



About Sewaco

The company commenced trading in 1979. Specialist activities include the design, manufacture, supply and construction of purpose built plant and equipment for use in water supply systems and treatment of municipal sewage and industrial waste water.

Sewaco manufacture a wide range of HYCOVER Rotary distributors including Trough arm, Standard arm & Self dosing siphon types suitable for either pump, gravity or siphon feed systems. The HYCOVER ranges of machines are designed to handle a wide variety of application rates with flows from 5 l/s to 980 l/s.

Sewaco works together with many Water Utility Companies across the UK, which include Anglian Water, Severn Trent Water, Scottish Water, Welsh Water, Yorkshire Water, Southern Water, Wessex Water and also with major Contractors.

The range of specialist products includes:
HYRATE Biofilter towers, both rectangular and Polytower format, factory built timber support matrix for modular plastic media, static and rotary distributors, Dissolved Air Flotation plant, high rate Biofiltration for BOD/COD removal and nitrification applications, nutrient Dosing and pH Control.



Illustrations of HYRATE Polytower Filter Bases, Shells and Ventilation Arrangements.

The following photographs show various stages of HYRATE Polytower construction. Ventilation is normally provided around the base of the filter with air passing through the gaps formed by the timber media support matrix modules.

Media suppliers usually require approx 4% of the filter plan to be available for low level ventilation. Air passage is created through the media pack by thermal circulation.

Roughing and Secondary treatment filter do not normally require ventilation control, unless there is likely to be an odour problem. In this case controlled fan assisted ventilation is used with an extract odour scrubber system. Air being drawn down through the media pack.

Nitrifying filters are more susceptible to wind chill and therefore are often fitted with either partial or total ventilation control. A series of adjustable panels or hatches being provided around the filter base to regulate the amount of air passing into the filter.



Typical base slab showing in-situ cast concrete dwarf walls and centre outfall channel. Note that the concrete lintels are still to be installed over the channel.

The timber secondary media support matrix is then placed onto these dwarf walls ready to receive the modular plastic media.

Here the dwarf walls have been partially formed from in-situ cast concrete with the upper section formed from dense concrete blocks. Note that the concrete lintels have been fitted and our marking out frame has been fitted around the centre column to enable accurate positioning of the steel structure.





Here the filter base has been fully decked with our factory jig built timber matrix modules. Beam spacing and timber section being selected and designed to support the full load applied from the media pack. Media pack can be up to 7.2 mts deep with operational weights of up to 540 kg/m³.

Modular plastic media is delivered in closed super-coupe artics trailers and offloaded into the filter after the shell has been constructed and clad. Media is stacked in 600 or 300 mm deep layers onto the installed secondary media support matrix. Each layer of media being rotated through 90 deg so that maximum dispersion of effluent is achieved as it passes through the pack



Normal ventilation is ensured by providing an air gap below the filter wall on all sites of the shell. In most cases this automatically provides the required 4% of open air passage that satisfies the media pack requirements.

Partial ventilation control can be provided by only installing ventilation enclosures to alternate faces of the shell. This allows a degree of regulation and can be arranged to close off areas of the filter that are subject to strong cooling winds during adverse weather.





This filter is located on the east coast of Norfolk and shows a typical HYRATE Polytower with partial low level ventilation panels fitted on the eastern side of an NTF filter. The total available air inlet area around the filter base is equal to 4.5% of the filter plan. 50% of the available ventilation area to the western side of the filter is permanently open with a further 50% of the filter plan controlled by opening 1 – 8 of the sliding hatches on the eastern side.

A large NTF filter with alternate faces fitted with lift-up type hatches to control air flow during the winter months.



Typical detail of ventilation panel fitted around the filter base



A new HYRATE Polytower filter constructed inside an existing concrete filter shell.

Sliding hatches fitted around all sides of the shell between the shell wall and the concrete surround to control ventilation.





HYRATE Polytower Biofilters and Rotary Distributors.



Sewaco Ltd provide the design, manufacture, supply and installation for the full range of our HYRATE rectangular and Polytower plastic media biofilters. Filter shells extend in size from 3.0 – 30 mt square and from 6 – 30 mt in diameter with structure height from 3.6 – 9.0 mts. Specially treated media support matrix modules are factory built and delivered ready for immediate installation, thus reducing site time. Filters can be fitted with sectional roof panels where an enclosed structure is required. Low level ventilation control and abstraction facilities are also provided.

Plastic modular media to suit roughing, secondary and nitrification applications are available. Access stairway structures are manufactured and installed to meet individual site requirements. Mesh infill panels being supplied to comply with site specific safety standards.

Flow rates from 3.5 – 980 lt/sec, are handled by our range of HYCOVER static and rotary distributors. Static distribution systems can be fitted with AUTOCLEANSE our automatic nozzle cleansing system is designed to maintain free flowing nozzles with minimal maintenance requirements. Our rotary distributors are available in both tubular and trough arm concept. Machines have stainless steel distribution arms and can be arranged for gravity or pumped feed. We also offer a self-dosing version that incorporates an integral dosing syphon. Rotary distributors are offered for both reaction drive and variable speed controlled power driven applications.



HYRATE Plastic Media Biofilters

Over the past 30 years we at Sewaco Ltd have developed and refined the design of our specialist range of HYRATE plastic media biofilter structures. We can now offer designs to meet almost all types of application where the containment of modular plastic media is required.

Our specially designed structures comply with BS 449 and BS6399 for wind loadings. All steelwork is fabricated 'in house'; enabling us to keep a close check on quality at every stage of work during the build program. Structures are sub assembled to confirm correct alignment of components prior to application of the required protective finish. Most structures are hot dip galvanised to comply with BS EN ISO 1461:1999, although we are able to offer painted steelwork if required.

Structures can be externally or internally clad, using preformed plastic coated galvanized steel box profile sheeting finished to a wide range of colours and profiles to meet local planning requirements. A unique feature of our HYRATE design is the inclusion of a second internal impervious wall that provides maximum protection of both cladding and structure from contact with waste water passing through the media pack.

Secondary Media Support Matrix.

Sewaco manufacture a prefabricated timber matrix media support system, using structural grade timber sourced from TRADA managed forests. Timber is graded and cut to specific lengths prior to being treated with a high strength AC500 solution. Modules are then factory jig built to produce easily transportable modules. This modular system can be manufactured to suit any configuration of containment structure. Modules are delivered to site ready for installation on prepared concrete dwarf walls, prepared by the civils contractor to our outline design. The system is quick and easy to install. On completion, it provides a working platform from which to construct the containment shell. Our modular media support system provides an exceptional service life, combining effective air flow with free drainage for the media pack, minimising cell blinding at point of contact.



Factory check of pre-assembled timber matrix modules ready for loading onto delivery transport to site of new filter shell



Timber matrix modules in place ready for construction of new HYRATE Polytower filter shell.



New 25 mt dia Polytower filter shell under construction using timber matrix as a working platform and for storage of materials.



HYRATE Polytower Biofilters for Municipal Sewage Treatment.



Space on site was at a premium on this sewage treatment works. So the twin 24.5 mt dia HYRATE Polytower biofilters, each packed with 1767 m³ modular plastic media, having a surface area of 150 m²/m³, and installed to a depth of 3.6 mts, were constructed inside existing stone trickling filter shells. This enabled accommodation of an increased hydraulic and biological load to the plant within the available space.

Each filter is fitted with an HYCOVER tubular arm type power driven rotary distributor designed to apply some 45 – 55 lt/sec. The variable speed drive fitted to each machine provides a 5 : 1 turndown ratio for periodic slow speed operation to flush the media pack.

Adjustable low level ventilation panels allow full control of air flow into the filter. Apertures on each panels can be arranged to suit varying wind and temperature conditions.

For more information on the range of specialist equipment that Sewaco can provide, visit our website: www.sewaco.co.uk, contact us on 01778 342202 or E.mail info@sewaco.co.uk



HYCOVER Rotary Distributor Machines

The ever increasing use of plastic media for the treatment of municipal and industrial waste waters has resulted in the need for the provision of rotary distributors with the ability to deliver much higher flows of effluent than that traditionally applied to stone trickling filters. In addition to these higher flows it has been established that there is a need for careful control of application rates to ensure that correct wetting of the media pack is achieved to provide the desired SK factor. Periodic slow speed operation of machines is also required to control the build-up of biomass within the media pack.

Sewaco have, for the past 30 years, specialised in the design, manufacture, supply and installation of purpose designed static and rotary **HYCOVER** distributors to meet this requirement. Rotary distributor machines are offered with variable speed electro-pneumatic drive units that incorporate a programmable facility to automatically activate an ultra slow speed setting for periodic flushing of the media pack.

A unique feature of the drive mechanism enables the **HYCOVER** distributors to revert to reaction drive in the event of power failure. Upon resumption of the power supply drive units automatically revert back to the pre-set speed.

HYCOVER Rotary distributors are available in a range of designs, including 2, 3, 4 & 6 arm versions that can handle a wide range of gravity or pumped feed rates. Self dosing machines with integral syphon arrangements. Open trough machines are often selected to cater for larger flows.

HYCOVER rotary distributors are manufactured using either Stainless Steel or heavy duty galvanised steel for centre columns and bowls. Tubular and open trough type arms are formed from stainless steel as standard. Our over mounted cartridge type assembly provides easy replacement of bearing thus avoiding the need for heavy plant to carry out the majority of repairs and maintenance. The unique **HYCOVER** design also avoids the need for a water seal arrangement on standard designs with the exception of the 'Lo-head' version.



Twin trough arm HYCOVER rotary distributor with variable speed drive arranged to apply up to 70lt/sec of primary settled sewage to the surface of a 13.1mt Ø roughing filter containing some 430m³ plastic media packed to 3.6mts



Twin tubular arm HYCOVER rotary distributor with variable speed drive arranged to apply up to 60lt/sec of secondary sewage effluent to the surface of a 22.5mt Ø HYRATE Polytower packed to 6.0mts with some 2430m³ of modular plastic media



Stainless Steel washout box set into surface of media adjacent to access stairway



Typical HYRATE Polytower with Stairway and local control panel adjacent to doorway



Distributor arms are fitted with Quick strip full flow washout end cup & stainless steel chain



Application of effluent to the media surface, using our unique design of stainless steel spreader plates, ensures effective cover throughout the full range of flow fed to each machine. Internal flow control weirs enable primary arms to accommodate normal flow and secondary arms to receive flows up to the maximum FFT for the filter

HYRATE biofilter shells range from 1.8 x 2.4 mt plan to 30 mt square and from 6.0 mt to 30 mt diameter. Our unique **HYRATE 'Polytower'** design has been developed over the past 15 years to accommodate the use of structured media and rotary distributors. Filter shells accommodate media packed in depths ranging from 2.4 -7.2 mts. Purpose made access stairways and high level splitter tanks complement the range of plant we manufacture.

Purpose designed media support systems for modular plastic media are factory built and delivered to site ready for installation onto prepared concrete dwarf walls, showing a worthwhile saving in construction time.

In addition to our range of **HYCOVER** rotary distributors Sewaco also manufacture the **HYCOVER** static distribution system. Suitable for installation directly onto the finished media surface in any sized rectangular filter the system includes a full set of access walkways and pipe support brackets, enabling easy access to every specially designed irrigation nozzle, fitted with our unique spreader plates.

The **HYCOVER** static distribution system can be fitted with our **AUTOCLEANSE** automatic nozzle cleansing system that is especially suited for distribution systems installed in enclosed filters where access is restricted



4 Arm all stainless **HYCOVER** trough type machine, to apply 55 lt/sec of primary sewage. Fitted with external over-mounted variable speed drive. Installed in an 11.75 mt **HYRATE Polytower** fitted with roof and low level odour extract system.



4 Arm motor driven **HYCOVER** tubular arm distributor applying some 170 lt/sec to 12.0 mt dia **HYRATE** nitrifying filter.



2 arm distributor in stone trickling filter.



4 arm distributor in 12.0 mt dia **HYRATE** nitrifying filter.



Installation of 27 mt dia HYCOVER Distributors For Four-Delivery at Fullerton WwTW.

Transporting the two fully assembled centre units of the distributor machines, each with an overall height of approx 4.0 mts required the use of an extra low trailer.

J A Smiths Transport with their special low loader rig was charged with the task of delivering them safely to site. A Trerex TC40L, one of Sparrow Cranes machines, was used to offload and place the bowl assemblies. Offloading was achieved in less than 1 hour thus releasing the transport and avoiding delays for other operations on site. Each bowl then being hoisted into place ready to receive troughs.



Delivery of HYCOVER Centre Columns.



The first set of Trough Arms arrive.

Each set of trough arms were fully assembled at Sewaco Workshops and wrapped in protective film ready for delivery to 4Delivery Ltd as part of their contract with Southern Water for the Fullerton WwTW. MRM Transport were contracted to deliver two loads of stainless steel arms to site. Each load comprising 4 fully assembled troughs. This enabled offloading of transport to be completed in a single lift and with the minimum of disturbance on site. Arms were then individually lifted into place and attached to the installed bowl assembly.

The twin 27 mt diameter HYCOVER distributors, each fitted with stainless steel open trough type arms, were installed and assembled onto the prepared concrete support columns by two members of the Sewaco Site Installation team in 4 days.

Subsequently the special distributor drive units were installed and the machines set ready to each receive up to 320 lt/sec.

When fully loaded each machine has an operational weight of some 13 tonne.



HYCOVER Distributors safely



HYCOVER Static Distribution System



The effective application of the effluent over the available surface area of the media is a fundamental requirement for all biofilters. Without this there is no possibility of obtaining the maximum biological performance for which the biofilter has been designed. Proper control of both maximum and minimum irrigation rates will regulate the build-up of biomass. Excessive accumulations of biomass will cause blockage of the passage ways within the media which in turn lead to ponding and development of anaerobic conditions. Whilst scouring by over irrigation results in a reduction of the active biomass. With the introduction of plastic media for use in high rate biological roughing filters came the need to provide an effective even distributor to ensure that all the media was effectively irrigated. The different types of media now available require a wide range of irrigation rates. The HYCOVER distribution system which has been developed over number of years is specially designed to meet these important criteria.

Design

The HYCOVER distribution system has been designed as a freestanding self-support system which incorporates an integral media level walkway to which the pipework support brackets are attached. These brackets ensure to correct location of the splashplates and distribution pipework above the surface of the media.

By providing an integral walkway and pipework support the design of the main tower construction can be simplified. No structural steelwork is required above the media pack to carry the distribution system and only an inspection catwalk is required. Alternatively access can be made directly onto the media level walkway. The walkway network also prevents damage to the media which can occur due to regular walking on the unprotected media surface.



Washout points are provided on header mains and laterals. Section isolating valves will be fitted, where necessary to permit routine inspection without shutting down the whole system. Pipework systems can be supplied without the steelwork, when required for special applications.

Construction

All parts of the HYCOVER system are manufactured from corrosion resistant materials. For normal applications, PVC pipework and fittings are used. The plastic injection moulded splashplates are suspended by stainless steel rods beneath the quick strip easy clean nozzles. All support steelwork walkway frames and open mesh flooring is hot dip galvanised. No nuts or bolts are required. Alternative materials are available. These include stainless steel, galvanised, ABS, PVC/GRP and filament wound GRP pipework. Stainless steel or plastic coated steelwork can also be supplied.

Applications

The HYCOVER system is suitable for all modular plastic media packed biofilters. Systems can be arranged to suit rectangular or circular towers of any size. Among other applications where this equipment has been used are: Random media biofilters; Gas scrubbing towers; Ammonia stripping towers; Cooling towers; Foam damping; Dust damping.

Installation

No special tools are required for site installation which is quick and simple. Irrigation rates can be easily adjusted and routine cleaning and servicing can be carried out by site trained plant operators.

Irrigation rates

A wide range of irrigation rates are available from 1.9m³/m²/hr – 4m³/m²/hr with operating pressures from 0.7 – 5.0m head (1-7 psi). Nozzle sizes vary from 10 – 30 mm.

Optional Systems

Where equipment is to be installed with minimum supervision or in hazardous areas an automatic or manually controlled pneumatic cleansing system can be supplied. Full details on request. The HYCOVER Distribution System is marketed exclusively by SEWACO LIMITED. We reserve the rights to change or modify designs without notice.

