



COOLING SYSTEMS FILTRATION

SELF CLEANING DISCS TECHNOLOGY

DENZER WATER



WATER QUALITY, Synonym of **Efficiency**

An accumulation of particles larger than 0.3 mm in the cooling circuit reduces its heat transference capacity by 10%

Cooling systems are present in the municipal, residential, and industrial sectors and in Data Processing Centres (DPC), where they dissipate heat generated during the production activity, ensuring optimal process temperatures.

These systems must handle large volumes of water and/or air exposed to the ingress of particles that settle and accumulate on the different heat transfer surfaces in the cooling circuit, reducing the performance of the installation and increasing process water delivery temperature, leading to loss of productivity and increased operating costs.



HOW DO THESE SOLID PARTICLES ENTER THE SYSTEM?

- Make-up water: contains various types and quantities of suspended and dissolved solids, depending on water origin and prior treatment.
- External environment: suspended particles in the air, such as dust, pollen, spores and microorganisms, which enter the system via the surroundings where it is located.
- Process water: due to the deterioration of system components, addition of inhibitors and biocides, and application characteristics.



WE UNDERSTAND YOUR CHALLENGES



SCALING

The loss of solubility of certain salts when in contact with high temperatures, principally CaCO3, causes their precipitation on the heat transfer surfaces of the cooling circuit, reducing energy efficiency.



SETTLED SLUDGE

The accumulation of suspended particles in areas with low system water velocity generates obstructions, favours microbial growth, and increases the intensity and duration of maintenance shutdowns.



BIOLOGICAL PROLIFERATION

The deposition of algae, protozoans and bacteria generates biofilms (heat transfer 25 - 600 times lower than many metals), corrosion and in the case of Legionela Pneumphila this leads to risks to human health.



CORROSION

Degradation of metal surfaces in the system increases the cost of premature replacement of equipment, unexpected production shutdowns, and loss of heat transfer efficiency.



Precipitation of calcium carbonate salts and the presence of corrosion on the heat transfer surfaces of a tubular heat exchanger.



The deposit and accumulation of sludge inside a heat exchanger increases its energy consumption and reduces its performance.



Cost increases due to unexpected production shutdowns, greater dosage of biocides and inhibitors, and a reduction in the life span of the installation.

Capital invested in the correct filtration system can be lower than the cost of a single unplanned production shutdowns



AZUD TECHNOLOGIES

Disc filter



- Filtration of organic and inorganic particles in suspension with sizes 5 - 400 µm.
- Provides double filtration: centrifugal separation and depth filtration.
- Technical plastic materials. Resistant to aggressive water and corrosive environments.
- Effective water/air self cleaning with minimum water consumption.
- Minimum footprint, with different configurations adaptable to any location.

Screen filter



- Filtration of inorganic particles with sizes 100 - 3,500 μm.
- Multilayer stainless steel mesh ensures filtration quality.
- Robust steel fabrication, resistant to high pressures and working temperatures.
- Effective self-cleaning, with suction nozzles having low water consumption.
- Elevated filter flows per unit with very low footprint.

Media filter



- Filtration of small inorganic particles with 10 μm.
- In-depth filtration with quality control by adjusting the water flow velocity.
- Fabricated in stainless steel, resistant to to tough working conditions.
- Optimised backwash water consumption thanks to the low density filter bed.

Centrifugal separator



- Filtration inorganic particles with higher density than water.
- Filtration by the combined effect of centrifugal and gravitational forces.
- Plastic and steel materials for operation at high working pressures and temperatures.
- Low flush water consumption due to cyclonic separation of water/particles.
- Minimum footprint.

5



TZUD HELIX

supply.

BACKWASH VALVE

enables the autonomous

and independent backwash

of each filter and guarantees a continuous filtered water

SELF CLEANING DISCS FILTRATION

SUPPORT STRUCTURE

monoblock MBK with columns that incorporate the spray nozzles.

Patented anti-clogging centrifugal deflector **AZUD HELIX**.

PLASTIC DUAL-PLATE

CHECK VALVE manages the flow of filtered water and flushing water. Reliable deisgn with a minimum pressure drop.

HYDRAULIC PISTON WITH A SPRING,

that compresses the disc stack during the filtration phase and releases the disc stack during the backwash phase.

FILTRATION MEDIA composed of the AZUD DISC stack with a wide range of filtration degrees (5 - 400 micron).



BASE AND LID house and protect the filter element. Easy opening system thanks to a tool-less safety clamp,

INLET, OUTLET AND DRAINAGE MANIFLODS,

made of HDPE, with DIN/ANSI flange or grooved connections, provide robustness, durability and maximum resistance to chemical and saline corrosion.



MODULARITY, with a wide range of flow rates and configurations using a minimum number of components.



NON-STOP FILTRATION, thanks to the sequential self-cleaning that garantees a continuous supply of clean water.



SAFETY, due to the rapid recuperation of the filter, even with high loads of organic and filamentous particles, thanks to the high-speed water-air mixture.

Particle retention efficiency of the AZUD 100 micron disc filter



The optimal degree of filtration is the one that ensures maximum efficiency while eliminating unwanted particles, with minimal cleaning frequency.



COOLING TOWERS

1 Full flow

- 100% filtration of the cooling circuit flow, ensuring total elimination of TSS from the system.
- > Larger filtration equipment.

3 Basin cleaning

- Continuous filtration of the total water volume in the cooling tower basin, reducing sludge sedimentation rate.
- Independent circuit, does not interfere with the production process.

2 Side-stream

Partial filtration of between 5% and 10% of the total circulating flow, ensuring elimination of 92% - 95% of TSS in the system.

Independent circuit, does not interfere with the production process.

Why filter?

- Guaranteed water quality for maximum heat dissipation efficiency of the system equipment.
- Optimized working condition of the cooling equipment, ensuring minimum energy consumption.
- Control and reduction of inspection and maintenance shutdowns on cooling equipment.
- Less chemical consumption necessary for microbial and corrosion control in the system.
- More security against high particle entry episodes, such as sand storms, in open circuits.





INDUSTRIAL COOLING CIRCUIT



Why filter?

- Retention of particles 5 to 10 times smaller than the diameter of the nozzles, eliminating obstruction risks.
- Uniform water distribution pattern over the components to be cooled.
- Elimination of production losses due to non-conformity with final product quality.
- Reduction in consumption of chemicals required to ensure water quality in the cooling circuit.
- Full flow or side stream configuration option to ensure the quality of water present in the cooling circuit.





DATA PROCESSING CENTRE (DPC)



Why filter?

- Increase in overall system security and guarantee of 24/7 continuity for the installation.
- Environmentally sustainable solution, reduction in the water footprint and savings in energy consumption.
- Different flow configurations are easily adaptable to the cooling circuit.
- Performance Indicator (PI) improvement through the increase in the adaptability of the system for flow and pressure changes and installed thermal capacity.



1. MODULAR FILTRATION SYSTEM:

Consisting of one or several filter elements

with a wide range of filtration degrees (5, 10, 20, 50, 100, 130, 200 and 400 micron).



3. VALVES:

Control valves for the complete isolation of the unit during maintenance and inspection tasks, and regulating valves in order to maintain operating conditions.

ΔZUD

5. AUTOMATION:

Instrumentation, continuous control and monitoring of water quality required for optimal process performance. Includes PLC & HMI with a single interface which permits remote control and autonomous operation of the filtration unit.

2. HORIZONTAL CENTRIFUGAL PUMP:

To ensure the supply of water with the required flow and pressure while assuring filter operating conditions.

4. SUPPORT STRUCTURE:

Constructed from coated carbon steel to provide robustness to the installation and to facilitate its integration.





COMPACT SOLUTION ensures a minimal footprint



TZUD HeLI

ADAPTABILITY to variations in water quality and pressure at the inlet



Filtration equipment

PLUG&PLAY CONNECTION for rapid installation and start-up



EXPERTS IN COOLING





EXPERIENCE

Knowledge and experience to ensure cooling circuit water quality, maintaining optimal working conditions in the system.



SUSTAINABILITY

Environmentally sustainable solution, minimising process water and carbon footprints.



MODULARITY

Wide range of flow rates, configurations and filtration degrees allow us to adapt our solutions to the needs of each user.



LIFE SPAN

High chemical and mechanical resistance construction materials to extend the life span of the units guaranteeing its optimal performance.



DIGITALISATION

Management, monitoring and remote control of the water quality circulating in the cooling system.

SERVICE

Local assistance for maintenance and training in our solutions is provided through several well-known companies around the globe.

LOCAL ASSISTANCE, GLOBAL CONTROL





District cooling

A large commercial centre located in Dubai wanted to improve the performance of its cooling system (DCP) and to protect it against dust and sand particles which entered the open circuit from the surrounding environment.

The solution offered by AZUD was a side stream filtration system ensuring the complete removal of 98% of particles suspended in the water, generating a reduction in energy consumption and ensuring stability in the target temperature within the design envelope.

EVOLUTION OF TOTAL SOLIDS IN SUSPENSION IN THE SYSTEM OVER TIME



PROJECT TECHNICAL INFORMATION

YEAR: 2016 PRODUCTION: 2,600 m3/h (11,479.5 gpm) MAKE-UP WATER: Condensed water DEGREE OF FILTRATION: 20 micron SOLUTION: 12 x AZUD HELIX AUTOMATIC 4DC7







Payback in less than 3 years



Maximum flow stability and water quality during the first 15 days



Guaranteed protection of the tower against sandstorm episodes

m 🕑

Total Solids in Suspension <5 ppm in cooling and process water volumes



Electrical Sector

One of the largest electricity companies in Latin America had 5 water cooling units which were incurring heat transfer losses of up to 30% due to an accumulation of small particles for which the client needed to apply a large quantity of biocide.

Their strong environmental conscience and the accumulated costs made them look for a solution. They trusted in AZUD to solve the situation by installing 5 side-stream disc filtration units capable of handling a maximum flow of 800 m³/h to the various cooling units.

SAVINGS IN CHEMICALS IN ONE COOLING TOWER



PROJECT TECHNICAL INFORMATION

YEAR: 2016 PRODUCTION: 800 m3/h (3,522.3 gpm) MAKE-UP WATER: Condensed water DEGREE OF FILTRATION: 130 micron SOLUTION: 5 x AZUD HELIX AUTOMATIC 210/6FX AA







Payback in less than 3 years



26% reduction in consumption of biocides in the tower



tasks

Reduced risk of corrosion and biofouling due to the increase in efficiency of the chemicals and biocides

75% reduction in maintenance



Petrochemicals Sector

A petrochemicals plant located in Belarus had a 500 ton capacity cooling tower operating with 4 concentration cycles. The most significant conditions in the region were large climatic fluctuations (from -35 °C to +37 °C), with an elevated presence of organic particles originating from the Pripiat river, the only available source of makeup water.

AZUD proposed a containerised solution consisting of air assisted disc filtration in order to ensure operating efficiency for the installation and to ensure the reliability of the filtration system in the presence of complex particles.

SAVINGS IN ENERGY AND CHEMICALS FOR THE COOLING TOWER



囚

25% saving in chemical consumption of the installation





22% savings in energy consumption compared to the initial consumption

■[☆] Robust construction in order to

conditions in the region

withstand the adverse climatic

PROJECT TECHNICAL INFORMATION

YEAR: 2014 PRODUCTION: 160 m3/h (704.5 gpm) MAKE-UP WATER: River DEGREE OF FILTRATION: 50 micron SOLUTION: 1 x AZUD HELIX AUTOMATIC 204/4FX AA + 1 x AZUD HELIX AUTOMATIC 208/6FX AA







Thermoplastics industry

The cooling water circuit of an industrial plant engaged in the manufacture and development of technical plastic products, showed a buildup of a large quantity of solids in suspension (plastic shavings, pellets, environment, makeup water, etc.), increasing production shutdowns for inspection and maintenance tasks, due to the level of precision required in the process water temperature.

AZUD proposed side stream filtration of the tower, with air assisted disc filtration, ensuring minimum water and energy consumption and filtration of complex particles from the process.

PRODUCTIVITY INCREASE IN PLASTIC EXTRUSION PROCESS



PROJECT TECHNICAL INFORMATION

YEAR: 2019 PRODUCTION: 138 m3/h (607.6 gpm) MAKE-UP WATER: Mains water DEGREE OF FILTRATION: 130 micron SOLUTION: 1 x AZUD HELIX AUTOMATIC FT206 AA







Payback in less than 2 years



70% reduction of maintenance and inspection shutdowns



ban the Savings in cooling tower makeup water and the consumption of chemicals



Data Centers

A data processing centre (DPC) was experiencing fouling problems in its cooling system serpentines, leading to large energy losses. In addition, the company wanted to obtain a PUE (Power Usage Effectiveness) as close as possible to 1.0.

AZUD proposed a secure basin cleaning system in order to prevent formation of sedimentary sludge, assuring optimal uninterrupted operating conditions for the cooling system.

PROJECT TECHNICAL INFORMATION

YEAR: 2020 **PRODUCTION:** 40 m3/h (176.1 gpm) MAKE-UP WATER: Basin water **DEGREE OF FILTRATION:** 100 micron **SOLUTION:** 2 × AZUD HELIX AUTOMATIC FES FT203





PERFORMANCE OF AN EVAPORATIVE CONDENSER WITH FOULING IN THE **SERPENTINES**



Homogenisation of the return water to the process



20% increase in evaporative condenser performance



Uninterrupted during equipment cleaning

production

Increase of the life span of the CRAC cooling units



Authorised Distributor



Geofluid Processors Private Limited

112, Building No.2, Mittal Industrial Estate,

Andheri Kurla Road, Marol, Andheri (E), Mumbai - 400 059.

info@geofluid.com



www.geofluid.com