

Utilisation, infiltration, retention, treatment, fire-fighting water provisioning



Mall CaviLine infiltration tunnel

This shallow rainwater infiltration system is suitable for private, commercial and public applications. It offers a high traffic loading capability, including HGVs (live load SLW 60), accessibility to all areas of the system, and a flexible, simple design.

- C35/45 reinforced concrete half-shells with monolithic structure
- Access through saddle piece
- Structure – optional: cone or cover plate and shaft cover, class B or class D for SLW 60
- Internal height of >1 m, accessed in accordance with DGVV (German Social Accident Insurance) regulation 103-003
- Special pre-filter fleece on the base prevents the entry of fine filterable substances (option).



Animation and
 installation videos at:
www.mall.info/tv

CaviLine – individual components

Components	Volume m ³	Length l mm	Width w mm	Height h mm	Infiltration area m ²	Weight kg
Tunnel element	6.10	2500	2500	1250	9.25	2,500
Tunnel end element	5.90	2400	2500	1250	11.10	3,230
Tunnel end element with access	5.90	2400	2500	1250	11.40	3,250
Saddle piece for shaft construction	–	–	–	–	–	210
Filter fleece for base cover	–	–	–	–	–	–

CaviLine – system packages

CaviLine type	Length outside m	Volume m ³	Width infiltration area m	Heaviest single weight kg	Total weight kg	Number of strings
25-1-2	5.00	11.80	3.70	3,250	6,800	1
25-1-3	7.50	17.90	3.70	3,250	9,300	1
25-1-4	10.00	24.00	3.70	3,250	11,800	1
25-1-5	12.50	30.10	3.70	3,250	14,640	1
25-1-6	15.00	36.20	3.70	3,250	17,140	1
25-1-7	17.50	42.30	3.70	3,250	19,640	1
25-1-8	20.00	48.40	3.70	3,250	22,140	1
25-2-5	12.50	60.20	7.40	3,250	29,280	2
25-2-6	15.00	72.40	7.40	3,250	34,280	2
25-2-7	17.50	84.60	7.40	3,250	39,280	2
25-2-8	20.00	96.80	7.40	3,250	44,280	2
25-3-6	15.00	108.60	11.10	3,250	51,420	3
25-3-7	17.50	126.90	11.10	3,250	58,920	3
25-3-8	20.00	145.20	11.10	3,250	66,420	3
25-3-9	22.50	163.50	11.10	3,250	73,920	3

Infiltration performance calculated for: Distance between individual strings min. 1.00 m, working space 0.5 m on all sides, substructure min. 0.25 m infiltration gravel

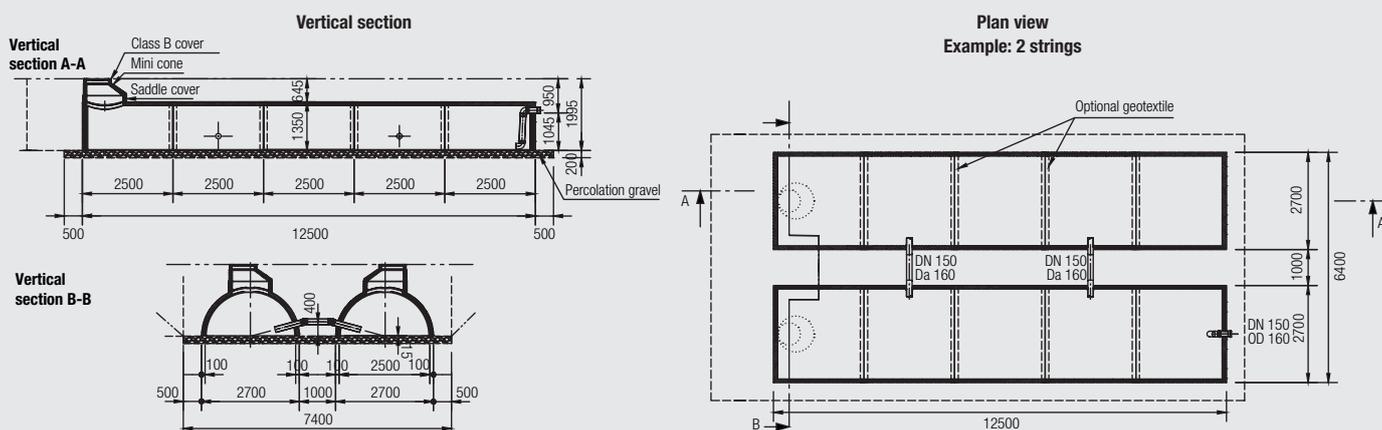
Note: Installation depths > 3 m require lean concrete foundation strip – see installation instructions at www.mall.info – max. installation depth: 5 m

Accessories

Order number

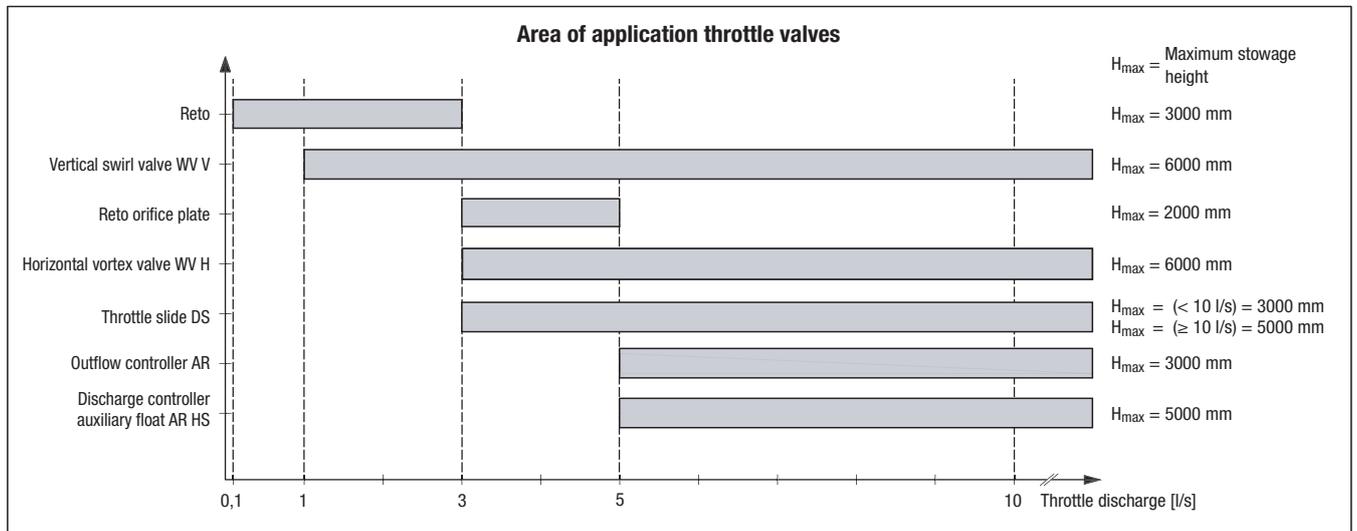
418741	Elastomer strip SBR-65 – L/W/H = 250/10/1 cm – mortar substitute
418297	Drainage pipe DN 150 – connection pipe for multiple-string systems
705092	Inlet fitting KG 2000 PP standard: DN 150
412526	Separating fleece RBK 3 for covering butt joints – pre-fabricated concrete components
417589	Pre-filter matt on trench base – colmation protection W/L = 250/600 cm
416494	Joint sealing tape for shaft connection rebate DIN 4034-2 (accesses)

- Shaft rings, cones, covers class A, B, D for accesses, see Chapter 8.
- Pre-treatment with sedimentation, lamellae or filter systems (see Chapter 1 Rainwater treatment)



Mall throttle and separating structures

Throttle structures are used when the volume of water discharged is to be reduced to a specified value, the throttle discharge Q_r , critical. They must always be designed on a project-specific basis. Throttling is carried out using various throttle valves, the areas of application of which depend on the dam height and throttle discharge, see diagram.



In addition, the required selectivity also determines the choice of suitable throttle fitting. The uncertainty factor UF is as a selection aid. It must be multiplied by the throttle discharge $Q_{r,krit}$ in order to obtain the rated inflow for the downstream systems.

Example

ViaPart throttle structure upstream of ViaTub lamella clarifier with required $Q_{r,krit}$: 10 l/s.

Selected throttle valve Vortex valve with $UF = 1,2$.

Rated inflow for ViaTub $Q_{dem} = 1,2 * 10 \text{ l/s} = 12 \text{ l/s}$

Throttle fitting	Blur factor (UF)	Discharge characteristic curve available
Discharge controller	1,0	Yes
Swirl valve	1,2	Yes
Reto	1,5	No
Throttle slide	1,5	Yes
Throttle orifice	~ 2,0	No
ViaSep	~ 2,0	No

If only a certain proportion of the wastewater produced is to be treated (partial flow treatment), the version with integrated separating sill and cut-off is used. In this case, the throttled partial flow $Q_{r,krit}$ is channelled through the treatment plant and the remaining partial flow Q_U into the receiving water without further treatment. This means that the treatment plant only has to be designed for a fraction of the water inflow Q_{dem} . Although the efficiency of the entire treatment package decreases, it can be adapted to the requirements by selecting the partial flow rates.

Mall throttle structures ViaPart (see page 8)

Throttle structure with one of the following throttle elements with existing discharge characteristic. Design with separating sill for partial flow treatment possible. Special geometries for discharge sills, pipe inlets, pump sumps and bottom discharges (for maintenance work) can be on request. Arrangement in a rectangular or square shaft may be advisable.

- Discharge controller AR Discharge control via float-driven gate valve, constant discharge (HS = Auxiliary float)
- Vortex valve WV Outflow control via hydraulic vortex, almost constant outflow, without moving parts; vertical (v) or horizontal (h)
- Throttle valve DS Outflow control via rigid gate valve, outflow dependent on inlet pressure

ViaSep mall dividing structure (see page 14)

The ViaSep system type consists of a separating sill with openings for the inlet, outlet and shut-off pipe. The outlet pipe is designed with a smaller nominal diameter than a pipe throttle. The pipe dimensions and length must be designed for the specific project.

Mall throttle structure ViaPart with discharge controller

 Webcode **M3315**

- Relief structure must be dimensioned on site
- Monolithic reinforced concrete round tank of C35/45, jointing according to DIN 4034-2
- Cover plate and cover, class D if necessary (SLW 60)
- With ready-mounted discharge controller with characteristic curve according to the connection width and flow rate
- Blur factor = 1.0
- Articulated, permanently elastic pipe connection for plastic pipes in the outlet according to the throttle device, in the inlet according to the nominal inlet diameter, other pipe materials and nominal diameters on request (from DN 600 always subject to a surcharge)
- Special geometries on request

Order number	Discharge capacity l/s	Interior Ø ID mm	Total depth GT mm	Inlet DN	Outlet DN	Heaviest single weight kg	Total weight kg
Part 5 AR	5	1200	2085	250	100	3.050	3.770
Part 10 AR	10	1500	2350	400	150	4.500	5.630
Part 15 AR	15	1500	2350	400	200	4.500	5.630
Part 20 AR	20	1500	2350	500	200	4.590	5.720
Part 25 AR	25	1500	2350	500	200	4.590	5.720
Part 30 AR	30	1500	2350	500	250	4.590	5.720
Part 40 AR	40	1500	2350	600	250	4.650	5.780
Part 50 AR ¹⁾	50	2000	2970	600	300	8.270	10.440
Part 75 AR ¹⁾	75	2000	2970	700	300	8.400	10.570
Part 100 AR ¹⁾	100	2000	2970	800	400	8.500	10.670
Part 125 AR ¹⁾	125	2000	2970	800	400	8.500	10.670

¹⁾ A suitable discharging device must be provided on site.

- A float-controlled drain regulator is used as standard.
- Optionally, an auxiliary float can be selected, which releases the entire drain cross-section for a short time when installed.

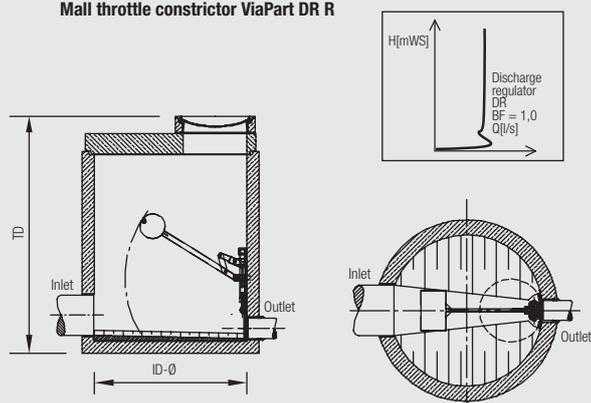
Mall throttle structure ViaPart with discharge controller for discharge limitation with integrated discharge device for partial flow treatment

- ViaPart with additional reinforced concrete threshold and opening for knock-down

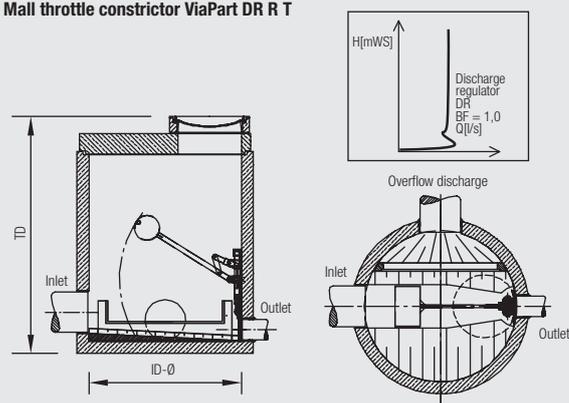
Order number	Discharge capacity l/s	Interior Ø ID mm	Total depth GT mm	Inlet DN	Outlet DN	Heaviest single weight kg	Total weight kg
Part 5 AR T	5	1200	2180	250	100	3.110	3.830
Part 10 AR T	10	1500	2350	400	150	4.580	5.710
Part 15 AR T	15	1500	2350	400	200	4.620	5.750
Part 20 AR T	20	1500	2350	500	200	4.710	5.840
Part 25 AR T	25	1500	2350	500	200	4.710	5.840
Part 30 AR T	30	1500	2350	500	250	4.720	5.850
Part 40 AR T	40	1500	2350	600	250	4.780	5.910
Part 50 AR T ¹⁾	50	2000	2350	600	300	8.480	10.650

¹⁾ A suitable unloading device must be provided by the customer.

Mall throttle constrictor ViaPart DR R



Mall throttle constrictor ViaPart DR R T



Mall throttle structure ViaPart with vortex valve



Animation at:
www.mall.info/tv

- Relief structure must be dimensioned on site
- Monolithic reinforced concrete round tank of C35/45, jointing according to DIN 4034-2
- Cover plate and cover, class D if necessary (SLW 60)
- With pre-assembled vortex valve with characteristic curve according to the connection width and flow rate
- Blur factor = 1.2
- Flexible, permanently elastic pipe connection for plastic pipes in the outlet according to the throttle device, in the inlet according to the nominal inlet diameter, other pipe materials and nominal diameters on request (from DN 600 always subject to a surcharge)
- Special geometries on request

Order number	Discharge capacity l/s	Interior Ø ID mm	Total depth GT mm	Connections		Heaviest single weight kg	Total weight kg
				Inlet DN	Outlet DN		
Part 5 WV	5	1200	2085	250	100	3.050	3.770
Part 10 WV	10	1500	2350	400	150	4.500	5.630
Part 15 WV	15	1500	2350	400	200	4.500	5.630
Part 20 WV	20	1500	2350	500	200	4.590	5.720
Part 25 WV	25	1500	2350	500	200	4.590	5.720
Part 30 WV	30	1500	2350	500	250	4.590	5.720
Part 40 WV	40	1500	2350	600	250	4.650	5.780
Part 50 WV ¹⁾	50	2000	2970	600	300	8.270	10.440
Part 75 WV ¹⁾	75	2000	2970	700	300	8.400	10.570
Part 100 WV ¹⁾	100	2000	2970	800	400	8.500	10.670
Part 125 WV ¹⁾	125	2000	2970	800	400	8.500	10.670

¹⁾ A suitable discharging device must be provided on site.

- Horizontal, wet-installed vortex valves are used as standard.
- Vertical vortex valves can be selected as an option. These can be pulled out manually during installation so that the entire drain cross-section is released. However, they require a throttle sump.
- Optional semi-dry, horizontal vortex valves.

Mall throttle structure ViaPart T with vortex valve

for discharge limitation with integrated discharge device for partial flow treatment

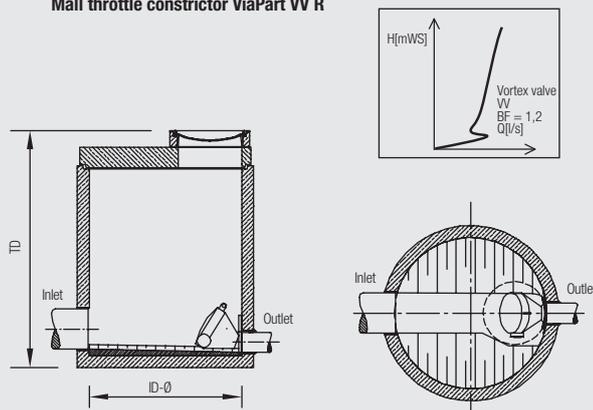
- ViaPart with additional reinforced concrete threshold and opening for knock-down

Order number	Discharge capacity l/s	Interior Ø ID mm	Total depth GT mm	Connections		Heaviest single weight kg	Total weight kg
				Inlet DN	Outlet DN		
Part 5 WV T	5	1200	2180	250	100	3.110	3.830
Part 10 WV T	10	1500	2350	400	150	4.580	5.710
Part 15 WV T	15	1500	2350	400	200	4.620	5.750
Part 20 WV T	20	1500	2350	500	200	4.710	5.840
Part 25 WV T	25	1500	2350	500	200	4.710	5.840
Part 30 WV T	30	1500	2350	500	250	4.720	5.850
Part 40 WV T	40	1500	2350	600	250	4.780	5.910
Part 50 WV T ¹⁾	50	2000	2350	600	300	8.480	10.650

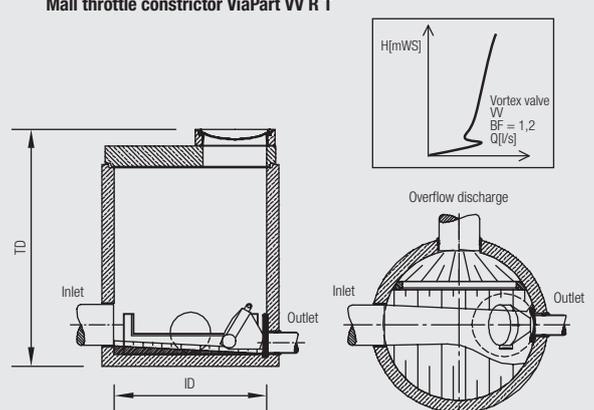
¹⁾ A suitable unloading device must be provided by the customer.

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Mall throttle constrictor ViaPart VV R



Mall throttle constrictor ViaPart VV R T



Mall throttle structure ViaPart with throttle valve

- Relief structure must be dimensioned on site
- Reinforced concrete round tank made of C35/45 in monolithic construction, jointing according to DIN 4034-2
- Cover plate and cover, class D if necessary (SLW 60)
- With pre-assembled throttle valve with characteristic curve corresponding to the connection width and flow rate
- Blur factor = 1.5
- Including counter for correct positioning of the slider after manual opening
- Flexible, permanently elastic pipe connection for plastic pipes in the outlet according to the throttle device, in the inlet according to the nominal inlet diameter, other pipe materials and nominal diameters on request (from DN 600 always subject to a surcharge)
- Special geometries on request



Animation at:
www.mall.info/tv

Order number	Discharge capacity l/s	Interior Ø ID mm	Total depth GT mm	Connections		Heaviest single weight kg	Total weight kg
				Inlet DN	Outlet DN		
Part 5 DS	5	1200	2135	250	100	3.050	3.770
Part 10 DS	10	1500	2400	400	150	4.500	5.630
Part 15 DS	15	1500	2400	400	200	4.500	5.630
Part 20 DS	20	1500	2400	500	200	4.590	5.720
Part 25 DS	25	1500	2400	500	200	4.590	5.720
Part 30 DS	30	1500	2400	500	250	4.590	5.720
Part 40 DS	40	1500	2400	600	250	4.650	5.780
Part 50 DS ¹⁾	50	2000	3020	600	300	8.270	10.440
Part 75 DS ¹⁾	75	2000	3020	700	300	8.400	10.570
Part 100 DS ¹⁾	100	2000	3020	800	400	8.500	10.670
Part 125 DS ¹⁾	125	2000	3020	800	400	8.500	10.670

¹⁾ A suitable discharging device must be provided on site.

- Optional road cap with guide if the spindle cannot be operated through an access opening.

Mall throttle structure ViaPart with throttle valve for discharge limitation with integrated discharge device for partial flow treatment

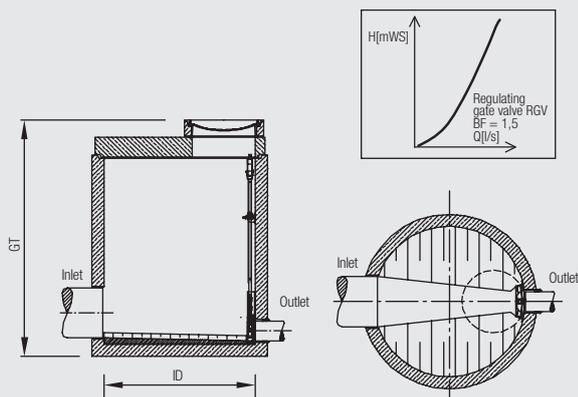
- ViaPart with additional reinforced concrete threshold and opening for knock-down

Order number	Inlet max. / Outlet l/s	Interior Ø ID mm	Total depth GT mm	Connections		Heaviest single weight kg	Total weight kg
				Inlet DN	Outlet DN		
Part 5 DS T	5	1200	2135	250	100	3.110	3.830
Part 10 DS T	10	1500	2400	400	150	4.580	5.710
Part 15 DS T	15	1500	2400	400	200	4.620	5.750
Part 20 DS T	20	1500	2350	500	200	4.710	5.840
Part 25 DS T	25	1500	2350	500	200	4.710	5.840
Part 30 DS T	30	1500	2350	500	250	4.720	5.850
Part 40 DS T	40	1500	2350	600	250	4.780	5.910
Part 50 DS T ¹⁾	50	2000	2350	600	300	8.480	10.650

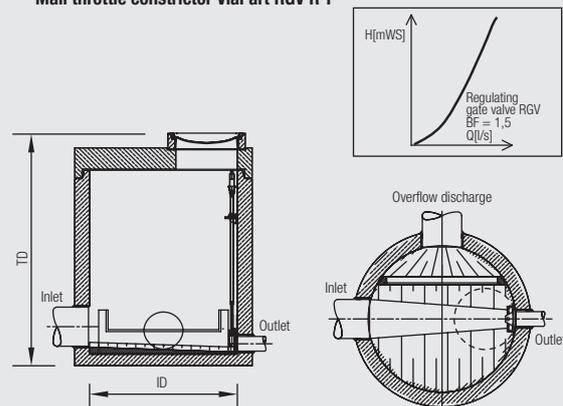
¹⁾ A suitable unloading device must be provided by the customer.

Webcode **M3315**

Mall throttle constrictor ViaPart RGV R



Mall throttle constrictor ViaPart RGV R T



Mall rainwater treatment plants

Mall rainwater treatment plants are used to safeguard waterways and groundwater. They represent an indispensable component in contemporary rainwater management in terms of maintaining a natural water balance. Requirements in particular around the urban climate and in terms of protecting against torrential rainfall make decentralised and flexible solutions a necessity in the separation system.

The technical rules and regulations for the classification of treatment systems are in a state of flux. National statutory specifications (Appendix AbV) do not (yet) exist, DWA worksheet A 102/BWK-A3 is in the drafting and discussion phase. The following classification of Mall rainwater management systems is intended to facilitate proper use against the backdrop of currently valid regulations and trends.

Mall ViaSed sedimentation plant

The "classic" treatment system in use for decades.

For flow throughputs between 4 and 620 l/s for a surface loading rate of 18 m/h, standard solutions are offered in the narrow application grid. All tank geometries (round, rectangular, oval and large container shafts) are used. Adaptations and special constructions are feasible.

Mall ViaTub lamella clarifier

Compact and volume-optimised solution as an alternative to the sedimentation plant.

Design approval of the Land of North Rhine-Westphalia (list of the State Office for the Protection of Nature, the Environment and Consumers, LANUV). Adaptations and special constructions are feasible.

Mall ViaCap dirt trap

System consisting of two tanks: Separation structure and collection basin (collecting tank). The initial heavily contaminated proportion of rainwater ("first flush") is collected and channelled into the contaminant sewerage system with time delay; less contaminated proportions are drained off into waterways. Power supply and connection to sewerage system necessary.

Mall ViaKan lamella clarifier

System consisting of separation structure and treatment tank (flow-through tank) with lamella clarifiers. Rainwater is intensively treated up to defined rainfall value Q_{crit} . Tank contents are channelled into the contaminant sewerage system with time delay. Heavy rainfall proportions (less contaminated) are drained off into waterways. Power supply and connection to sewerage system necessary.

Benefits of operating method without permanent retention (or automatic basin emptying)

- No sludge disposal and no sludge storage necessary (smaller structures)
- Avoidance of the undesired discharge of sludge due to unforeseen operating states
- The mode of action is much more effective particularly in the case of dissolved and very fine substances.

Prerequisites for operation without permanent retention

- Connection to wastewater (mixed water) sewerage system
- Measurement system for detecting fill level and condition of discharge (precipitation event yes/no?)
- Pump or controllable sliding gate for emptying treatment tank
- System equipment: Microprocessor controller, wastewater submersible motor pump, float switch in the area of tank base and a float probe in the area of the clarifier overflow

Mall ViaSep separation structure

System for implementing partial flows, i.e. removal of less contaminated torrential rainfall via a raised divider.

Used in combination with ViaSed or ViaTub; restriction effect via downstream pipe restrictor line as a cost-effective alternative to the ViaPart series

Mall ViaPlus* substrate filter

Multi-stage system with externally monitored ViaSorp granulate for treating road wastewater according to the criteria of the German Federal Soil Protection Ordinance (BBodSchV) for the parameters filterable substances, mineral hydrocarbons, copper and zinc. Usage list based on extensive laboratory testing procedures

Mall Tecto MVS* metal-roof filter

Multi-stage system with externally monitored ViaSorp granulate for treating metal roof run-off according to the criteria of the Bavarian Water Act for the parameters copper and zinc. Usage list based on extensive field testing procedures

* DIBt approval/design approval of Bavaria

Main application areas:

- Purification of rainwater from roof and traffic surfaces to remove fine sludge
- Upstream of waterways and infiltration systems
- Large sludge collection volumes
- Dimensioning based on surface loading rate

Main application areas:

- Purification of rainwater from roof and traffic surfaces to remove fine sludge
- Upstream of waterways and infiltration systems
- Small component dimensions
- Dimensioning based on surface loading rate

Main application areas:

- Purification of rainwater from particularly heavily contaminated (traffic) areas within a property
- Automatic basin emptying necessary after precipitation event
- Dimensioning based on flow time and critical rainfall Q_{crit}

Main application areas:

- Intensive purification of rainwater, including over large areas, with surface loading rate of 4 m/h
- Automatic basin emptying necessary after precipitation event
- Dimensioning based on critical rainfall Q_{crit}
- Satisfies criteria according to DWA A 102 (draft) and DWA A 176

Main application areas:

- Partial flow treatment
- Only in combination with pipe restrictor line
- Dimensioning based on downstream straight piping run and line length
- Blur factor 2.0 tolerable

Main application areas:

- Requirement of DIBt design approval
- Infiltration of traffic surface run-off
- Dimensioning based on max. collection area

Main application areas:

- Requirement of Bavaria State Office for the Environment (LfU Bayern) design approval
- Infiltration of uncoated metal roof run-off
- Dimensioning based on max. collection area

Mall ViaSed and ViaTub rainwater treatment plants

Mall rainwater treatment plants of the ViaSed and ViaTub model series are used to decentrally purify rainwater in separation systems. Water, in particular collected and drained from traffic surfaces, that is intended to be channelled into waterways must be treated to minimise contamination and blockage caused by settling materials. These systems may also make sense for rainwater from other collection areas and/or discharging into groundwater (infiltration). The requirement for and intensity of treatment depends on official specifications and the sensitivity of waterways and must be checked in individual cases. The surface loading rate is the decisive parameter in the current regulations.

For ordinary values, the correlation between the following is illustrated on page 13 in table form:

■ Surface loading rate	Q_a	[m/h]
■ Permissible plant inflow	Q_a	[l/s]
■ Treated rainfall value	r_{crit}	[l/s * ha]
■ Cleaning effect DWA M 153	D	[-]

The connectible, outlet-effective area A_i is calculated from: $A_i = Q/r_{crit}$ [ha].

The different geometries and installed equipment ensure cleaning efficacy under optimal economic conditions for various flow quantities.

Mall sedimentation plants in ViaSed L and OL (oval) long design

- Segmented, rectangular or oval designs facilitate discretionary tank lengths and thus effective tank surfaces.
- Mudsill (option: pump sump) facilitates maintenance; stainless-steel baffle holds back floating substances.

Mall sedimentation plants in ViaSed R round design

- Tangential discharging of wastewater flow optimises the flow path and sludge deposition.
- Central pipe with leak-free connection of outlet pipe keeps back floating substances and facilitates the central suctioning of sludge.

Mall lamella clarifier in ViaTub R round design

- Integrated lamellae bodies increase the effective area through parallel flow channels and enhance the settling capacity of sludge particles.
- Inclination ensures optimal hydraulic conditions.
- Monolithic round tank with integrated dividing wall and dip pipes installable in one piece

Mall lamella clarifier in ViaTub L and OL (oval) long design

- Segmented, rectangular or oval designs facilitate discretionary tank lengths and thus a greater number of installed lamellae packages.
- Large sludge and floating layer areas facilitate maintenance.

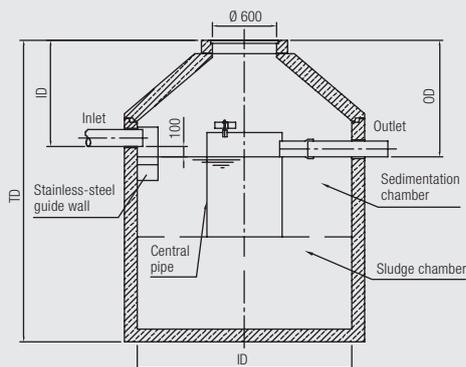
ViaSed measurement basis and notes

- Types ViaSed-N = systems for surfaces with normal soiling (residential streets, private courtyards etc.)
- Types ViaSed-E = systems for surfaces with heavy soiling (main transit roads, factory courtyards etc.)
- Sedimentation systems are not separators as per DIN EN 858/DIN 1999-100 and are unsuitable for surfaces for which a light liquid separator is necessary according to DIN EN 858/DIN 1999-100.
- Flow rate $v_z < 5$ cm/s
- Retention time at nominal load $T_A > 120$ s

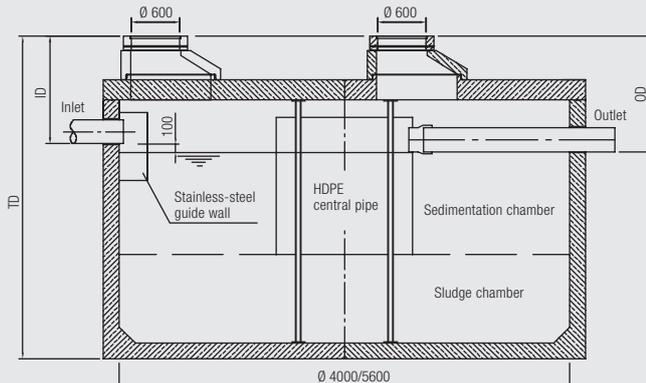
The systems can be equipped upon request with basin emptying after rain has stopped, i.e. operation without permanent retention.

ViaSed round

Vertical section of ViaSed 4-35



Vertical section of ViaSed 63-123



Classification of ViaSed and ViaTub rainwater treatment plants

Mall rainwater treatment plant	Surface loading [m/h]	Flow Q [l/s]						
ViaSed 18 R 4	18	4	10	2	9	2	7.5	2
ViaSed 18 R 6	18	6	10	3	9	3	7.5	3
ViaSed 18 R 9	18	9	10	5	9	5	7.5	4
ViaSed 18 R 15	18	15	10	8	9	8	7.5	6
ViaTub 18 R 20	18	20	10	11	9	10	7.5	8
ViaSed 18 R 24	18	24	10	13	9	12	7.5	10
ViaSed 18 R 35	18	35	10	19	9	18	7.5	15
ViaTub 18 R 38	18	38	10	21	9	19	7.5	16
ViaSed OL 60	18	60	10	33	9	30	7.5	25
ViaTub 18 R 63	18	63	10	35	9	32	7.5	26
ViaSed 18 R 63	18	63	10	35	9	32	7.5	26
ViaSed OL 70	18	70	10	39	9	35	7.5	29
ViaSed OL 80	18	80	10	44	9	40	7.5	33
ViaSed 18 R 123	18	123	10	68	9	62	7.5	51
ViaTub 18 L 133/OL 133	18	133	10	74	9	67	7.5	55
ViaSed 18 L 200	18	200	10	111	9	100	7.5	83
ViaSed 18 L 250	18	250	10	139	9	125	7.5	104
ViaTub 18 L 272/OL 272	18	272	10	151	9	136	7.5	113
ViaTub 18 L 302	18	302	10	167	9	151	7.5	125
ViaSed 18 L 350	18	350	10	194	9	175	7.5	146
ViaTub 18 L 406	18	406	10	226	9	203	7.5	168
ViaSed 18 L 425	18	425	10	236	9	213	7.5	177
ViaSed 18 L 450	18	450	10	250	9	225	7.5	188
ViaSed 18 L 540	18	540	10	300	9	270	7.5	225
ViaSed 18 L 620	18	620	10	344	9	310	7.5	258
ViaTub 18 L 674	18	674	10	374	9	337	7.5	281
ViaTub 18 L 1363	18	1363	10	757	9	682	7.5	568

Rainfall	Throughput value D as per DWA-M 153			SOW manual Baden-Württemberg
	Complete ¹⁾ $r_{(15.1)}$	0.35	Unusual	0.2
45 l/(s x ha)	0.65	0.5	Unusual	0.38
Partial flow ²⁾ 30 l/(s x ha)	0.7	0.55	Unusual	0.45
15 l/(s x ha)	0.8	0.65 ³⁾	Unusual	0.58

¹⁾ Measured rainfall intensity $r_{crit} = r_{(15.1)}$ for complete treatment of the volume flow can be safely assumed to be 150 l/(s/ha); reductions lead in individual cases to larger collection areas.

²⁾ When choosing partial flow treatment (reduction of measured rainfall intensity r_{crit}) as per DWA-M 153, the connected surface A_1 can be increased many times or the desired throughput value adjusted to the property conditions. In this case, ViaPart or ViaSep systems (overflow or restrictor installation) must be connected upstream. Connected cable cross-sections must then be reduced in deviation from the standard specifications and adapted to the inflow volumes. For classification as per DWA A 102, partial flow treatment is also necessary in the normal case.

³⁾ Satisfies Category II criteria of requirements on rainwater draining in the separating method in North Rhine-Westphalia ("NRW separation directive").

Mall ViaSed round separation plant


 Animation at:
www.mall.info/tv

with **tangential discharge of the wastewater flow** for protection of infiltration systems, **channel networks and recipient waters against contamination and blockage caused by settling materials** upon discharge of waste rainwater from road surfaces

- C35/45 (B45) reinforced concrete tank with monolithic round structure up to ViaSed 18R 35
- Central pipe and outlet pipe made of PEHD
- Articulated pipe connection in inlet for plastic pipe (other pipe materials on request) with multiple lip seal
- Cone and shaft cover can be driven over by passenger cars, class B 125 kN (ViaSed 18R 4 – 18R 35), design which can be driven over by 60 t HGVs available on request
- Stainless steel inlet fitting, flow-optimised

Order number	Interior Ø ID mm	Inlet depth ID mm	Total depth TD mm	Permiss. Q l/s	Nominal size DN	Heaviest single weight kg	Total weight kg
ViaSed 18R 4N	1000	1005	2745	4	150	2,380	2,900
ViaSed 18R 4E	1000	1050	3355	4	150	1,850	3,860
ViaSed 18R 6N	1200	1005	2745	6	150	2,880	3,520
ViaSed 18R 6E	1200	1050	3335	6	150	2,520	5,200
ViaSed 18R 9N	1500	1005	2745	9	150	3,640	4,350
ViaSed 18R 9E	1500	1005	3345	9	150	4,550	5,320
ViaSed 18R 15N	2000	1005	2845	15	150	5,430	6,770
ViaSed 18R 15E	2000	1005	3345	15	150	6,430	7,770
ViaSed 18R 24N	2500	1055	2845	24	200	7,088	9,230
ViaSed 18R 24E	2500	1055	3345	24	200	8,320	10,460
ViaSed 18R 35N	3000	1100	2995	35	250	9,710 ¹⁾	12,390
ViaSed 18R 35E	3000	1100	3495	35	250	11,150 ¹⁾	13,830

Mall ViaSed oval separation plant

- Prefabricated reinforced concrete tank with monolithic oval structure C 45/55 (B55)
- Flow distributor at inlet
- Baffle and mudsill
- Cover for loading profile "passenger cars/12 t HGVs" with class B; option: "EC2 lane 1" with class D on request
- Articulated pipe connections in inlet and outlet

Order number	Width/length mm	Total depth TD mm	Permiss. Q l/s	Nominal size DN	Heaviest single weight kg	Total weight kg
ViaSed 18 OL 60	2240/5600	2995	60	300	17,210 ¹⁾	25,270
ViaSed 18 OL 80	2240/7600	2995	80	300	22,220 ¹⁾	33,900

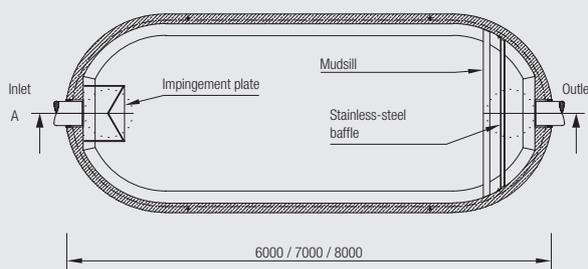
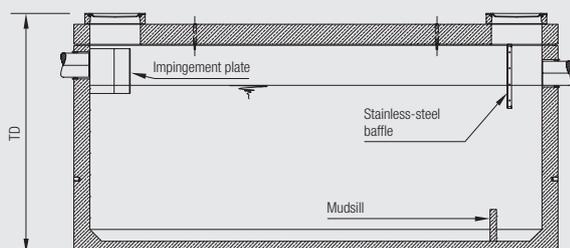
¹⁾ For types ViaSed 18R 35 and ViaSed 18 OL, suitable unloading equipment is to be provided on site by the customer.

 Webcode **M3310**

ViaSed oval

Vertical section

Plan view



Mall ViaTub lamella clarifier

- Round C35/45 (B45) reinforced concrete tank with monolithic structure
- HDPE lamellae with stainless steel retaining structure
- Articulated pipe connection in inlet for plastic pipe (other pipe materials on request)
- Shaft cover plates, class B 125 if applicable, can be driven over by passenger cars; design which can be driven over by 60 t HGVs available on request
- HDPE inlet and outlet fittings, stainless steel brackets



Animation at:
www.mall.info/tv

Webcode **M3313**

Order number	Inner Ø ID or width/length mm	Total depth TD mm	Permiss. Q l/s	Nominal size DN	Heaviest single weight kg	Total weight kg
ViaTub 18R 20	2000	2935	20	200	7,570	9,600
ViaTub 18R 38	2500	2935	38	250	9,740	1,280

*) Unloading by customer.

Specifications for dimensioning see notes on page 12

System successfully checked with respect to basic approval criteria of LANUV NRW



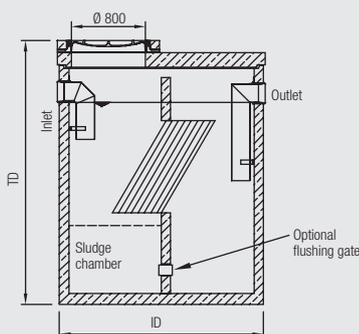
Mall ViaTub lamella clarifier oval

- Prefabricated reinforced concrete tank with monolithic oval structure C 45/55 (B55)
- Inlet fitting
- Baffle and mudsill
- HDPE lamellae including retaining structure
- Cover which can be driven over by passenger cars/HGVs, class B 125; option: "EC2 lane 1" with class D on request
- Articulated pipe connections in inlet and outlet

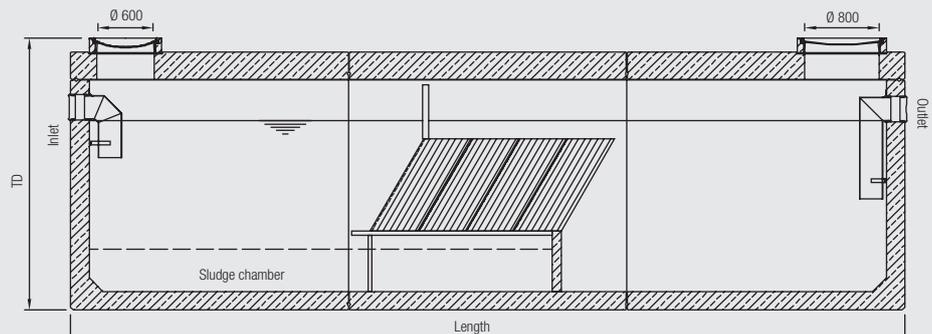
Order number	Width/length mm	Total depth TD mm	Permiss. Q l/s	Nominal size DN	Heaviest single weight kg	Total weight kg
ViaTub 18 OL 133 ^{*)}	2240/5600	2965	133	400	17,310	25,370
ViaTub 18 OL 200 ^{*)}	2240/5600	2965	200	400	17,310	25,410
ViaTub 18 OL 272 ^{*)}	2240/6600	2965	272	400	23,150	34,510

*) Unloading by customer

Vertical section of ViaTub R



Vertical section of ViaTub L



Mall ViaPlus substrate filter patented

DIBt approvals Z-84.2-8, Z-84.2-12 and Z-84.2-25

The system satisfies the test principles of the German Institute for Civil Engineering (DIBt) relating to the treatment of precipitation water from traffic surface areas for subsequent non-hazardous underground infiltration. Site-specific restrictions and conditions (water protection zone, groundwater level, etc.) are to be taken into consideration.

Verified contaminant retention for the parameters: filterable substances (solid materials), mineral hydrocarbons (oil) and Cu, Zn (heavy metals)



Animation at:
www.mall.info/tv

Substrate filter

- C35/45 (45) reinforced concrete tank with monolithic round structure as per the type structure
- Hydrocyclone (sludge tank) and removable substrate filter insert pre-mounted in factory
- Articulated pipe connections DN 150 for inlet and outlet fittings, HDPE, completely pre-mounted in factory
- Cover plate for loading profile passenger cars/12 t HGVs, optionally 60 t HGVs/EC 2
- Shaft cover D = 800 mm, class B 125, class D 400 optional
- Service life/filter unit replacement interval as per approval: 3 or 4 years

Order number	Inner Ø ID / B-L mm	Connectible traffic surface area A_1 m ²	Inlet/outlet Ø DN	Flow rate Q l/s	Inlet depth ID mm	Outlet depth OD mm	Total depth TT mm	Heaviest individual weight kg	Total weight kg
ViaPlus 500 ¹⁾	1200	500	150	5.0 ¹⁾	800	1280	2255	3,370	3,920
ViaPlus 800	2000	800	150	8.0	1090	1390	2525	6,020	8,680
ViaPlus 1250	2500	1250	150	12.5	1090	1390	2525	7,680	11,810
ViaPlus 3000 ^{2) *)}	3000	3000	200	30.0 ²⁾	760	2500	2875	14,480	21,300
ViaPlus 3800 ^{*)}	2 x 3000	3800	250	38.0	1220	1520	2665	10,650	33,300
ViaPlus 6600 ^{*)}	2 x 2400/5200	6600	300	66.0	1390	1690	2885	27,940	79,300

¹⁾ Max. tested hydraulic capacity: 7.5 l/s; material verification for 5 l/s

²⁾ Hydraulic capacity 45 l/s and material verification per 30 l/s – note pipe hydraulics (diameter) – emergency overflow level may diverge from design approval

*) Unloading by customer

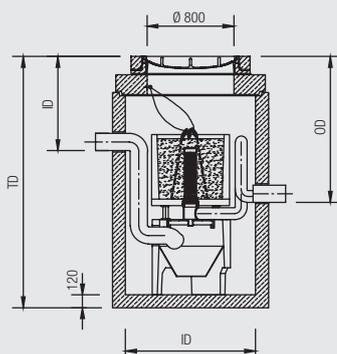
Note

- Deviating inlet and outlet depths are possible without static loading restrictions on request.
- According to the test principles of the DIBt an arrangement containing a bypass is not normally provided. Corresponding applications are to be agreed with the relevant approving authorities.
- The maximum approved rain intensity is 100 l/(sxha); the hydraulic conditions are to be individually checked for each object.
- Downstream infiltration systems (e.g. CaviLine infiltration tunnel) on request
- Larger shaft and connection dimensions exceeding the approval requirements can be implemented if required.
- Performing of maintenance and inspection services on request

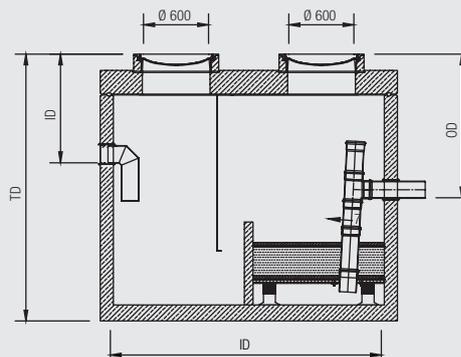
System successfully checked with respect to basic approval criteria of LANUV NRW.

Webcode **M3610**

Vertical section of ViaPlus 500



Vertical section of ViaPlus 1250



Mall Tecto MVS metal-roof filter

Design approval LfU-BY-41f-2020/1.0.0

- C35/45 (B45) reinforced concrete shaft parts in round design
- Central cone opening 625 mm
- Intermediate plate with filter basket type A DIN 1989-100, irrigation, HDPE or stainless steel
- Filter granulate (big pack) for on-site installation
- Composite geotextile as colmation protection, GRK3 filter fleece for excavation pit
- Shaft cover, class A, higher load classes on request
- Optional: Level monitor type S, see below, incl. additional hole for empty conduit

Order number	Interior Ø ID mm	Connectable roof surface area ¹⁾ m ²	Inlet and outlet ²⁾ DN	Inlet depth (standard) ID mm	Total depth TD mm	Heaviest single weight kg	Total weight kg
Tecto MVS 70	1000	70	100	1090	3380	1,000	3,750
Tecto MVS 100	1200	100	100	1090	3380	1,000	4,350
Tecto MVS 160	1500	160	100	1090	3380	1,110	5,190
Tecto MVS 290	2000	290	150	1090	3380	1,960	9,410
Tecto MVS 450	2500	450	150	1090	3380	2,420	13,980
Tecto MVS 640	3000	640	200	1090	3380	2,850	17,280

¹⁾ Separate verification for discharge into infiltration system: from experience dependent on permeability coefficient; for discharge into the sewage system, higher metal concentrations or roof areas with a bypass solution with deviating systems are possible where required.

²⁾ Selection of the standard nominal diameter prevents hydraulic overloading – other options available on request.

Note:

The system is explicitly approved for the adsorption of copper and zinc. As these metals cannot be chemically converted but only extracted, regular replacement of the filter materials is necessary.

An inspection interval of one year can be assumed. The service life according to the approval specifications is 25 years.

Foundation of 25 cm of gravel sand on site. A geotextile is required to ensure filter stability below the granulate (included in scope of delivery).

The system was designed on the basis of the results of a research project at the Technical University of Munich, Germany.

This yields a proven purification performance of > 97 % in relation to the metal content and an average annual effluent concentration of less than 50 mg copper/litre.

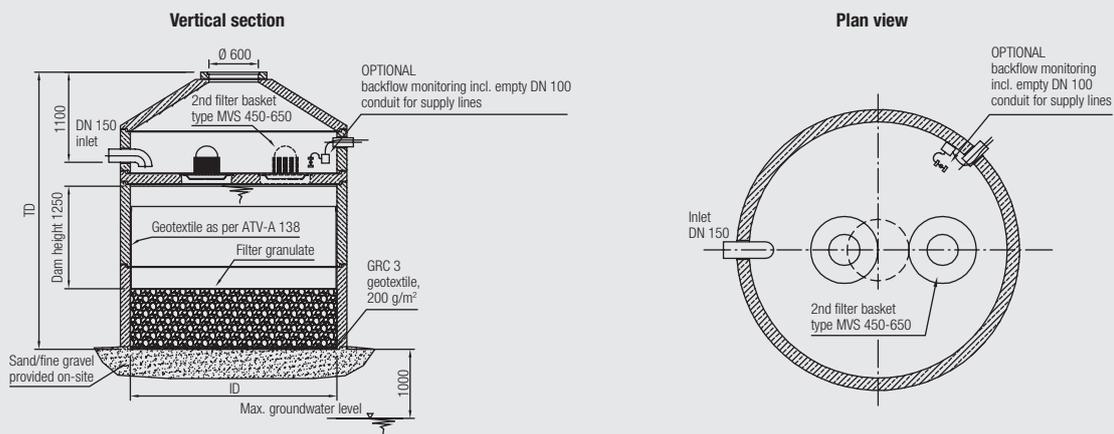
Optional:

Fill level monitoring type S, consisting of:

- Control board with transformer power pack and housing for basement installation, 230 V
- 9 V monobloc battery for acoustic alarm, 10 m cable length
- Installation accessories

Order number	Designation
611440	Fill level monitoring type S

Webcode **M3380** 



Mall ViaKan lamella clarifier without permanent retention


 Animation at:
www.mall.info/tv

As per DWA leaflet M 176 November 2013 issue, particular structural requirements are placed on lamella clarifiers depending on their intended purpose.

The ViaKan type series fulfils these criteria, including with upstream separation structure, optimised plastic lamellae to increase the settling effect, restricting removal system (gutter) via lamellae, sensor, float and controller to ensure automatic emptying after rain has stopped, and the specifications of draft DWA-A 102.

Treatment tank and separation structure

Consisting of:

- Reinforced concrete tank (up to DN 3000), for larger diameters multi-component structure
- HDPE lamellae bodies (treatment tank)
- Inlet and outlet construction, brackets made from stainless steel
- Restriction device in outlet of lamellae bodies
- Wastewater submersible motor pump (separation structure)
- Controller for internal installation incl. sensors, controller and technical equipment available in various versions
- Shaft cover, class B, higher load classes on request

Order number	Separation structure		Treatment tank		Design inflow l/s	Heaviest single weight kg	Total weight kg
	Interior Ø ID mm	Total depth mm	Interior Ø ID mm	Total depth mm			
ViaKan 4 ¹⁾	-	-	2000	2935	4	7,360	9,460
ViaKan 8	1200	3060	2000	2875	8	7,060	13,440
ViaKan 24	1200	3260	2500	3075	24	10,410	18,260
ViaKan 32 ¹⁾	1500	3360	3000	3175	32	14,040	24,650
ViaKan 48	1500	3595	4000	3410	48	11,720	39,620
ViaKan 64	2000	3705	4000	3520	64	11,720	45,880
ViaKan 80	2500	4000	5600	3815	80	22,860	83,420
ViaKan 120	3000	4000	5600	3815	120	22,860	89,570
ViaKan 144	3000	4000	5600	3815	144	22,860	90,070

¹⁾ A restriction device and an overflow structure are already integrated into the system.

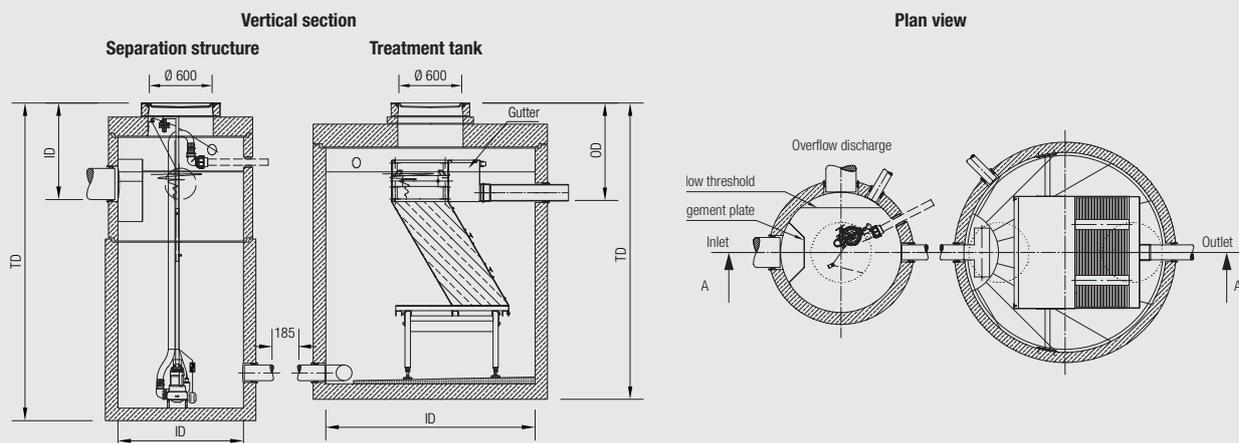
*) Unloading by customer

The outlet of the systems is automatically restricted to the maximum flow throughput. The surface loading rate is fixed at approx. 4 m/h in due consideration of the lamellae effect.

Connectible impermeable area A_i (rounded values)

As the hydraulic throughputs of the systems are fixed, the connectible impermeable area is based on the critical rainfall that has been selected.

Order number	Nominal throughput [l/s]	Standard case			
		Critical rainfall r_{crit} l / (s * ha)			
		15	30	45	60
		Permiss. A_i [m ²]	Permiss. A_i [m ²]	Permiss. A_i [m ²]	Permiss. A_i [m ²]
ViaKan 4	4	2700	1300	900	700
ViaKan 8	8	5300	2700	1800	1300
ViaKan 24	24	16000	8000	5300	4000
ViaKan 32	32	21300	10700	7180	5300
ViaKan 48	48	32000	16000	10700	8000
ViaKan 64	64	42700	21300	14200	10700
ViaKan 80	80	53300	26700	17800	13300
ViaKan 120	120	80000	40000	26700	20000
ViaKan 144	144	96000	48000	32000	24000
Throughput value D (M153)		0.35	0.28	0.24	0.20

 Webcode **M3319**


Mall water protection filter with pre-filter fleece and substrate layer ViaGard

Webcode **M3321**

for the treatment of heavily contaminated rainwater from traffic areas and areas with relevant amounts of uncoated metals before discharging into waterways

- * Reinforced concrete tank with monolithic structure
- Inlet and outlet opening with multi-lip seal
- Impingement plate to prevent scouring
- Patented outlet fitting for equal loading of the filter
- Pre-filter fleece for the retention of filterable substances
- Substrate layer as per Austrian standard ÖNORM B 2506-3

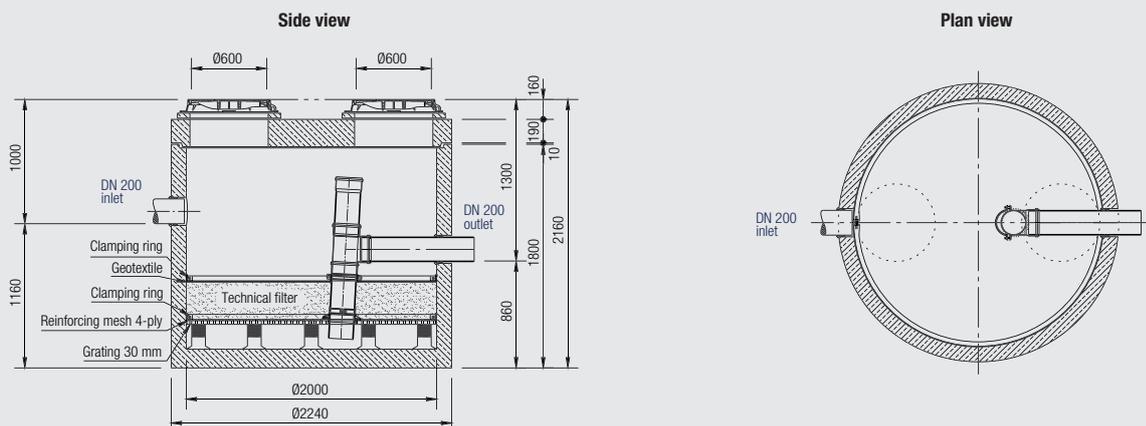
Type	Inner Ø ID mm	Total height mm	Inlet depth mm	Storage volume m ³	Max connected area A ₁ * m ²	Heaviest single weight kg	Total weight kg
Round tank							
ViaGard F 1200	1200	2225	1000	0.34	283	2,570	3,210
ViaGard F 1500	1500	2625	1000	0.53	442	4,000	5,155
ViaGard F 2000	2000	2725	1050	0.94	785	5,950	7,935
ViaGard F 2500	2500	2725	1150	1.47	1227	7,980	11,040
ViaGard F 3000	3000	2725	1150		1766	11,970	16,875

Oval tank							
ViaGard OF 6000	2240	2975	1000	3.43	2866	20,880	29,390
ViaGard OF 7000	2240	2975	1000	4.10	3426	25,100	34,190
ViaGard OF 8000	2240	2975	1000	7.78	3986	27,325	39,010

The use of a pre-treatment system is recommended for operating shaft infiltration configurations. Systems of type ViaSed and ViaTub are the best suited.

ViaGard type	Recommended ViaSed type
ViaGard 15...	ViaSed 18 R 9N
ViaGard 20...	ViaSed 18 R 15N
ViaGard 25...	ViaSed 18 R 24N
ViaGard 602530	ViaTub 18 R 38
ViaGard 702530	ViaTub 18 R 63
ViaGard 802530	ViaTub 18 R 63

* Specification of the maximum connectible surface area refers only to the filter area. The infiltration area and retention volume must be dimensioned according to Austrian standard ÖNORM B 2506-1.



Treatment of rainwater with capacity for a critical amount of precipitation

Designed particularly for the drainage of rainwater from road and car park surfaces into surface waters or for the pre-treatment of rainwater before it is routed to trenches or infiltration basins.

Run-off coefficient D as per DWA M 153 = 0.25 for rain intensity of $r_{15,1}$

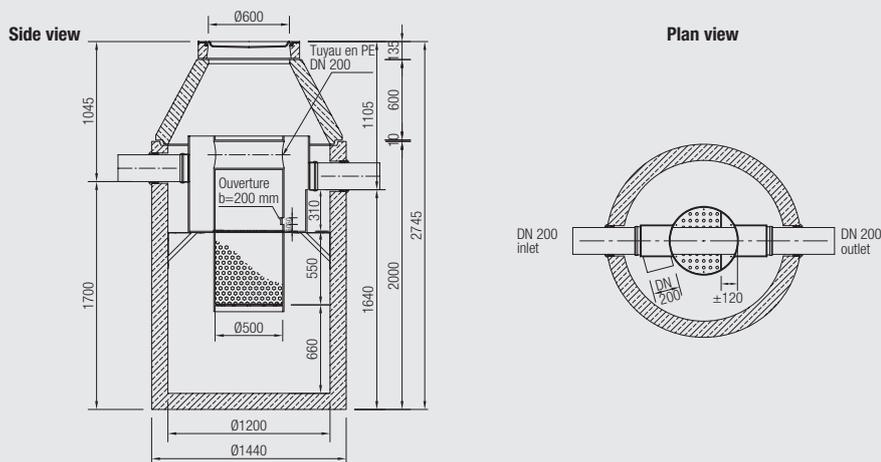
- Reinforced concrete tank with a circular monolithic structure
- Inlet, treatment and outlet combined in a compact unit
- Filtration unit with spherical lamellae for optimal separation of filterable materials and to limit the outlet flow rate
- Retention of mineral hydrocarbons and filterable substances
- Outlet flow rate limited to the hydraulic capacity of the filters under normal service conditions; quantities of water above the critical outlet flow rate threshold are routed to a bypass around the purification unit
- Sludge-collection compartment accessible below the filter for easy removal
- Loading of the surface of the spherical lamellae < 1 m/h, relative to the interior surface of the substrate.
This value corresponds to approx. 2 m/h relative to the projected surface area of the lamellae

Standard model with a cone, B125 class manhole cover

Type	Inner Ø mm	Installation depth m	Operating flow rate l/s	Maximum controlled flow rate l/s	Diameter of central tube mm	Heaviest single weight kg	Total weight kg
3/15	1000	2.44	3	15	400	2,380	2,700
6/30	1200	2.74	6	30	500	2,880	3,520
9/45	1500	2.89	9	45	600	3,860	4,580
12/60	2000	2.89	12	60	700	5,520	6,870
15/75	2000	3.14	15	75	700	6,020	7,370
20/100	2000	3.59	20	100	800	6,920	8,270
25/125-2.0	2000	3.74	25	125	900	7,220	8,570
30/150-2.5	2500	3.54	30	150	1000	8,800	10,800
35/175-2.5	2500	3.64	35	175	1100	9,050	11,050
40/200-2.5	2500	3.74	40	200	1200	9,300	11,300
45/225-3.0	3000	3.64	45	225	1300	11,580	14,260
50/250-3.0	3000	3.59	50	250	1300	11,440	14,120

Accessories and wearing parts:

Filters must be maintained or replaced at regular intervals or else as necessary.



Mall water container for fire fighting in multi-component tanks

Webcode **M3082** 

compliant with DIN 14230

- Reinforced concrete tank in quality-controlled concrete, concrete strength class C45/55 (B55), manufactured as per DIN 1045 / EN 206
- Air cushion as per DIN 14230
- Openings with FORSHEDA sealing element for inlet and emergency overflow according to plan requirements
- DN 125 suction pipe including seal insert, suction line including stainless steel coupling 1.4301, height above ground approximately 300 mm
- DN 100 stainless steel ventilation pipe 1.4301, height above ground approximately 1000 mm, with hood and fastening material
- Reinforced plastic ladder, stainless steel entry aid with single-bar design
- Shaft superstructure as per DIN 4034 part 1
- "Extinguishing water suction line" information sign
- Shaft cover class B, adequate for fire fighting vehicles (16-t trucks)

Order number	Total height mm	Inner Ø mm	TD mm	Usable volume m ³	Number of tanks items	Additional tank type	Heaviest single weight kg	Total weight kg
LW 20-R	3940	3000	4240	20	1	—	10,960	19,110
LW 40-R	3940	3000	4240	40	2	A	12,590	34,500
LW 50-R	3710	2500	4010	50	4	B	9,300	48,320
LW 60-R	3940	3000	4240	60	3	A	12,590	49,770
LW 80-R	3940	3000	4240	80	4	A	12,590	65,040
LW 100-R	3940	3000	4240	100	5	A	12,590	80,310
LW 120-R	3940	3000	4240	120	6	A	12,590	95,580

Additional tanks

Order number	Total height mm	Inner Ø mm	TD mm	Additional tank type	Weight kg
LW-R-A-Z	3250	3000	3995	A	12,530
LW-R-B-Z	3000	2500	3745	B	9,350

