VFL® HOLDING

LEADING WASTEWATER TREATMENT TECHNOLOGIES

Joined strategic cooperation between **two producers** and **co-owners of Vertical Flow Labyrinth – VFL® technology for Wastewater Treatment plants**.

AUGUST

AQUATEC®

www.vflholding.com

VFL® HOLDING

About VFL® Holding

70.000

and more installations of wastewater treatment plants with VFL® technology

200

qualified employees

15 Mio. EUR

turn over in a year

50

countries in which we are working and supplying our wastewater treatment plants

17.000 m^2

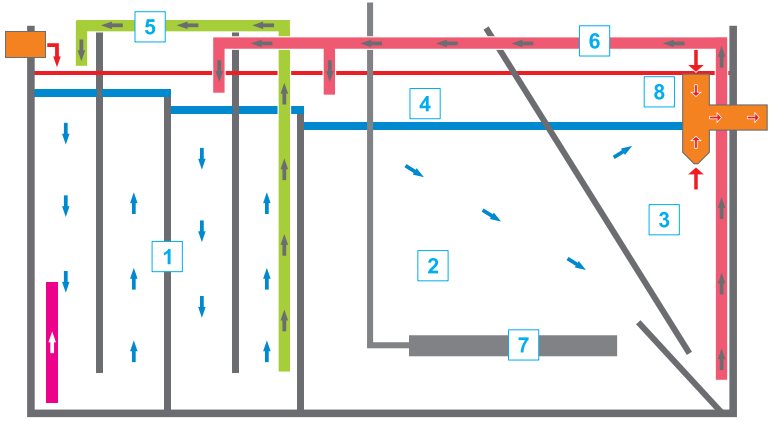
total production area for wastewater treatment systems

BREEAM

Vertical Flow Labyrinth – VFL® - Treatment process

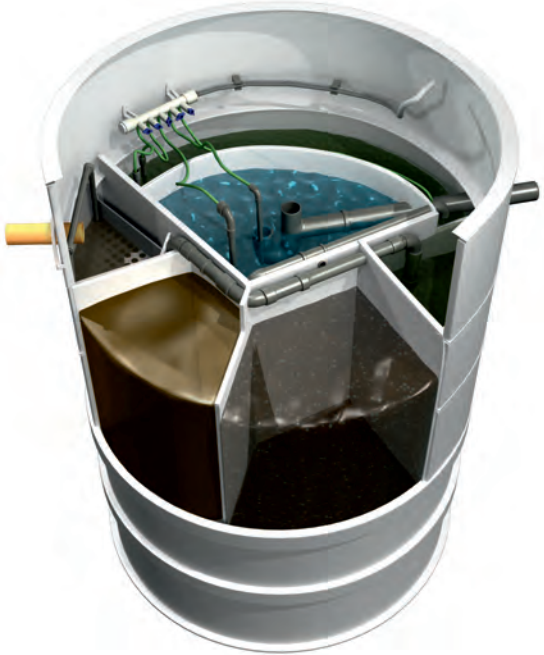
The technology uses a continuous-flow activated sludge process with biological nitrogen and phosphorus removal, which combines the following processes in a single tank: mechanical pre-treatment, excess sludge collection, biological treatment using a low-loaded activated sludge process, separation of the treated water from activated sludge in the final clarification chamber, flow balancing of fluctuating inflow of wastewater in the retention chamber. The treatment process consists of several technological processes. Raw wastewater flows into the non-aerated activated sludge chamber with anaerobic and anoxic zones creating and admixture with the recirculated activated sludge, the mechanical pre-treatment of inflowing raw wastewater and the decomposition of coarse impurities, denitrification and accumulation of readily degradable organic contamination is taking place in the non-aerated activated sludge chamber, which is divided by inner partition walls to create a vertical flow labyrinth, where internal circulation is established.

Furthermore, allowing the admixture flow gravitationally into the aerated activated sludge chamber with includes fine-bubble diffusors. In oxic conditions the biological degradation of organic contamination, nitrification and

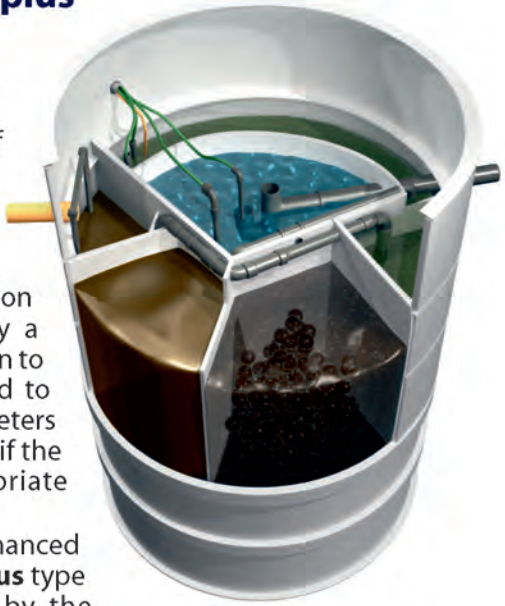


1 – Anaerobic and anoxic zones with „Vertical Flow Labyrinth“
2 – Oxic chamber
3 – Final clarification chamber
4 – Integrated retention chamber
5 – Internal recirculation
6 – Recirculation of sludge
7 – Fine-bubble diffusor
8 – Flow regulator

phosphorus uptake is taking place. The activated sludge flows into the final clarification chamber, where the activated sludge is separated from the treated wastewater. The treated wastewater is discharged into a water flow, infiltrated or recycled and the separated activated sludge is recirculated by air-lifts.
A flow regulator is installed at the water level in the final clarification chamber which controls the outflow in order to maintain the water level between the normal and maximum level in the tank (integrated retention chamber).
The pressurized air is supplied by blowers for aeration of the activated sludge chamber and for recirculation via air-lift pumps. The recirculation and aeration is controlled by a microprocessor control unit which also enables the wastewater treatment plant to work in various modes depending on the loading.



Vertical Flow Labyrinth – VFL® - Treatment process AT plus



The method of wastewater treatment with enhanced removal of nitrogen and phosphorus in the AT plus type wastewater treatment plant is characterized by a newly developed intermittent operation control of aeration, recirculation and mixing of the activated sludge. The short aeration pulse periods alternate with short recirculation and mixing periods, wherein the pressure air is directed either into the diffuser circuit or into the circuit of recirculation air-lift pumps.

The switching between daily cycle schedules with fixed or fluctuating duration of aeration period and recirculation and mixing period is ensured by a microprocessor control unit. If it is necessary to adapt recirculation or aeration to changes in quality and amount of wastewater, it can be simply switched to different time schedule manually or automatically based on measured parameters and this change can also be performed remotely, if the treatment plant is equipped with an appropriate communication module, e.g. GSM module.

The method of wastewater treatment with enhanced removal of nitrogen and phosphorus in the **AT plus** type wastewater treatment plant is characterized by the following processes:

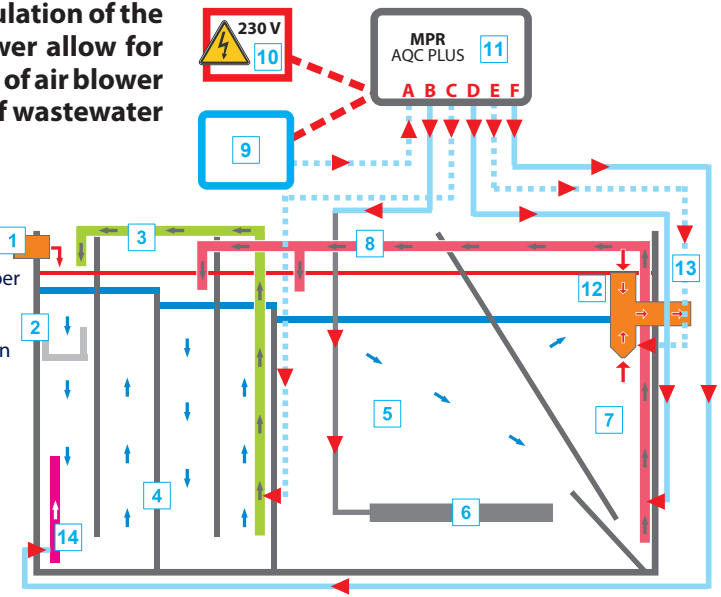
- during the short aeration period, the aeration and mixing of the activated sludge takes place in the aerated activated sludge chamber and, simultaneously, recirculation and mixing of the activated sludge in the non-aerated activated sludge chamber is stopped, or, the intensity of recirculation and mixing in the non-aerated chamber is substantially reduced. In the aerated chamber, a process of aerobic oxidation of organic substances, nitrification of reduced forms of nitrogen compounds and accumulation of phosphorus into the activated sludge takes place. Settling of heavier particles from the raw wastewater and heavier activated sludge floc particles takes place in the anaerobic zone and the

anoxic zone of the vertical flow labyrinth, while recirculation and mixing of the activated sludge mixture is stopped or intensity of recirculation and mixing of the activated sludge mixture is reduced, wherein anaerobic conditions are created closer to the bottom of the non-aerated chamber, under which process of hydrolysis and fermentation of sedimentary and colloidal biodegradable organic substances and activated sludge takes place, wherein easily available substrate is produced for denitrification and phosphor accumulating microorganisms in the activated sludge, resulting in a more efficient removal of nitrogen and phosphorus.

- during the short recirculation period, aeration and mixing of the activated sludge in the aerated chamber is stopped or intensity of aeration and mixing in the aerated chamber is substantially reduced and, simultaneously, in the non-aerated chamber, recirculation and mixing of the activated sludge takes place. In the anoxic zone of the vertical flow labyrinth denitrification process takes place in the presence of easily available substrate for the denitrification microorganisms from the recirculation in the non-aerated chamber. In the aerated chamber, the concentration of dissolved oxygen is decreased by assimilation of organic substances. In the anaerobic zone of the vertical flow labyrinth, assimilation of easily available substrate by the phosphorus accumulating bacteria takes place.

One or more two- or three-way solenoid valves serves for redirection of the pressure air alternatively into an air branch for aeration and air branches for recirculation or increase of air flow into the air branch for aeration while the air flow into the recirculation air branches for recirculation is reduced.

Non-synchronous processes of aeration and recirculation of the activated sludge using the pressure air from blower allow for energy savings for operating the air blower and use of air blower with lower capacity and also make the operation of wastewater treatment plant more comfortable and stabile.



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

Vertical Flow Labyrinth – VFL® - Tested by PIA in Aachen, Germany

2006

Efficiency test of WWTP according to the EN 12566-3 made at PIA – Testing Institute for Wastewater Technology in Aachen, Germany.

COD 59 mg/l - BOD_5 7 mg/l - N_{tot} 15 mg/l - NH_4-N 1.1 mg/l - P_{tot} 3.7 mg/l - SS 17 mg/l

2007

Efficiency test of WWTP with Sand Filter according to the EN 12566-3 made at PIA – Testing Institute for Wastewater Technology in Aachen, Germany.

COD 42 mg/l - BOD_5 5 mg/l - NH_4-N 1.3 mg/l - SS 3 mg/l - Faecal coliforms 99.99997% log 7.1

2014

Efficiency test of WWTP according to the EN 12566-3 for ATplus made at PIA – Testing Institute for Wastewater Technology in Aachen, Germany.

COD 45 mg/l - BOD_5 7 mg/l - N_{tot} 5.6 mg/l - NH_4-N 0.2 mg/l - P_{tot} 0.6 mg/l - SS 12 mg/l

Efficiency test of WWTP according to the EN 12566-3 for ATplus with additional phosphorous precipitation made at PIA – Testing Institute for Wastewater Technology in Aachen, Germany.

COD 36 mg/l - BOD_5 5 mg/l - N_{tot} 10.5 mg/l - NH_4-N 14.7 mg/l - P_{tot} 0.3 mg/l - SS 9 mg/l

CE

PIA Prüfinstitut für Abwassertechnik GmbH

TSÚS
TECHNICKÝ A SKÚŠOBNÝ ÚSTAV STAVEBNÝ
BUILDING TESTING AND RESEARCH INSTITUTE

Vertical Flow Labyrinth – VFL® - Tested by PIA in Aachen, Germany

Deutsches Institut für Bautechnik (DIBt) is an authority of the German Länder Governments for a uniform fulfillment of technical tasks in the field of public law. DIBt is an authority which issues certificates for WWTP. This certificate is a must for sale in Germany and is also respected in other countries (f.e. Austria, Switzerland).

We fulfill the norms and regulations for sale of wastewater treatment plants in France.

SINTEF (Norway) is a broad, multidisciplinary research organisation with international top-level expertise in the fields of technology, the natural sciences, medicine and the social sciences.

SP Technical Research Institute of Sweden is the national institute for technical evaluation, research, testing and works closely with companies, universities, institutes of technology and other organisations.

Nova Scotia (Canada) provides certification of persons operating classified water and wastewater facilities in Nova Scotia is mandatory under the Water and Wastewater Facilities and Public Drinking Water Supplies Regulations.

Generalitat Valenciana (Spain) – government institution has confirmed the conformity of the declared standards

PCT (Russia) - The certificate of quality issued by the Russian certification system. Confirms the compliance with regulatory acts.

SPSC (Lithuania) - The main goal of SPSC is to provide services of certification of construction products, assessment of consistency of performance, testing and assessment of internal production control upon clients applications.

Performance test of WWTP with filter - VEOLIA EAU Protocol made at PIA – Testing Institute for Waste Water Technology in Aachen, Germany.

August ir Ko factory is the first production building in Lithuania corresponding to BREEAM environmental assessment standards and in September, 2015 the building received A+ energy efficiency rating.

ISO 9001
ISO 14001
BS OHSAS 18001

Residential Wastewater Treatment Plants AT6-AT20

The compact, "one-tank system" wastewater treatment plants from AT6 to AT20 are comprised of a single vertical cylindrical tank, made from polypropylene - the biological reactor. The dimensions of the plants are ideally suited for transporting in a standard shipping sea container or by a regular truck.

The range of residential wastewater treatment plants from AT6 to AT20 is designed for decentralized solutions of wastewater treatment in the range of 0.6 up to 2.7 cubic meters per day (4 PE - 18 PE).

CE

Accessories for VFL® wastewater treatment plants:
Tank for blower - Treated water tank - Service kit - Microprocessor control unit

High effluent quality:

- Wastewater treatment plant with biological N removal with high efficiency (denitrification over 90% and nitrification over 80%) due to patented Vertical Flow Labyrinth VFL®.
- Wastewater treatment plant biological P removal with high efficiency over 80% due to patented Vertical Flow Labyrinth VFL®.
- Reuse of treated water from wastewater treatment plants is possible.
- P-removal by dosing can be integrated into the tank of wastewater treatment plant.
- Discharge into sensitive water, groundwater, bathing water.

Features and advantages:

- Compact wastewater treatment plants
- Very small footprint of wastewater treatment plant due to patented Vertical Flow Labyrinth VFL®.
- Minimized construction work.
- Quick and easy installation of wastewater treatment plant.
- One-tank wastewater treatment plant system.

Technical parameters of residential wastewater treatment plants AT6-AT20:

Type	Max. no. of inhabitants	No. of tanks	Diameter	Height	Daily inflow	BOD_5 load	Power input	Voltage	Sludge production	Power consumption
			[mm]	[mm]	[m^3/day]	[kg/day]	[W]	[V]	[m^3/year]	[kWh/year]
AT6	4	1	1400	1800	0,60	0,24	76	230	1,00	183
AT8	6	1	1400	2200	0,90	0,36	76	230	1,50	256
AT10	8	1	1600	2200	1,20	0,48	109	230	2,00	402
AT12	10	1	1750	2200	1,50	0,60	141	230	2,50	621
AT15	13	1	2050	2200	2,00	0,78	172	230	3,30	730
AT20	18	1	2050	2700	2,70	1,08	221	230	4,50	1059

Small wastewater treatment plants from AT30oval to AT225oval

(standard transport with sea container or regular truck)

The compact, "one-tank system" wastewater treatment plants from AT30oval to AT225oval are comprised of a single vertical tank with oval ground plan, made from polypropylene - the biological reactor. **The dimensions of the plants are ideally suited for transporting in a standard shipping sea container or by a regular truck.**

The range of small wastewater treatment plants from AT30oval to AT225oval is designed for decentralized and semi-centralized solutions of wastewater treatment in the range of 4.5 up to 33.8 cubic meters per day (30 PE - 225 PE).

The small wastewater treatment systems comprised of the biological reactors from AT30oval to AT225oval can be gradually expanded up to the capacity of 135 cubic meters per day (900 PE) by installing several units in parallel.

Accessories:

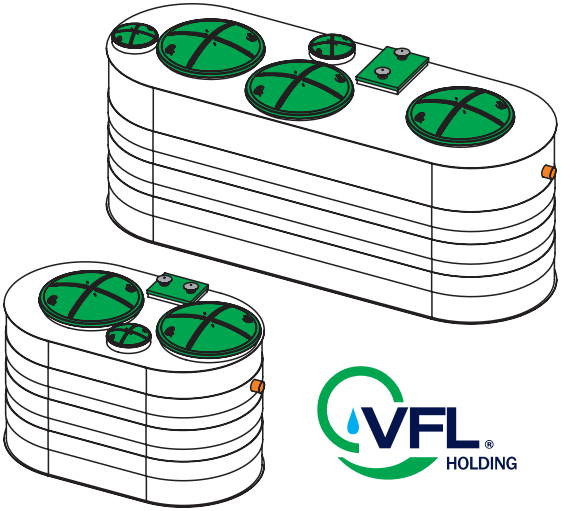
- Tank for blower for wastewater treatment plant
- Pumping station with mechanical pretreatment for wastewater treatment plant
- Sludge tank for wastewater treatment plant
- Microprocessor control unit for wastewater treatment plant

Features and advantages:

- Compact wastewater treatment plants
- Low operation cost wastewater treatment plants
- Easy to transport wastewater treatment plants
- Reliable operation of wastewater treatment plants
- High effluent quality
- Remote monitoring and control
- Odor free operation of wastewater treatment plants
- Low noise level of wastewater treatment plants

Technical parameters of oval wastewater treatment plants:

Type	Max. no. of inhabitants	No. of tanks	Length	Width	Height	Daily inflow	BOD_5load	Power input	Voltage	Sludge production	Power consumption
			[mm]	[mm]	[mm]	[m^3/day]	[kg/day]	[kW]	[V]	[m^3/year]	[kWh/year]
AT30oval	30	1	3720	2210	2250	4,50	1,80	0,23	230	7,50	1511
AT40oval	40	1	4660	2210	2250	6,00	2,40	0,23	230	10,00	1713
AT50oval	50	1	4850	2210	2500	7,50	3,00	0,36	230	12,50	2365
AT75oval	75	1	5160	2210	2500	11,30	4,50	0,46	230	13,80	3425
AT100oval	100	1	6410	2260	2500	15,00	6,00	0,72	230	18,40	4730
AT120oval	120	1	7110	2260	2500	18,00	7,20	0,90	230	22,10	5913
AT150oval	150	1	8560	2260	2500	22,50	9,00	0,90	230	27,60	6701
AT175oval	175	1	9760	2260	2500	26,30	10,50	1,08	230	32,20	8042
AT200oval	200	1	10960	2260	2500	30,00	12,00	1,35	230	36,80	8870
AT225oval	225	1	12000	2260	2500	33,80	13,50	1,35	230	41,40	10052



VFL® HOLDING

Small wastewater treatment plants from AT30 to AT300

(transport with oversize transportation truck)

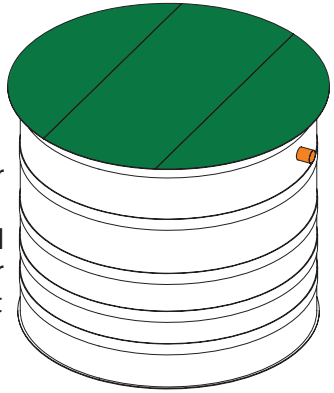
The compact, "one-tank system" wastewater treatment plants from AT30 to AT300 are comprised of a single vertical cylindrical tank, made from polypropylene - the biological reactor. **The biological reactors can be transported ready-for-use by oversize transportation truck "convoi exceptionnel".**

The range of small wastewater treatment plants from AT30 to AT300 is designed for decentralized and semi-centralized solutions of wastewater treatment in the range of 3.8 up to 45.0 cubic meters per day (30 PE - 300 PE).

The small wastewater treatment systems comprised of the biological reactors from AT30 to AT300 can be gradually expanded up to the capacity of 135 cubic meters per day (900 PE) by installing several units in parallel.

Accessories:

- Tank for blower for wastewater treatment plant
- Pumping station with mechanical pretreatment for wastewater treatment plant
- Sludge tank for wastewater treatment plant
- Control unit or electrical control panel for wastewater treatment plant



Features and advantages:

- Compact wastewater treatment plants
- Low operation cost wastewater treatment plants
- Easy to transport wastewater treatment plants
- Reliable operation of wastewater treatment plants
- High effluent quality
- Remote monitoring and control
- Odor free operation of wastewater treatment plants
- Low noise level of wastewater treatment plants

Technical parameters of circular wastewater treatment plants:

Type	Max. no. of inhabitants	No. of tanks	Diameter	Height	Daily inflow	BOD_5 load	Power input	Voltage	Sludge production	Power consumption
			[mm]	[mm]	[m^3/day]	[kg/day]	[kW]	[V]	[m^3/year]	[kWh/year]
AT30	25	1	2400	2700	3,80	1,50	0,23	230	6,30	1478
AT40	35	1	2850	2700	5,30	2,10	0,23	230	8,80	1511
AT50	50	1	2950	3000	7,50	3,00	0,55	400	12,50	3212
AT75	75	1	3300	3000	11,30	4,50	0,75	400	13,90	2628
AT100	100	1	3500	3000	15,00	6,00	0,75	400	18,30	3504
AT120	120	1	4000	3000	18,00	7,20	0,75	400	21,90	4161
AT150	150	1	4500	3000	22,50	9,00	1,50	400	29,20	6570
AT200	200	1	5000	3000	30,00	12,00	1,50	400	36,50	6570
AT250	250	1	5300	3000	37,50	15,00	1,50	400	47,50	7665
AT300	300	1	5500	3000	45,00	18,00	1,50	400	54,80	8760

Large Wastewater Treatment Plants - Centralized Solutions

Range of wastewater treatment plants:

- **From 150 up to 4000 cubic meters per day (1000 PE up to 25000 PE).**

Intended use:

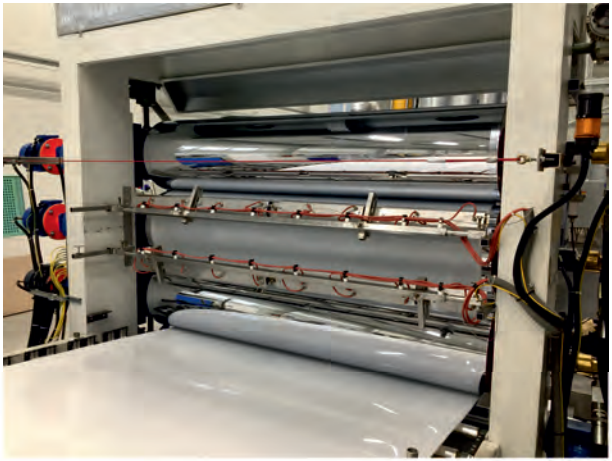
- For villages, small towns, etc.

Components:

- **Biological reactor**
- **Mechanical pretreatment**
- **Physical-chemical pretreatment**
- **Pumping station**
- **Sludge treatment**
- **Tertiary treatment**
- **Control unit**

Large Wastewater Treatment Plants

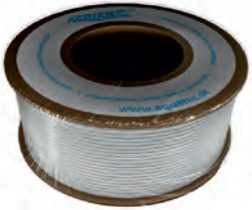
Polypropylene plastic sheet extrusion



Polypropylene (PP) plastic sheets are produced on the extrusion line for plastic sheets. We mainly use this sheets for our own production of wastewater treatment plants. This gives us the independence from different suppliers.

The goal of setting up extrusion line was mainly to cover the internal consumption of PP plastic sheets which we need for the production of wastewater treatment plants. Later we launched the commercial sale of PP sheets.
The connection of modern technologies, many years of know-how in the field of plastic extrusion and long-standing know-how in processing of PP sheets is a guarantee of high quality products and unique possibilities for testing and processing of high-quality raw materials.

Part of extrusion is also the production PP welding wires.



Plastic Sheet Extrusion

Rotomolding

Rotational moulding, also known as rotomoulding, is unique amongst plastics moulding processes because heating, shaping and cooling of the plastic, all take place inside the mould with no application of pressure. The concept is simple. Cold plastic powder is placed in one half of a cold mould - usually sheet steel. The mould is then closed and rotated biaxially in a heated oven. When all the powder has melted, the mould is transferred to a cooled environment. After the process is completed, the mould is opened and a product is removed. The final products are characterized by good mechanical and chemical properties. No welds are caused by processing, the product is monolithic and 100% waterproof.

Based on the experience, we can offer our clients support in rotomoulding of different products. We support our customers with a wide range of services: design of rotomoulded products, 3D visualisations, static calculations, drawing documentation, production of moulds and rotational moulding of products.

We have been working with several renowned material suppliers all around the world supplying us with quality materials. With the detailed inspection being held in our laboratory as well as high inspection of rotational moulding process, we are able to provide the optimal and stable quality of our products.

CNC Cutting Of Plastics

Our plastic fabrication capacity was increased by **high precision CNC cutting machines for plastics**. Wastewater treatment plants and other parts which are made from PP sheets are cut out by next generation of CNC stands, which can increase productivity without sacrificing high precision and which guarantees the highest quality shape of all parts.

Polypropylene as material is very suitable for production of wastewater treatment systems of all size. It has high chemical resistance, it can be processed very well and it is low weight compared to lot of other materials.

CNC Cutting Of Plastics

Certificates

BUREAU VERITAS
Certification

Aquatec VFL s. r. o.

Továrenská 49/4054, 018 41 Dubnica nad V
Slovak Republic

Bureau Veritas Certification Holding SAS – UK Branch certifies th
System of the above organisation has been audited and found t
with the requirements of the management system standards

ISO 14001:2015

Scope of certification

DEVELOPMENT AND PRODUCTION OF BIOLOGIC
TREATMENT PLANTS WITH THE TECHNC

03.03.2008

BUREA
Certific

Aquatec VFL s. r.

Továrenská 49/4054, 018 41 Dubnic
Slovak Republic

Bureau Veritas Certification Holding SAS – UK Branch c
System of the above organisation has been audited an
with the requirements of the management system s

ISO 9001:2015

Scope of certification

DEVELOPMENT AND PRODUCTION OF BIOL
TREATMENT PLANTS WITH THE TEC

Original cycle start date: 03.03.200

Recertification cycle start date: 28.02.2017

Allgemeine bauaufsichtliche Zulassung

DIBt

15.09.2014

Z-55.31-331

15. September 2014
15. September 2019

AQUATEC VFL, s.r.o.
Továrenská 49/54/49
018 41 DUBNICA NAD VÁHOM
SLOVAKISCHE REPUBLIK

Anwendungsbestimmungen für Kleinkläranlagen nach DIN EN 12566-3 mit CE-Kennzeichnung:

Journal officiel de la République française — Texte 86 sur 105 — janvier 2012

Avis et communications

AVIS DIVERS

MINISTÈRE DU TRAVAIL, DE L'EMPLOI ET DE LA SANTÉ

Avis relatif à l'agrément de dispositifs de traitem
des eaux usées domestiques et fiches techniques corres

NOR : ETSP1137155V

En application de l'article 7 de l'arrêté du 7 septembre 2009 fixant les prescri
aux installations d'assainissement non collectif recevant une charge brute de poll
égale à 1,2 kpj de DBO5 et après évaluation par des organismes notifiés, l
développement durable, des transports et du logement et le ministre du travail
agréent le dispositif suivant :

– aquatec VFL ATF-8 EH (8 EH) ; AQUATEC VFL s.r.o

L'agrément de ce dispositif de traitement porte seulement sur le traitement
L'éva
La fi

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

17 mars 2012 — Journal officiel de la République française — Texte 85 sur 111

Avis et communications

AVIS DIVERS

DU TRAVAIL, DE L'EMPLOI ET DE LA SANTÉ

ent de dispositifs de traitement des eaux usées domestiques
et fiches techniques correspondantes

NOR : ETSP1205227V

de l'arrêté du 7 septembre 2009 fixant les prescriptions techniques applicables
nt non collectif recevant une charge brute de pollution organique inférieure ou
après évaluation par des organismes notifiés, le ministre de l'écologie, du
ansports et du logement et le ministre du travail, de l'emploi et de la santé

H : AQUATEC VFL sro.

de traitement porte seulement sur le traitement des eaux usées.
doit respecter les prescriptions techniques en vigueur.
idante est présentée en annexe.

ANNEXE

TECHNIQUE DESCRIPTIVE ASSOCIÉE AU DISPOSITIF
TRAITEMENT AGRÉÉ « AQUATEC VFL AT-6EH »

Références administratives

	2012-085
	AQUATEC VFL sro, Továrenská 49/54/8, PO Box 85, 018 41 Dubnica nad Váhom (Slovaquie)
	AQUATEC VFL AT-6EH
	6 équivalents/habitants

Références de l'évaluation de l'installation

	Centre détudes et de recherches de lindustrie du béton
ra	3 février 2012

Références normalisation et réglementation

	NF EN 12566-3-A1
	Arrêté du 7 septembre 2009

CERTIFICATE

TIC

for the management system according
to ISO 9001:2015 and ISO 14001:2015
and BS OHSAS 18001:2007

The proof of the conforming application with the regulation was furnished and in accordance with certification procedure it is certified for the company

AUGUST

August ir Ko, UAB
Juodasis Kelias 104A
LT-11307 Vilnius
Lithuania (Lietuva)

Scope:

Design, manufacture, sale, installation, commissioning, and maintenance of wastewater treatment plants. Design, project supervision, construction, commissioning, and maintenance of special and non-special structures. General and special construction works

Certificate Registration No.: TIC 15 100 75075
TIC 15 104 7416
TIC 15 110 10243

Valid until: 2019-10-31
Valid from: 2016-11-01

Audit Report No.: 3330 28SP J0

Initial certification:
2007 // 2007 // 2010

The certification was conducted in accordance with the TIC auditing and certification procedures and is subject to regular surveillance audits.

TÜV THÜRINGEN

Jena, 2016-10-28

TÜV Thüringen e.V.
Certification body for
systems and personnel

DAkkS

BREEAM

Final Certificate
This is to certify that:

AUGUST IR KO Industrial building
Meiliakalnio village 1
Širvintos district municipality
Lithuania

BREEAM 2009 Europe Commercial: Industrial (Fully Fitted)

August ir Ko, UAB

Very Good

BREEAM-0063-2785-

01

20 October 2016

UAB Versa Consulting

Gavin Dunn

Ireland

August ir Ko, UAB

Lithuania

TÜZUS

TECHNICKÝ A SKÚŠOBNÝ ÚSTAV STAVEBNÝ, n. o.
Product Certification Body

PRODUCT CERTIFICATE
No. 00021/TSUS/Y/2016
from 21 July 2016

Product: Polypropylene plastic sheets, type C

Manufacturer: Aquatec VFL s. r. o. Business ID: 43874355
Továrenská 49/4054, 018 41 Dubnica nad Váhom, Slovak Republic

Manufacture place: Aquatec VFL s. r. o. Business ID: 43874355
Továrenská 49/4054, 018 41 Dubnica nad Váhom, Slovak Republic

This product was the subject of the certification in accordance with the working procedures of TSÚS, as an certification body for product certification and

declares, that the product characteristics:

Tensile stress at yield (≥20 MPa), Tensile stress at break (≥15 MPa), Tensile strain at break (≥200 %), Melt mass-flow rate (0,5 ±0,1 g/10 min), Density (≥0,900 g/cm³), Suitability for contact with drinking water (recommendation for contact with drinking water) —

respond to the following criteria:

Business standard PN AQT 0001/2016. Polypropylene plastic sheets - extrusion of PP sheets. Types: H, C, E, elaborated by Aquatec VFL s. r. o., Dubnica nad Váhom, efficiency from June 2016 —

Purpose and conditions of product use: Polypropylene plastic sheets, type C, are used for construction purposes, for the manufacture of tanks, manholes, storage systems, wastewater treatment systems, in the chemical engineering, galvanizing (plating) technology and the production of ventilation systems. —

This certificate is issued on the basis of the Report of product certification No. 00021/TSUS/Y/2016 of the 20 July 2016.

Validity of the certificate from: **21 July 2016** to: **without restriction**.

A part of the product certification are surveillance inspections conducted in given periods and performance of control testing in the specified range.

Note:
The reproduction of the Product Certificate is possible only as whole, or a part of it only with the written approval of the Certification Body. The misuse of the certificate will be by the certification body sanctioned under the provisions of relevant laws.

Ing. Dáša Kozárová
Head of certification body

078834

VFL HOLDING

Certificates

Certifikat
SC2129-12

Minireningsverk AgustEco modell AT6-AT50

Innehavare
AgustEco AB, Traversvägen 2, 136 50 Jordbro
Organisationsnummer: 556897-0007
Tel: 072 300 7310
E-post: info@agusteco.se, Hemsida: www.agusteco.se

Produkt
Minireningsverk AgustEco modell AT6-AT50 är ett fönsterverk, biologiskt reningsverk för BDT+KL-vatten (bad, dusch, tvätt + klosett) och finns i storlekar från 4 person ekvivalent, pe, till 50 pe med genomsnittlig dagligt flöde (last), 0,54 till 7,5 m³/dygn, respektive daglig organisk belastning, 0,24 till 3,00 kg BOD₇/dygn. Minireningsverkets tank är tillverkad av polypropen. Minireningsverket levereras komplett med all utrustning för reningsprocessen.

Avsedd användning
Rening av avloppsvatten, BDT + KL (bad, dusch, tvätt + klosett) "normalt" hushållsavlopp

Handelsnamn
Minireningsverk AgustEco modell AT6-AT50

Godkännande
Produkterna har verifierats mot nedanstående avsnitt i Boverkets Byggregler (BBR) och Boverkets föreskrifter

ФЕДЕРАЛЬНАЯ СЛУЖБА ПО НАДЗОРУ
В СФЕРЕ ЗАЩИТЫ ПРАВ ПОТРЕБИТЕЛЕЙ И БЛАГОПОЛУЧИЯ ЧЕЛОВЕКА

САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОЕ ЗАКЛЮЧЕНИЕ
№ 50.РА.05.485.П.001250.06.10 от 30.06.2010 г.

Настоящим санитарно-эпидемиологическим заключением удостоверяется, что продукция:
Установка очистки бытовых стоков вод AT-6-AT-5000

СООТВЕТСТВУЕТ (НЕСООТВЕТСТВУЕТ) санитарным правилам

Организация-изготовитель
UAB August ir Ko (ЗАО Аугуст ир Ко), Juodasis kelias 104A, LT-11307, Vilnius, (Литва)

Получатель санитарно-эпидемиологического заключения
UAB August ir Ko (ЗАО Аугуст ир Ко), Juodasis kelias 104A, LT-11307, Vilnius, (Литва)

SPSC
KVALIFIKACIJOS ATESTATAS
Nr.4302

UAB "AUGUST IR KO"
Įmonės kodas: 124600588
Juodasis kelias 104A, LT-11307 Vilnius

Suteikiama teisė būti ypatingo statinio statybos rangovu.

PIA

PERFORMANCE RESULTS

EN 12566-3:2005+A2:2013, Chapter 6.6
EN ISO 11925-2:2010 – "Reaction to fire tests – Ignitability of products subjected to direct impingement of flame – Part 2: Single-flame source test"

Product	Wastewater treatment plant
Name	AT
Material	Polypropylene
Flame smaller than 150 mm	Yes
Classification according to EN 13501-1:2007+A1:2009	Class E

Performance tested by:
PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

PASTATO ENERGINIO NAUDINGUMO SERTIFIKATAS
Nr. GM-0084-00160

A++
A+
A
B
C
D
E
F
G

SINTEF
SINTEF Certification
Nr. 20118

Teknisk Godkjenning

August AT minirenseanlegg med kjemisk felling

1. Innehaver av godkjenningen
August Norge AS
Industriveien 3
890 Rakkestad

2. Produktbeskrivelse

3. Bruksområder

4. Egenskaper

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PIA

Aquatec VFL s.r.o.
Továrenská 4054/49
01841 Dubnica nad Váhom
SLOWAKEI

18.03.2016

I'm very happy that since 2006 the company Aquatec VFL uses our PIA – Testing Institute for Waste Water Technology in Aachen, Germany for testing their wastewater treatment plants.

We are testing the VFL technology, which is, compared to German standard used technologies, not so common, but the VFL technology shows a high operational stability and very goog cleaning performance, which was also proved by all tests during the years.

So we have a very good experience with tested wastewater treatment plants with VFL technology.

With reference to all the individual tests which were made, we can say, that the wastewater treatment plants with VFL technology are very well suited for the European market for cleaning the sewage water.

And we are very happy about the great success which this company has reached.

Dr.-Ing. Elmar Dorgeloh
(Managing Director)

and more...

Main Performance Results - Residential Wastewater Treatment Plants - *up to 50 PT*

AUGUST AQUATEC®

PERFORMANCE RESULTS

EN 12566-3
Small wastewater treatment systems for up to 50 PT
Small wastewater treatment system AT
Suspended growth activated sludge process in continuous-flow in a polypropylene tank
Test report – No PIA2014-215838

Nominal organic daily load	0.35	kg BOD_5/d
Nominal hydraulic daily load	0.90	m³/d
Material	Polypropylene	

Treatment efficiency (nominal sequences)	Efficiency	Effluent
COD	94.4 %	45.0 mg/l
BOD_5	98.2 %	7.0 mg/l
SS	97.2 %	12.0 mg/l
NH_4-N*	99.5 %	0.2 mg/l
N_{inc}*	83.2 %	5.6 mg/l
P_{tot}	93.3 %	0.6 mg/l

Electrical consumption	1.0	kWh/d

*determined for temperatures ≥ 12°C in the bioreactor

Performance tested by:
PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Elmar Lenzi — September 2014

PERFORMANCE RESULTS

EN 12566-3 annex B
"Small wastewater treatment systems for up to 50 PT"
Small wastewater treatment system VFL® bioreactor AT10

Nominal organic daily load	0.32	kg/d
Nominal hydraulic daily load	1.20	m³/d
Material	Polypropylene (PP)	

Treatment efficiency (nominal sequences)	
COD	88.1 %
BOD_5	97.2 %
SS	94.0 %
NH_4-N*	96.7 %
N_{inc}*	61.7 %
P_{tot}	47.4 %

Electrical consumption	1.7	kWh/d

* determined for temperatures ≥ 12°C in the bioreactor

Performance tested by:
PIA - Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
D-52074 Aachen

Certified according to ISO 9001:2000

Notified Body number: 1739

This document replaces neither the declaration of conformity nor the CE marking.

Elmar Lenzi — June 2006

PERFORMANCE RESULTS

EN 12566-3, Annex B
Small wastewater treatment systems for up to 50 PT
Small wastewater treatment system VFL® bioreactor AT with filter
Modified continuous activated sludge process with chlorine desinfection
Test report PIA2007-021 (054B21)

Nominal organic daily load	0.32	kg BOD_5/d
Nominal hydraulic daily load	1.20	m³/d
Material	Polypropylene	

Treatment efficiency (nominal sequences)	Efficiency	Effluent
COD	91.3 %	42 mg/l
BOD_5	98.1 %	5 mg/l
NH_4-N*	99.0 %	1.3 mg/l
SS	98.8 %	3 mg/l
Faecal coliforms	99.99997 %	2 /100 ml
Faecal coliforms	log 7.1	

Electrical consumption	1.7 kWh/d

*determined for temperatures ≥ 12°C in the bioreactor

Performance tested by:
PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Elmar Lenzi — January 2010

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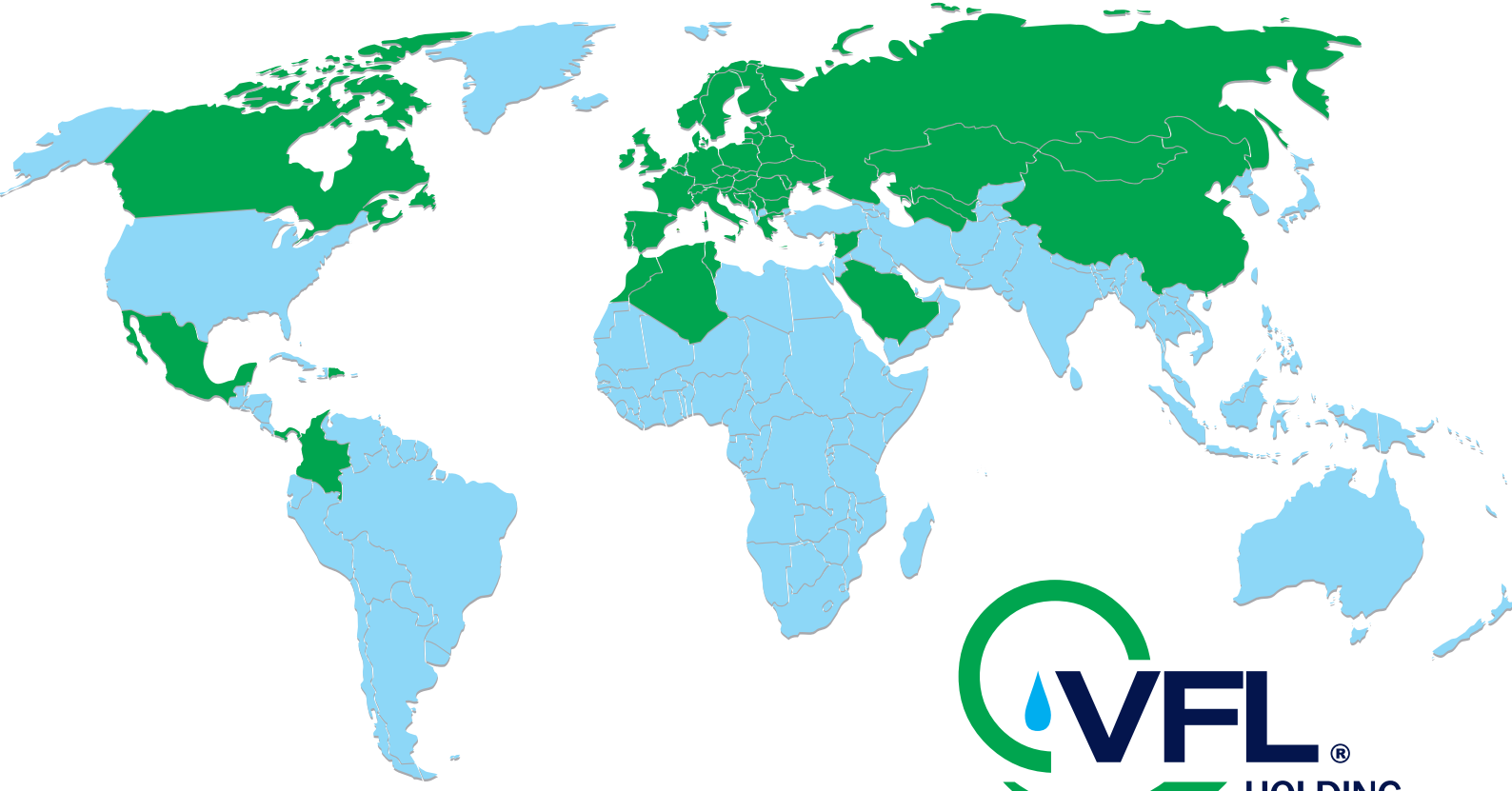
Wastewater Treatment Plants References



VFL® HOLDING

Wastewater Treatment Plants References

Wastewater treatment plants made with VFL® wastewater treatment technology.

1.	Maišiagala, Lithuania	3760 PE	Municipal	2010
2.	Sudervė, Lithuania	1315 PE	Municipal	2010
3.	Dusetos, Lithuania	1870 PE	Municipal	2011
4.	Kazokiškės, Lithuania	330 PE	Municipal	2011
5.	Medingėnai, Lithuania	533 PE	Municipal	2011
6.	Saugos, Lithuania	1000 PE	Municipal	2012
7.	Vainutas, Lithuania	1000 PE	Municipal	2012
8.	Inkakliai, Lithuania	500 PE	Municipal	2012
9.	Beijing-Beiliu, China	3125PE	Municipal	2013
10.	Le Meridien Vilnius, Lithuania	3125 PE	Hotel	2013
11.	Kalveliai, Lithuania	2000 PE	Municipal	2013
12.	Klausučiai, Lithuania	1300 PE	Municipal	2013
13.	Seredžius, Lithuania	800 PE	Municipal	2013
14.	Viešvilė, Lithuania	1000 PE	Municipal	2013
15.	Palūšė, Lithuania	188 PE	Municipal	2013
16.	Antazavė, Lithuania	150 PE	Municipal	2013
17.	Skaistgirys, Lithuania	868 PE	Municipal	2013
19.	Gilučiai, Lithuania	250 PE	Municipal	2013
20.	Pastrėvys, Lithuania	300 PE	Municipal	2013
21.	Daugirdiškės, Lithuania	32 PE	Municipal	2013
22.	Musteniai, Lithuania	96 PE	Municipal	2013
23.	Philips Morris Lietuva, Lithuania	1000 PE	Factory	2014
24.	Beijing-Wang Yu, China	1250 PE	Municipal	2014
25.	Beijing-Xiaotangshan, China	1875 PE	Municipal	2014
26.	Anhui Province Bazhen, China	6250 PE	Municipal	2014
27.	Beijing-RailwayBridge, China	3750 PE	Municipal	2014
28.	Beijing-ChaozongBridge, China	9375 PE	Municipal	2014
29.	Beijing-Ma SquareBridge, China	12500 PE	Municipal	2014
30.	Changsa, China	15625 PE	Municipal	2014
31.	Dapkiškė, Lithuania	304 PE	Municipal	2014
32.	Gaurė, Lithuania	470 PE	Municipal	2014
33.	Pagramantis, Lithuania	596 PE	Municipal	2014
34.	Pilviškiai, Lithuania	1010 PE	Municipal	2014
35.	Aksniupiai, Lithuania	373 PE	Municipal	2014
36.	Šniūraičiai, Lithuania	188 PE	Municipal	2014
37.	Šiaulėnai, Lithuania	373 PE	Municipal	2014
38.	Šaukotas, Lithuania	188 PE	Municipal	2014
39.	Gražionys, Lithuania	373 PE	Municipal	2014
40.	Skirsnemunė, Lithuania	1040 PE	Municipal	2014
41.	Changsha, China	12500 PE	Municipal	2015
42.	Zhejiang-Tang Hong, China	1562 PE	Municipal	2015
43.	Fujian-Shaowu, China	6250 PE	Municipal	2015
44.	Bejing-Yanshou, China	2500 PE	Municipal	2015
45.	Beijing-Dingling, China	2500 PE	Municipal	2015
46.	Hunan-Leiyang, China	12500 PE	Municipal	2015
47.	Beijing-Zhuanglu, China	2625 PE	Municipal	2015
48.	Tauragnai, Lithuania	522 PE	Municipal	2015
49.	Sudeikiai, Lithuania	500 PE	Municipal	2015
50.	Vyžuonos, Lithuania	605 PE	Municipal	2015
51.	Užpaliai, Lithuania	700 PE	Municipal	2015
52.	Usėnai, Lithuania	1000 PE	Municipal	2015
53.	Katyčiai, Lithuania	660 PE	Municipal	2015
54.	Šunskai, Lithuania	600 PE	Municipal	2015
55.	Ąžuolija, Lithuania	41 PE	Municipal	2015
56.	Gelgaudiškis, Lithuania	3529 PE	Municipal	2015
57.	Juknaičiai, Lithuania	1575 PE	Municipal	2015
58.	Beijing-Changlu, China	1250 PE	Municipal	2016
59.	Beijing-South exit, China	2500 PE	Municipal	2016
60.	Beijing-Majuqiao, China	3125 PE	Municipal	2016
61.	Fujian-Youxi, China	9375 PE	Municipal	2016
62.	Zhejiang-Huzhou Wuxing, China	93750 PE	Factory	2016
63.	Toliočiai, Lithuania	149 PE	Municipal	2017
64.	Paberžė, Lithuania	1540 PE	Municipal	2017
65.	Šiaudiniai, Lithuania	227 PE	Municipal	2017
66.	Raguviškiai, Lithuania	159 PE	Municipal	2017

Partnership with VFL® Holding

Become a partner of VFL® wastewater treatment technology

Together we will be able to contribute to a cleaner environment and at the same time increase the profit of our and your company. We are delighted to offer you the opportunity of a mutually beneficial partnership:

- **Sale and distribution of our wastewater treatment plants and solutions for decentralized and semi-centralized wastewater systems in your country or region.**
- **Assembling of our wastewater treatment plants based on a treatment technology and know how transfer.**

What we can offer:

www.vflholding.com

- Professional, technical and technological support for design, sale, marketing, installation and long-term maintenance of our products and solutions for decentralized, semi-centralized and centralized wastewater systems.
- Long-term cooperation with you.
- Training and schooling of the workers for installation and maintenance of wastewater treatment plants.
- Common development of the product adaptation to local requirements in your country or region with you.
- Transfer of know-how, technology and expertise, agreement on manufacturing of wastewater treatment plants or other products from polypropylene sheets.
- Technical assistance during the transfer of know-how, technology and expertise.
- Future ongoing research and developlment of wastewater treatment technologies and water reuse technologies.

Partnership with VFL® Holding

Residential Wastewater Treatment Plants

Small Wastewater Treatment Plants
OVAL

Small Wastewater Treatment Plants
CIRCULAR

Large Wastewater Treatment Plants

Large Wastewater Treatment Plants

www.vflholding.com

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ID No.: 51104458 VAT ID: SK2120603540 • info@vflholding.com