

# poseidon\* PPM\* dissolved nitrogen flotation units

industrial process water and wastewater treatment

The poseidon\* PPM\* DNF units use dissolved nitrogen flotation technology to separate suspended contaminants from water. The unique design of the poseidon PPM DNF units provides cost-effective water treatment and allows for the achievement of a high contaminants removal rate with maximum operational flexibility.

SUEZ's poseidon PPM DNF are modular, preassembled, rectangular-shaped units which are space-efficient because of their small footprints and minimal field erection.

Different stainless steel grades, such as 304L, 316L, Duplex 2205 and other corrosion-resistant materials are used to fit process needs.

## feeding the unit

SUEZ's poseidon PPM DNF unit can be fed by pumping or by gravity with either a constant or variable flow. The unit tolerates variations in feed concentration, which allows for operational flexibility. A dual or a single chemical system may be required for optimum contaminants removal. With a dual chemical system, a coagulant is mixed with the influent at the suction of the feed pump or at the inlet of a flocculator in order to coagulate the finely dispersed material. Downstream, in the manifold area, a polyelectrolyte is mixed into the stream, initiating floc formation. With a single chemical system, the flocculant is mixed with the stream prior to the inlet compartment. If the feed flow rate varies, a proportional flow regulator for the chemical dosage pumps will allow for the right chemical addition rates.

## proprietary recirculation system

The micro-bubbles required for proper flotation are produced with a recirculation system using nitrogen as flotation gas. This recirculation system, designed to operate at a steady rate on a continuous basis, meets the essential conditions for proper flotation gas dissolution and micro-bubble generation. It also ensures a high capture rate by allowing the combining of flocs and microscopic gas bubbles, forming gas-floc conglomerates.

The recirculation system is composed of a pneumatic box, a patented poseipump\* recirculation pump (U.S. Patent 5.385.443) and a pressure release system. The efficiency of the recirculation system is mainly attributed to the poseipump, which ensures fine flotation gas dispersion into the recirculated water and builds a proper pressure to allow for gas dissolution. The poseipump is fed from the clarified water outlet, the recirculation water ratio being about 10% to 15% of the total design flow. The micro-bubbles are formed when the recirculated water is released to atmospheric pressure prior to entering the inlet compartment of the unit.

The poseidon flotation gas dissolving system generates very small gas bubbles (30-40  $\mu\text{m}$ ) and ensures the combination of the micro-bubbles with the flocculated contaminants, increasing their buoyancy. The floatable gas-floc conglomerates, along with the rest of the wastewater stream, enter into the flotation unit inlet compartment and then into the separation cell. The floatable material then rises to the surface, and any heavy settleable particles (sand, grit, etc.) settle into sludge cones at the bottom of the machine.

## intermediate capture surface zone

The poseidon PPM DNF unit is equipped with poseidon poseipack which constitutes an intermediate capture surface zone that maintains a low overflow rate and ensures a high capture rate. The poseipack also allows for low polymer consumption. Contaminants having different densities will rise and form the float layer at different rates.



## benefits

- **HIGH PERFORMANCE AND OPERATIONAL FLEXIBILITY:**
  - + High TSS and O&G capture rate
  - + High float consistency
  - + Easily handles upstream variations in flow rate and contaminant concentration
- **LOW OPERATING COSTS:**
  - + Efficient polymer consumption
  - + Minimal operator monitoring required
  - + Minimal maintenance required
  - + Stainless steel and complete corrosion-resistant construction
- **LOW INSTALLATION COSTS:**
  - + Modular preassembled units
  - + Space-efficient small footprint
  - + Minimal field erection time: unload, position and connect

Fast rising contaminants will rise in the upper part of the separation cell and smaller, slow rising contaminants, will be separated with the poseipack, located prior to the outlet of the flotation unit. The poseipack uses corrugations to favor the contact between smaller flocs and micro-bubbles, increasing their size and buoyancy, thus allowing them to rise to the float layer. The clarified water flows down through the poseipack and is collected at the bottom by a network of pipes and directed to the unit outlet.

# float removal system

SUEZ's poseidon PPM DNF unit is equipped with a scraping system which allows for continuous proper removal of the float. This system includes a scraper and one or more rotary thickeners each of which are equipped with a motor-reducer with variable speed adjustment capabilities. This provides for reliability and flexibility of the float consistency and removal.

# water level adjustment

The poseidon PPM DNF unit is operated with an automatic level control system consisting of a level control valve, level switches and a level transmitter. This type of level adjustment allow for flexibility on the float consistency and removal, in addition to increasing the stability of the treatment by maintaining a constant level in the unit.

# sediment removal system

In order to avoid any build up of heavy solids at the bottom of the unit, sludge cones and automatic drain valves are installed. The sequence of drainage is set relative to the particular application requirements .

# cover and blanketing

The poseidon PPM DNF unit is equipped with a sealed cover and allow for blanketing to control odors and hydrocarbon emissions (VOC) while eliminating the risk of fire. The covers are fabricated in stainless steel and flanged to receive all the necessary instrumentation and safety devices for vapor handling.



Preassembled, modular, space-saving design

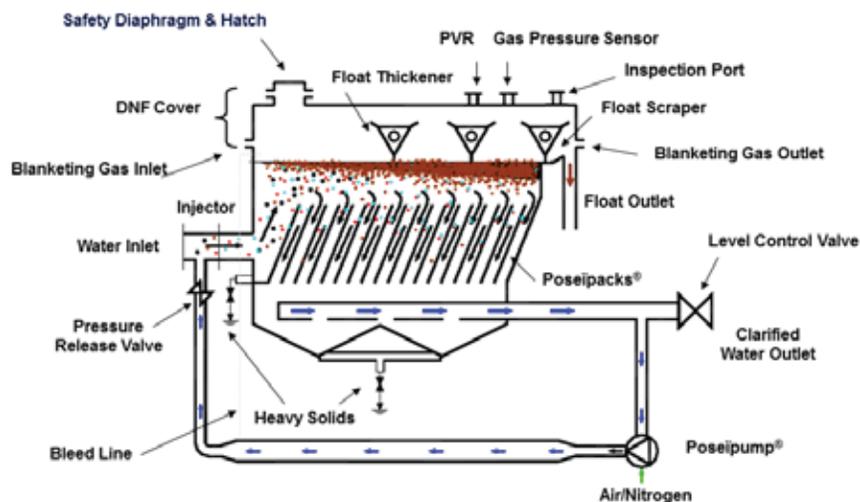
Small installed footprint saves space and new building cost



poseidon PPM DNF unit

conventional rectangular DNF unit

poseidon PPM DNF Model E unit shown



# poseidon PPM

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## integrated treatment solutions

As a full treatment line specialist, SUEZ draws upon a broad portfolio of proven technologies to assist industries and municipalities in meeting their water and wastewater treatment challenges. We custom design integrated equipment solutions and offer a comprehensive set of chemicals, monitoring instruments, and digitally enabled services for a wide range of applications:

- industrial water and wastewater
- municipal drinking water
- municipal wastewater
- biosolids management

We also offer global expertise in the design, build, operation and maintenance of water treatment plants and systems, all delivered to your specific demands.

## piloting

SUEZ offers pilot systems and services for this and many other of our product offerings. Pilot studies are a practical means of optimizing physical-chemical and biological process designs and offer the client several benefits, such as:

- proof of system reliability
- optimal design conditions for the full-scale system
- raw water lab analysis
- regulatory approval

If you are interested in a pilot system, please contact us.

**contact** Find a contact near you by visiting [www.suezwatertechnologies.com](http://www.suezwatertechnologies.com) and clicking on “**Contact Us.**”

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BRclposeidon\_DNF\_PPM\_EN Jun-18

