

ENSIGN PACKAGE SEWAGE TREATMENT PLANT ➤

INTENSIVE BIOLOGICAL PROCESSING FOR OFF-MAINS WASTEWATER

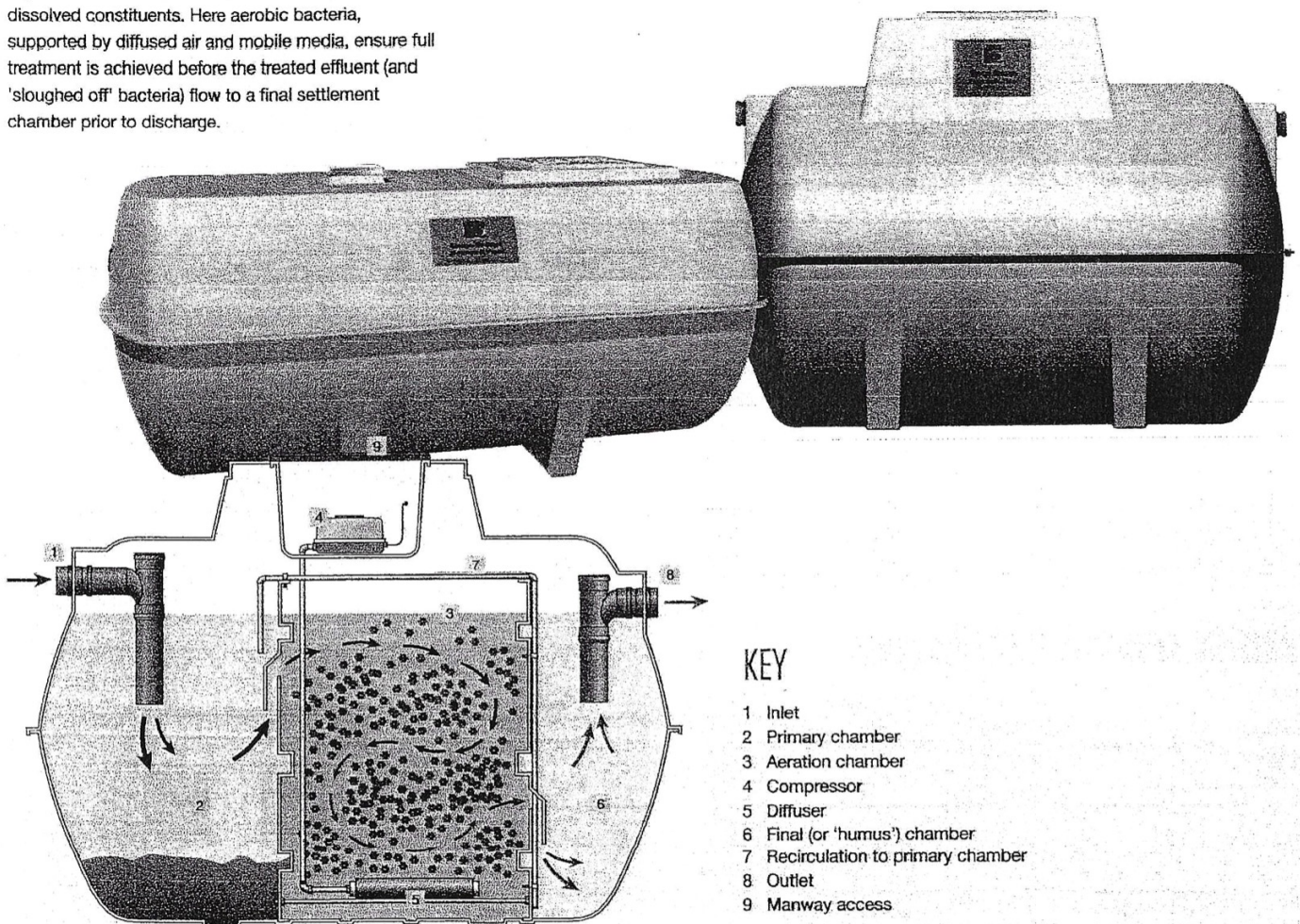
Package Sewage Treatment Plant's (or PSTP's) are often a suitable option where groundwater in the surrounding environment is vulnerable, drainage field percolation values are restrictive, or direct discharge to watercourse or surface water sewer is the preferred discharge method.

In addition to the anaerobic digestion taking place in the primary settlement tank (as septic tanks) the Ensign unit allows the clarified water to pass into a second 'aeration' chamber where it is treated to remove the dissolved constituents. Here aerobic bacteria, supported by diffused air and mobile media, ensure full treatment is achieved before the treated effluent (and 'sloughed off' bacteria) flow to a final settlement chamber prior to discharge.

- > PSTP's should be sized using the latest version of British Water Flows & Loads which provides detailed information on sewage production figures and sizing calculations
- > Regulatory authorities for the control of pollution in the UK normally require treatment plants conforming to BSEN12566:3 to be demonstrated as capable of producing a minimum effluent discharge quality of 20:30:20 (Biochemical

Oxygen Demand; Suspended Solids; Ammoniacal Nitrogen in mg/ltr), although in certain areas more stringent site-specific qualities may be required

- > No surface water should enter the system as this can reduce the system's capacity and cause solids to be flushed out which may prematurely block drainage field or cause pollution
- > As with septic tanks sludge should be removed annually or in line with manufacturers instructions



MARSH INDUSTRIES

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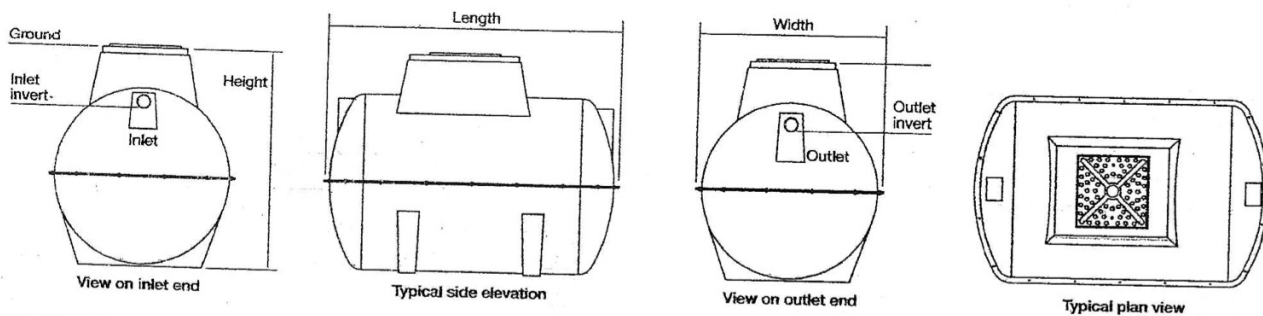


ENSIGN BENEFITS



- > Tested to BSEN12566:3 and CE-marked to ensure compliance with latest environmental and Building Regulations requirements
- > Class-leading effluent quality of **11.5:19.2:8.4 (BOD:SS:NH⁴)** ensures discharges well within national consent standards
- > Three chamber system correctly sized for separation and retention of solids improves final effluent quality
- > Standard or shallow options enable suitability for all site conditions (including driveways - subject to plinth/surround to prevent superimposed loadings)
- > Shallow option ideal for groundworks involving bedrock or high water table as the low profile allows for safe, cost effective installation
- > Low energy compressors ensure minimal running, maintenance and servicing costs
- > High specification bio-media (310m³ per m²) and membrane diffusers ensure even circulation to eliminate 'dead spots'
- > Internal recirculation (from final to primary chamber) continues treatment process to provide higher effluent quality whilst balancing flow over 24 hour period or periods of intermittent use
- > Integral lifting eyes for improved on-site handling
- > Unique 'keying-in' lip to assist anchoring into granular or concrete surround
- > Optional extras include patented Polylok filter to further reduce suspended solids and extend life of drainage field; extensions for deep installations; pumped outlets for sites with adverse levels; and many more

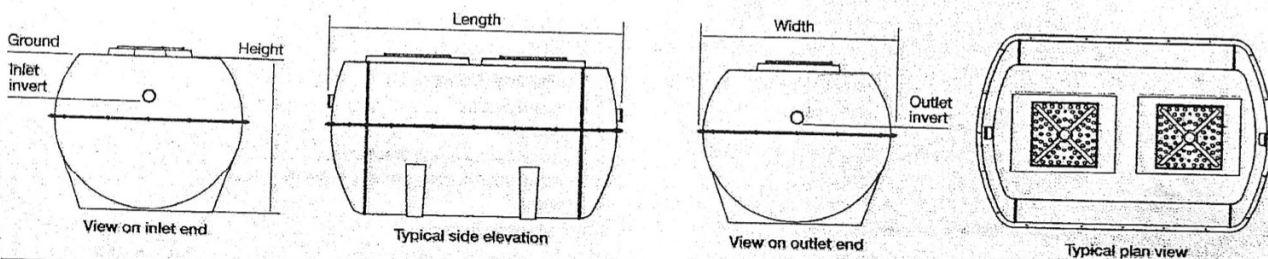
ENSIGN SPECIFICATIONS



Model	Length	Width	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
6	2602	1650	1935	550	110	625	110
10	2602	1650	1935	550	110	625	110
12	2860	1912	2139	550	110	625	110
16	2860	1912	2284	720	110	800	110
20	3650	1912	2284	720	160	800	160
25	3650	1912	2284	770	160	850	160
30	4550	1912	2284	770	160	850	160
35	4550	1912	2284	770	160	850	160
40	5200	1912	2284	770	160	850	160
45	5200	1912	2284	770	160	850	160
50	5200	1912	2284	770	160	850	160

All dimensions in mm

ENSIGN SHALLOW SPECIFICATIONS



Model	Length	Width	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
6	2860	1912	1600	500	110	575	110
10	2860	1912	1600	500	110	575	110
12	2860	1912	1600	500	110	575	110
16	3400	1912	1600	500	110	575	110
20	4550	1912	1600	500	160	575	160
25	4550	1912	1600	500	160	575	160
30	5500	1912	1600	500	160	575	160
35	5500	1912	1600	500	160	575	160

All dimensions in mm

Marsh Sewage Plant Process Details Marsh Ensign Sewage Treatment Plants

The Marsh Industries Ensign SAF Range of high performance sewage treatment plants use high specification Bio-Media (310m^2 per m^3) filtration combined with the extremely low energy use compressors from Secoh. This along with the correct sizing and retention design provides submerged aeration filtration processing, SAF processing is firmly established as a reliable high performance sewage treatment practice.

The internal RAS (re-cycling from the humus chambers) also provides a higher effluent quality whilst balancing the flow over a twenty four period. This enables the plant to continue to treat and process the effluent through times of peak flow.

Marsh fit the scum ports to its internal baffles these continue to ensure the highest quality of bio-mass bacterial growth in the aeration chambers. Cylindrical precision die cut EPDM membrane diffusers are installed into the bio-zone to ensure diffused oxygen is distributed evenly throughout preventing "dead spots"

The Marsh Ensign plants are manufactured and designed for "turn key" domestic, commercial industrial and leisure site projects. Marsh Industries are members of British Water & the SBWWI and design the plants to the British Water loads & flows and European Standards. The plants can be designed and manufactured in modular form or with the design and manufacture calculated for lower levels of Ammonia treatment.

Marsh has submitted and holds five TUV-Sud test certificates for **EN12566 sewage treatment** and therefore our sewage plants have been type tested and certified to the latest UK & European standards EN 12566-3:2005+A1:2009. As detailed below the tested influent strength of the raw sewage is .49mg/litre/day far greater than the UK National Forward of .300mg/litre/day.

In standard configuration the plant offers treatment to a 12mg/l BOD: 19mg/l SS: 09mg/l NH_4 effluent quality. The plants are almost silent running and easy to maintain with only the Bio-media moving by the cyclonic action generated between the diffused oxygen and effluent.

Marsh plants are manufactured using only 100% pure resin and chop strand glass, some UK manufactures use up to 50% chalk powder as filling agent, in our opinion this can cause air pockets and inconsistency in wall thickness of the resin.

Treatment efficiency on organic daily flow $\text{BOD}_5 = 0.49$ kg/d	Marsh Tested % Reduction	Marsh Final Tested Effluent Quality mg/l
BOD_5	97.4	11.5 (UK Standard 20mg/l)
COD_{CR}	91.0	71.5 (no UK test for COD)
TSS	94.1	19.2 (UK Standard 30mg/l)
N-NH_4^+	81.0	8.4 (UK Standard 20mg/l)
P_{total}	42.0	5.7 (no UK test for COD)

