Advanced Water and Wastewater Treatment Solutions
Global Water Market Trends

UPWARD TRENDS
- Environment Awareness
- Policy & Regulation
- Energy Costs
- Disposal Costs
- Fresh Water Price

DOWNWARD TRENDS
- Fresh Water Access
- Land Availability
- Infrastructure Quality
Company Highlights
About Aqwise
Aqwise is an industry leader in advanced water and wastewater treatment technologies

- **Expertise**
  - Strong biological process know-how
  - Multidisciplinary expert staff

- **Global Reach, Local Presence**
  - Over 500 installations in 50 countries
  - Worldwide regional offices and sales representatives
Global Solution Provider

Aqwise is a trusted solution provider for municipal and industrial customers

- >400 Municipal Installations
- >100 Industrial Deployments
- >50 Countries Worldwide
- >380M m³/year Treated Wastewater
Market Recognition
Aqwise has received widespread recognition from industry experts and analysts

Dun’s 100 by Dun and Bradstreet
- Received the Dun’s 100 mark of excellence: 2017, 2018

Frost & Sullivan: Performance Value Award
- Aqwise received the 2017 F&S Global Performance Value Leadership Award for the water sector

Deloitte, Technology FAST 50
- Fast 50, Israel: 8 consecutive years (2008-2015)
- Fast 50, Israel: Winner 2009
Global Impact
Diverse Solutions

Municipal WWTPs Upgrades and Retrofits

Aerobic and Anaerobic Industrial WWTPs

Decentralized Wastewater Treatment & Reuse

Surface Water and Groundwater Treatment
Aqwise Technology
Technology Highlights

Aqwise technology is the result of over a decade of multidisciplinary research and development

- Innovative biofilm-based technology
- Strong IP portfolio
- Unique proprietary know-how
- Cost efficient, scalable, and eco-friendly
- Field-proven in diverse applications
Innovation That Works
Aqwise Biomass Carriers protect biofilm against abrasion and ensure mass transfer efficiency

- Recycled, high-density polyethylene
- Highly open external design
- Optimal oxygen and nutrients transfer
- Applicable for various biological processes
- High Effective surface area
Customer Benefits

**SMALL FOOTPRINT**
Suitable for both new applications and existing plant upgrades.

**DURBLE & STABLE**
Highly resistant to hydraulic shock loads with short recovery time after toxic loads.

**COST EFFICIENT**
Requires minimal civil works, short project life cycle and lower Capex/Opex.

**LOW MAINTENANCE**
Simple maintenance and low operational costs.

**SCALABLE & FLEXIBLE**
Smooth upgrade or gradual expansion based on just-in-time investment.

**ECO FRIENDLY**
Recycled materials, less land usage, no scenery obstruction and less sludge.
Aqwise: Eco-Friendly Approach
Aqwise solutions enable retrofit, reuse and recycling of existing equipment, materials and resources.
Diverse Biological Processes

AGAR® Aerobic Processes

AGAR® MBBR

AGAR® IFAS

DACS® Anaerobic Processes

DACS®

DACS® DANA
AGAR® Technology Overview

A  Advanced Biomass Carriers

B  Unique Double-roll Airflow Design

Inlet

Effluent

Sludge Treatment
Aerobic Technology

Moving Bed Biological Reactor

AGAR® MBBR Solutions

- Simple, single-through process
- Reduces soluble pollutants with minimal process complexity
- Requires a significantly smaller footprint
Aerobic Technology

AGAR® IFAS Solutions

- Combines activated sludge and biofilm systems
- Enhances nutrient removal
- Typically used to upgrade existing plants

Integrated Fixed Film Activated Sludge
Anaerobic Technology

Downflow Anaerobic Carrier System

- Biogas Outlet
- Distribution System Carriers
- Double Membrane
- Influent
- Sludge on Carriers
- Effluent

DACS ® Solutions

- Suitable for heavily loaded industrial applications
- Downflow distribution method of wastewater on biomass carriers
- Very fast Return on Investment through energy generation

Aqwise
an Aqwise company

Proprietary and confidential
Anaerobic Technology

Dynamic Anaerobic Aerobic System

- Effluent
- Aerobic Reactor
- Distribution System
- Anaerobic Reactor
- Carriers
- Sludge on Carriers
- Aeration
- Influent
- Biogas Outlet
- Biogas Compartment
- Sludge on Carriers
- Riser

DACS® DANA Solutions

- Hybrid system: “One-Stop-Shop” approach
- Complete solution for high load industrial applications meeting stringent discharge requirements
- Enables reuse of both water & energy

Aqwise
Clear and Simple

Proprietary and confidential
Packaged Plants
Pre-fabricated wastewater treatment facilities

- Tailor-made & modular solutions
- Small footprint
- Short project life cycle
- Minimize on-site local works
- High-level quality assurance
AGAR®-PnP
AGAR®-PnP (Plug & Play) - The next generation of containerized WWTP

- Fully automated remote monitored units
- Flow: 50-400 m³/day
- Especially designed for rural areas and small communities
- AGAR® MBBR-BNR configuration followed by Aqwise MC for solids removal
- High treatment capacity for cold climate
- High effluent quality including TN & TP removal
Research & Development

Aqwise is actively involved in the development of new and innovative biological solutions

- **Research Facilities**
  - Advanced Research & Development center located in Israel
  - Biological process excellence center

- **Wastewater Treatment**
  - Development of new biological processes for treatment and compliance to new standards

- **Drinking Water**
  - Focus on efficient treatment of new pollutants
Combining Circular Economy & Innovation
Developing the next generation sustainable technologies

Creating new water sources
Enhanced biogas quality
Positive Energy WWTP Carbon recovery
Aqwise Solution Portfolio
Aqwise supplies adaptable technology and tailor-made solutions for the global markets

MUNICIPAL
• New and upgrade installations
• Large or small scale facilities
• Full water reuse or discharge to the environment

INDUSTRIAL
• High strength wastewater treatment
• Wide range of industries
• Water reuse & energy recovery

DRINKING WATER
• Surface water treatment
• Ground water treatment
• Environmental approach for treating a variety of pollutants
Project Management

Aqwise implements recognized industry standard project management methodologies:

- Design & Piloting
- Civil Works
- Installation & Testing
- Operation & Maintenance

- Detailed Design
- Purchase & Supply
- Commissioning & Startup
Municipal Solutions
Aqwise offers the widest range of solutions to meet municipal customer needs

Ability
- New facilities
- Efficient upgrades

Plant Scale
- Large Scale
- Small to medium scale

Effluent
- Full reuse of water
- Complete discharge
Industrial Solutions

Aqwise has a proven track record in a wide range of industrial sectors

- Pharmaceuticals and Chemicals
- Pulp and Paper
- Oil and Gas
- Food and Beverage
- Aquaculture
Large Scale Municipal Solutions
Aqwise solutions include implementation of new plants and upgrade of existing facilities

- Small Physical Footprint
- Minimal Civil Works
- Retrofit of Existing Facilities
- Simple Operation & Maintenance
- Expansion of flow capacity
Compact Municipal Solutions

Full “all-in-one” containerized solutions suitable for a wide range of purposes

Wide Range of Applications

- Remote Communities
- Industrial Parks
- Hotels & Resorts
- Gas Stations & Rest Areas
- Marine, Oil & Gas
- Mining & Construction
Case Study: Municipal Plant Upgrade

HIGHLIGHTS
- Customer: Monclova Municipality
- Location: Mexico
- Capacity: 58,000 m³/d

REQUIREMENTS
- Upgrade of existing plant from 30,000 m³/d to 58,000 m³/d

SOLUTION
- AGAR® IFAS configuration
- No reactor expansion
- Industry reuse water quality

Monclova, Mexico
Case Study: Greenfield Municipal Plant

**HIGHLIGHTS**
- Customer: Meitzar Municipality
- Location: Israel
- Capacity: 5,000 m³/d

**REQUIREMENTS**
- New wastewater treatment plant for a growing area

**SOLUTION**
- AGAR® IFAS configuration
- Intensive nutrient removal
- Scalability for future upgrades

Meitzar, Israel
Case Study: Package Plant

**HIGHLIGHTS**
- Customer: Small, remote municipality
- Location: Israel
- Capacity: 100 m³/d

**REQUIREMENTS**
- Wastewater reuse for irrigation

**SOLUTION**
- AGAR® MBBR configuration
- Containerized Plug & Play solution
- Proprietary Aqwise Media Clarifier
Industrial Solutions
Industrial Applications

**Food & Beverage**
Soft beverages and breweries, food processing and production, bakeries and all types of dairy products

**Pulp & Paper**
Pulp and all types of Paper Mills including combined and reusable ZLD production plants

**Pharma & Chemicals**
Active Pharmaceutical ingredients (API) facilities and pill manufacturing plants

**Oil & Gas**
Wide range of upstream and downstream applications for oil refineries and gas stations.
Case Study: Pulp & Paper

**HIGHLIGHTS**
- Customer: Europaper
- Location: Italy
- Capacity: 2,000 m³/d

**REQUIREMENTS**
- Changes in the paper production led to a capacity increase and high BOD loads

**SOLUTION**
- DAF-AGAR® MBBR configuration for industrial use

*Paper Factory, Italy*
Case Study: Food & Beverage

**HIGHLIGHTS**
- Customer: Friesland Campina
- Location: The Netherlands
- Capacity: 1,440 m³/d

**REQUIREMENTS**
- Fluctuation in wastewater composition
- Very limited footprint

**SOLUTION**
- AGAR® MBBR-DAF configuration for production of dairy products
Case Study: Food & Beverage

HIGHLIGHTS

- Customer: TAB Koncentraty
- Location: Poland
- Capacity: 1,000 m³/d

REQUIREMENTS

- Treatment of high COD levels – from apple concentrate factory

SOLUTION

- Two DACS® reactors followed by a two-stage AGAR® MBBR
- Treating variable loads in minimal footprint

Apple Concentration Factory, Poland
Case Study: Pharmaceuticals

TEVA Pharmaceutical Plant, Israel

HIGHLIGHTS
- Customer: TEVA Pharmaceuticals
- Location: Israel
- Capacity: 300 m³/d

REQUIREMENTS
- Retrofit of an existing oxidation process plant in a very limited footprint

SOLUTION
- AGAR® MBBR – DAF configuration for industrial use
- Meeting requirements in variable influent conditions
Drinking Water Solutions
Aqwise technology leads the way in biological potable water treatment

- Biological treatment for surface and ground water sources
- No brine for disposal
- Low energy costs
- Scalable design
- Eco-friendly technology
Case Study: Surface Water Treatment

HIGHLIGHTS

- Customer: Municipality of Agra
- Location: Yamuna River, Agra, India
- Capacity: 163,000 m³/d

REQUIREMENTS

- Need to provide safe drinking water for population of 2 million people

SOLUTION

- Cost-efficient surface water treatment
- AGAR® MBBR and UF membrane polishing
- Adaptive to variable loads

River Water Treatment - Agra, India
Case Study: Ground Water Treatment

**HIGHLIGHTS**
- Customer: Kibbutz Sdot Yam
- Location: Israel
- Capacity: 1,300 m³/d

**REQUIREMENTS**
- Meeting drinking water nitrate health regulations for well water treatment

**SOLUTION**
- Denitrification AGAR® MBBR, UF polishing
- Minimal footprint
- No residual brine
Scope of Services
Business Models
Aqwise offers a wide range of business models to fit customer needs

- **Turn-Key Project**
  Full project management and implementation.

- **Process Package**
  Technological process design services and equipment.

- **Professional Services**
  Pilot Services, process supervision up to full Operation & Maintenance.

- **Package Plant**
  Compact containerized and pre-fabricated solutions.

- **Financing**
  Tailor-made financial models to meet customer budget requirements.
Aqwise – Clear and Simple

- Technology Leadership
- Global Reach, Local Presence
- Proven Track Record
- Measurable Return on Investment
  - Wastewater reuse
  - Energy recovery
  - Retrofit capabilities
Thank You