

**ESMIL**  
EQUIPMENT

EQUIPMENT AND TECHNOLOGIES  
for wastewater treatment

[www.esmil.eu](http://www.esmil.eu)

## ESMIL DAF-UNIT

### Highly efficient wastewater treatment equipment

Dissolved air flotation units (DAF) are an efficient piece of equipment for cleaning wastewater from suspended solids, fats, oil products, metals and phosphates, which allows to considerably decrease COD and BOD. Our DAF-units have been successfully operating in industrial plants and wastewater treatment plants for many years.



Minimum operating costs;



High performance;



Flexible adaptation to wastewater characteristics;



Process automation;



Long term of uninterrupted operation.



# WHAT MAKES ESMIL DAF-UNIT A UNIVERSAL PRODUCT FOR WASTEWATER TREATMENT?

ESMIL DAF-UNITITS ARE ONE OF THE BEST SOLUTIONS ON THE MARKET FOR WASTEWATER TREATMENT EQUIPMENT IN TERMS OF WORKING CONDITIONS, WHICH GIVE A WIDE RANGE OF APPLICATIONS AND HIGH EFFICIENCY:

- » Separation of oil products, suspended solids, fats, oils that are not dissolved.
- » High purification efficiency makes it possible to prepare the wastewater for discharging into city networks and eliminates costs for additional operations.
- » Eliminating blockages and wear of pipelines and other related equipment increases the reliability and efficiency of production.

## SCOPE OF APPLICATION:

A WIDE RANGE OF INDUSTRIAL FACILITIES:

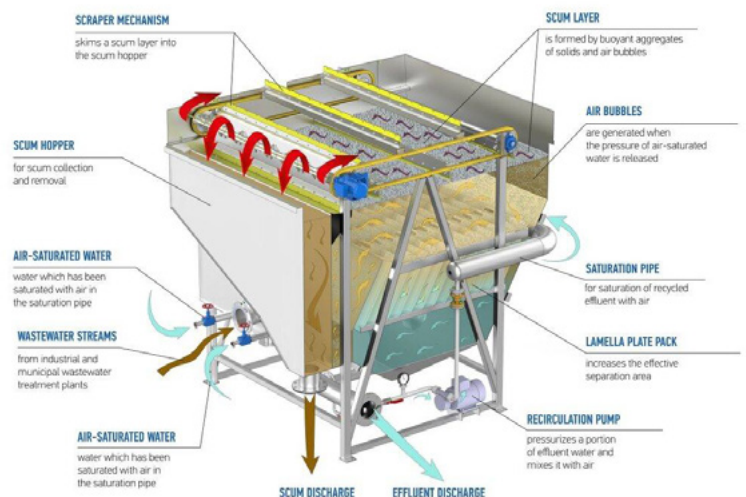
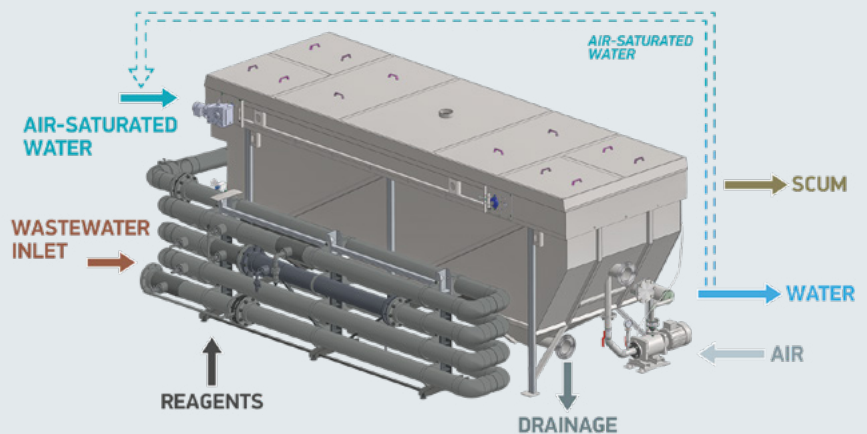
-  Meat processing plants and slaughterhouses;
-  Milk processing enterprises;
-  Fish and canning factories;
-  Oil and fat plants;
-  Petrochemical and chemical industries;
-  Textile and leather industry;
-  Iron and steel industry.

# HOW DOES IT WORK?

Initial wastewater is pumped to the mixer inlet, i.e. flocculator, where the wastewater is treated with reagents. Treated effluents enter the mixing chamber of the flotator with the simultaneous supply of a water-air mixture. The released air bubbles and waste form flotation complexes that float to the surface. Larger flotation complexes reach the surface even in the mixing chamber. The rest goes along with the waste water to the flotation chamber, where it is finally separated from the liquid.

The resulting foam is removed from the surface of the water with a scraper mechanism and discharged into the collection tray. Heavy contaminants settle on the bottom, from where they are removed through a special pipe. Clarified wastewater is discharged through a controlled overflow into the tank for purified water and removed from the installation. Part of the purified water is taken by the recirculation pump to saturate it with air. This process takes place in the line under a pressure of about 0.6 MPa.

After that, the air-water mixture is distributed for dispersed supply into the flotation and reagent wastewater treatment areas. The pressure is relieved by a control valve. The water level in the flotator is controlled by changing the overflow height.



# CHARACTERISTIC FEATURES AND ADVANTAGES OF ESMIL DAF-UNIT

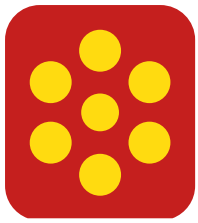
- » Time-tested technologies – many years of experience in using various types of flotation processes were taken into account and the most effective ones were applied.
- » Calculation and design for each DAF-unit is performed using CAE calculation systems and CAD computer aided design.
- » The type and size of the tank is selected individually in each case depending on the flow rate, the amount of waste, the waste specifics, the required degree of wastewater treatment.
- » The shapes of the DAF-unit tanks and their internals are designed using (CAD) computer aided drawing to create the most favorable conditions for the separation of contaminants.
- » The material for the production of the lamella blocks is selected depending on the parameters of the treated wastewater, which ensures the reliability and durability of the lamellas.
- » The use of patented static mixers demonstrates the importance for efficient mixing of reagent solutions with wastewater.
- » Tanks for accumulating sludge, are equipped with a level sensor for operating in the selected mode for sludge removal.
- » Due to the cone shape design of the sediment accumulation area, the sediment is efficiently removed, without the need to install additional scrapers in the bottom of the DAF-unit.
- » Synchronized operation of the scraper mechanism minimizes the destruction of flotation sludge during its movement over the water surface.
- » Retention time - set by flow rates and calculated doses of reagents, as well as sediment pumping management.
- » Equipment functions are controlled by using a touch panel or other device via remote access. The control cabinet is constructed using Siemens PLC and Schneider Electric components.

## ERGONOMICS. DURABILITY.

- » The self-cleansing system of the thin-layer modules extends the period of routine cleaning of equipment.
- » The container is made from AISI 304 stainless steel, or optionally from AISI 316 or fiber-reinforced polymer (FRP).
- » The flexible elements of the scrapers are made of polyurethane, which guarantees a long service life. When necessary, special elastomeric materials can be used to provide resistance to specific effluents.
- » Indication of the normal operation of equipment and emergency situations is provided. It is possible to transfer data on the state of the equipments operation to the upper-level APCS using standard communication protocols by agreement with the customer.
- » The scraper mechanism has a special design with the ability to change the drive speed or the number of scrapers. This is beneficial for instances when a large volume of flotation sludge and foam is generated.
- » Many useful options that make the work of the DAF-unit even more convenient and safe include; ventilation box, explosion-proof design, devices for extinguishing foam in the collecting tank, and service platforms.
- » ESMIL can develop automatic integration with related equipment, e.g. mechanical cleaning units, tanks, conveyors, dewatering system.

### Average indicators of cleaning efficiency:

INDUSTRY	COD	SUSPENDED SOLIDS	OIL PRODUCTS AND FATS	PHOSPHATES	SULFIDES	METALS
<i>Slaughter and meat processing</i>	55-80 %	Up to 98 %	Up to 95 %	Up to 90 %	Up to 99 %	Up to 95 %
<i>Dairy industry</i>	35-60 %	Up to 98 %	Up to 95 %			
<i>Oil processing</i>	45-55 %	Up to 95 %				
<i>Other branches</i>	35-80 %	85-95 %	85-95 %			



### REMEMBER:

We can assess the feasibility of application, the location of the DAF-unit, determine its specifications and the expected cleaning efficiency based on the initial data obtained and analyzing wastewater samples in our own laboratory.

### Specifications:

Recirculation coefficient	20 - 200%
Recycle pressure	5-6.5 bar
Flotation surface	0.5-21.6 m <sup>2</sup>
Lamella block volume	0.5-16 m <sup>3</sup>
Reduced lamella block flotation area	5-94 m <sup>2</sup>

### International Sales Department

+48 87 620 06 02  
[prodeko@esmil.eu](mailto:prodeko@esmil.eu)

