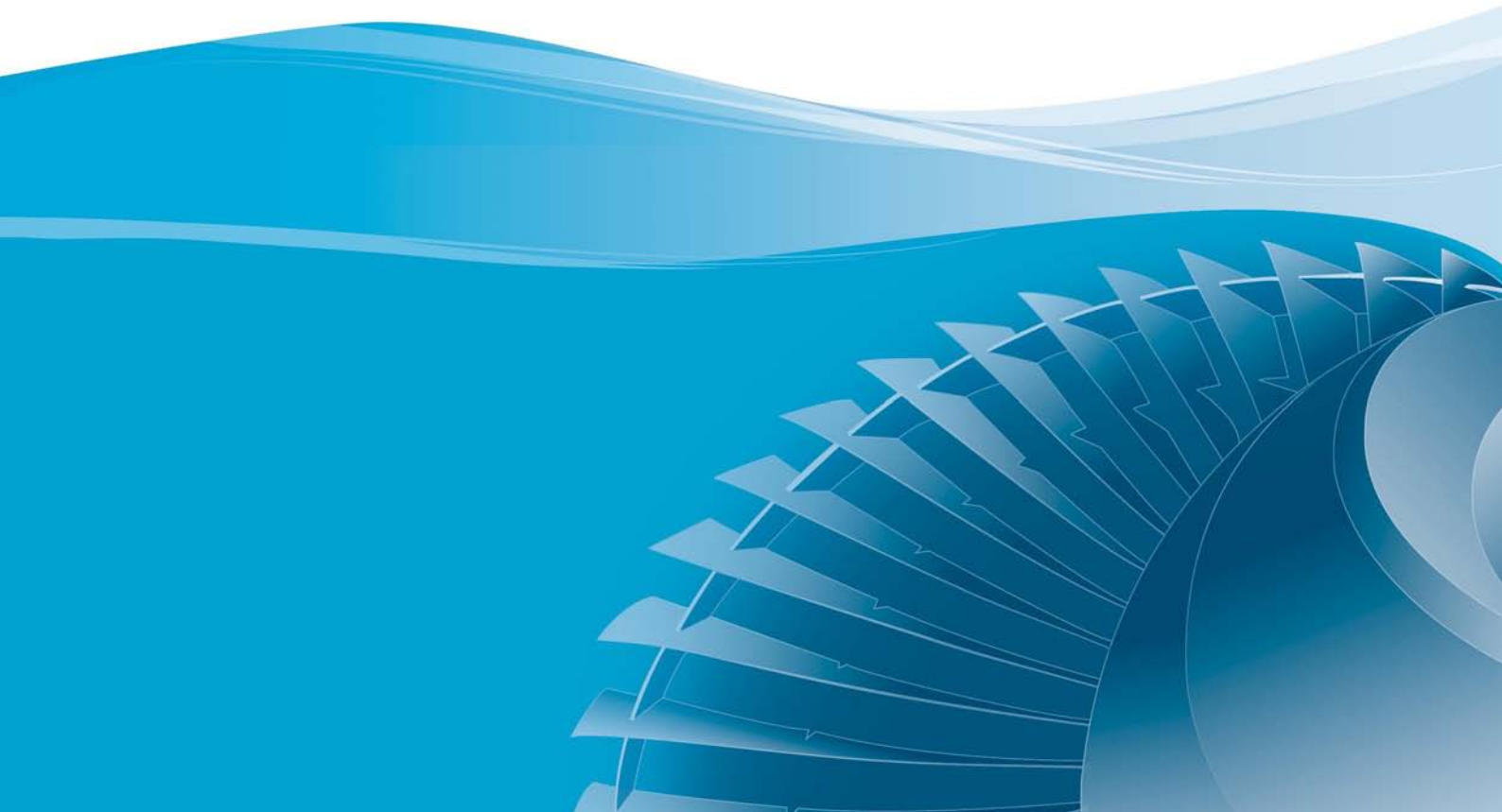


HELAMIN®

SUCCESSFUL, ECONOMIC & ECOLOGICAL CORROSION & SCALING INHIBITORS SINCE 1986



The environmentally friendly alternative to conventional treatment with hydrazine and phosphates in:

- water-steam circuit
- hot water systems
- district heating networks
- cooling circuits

Reliable protection against corrosion and deposits

These environmentally friendly products can be applied in compliance with European feedwater guidelines (VGB, VdTÜV, ...)

Function

HELAMIN contains an amine which is adsorbed to the boiler or pipe surface and forms a membrane; in this way the metal is protected against corrosion while deposits are prevented to a large extent.

HELAMIN application

A *HELAMIN* solution is dosed into the feed water upstream of the feed pump. A higher initial concentration is necessary in order to build up the protective membrane. Follow in this respect the *HELAMIN* representative's instructions.

Analysis

A simple test is available which measures the *HELAMIN* concentration left in the bulk solution, thus ensuring economical use.

Behaviour at high temperatures

HELAMIN contributes to build-up a protective magnetite layer. Indeed, it has been proved that *HELAMIN* improves the structure of the magnetite layer and increases the protective effect. Thermal and oxidative decomposition haven't been found to form toxic products.

Toxicological evaluation

HELAMIN is tested in accordance with the legislation on chemicals and in compliance with OECD principles. Its toxicity lies around the less poisonous limit.

HELAMIN is not a product classified as dangerous to the environment. It is Class 3 as per DIN 1988 Part 4 and is therefore suitable for heating circuits, notably heating drink water pipes (single layer heat exchangers).

Water danger class 1 or 2 (WGK).

Eco-toxicological behaviour of *HELAMIN* in water

All the relevant physical and chemical information, protective measures and handling instructions are listed in the EU safety data sheets. Information on toxicology and additional data on ecology in accordance with OECD guidelines 202 and 203 are also given.

Tests results

The results of many years of research and development activities and excellent results of field tests are available on request.



How *HELAMIN* works

HELAMIN is essentially formulations consisting of polycarboxylates and surface-active fatty alkyl polyamines in combination with other amines of varying volatility.

The use of *HELAMIN* to treat water and steam carrying systems, such as water/steam and heating circuits, has many advantages over conventional conditioning which often requires several substances to be added at various locations and needs regular monitoring.

In the boiler water of steam generators the polyelectrolytes have a synergetic effect. The polycarboxylate (as sodium salt) causes at every temperature an alkalisation because of hydrolysis. As a polyelectrolyte it has greater affinity to bivalent cations (e.g. Fe^{2+} or Ca^{2+}), like a weak acidic ion exchanger. Hence, quite stable calcium or iron salts are formed which can be removed by blow down. At the stoichiometric limits any residual hardness is kept in solution.

Any additional quantities are sequestered, suspended and dispersed, i.e. prevented from crystallising and therefore from forming scale, or any other deposits. The polyamine has a greater propensity to be adsorbed at the interfaces.

In addition to the corrosion-protecting effect of the membrane, it also prevents calcium carbonate crystals from growing on the material surface, especially in the area of the heat transfer. Corrosion products which are transported into the boiler are also prevented from accumulating and any existing deposits can be gently removed. If used in steam generators, warm and hot water networks, superheaters, turbines and cooling systems, *HELAMIN* is an efficient, economical and ecological solution to the difficult problem of corrosion and scaling.

The *HELAMIN* range of conditioners provides additional safety thanks to preventive surface protection - the key to successful and economic operation of your systems.



The advantages of *HELAMIN*

- Use of a combination of environment-compatible agents in a patented formulation
- Affects the structure of the protective magnetite layer in the boiler so to increase protection
- The system is protected against corrosion as a membrane is formed
- Gentle removal of existing scaling from calcium carbonate and corrosion products
- Economical and ecological alternative to water conditioning
- The salt content of boiler water is not increased
- Reduction of boiler water blow-down rate
- Disperses dirt, mineral salts and iron oxide
- Alkalises the entire steam system including condensate recirculation and feed water systems
- Simple analysis for determining the *HELAMIN* content of the boiler water and condensate
- Energy-saving thanks to improved heat transfer

Use in water-stream circuits

Type	Physical Data	Composition and Effect
HELAMIN 9012 H For steam systems and hot water systems with demineralized feed water	pH = 12.5 Effective in water and in the steam phase up to 600°C	Mixture of polyamines and volatile amines which alkalis the condensate and feed water areas
HELAMIN 90 H-Turb For water steam circuits with demineralized feed water including a turbine		
HELAMIN 906 H For steam and hot water systems with dealkalized or softened feed water	pH = 12.5 Effective in water and in the steam phase up to 600°C	Mixture of polyamines and polycarboxylate in aqueous solution
HELAMIN BRW 150 H¹ For steam and hot water systems with dealkalized or softened feed water	pH = 12.5 Effective in water and in the steam phase up to 600°C	Mixture of polyamines and polycarboxylate in aqueous solution. VdTÜV approved for removing boiler scaling, Code 01 KG 50
HELAMIN HS 190 H For warm and hot water networks	pH = 12.5 Effective in water up to 200°C	Mixture of polyamines and polycarboxylate in aqueous solution
HELAMIN HAL-AO² For steam systems in the food industry	pH = 12.5 Effective in water and in the steam phase up to 300°C	Mixture of organic polymers, ammonium and oxygen scavengers

¹ VdTÜV controlled (approval n° 01/KG/150); HELAMIN BRW 150 H has an antiscaling effect

² Approval of the Swiss federal office of public health in Bern, and of the federal institute of food products analysis and research in Vienna.

Use in cooling systems

HELAMIN 9500 BF For cooling circuits and air humidifiers	pH = 3.5	Mixture of polyelectrolytes
HELAMIN RW 47 H For cooling circuits and air humidifiers	pH = 12.5	Mixture of polyamines and polycarboxylate in aqueous solution

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