



# NIJHUIS FLOTATION (i-DAF)

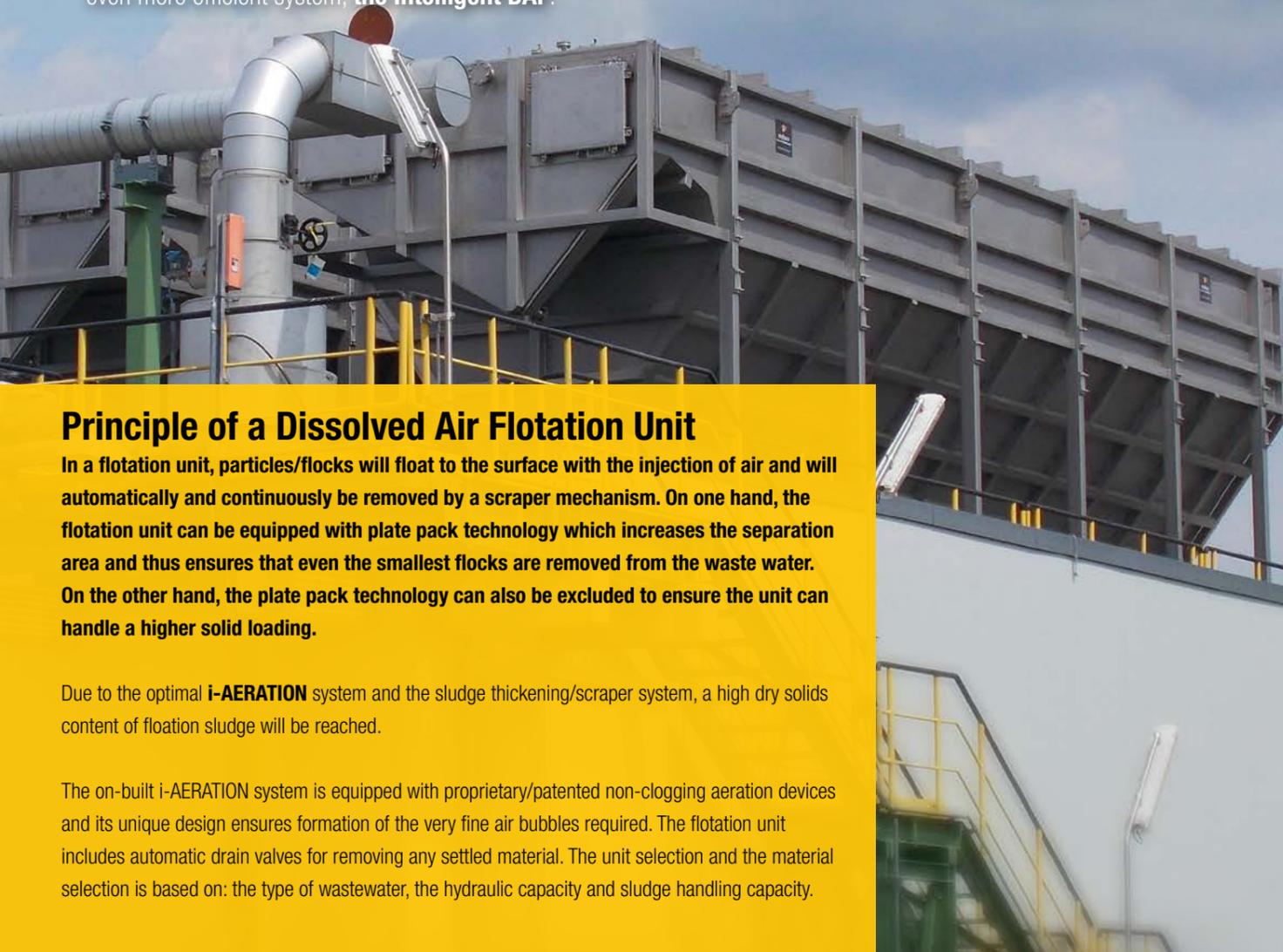
The intelligent DAF solutions



# “The intelligent DAF solutions”

For decades the Nijhuis Dissolved Air flotation unit has been known as the most robust, solid and best DAF unit available on the market. Since the early seventies of last century, Nijhuis flotation systems are used to separate non-dissolved and coagulated material from water or process streams in multiple industries.

To maximize sustainability and minimize operational costs, Nijhuis has redesigned their DAF systems and developed an even more efficient system, the **Intelligent DAF**.



## Principle of a Dissolved Air Flotation Unit

In a flotation unit, particles/flocks will float to the surface with the injection of air and will automatically and continuously be removed by a scraper mechanism. On one hand, the flotation unit can be equipped with plate pack technology which increases the separation area and thus ensures that even the smallest flocks are removed from the waste water. On the other hand, the plate pack technology can also be excluded to ensure the unit can handle a higher solid loading.

Due to the optimal **i-AERATION** system and the sludge thickening/scraper system, a high dry solids content of flotation sludge will be reached.

The on-built **i-AERATION** system is equipped with proprietary/patented non-clogging aeration devices and its unique design ensures formation of the very fine air bubbles required. The flotation unit includes automatic drain valves for removing any settled material. The unit selection and the material selection is based on: the type of wastewater, the hydraulic capacity and sludge handling capacity.

“More than **3,000** installed DAF plants and solutions around the world”

## INDUSTRY APPLICATIONS FOR (Dissolved Air) Flotation Systems

Oil, Gas & Mining



Food



Beverage



Dairy



Municipal & Sewage



Meat and Processing



Agriculture



Additional Industry Applications



# Why Nijhuis Flotation?

The most robust, solid and best DAF unit available on the market

Complete **modular product line** of flotation systems **from 2 m<sup>3</sup>/hr to 1,850 m<sup>3</sup>/hr in one single unit**

## Maximum Removal Efficiency | Reduced Energy Consumption

### Nijhuis patented i-AERATION system

The Nijhuis i-DAF system is based on the **innovative i-AERATION system** which forms fine air bubbles for the separation of particles ensured by the patented non-clogging depressurization nozzles. Micro air bubbles are dosed in and before the inlet construction of the DAF unit.

In the i-AERATION system, a part of the treated water is brought under a pressure of 5 bar, making air dissolves in water. By reducing the pressure down to 1 bar, small air bubbles of 20 to 60 micron are formed, which quickly stick to the impurities in the water and cause a high degree of clarification.



## Reduced installation time

### Nijhuis prefabricated units

Nijhuis provides the most sophisticated production facility, securing our customers with the highest quality, against a competitive price for standardized products with prefabricated units (stand-alone, container, boxframe or flatrack) under international standards like ATEX, Norsok or custom-made designs. We offer prefabricated flotation units from 2 m<sup>3</sup>/hr to 1,850 m<sup>3</sup>/hr.



## Suitable for several polluted waters and applications

### Nijhuis flotation material execution

Depending on the application and water pollution, we select the right type of material execution. For example, concrete or (super)duplex DAFs are used as corrosion resistance executed and stainless DAFs are applicable as modular and transportable units.



## Operational flexibility | Reduced sludge disposal

### Nijhuis smart level control | Sludge scraper system

Due to the optimal aeration system and the sludge thickening/scraper system, a high dry solids content is reached. To anticipate on fluctuating flows, the Nijhuis Smart Level Control ensures solid removal and high and stable dry solids content.



## Reduced Footprint

### Nijhuis plate pack technology

With the Nijhuis plate pack technology, the footprint of the DAF unit will be reduced up to 75% in comparison to flotation units without plate packs.



## High solids loading

### Nijhuis open flotation technology

With the Nijhuis open flotation technology, the unit can handle a higher solids loading. A fit for purpose i-AERATION system is included, to adjust the air to the wastewater and solids loading, meeting customer specifications with the lowest possible energy consumption.



## IPF

### Minimal Footprint

- Minimal footprint requirements, compact unit with plate pack
- High level of standardization and efficient, state of the art production
- Laminar flow through the unit for optimal removal efficiency
- Intelligent DAF design:
  - Lower sludge discharge costs, higher dry solids content
  - Better effluent quality
  - i-AERATION system to control & monitor the aeration process



## NPF

### Large Flows

- Minimal footprint requirements, compact unit with plate pack
- High level of standardization and efficient, state of the art production
- Laminar flow through the unit for optimal removal efficiency
- NPF HX special designed range for low polluted waters which result in a high capacity per unit
- Intelligent DAF design:
  - Lower sludge discharge costs, higher dry solids content
  - Better effluent quality
  - i-AERATION system to control & monitor the aeration process



## NOF

### High Solids loading

- Next generation of modular open flotation units
- Large free surface specially for water with a high solids loading
- Reduced delivery time because of modular set-up
- Fit for purpose i-AERATION system, according to wastewater and solids loading
- Intelligent DAF design:
  - Lower sludge discharge costs, higher dry solids content
  - Better effluent quality
  - i-AERATION system to control & monitor the aeration process



## DGF / DNF

### Nitrogen / Gas Flotation

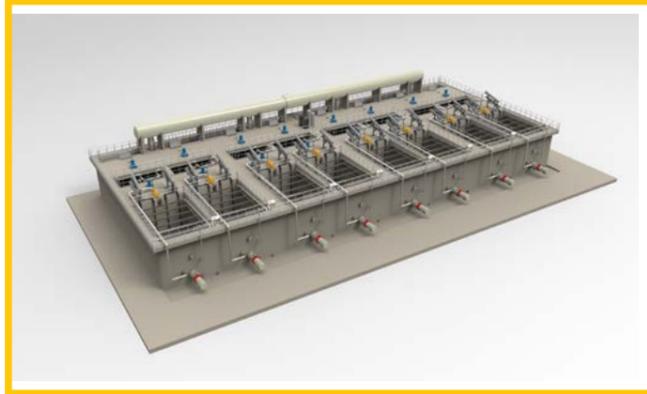
- Dissolved (bio)gas or Nitrogen Flotation (with gas cover)
- Large free surface specially for high polluted waters
- High level of standardization and efficient, state of the art production
- Applicable as pre-treatment for the oil and gas industry
- Applicable as solid/liquid separation after digestion



## High Rate i-DAF

### Large Flows & Sea Water

- Large free surface (high polluted water) or plate pack technology (reduced footprint)
- Operational flexibility by anticipating on fluctuating flows
- Execution possibilities, depending on the application:
  - Concrete: optimized corrosion resistance
  - Stainless steel / (super)duplex
- Maximum protection of any post-treatment
- Reduced sludge disposal cost by Nijhuis smart level control



## ICF(F)

### Minimal Footprint & Flexible

- Flexible modular solution based on a 'plug and play' principle
- Remote control and monitoring by NI-Connect
- Reduced installation and commissioning time
- Simplify permitting procedures
- Revolutionary next generation wastewater solution available in 40, 80 and 120 m<sup>3</sup>/hr
- Smart rail technology making it easy to roll out the flotation unit from inside the container/boxframe for periodic maintenance



## Modular Rental Fleet

### Emergencies & test units

A large rental fleet of modular treatment plants is available for use anywhere around the world. Our mobile rental and modular containerized solutions are applicable to a variety of situations and technologies to treat your wastewater, process water or waste.

- A fast response to the urgent need for a solution to a wide range in industrial activities
- Flexible modular solutions based on a 'plug and play' principle allowing easy, on demand, expansion or relocation of wastewater utilities



# FLOTATION ADD-ONS

Maximize **sustainability** and minimize operational costs

## Coagulation/Flocculation - PFR

### Higher Quality Effluent

- Accurate mixing results in uniform floc growth
- Design of flocculator based on (waste)water pollution and used chemical types
- Compact design and completely pre-assembled



## Coagulation/Flocculation - Mixing Tank

### Higher Quality Effluent

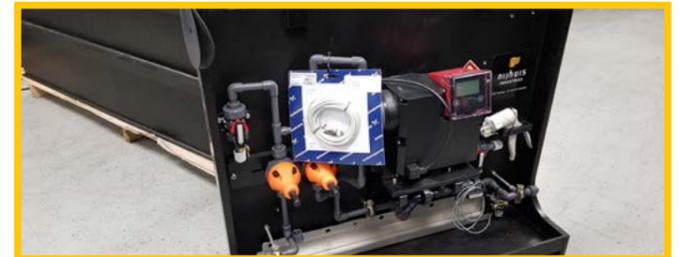
- Accurate mixing results in uniform floc growth
- Design of mixing tank based on low TSS load in the (waste)water and used chemical types
- Compact design and completely pre-assembled



## Chemical Dosing Equipment

### High level of standardization and efficient production

- **CDU/FDU:** Skid mounted or wall mounted chemical dosing units, equipped with all required safety measures
- **NMA / NMM:** Flocculant make-up unit for powder or liquid product, preparing an optimal concentration for dosage



## Intelligent Dosing - i-DOSE

### Save on chemical consumption and operators presence

- Reduced additional operators presence due to automation
- Reduce chemical consumption costs up to 30%
- Stable effluent concentrations
- Real-time control of the production process
- Reduced balance tank footprint



## Decentralized Control - i-CONTROL

### Reduce installation and cabling cost

- Modular and flexible upgrade and extension possibilities
- Reduce production time, standardized panels
- Reduce field cabling cost, pre-cabled solution
- Easy replacement of electrical wear & tear parts
- Increased field information & diagnostic



# FLOTATION ADD-ONS

Maximize sustainability and minimize operational costs

## Electro coagulation - i-NEC

### Chemical free coagulation

- Electro coagulation by an electrical process without the dosage of external chemicals
- Supplied as a skid mounted unit or stand-alone
- Low operating costs and expenses (power, maintenance, sludge)



## Platform & Staircase

### Flotation Unit Inspection

- Inspection platform & staircase along side the flotation unit



## Flotation Cover

### Gas Tight Cover

- Cover for flotation unit, gas tight option available



## Sludge Reducers

### Sludge Reduction

- The sludge reducer reduces the flange connection from the flotation unit for easier connection of the sludge pump. The reducer includes a connection point for our standard level control.



**Contact your local Sales & Service Center - [www.nijhuisindustries.com](http://www.nijhuisindustries.com)**

With Headquarters in the Netherlands, Nijhuis Industries is active in all geographical regions around the world, serving over 2,600 references from its Sales & Service Centers in China, Dubai, England, Poland, Russia, Singapore, USA & Latin America.

### About Nijhuis Industries

Nijhuis Industries delivers solid solutions for sustainable water use & resource recovery, with the highest level of intelligent innovations across a wide range of industries. We meet today's challenges as well as those of the future, as a response towards a CIRCULAR economy in a 'fluid' world. To accommodate the customer's requirements, Nijhuis offers customized installations, to create profit out of (waste)water, process water and waste.

At Nijhuis Industries it is our mission to help customers to reduce, reuse and recover water and resources to create profit. We help our valued customers to meet their increasingly demanding sustainability requirements, lower their environmental footprint, combine productivity and energy efficiency and reduce life cycle cost at the same time.

