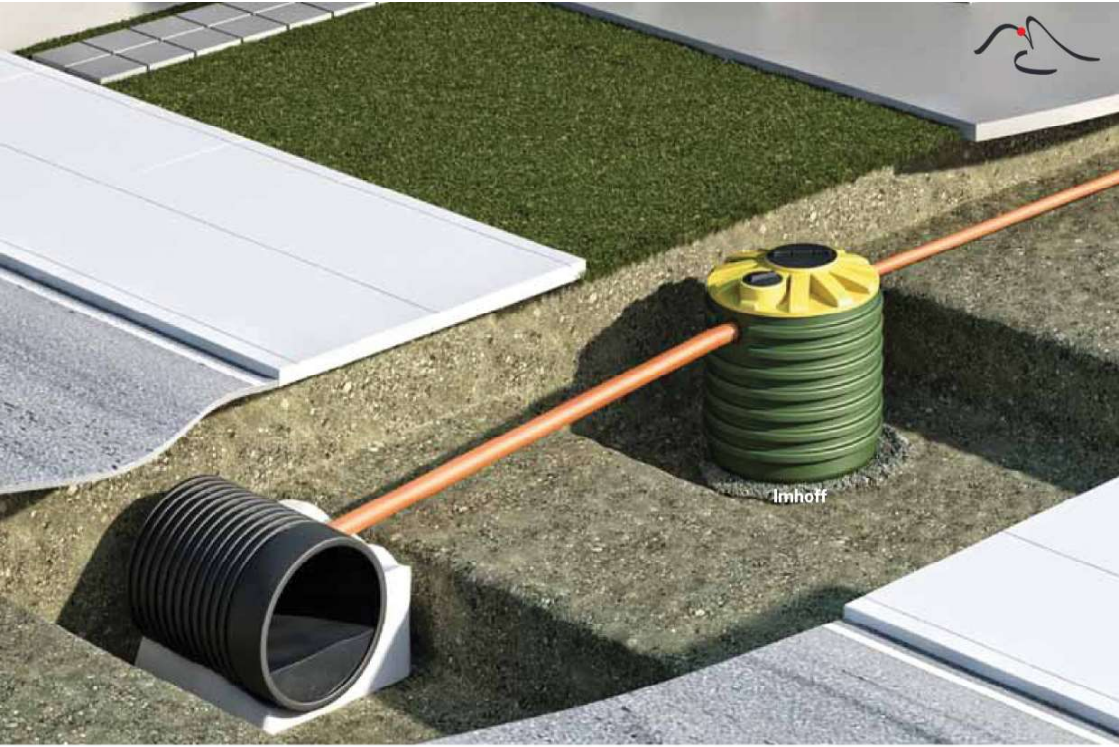




IMHOFF BIOLOGICAL TANKS



1. SECONDARY TREATMENT OR SUBSURFACE DISCHARGE
2. DISCHARGE TO PUBLIC SEWER





TECHNICAL CHARACTERISTICS

Crude sewage is subjected to a mechanical type pre-treatment process to eliminate materials that, due to their size and characteristics, would create difficulties for the subsequent treatment phases. In a domestic discharge, 60-70% of the suspended solids are sedimentable and, therefore, can be removed through primary sedimentation. This type of treatment also allows the simultaneous removal of 25-30% of the organic content, in terms of BOD₅. Imhoff tanks consist of two overlapping and hydraulical communicating compartments.

In the upper compartment, the sedimentable solids gravitate to the bottom of the sedimentation chamber, which has a suitable inclination to allow the sludge to pass to the lower compartment where it is digested. This type of plant makes use of the combined actions of a mechanical sedimentation process and a biological treatment of cold anaerobic digestion.

Rototec Imhoff tanks consist of a container and a sedimentation chamber in one-piece polyethylene with PVC inlet and outlet pipes. The tanks are sized to satisfy different treatment requirements: for delivery to public sewers, the limits specified in Table 3 of Law Decree 152/06 are generally satisfied using a balancing and sedimentation treatment. In these cases, a retention time of 2-3 hours in the sedimentation compartment at mean flow rate is sufficient. For isolated residential complexes, the final effluent can be discharged to land in accordance with the design criteria laid down by the Interministerial Committee resolution of 4th February 1977. In particular, for Imhoff tanks, the requirements are for sedimentation times of 4-6 hours for peak flows, with mean volumes of 40-50 l/habitant and minimum capacity 250 l. For the digestion compartment, the requirement is for a volume of 100-120 l per capita in the case of two sludge removal operations per year and 180-200 l in the case of one removal operation. **Imhoff tanks are certified in accordance with UNI EN 12566-3 norm.**

USE AND MAINTENANCE

An excessive accumulation of sedimentable material in the sludge compartment can cause uncontrolled anaerobic digestion phenomena, leading to an over-production of biogas and malodorous emissions.

Furthermore, the reduction in the volume available in the digestion compartment and the excessive production of gas bubbles will cause the settled material to rise, thus causing deterioration in the quality of the treated effluent. The use of the Rototec BIO-ACTIVATOR is highly recommended for rendering the initiation of the biological processes more rapid, thus limiting the number of sludge removal operations and reducing the risk of malodorous emissions. The Imhoff tanks are designed to provide primary sludge storage for a period of 6-8 months of plant operation. When sizing plant for Sensitive Areas, the frequency of sludge emptying operations is reduced to once every 12-14 months. A minimum of 1-2 inspections per year by qualified personnel and eventual emptying operations must be programmed according to the loads fed to the tank.

Once the settled sludge has been removed, the internal surfaces of the tank must be cleaned in order to eliminate any material obstructing the effluent inlet and outlet pipes and the outlet of the sedimentation chamber.

SPECIFICATION ITEMS

Imhoff biological tank for primary treatment of wastewater coming from residential buildings or similar, polyethylene (PE) one-piece structure, manufactured in **ISO 9001/2008 certified company**, certified in accordance with **UNI EN 12566-3 norm** and with Legislative Decree n°152/2006 and with Interministerial Committee resolution of 04/02/1977, for underground installation, fitted with: sedimentation chamber, inlet pipe with 90° elbow in PVC with watertight gasket in NBR rubber, outlet pipe with deflector T in PVC with watertight gasket in NBR rubber, biogas vent, threaded covers in polypropylene (PP) for inspection, emptying and cleaning purposes; optional threaded extensions; Imhoff biological tank mod.....sedimentation volume.....lt, digestion volume.....lt, dimensionsX.....X.....CM

N.B.: Underground installation instructions on page 107

1. Imhoff

Secondary treatment or subsurface discharge



Certification UNI - EN 12566-3 CE (only corrugated tanks)

Sizing Defined by the Interministerial Committee resolution on safeguarding water resources against pollution, appendix 5 of 4/2/1977, for the discharge of domestic sewage from isolated residential complexes of less than 50 PE, with subsoil discharge and discharge to public sewers in cases where the Regional Authority, Arpa or the controlling body require its application.

Use Primary treatment for discharge other than to public sewers or biological treatment, ideal for: isolated residential buildings, public offices, industrial or commercial activities, fast-food hygiene services, restaurants, bars, holiday farms, hotels, campsites, service stations, railway stations, airports.



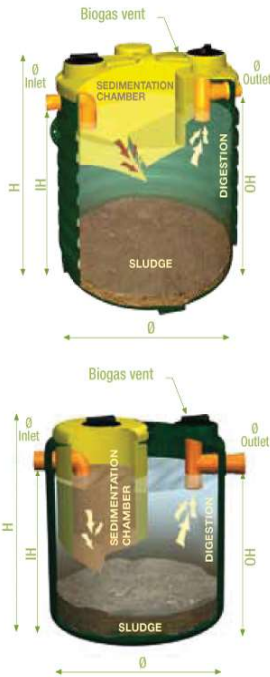
Corrugated Imhoff tank*

Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Sedimen. lt.	Digest. lt.	Organic load Kg BOD ₅ /d	Hydraulic load m ³ /d	P.E.
NIM 1000	1150	1220	880	860	110	CC455-CC255	PP45-PP30	243	607	0,36	1,2	6
NIM 1500	1150	1720	1360	1340	110	CC455-CC255	PP45-PP30	362	906	0,54	1,8	9
NIM 2000	1150	2280	1985	1965	110	CC455-CC255	PP45-PP30	460	1381	0,66	2,2	11
NIM 2600	1710	1350	1000	980	125	CC455-CC355	PP45-PP35	629	1432	0,78	2,6	13
NIM 3200	1710	1625	1240	1220	125	CC455-CC355	PP45-PP35	760	1765	1,02	3,4	17
NIM 3800	1710	1855	1490	1470	160	CC455-CC355	PP45-PP35	965	2139	1,26	4,2	21
NIM 4600	1710	2125	1710	1690	160	CC455-CC355	PP45-PP35	1085	2713	1,62	5,4	27
NIM 7000	2250	2367	1850	1830	160	CC600-CC455	PP65-PP45	1460	5474	2,16	7,2	36
NIM 9000	2250	2625	2070	2050	160	CC600-CC455	PP65-PP45	2020	5803	3	10	50

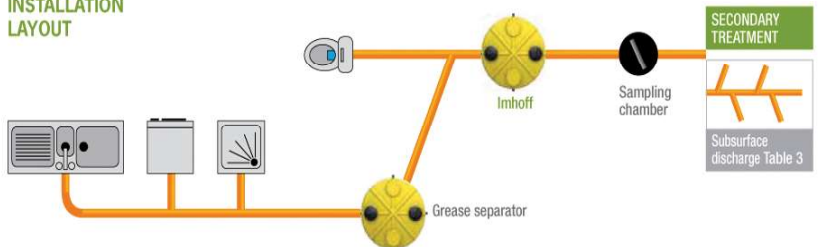
Smooth Imhoff tank*

Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Sedimen. lt.	Digest. lt.	Organic load Kg BOD ₅ /d	Hydraulic load m ³ /d	P.E.
IM 500	790	790	620	600	110	CC255-CC140	PP30	87	218	0,12	0,4	2
IM 800	1480 x 630	1090	870	850	110	CC255-CC255	PP30-PP30	131	601	0,18	0,6	3
IM 1000	1160	1140	910	890	110	CC255-CC255	PP30-PP30	205	712	0,3	1	5
IM 1500	1160	1610	1390	1370	110	CC255-CC255	PP30-PP30	282	1125	0,42	1,4	7
IM 2000	1160	2075	1810	1790	125	CC255-CC255	PP30-PP30	402	1501	0,6	2	10
IM 3000	1450	1940	1650	1630	125	CC255-CC255	PP30-PP30	644	1998	0,96	3,2	16

* On request, it's possible to supply the Imhoff tank with a housing for a chlorine tablet inserted in the outlet pipe



INSTALLATION LAYOUT

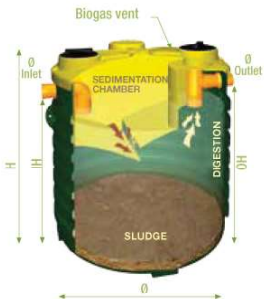




2. Imhoff Discharge to public sewer

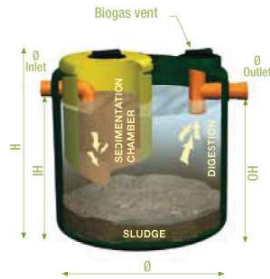
Sizing Defined by the Interministerial Committee resolution on safeguarding water resources against pollution, appendix 5 of 4/2/1977, less restrictive and applicable to domestic discharges or those assimilable to domestic sewage with medium-low organic loads: Feed flow 200 l/dP.E. - BOD₅ concentration less than 300 mg/l - Suspended solids content less than 400 mg/l.

Use Primary treatment for discharge to public sewers, ideal for: isolated residential buildings, public offices, industrial or commercial activities, fast-food hygiene services, restaurants, bars, holiday farms, hotels, campsites, service stations, railway stations, airports.



Corrugated Imhoff tank*

Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Sedimen. lt.	Digest. lt.	Organic load Kg BOD ₅ /d	Hydraulic load m ³ /d	P.E.
NIM 1000	1150	1220	880	860	110	CC455-CC255	PP45-PP30	243	607	0,48	1,6	8
NIM 1500	1150	1720	1360	1340	110	CC455-CC255	PP45-PP30	362	906	0,84	2,8	14
NIM 2000	1150	2280	1985	1965	110	CC455-CC255	PP45-PP30	460	1381	1,08	3,6	18
NIM 2600	1710	1350	1000	980	125	CC455-CC355	PP45-PP35	629	1432	1,2	4	20
NIM 3200	1710	1625	1240	1220	125	CC455-CC355	PP45-PP35	760	1765	1,5	5	25
NIM 3800	1710	1855	1490	1470	160	CC455-CC355	PP45-PP35	965	2139	1,86	6,2	31
NIM 4600	1710	2125	1710	1690	160	CC455-CC355	PP45-PP35	1085	2713	2,4	8	40
NIM 7000	2250	2367	1850	1830	160	CC600-CC455	PP65-PP45	1460	5474	3,6	12	60
NIM 9000	2250	2625	2070	2050	160	CC600-CC455	PP65-PP45	2020	5803	4,8	16	80

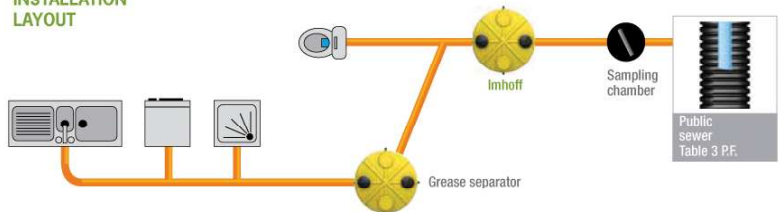


Smooth Imhoff tank*

Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Sedimen. lt.	Digest. lt.	Organic load Kg BOD ₅ /d	Hydraulic load m ³ /d	P.E.
IM 500	790	790	620	600	110	CC255-CC140	PP30	87	218	0,18	0,6	3
IM 800	1480 x 630	1090	870	850	110	CC255-CC255	PP30-PP30	131	601	0,42	1,4	7
IM 1000	1160	1140	910	890	110	CC255-CC255	PP30-PP30	205	712	0,54	1,8	9
IM 1500	1160	1610	1390	1370	110	CC255-CC255	PP30-PP30	282	1125	0,84	2,8	14
IM 2000	1160	2075	1810	1790	125	CC255-CC255	PP30-PP30	402	1501	1,14	3,08	19
IM 3000	1450	1940	1650	1630	125	CC255-CC255	PP30-PP30	644	1998	1,62	5,4	27

* On request, it's possible to supply the Imhoff tank with a housing for a chlorine tablet inserted in the outlet pipe

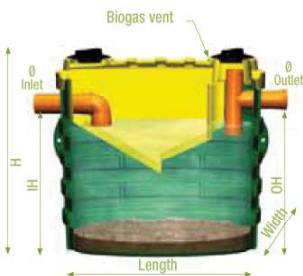
INSTALLATION LAYOUT





Ideal for underground installation in tight spaces

The Elipse model corrugated tanks have been specially designed for more difficult installation conditions. In fact, they guarantee lightness and watertightness while possessing a form that allows easy transport through confined spaces and subsequent underground installation under cellars, basements and pavements. Furthermore, their elongated shape improves the separation efficiency of sedimentable solids and floating matter, resulting in a high-performance treatment. Elipse is the Rototec solution.



ELIPSE Imhoff tank Subsurface discharge*



Articolo	Lunghezza mm	Larghezza mm	H mm	HE mm	HU mm	Ø E/U mm	Tappo	Prolunghe	Sedimen. It.	Digest. It.	Carico organico Kg BOD ₅ /d	Carico idraulico m ³ /d	A.E.
NIM 1200	1900	708	1630	1250	1230	110	CC455-CC355	PP45-PP35	290	910	0,42	1,4	7
NIM 1700	1900	708	2140	1760	1740	110	CC455-CC355	PP45-PP35	412	1363	0,6	2	10

ELIPSE Imhoff tank Discharge to public sewer*

Articolo	Lunghezza mm	Larghezza mm	H mm	HE mm	HU mm	Ø E/U mm	Tappo	Prolunghe	Sedimen. It.	Digest. It.	Carico organico Kg BOD ₅ /d	Carico idraulico m ³ /d	A.E.
NIM 1200	1900	708	1630	1250	1230	110	CC455-CC355	PP45-PP35	290	910	0,72	2,4	12
NIM 1700	1900	708	2140	1760	1740	110	CC455-CC355	PP45-PP35	412	1363	0,96	3,2	16

* On request, it's possible to supply the Imhoff tank with a housing for a chlorine tablet inserted in the outlet pipe



Grease separator

Three chamber septic tank

- 1. SEPTIC TANK
- 2. TWO-CHAMBER SEPTIC TANK
- 3. THREE-CHAMBER SEPTIC TANK





TECHNICAL CHARACTERISTICS

Septic tanks constitute a reliable device for the primary treatment of sewage. The treatment systems are passive, extremely stable, simple and inexpensive. They are used, above all, for treating domestic sewage from small communities. The configuration of the tank forces the sewage to pass through the liquid mass contained in it. The slowing down of the flow allows sedimentable solids and substances of specific weight less than that of the water to separate. Furthermore, an anaerobic fermentation process is triggered with the resulting solubilisation and synthesis of part of the suspended solids. In this way, the effluent leaving the tank is conditioned, i.e. it has a limited concentration of solids, transformed for the most part into dissolved and colloidal solids. Septic tanks are nothing more than stilling tanks in which the following processes take place:

- separation of sedimentable solids, coarse material, sands/grits, oils and greases present in the sewage;
- reduction of a fraction of the accumulated organic substances by decomposition
- accumulation and prolonged storage of the separated materials.

Compartmentation, i.e. the division of the system into chambers, significantly influences the efficiency of the treatment process. With this configuration, a large part of the suspended solids accumulate in the first compartment and only pass to the next chamber with great difficulty. Compartmentation is particularly effective when high levels of purification are required, in particular for separating suspended solids. Septic tanks are sized to achieve a high purification performance and to obtain liquefaction of the sludge, reducing its formation and thus minimising disposal costs.

For populations of up to 50 P.E., the sizing, which is not applicable to new installations, follows the guidelines provided for by the resolution of 4/2/77, in which a minimum retention time of 12 hours is required for the daily flow discharged (150-200 l/P.E.) and at least 50 l per capita for the sludge storage, for a total of 125-150 l/P.E.

Septic tanks are certified in accordance with UNI EN 12566-1 norm.

USE AND MAINTENANCE

An excessive accumulation of putrescible material at the bottom of the tank can cause uncontrolled anaerobic digestion phenomena, leading to an over-production of biogas and the development of malodorous emissions. Furthermore, the reduction in the volume available in the digestion compartment and the excessive production of gas bubbles will cause the settled material to rise, thus causing deterioration in the quality of the treated effluent. For this reason, 1 to 4 inspections per year by qualified personnel and eventual removal of the surface crust and accumulated sludge must be programmed in accordance with the loads fed to the tank. Once the settled sludge has been removed, the internal surfaces of the tank must be cleaned in order to eliminate any material that could obstruct the effluent inlet and outlet pipes. It is occasionally recommended that not all the deposited sludge is removed and that approximately 1/10 of the sludge deposited is left in the tank, as this will accelerate the restart of the biological processes. The use of the Rototec BIO-ACTIVATOR is highly recommended for rendering the initiation of the biological processes more rapid, thus limiting the number of sludge removal operations and reducing the risk of malodorous emissions.

SPECIFICATION ITEMS

Biological septic tank for primary treatment of wastewater coming from residential buildings or similar, polyethylene (PE) one-piece structure, manufactured in **ISO 9001/2008 certified company**, certified in accordance with **UNI EN 12566-1 norm** and with Legislative Decree n°152/2006 and with Interministerial Committee resolution of 04/02/1977, for underground installation, fitted with: inlet pipe with 90° elbow in PVC with watertight gasket in NBR rubber for dampening and distributing the flow, outlet pipe with deflector T in PVC with watertight gasket in NBR rubber, biogas vent, threaded covers in polypropylene (PP) for inspection, emptying and cleaning purposes; optional threaded extensions;

Biological septic tank mod.....useful volume.....
 lt, dimensionsX.....X.....cm

N.B.: Underground installation instructions on page 107

1. Septic tanks



Certification UNI - EN 12566-1

Sizing Sized in line with Interministerial Committee resolution 4/2/1977 on safeguarding water resources against pollution.

Use Primary treatment for discharge to public sewers, biological treatment or discharge to a soil absorption system, ideal for: isolated residential buildings, public offices, industrial or commercial activities, service stations, railway stations, airports, fast-food hygiene services, restaurants, bars, holiday farms, hotels, campsites, etc.



Corrugated septic tank



Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Useful vol. lt.	P.E.
NSE 1000	1150	1220	880	860	110	CC455-CC255	PP45-PP30	850	7
NSE 1200*	1900x708	1630	1250	1230	110	CC455-CC355	PP45-PP35	1200	9
NSE 1500	1150	1720	1360	1340	110	CC455-CC255	PP45-PP30	1268	11
NSE 1700*	1900x708	2140	1760	1740	110	CC455-CC355	PP45-PP35	1775	13
NSE 2000	1150	2280	1985	1965	110	CC455-CC255	PP45-PP30	1841	15
NSE 2600	1710	1350	1000	980	125	CC455-CC355	PP45-PP35	2061	16
NSE 3200	1710	1625	1240	1220	125	CC455-CC355	PP45-PP35	2525	20
NSE 3800	1710	1855	1525	1505	125	CC455-CC355	PP45-PP35	3175	24
NSE 4600	1710	2125	1745	1725	125	CC455-CC355	PP45-PP35	3835	30
NSE 7000	2250	2367	1850	1830	160	CC600-CC455	PP65-PP45	6934	55
NSE 9000	2250	2625	2070	2050	160	CC600-CC455	PP65-PP45	7823	70

* Ellipse tank with rectangular base

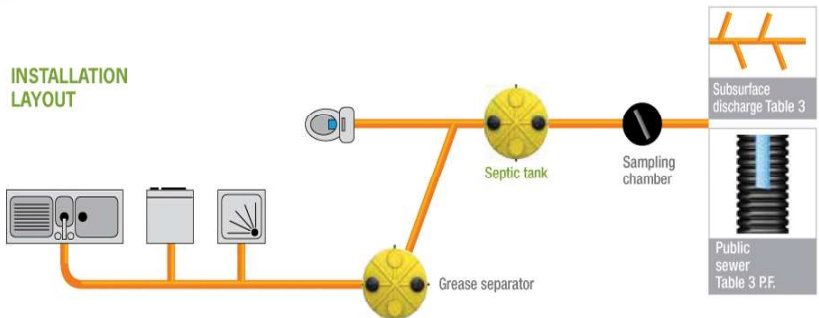


Smooth septic tank



Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Useful vol. lt.	P.E.
SE 500	790	790	620	600	110	CC455-CC140	PP45	305	2
SE 800	1480x630	1090	870	850	110	CC455-CC255	PP45-PP30	732	6
SE 1000	1160	1140	910	890	110	CC455-CC255	PP45-PP30	917	7
SE 1500	1160	1610	1390	1370	110	CC455-CC255	PP45-PP30	1407	11
SE 2000	1160	2075	1810	1790	125	CC455-CC255	PP45-PP30	1903	14
SE 3000	1450	1940	1650	1630	125	CC455-CC255	PP45-PP30	2642	20

INSTALLATION LAYOUT





2. Two-chamber septic tanks

Sizing Sized in line with Interministerial Committee resolution 4/2/1977 on safeguarding water resources against pollution.

Use Primary treatment for discharge to public sewers, biological treatment or discharge to a soil absorption system, ideal for: isolated residential buildings, public offices, industrial or commercial activities, service stations, railway stations, airports, fast-food hygiene services, restaurants, bars, holiday farms, hotels, campsites, etc.



Corrugated two-chamber septic tank

Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Useful vol. ft.	P.E.
NSEB 1000x2	1150	1220	880	860	110	CC455-CC255	PP45-PP30	1700	14
NSEB 1200x2*	1900x708	1630	1250	1230	110	CC455-CC355	PP45-PP35	2400	18
NSEB 1500x2	1150	1720	1360	1340	110	CC455-CC255	PP45-PP30	2536	22
NSEB 1700x2*	1900x708	2140	1760	1740	110	CC455-CC355	PP45-PP35	3550	26
NSEB 2000x2	1150	2280	1985	1965	110	CC455-CC255	PP45-PP30	3682	30
NSEB 2600x2	1710	1350	1000	980	125	CC455-CC355	PP45-PP35	4122	32
NSEB 3200x2	1710	1625	1240	1220	125	CC455-CC355	PP45-PP35	5050	40
NSEB 3800x2	1710	1855	1525	1505	125	CC455-CC355	PP45-PP35	6350	48
NSEB 4600x2	1710	2125	1745	1725	125	CC455-CC355	PP45-PP35	7670	60
NSEB 7000x2	2250	2367	1850	1830	160	CC600-CC455	PP65-PP45	13868	110
NSEB 9000x2	2250	2625	2070	2050	160	CC600-CC455	PP65-PP45	15646	140

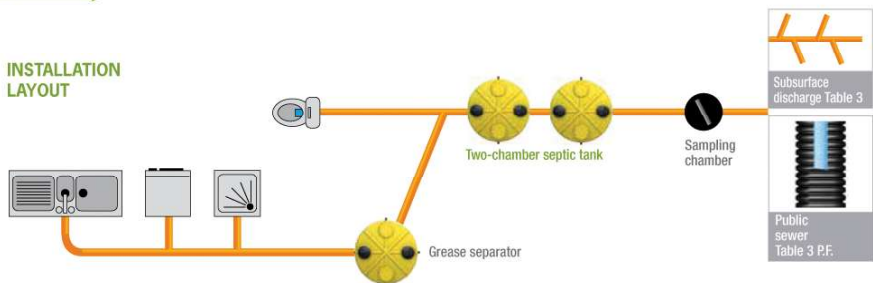
* Ellipse tank with rectangular base



Smooth two-chamber septic tank

Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Useful vol. ft.	P.E.
SEB 500x2	790	790	620	600	110	CC455-CC140	PP45	610	4
SEB 800x2	1480x630	1090	870	850	110	CC455-CC255	PP45-PP30	1464	12
SEB 1000x2	1160	1140	910	890	110	CC455-CC255	PP45-PP30	1834	14
SEB 1500x2	1160	1610	1390	1370	110	CC455-CC255	PP45-PP30	2814	22
SEB 2000x2	1160	2075	1810	1790	125	CC455-CC255	PP45-PP30	3806	28
SEB 3000x2	1450	1940	1650	1630	125	CC455-CC255	PP45-PP30	5284	40

INSTALLATION LAYOUT



3. Three-chamber septic tanks



Sizing Sized in line with Interministerial Committee resolution 4/2/1977 on safeguarding water resources against pollution.

Use Primary treatment for discharge to public sewers, biological treatment or discharge to a soil absorption system, ideal for: isolated residential buildings, public offices, industrial or commercial activities, service stations, railway stations, airports, fast-food hygiene services, restaurants, bars, holiday farms, hotels, campsites, etc.

Corrugated three-chamber septic tank



Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Useful vol. lt.	P.E.
NSET 1000x3	1150	1220	880	860	110	CC455-CC255	PP45-PP30	2550	21
NSET 1200x3*	1900x708	1630	1250	1230	110	CC455-CC355	PP45-PP35	3600	27
NSET 1500x3	1150	1720	1360	1340	110	CC455-CC255	PP45-PP30	3804	33
NSET 1700x3*	1900x708	2140	1760	1740	110	CC455-CC355	PP45-PP35	5325	39
NSET 2000x3	1150	2280	1985	1965	110	CC455-CC255	PP45-PP30	5523	45
NSET 2600x3	1710	1350	1000	980	125	CC455-CC355	PP45-PP35	6183	48
NSET 3200x3	1710	1625	1240	1220	125	CC455-CC355	PP45-PP35	7575	60
NSET 3800x3	1710	1855	1525	1505	125	CC455-CC355	PP45-PP35	9525	72
NSET 4600x3	1710	2125	1745	1725	125	CC455-CC355	PP45-PP35	11505	90
NSET 7000x3	2250	2367	1850	1830	160	CC600-CC455	PP65-PP45	20802	165
NSET 9000x3	2250	2625	2070	2050	160	CC600-CC455	PP65-PP45	23619	210

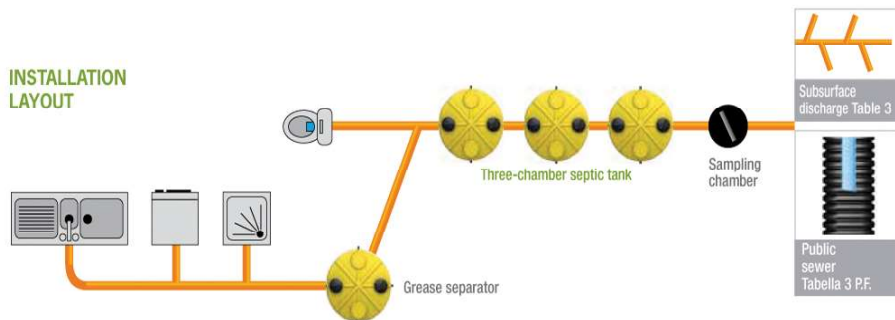
* Elipse tank with rectangular base



Smooth three-chamber septic tank

Item	Ø mm	H mm	IH mm	OH mm	Ø I/O mm	Cover	Extensions	Useful vol. lt.	P.E.
SET 500x3	790	790	620	600	110	CC455-CC140	PP45	915	6
SET 800x3	1480 x 630	1090	870	850	110	CC455-CC255	PP45-PP30	2196	18
SET 1000x3	1160	1140	910	890	110	CC455-CC255	PP45-PP30	2751	21
SET 1500x3	1160	1610	1390	1370	110	CC455-CC255	PP45-PP30	4221	33
SET 2000x3	1160	2075	1810	1790	125	CC455-CC255	PP45-PP30	5709	42
SET 3000x3	1450	1940	1650	1630	125	CC455-CC255	PP45-PP30	7926	60

INSTALLATION LAYOUT





1. LOW LOAD (downstream of the Imhoff and grease separator)
2. TOTAL OXIDATION (downstream of the grease separator)

ACTIVATED SLUDGE PLANTS



TECHNICAL CHARACTERISTICS

Activated sludge plants are secondary treatment systems that make use of the action of the bacterial colonies that, remaining in suspension in the sewage, consume the biodegradable organic material, using it as a nutrient to obtain the necessary energy and the material required for the synthesis of new cells. In this manner, increasingly stable compounds are formed leading to the total degradation of the organic load. Very high concentrations of aerobic type bacteria are developed inside activated sludge plants, sufficient, that is, to absorb the dissolved oxygen in the water in order to consume the biodegradable material. To guarantee the concentration of oxygen necessary for the development of the biological reaction, an aeration system is adopted consisting of submerged diffusers which, from the bottom of the tank, disperse a flow of fine air bubbles. This also guarantees sufficient mixing to keep the high concentrations of solids present in the tank in suspension. In the oxygen rich environment of the aeration tank, a number of different processes are set in motion:

- Chemical, i.e. the oxidation of malodorous compounds (hydrogen sulphide, sulphites...).
- Physical, i.e. the removal of sewage solids trapped by the dispersion of bacteria.
- Biological, i.e. direct assimilation of the organic substances dissolved in the sewage.

The sizing of the activated sludge plants is performed on the basis of the sludge load (or organic load factor) expressed as the ratio between the organic load (BOD₅) and the micro-organisms; the lower this ratio, the more intensely the organic load is consumed, at the same time reducing the production of excess sludge. Rototec activated sludge plants are sized to have sludge loads of less than 0.08 KgBOD/KgSSd with retention times of more than 24 hours at mean flows and volumetric loads of less than 0.25 KgBOD/m³d in the prolonged aeration (or total oxidation) configuration and sludge loads of less than 0.15 KgBOD/KgSSd and volumetric loads less than 0.5 KgBOD/m³d in the low-load configuration.

Low load activated sludge plants are certified in accordance with UNI EN 12566-3 norm.

USE AND MAINTENANCE

The small user activated sludge plant is designed with the sedimentation compartment inside the oxidation tank in order to provide sewage settlement as well as sludge recirculation. This however leads to a build-up of solids in the oxidation chamber. In order to avoid an excessively turbid discharge it is advisable to inspect the plant and remove any excess sludge at least once a year.

These operations are normally carried out as part of the Imhoff tank inspection and emptying operations. Cleaning is effected by removing a part of the excess sludge, paying particular attention to removing accumulations at the inlet and outlet pipes and

cleaning the air diffusers to prevent blockages. It should also be remembered that in order to ensure the correct operation of a low-load activated sludge plant, a grease separator and Imhoff tank or similar should be installed upstream of the reactor itself. Furthermore, the aeration should be continuous during the period of use of the plant and any discharge of disinfectants, bleaches, strong acids or bases should be minimised as much as possible to prevent possible deactivation of the biomass. The plant needs 10-15 days in order to reach normal operation, this time can be reduced however by adding biomass activators (RO-TOTEC BIO ACTIVATOR) directly to the sewage.

SPECIFICATION ITEMS

Activated sludge plant for secondary treatment of wastewater coming from residential buildings or similar, polyethylene (PE) one-piece structure, manufactured in **ISO 9001/2008 certified company**, certified in accordance with **UNI EN 12566-3 norm** and with Legislative Decree n°152/2006 for final discharge to a soil absorption system or surface watercourse, fitted with: inlet pipe with 90° elbow in PVC with watertight gasket in NBR rubber, sedimentation chamber, outlet pipe with deflector T and housing for chlorine tablet in PVC with watertight gasket in NBR rubber; supply with an aeration system with diaphragm blower, rubber pipe and plate diffuser/s in microbored rubber; fitted also with biogas vent, threaded covers in polypropylene (PP) for inspection, emptying and cleaning purposes; optional threaded extensions;
 Activated sludge plant mod.....useful volume.....
 lt, dimensionsx.....x.....cm

Total oxidation activated sludge plant for primary treatment (downstream of a grease separator) of wastewater coming from residential buildings or similar, polyethylene (PE) one-piece structure, manufactured in **ISO 9001/2008 certified company**, in accordance with Legislative Decree n°152/2006 for final discharge to a soil absorption system or surface watercourse, fitted with: inlet pipe with 90° elbow in PVC with watertight gasket in NBR rubber, outlet dispersion pipe with housing for chlorine tablet in PVC with watertight gasket in NBR rubber; supply with an aeration system with diaphragm blower, rubber pipe and plate diffuser/s in microbored rubber; fitted also with biogas vent, threaded covers in polypropylene (PP) for inspection, emptying and cleaning purposes; optional threaded extensions;
 Totale oxidation activated sludge plant mod.....useful volume.....lt, dimensionsx.....x.....cm

N.B.: Underground installation instructions on page 107

1. Low load activated sludge plants



Certification UNI-EN 12566 - 3 CE

Sizing This configuration is recommended in the presence of primary sedimentation and allows removal of suspended solids and organic load in accordance with the tabled requirements of Law Decree 152/06 and subsequent amendments. The plants are designed for a daily organic load per capita of 48 gBOD₅/P.E. (downstream of an Imhoff or septic tank type primary sedimentation and grease separator) and for a mean daily flow of 200 l/P.E.

Use As secondary treatment downstream of primary treatments (Imhoff, grease separator), for final discharge to a soil absorption system or surface watercourse, ideal for: isolated residential buildings, public offices, industrial or commercial activities, service stations, railway stations, airports, fast-food hygiene services, restaurants, bars, holiday farms, hotels, campsites, etc. .



Corrugated activated sludge plant

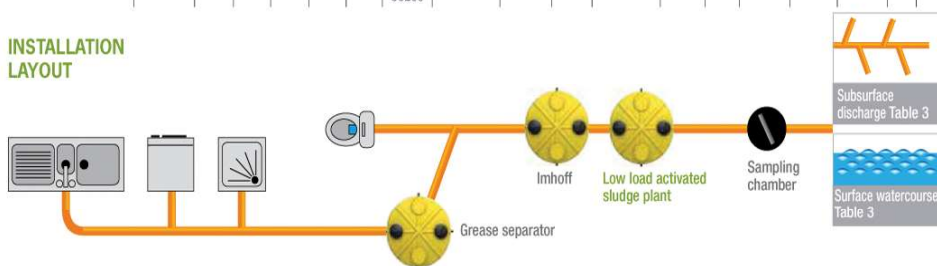
Item	Ø mm	H mm	IH mm	OH mm	ØI/Ø mm	Cover	Extensions	Aerated vol. l	Sed. vol. l	Volumetric load kgBOD/m ³	Retention time		Blower	OC kg O ₂ /kgBOD	Diffuser plates n°	P.E.
											Aerat. H	Sed. H				
NIFA 1000	1150	1220	880	860	110	CC455-CC255	PP45-PP30	607	243	0,383	15	5,9	HP40	3	1	5
NIFA 1200*	1900x708	1630	1250	1230	110	CC455-CC355	PP45-PP35	910	290	0,317	18	4,9	HP40	3	1	6
NIFA 1500	1150	1720	1360	1340	110	CC455-CC255	PP45-PP30	906	362	0,379	15,2	5,7	HP40	3	1	8
NIFA 1700*	1900x708	2140	1760	1740	110	CC455-CC355	PP45-PP35	1363	412	0,308	18,6	4,9	HP40	3	1	9
NIFA 2600	1710	1350	1000	980	125	CC455-CC355	PP45-PP35	1432	629	0,42	13,7	4,9	HP80	2,5	2	13
NIFA 3200	1710	1625	1240	1220	125	CC455-CC355	PP45-PP35	1765	760	0,414	13,9	5,1	HP80	2,5	2	16
NIFA 3800	1710	1855	1525	1505	125	CC455-CC355	PP45-PP35	2139	965	0,421	13,7	5	HP80	2,5	2	20
NIFA 4600	1710	2125	1710	1690	160	CC455-CC355	PP45-PP35	2713	1085	0,419	13,7	5,3	HP80	2,5	2	25
NIFA 7000	2250	2367	1850	1830	160	CC600-CC455	PP65-PP45	5474	1460	0,343	16,7	4,3	HP150	3	2	40
NIFA 9000	2250	2625	2070	2050	160	CC600-CC455	PP65-PP45	5803	2020	0,397	14,5	4,8	HP150	3	2	50

* Ellipse tank with rectangular base

Smooth activated sludge plant

Item	Ø mm	H mm	IH mm	OH mm	ØI/Ø mm	Cover	Extensions	Aerated vol. l	Sed. vol. l	Volumetric load kgBOD/m ³	Retention time		Blower	OC kg O ₂ /kgBOD	Diffuser plates n°	P.E.
											Aerat. H	Sed. H				
IFA 800	1480x630	1090	870	850	110	CC255-CC255	PP30-PP30	601	131	0,333	17	5	HP40	3	1	3
IFA 1000	1160	1140	910	890	110	CC255-CC255	PP30-PP30	712	205	0,333	17,3	5,2	HP40	3	1	5
IFA 1500	1160	1610	1390	1370	110	CC255-CC255	PP30-PP30	1125	282	0,384	15	3,8	HP40	2,6	1	9
IFA 2000	1160	2075	1810	1790	125	CC235-CC255	PP30-PP30	1501	402	0,35	16,5	4,4	HP40	2,9	1	11
IFA 3000	1450	1940	1650	1630	125	CC255-CC255	PP30-PP30	1998	644	0,421	13,7	4,3	HP80	3	2	18

INSTALLATION LAYOUT





2. Total oxidation activated sludge plants

Sizing This plant configuration guarantees a highly efficient removal of the biological load and reduced production of excess sludge, including in the absence of primary sedimentation. The daily organic load per capita used for sizing the plant is 60 gBOD₅/P.E. with a daily inflow of 200 l/P.E.

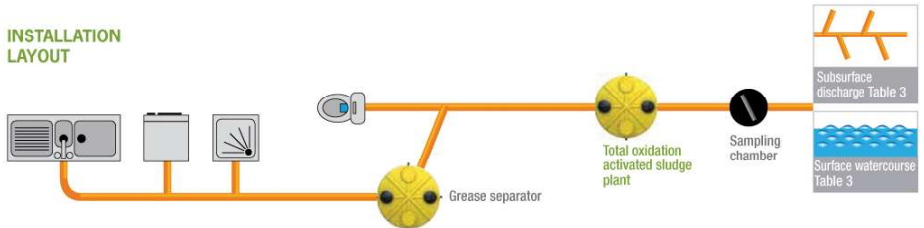
Use As primary and secondary treatment of foul sewage downstream of a grease separator, for final discharge to a soil absorption system or surface watercourse, ideal for: isolated residential buildings, public offices, industrial or commercial activities, service stations, railway stations, airports, fast food hygiene services, restaurants, bars, holiday farms, hotels, campsites, etc. .



Corrugated activated sludge plant

Item	Ø mm	H mm	IH mm	OH mm	ØI/O mm	Cover	Extensions	Aerated vol. l	Organic load kgBOD / m ³	Retention time Aeration H	Blower	OC kg O ₂ / kgBOD	Diffuser plates n°	P.E.
NIFAT 1000	1150	1220	880	860	110	CC455-CC255	PP45-PP30	850	0,191	37	HP40	6	1	2
NIFAT 1500	1150	1720	1360	1340	110	CC455-CC255	PP45-PP30	1268	0,178	40	HP40	4,8	1	4
NIFAT 2600	1710	1350	1000	980	125	CC455-CC355	PP45-PP35	2061	0,242	29	HP80	4,2	2	6
NIFAT 3200	1710	1625	1240	1220	125	CC455-CC355	PP45-PP35	2525	0,226	32	HP80	4	2	8
NIFAT 3800	1710	1855	1525	1505	125	CC455-CC355	PP45-PP35	3104	0,211	34	HP80	3,9	2	10
NIFAT 4600	1710	2125	1745	1725	125	CC455-CC355	PP45-PP35	3594	0,21	34	HP80	4,1	2	12
NIFAT 7000	2250	2367	1885	1865	125	CC600-CC455	PP65-PP45	6934	0,214	33,7	HP150	3	2	25
NIFAT 9000	2250	2625	2105	2085	125	CC600-CC455	PP65-PP45	7823	0,224	32	HP150	3	2	30

INSTALLATION LAYOUT





Blowers - Compressors

Company fits its Activated Sludge plants with diaphragm type air compressors which make use of the electromagnetic vibration of an actuator rod supported by rubber diaphragms. This system reduces energy consumption to a minimum by supplying constant air flows without any variations in working pressure. The blower does not have any moving parts in contact, and as such does not require any lubrication. Special attention is paid to the acoustic insulation and to the design of the vibrating section of the compressor in order to make it as silent as possible.



Item	Voltage V	Frequency Hz	Watt W	Ampere A	Flow rate l/min	Nominal pressure bar	Noise level db	Weight kg
HP 40	220	50	31	0,32	40	0,13	< 39	4,9
HP 60	220	50	61	0,6	70	0,15	< 48	6,9
HP 80	220	50	91	1	88	0,15	< 57	7
HP 150	220	50	106	1,2	114	0,2	< 52	11,8
HP 200	220	50	152	1,9	148	0,2	< 53	12

USE AND MAINTENANCE

the blower does not have any moving parts in contact, and as such does not require lubrication. Apart from the simple replacement of a few components (diaphragm) and cleaning of the air intake filter once every three months, its operation is long-term and does not require any other maintenance. It should, however, be installed in a suitable cabinet by qualified personnel. The cabinet must have the following characteristics:

- It must be positioned above ground at a maximum distance of 10 m from the treatment plant;
- The support must be solid, flat and located above the level of the tank in order to avoid a backflow of sludge in the case of an interruption in the air supply;
- It must ensure a sufficient air change to prevent overheating of the blower;
- The internal environment must be free of corrosive gases and must not be exposed to vibration;
- It must be equipped with an electric panel or an adequate number of power sockets (220V; 50Hz), including a service socket, and a manual switch (fused or thermomagnetic), all installed by specialised qualified personnel;
- The air pipes must be protected by ducts running from the cabinet to the tank (minimum diameter 80 mm), similarly for the electric wiring (minimum diameter 63 mm);
- The air supply to the compressor must be permanent. A prolonged state of anoxia (lack of oxygen) can kill the microorganisms that guarantee the effectiveness of the treatment.

INSTALLATION

- Connect one end of the air feed pipe supplied to the outlet of the blower using the appropriate clips;
- Connect the other end of the pipe to the coupling on the tank.

PRECAUTIONS DURING USE

Carry out all cleaning and/or part replacement operations with the power supply disconnected:

- Before carrying out any cleaning or part replacement operations, in order to avoid risks of burning, make sure that the compressor has cooled down sufficiently;
- When carrying out repairs, in order to guarantee the safety of the equipment, it is good practice to use original spare parts only;
- Maintenance operations requiring the presence of electricity, such as troubleshooting the blower, must be carried out by qualified personnel;
- Do not connect the compressor to a power supply other than that specified. In the case of doubt regarding making the connections, do not connect the equipment.





Accessories for activated sludge plants (included in the supply)

Diffuser plates



In its activated sludge plants, company uses diaphragm type diffusers in microbored rubber, constructed to provide a uniform distribution of air with bubbles of microscopic diameter designed to optimise the oxygenation of the effluent. The particular structure of the plates reduces the risk of blockages during operation to a minimum and eliminates the possibility of its separation during the inspection phase, thus guaranteeing a high air flow with minimum head loss.

Item	Diameter mm	Weight kg	Maximum air flow m ³ /h	Diameter of bubbles mm	Oxygenation capacity g _o /Nm ³ per meter head
IFADN	211	2,1	5	1-3	18 -20

USE AND MAINTENANCE

The particular structure of the diffuser reduces the risk of blockages during operation (including intermittent) to a minimum and eliminates the possibility of separation during the inspection phase, thus guaranteeing a high air flow with minimum head loss. The rubber lining of the rigid air distributor provides protection against accidental damage to the system, which will maintain its original characteristics over time. It is nevertheless advisable to clean the diffuser with a jet of water each time sludge is removed from the tank. This will prevent any accumulation in the microbores, which could result in an insufficient delivery of air and a consequent reduction in the performance of the plant.



Chlorine tablets

The Activated Sludge plants are constructed with a disinfection compartment inserted in the effluent discharge pipe. A chlorine tablet can be placed in the housing to produce a disinfected effect which will last for 30-60 days. This device was introduced to prevent the risk of a micro-biological presence in the discharge not complying with legal requirements.

Item	Weight mg	Diameter mm	Height mm
IFACC	200	75	25

PRECAUTIONS DURING USE

- Harmful when swallowed.
- Irritant for eyes and respiratory tract (in the case of contact with eyes, wash immediately and abundantly in water and seek medical help).
- Store out of reach of children.
- Keep away from humidity.
- In the case of fire and/or explosion, do not breathe in the fumes
- Can cause ignition of combustible raw materials
- Emits toxic gas on contact with acids.
- Highly toxic for aquatic organisms

