



Wastewater Treatment Plants • Below Ground Plastic Tanks • Plastic Sheet Extrusion

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... because water is life ...

Water covers 70 % of our planet, of which only 2,6 % is drinking water. That is the reason why our basic human duty is to preserve its cleanliness.

Aquatec VFL company introduces to the market special equipment - wastewater treatment plant AT with patented VFL® technology.

This is the way in which all of us can contribute to the global environment protection through their own effort.



*... because
water is life ...*

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About Aquatec VFL s. r. o.

Based on years of experience with an international team on the purification of wastewater, the company **Aquatec VFL s. r. o.**, located in Dubnica nad Váhom, Slovakia, was established with the intention of bringing an innovative and unique residential wastewater treatment plant model, which represents the key point of its production program. **This program offers a complete range of residential, pre-assembled plastic treatment plants and compact reinforced concrete treatment plants up to 20 000 PE.**



The philosophy of the company is to bring to European and global markets a specific type of purification plant, that meets the most stringent criteria in terms of European technology with respect to the required quality of discharged water, materials, static resistance, ease of maintenance of the wastewater treatment plants and, last but not least, affordability.



... because water is life ...

Vertical Flow Labyrinth – VFL®. Aquatec VFL uses a well-established system of the biological wastewater purification with integrated accumulation of abruptly inflowing water. The technology is also known under the international brand of Vertical Flow Labyrinth – VFL®. The technology is patented and the brand name has been copyrighted.

The technology used in the purification process ensures a high quality of treated water along with low investment and operating costs.

In 2012 the company established a line of **rotational moulding** of plastics and expanded its portfolio of rainwater into the production of underground plastic tanks along with the complete technological equipment. Regarding the distribution of drinking water, the company has started producing rotomoulded watermeter shafts of a high quality.

In 2016 the **extrusion line for the production of polypropylene plastic sheets** was launched. The main use of the sheets is the wastewater treatment plants production and commercial sale.

Aquatec VFL s. r. o. focuses on providing services to meet the customer needs and satisfaction. The company implements its own development system and design of products. Highly qualified staff provide counseling, transportation, installation and putting into operation. The warranty, customer service and technological service are fully guaranteed at the highest level.



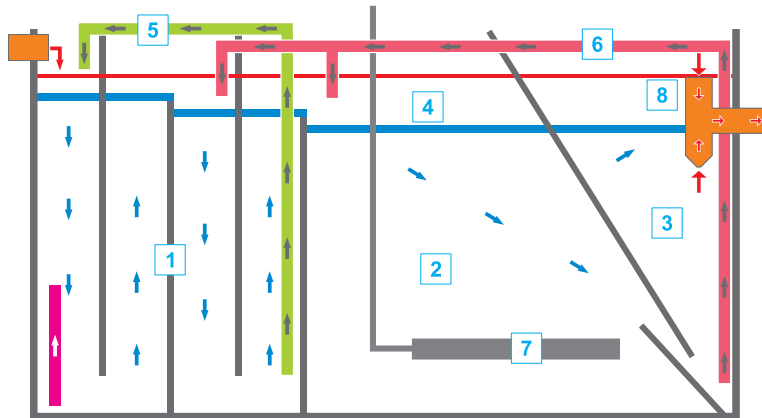
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Vertical Flow Labyrinth – VFL® - Treatment process



AT type wastewater treatment plants use continuous-flow activated sludge process with a continuous discharge pattern. The wastewater treatment plant consists of a biological reactor which combines the following processes in one tank: **mechanical pretreatment, accumulation of excess sludge, biological purification by a low draining process, separation of purified water from activated sludge in the final clarification chamber and equalization of uneven wastewater flow in the retention space.**

The cleaning process consists of a sequence of several technological processes. The raw wastewater flows to a non-aerated activation part with anaerobic and anoxic zones and forms an activated sludge activation mixture. Mechanical pre-treatment of wastewater and solids degradation takes place in this part. The non-aerated activation part is divided by several internal dividing walls forming a vertical flow labyrinth in which internal circulation is established.



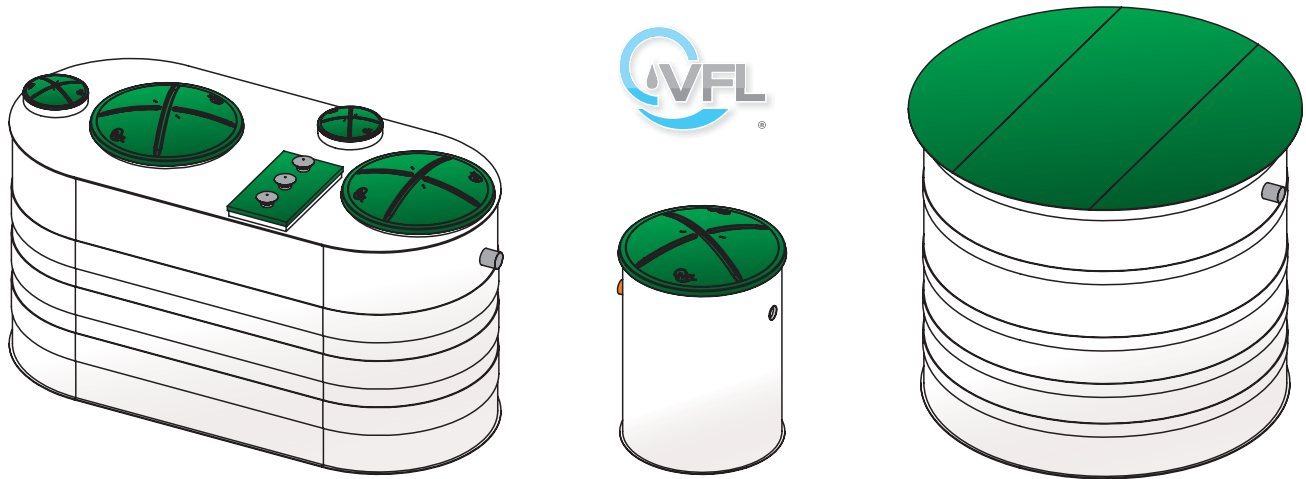
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- 1 – Anaerobic and anoxic zones with „Vertical Flow Labyrinth“
- 2 – Oxidic chamber
- 3 – Final clarification chamber
- 4 – Integrated retention chamber
- 5 – Internal recirculation
- 6 – Recirculation of sludge
- 7 – Fine-bubble diffuser
- 8 – Flow regulator

Furthermore, the wastewater flows gravitationally into the aerated low-activation chamber where, in the presence of oxygen, biological degradation of organic pollution occurs and nitrification of ammoniacal nitrogen. Pressurized air is injected into the aerated space through fine aerobic aeration elements.

Another stage of purification is the separation (final clarification) where the purified water is separated from the activated sludge, the purified water is discharged into the water stream, or recycled. Separated activated sludge is returned to the system by air lift from the bottom of the final clarification chamber into the non-aerated or aerated parts. In this section, there is a flow regulator that allows you to use the built-in retention space in the wastewater treatment plant to prevent overload of the plant. This creates conditions for discharging wastewater into the groundwater and for recycling of biologically purified wastewater as the outflowing water does not break down the pores of the filter bed of the substrate or the filtering devices.

The compressed air supplied by the blowers is controlled by the AQC Basic microprocessor control unit, which can be operated in different modes depending on the load. In this case, the intensive operation, when the compressed air flows into the aeration circuit and simultaneously into the overflow circuit phases alternate with the phases of rest, when the blower is inactive.



Vertical Flow Labyrinth – VFL® - Treatment process AT PLUS

AT PLUS type wastewater treatment plants use continuous-flow activated sludge process with a continuous discharge pattern. The plant, as well as the AT wastewater treatment plant, consists of a biological reactor which combines the following processes in one tank: mechanical pretreatment, accumulation of excess sludge, biological purification by a low draining process, separation of purified water from activated sludge in the final clarification chamber and equalization of uneven wastewater flow in the retention space. The cleaning process is the same as for AT.



PLUS is a high-grade wastewater treatment plant designation, the AQC PLUS control unit is used to control the plant. The air distributor is located directly in the control unit, therefore the control unit electronically controls not only the operating modes but also the air flow into the individual circuits.



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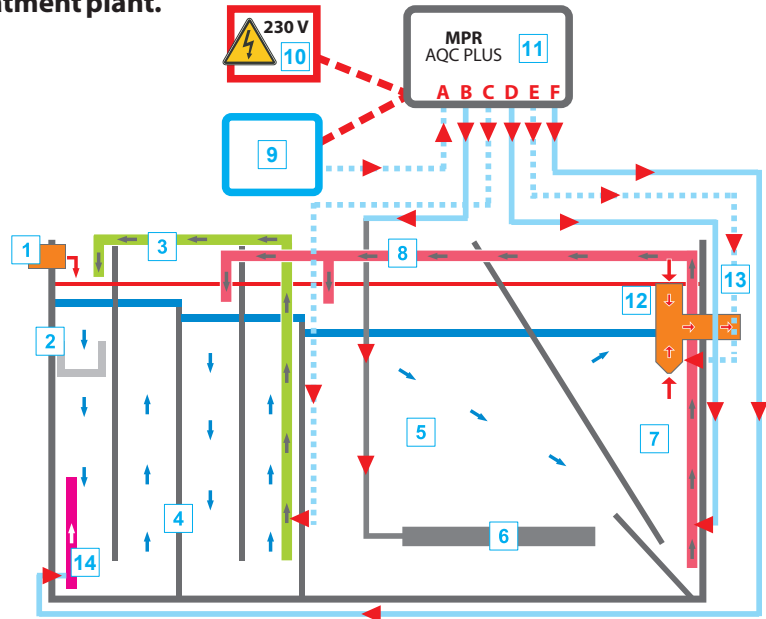


The air pump works intermittently. There alternate the phase of aeration, phase of recirculation and mixing and stop phase. The pressure air from the air pump is divided by a three-way solenoid valve alternately either to the aeration circuit or to the circuit of recirculation by air-lift pumps. Programs differ particularly in duration of phase of aeration, recirculation and stop phase, wherein one aeration phase, one recirculation and mixing phase and one stop phase represent a single cycle which is repeated the whole day. Changing the mode of operation of the plant can be done manually, automatically or remotely using the GSM module in the control unit.

Wastewater purification method with increased nitrogen and phosphorus removal in the AT PLUS type cleaner allows you to save energy for blower operation and use a lower-capacity blower. It also improves the comfort and stability of the wastewater treatment plant.



- 1 - Inflow
- 2 - Basket screen
- 3 - Internal recirculation - air-lift pump
- 4 - Anaerobic and anoxic zones with „Vertical Flow Labyrinth“
- 5 - Oxidation chamber
- 6 - Fine-bubble diffuser
- 7 - Final clarification chamber
- 8 - Recirculation of sludge - air-lift pump
- 9 - Air blower
- 10 - Power 230 V, 50 Hz
- 11 - Control unit AQC Plus (GSM)
- 12 - Integrated retention chamber
- 13 - Outflow
- 14 - Air-lift pump for mixing the content of the basket screen



Residential Wastewater Treatment Plants

AT 6 - AT 20 and AT 6 PLUS - AT 20 PLUS residential wastewater treatment plants were invented to purify sewage water for detached houses. Furthermore the purified water can either discharge into the surface or underground water, respectively it can be reused for irrigation.



In compliance with requirements of **European Norm EN 12566-3**, the residential wastewater treatment plant was subjected to a long-term efficiency test of purification, comprehensive tests of static resistance, water tightness, durability and the checking of dimensions of accessibility. The initial tests and internal control of the workshop proved that the conformity, the manufacturer declared, is in full compliance with the EU legislation. This way, **the company was authorised to label the plants up to 50 PE with the CE Mark of Conformity.**

Basic description

The wastewater treatment plant consists of an all-plastic reactor with a built-in technology. Because of the low loaded activated sludge process with aerobic sludge stabilization, it can achieve the maximum treatment efficiency. Every AT wastewater treatment plant includes a removable, lockable PE cover with stainless steel locks. The AT wastewater treatment plant uses a well-established system of a continuous-flow, suspended growth activated sludge process with an integrated retention chamber to handle the surge of inflowing wastewater.

Residential wastewater treatment plants: AT6 - AT8 - AT10 - AT12 - AT15 - AT20



The treatment technology ensures the **high quality of purified water, low investment and operation costs**. The technology also can be found under the international name of **Vertical Flow Labyrinth - VFL**.

WWTP Type	Designed daily flow [m ³ /day]	Designed daily load [kg BOD ₅ /day]	Usable volume [m ³]	Tank diameter/height [mm]	Height and DN inflow/outflow [mm]	Weight [kg]	Blower AT/AT PLUS [W]
AT 6 / AT 6 plus	0,60	0,24	1,7	1400/1800	1300/1150/DN125	105	60/50
AT 8 / AT 8 plus	0,90	0,36	2,2	1400/2200	1700/1500/DN125	125	60/60
AT 10 / AT 10 plus	1,20	0,48	3,1	1750/2200	1500/1250/DN125	195	80/60
AT 12 / AT 12 plus	1,50	0,60	3,7	1750/2400	1700/1500/DN125	225	100/80
AT 15 / AT 15 plus	1,95	0,78	5,1	2050/2200	1700/1500/DN150	330	120/100
AT 20 / AT 20 plus	2,70	1,08	6,7	2050/2700	2200/2000/DN150	405	150/120



Accessories – residential wastewater treatment plants



Simple installation of AT wastewater treatment plants

WWTPs of the type AT 6 to AT 20 and type AT 6 PLUS - AT 20 PLUS are installed into a pit with a 15 cm thick reinforced concrete slab on the bottom, so that the upper edge of the WWTP tank overlaps about 5 cm above the terrain. If necessary, and if the design documentation requires it, the WWTP is to be concreted to the height specified by the project documentation. WWTP must be filled with water (to the outflow pipe level) before doing the backfill. Detailed instructions for installing of WWTPs are given in the operating instructions annexed. The Aquatec VFL technical team can take care of the installation.



cover reduction of WWTP to 600 mm

Main Rotomoulding Products

Low profile underground plastic tanks, for shallow and flat excavation and installation, used for rain water or sewage water, designed with a pre-made inlet.

Outlet point can be selected from pre-arranged positions during the installation.

The tanks are assembled on the compacted sub-base without using concrete foundation slab.

TYPE	Volume [m ³]	Length x Width [mm]	Total height [mm]
TD 3,2	3,20	2400x2400	1180



Horizontal placed underground plastic tanks, used for pump stations, rain water or sewage water, designed with a pre-made inlet and outlet. The tank is placed on the compacted sub-base 25 cm thick including overlapping the footprint of the tank by 20 cm. In 30 cm layers 4/8 gravel is used for backfilling the tank and make up the sub-base.

TYPE	Volume [m ³]	Length [mm]	Total height [mm]
TH 2,3	2,30	2400	1500
TH 3,15	3,15	2400	1700
TH 4,2	4,20	2400	1920
TH 5,2	5,20	2400	2120
TH 6,2	6,20	2400	2300



Main Rotomoulding Products



Vertical under ground plastic tanks, used for pump stations, rain water or sewage water, designed with a pre-made inlet. Outlet point can be selected. The tanks are placed on the concrete foundation slab. Backfill with 4/8 mm gravel.

TYPE	Volume [m ³]	Diameter [mm]	Total height [mm]	Foundation
T 1	1,0	1200	1750	concrete
T 2	2,0	1600	1880	concrete
T 3	3,0	1900	2000	concrete

Watermeter shaft consists of a monolithic plastic tank whose dimensions and shape (eccentrically located revision entry) allow an entry of users in need of installation, exchange or water-gauge deduction smoothly.

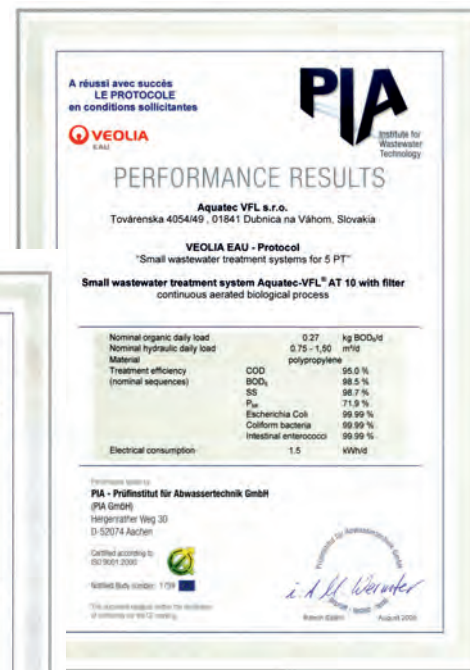
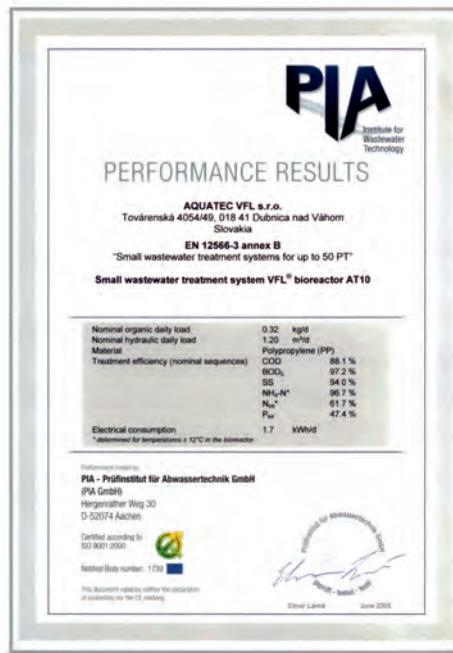
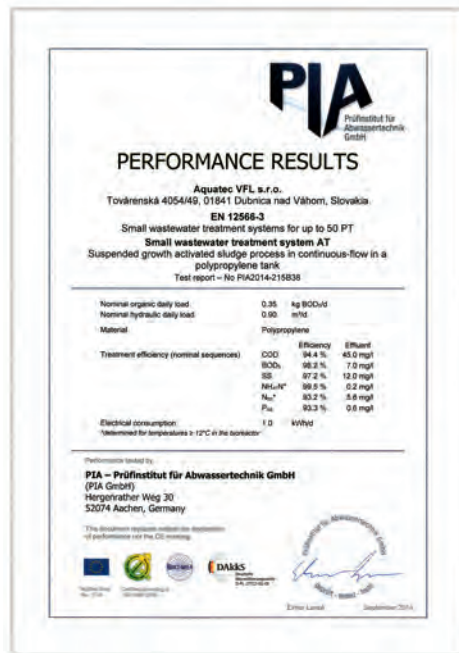
Included in the entire distribution is the installation of the water meter at the base of the shaft which prevents it from freezing.



TYPE	Diameter [mm]	Height [mm]	Manhole [mm]
VS 1,4	1100	1500	600 (excentric)



Performance Results - Residential Wastewater Treatment Plants - up to 50 PE



Partner Companies



Dubnica nad Vahom, Slovakia

- production of WWTP
- rotomoulding production
- polypropylene plastic sheet extrusion
- complete service



AUGUST

Vilnius, Lithuania

- production of WWTP
- complete service



Wastewater Treatment Plants References



Algeria
Austria
Belarus
Bulgaria
China
Columbia
Croatia
Czech Republic
Estonia
France
Germany
Hungary
Italy
Latvia
Lithuania
Mexico
Morocco
Poland
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Serbia
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Spain
Sweden
Switzerland
Syria
Tunisia
Ukraine

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Photo Gallery

Residential Wastewater Treatment Plants





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