

### Complimentary Equipment

- VWS offers a complete range of distributors. The Cascade, Hi-Gard and Mini-Gard units are all engineered to the highest standards, enabling the units to produce optimum liquid distribution across the surface of the filter bed. Each distributor system is designed to take into account the effects of irrigation rates, recirculation requirements, flushing intensity and surface organic and hydraulic loading rates onto the filter. All distributors can be supplied as reaction drive or motor driven, with variable speeds, and can be supplied in a variety of materials.
- Cascade Media Support Deck has been specifically developed as a support floor for use with the Cascade range of media and designed exclusively for use in wastewater treatment applications. The moulded construction of Cascade Media Support Deck has strength together with a complete resistance to rot, fungal or bacterial attack, UV-degradation, ageing, erosion and disintegration and is therefore ideal for use in the harsh environment at the base of a high performance fixed growth reactor.



Solutions & Technologies

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VWS (UK) Ltd is accredited by Lloyds Register Quality Assurance to BS EN ISO 9001:2000 - Quality Management Systems

Veolia Water Solutions & Technologies previously operated under the names of Kruger, Edwards & Jones, Mass Transfer International, OTV and PTS.



# CASCADE FILTERPAK

High Efficiency Media

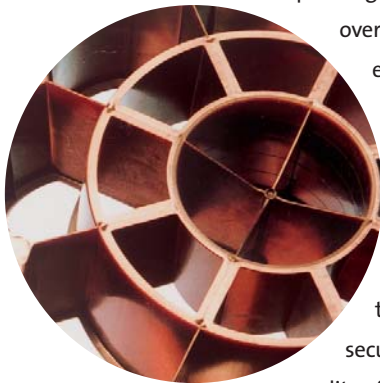


Solutions & Technologies

With over 35 years experience in the design, installation and operation of wastewater treatment systems, Veolia Water Solutions & Technologies is regarded as a world leader in the field of fixed film technology. Using this wealth of experience, VWS has developed a range of high efficiency plastic media that provide the optimum effective surface area for biological growth whilst ensuring excellent gas and liquid distribution within the packed bed.



Ideally suited for use in traditional trickling filter applications and further complimented with a range of neutral buoyancy media specifically designed for use in Submerged Aerated Filters (SAF™) and Anaerobic reactors. Operating data from plants installed over the past three decades has enabled VWS to develop computer software that accurately calculates the required media volume for any specific municipal or industrial application, thereby offering process security with a guaranteed high quality effluent.



### Trickling Filter Applications

#### YTH1120

Cascade Filterpak YTH1120 media with an effective surface area of  $100\text{m}^2/\text{m}^3$  is specifically designed for use in trickling filter applications. The unique height to diameter ratio of the media results in a controlled orientation within the reactor, ensuring optimal three dimensional liquid distribution, increased hydraulic retention time and improved liquid film diffusion within the media bed. The media is designed for installation in a random orientation thereby eliminating the need for cutting or shaping to suit individual reactor profiles. The material of manufacture is a strong, lightweight, thermoplastic resin (polypropylene) suitable for wastewater treatment applications. It is non toxic to micro-organisms, immune to rot, fungus or bacterial attack and has a high resistance to ultra violet degradation, ageing, erosion or disintegration.

#### YTH1150

With a surface area of  $200\text{m}^2/\text{m}^3$  Cascade Filterpak YTH1150 random dumped polypropylene media, is ideally suited for nitrification applications as well as remedial carbonaceous BOD<sub>5</sub> removal.

The media is capable of redistributing liquid flow horizontally and throughout a 360 degree field, a minimum of 300 mm per 300 mm of media depth. The media being so designed to orientate within the reactor bed so that any tendency to generate continuous vertical or horizontal surfaces is avoided. 36,000 mixing or internal redistribution points for both liquid and air are provided per cubic metre of media. This effective internal redistribution ensures a high degree of mixing, thereby lowering diffusional resistance and maximising substrate removal rates.

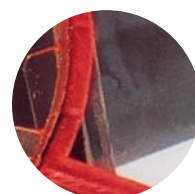
### Submerged Applications

#### YTH1140

Cascade Filterpak YTH1140 is a random packed polypropylene media which has been used for over 15 years in both aerobic and anaerobic submerged reactor applications treating a wide range of municipal and industrial effluents.

Developed from VWS unique background in submerged reactor technology, the media has been designed to provide the optimum effective surface area for biological growth, whilst addressing the specific operational requirements of submerged processes.

With a surface area of  $100\text{m}^2/\text{m}^3$  and a void ratio of 0.95, the media is ideally suited to the treatment of high strength wastewater. In submerged aerobic applications these media characteristics enable a high degree of endogenous biomass respiration to occur, resulting in reduced sludge yields. This minimises the need for media backwashing, ensuring process stability and lower operational costs.





## YTH1170

Cascade Filterpak YTH1170 is a high surface area neutral buoyancy polypropylene media specifically developed for use in submerged reactor applications.

The combination of a  $200\text{m}^2/\text{m}^3$  surface area and a void ratio of 0.95, ensures that a high active population of biomass can be maintained at low biomass concentrations. This significantly reduces the need for backwashing, maintains process stability and reduces operational costs.

The high porosity and minimal resistance to flow, facilitates completely mixed operating conditions within packed reactors, reducing the effects of toxic shocks and ensuring even biofilm development throughout the reactor volume.

Cascade Filterpak YTH1170 is ideal for the treatment of both municipal and industrial effluents in aerobic and anaerobic applications.

CASCADE FILTERPAK				
Product	YTH1120	YTH1150	YTH1140	YTH1170
Applications	Trickling Filter	Trickling Filter	Submerged	Submerged
Surface Area	$100\text{m}^2/\text{m}^3$	$200\text{m}^2/\text{m}^3$	$100\text{m}^2/\text{m}^3$	$200\text{m}^2/\text{m}^3$
Void Space	95%	95%	95%	95%
Raw Material	Polypropylene	Polypropylene	Polypropylene	Polypropylene
Specific Gravity	0.905	0.905	1.04	1.04
Dimensions (mm)	187 x 51	100 x 30	187 x 51	100 x 30

## Polypropylene properties

Cascade Filterpak is manufactured to VWS own formulation and will meet or exceed the following material test standards.

POLYPROPYLENE PROPERTIES				
Property	Unit	Test	Standard YTH1120/1150	Standard YTH1140/1170
Tensile Yield	MPa	DIN 53455	28	34
Modules of Elasticity	MPa	DIN 53452	1500	2900
Deflection Temp (0.46 MPa)	°C	DIN 53461	70	125
Flammability	Ignition temperatures $600^\circ\text{C}$ , burning rate slow			

## Additional media products

VWS offers a variety of media products including FLOCOR and high surface area neutral buoyancy media for use in Moving Bed BioReactor (MBBR) applications.

## Local production

An added advantage of using Filterpak media in overseas applications is the ability to use local manufacturing facilities. This not only reduces expensive shipping costs but in addition puts monies back into the local community by utilising local labour and resources.

In order to ensure a consistently high standard of production, Cascade Filterpak is manufactured to VWS own stringent quality control standards.

*Cascade and Filterpak are registered trademarks of VWS.*