



INDUSTRIAL & CIVIL APPLICATION



DYNAMIC
BIOFILM
PROTECTION

HASYTEC *electronics*

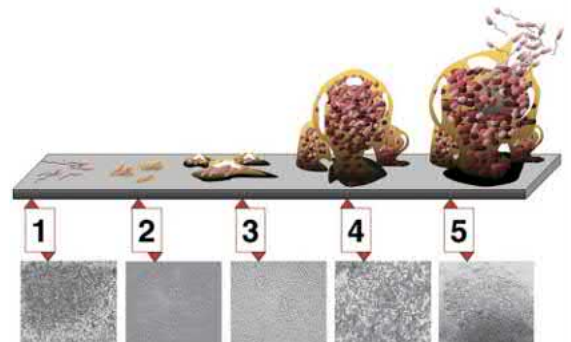


BIOLOGICAL FOULING

LEGIONELLA

Legionella is a genus of bacteria provoking diseases with potentially fatal ending. These bacteria are common and wide spread, especially in water cooling systems which provide ideal temperature range to favor their growth as well as any water systems and plants using or storing water. The most risk present:

- Cooling towers,
- Evaporative condensers
- Hot and cold water systems
- Fountains
- Car/bus washes



BIOFILM

Biofilm consists of micro-organisms in which cells are sticking to each other. These micro-organisms are able to multiply under favorable conditions and as a result will form biofilm.

This biofilm is the attachment and food base for every further fouling and growth as algae, barnacles or shells.

CONSEQUENCES

Fouling as the result of biofilm causes a lot of issues like corrosion, formation of micro-organisms and deterioration of heat transfer as well as cross-section reduction and blockages. All these issues lead to the necessity of using chemicals, carrying out cleanings or other costly and environmental unfriendly procedures.

TARGETS

The removal of biofilm is really difficult since it has the ability to protect itself. In addition, if remaining parts of biofilm are not completely removed (i.e. after cleaning), subsequently this will lead to an accelerated regrowth of micro-organisms. Therefore biological fouling prevention is a major target in the pre-treatment process. It will conspicuously save costs and will contribute to an environmental friendly and sustainable solution.

Legionella bacteria spread represents a big social problem for running water-based equipment. That is why authorities in many countries require operators to follow costly maintenance programs, understanding constant and very frequent systems' cleanings which lead to tremendous expenses for operators. Thereby, legionella prevention is understood to be extremely important target both from economic and social considerations.

Major targets

- Micro-organisms attachment prevention
- Biofilm removal and prevention
- Avoiding attachment of particles as lime or rust
- Preventing the development of bacteria, such as legionella
- Destruction of all unicellular organisms as, e.g. algae, by breaking their membrane-bound organelles
- Total avoiding biocorrosion
- Total avoiding biofouling





WORKING PRINCIPLE

PRINCIPLE OF DYNAMIC BIOFILM PROTECTION

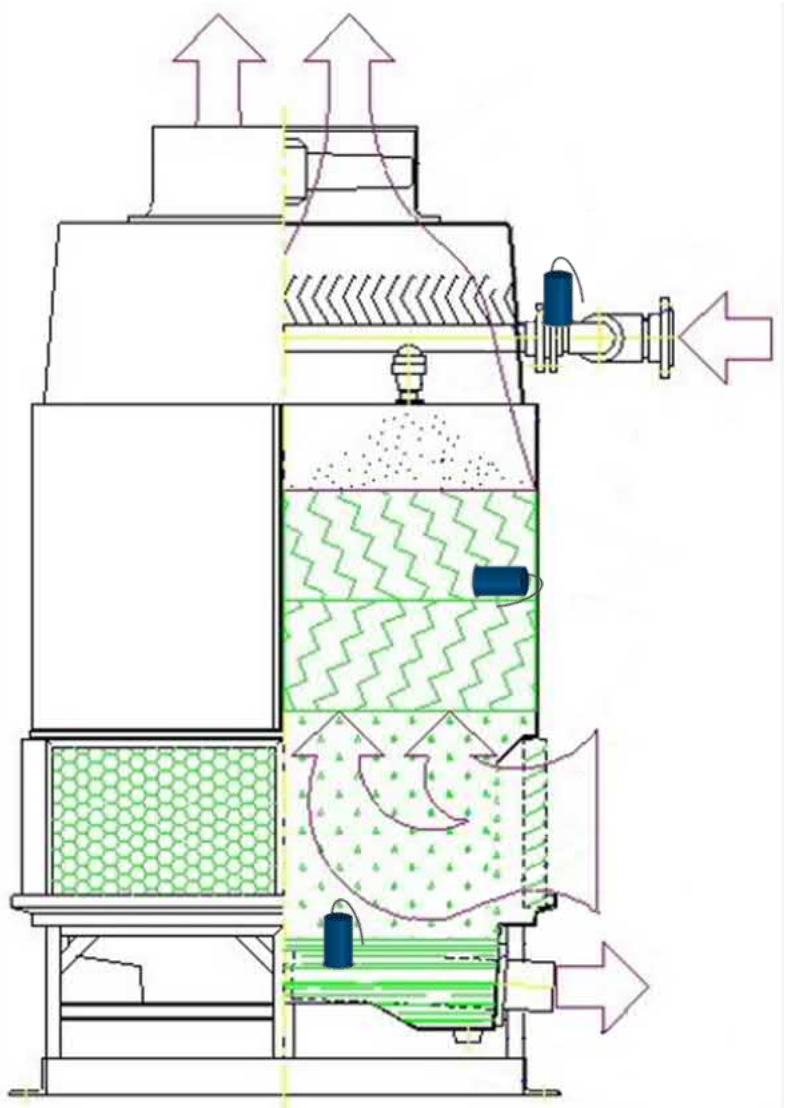
The uniqueness of HASYTEC Dynamic Biofilm Protection is the combination between the “low power” consuming transducers and the intelligent software, which results in the transducers to be directed highly focused and controlled. HASYTEC DBP runs a very precisely tuned program of several frequencies and power consumptions.

The transducers need to be glued with special industrial glue onto the requested applications. The metal transports the ultrasonic signals into the liquid (mostly water) and as a consequence it will diffuse completely through the medium. These diffused ultrasonic waves will prevent the biofilm formation (will even remove it in early stages) together with prevention of bacteria appearances, such as Legionella. Consequently HASYTEC DBP prevents fouling, bacteria, clogging and blockage.

Due to the fact that the emitted ultrasound is running on several different frequencies which only avoid biofilm and destroy unicellular organisms, it doesn't harm the environment as fishes, dolphins, whales or human beings, hence Hasytec DBP systems may be installed in places of their habitation.

The system consumes maximum 20 Watt per transducer. Requiring a constant power supply (to be provided 24/7), usual installation consumes not more power than electrical tea-pot or coffee machine. HASYTEC DBP is maintenance free equipment which does not require any human intervention.

HASYTEC provides 5 years complete warranty on effective functioning of DBP systems in all applications. This means that HASYTEC GMBH guarantees that any object protected by DBP will be free of any fouling, including biofilm, for minimum 5 years.





APPLICATIONS

OVERVIEW

COOLING TOWERS



METAL PROCESSING



PAPER PROCESSING



PROCESS WATER



OFFSHORE



OIL AND GAS



INSTALLATION EXAMPLES





PRODUCT DESCRIPTIONS

PRODUCT HIGHLIGHTS

HASYTEC DBP is the result of 22 years electro technical marine experience and prevents biofilm which is the initial basis of all fouling and marine growth. It is developed to combat fouling and bacteria on every liquid carrying surface and in any water storage.

HASYTEC DBP is currently the only system on the market which enables 8 transducers emitting ultrasound at the same time which increases the effect and the covered areas enormously.

Highly efficient against any fouling, including biofilm, and bacteria formation in:

- Cooling towers
- Heat exchangers
- Membranes
- Pipes
- Pools
- Tanks
- Process water lines

Using Hasytec DBP understands no operational limitations: equipment works in harsh environments, high temperatures and any other circumstances. The only requirement is 24/7 electric supply for 20 Watt transducers.

TECHNICAL HIGHLIGHTS

- modular control unit controls up to 8 transducers which are emitting ultrasound at the same time
- casted alloy casing, protected in IP 66 standard, powder coated (DNV GL approved)
- protected cables (DNV GL approved)
- cable routing in stainless steel (DNV GL approved)
- cable length up to 25 m
- cables to be connected inside control unit => no plugs needed

**DYNAMIC
BIOFILM
PROTECTION**



Hasytec DBP is developed and produced in Germany

ADVANTAGES

- ✓ Reduces the costs of fouling and bacteria prevention
- ✓ Reduces operational costs
- ✓ Reduces the Total Cost Of Ownership
- ✓ Environmental friendly and sustainable
- ✓ Maintenance free
- ✓ 5 years warranty

**5 YEARS
WARRANTY**



**MADE IN
GERMANY**



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