

# HiPAF

submerged aerated filter sewage treatment plants

Bespoke SAF solutions for demanding specifications



domestic communities | commercial properties | water utilities  
new projects | existing plant upgrades | replacement plants  
population equivalent 1-3000 people



Environmental Wastewater Solutions

## HiPAF High Performance Aerated Filter

The WPL Limited HiPAF SAF (Submerged Aerated Filter), is a bespoke sewage treatment plant solution specifically designed to meet demanding, individual site requirements.

Combining versatility, efficient processing, reliability and a robust design, this plant meets Environment Agency standards, whilst minimising visual impact on the landscape.

With over 1400 units installed throughout the United Kingdom and overseas, the HiPAF is regularly specified by Water Companies including United Utilities, Yorkshire Water, Anglian Water and Southern Water, whilst also being the preferred choice in many commercial and domestic applications not connected to mains drainage.

WPL Limited offers a complete turnkey service via its preferred contractor network including an initial site survey.



HiPAF Midi plant installed at a rural public house

## HiPAF Sewage Treatment Plant Applications

- Water companies
- Camping and caravanning sites
- Villages, rural communities and housing associations
- Motorway service stations
- Hotels and leisure centres
- Restaurants and public houses
- Zoos/theme parks/leisure attractions
- Farms
- Schools
- MOD and Custodial establishments
- Garden centres
- Stables/kennels
- Stately homes and large country estates
- Nursing homes
- Abattoirs
- Rural industrial buildings and offices
- Golf courses
- International projects



## Benefits

- Bespoke designs to meet each site's specific requirements
- Will attain a treatment quality up to:  
BOD 10 mg/l: SS 10mg/l:Amm. Nitrogen 2mg/l (with tertiary treatment)
- Copes with variable flows and loads with unique flow balancing in primary tank
- Reliable operation and stand-by facility
- Segmented biological treatment module
- No internal mechanical moving parts
- Safe, clean accessible air diffuser system with large access lids for easy maintenance
- No emptying of tank required during maintenance on the air distribution system
- Humus and primary sludge are stored in one place for simple tankering operation
- Small installation footprint, low installation costs, minimal visual impact

WPL Offers a complete in-house design and specification service



## The HiPAF Range

### HiPAF Compact Plant 1-60 Persons

- Below ground and above ground options
- A compact, package plant usually cylindrical containing primary settlement, biological treatment and final settlement modules in GRP

### HiPAF Midi Plant 60-250 Persons

- Below ground
- A package plant containing primary settlement, biological treatment and final settlement modules, for larger applications in GRP

### HiPAF Modular Plant 250-3000 Persons

- Below ground
- Separate primary settlement, biological treatment and final settlement modules used to construct much larger treatment works in GRP



HiPAF Compact installed above ground (left)



HiPAF Midi installed at an out of town fast food restaurant (below)

## HiPAF Transportable and Temporary SAF Plant

- Above ground
- Compact, Midi and Modular HiPAFs can be designed as a mobile or temporary unit in GRP or steel construction, to provide wastewater treatment when and where required

### Applications

- Temporary sites e.g. construction sites
- Existing wastewater treatment sites where a plant is failing
- When emergency treatment is required

### Benefits

All the standard HiPAF benefits plus:

- Flexible finance and hire period options
- Savings on installation costs and capital expenditure



HiPAF Transportable plants installed at a power station

## Installed HiPAF Plants



HiPAF Compact plant, below ground installation



HiPAF Midi Plant with control kiosk



HiPAF Modular plant with kiosk and separate primary, biological and secondary tanks for larger works

## The HiPAF Treatment Process

- **Primary** - Primary settlement is in accordance with BS6297, giving the required hydraulic retention time and ensuring that 30% of the BOD will settle out in the primary tank. HiPAF plants below 500 persons will have sludge storage integral to the primary tank.

The primary settlement tank is equipped with baffles to prevent floating scum entering the biological phase of the treatment process. It also incorporates WPL Limited's unique forward feed system which lowers the level in the tank, during periods of low flow, to provide a buffering capacity for possible surges in the influent.

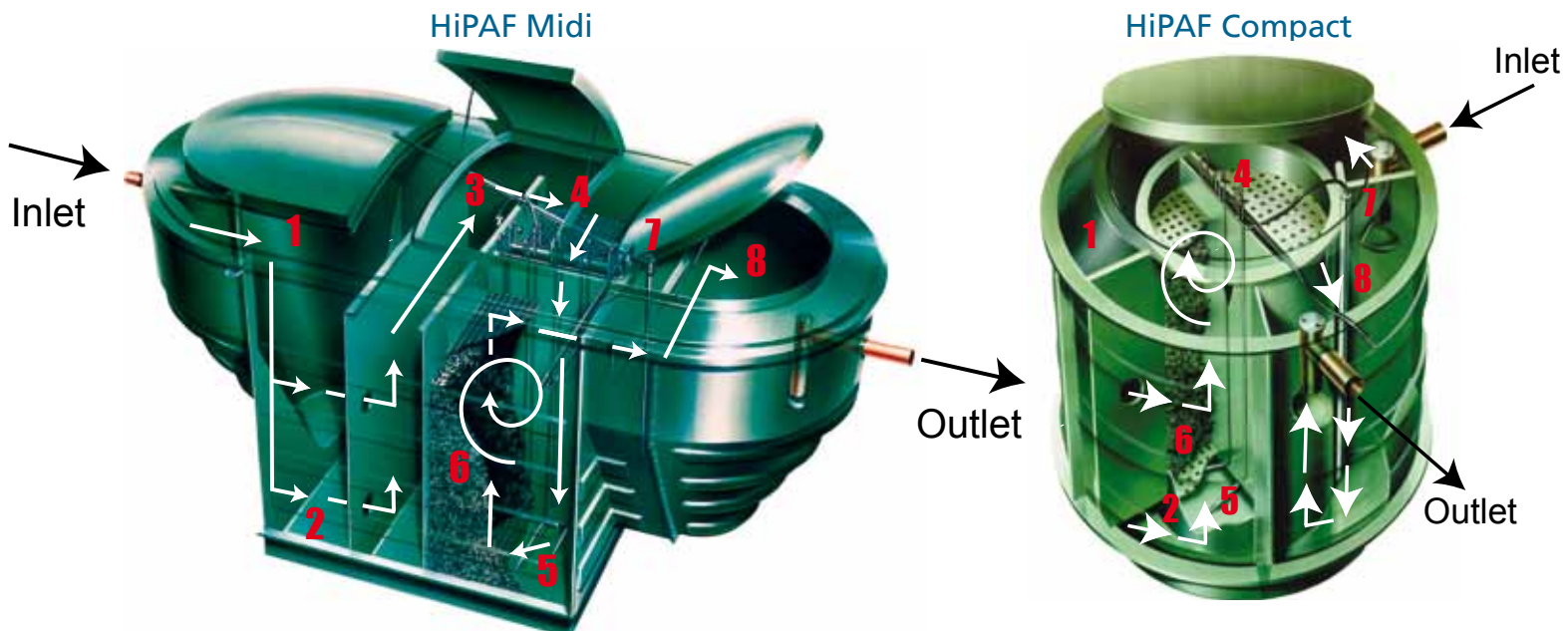
- **Biological** - After primary settlement, the settled liquor flows to the biological treatment unit by displacement and via the air lift forward feed.

The biozone is fully segmented internally to eliminate the risk of process short cuts. Each biozone segment is filled with high voidage plastic filter media, where both carbonaceous and nitrifying processes take place, mitigating process risks associated with variable loads. Air to oxygenate the influent and to scour excess biomass from the filter media is introduced continuously below each chamber by a series of diffusers.

- **Final** - Following biological treatment the effluent flows into the final (humus) settlement tank where the excess biomass settles out. The humus tank is equipped with air lifts which are arranged to automatically transfer settled humus sludge to the primary tank for co-settlement. The treated effluent flows under gravity to the works outfall.

## Cut-away graphics showing the treatment process

- |                                                                    |                                               |
|--------------------------------------------------------------------|-----------------------------------------------|
| 1 Primary settlement tank                                          | 5 Air diffusers at the bottom of each chamber |
| 2 Settled solids at bottom                                         | 6 Filter media                                |
| 3 Unique air lift forward feed into biozone (not shown on Compact) | 7 Settled sludge air lift back to primary     |
| 4 Biological treatment unit (biozone)                              | 8 Final (humus) settlement tank               |



## Design Parameters

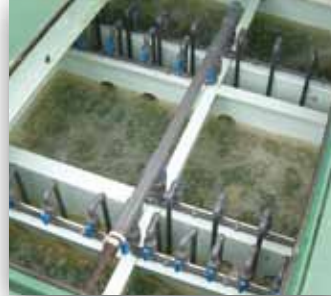
Dry Weather Flow	As British Water COP 1/05
Peak Flow to Treatment	Bespoke design but generally 3-6 DWF
Invert Depth	0.5 to 1.5m
Discharge Standards	As specified. Will attain: BOD 10mg/l: SS 10mg/l: Amm.Nitrogen 2mg/l (with tertiary treatment)

## Internal Configuration

The internal sections of the plant are accessible from the top by opening the access lids, for easy servicing, maintenance and de-sludging. The plant is fitted, as standard, with large, stainless steel, gas strut assisted lids (top left and top right) to give full access to these parts of the plant. Other lid types are available (bottom right image shows Mk 3 lids, standard invert depth only).

Air is introduced to the HiPAF unit by a series of air diffusers (bottom left). Each air diffuser is capable of being isolated and removed individually without the need to shut down the plant or affect air supply to the rest of the unit.

The complete absence of mechanical and electrical components within the hostile environment provides safe and clean working conditions on site.



## Kiosk Design

Each HiPAF comes complete with a discreet, weatherproof, acoustically lined GRP kiosk, situated above ground. This houses the blower(s), a Form 2 control panel and air distribution manifold.

Included as standard is 10m of airline, to connect the blowers to the tank. Blower and airline upgrades are available if the kiosk is sited further than 10m from the plant.

The Form 2 control panel, automatically controls the operation of the plant. (Form 4 is also available.)

Please contact WPL Limited or your authorised distributor for advice.

## Optional Items and Upgrades

- Lid type, orientation and colour finish options are available
- Single or three phase electrics
- Blower cooling fan
- Tertiary treatment options
- Inverts up to 1.5m with turret extensions (not MK3)
- Separate Robust Aerobic Digestion System (RADS) sludge handling and sludge digestion
- Volt free telemetry contacts on control panel
- Form 4 control panel
- Pumped inlet flow control
- Above ground or below ground solutions
- Permanent or temporary solutions
- Duty/duty stand-by blower upgrades
- Blower and airline hose upgrades
- GRP or steel construction for transportable plants



## Case Study

Housing development,  
Green Loaning,  
Scotland, 150 pe

HiPAF Midi Plant - This solution was designed as a package treatment plant incorporating integral primary settlement, biological treatment and final (humus) settlement tanks, and it also incorporates fixed de-sludge pipes with Bauer connections. The Kiosk houses duty and stand-by compressors, Water Plc specified control panel and telemetry links.



## Case Study

Motorway service  
station, near Sutton  
Scotney, 1500 pe

HiPAF Modular Plant - This solution was designed to incorporate separate primary settlement, biological treatment and final (humus) settlement tanks. This particular solution has a separate sludge system, the WPL Limited Robust Aerobic Digestion System (RADS) to reduce tanker visits. It was also designed to allow for the addition of extra treatment modules should activity increase at the service station area or the consent standard tighten, highlighting the flexibility of the modular system approach.



## Availability

WPL Limited manufactures the entire HiPAF range to order. Normally, deliveries within mainland England, Scotland & Wales, can be guaranteed between 8-12 weeks, depending on the production schedule. Please contact WPL Limited if you have specific delivery requirements.

## Guarantee

The HiPAF range comes with a comprehensive two year guarantee on workmanship for the plant and minimum of 12 months guarantee on the blower. Process guarantee for the lifetime of the plant.

## Installation, Service and Maintenance

Each HiPAF solution is supplied with an installation manual and an operation and maintenance manual. WPL Limited can provide on-site mechanical and electrical installation, setting to work and commissioning of the unit.

Civil installation of the units can be arranged through a nominated contractor.

**WPL Limited also offer Service Contracts, tailored to specific site requirements.**

**Please contact the WPL Limited Service Team on 023 9224 2600 for further information.**

### About WPL Limited

WPL Limited provides innovative and reliable wastewater treatment, rainwater harvesting and grease management systems for domestic, commercial and industrial markets as well as holding a prominent position as a supplier to the water companies. As an internationally recognised leader in the design, manufacture and supply of both standardised, and bespoke environmental solutions, WPL Limited is dedicated to ensure the provision of high quality products and services.

### Environmental Policy

WPL Limited is ISO14001 accredited. WPL Limited rigorously fulfils its vision of protecting the environment by delivering reliable wastewater solutions. A strong focus on quality and compliance ensures that all wastewater treatment systems are designed to work within the guidelines of the British Water Code of Practice and exceed all present and proposed discharge consent standards enforced by the Environment Agency, SEPA and other regulatory authorities.



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