of the Oberpullendorf kindergarten was fitted with a GRANDER® unit in 2004.

An analysis of the heating water more than fifteen years after the installation revealed that the heating water is still crystal clear and has drinking water quality! Ever since the installation of a GRANDER® Circulation Unit in the kindergarten's heating system, the heating water has been closely monitored. The various analyses conducted show that **all chemical and chemical-physical parameters checked not only satisfy the requirements of the ÖNORM H 5195-1**

standard of the Austrian Standards Institute, they also meet the quality standards set by the Austrian Drinking Water Regulation.

The GRANDER® Inline Unit restores the transport capacity, vitality, and self-cleaning properties to the heating water. Having regained its natural power to self-clean, the dirty and often foul-smelling heating water turns clear and mostly odorless in a matter of only a few months. This not only results in cost savings but also prompts a palpable and positive change in the heated rooms.

There are few areas where the GRANDER® effect shows as clearly as in heating water. The samples taken from the Oberpullendorf kindergarten's heating system prove that GRANDER® starts paying off from the moment it is installed:

- > Makes for clean and odorless heating water
- > Lowers risk of silt deposits as biofilm formation is considerably reduced
- > Reduces susceptibility to microbial contamination and corrosion
- > Lowers susceptibility to deposit formation: improves throughput of heating pipes and radiators as well as the piping of floor and wall heating systems
- > Saves energy
- > Increases heating efficiency
- > Creates a pleasant room climate
- > Optimizes operating and maintenance costs



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Münchwilen/CH

VITALIZED SUCCESS STORY OF THE WOOD CHIP HEATING

GRANDER® clarified polluted and silted circulating water

GRANDER® made contributions to the following two projects: the 'Murgtal wood chip heating plant' project was kicked off in 2011, but after only a few months of operation, contaminations in the plate heat exchanger started causing problems. Chemical, physical, and microbial analyses showed that the contaminations were caused by microbial factors.

Based on the vast experience gained in many years of advising customers on biological problems of industrial and heating system applications, we recommended the installation of a GRANDER® Circulation Unit in the heating plant, which would be able to solve the issues without water exchange.

Laboratory analyses proved the effectiveness of this approach: GRANDER® water revitalization cleaned and stabilized the heating plant's water in a visible and measurable way.

As a result, a GRANDER® Circulation Unit was installed from the very beginning in a new communal heating system that was set up and put into operation in September 2014. Once completed, this second project will be considerably larger than the 'Murgtal' project. In addition to single-family and apartment

buildings, it also supplies energy to the industrial company Diversey AG, which operates commercial facilities and a restaurant on its premises. When this heating system was put into operation using demineralized water, it took only 14 days until a considerable amount of foul-smelling silt deposits had formed. The industrial heating grid had been connected without rinsing or exchanging the water and due to the high solubilizing capacity of GRANDER® water revitalization, the silt deposits in the piping system had started to come off.

As GRANDER® water revitalization triggers the circulation water's organic purification properties, no further measures were necessary besides the use of a pH buffer solution to gradually clarify the smelly and silty water. The project support team regularly takes samples and confirms that the circulation system's water was fully and sustainably cleaned.

GRANDER® Circulation Units stabilize circulation water in a sustainable way, as a result of which no buffers or inhibitors are needed. For operators, this means increased efficiency and also a vital contribution to environmental protection.



Alta Badia/IT

A COZY AND WARM HOME FOR THE FISTILLS

Clear water has a positive effect on the utility bill

The Fistills first heard about GRANDER® water revitalization from a friend, who highly recommended it. In 2017, the South Tyrolean family decided to get GRANDER® for their home in La Villa/Alta Badia in the Badia Valley.

In the small village of La Villa, numerous family and hamlet names somehow refer to water. One example is the Funtanacia hamlet, whose name is related to the Ladin word for 'fountain.' By a twist of fate, this is the very hamlet that is home to the Fistill family. Also the Fistills' name has a connection to water as 'fisti' means 'well.'

It is important to the Fistills to have fresh, high-quality water in their home. But as opposed to their ancestors, who relied on their own well, their water comes from the tap.

Following a family friend's recommendation, the Fistills brought GRANDER® to their home to revitalize both their drinking and heating water — and they are exhilarated about the effects, reporting about tap water with an exquisite taste and also pronounced effects in their heating system!

For many years, their home's old pipes had clogged up time and again. As a result, the house was not heated efficiently. Biofilm and silt are formed by slimy deposits containing bacteria, fungi, algae, and other contaminants. Such deposits are particularly a problem in floor heating systems, where they impair the heating effect. This also results in higher costs.

GRANDER® restores the transport capacity, vitality, and self-cleaning properties to heating water. Also in the Fistills' home, lime deposits dissolved due to the revitalization of the heating water. Now, the house can be heated more effectively and efficiently.

The heating water also turned clear and even lost its foul smell. The revitalized heating system has thus lowered operation costs and markedly improved the atmosphere in all rooms.





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