

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

# www.aquatec.sk



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 ...





### **About Aquatec VFLs.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.



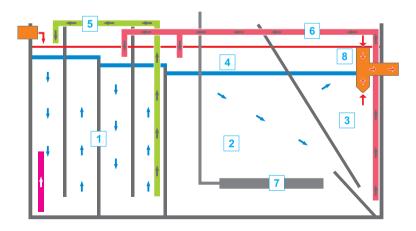


### Vertical Flow Labyrinth – VFL® - Treatment process

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.



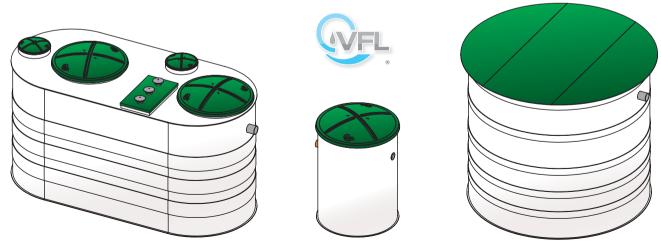


- 1 Anaerobic and anoxic zones with "Vertical Flow Labyrinth"
- 2 Oxic chamber
- 3 Final clarification chamber
- 4 Integrated retention chamber
- 5 Internal recirculation
- 6 Recirculation of sludge
- 7 Fine-bubble diffusor
- 8 Flow regulator

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.

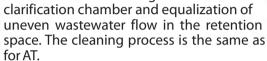
Another stage of purification is the separation (final clarification) where the purified water is separated from the activated sludge, the purified water is discharged into the water stream, or recycled. Separated activated sludge is returned to the system by air lift from the bottom of the final clarification 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



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.







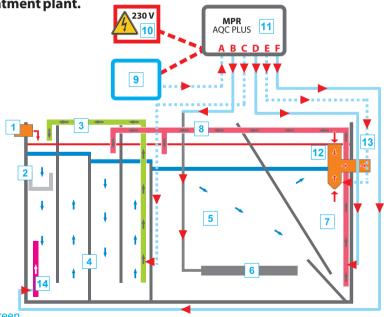


The air pump works intermittently. There alternate the phase of aeration, phase of recirculation and mixing and stop phase. The pressure air from the air pump is divided by a three-way solenoid valve alternately either to the aeration circuit or to the circuit of recirculation by air-lift pumps. Programs 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 Oxic chamber
- 6 Fine-bubble diffusor
- 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.



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 [m³/day]	Designed daily load [kg BOD₅/day	Usable volume ] [m³]	Tank diameter/heig [mm]	Height and DN ht 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**





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.



### **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	Length x Width	Total height
	[m³]	[mm]	[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 [m³]	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.

ТҮРЕ	Volume [m³]	Diameter [mm]	Total height [mm]	Foundation
T 1	1,0	1200	1750	concrete
T 2	2,0	1600	1880	concrete
Т3	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	Height	Manhole
	[mm]	[mm]	[mm]
VS 1,4	1100	1500	600 (excentric)



AQUAREC VFL S. F. O. is 4 94054 018 41 Dubnica had Vahom

ISO 9001: 2015

Scope of conflication DEVELOPMENT AND PRODUCTION OF BIOLOGICAL MAN

PRODUCTION OF EXTRIDED PLASTIC SHEETS AND

AQUAIEC ®

scentification cycle start date.

Bureau Verities Certification Holding SAS – UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 14001: 2015

Scope of certification

**DEVELOPMENT AND PRODUCTION OF BIOLOGICAL WASTEWATER** TREATMENT PLANTS WITH THE TECHNOLOGY VFL.

PRODUCTION OF EXTRUDED

Original cycle start date

Reportification curts start date:

Certificate No. SK-U20 021E

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AQUATEC YFL, E.F.O.

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Zulassung

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## Avis et communications

#### AVIS DIVERS

JOURNAL OFFICIEL DE LA RÉPUBLIQUE FRANÇAISE

MINISTÈRE DU TRAVAIL, DE LEMPLOI ET DE LA SANTÉ

Avis relatif Alagrèment de dispositifs de traitement des eaux usées domestiques et fiches techniques correspondantes

En spelcosion de l'article 7 de l'artifé du 7 septembre 200 finate les perceiptions techniques applicables au maniforment au sanisonement sur officielle que une charge beut de politime organisse "réclusion de la 12 de 200 de 100 de 1

меет и шърмани мичин: – aquatec VFL ATF-8 EH (8 EH); AQUATEC VFL кл.о 12 de l'arrité du 7 septembre 2009 précité.

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FICHE TECHNIQUE DE TRAITEMEN

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Texto 86 sur 105

#### Avis et communications

#### AVIS DIVERS

MINISTÈRE DU TRAVAIL, DE LEMPLOI ET DE LA SANTÉ

Avis relatif & lagrèment de dispositifs de traitement des eaux usées domestiques et fiches techniques correspondantes

NOR - 67591306221V

En application de l'article 7 de l'article du 7 septembre 2009 fixant les prescriptions techniques applicables aux installations d'assinitissement non collectif recevant une charge brute de pollution organiques inférieures uégale 2 L2 kg/j de DBO, et apris évaluation par des organismes nodifiels, le ministre de l'écologie, du développement dambbé, des transportes et du logenment et le ministre du travail, de l'emploi et de la samé

AQUATEC VFL AT-6 EH; AQUATEC VFL sro.

L'appénent de ce dispositif de traitement norte seulement sur le traitement des eaux nuées

L'évacuation des eaux usées doit respecter les prescriptions techniques en vigueur. La fiche technique correspondante est présentée en annexe.

#### ANNEXE

FICHE TECHNIQUE DESCRIPTIVE ASSOCIÉE AU DISPOSITIF DE TRAITEMENT AGRÉÉ « AQUATEC VEL AT-6FH »

#### Références administratives

éro national degrément	2012-005
aine de Lagniment	ADUATEC VPL srs, Továnenská 405498, PO Boe 85, 01841 Dubeica nad Váhom (Slovaquie)
omination commerciale du dispositif	AQUATEC VFL AT 46H
nitió de traitement	6 iquivalentahabitanta

#### Références de l'évaluation de l'installation

sine notifié en sharge de lévaluation	Contre détudes et de rechendres de lindustrie du bitan
viception de lavia de lorganisme natifié 3	Write 2012

Références normalisation et réglementation

riglementation rationals	Arritri du 7 septembre 2009
normalisation	NF EN 12586-3-A1





## **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



### 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** Romania Russia Saudi Arabia Serbia Slovakia Slovenia Spain Sweden **Switzerland** Syria Tunisia Ukraine

**Photo Gallery**Residential Wastewater Treatment Plants











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