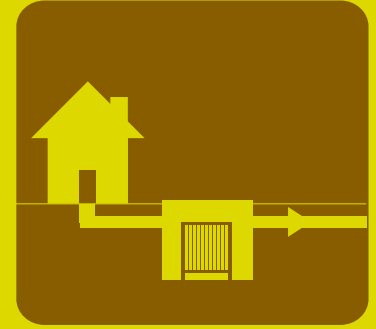


serious\*\*

# package treatment



**Packaged sewage treatment plants are the most common solution for meeting the Environment Agency's discharge limits.**

**Sewage treatment plants allow you to discharge treated effluent to a local water course. They require an electricity supply to run and a 'consent to discharge' from the Environment Agency.**

## **How it works**

**Package sewage treatment plants create an artificial environment. They accelerate the natural process of breaking down pollutants in sewage to produce an effluent of suitable quality for discharge to a watercourse or soakaway system.**

## **The main types of process are:**

- **Rotating biological contactor (R.B.C.)**
- **Aerated filter**
- **Submerged aerated media (S.A.M.)**

**Though these work in different ways, they all have the core three treatment stages (in small tanks these will be the separate chambers of the package plant):**

## package treatment (2)



### Primary treatment (settlement)

Initially, solid matter is deposited and/or allowed to settle by sedimentation in primary settlement tanks, lighter material forms a scum layer on the top. The sludge (solid matter) and scum that accumulate should be removed at regular intervals by vacuum tanker usually for disposal at large municipal waste water treatment works. Any solid matter being carried over with the liquor will eventually blind the filter, soakaway, etc. leading to the system backing up and expensive remedial works resulting, hence a routine tanker de-sludging programme is essential.

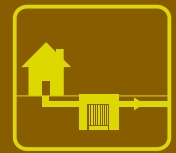
### Secondary treatment

The remaining organic liquor is then treated using live naturally occurring micro-organisms to produce an effluent of suitable quality for discharge to a water course or soakaway drainage system. The bio-mass in package treatment plants is fed with oxygen to speed up the digestion process.

### Tertiary treatment

This final stage allows the by-products of the bacterial action (humus) to settle out, usually in another chamber. Where discharge consent is more stringent, tertiary treatment is likely. This adds significantly to overall process costs, e.g. nitrification units, sand filters, reed beds etc. not forgetting the need for more frequent tanker de-sludging.

## package treatment (3)



### Effluent disposal

If a watercourse is available and 'consent to discharge' is obtained from the Environment Agency then this is the simplest method of final disposal. Currently the most common consent issued is:

<b>BOD (biological oxygen demand)</b>	<b>20mg/l</b>
<b>S.S. (total suspended solids)</b>	<b>30mg/l</b>
<b>Ammonia</b>	<b>20mg/l</b>

### Maintenance

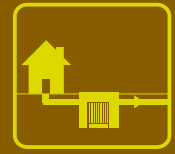
Regular tankering of the sludge that builds up is required, as is mechanical and electrical maintenance (including a daily inspection to ensure the plant is working).

To find out more, scroll down to our Package Treatment Dos and Don'ts.

### Failure to maintain

If you don't maintain the plant, it may become ineffective. Untreated effluent will then discharge directly to the environment causing pollution and carrying a risk of prosecution.

If the bio-mass is damaged, it will usually recover with time. In the meantime, one of the more obvious symptoms is an unpleasant smell so it is in your interest to avoid this!



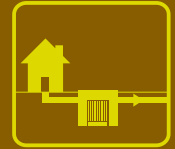
## trouble shooting guide

### Observation

### Possible causes

No crust layer in primary tank	Hydraulic overload causing scouring Inlet/outlet dip-pipe missing Secondary sludge return (SSR) connected direct to primary tank instead of to inlet manhole
Heavy crust layer in second compartment of primary tank	De-sludge overdue Baffle missing or damaged
No biological growth in the biozone	Chemical toxicity
White filamentous biological growth in biozone	Plant overload Insufficient oxygen
Uneven distribution of bio-mass on the surface of a filter bed	Poor distribution due to clogged distribution system
Unpleasant odour from the biozone	Plant overload/insufficient oxygen available
Poor bubble pattern over submerged media	Blocked distribution system
Head loss through the biozone	Blocked media due to carry-over of primary sludges or overgrowth of bio-mass
No aeration/distribution	Ineffective or failed SSR system Can also indicate high plant performance-denitrification causing gassing and rapid rise of settled humus solid
Floating sludge in the humus tank	Pump/blower not functioning
High suspended solids in an otherwise good effluent	Failed/ineffective SSR system

## package treatment (5)



## dos & don'ts

### **Washing machine and dishwasher detergents, washing up liquids**

These are generally OK to use in normal concentrations and in normal domestic usage. Problems can occur if, for instance, you're washing the jerseys of five local rugby teams or you're a commercial user e.g. a hotel or nursing home. Only install each unit after an individual assessment of the sewage load, including laundry. Biological powders can degrade the bio-mass. Substitute them with non-biological ones, without enzymes. Spread your washing over a few days.

### **Floor cleaners, disinfectants and bleaches**

These are safe to use in accordance with the maker's recommendations and in the minimum concentration. Don't pour neat disinfectant or bleach down sinks or outside gullies. If these are smelly it usually indicates a build up of decaying material or a plumbing problem and should be dealt with accordingly.

### **Nappy disinfectants and bottle sterilising fluids e.g. Milton**

When disposing of the used fluid, make sure it's well diluted with water. The easiest way of doing this is usually to flush it down the toilet.

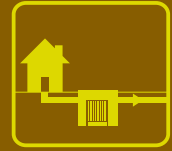
### **Waste disposal units**

These don't inhibit the bio-mass but, depending on use, can put extra load on the treatment plant unbalancing the treatment process and leading to problems. It's much better to compost your vegetable peelings etc. It's cheaper and environmentally friendly.

### **Home beer and wine making**

As with waste disposal units, the plant has to work as hard to treat one pint of beer tipped down the drain as it does to treat all the normal waste produced by one person in 24 hours. See notes above on sterilising fluids.

## **package treatment (6)**



### **Don't discharge**

**Motor oil, grease, anti-freeze, brake fluid etc.**

**Cooking oil and fat**

**Weed-killers, insecticides, fungicides and other gardening chemicals**

**Paint, thinners, white spirit, turpentine, creosote etc**

**Medicines - take unused medicines to a pharmacist for safe disposal**

**Chemical toilet waste**

**Photographic developing fluids**

**Nappies, sanitary towels, rags, soft toys, tennis balls etc.**