

# WATER SOLUTIONS FOR A SUSTAINABLE FUTURE



## About Akk k Holding:

Founded in 1952 by the late Raif Din k k, and with deep knowhow spanning 68 years, Akk k Holding ranks among the most well established industrial groups in Turkey. The Group conducts operations in the fields of chemicals, energy and real estate, with 20 commercial and industrial enterprises, one of which is overseas, and with 19 production plants. By closely following the trends in the world's markets and in its operating industries, Akk k Holding aims to catch up with the global competition, and achieve world-class standards together with all the companies under its roof.





## About Akkim:

Akkim Kimya, the leading chemicals producer of Turkey, was established in Yalova in 1977. Conducting manufacturing operations at 5 different locations with over 1000 employees, Akkim has a special place in the chemicals industry with its diversity of products. Akkim is a chemicals company that has been serving over 70 countries in six continents with its wide range of products, including chlor-alkali and derivatives, peroxides, methylamines, persulfates, bisulphites, textile auxiliaries, paper, water treatment chemicals, construction chemicals and plastic additives. Positioned as the market leader for many products in basic chemicals and performance chemicals; the company serves the cleaning, hygiene, water treatment, textile, paper, construction, plastics, food, metal, energy, detergent, drilling, mining, and chemicals industries.

Working to enrich its products and to produce innovative solutions by directing its efforts conducted at its R&D Center established in 2013 towards achievement of the right goals and objectives, Akkim has turned into an organization that can develop innovations at global standards. The utilization of resources has been reorganized in line with market and customer needs. Having been selling some of its know-how and technologies to overseas companies since 2002, the Company provides various services ranging from engineering services to turnkey-delivery contracting projects.

Leveraging its presence and synergy in water treatment sector, Akkim has entered the high-tech water treatment industry with its ultrafiltration membrane module investment at its Yalova Plant. The Company is the first and only producer of this product in the region stretching from Europe to Asia with its modern factory commissioned in 2016.

The Company always places importance on inorganic growth opportunities. Acquiring Akcoat (Gizem Frit) company, the world's pioneer manufacturer of chemical coating materials with 5 main product groups: enamel, ceramic, non-stick decorative coatings, pigment and glass, Akkim has become capable of adding value to the household appliances, kitchenware, ovens, ceramics and glass industries. The Company also acquired Dinox, the chemical sales and marketing company based in Germany in 2017 in order to get closer to its customers in the European market and to further expand its export activities. On the other hand, Akcoat acquired the company Akcoat Spain (Megacolor) producing ceramic printing inks in Spain, thus accomplishing a major integration investment. Akkim has finally acquired USK Kimya, one of the largest carboxymethyl cellulose producers in Turkey and the world in 2021.







50 Years

Experience in

**FIBER SPINNING**

Expertise in

**FILTRATION**

**ULTRAFILTRATION  
MODULES**



**NSF**

Certified to  
NSF/ANSI 61

# ULTRAFILTRATION

Ultrafiltration (UF) is a type of membrane filtration in which hydrostatic pressure forces a liquid against a semipermeable membrane. Suspended solids and solutes of high molecular weight are retained, while water and low molecular weight solutes pass through the membrane.

When strategically combined with other purification technologies in a complete water system, UF is ideal for the removal of colloids, proteins, bacteria, pyrogens and macromolecules from water. The primary removal mechanism is size exclusion, though surface chemistry of the particles or the membrane may affect the purification efficiency.

The primary advantages of low-pressure UF membrane processes compared with conventional clarification and disinfection (post chlorination) processes are:

- ✓ Size-exclusion filtration as opposed to media depth filtration
- ✓ Since the basic principal of hollow fiber is filtration, it does not create any waste during operation except the undesired component in the feed stream
- ✓ Low energy consumption

- ✓ Good and constant quality of the treated water in terms of particle and microbial removal
- ✓ Process and plant compactness
- ✓ Simple automation

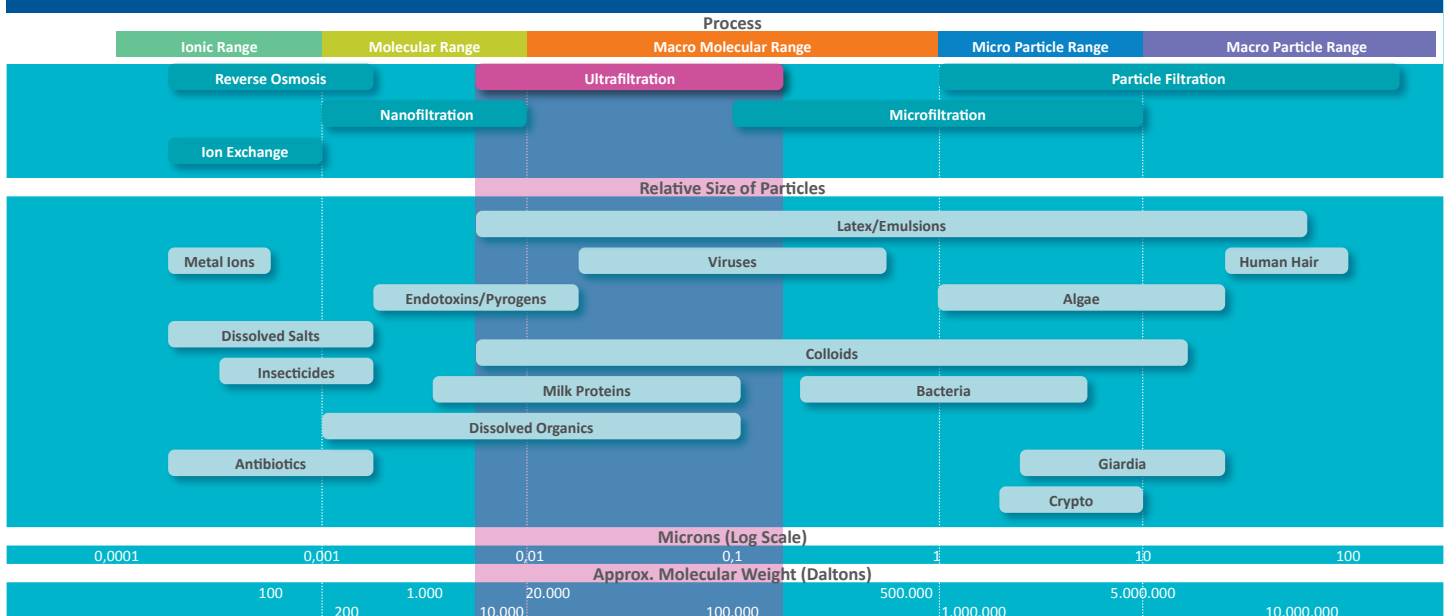
## Ultrafiltration is used in

- ✓ Municipal water treatment, waste water treatment and reuse
- ✓ Industrial water treatment, waste water treatment and reuse
- ✓ Effluent, brackish and surface water treatment
- ✓ Drinking water treatment
- ✓ Rain water treatment
- ✓ Sea water desalination
- ✓ Cooling towers
- ✓ Food & Beverage industry
- ✓ Medical industry (bacteria free water production)
- ✓ Pharmaceutical industry

Many other industrial solution systems



## Filtration and Separation Comparison



## AKUALYS ULTRAFILTRATION MODULES

Module	APM 80T	APM 80	AGM 70	ASM 35	ACM 20	ACM 10
Filtration Area	80 m <sup>2</sup>	80 m <sup>2</sup>	70 m <sup>2</sup>	35 m <sup>2</sup>	20 m <sup>2</sup>	10 m <sup>2</sup>
Operating Mode	Outside-In / Dead-End, Cross-Flow					
Fiber Material	m-PVDF					
Fiber OD / ID	1.4/0.8 mm					
Operating pH	2 – 11					
Operating Temperature	5 – 40 C					
Max. Inlet Pressure @25 C	5 bar					
MWCO (Dalton)	≤150,000					
Filtrate Turbidity	≤0.2 NTU					
Filtrate SDI	≤ 2.5					

Based on its R&D abilities and long term work in collaboration with universities and research centers, Akkim has developed a hollow fiber especially designed for high performance ultrafiltration purpose. The unique design of the modules allows enhanced feed water flow inside the U-PVC tube and between the fibers to improve the flow rate and reduce the accumulation of the sludge. The reduced fouling of the fibers improves the backwash and chemical cycles, hence increasing the life time of the membranes.

### Specialty modified PVDF based fiber to

- ✓ Reduce the fouling
- ✓ Improve the permeability
- ✓ Controlled pore size and distribution
- ✓ Improved mechanical strength of the fiber

### Unique module design

- ✓ U-PVC tube allowing chemical resistance and UV protection
- ✓ Improved feed water circulation between the fibers
- ✓ Reduced fouling
- ✓ Facilitated back wash and air scouring
- ✓ Increased life time of the membrane
- ✓ PUR potting

### Akkim Akualys UF module advantages

- ✓ Low backwash water consumption
- ✓ Low energy consumption with smaller backwash pumps
- ✓ More efficient backwash with “in to out” sequence
- ✓ More efficient and longer fouling time results to longer operation sequences

### We can also offer

- ✓ Hollow fiber supply
- ✓ Squid design and supply including the backwashing, air scouring and chemical cleaning cycles depending on the quality of your feed water





## AKKİM ULTRAFILTRATION FACILITY



Turkey's pioneer chemicals company Akkim is located in Yalova and Çerkezköy on an area covering 350 thousand square meters. Akkim water solutions produces Ultrafiltration Modules in Yalova Turkey. Water solutions production facility is built on 2.800 square meters covered area. We are the first and sole manufacturer in Turkey as well as in the region.



The hollow fiber membrane, designed and produced by Akkim with its own technology, ensure physical treatment process via absolute filtration model without changing the chemical properties of water.



Through long term R&D activities, Akkim Water Solutions developed high performance hollow fiber membrane module specially designed for ultrafiltration process.



Akkim Water Solutions uses the most advanced production equipment and performs under integrated and automatic control systems. We are able to propose you a high performance product quality.

## ADAPTABLE SKID OPTIONS

APM80T-RFP-8



APM80T-RCH-8



APM80T-RFP-12



APM80T-RCH-12



APM80T-RFP-20



APM80T-RCH-20





## SPECIFICATIONS OF AKKİM ULTRAFILTRATION MODULE



1

High efficiency

2

High chemical resistance

3

High retention capacity of contaminants

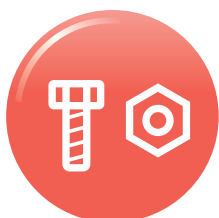
4

Strong and flexible fiber structure

5

Suitable for different water sources

## ADVANTAGES OF ULTRAFILTRATION AKKİM MODULE



Easy installation



Low maintenance cost



Low operational cost



Long usage time



Less coverage



Fixed quality of filtered water



Low investment cost

## REFERENCES / FRESH WATER AND DESALINATION APPLICATIONS



**AZERSU Ceyranbatan  
Surface Water Treatment Plant**

**Capacity** : 570,000 m<sup>3</sup>/day, 5.280 Modules  
**Water Type** : Surface Water



**ICDAS Steel Mill  
Sea Water Desalination Plant**

**Capacity** : 30,000 m<sup>3</sup>/day, 360 Modules  
**Water Type** : Sea Water



**Aksaray Municipality  
Well Water Treatment Plant**

**Capacity** : 34,560 m<sup>3</sup>/day, 320 Modules  
**Water Type** : Well Water



**Nuh Cement  
Sea Water Desalination Plant**

**Capacity** : 34,560 m<sup>3</sup>/day, 336 Modules  
**Water Type** : Sea Water



**Mingachevir Power Plant  
Surface Water Treatment Plant**

**Capacity** : 12,528 m<sup>3</sup>/day, 120 Modules  
**Water Type** : Surface Water



**S. Azerbaijan Greenhouse  
Surface Water Treatment Plant**

**Capacity** : 9,600 m<sup>3</sup>/day, 104 Modules  
**Water Type** : Surface Water



## REFERENCES / WASTEWATER REUSE APPLICATIONS



**Tuzla Leather Industrial Zone  
Wastewater Reuse Plant**

**Capacity** : 14,400 m<sup>3</sup>/day, 140 Modules

**Water Type** : Leather Industry Wastewater



**New Istanbul Airport  
Wastewater Reuse Plant**

**Capacity** : 6,000 m<sup>3</sup>/day, 84 Modules

**Water Type** : Domestic Wastewater



**Tekirdag Textile Factory  
Wastewater Reuse Plant**

**Capacity** : 720 m<sup>3</sup>/day, 10 Modules

**Water Type** : Textile Wastewater





# CHEMICAL Solutions *for* WATER Treatment

WATER TREATMENT  
CHEMICALS





## AKKIM WATER TREATMENT CHEMICALS



## SUSTAINABILITY ORIENTED, HIGH QUALITY, COST EFFECTIVE SOLUTIONS



Improves and protects quality of life.



Contributes to protection of environment with cost-effective solutions.



Attaches great importance to a sustainable world for future.

## INORGANIC COAGULANTS

Ferric III Chloride ( $\text{FeCl}_3$ ), Polialuminum Chloride are used as inorganic coagulants in municipal drinking water and waste water treatment, industrial process water and waste water treatment plants. Akkim produces inorganic coagulants in its high technology facilities. Akkim establishes Ferric III Chloride facilities abroad. The Company has been exporting its know-how of technologies since 2002. Akkim is the leading producer in Turkey with its most diverse water solutions product range.



### Advantages of Inorganic Coagulants

- ✓ They ensure that colloidal impurities in water are precipitated by coagulation and removed from water.
- ✓ By increasing the quality of water, they supply to get appropriate water parameters such as TSS, COD, phosphorus, turbidity, etc.
- ✓ They are used in conventional pre-treatment systems to reduce the load and extend the life of advanced treatment systems in the process.
- ✓ They provide high performance treatment at low cost.
- ✓ Our product range makes it easy to find solution alternatives according to the type of water pollution.

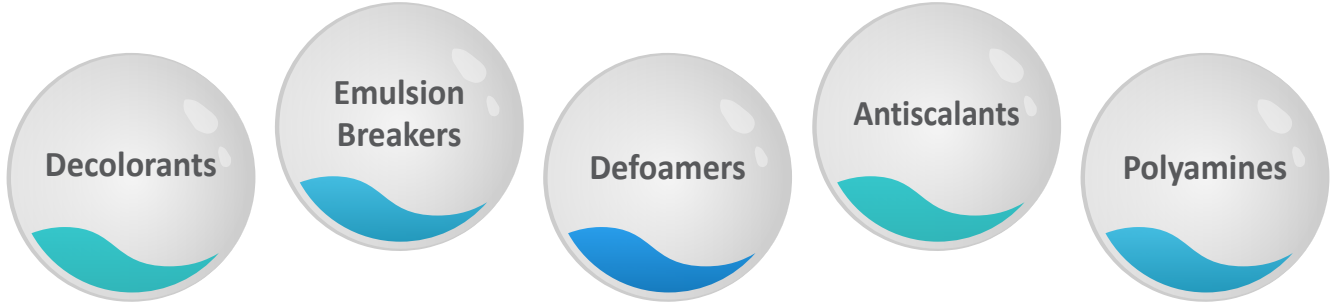




## ORGANIC COAGULANTS & FLOCCULANTS

### COAGULANTS

Decolorants, emulsion breakers, defoamers, antiscalants are used as organic coagulants in municipal, industrial, mining, drinking water/waste water treatment processes. Akkim produces these organic coagulants in its own high tech plants. Akkim is Turkey's leading manufacturer in the production of these products.



#### Advantages of Organic Coagulants

- ✓ Unique solutions for textile industry (decolorants)
- ✓ Less sludge problems
- ✓ High efficiency and low chemical consumption
- ✓ Better water quality and results for COD, Color limit, TDS, coagulation, Water/Oil separations
- ✓ High Range treatment for all type of waste water treatment plants.

### FLOCCULANTS

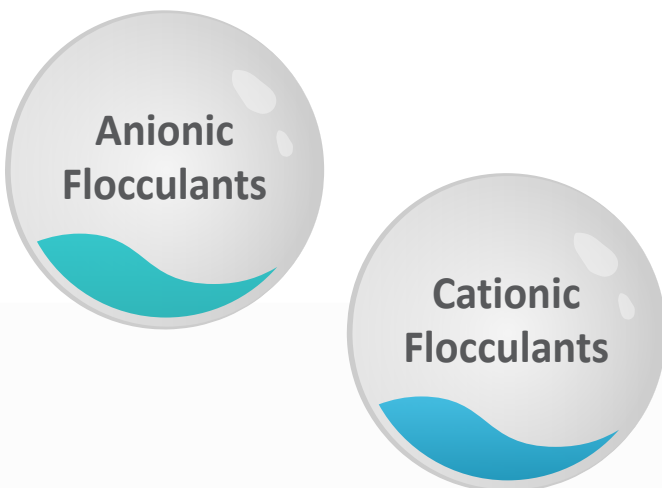
Anionic and Cationic flocculants are used flocculant in flocculation and sludge dewatering waste water treatment plants. Flocculants have very wide application fields with the performance they provide.

#### Application Fields of Flocculants

- ✓ Mining
- ✓ Municipal
- ✓ Textile
- ✓ Metal Processes
- ✓ All Type of Sludge dewatering proceses

#### Advantages of Flocculants

- ✓ Very high flocculation performance by high molecular weight
- ✓ Better clarification solutions
- ✓ User friendly liquid products according the facility
- ✓ Fast and high preformedanced flocculation process
- ✓ Long shelf life
- ✓ Able to apply for all sludge dewatering systems (Decanter, Filter press etc.)





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