



Water Treatment

Water
Treatment



Steam generators and condensate lines
Cooling towers
Domestic hot water



The use of water in industrial activities has an prominent role, both like real feedstock (for example in the alimentary sector in general, in the beverage industry and the chemical industry); both as process fluid when used as a means of transfer of thermal energy, as happens in the case of the production of steam by means of industrial boilers, or when it is used as a cooling fluid in systems such as cooling towers or cooling batteries.

The use of water is also essential in the civil sector, both for the normal human water needs, both for hygienic-sanitary uses, where it is used in large quantities, especially in large hotels and hospitals, as feedwater of thermohydraulic plants for the production of hot water.

The chemical-physical and microbiological characteristics of process water, represent a fundamental aspect to be checked previously to their use as feedwater for thermal and cooling systems because it is by some values of certain parameters that depends strictly on the good management and the correct operation of these systems: parameters such as hardness, alkalinity, pH, conductivity, dissolved solids, dissolved oxygen and carbon dioxide, the presence of microbiological pollution, etc., can in fact greatly influence the operation of a plant causing phenomena such as the formation of lime scale deposits, corrosion and, sometimes even, of silt and biofilm.

These phenomena can drastically affect the operation of the plants causing for example a low energy efficiency of the steam generators, the drilling of pipes and/or exchange surfaces of the plants or generating serious phenomena of bacterial pollution such as the development of very dangerous pathogens in the cooling towers (*Legionella Pneumophila*).

From the foregoing it is understood that it is essential, for optimum driving of the processes, to prolong the life of the plants and to preserve water resources, the use of chemical conditioning preparations for the treatment of primary water to be used as process water for boilers, cooling towers and thermohydraulic systems; and it is for these reasons that, to meet the needs of maintainers and conductors of plants, the research and development department of **AQUOS** has designed and produced some lines from specialized products, with different functional characteristics, for the chemical conditioning of industrial process waters and domestic hot water:

Aquozyme

Antiscaling, anticorrosive, alkalizing, deoxygenating, dealkalizing, passivating, dispersants, forming film and neutralizing for the treatment of steam generators and condensate lines

Aquotreat

Anticorrosive, antiscaling, dispersant, stabilizing for the treatment of cooling towers

Aquocide

Oxidizing and non-oxidizing biocides for cooling towers

Aquosil

Anticorrosive, antiscaling and sanitizers for the treatment of domestic hot water

Biosan

Sanitizers for the treatment of domestic hot water

Steam Generators and Condensate Lines








After the water, the steam is undoubtedly the service fluid most commonly used in the industrial sector as a means of transfer of heat energy. Its production is obtained by means of steam generators (or boilers) in which the heat generated by the combustion of a fuel is transferred to a liquid (generally water) which, reaching the boiling point, is transformed into steam which is transferred, by pipeline, to the various devices for different industrial uses.

As mentioned above, both the boiler, and in particular the surfaces that allow the transfer of thermal energy from the combustion chamber to the water, both the steam pipes and condensate lines (where the escaping steam by utilities condenses by cooling and is generally recovered and reintroduced in the boiler) can be affected by phenomena such as the formation of deposits of lime scale and corrosion, mainly resulting from the chemical-physical characteristics of feedwater; therefore, a good exercise of the boiler and auxiliary equipment and utilities, is not possible without an effective conditioning treatment of feedwater and condensate lines.




Our range of products **Aquozyme**, described in the table below, is the perfect choice to prevent these phenomena and ensure long term the reliability of the steam generator and all the steam plant, including machines, end users and condensate lines:

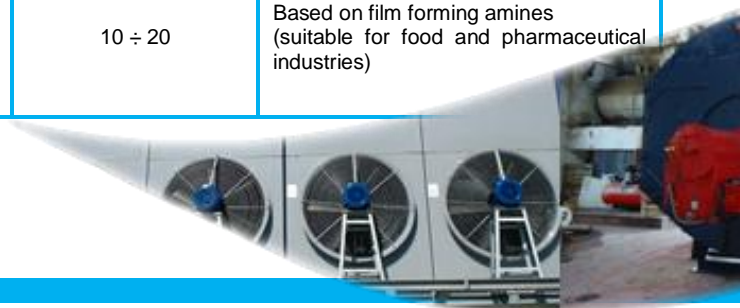
STEAM GENERATORS

Internal treatment

| Chemical | Features | Dosage (ppm) | Notes |
|--|---|--------------|---|
| Aquozyne 1224  | Antiscaling Anticorrosive Alkalizing | 2 ÷ 10 | Based on phosphonates and alkaline salts |
| Aquozyne 1225  | Deoxygenating Antiscaling Alkalizing | 2 ÷ 10 | Based on sulphite catalyzed (suitable for waters with average values of M alkalinity < 70 ppm) |
| Aquozyne 1226  | Deoxygenating Antiscaling Dealkalizing | 5 ÷ 8 | Based on sulphite catalyzed (suitable for waters with high alkalinity values) |
| Aquozyne 1323  | Deoxygenating Antiscaling Anticorrosive | 3 ÷ 8 | Based on ascorbate (suitable for food and pharmaceutical industries) |
| Aquozyne 1328  | Deoxygenating Antiscaling Anticorrosive | 3 ÷ 8 | Based on ascorbate and morpholine |
| Aquozyne 1329  | Deoxygenating Alkalizing Passivating | 1 ÷ 5 | Totally volatile based on DHEA, morpholine and cyclohexylamine (indicated for highly pure water) |
| Aquozyne 1330  | Deoxygenating Alkalizing Dispersant | 1 ÷ 5 | Totally volatile based on DHEA, morpholine and cyclohexylamine (energetic dispersant/cleaning action) |

Treatment of condensate lines

| Chemical | Features | Dosage (ppm) | Notes |
|--|-------------------------------|--------------|--|
| Aquozyne 1422  | Anticorrosive Film forming | 5 ÷ 15 | Based on polyphosphates |
| Aquozyne 1423  | Deoxygenating Neutralizing | 5 ÷ 15 | Based on morpholine (volatile) |
| Aquozyne 1424  | Neutralizing Film forming | 10 ÷ 20 | Based on film forming amines (suitable for food and pharmaceutical industries) |



In all industrial processes characterized by thermal cycles for the production of steam, there is often the need to remove the heat not used, or in excess, in order to avoid its accumulation which might cause problems to the same production process; this function is performed by the cooling towers.

In the cooling towers the water to be cooled falling from above met the air that rises upwards which, having a lower temperature than that of water and a low moisture content, in contact with this causes the evaporation of part of it, with subtraction of heat equal to the amount of thermal energy required for the transition from the liquid to the gaseous state.






Due to evaporation of part of the water coming from the process this last, inside the tubes of the tower, is concentrated with an increase in the content of mineral salts and the subsequent formation of deposits of suspended solids and scaling salts on the tower components, and in particular within the plate packs of heat exchange. This inevitably leads to an increasing clogging of exchange lamellar pack and, consequently, a decrease in the cooling capacity of the cooling tower as well as the occurrence of corrosion phenomena.

In addition, because of the temperature, inside of the cooling towers are generated microclimatic conditions that can favor the development of biofilms and microorganisms such as algae, fungi, iron bacteria, sulphate-reducing bacteria, etc., sometimes also particularly dangerous to human health as in the case of Legionella Pneumophila, responsible for Legionnaires' disease that, in about 10% of cases, can be fatal.

In order to avoid these phenomena, and ensure a long-term, reliable and hygienically safe operation of the cooling towers, **AQUOS** proposes the following ranges of **Aquotreat** and **Aquocide** products, designed and made respectively for anticorrosive, antiscaling, dispersant and stabilizing treatment and the biocide treatment of industrial cooling systems:




COOLING TOWERS

Antiscaling, dispersant, anticorrosive and stabilizing treatment



| Chemical | Features | Dosage (ppm) | Notes |
|---|--|--------------|--|
| Aquotreat 2172  | Antiscaling Anticorrosive | 2 ÷ 5 | With particular antifouling action for ferruginous disposable waters |
| Aquotreat 2402  | Anticorrosive Antiscaling Sanitizer | 30 ÷ 150 | Multifunctional product characterized by ease of management |
| Aquotreat 2492  | Anticorrosive Antiscaling | 0,5 ÷ 5 | Particularly suitable in cooling systems with high water exchange and high values of calcium hardness and total alkalinity |
| Aquotreat 2762  | Anticorrosive Dispersant | 20 ÷ 30 | Strong anticorrosive action for the presence of cathodic and anodic inhibitors balanced perfectly (indicated for circuits with complex metallurgy) |
| Aquotreat 2882  | Dispersant Anticorrosive Stabilizing | 30 ÷ 60 | Organic product characterized by a vigorous cleaning action |

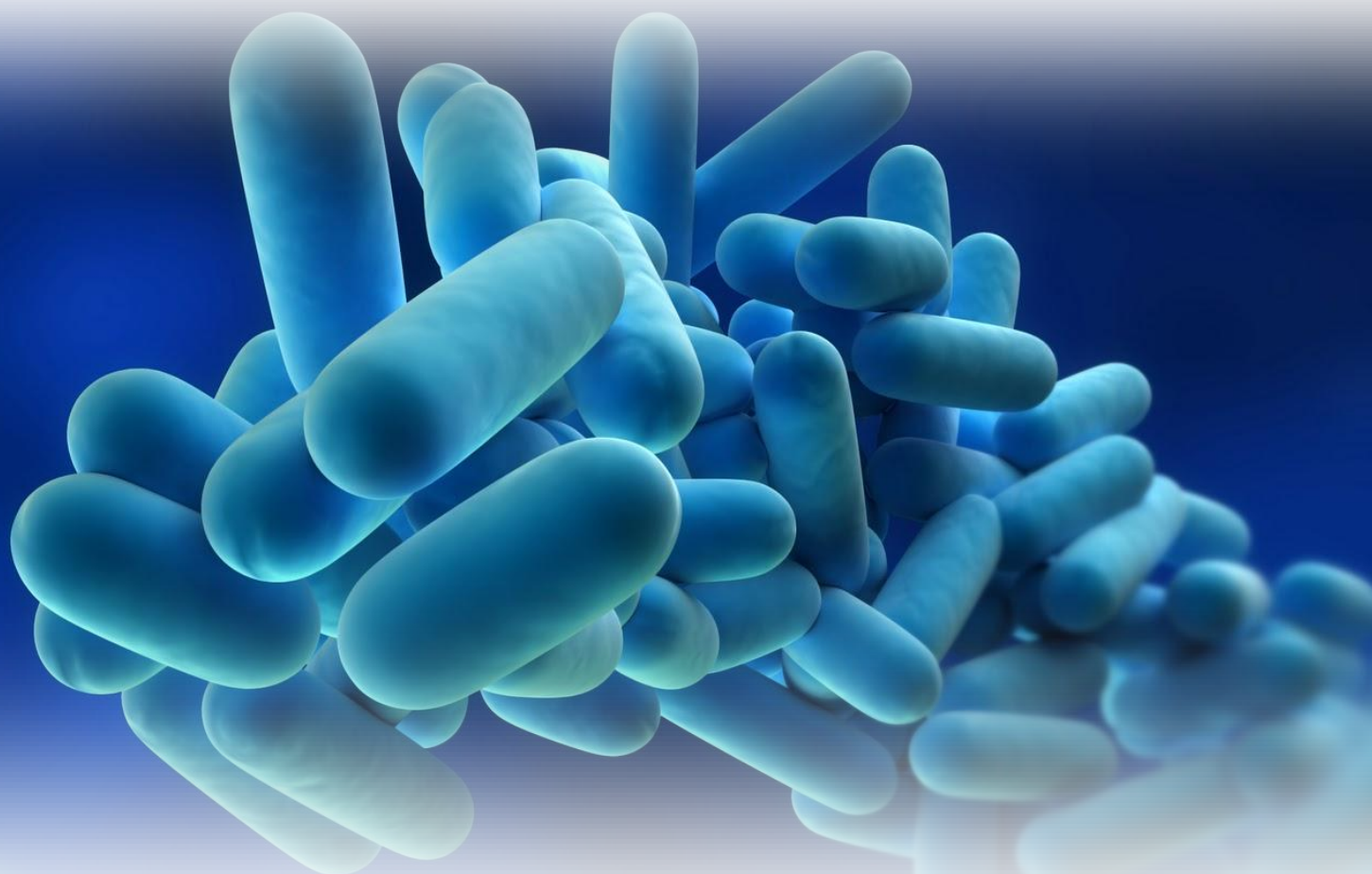
COOLING TOWERS

Oxydizing biocides

| Chemical | Features | Dosage (ppm) | Notes |
|---|--|--------------------------------------|---|
| Aquocide 1000S  | Biocide based on chlorine dioxide ClO ₂ | Based on the extent of contamination | Particularly active on biofilm and Legionella |
| Aquocide 3062  | Biocide Fungicide based on amino-brominated | 10 ÷ 40 | With a wide range of action and with strong penetrating properties towards organic clusters |
| Aquocide 3012  | Biocide based on stabilized peroxide | 50 ÷ 150 | Active on biofilms, yeasts, algae and fungi |

Non-oxydizing biocides

| Chemical | Features | Dosage (ppm) | Notes |
|--|--|--------------------------------------|--|
| Aquocide 3032  | Algaecide Bactericide based on polymeric quaternary ammonium | 10 ÷ 300 | Particular algaecide action |
| Aquocide 3042  | Biocide Algaecide | Based on the extent of contamination | Particularly active against iron bacteria and sulphate-reducing bacteria |



Even in the thermohydraulic plants for the production of domestic hot water, the chemical-physical and microbiological characteristics of the feedwater, together with the operating temperatures, can give rise to problems of deposits and incrustations, corrosion and formation of silt and biofilm. These phenomena, in addition to determining a remarkable energy efficiency reduction of plants, may give rise to drilling of pipes and heat exchange surfaces and determine the development of pathogenic bacterial flora, with particular reference to Legionella Pneumophila, which causes a disease very serious such as Legionnaires' disease.





For these reasons, as well as to protect the environment in terms of quality and quantity of emissions and reduction of energy consumption (as also dictated by the legislation and by industry regulations), it is necessary to perform a treatment of the feedwater of the domestic hot water plants to prevent the formation of limestone incrustations and deposits, corrosion and the development of microbiological pollution.

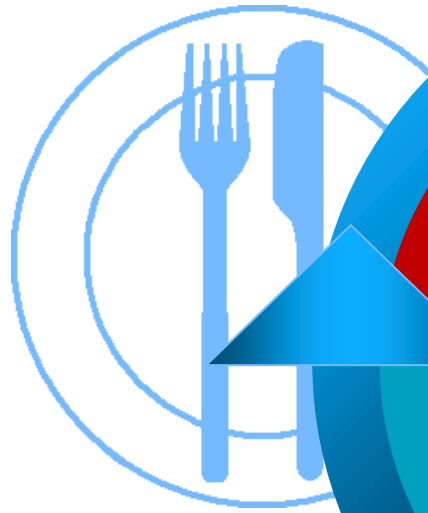
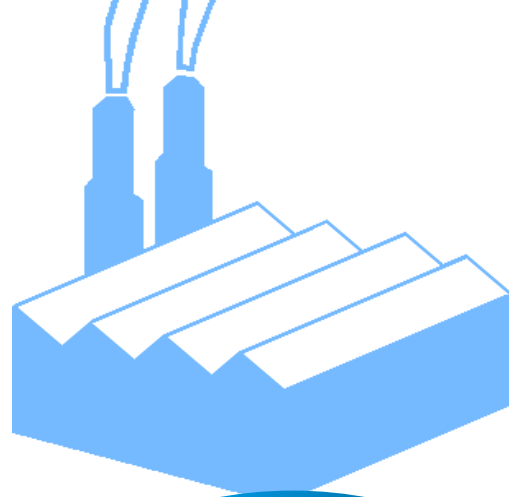
For this type of chemical conditioning treatment **AQUOS** proposes to the industry its ranges of **Aquosil** and **Biosan** products, designed and developed to an effective anticorrosive, antiscaling and sanitizing treatment of water for thermohydraulic plants:



DOMESTIC HOT WATER

Anticorrosive, antiscalants and sanitizers

| Chemical | Features | Dosage (ppm) | Notes |
|---|---|--|----------------------------------|
| Aquosil 5325  | Anticorrosive Antiscaling | 50 ÷ 250 | Conforme alla direttiva 98/83/CE |
| Aquosil 5325/C  | Anticorrosive Antiscaling Sanitizer | Shock dose 10 ÷ 500 Regular dose 30 ÷ 50 | Conforme alla direttiva 98/83/CE |
| Biosan 500 SW  | Sanitizer based on stabilized chlorine | Such as to obtain at the point of final users a concentration of not more than 0.2 mg/l of residual chlorine | Approved by the FDA |
| Biosan 1500 SW  | Sanitizer based on stabilized chlorine | Such as to obtain at the point of final users a concentration of not more than 0.2 mg/l of residual chlorine | approved by the FDA |



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....a little magic for a perfect clean

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