

Ramdon Fill Media





Microsystem-P

Biofilter for MBBR

The MICROSYSTEM-P, little brother of our conventional fillers, has the following details:

Technical Characteristics

Shape	cylindrical with internal radii
Dimensions	$\phi = 25 \text{ mm}$. $h = 15 \text{ mm}$.
Specific Surface	900 m ² / m ³
Manufacturing	injection - extrusion
Pieces / m ³	87,000 ud / m ³
Average thickness	0.5 mm
Density	according to request
Gap Index	90%
Weight per Piece	1.85 gr.
Material	polypropylene / polyethylene
Dry Weight	161 kg / m ³

MICROSYSTEM-P, is indicated for installation in treatment plants that are receiving a higher load than estimated in its initial design.

In the face of growing populations, in which it is required to increase the capacity of existing wastewater treatment plants, the MICROSYSTEM-P biofilter makes sense. MICROSYSTEM-P becomes the perfect solution when there is no possibility of physically increasing the plant, either due to physical space or due to construction costs.

Microsystem-P



SYSTEM-P is a modern biofilter in bulk. This filler has been developed and tested for use in trickling beds.

SYSTEM-P allows the application of high surface hydraulic loads.

Technical Characteristics

Shape	Truncated cone
Dimensions	188 mm
Specific Surface	140 m ² / m ³
Pieces / m ³	420 ud / m ³
Gap Index	aprox. 95%
Dry Weight	36 kg/m ³
Material	Black isostatic polypropylene

The high permeability and the strong applicable hydraulic load minimize the risk of clogging of the bed, even when subjected to specific strong organic loads. For heights in beds of up to 6m., The most compressed strata undergo deformation of less than 1-2%, under these conditions, the permeability of the bed remains practically unchanged.

Made of isostatic polypropylene (black), which gives it optimal characteristics of chemical and mechanical resistance.

The SYSTEM-P geometry has been designed to achieve trickling beds that have a large specific surface in relation to their volume.

The material used, combined with the SYSTEM-P design, give it a remarkable resistance to compression.

Comparison with Traditional Fillings

SYSTEM-P presents great improvements compared to traditional fillers, being in bulk all the parameters are improved.

THE SPECIFIC SURFACE: it is significantly increased, reaching practically double (+ 100% approx.)

PERMEABILITY: expressed as the vacuum index, it is greatly improved (+ 70% approx.)

THE WEIGHT IN EXERCISE: decreases by - 80% approx.

SYSTEM-P allows the application of high specific organic loads. From 2-5 kg. BOD5 applied / m3 of filler / day, up to a maximum of approximately 0.6 kg / m3 ^ a, applicable to traditional percolators. Due to the high applicable hydraulic surface loads, the detachment of the biological film must first be verified.

SYSTEM-P offers applicable organic loading and performance in lowering BOD5 compared to other ordinary fillers.

The Limits to Observe are

SYSTEM-P presents great improvements compared to traditional fillers, being in bulk all the parameters are improved.

» The residual water must be clarified and sanitized and afterwards it must be submitted to the relative preliminary treatments.

» The recycling of the effluent must be carried out after decanting.

» The residual water entering the percolator is admitted with a concentration of approx. 2-5kg of DB05 per m3 of filling. On the other hand, recycling is necessary to ensure the correct surface hydraulic load. The BOD5 of the residual water entering the percolator, although depending on the BOD5 demanded by the effluent, has its optimal value at 250 mg / lt. approx., except for single-stage percolators or roughing. These limits are, moreover, common in ordinary fills, the latter being theoretically less subject to obstructions by virtue of their geometry.

In practice, applying the correct surface hydraulic loads correctly, no bed has been clogged even though SYSTEM-P is a bulk filling unit.

Hydraulic Load			
Filling Unit	Self Clean	Load in Exercise	Critical Organic Load
TRADITIONAL SUP. ESP. M2 / M3 50	0.25 APROX.	0.5 / 1.0 APROX.	> 1.5
SYSTEM-P SUP. ESP. M2/M3 126	0.5 APROX.	0.75 / 4.50 APROX.	> 5.0
ORDERED SUP. ESP. M2 / M3 200	1.0 APROX.	2.0 / 5.0 APROX.	> 5.5

(*) Indications of maximum width, for residual waters after decantation.

ORGANIC LOAD APPLIED

Expressed in Kg / day per m3 of filling.

Organic Load		
Filling Unit	Load in Exercise	Critical Organic Load
TRADITIONAL	0.5 / 2.5 APROX.	> 3.0 / 4.5
SYSTEM-P	2.0 / 5.0 APROX.	> 6.0 / 7.0
ORDERED	3.0 / 8.0 APROX.	> 8.0 / 9.5

Note:

Exceeded a certain value of applied organic load, the amount of BOD5 reduced is constant; this value and that of the critical organic load are a function of the specific surface developed in the filling unit. For SYSTEM-P the critical organic load assumes values of approximately 6-7 kg. BOD5 days applied per m3 of filling.



Minisystem-P

Biofilter for trickling beds

Technical Characteristics

Shape	Truncated cone
Dimensions	188 mm
Specific Surface	140 m ² / m ³
Pieces / m ³	420 ud / m ³
Gap Index	aprox. 95%
Dry Weight	36 kg/m ³
Material	Black isostatic polypropylene

MINI SYSTEM-P, New Biofilter for Bacterial Beds

MINI SYSTEM-P is a modern biofilter developed for installation in medium / high load bacterial beds.

It is made of black isostatic polypropylene, a material that offers the perfect characteristics of chemical and mechanical resistance.

The geometry of the MINI SYSTEM-P biofilters is the result of extensive studies that have managed to obtain a wide specific surface area and high permeability, making the MINI SYSTEM-P the most effective biofilter for high hydraulic and surface loads.

The combination of the material, polypropylene, with the geometry of its design offers a high resistance to compression, allowing a percolator height of up to 6 meters, resulting in a deformation of less than 1%, which maintains the permeabilization capacity unaltered. of the percolator.

OBSERVATIONS:

- » The residual water must be previously submitted to a clarification, de-sanding and primary treatment process.
- » The recycling of the effluent must be carried out after its decantation.
- » The wastewater entering the percolator should have a BOD₅ concentration of approximately 2-5 kg. per m³ of biofilter.

The effluent must be redirected when it is necessary to ensure the correct surface hydraulic load.

The BOD₅ of the residual water entering the percolator, although depending on the BOD₅ demanded by the effluent, has its optimal value at 250 mg / l. approx. except for single-stage percolators or roughing.

These observations are applicable to all ordinary biofilters.

The beds with MINI SYSTEM-P biofilters are less subject to possible obstructions due to their geometry. In practice, by correctly applying the surface hydraulic loads, there is no clogging of the bed, even if the MINI SYSTEM-P is a bulk filling unit.



Mini System-P Plus

Biofilter for trickling beds

The MINI-SYSTEM - P PLUS is a modern biofilter, developed for installation in trickling filters of medium / high load.

Technical Characteristics	
Shape	Truncated cone
Dimensions	90 mm
Specific Surface	205 m ² / m ³
Pieces / m ³	1.550 ud / m ³
Gap Index	95%
Dry Weight	65 kg/m ³
Material	Black isostatic polypropylene

Technical Characteristics	
RESISTANCE TO EFFORTS	380 kg / cm ² S / DIN 53,455
DEFORMATION TEMPERATURE	165oC S / DIN 53.461
SPECIFIC DENSITY	0.905 gr / cm ³ DIN 53.461
INFLAMMABILITY	Ignition temperature 600oC slow burned
ELASTICITY MODULE	1500 N / mm ²
AGING FACTOR OF P.P.	2.2
TEMPERATURE FACTOR	KT. 1.5



BIO- ECO

Biofilter for trickling beds

Technical Characteristics

Shape	Truncated cone
Dimensions	90 mm
Specific Surface	205 m ² / m ³
Pieces / m ³	1.550 ud / m ³
Gap Index	95%
Dry Weight	65 kg/m ³
Material	Black isostatic polypropylene

BIO-ECO applications:

The BIO-ECO is a biofilter in bulk for trickling beds of medium / high load, intended for the treatment of biodegradable domestic and / or industrial sewage. The most commonly refluxed industrial refluxes by biofiltration are those coming from the milk industry and its derivatives, distilleries, agro-food industries, butchers, breweries, cattle breeding, pigs, farms, etc ...

One-stage percolators, for sewage that, after primary settling, have a BOD₅ equal to or greater than 400 mg/l.

Bietapico percolators, when the refluxes to be treated have, after the primary settling, a BOD₅ greater than 400 mg / l.

In two-stage systems, roughing strainer followed by active sludge, in complex cases for the purification of heavily loaded sewage.

To enhance existing facilities, both as a substitute for "traditional" fillers, and as an additional treatment unit.

Advantages of the BIO-ECO:

With the BIO-ECO, modern percolators at medium / high load are made economically. These are the updated versions of traditional strainers (with ballast) that have been the first valid purification system for domestic sewage. Applying the BIO-ECO two types of advantages are obtained:

1. First of all for its purification system (casting) that allows considerable energy savings compared to active sludge. It also has other advantages such as simple driving, resistance to overloads and limited space ...

2. Secondly due to the design characteristics of the BIO-ECO:

» Due to its high specific surface area and high vacuum index, it achieves good scrubbing performance even for other applied organic loads.

» Because of its lightness, which allows for simpler and less expensive civil works (percolators), compared to traditional gravel fillings or the like.



Nitification:

The almost complete nitrification (oxidation of ammoniacal nitrogen in nitric nitrogen > 98%) of domestic black waters is generally obtained when they have the following conditions:

- » Organic load applied equal to or less than AC. 2.0kg BOD5 / m³ per day, also considered the effect of recycling.
- » Liquid temperature, after percolation, equal to or greater than 15 °.
- » BOD5 of the strainer effluents (after settling) equal to or less than AC. 20m² / l. as a "tip" value.
- » Absence of inhibition factors.

In conditions other than those indicated above, nitrification is almost nil (less than 15%) and, therefore, cannot be obtained safely and continuously.

Recycling:

The recycling of sewage is an advantageous use and is normally necessary to obtain the correct hydraulic charge. For the BIO-ECO (as for all bulk fillings) it is necessary that the recycle stream is poor of solid material in suspension. For this reason also the recycling (in addition to the feeding) must be carried out with the clarified black waters.

Employment Standards:

When making casting beds with BIO-ECO, the following instructions must be observed:

- » THE HEIGHT OF THE PERCOLATOR MUST BE INCLUDED BETWEEN A MINIMUM OF AROUND 3 AND A MAXIMUM OF AROUND 6 M.
- » IT IS NECESSARY TO CARRY OUT, even through recycling, A SURFACE HYDRAULIC LOAD BETWEEN 0.75 AND 4.5 M³ / M²; PREFERABLY IF WITHIN THE 1.5 AND 3.5 M³ / H.M².
- » THE DISTRIBUTION OF THE BLACK WATERS ON THE PERCOLATOR SURFACE MUST BE VERY UNIFORM: with soft jets in the shape of a full brush. The best system is the classic rotary distributor (hydraulic reaction eddy) with a peripheral speed of around 0.8 1.2 m / sg.
- » NATURAL VENTILATION IS INSURED WHEN AERATION OPENINGS ARE EQUIVALENT TO AT LEAST 4% OF THE PERCOLATING HORIZONTAL SECTION. For the support of the filler in BIO-ECO, our filler body is recommended for filtration of high measured load TRAMEX.

DOCUMENTS:

We answers your queries for the dimensioning of trickling beds, for this you need to know:

- » THE MOST SATISFACTORY PROJECT DATA POSSIBLE.
- » THE SCHEME OF INTENDED PRINCIPLE

ECO RING

Biofilter for trickling beds



The ECO RING is a modern messy biofilter suitable for deodorizing towers.

Technical Characteristics

Shape	Truncated cone
Dimensions	$\phi = 58 - 45 \text{ mm}$. $h = 50 \text{ mm}$
Specific Surface	$152 \text{ m}^2 / \text{m}^3$
Pieces / m^3	$6,900 \text{ u} / \text{m}^3$
Average thickness	0.5 mm
Density	according to request
Gap Index	95%
Material	black isostatic polypropylene
Dry Weight	$64 \text{ kg} / \text{m}^3$
Temp. of deformation	165° according to DIN 53455
Break to Effort	$<0.02\%$
Water absorption	110° C
Work temperature	6 m.
Maximum height	less than 1.5%
Deformation	

POLYPROPYLENE AND WORKING CHARACTERISTICS

RESISTANCE TO EFFORTS:	$380 \text{ Kg} / \text{cm}^2 \text{ S} / \text{DIN } 53,455$
DEFORMATION TEMPERATURE:	$165^\circ \text{ C S} / \text{DIN } 53.461$
SPECIFIC DENSITY:	$0.985 \text{ gr} / \text{cm}^3 \text{ DIN } 53,461$
INFLAMMABILITY:	Ignition temperature 600° C slow burning.
ELASTICITY MODULE:	$1500 \text{ N} / \text{mm}^2$
P.P AGING FACTOR:	2.2
TEMPERATURE FACTOR:	KT. 1.5
HEIGHT OF FILLING IN FILTER:	6m
ORGANIC WORK LOAD:	$0.78 \text{ kg DBOD} / \text{m}^3$
SPECIFIC IRRIGATION FLOW:	$0.5 \text{ m}^3 / \text{m}^2 \times \text{H}$.
MINIMUM TEMPERATURE:	$+ 5^\circ \text{ C}$
MAXIMUM TEMPERATURE:	$+ 20-30^\circ \text{ C}$
PERFORMANCE ELIMINATION DBOD:	86%
DBOD (IN):	269 ppm
SS (IN):	137 ppm
MAXIMUM WEIGHT OF COLMATED FILLING:	$400 \text{ kg} / \text{m}^3$
MAXIMUM LOAD APPLIED TO THE FILLING SUPPORT WHEN WORKING WITH 5M HEIGHT:	$2000 \text{ kg} / \text{m}^2$

DROP MAKER

Biofilter for trickling beds

INSTALLATION OF DROP MKR offers the indicated benefits when:

- » It is installed with a minimum inclination of 45 ° above the horizontal. Therefore, vertical mounting is recommended, in which case the attached diagrams are valid.
- » The gas stream inverts the batch, regularly, without turbulence and with uniform speed.
- » No preferential routes are given.

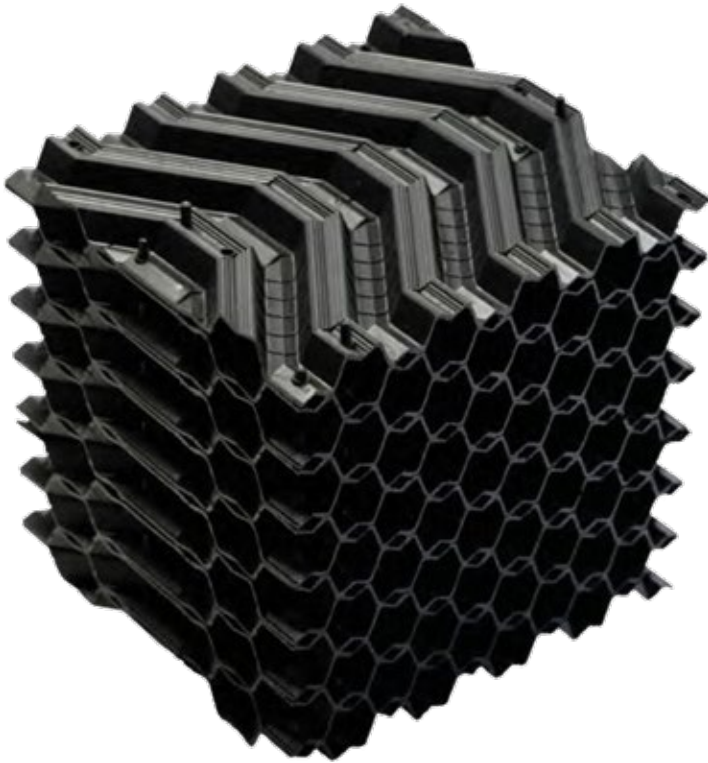
PERFORMANCE

The yield, in terms of percentages of liquid removed from the aerosol, depends on many factors, the main ones being:



- » Dimensions and concentration of the drops at the entrance of the "lot"
- » Temperature and viscosity of aerosol components.
- » "Maximum capacity" or "access speed" at which the batch is loaded.

The diagram shows the performance of the DROP MKR droplet separator for air / water aerosol at room temperature and pressure.



ORDERED PLASTIC FILLERS DROP SEPARATOR

DROP MKR is produced in combinable modules of various material dimensions:

By combining the modules in a timely manner, droplet separations of the desired dimensions are obtained with multiple surfaces of 0.043 m².

Technical Characteristics

Shape	Rectangular
Dimensions mm	L = 215 A = 205 H = 195
Specific Surface	258.8 m ² / m ³
Weight per module	1.3 kg
Material	Black isostatic polypropylene

Likewise, the profiles necessary for the assembly of the modules are supplied. The already installed DROP MKR droplet separator can be delivered on request. DROP MKR is typically used to:

- » Columnas de lavado y/o escurrimiento de gases.
- » Deshumidificación de gas y/o vapores.



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