

APEX is a Submerged Aerated Filter (SAF) sewage treatment plant.



APEX is designed to receive wastewater (sewage) and process it so that only a clear effluent is discharged into the environment.

It can be used for domestic houses and is also ideally suited for commercial applications such as hotels, restaurants, offices, schools and campsites.

The APEX has been tested and certified to EN 12566-3.

ADVANTAGES

- ✓ Simple and reliable operation
- ✓ Easy and low cost installation
- ✓ Excellent build quality
- ✓ Low noise
- ✓ Low electricity demand
- ✓ Excellent effluent quality
- ✓ No internal moving parts
- ✓ Small visual footprint
- ✓ CE marked
- ✓ EN 12566-3 certified
- ✓ Excellent value for money

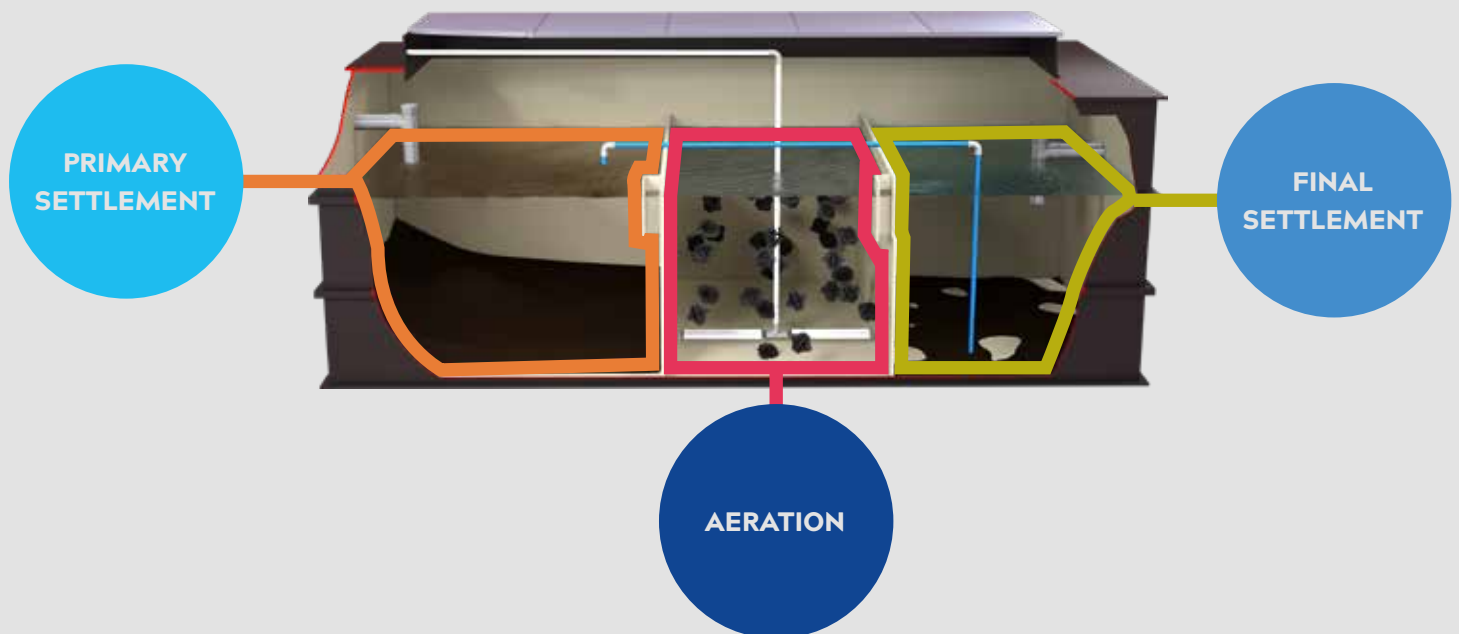


Treatment Process Overview

APEX is a simple and robust system for the treatment of wastewater and has proven itself over many years.

It has no internal moving parts and is a very reliable system.

There are three principal stages to the treatments process:

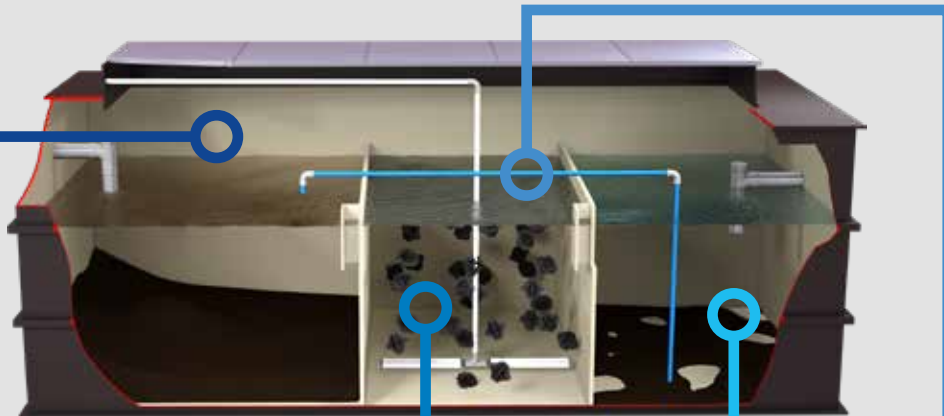


Performance

APEX has been designed to meet the UK Royal Commission Standard for effluent. Due to its unique design, it far exceeded this standard during EN testing.

Pollutant	Design Effluent Quality (95%ile Basis)	Average Effluent Quality - During EN 12566-3 Testing - 100% Loading
COD	N/A	53.8 mg/L
BOD ₅	20 mg/L	9.9 mg/L
Suspended Solids	30 mg/L	14.7 mg/L
Ammonia (NH ₄ -N)	20 mg/L	6.8 mg/L

Treatment Process Detail



STAGE 1

Wastewater from the building(s) enters the **Primary Settlement Tank (PST)**.

Here solids and liquids are separated with the solids being retained for periodic removal by a tanker.

Liquid wastewater then flows into the Biozone.

STAGE 2

The **Biozone** is the heart of the treatment process and is where the liquid effluent is biologically cleaned.

The Biozone is filled with EDNA media.

Aerobic bacteria and microorganisms clean the wastewater by feeding on the pollutants as it flows through the EDNA matrix.

The bacteria must have a constant oxygen supply and this is provided by an external air blower.

STAGE 3

The wastewater then flows into the **Final Settlement Tank (FST)** where any remaining fine solids settle at the base of the tank forming sludge.

The clear effluent is discharged into the environment (drainage field or watercourse).

STAGE 4

The settled sludge is returned to the Primary Tank via a non-mechanical air lift system. This keeps the bacteria in the Biozone supplied with food even when there is little or no wastewater coming from the building(s) and keeps the system working during low use and holiday periods

EDNA Media

EDNA has been specifically developed to provide the optimum surface area : volume ratio needed for wastewater treatment.

It provides a huge surface area for bacteria to colonise, whilst providing excellent water flow pathways.

The large surface area greatly increases the number of bacteria in the Biozone. This improves the efficiency of the biological filter and reduces the volume required to a minimum.

Self Regulating Biozone

One of the major advantages of APEX is that the Biozone self regulates depending on how much wastewater the system must process.

As a rough rule, sewage treatment plants require at least 50% of their design load in order to function. It is common however for many sewage treatment plants to be underloaded and fail to produce satisfactory effluent as a result because the bacteria are starved of food.

20%

The design of the Biozone enables APEX to function at only 20% of its design load (10% on APEX HH models).

In larger models the Biozone is divided into multiple stages. When fully loaded, bacteria will colonise all the media in each Biozone but when the usage is reduced, bacteria will only colonise as much of the media as the incoming load requires. In this way the APEX system is able to shut down part of the Biozone and prevent the system from becoming starved due to lack of food/use.

EXAMPLE

A four bedroom house requires a 6PE (6 person) sewage treatment plant.

A 6PE sewage treatment plant should have at least three residents using it.

The house is only occupied by two residents and the sewage treatment plant doesn't function correctly as a result.

The Sludge Management System

All three stage sewage treatment plants produce sludge as part of the treatment process.

There are two types of sludge:

Primary Sludge

Solids from the incoming wastewater that accumulate in the PST.

Secondary Sludge

Dead bacteria and undigested particles that accumulate in the Biozone and FST.

APEX is able to automatically recycle secondary sludge to optimise performance and reduce maintenance.

Settled Sludge Return (SSR)

Settled sludge is recycled from the bottom of the Final Settlement Tank back to the Primary Settlement Tank using a simple, non-mechanical, air lift.

1

In the Final Settlement Tank sludge accumulates in the base.

2

Air from the blower is spurred to the Settled Sludge Return (SSR).

3

As air rises up the sludge return pipe a vacuum is created that syphons the sludge back to the Primary Settlement Tank.

The return of settled sludge gives the bacteria in the Biozone a food supply even when there is little or no wastewater coming from the building. This makes APEX better able to handle low occupation stress than other sewage treatment plants.

In conjunction with the Self Regulating Biozone, the Sludge management System makes APEX ideally suited for sites where there is low usage and/or a fluctuating load. i.e.:

- ✓ Restaurants
- ✓ Hotels
- ✓ Campsites
- ✓ Offices
- ✓ Schools
- ✓ Labour Camps
- ✓ Etc

Variants

APEX is available in a range of options:

APEX S (Standard)

The standard units are constructed from polypropylene sheet reinforced with steel.

These tanks are for underground installation only.

APEX E (Export)

APEX tanks can be constructed so that they can be packed inside standard shipping containers.

This is the most popular option for export as it greatly reduces the shipping costs.

APEX C (Containerised)

The APEX system can be permanently built inside standard open top shipping containers.

This allows the tanks to be shipped easily and once on site they can be installed either below or above ground as the container provides added strength to the system.

They can also be emptied of water and moved to another site and hence can be seen as being a mobile option for wastewater treatment.

APEX AG (Above Ground)

These are reinforced standard units for installation above ground.

APEX HH (Half & Half)

This is an adjustable system for sites with a fluctuating seasonal load.

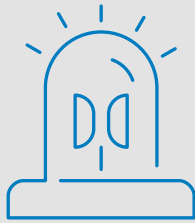
APEX HH tanks are two smaller tanks built into a single shell.

Underloading is a major problem for many sites as insufficient use will prevent a sewage treatment plant from working adequately. APEX can function at 20% of its design loading but many sites, such as campsites, drop below 20% of their maximum usage for several months of the year.

APEX HH allows 50% of the system to be turned off. This maximises performance as it prevents bacteria in the Biozone from being starved and allows the system to function at only 10% of its maximum capability.

Failure Alarm

To comply with EN 12566-3, a sewage treatment plant must have an alarm to alert the user in the event of failure.



All APEX tanks come with an audio and visual alarm as standard.

Remote and telemetry alarms are available on request.

UV Treatment

For sites where the reuse of wastewater is required, APEX can be manufactured with an integral UV filter to remove 99% of pathogens in the effluent.

If you are considering effluent reuse, please contact our sales office.

Commercial Use

APEX is ideally suited for commercial sites as it has been designed to handle wastewater that is stronger than that discharged from domestic properties.

Commercial sites often present the following challenges for wastewater treatment:

- 1 The wastewater production has a higher concentration of pollutants or reduced wastewater volume (both create the same problem).
- 2 The wastewater contains non degradable material (sanitary items, etc.).
- 3 There are fluctuations in use. Week/ weekend or summer/winter usage is not the same.

Unlike most sewage treatment plants, APEX is designed to be able to process wastewater from domestic and commercial sources. This makes it an ideal choice for the following applications:

- ✓ Restaurants
- ✓ Hotels
- ✓ Campsites
- ✓ Offices
- ✓ Schools
- ✓ Labour Camps
- ✓ Etc



Installation

The compact design and robust construction make installation as simple, quick and low cost as possible.

APEX is capable of being installed above ground if required.

Shallow and deep inlet inverts are available for most tanks in the range to cater for a range of foul drain depths.

Please contact our office if you would like the details of your nearest approved installer.

Technical Details

Model	PE	Length (mm)	Width (mm)	In Ground Depth (mm)	Inlet Invert (mm)*	Outlet Invert (mm)†	Power (w)
APEX 6	6	Ø 1,500		1,956	600	650	40
APEX 9	9	Ø 1,700		1,956	600	650	40
APEX 12	12	Ø 1,900		1,956	600	650	50
APEX 18	18	Ø 2,200		1,956	600	650	95
APEX 25	25	Ø 2,500		1,956	600	650	95
APEX 30	30	4,100	1,624	1,912	600	700	200
APEX 40	40	4,500	1,624	1,912	600	700	370
APEX 50	50	5,100	2,124	1,912	600	700	700

The APEX range extends up to 5,000 PE. Please contact our sales office for details.

*Other inlet inverts available

†Pumped outlet options available