



DEPOSITS OF CALCIUM CARBONATE (LIMESCALE)

Limescale accumulates as soon as hard water flows through pipes. It represents a foreign body on the wall of the pipes, creating massive problems. Its destructive effect on machine parts and equipment that come into contact with water is not to be underestimated either.

Typical problems that can be caused by limescale:

- Blocked pipework
- Loss of water pressure
- Build-up of rust on pipes that can lead to corrosion
- Bacterial growth in drinking water and process water
- Recurring repairs
- Loss of energy in hot water circuits, resulting in higher heating costs
- A need for aggressive cleaning agents, resulting in high costs
- Faulty machinery – declining productivity caused by more frequent maintenance

“A heating rod with only one millimetre of limescale incrustation results in 10% higher energy costs. The energy consumption increases by over 40% with one centimetre of incrustation.”


(Source: DFLW, Deutscher Fachverband für Luft- und Wasserhygiene; Test report, ZELMIT TU Berlin)



WATER HARDNESS

Water hardness	ppm Unit per million (mg/l)	°dH General Hardness
very soft	1 - 70	1,0 - 4,0
soft	71 - 125	4,1 - 7,9
moderately hard	126 - 250	8,0 - 14,9
hard	251 - 500	15,0 - 21,9
very hard	501 and higher	22,0 and higher





An electromagnetic field is generated by an induction pipe in the **STAP** process. So-called submicroscopic clusters of the ions dissolved in the water are formed by stimulation of the coil current of the electromagnetic field induced by the **STAP** process.

These clusters act as crystallisation nuclei and – especially when the fluid is heated up – cause calcium carbonate to precipitate in the form of suspended particles. This represents a process that competes with calcium deposition on the inner walls of pipes, boilers and machine parts.

As the **STAP** process continues, more ions from the water accumulate on these crystallisation nuclei caused by precipitation, which can lead to a considerable growth of these suspended particles, depending on the duration of the electromagnetic effect.

This process takes place throughout the entire volume of water. The crystal nuclei thus formed act as crystallisation centres in places of raised supersaturation and, thanks to their growth, succeed in significantly reducing supersaturation. In addition to transforming the molecular structure of constituents – for instance in calcitic molecules – the **STAP** process is also capable of preventing further deposits.

The crystallisation nuclei formed bind more calcium from the limescale deposits dissipating it as amorphous precipitation. This process continues until the surface is free of deposits. A thin protective layer is formed once the limescale deposits have been dissolved, which is produced by the amorphous surface of the crystals reacting with the metallic surface. As soon as the thin protective layer has formed it no longer grows.

I would be happy to confirm that the scientific findings we have conducted by means of transmission electromicroscopy included in the images and text in your product data sheet, are correct and have been accurately reproduced.

-- signed Dr. Dirk Berger

Extract from a letter from the Technical University of Berlin, ZELMI – Centre for Electron Microscopy, Dr. Dirk Berger.

WE HAVE THE RIGHT SOLUTION FOR EVERY PROBLEM



profi-® 800



Induction pipe



Aqua-Split



Filter unit



mobile-400®

Our product range can be easily combined to deal with any situation in your building or business. The kit always comprises an **-profi-® control unit** – with the size based on the imperial size of your water pipe – and one of two induction pipes. The induction pipe is replaced by a turbo pipe in industrial applications, which also enables larger volumes of water to be successfully treated.

The **filter unit included with the Aqua-Split** is another key component of the system. This system generates a high level of turbulence and needs to be integrated if you use catering coffee machines, dishwashers, ovens and convector ovens in your company, as it protects these sensitive units very effectively against limescale.

We have developed the **KF-mobile-400®** specifically for premises that are only rented, such as petrol stations, food stands or transport solutions. It is simple to integrate, as all the components, including the control unit and induction pipe, are housed within a splash water-proof case.

THE -PROFI-® IN USE



Apartment block with 10 residential units, Würzburg region, Property management: Eichhorn Immobilien GmbH



Industrial business, Stuttgart

The turbo pipe always replaces the induction pipe wherever larger volumes of water are moved.

The water is "denser" (molecular structure) and the flow velocity has decreased since we fitted the -profi.[®] 800. It is easier to handle the water, meaning that we also **consume less water**.

As there are no longer air bubbles in the water, it freezes more quickly – **saving energy and labour time**. The ice is harder, more compact and more stable.

We have less work and are really satisfied. The treated water is only used in the ice rink to top up the ice-making machines to build up the ice.

BENEFITS WITH ARTIFICIAL ICE TREATMENT

Ruhpolding Ice Rink

The -profi.[®] 800 has been installed in the Vita Alpina since 2013. Before it was commissioned, the pipes were very heavily calcified. The -profi.[®] 800 has dissolved the caked limescale and no additional deposits have been formed. There is **no longer a need for maintenance work**.

Installing the system means that we also **save heating energy**. The -profi.[®] 800 has been **working totally maintenance-free** since it was installed.

Charly Waldherr, Assistant Operations Manager of the Vita Alpina


BENEFITS IN WAVE POOLS

Vita Alpina
Water park & spa, Ruhpolding



Vita Alpina – Water park & spa, Ruhpolding

TECHNICAL DATA -PROFI-®



	400	600	800
Width	200 mm	200 mm	260 mm
Height	200 mm	200 mm	250 mm
Depth	100 mm	100 mm	150 mm
Weight	1.4 kg	1.5 kg	2.9 kg
Power consumption	10 VA	10 VA	25 VA
Mains voltage	115/230 V 50-60Hz	115/230 V 50-60Hz	115/230 V 50-60Hz
Rating	IP 54	IP 54	IP 54
Connecting cable	2.5 m	2.5 m	2.5 m
Ambient temperature	-10 °C to +30 °C	-10 °C to +30 °C	-10 °C to +30 °C
EC conformity mark	CE	CE	CE
Water hardness	8 dGH to 54 dGH	8 dGH to 54 dGH	8 dGH to 54 dGH
Boiler size	0-400 litres	0-1000 litres	0-3000 litres
Flow rate	0-3 m ³ / h	0-6 m ³ / h	0-15 m ³ / h
Residential units	up to 4	up to 20	up to 100
Use of induction pipes	1 no.	2 no.	2 no.
Installation location	One induction pipe in the cold water supply line	Two induction pipes in the cold water supply line, connected in parallel	Two induction pipes in the cold water supply line, connected in parallel

INDUCTION PIPE

	IR 15	IR 20	IR 25	IR 32	IR 40	IR 50
Pipe dimension	½ inch	¾ inch	1 inch	1¼ inch	1½ inch	2 inches
Width	356 mm	356 mm	365 mm	450 mm	490 mm	520 mm
Height	350 mm	350 mm	350 mm	450 mm	450 mm	450 mm
Depth	80 mm	80 mm	80 mm	80 mm	100 mm	100 mm
Weight	2.9 kg	2.9 kg	3.5 kg	3.6 kg	5.2 kg	7.0 kg

TURBO PIPE

	1½ inch	2 inches	2½ inches	3 inches	4 inches	5 inches
Overall length	720 mm	Custom-made The turbo pipe is always a non-standard solution				
Radius	430 mm					

AQUA-SPLIT

	DN 15/ 20 - 3	DN 25/ 32 - 3	DN 15/ 20 - 5	DN 25/ 32 - 3
Width	237 mm	358 mm	340 mm	658 mm
Division	3 sections	3 sections	5 sections	5 sections

FILTER

Width 200 mm, height 120 mm



 <p>Europäisches Patentamt European Patent Office Office européen des brevets</p>		
URKUNDE	CERTIFICATE	CERTIFICAT
<p>Es wird hiermit bescheinigt, dass für die in der Patentschrift beschriebene Erfindung ein europäisches Patent für die in der Patentschrift bezeichneten Vertragsstaaten erteilt worden ist.</p>	<p>It is hereby certified that a European patent has been granted in respect of the invention described in the patent specification for the Contracting States designated in the specification.</p>	<p>Il est certifié qu'un brevet européen a été délivré pour l'invention décrite dans le fascicule de brevet, pour les Etats contractants désignés dans le fascicule de brevet.</p>
Europäisches Patent Nr.	European patent No.	Brevet européen n°
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Patentinhaber	Proprietor of the patent	Titulaire du brevet
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<p>München, den Munich, Fait à Munich, le</p>		 Benoit Battistelli Präsident des Europäischen Patentamts President of the European Patent Office Président de l'Office européen des brevets
<p>26.10.16</p>		
<p>ENVA/C008 2011 010</p>		

6) Zusammenfassung

a) Die Auskristallisierung der mit dem STAP-Verfahren behandelte Wasserprobe

- enthält im wesentlichen amorphe Bestandteile der Element Ca, C, O (amorphes Calciumcarbonat ACC), die kettenförmig verwoben sind
- und
- enthält vereinzelt eingebettete Calciumcarbonatkristallite, die maximal 200 nm groß sind.

b) Die Auskristallisierung einer Probe desselben unbehandelten Wassers

- enthält 2 ... 7 µm große Partikel der Element Ca, C, O mit hohem Kristallisationsgrad (kristallines Calciumcarbonat Calcit, Aragonit oder Vaterit)

Bei den Untersuchungen handelt es sich nicht um eine einzelne punktförmige Analyse, sondern die Ergebnisse lassen sich auf der gesamten Probe erzielen.

Mit diesen Untersuchungen ist nachgewiesen, dass das STAP-Verfahren die kristalline Struktur der Auskristallisierungen von Wasserproben eindeutig ändert, indem fast alle Kristallstrukturen amorphisiert werden.

Eine differenzierte Analyse der auftretenden Calciumcarbonatkristalle war nicht Gegenstand der Untersuchung.





Summary and advantages:

- Prevention of limescale formation throughout the water network.
- Degradation of previously formed limescale deposits
- Formation of a protective layer on the inner wall of the pipe
- Reduction of energy costs
- No use of chemicals necessary
- Maintenance-free operation of the system
- No maintenance costs
- Small installation size
- Very low power consumption
- Noiseless operation of the system
- Offers unchanged good drinking water quality
- More compatible water for skin and hair
- Better taste for beverages, e.g. coffee
- Confirmed effect of the Technical University in Berlin, Germany
- Guarantee of 2 years



Export – Import & Business Development Projects
organisation – planning – execution



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Our Passion Belongs To People

