



# DAT DYNAMIC AQUABION® TOWER GmbH

## Innovative Treatment Of Cooling Water Systems

Non-Polluting – Low-Maintenance – Cost-Efficient

# Background and Highlights



- DAT GmbH is a partner of ION Deutschland GmbH, with the patented product AQUABION for over 20 years specialized in anodic inhibition of scale and corrosion with >50,000 systems on the German market.
- The new and innovative DAT-system creates a unique combination of state-of-the-art technologies for chemical free and cost effective treatment of water in cooling tower systems.
- Sophisticated modules are combined into an intelligent environmental-friendly packaged solution.
- Scaling and corrosion of the cooling tower is prevented together with the minimization of microbial deposits.
- DAT saves up to 50% in comparison to a standard chemical treatment approach. Providing a pay out period of less than 2 years.
- DAT offers a unique way out of the chemical burdened trap.



# Problems Involved



In industrial processes, water is the most important medium to cool temperature inducing processes.

In Germany alone over 32 billion metric tons/year of cooling water are required.

Problem areas:

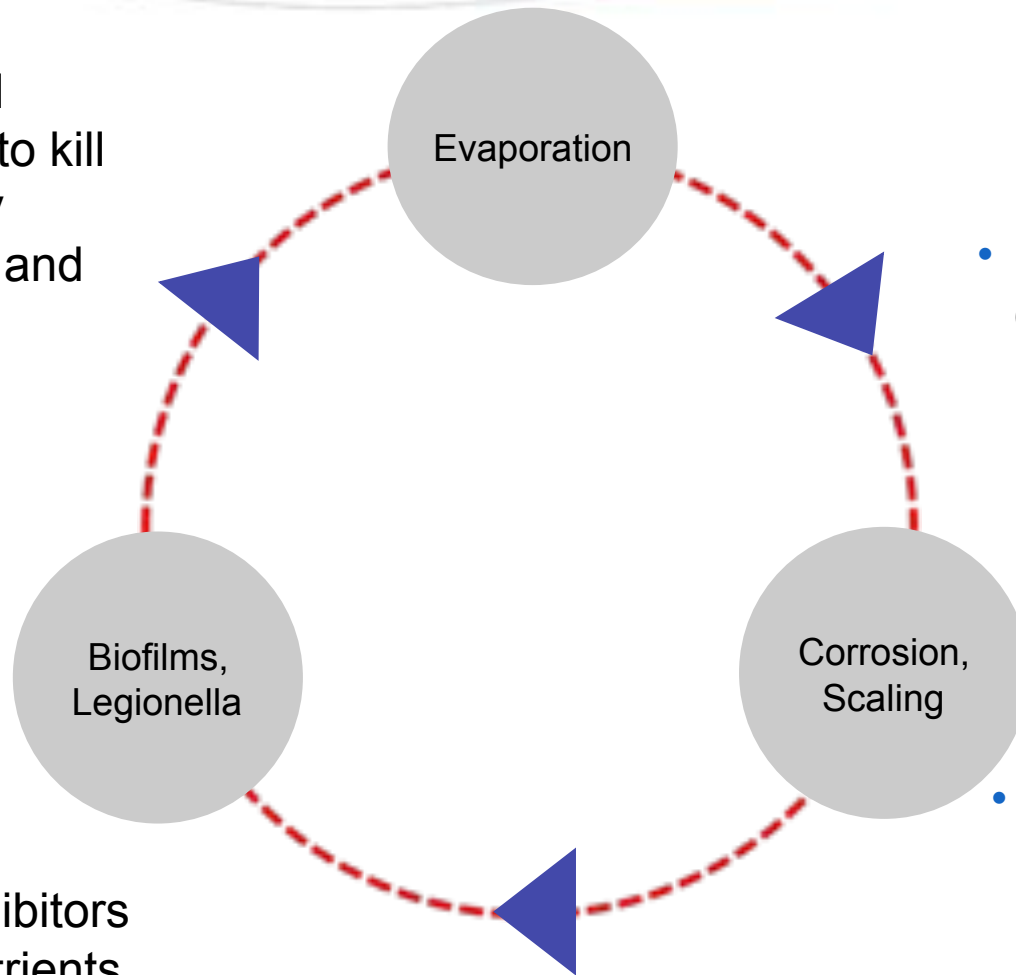
- inorganic: CORROSION & SCALING
- organic: Microorganisms (CfU, LEGIONELLA and biofilms)

Consequences:

- high consumption of water and energy
- costly leakages or failures of equipment

# Vicious *Cooling* Circle

- biocides and dispergants to kill microbiology e.g. biofilms and legionella



- make-up water is complex und corrosive

- chemical inhibitors are often nutrients for microorganisms

- need for stabilizers and corrosion inhibitors
- ion exchanger/reverse osmosis to remove hardness

# Focus: Corrosion

- Corrosion attacks equipment
- Corrosion reduces running time
- Corrosion promotes formation of biofilm
- Corrosion affects hygiene
- Corrosion costs money



# Focus: Scale

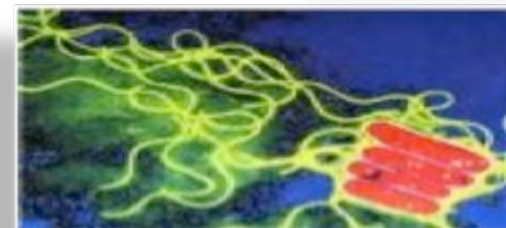
- Scale increases energy demand
- Scale raises water consumption
- Scale raises maintenance
- Scale promotes biofilm
- Scale destroys equipment



# Focus: Microbiology



- MB jams heat exchanger and cooling tower packages
- MB activity induces corrosion (MIC)
- Biofilm impacts plant efficiency
- Biofilms are ideal breeding places for Legionella
- Legionella are dangerous for employees
- in Europe more people die by Legionella than in traffic accidents (source: WHO)



# Problem Areas





# Classical Water Treatment Programs



Reverse Osmosis



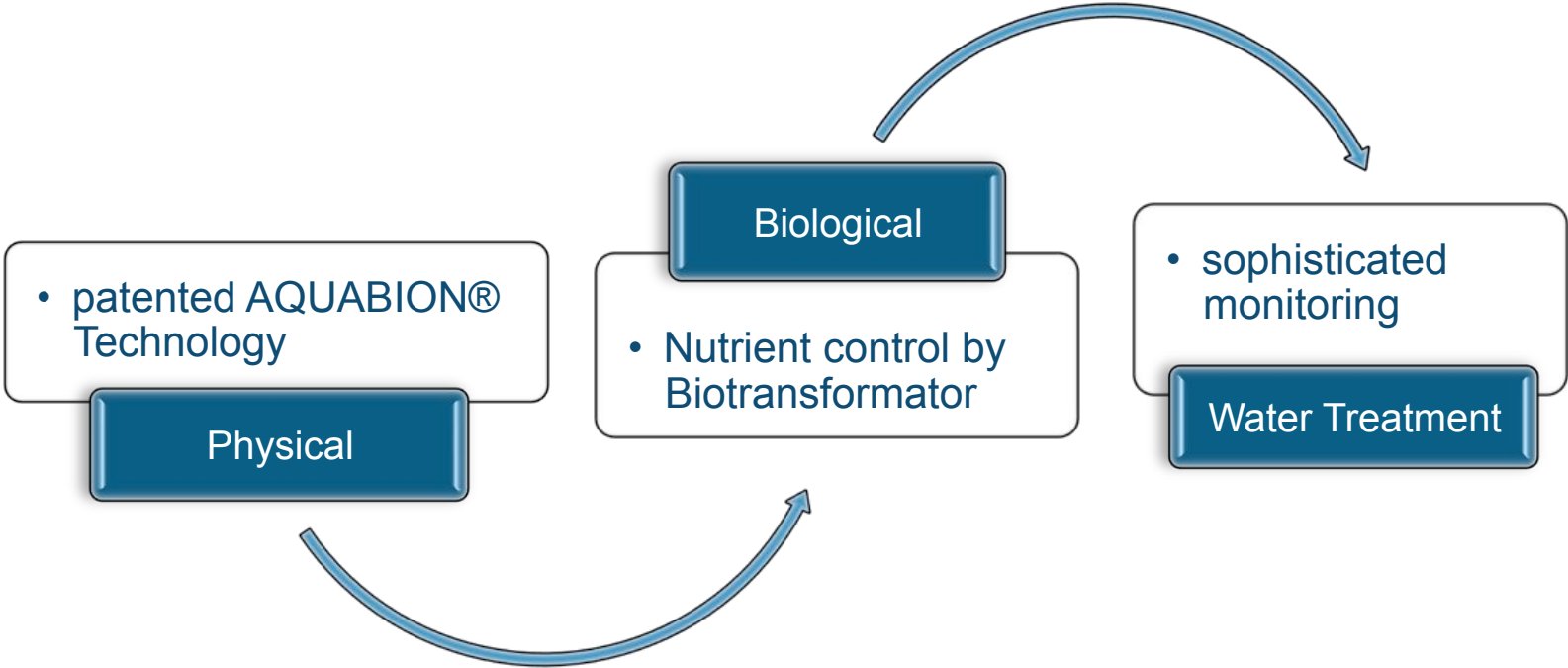
Ion Exchanger



Chemicals



# DAT: Innovation of Water Treatment

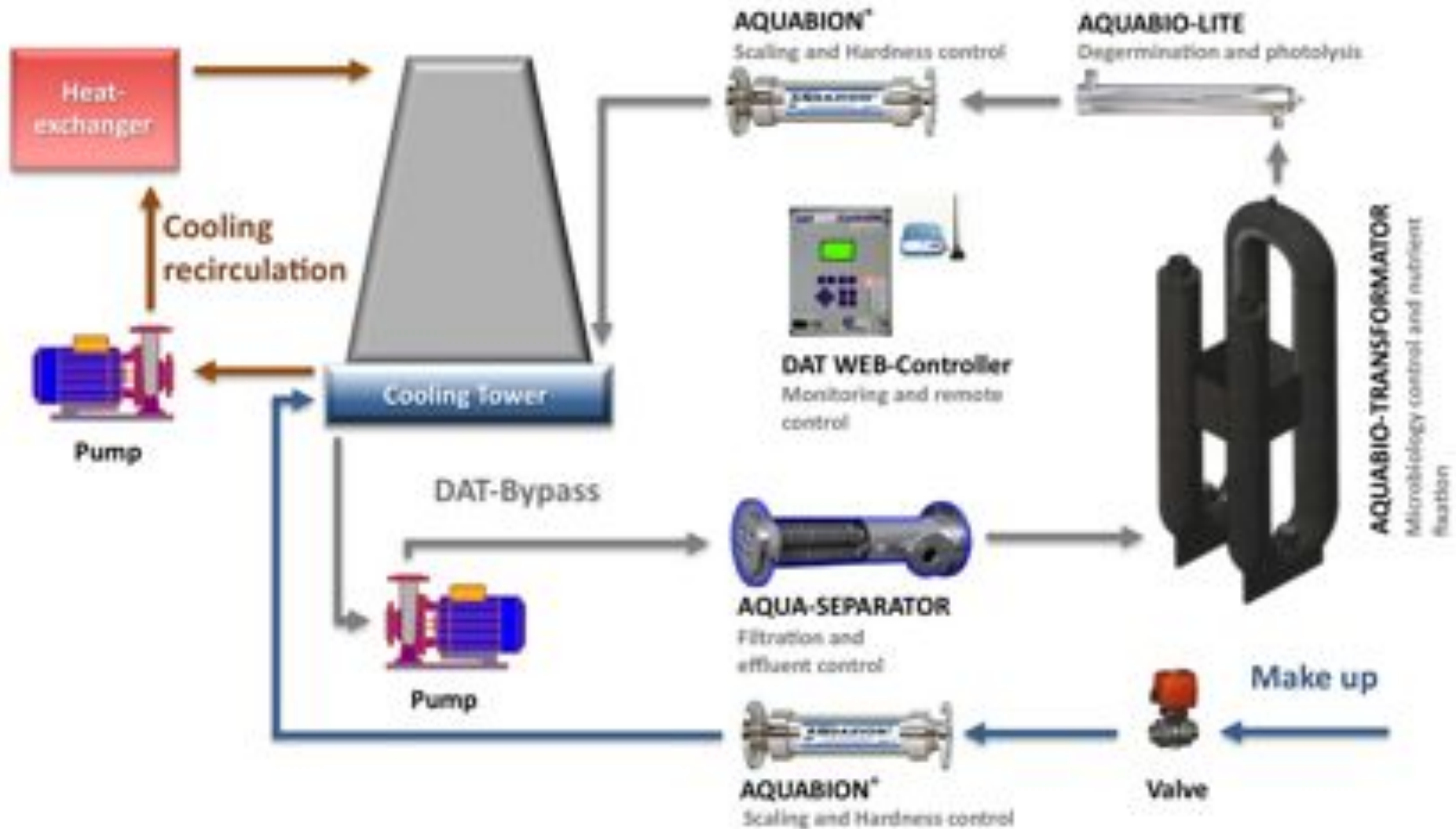


DAT for closed cooling systems

DAT for open cooling systems

DAT for semiclosed cooling systems

# DAT - System



# DAT: Operating Mode



Balancing of single components forms a process which is unique in the world:

- DAT WEB-CONTROLLER for remote operation and monitoring
- water make-up is pre-treated by patented DAT AQUABION to minimize scale and corrosion
- DAT AQUABIO-TRANSFORMATOR reduces nutrients
- DAT AQUA-BIOLITE kills microorganisms
- DAT AQUABION controls hardness and corrosion
- DAT AQUA-SEPARATOR for particle and blowdown control



# DAT: System Integration



Plant installation



External container solution

# DAT Concept



## Saving Of

- ✓ Operating costs
- ✓ Water + Effluent
- ✓ Energy
- ✓ Maintenance
- ✓ Chemicals

## Avoiding

- ✓ Environmental impact
- ✓ Health hazards
- ✓ Toxic substances
- ✓ Expensive maintenance

**DAT = pay-out within 2 years**

A large, 3D-style green arrow pointing to the right, containing the text 'DAT = pay-out within 2 years' in white.

# DAT Saves Money

(e.g. DAT- System S10)



Chemical treatment	
Water	Euro
Make-up water	27,187
Effluent	19,132
Regeneration	2,600
Chemicals	
Salt	1,982
Inhibitors	2,383
Biocides	2,720
Service	
Maintenance	840
Cleaning	1,680
Manpower	0
<b>Sum</b>	<b>58,526</b>

DAT treatment	
Water	Euro
Make-up water	22,474
Effluent	9,704
Regeneration	0
Chemicals	
Salt	0
Inhibitors	0
Biocides	0
Service	
Maintenance	560
Cleaning	1,190
Manpower	0
<b>Sum</b>	<b>33,928</b>



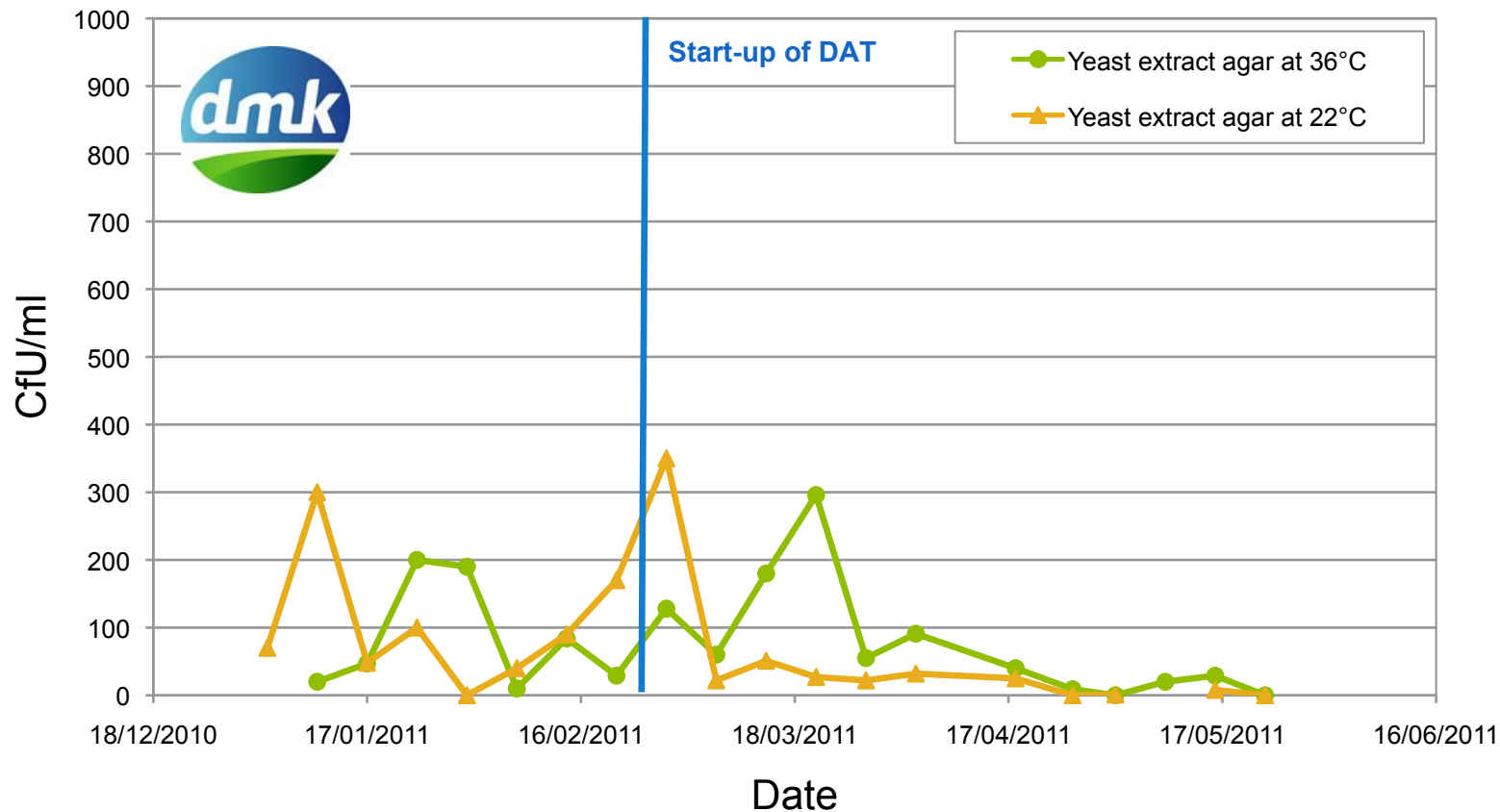
Costs without DAT-treatment	58,526
Costs with DAT-treatment	33,928
Annual economization	24,598
Monthly economization	2,049
Investition for DAT-System	42,521
<b>Return on investment</b>	<b>1.9</b>

# DAT-System Controls Microbes

(e.g. Deutsches Milchkontor GmbH)



Recirculation water - analysis done by customer



Abundance of microbes dropped below certain specified German limits of 10,000 CfU/ml (see VDI 3803).



**Thanks for your attention ...**

**...and when do you want to use the  
advantages of DAT**

**?**