



EVOGEN WASTEWATER TREATMENT

An **Evogen Microbial** product range

Disruptive, innovative microbial and antimicrobial
technologies for Wastewater treatment applications.



ABOUT GENESIS BIOSCIENCES

Genesis Biosciences is a global biosciences company with the unique capability to ferment bacteria strains and develop safe and natural microbial and antimicrobial products on a solid foundation of eco-benign® technology.

The company's manufacturing and laboratory facilities, strategically based in the United States and the UK, enable unrivalled global technical support and innovative, eco-benign® solutions and services for a wide range of sectors, positioning Genesis to respond to the ever-changing demands of its customers around the globe.

Our successful combination of a state-of-the-art fermentation facility and our microbial and antimicrobial product development expertise has generated high-quality custom products for a broad range of applications and business sectors.

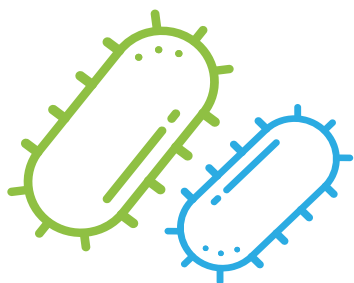
In Europe and the US, our laboratories and research and development facilities are staffed with the most highly qualified chemists, microbiologists, fermentation specialists and engineers, including several PhD scientists.

Our diverse and highly skilled R&D teams come from successful, high-science backgrounds in several industries including wastewater treatment, pharmaceutical, medical and the health sciences field.

This level of expertise in the research and development of performance-driven products and solutions is unparalleled in our industry and drives Genesis Biosciences to develop award-winning innovations.

OUR APPROACH

APPLICATION-SPECIFIC TECHNOLOGY



What is *Bacillus*?

Bacillus are a genus of Gram-positive microorganisms found across the globe in a range of environments.

They are metabolically diverse and with a few notable exceptions are non-pathogenic and safe to use. They are able to survive when conditions move outside of those needed for survival through the production of spores.

Spore formation allows this type of bacteria to be grown in very high concentrations and blended into a stable product with a long shelf-life.

This makes it ideal for industrial applications where often a large amount of *Bacillus* cells are needed to amend a system.

Why is Genesis different?

At Genesis we ferment all our own bacteria to the highest standards (ISO 9001) so we can guarantee that the *Bacillus* we deliver are correct in both species and concentration and are free from contaminants. We have taken time to design our products to ensure they have minimal impact upon the environment and end user, whilst at the same time offering an efficacious and prolonged result.

As *Bacillus* is our main technology, we ensure that we understand each of our isolates. We have invested in cutting edge genomic techniques to fully comprehend the potential of each of our *Bacillus* species, and in doing so we have created effective and truly application-specific technology. All of our products come with expert technical support as standard.



Minimal environmental impact
Uncompromising on soiling
Recyclable packaging

eco-benign®
by design

ECO-BENIGN® BY DESIGN

Genesis Biosciences is fully committed to creating and developing the most environmentally responsible microbial and antimicrobial products available globally. Allow us to introduce you to eco-benign®.

Our microbial products are formulated with superior chemical technologies combined with specialised *Bacillus* cultures, to have a gentle or harmless effect on the environment when an introduction is made through application or disposal.

The *Bacillus* components of these formulations can also be seen as a benefit to an ecosystem where introduction has occurred.

Our eco-benign® philosophy also uses recyclable packaging, is considerate to our carbon footprint and creates low to zero impact on the environment.


A photograph of a wastewater treatment facility. In the foreground, several large, curved metal pipes are arranged in a row, with water cascading over them, creating a waterfall effect. The water is white and frothy. In the background, there are industrial structures, including a blue and white building and some greenery.

Evogen WWT products can greatly reduce contaminant levels in different industrial wastewaters using the application-specific bacteria strains we have identified and combined with our eco-benign[®] chemistry to provide unparalleled safe results in each application.

Dr Chris Charles

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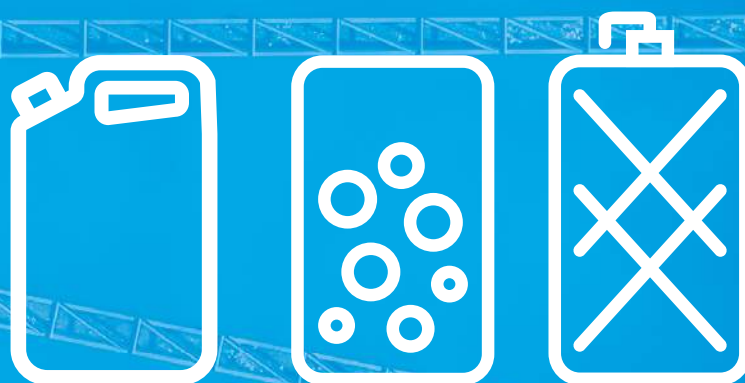
INTRODUCING THE RANGE

Evogen WWT products provide a solution for a broad range of wastewater types ranging from municipal to demanding industrial effluents such as those generated from dairies, slaughterhouses, petrochemical plants and many more.

All *Bacillus* species and strains within the range are completely safe and, due to a lack of mobile genetic elements and antimicrobial resistance (AMR) genes of clinical relevance, harbour a low potential for transmission of AMR.

Available in a variety of blocks, powder and liquid products, Evogen WWT can be used in a wide range of water types including fresh, saline and brackish.

We are committed
to perfection in
fermentation for
a cleaner world



KEY FEATURES OF THE RANGE

Application-specific

The metabolically diverse *Bacillus* strains in the products have been specifically selected for their ability to degrade a wide range of polymeric components

Safety

All *Bacillus* species and strains within the Evogen WWT range are safe to use, non-pathogenic and harbour no toxicity towards humans or animals

eco-benign®

Our products are formulated with superior chemical technologies combined with specialised *Bacillus* cultures to have a gentle or harmless effect on the environment

Stability

Stable spore formulations offer long term product stability.

Product resilience

Wide temperature and pH profiles and tolerance of organic strength variations enables growth in variable conditions.

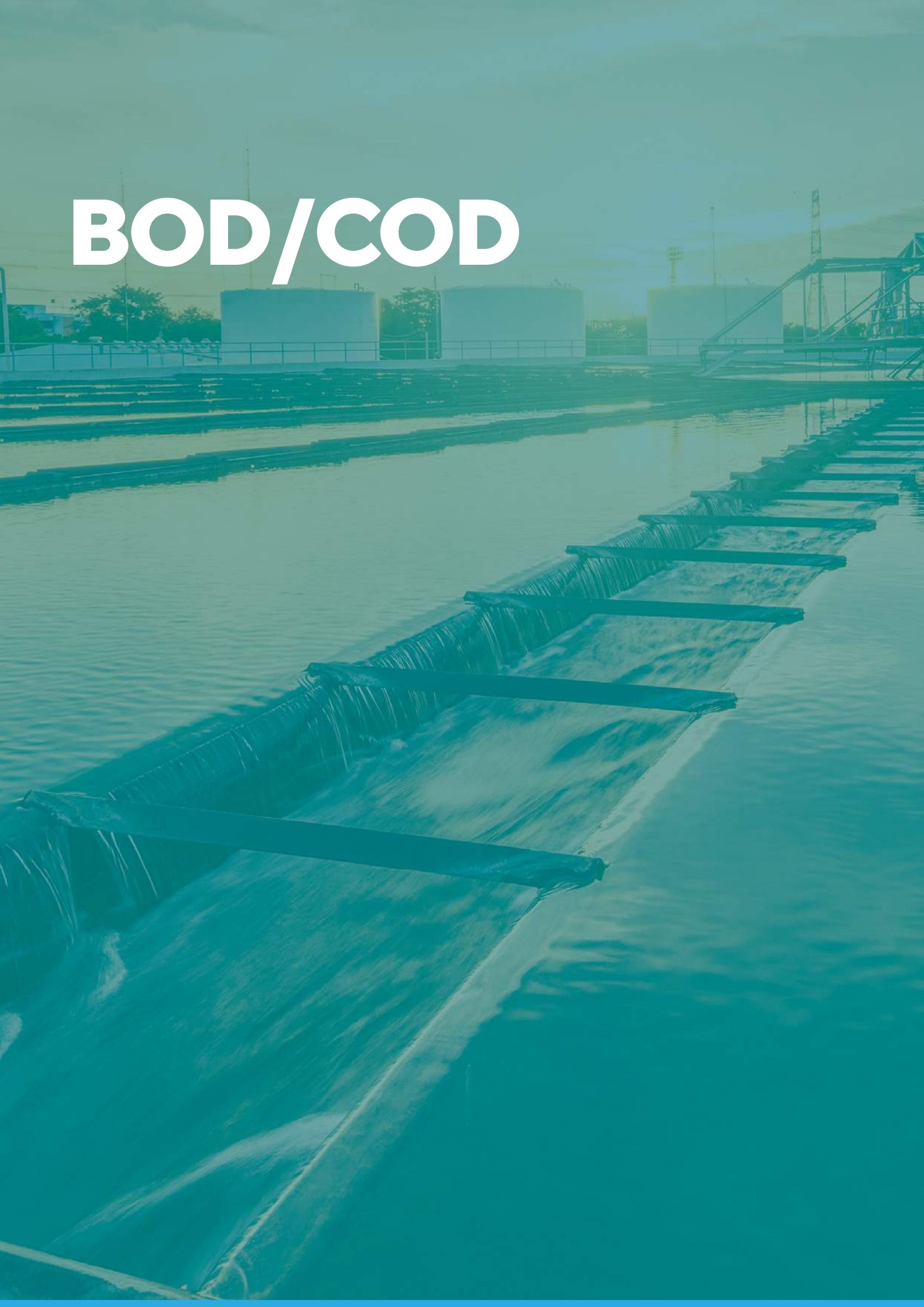
Quality assured

Manufactured in accordance with recognised international standard ISO 9001 to guarantee quality, integrity and reproducibility.

Technical expertise

Non-pathogenic, environmentally responsible and easy to use

BOD/COD



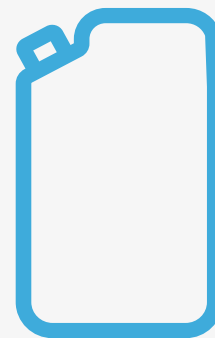


THE PROBLEM

- > Excessive BOD / COD concentrations in effluents can cause significant cost associated with their disposal and lead to pollution issues in receiving water bodies.
-
- > Poor heterotrophic growth, limited metabolic potential or plant limitation can lead to poor treatment efficiencies which are not capable of dealing with increasing demands.
-
- > There is a growing need to do more with less.

MULTIUSE LIQUID

An **Evogen Microbial** product



KEY FEATURES

Liquid designed for improving the start-up of activated sludge systems through *Bacillus* bioaugmentation.

Robust heterotrophic growth parameters combined with diverse extracellular enzyme capabilities allow for growth across a range of effluent conditions and types.

Recommended in particular for use in organic rich effluents (e.g. rich in protein, carbohydrates, fats oils and grease) such as municipal effluents or industrial effluents from bakery, dairy, slaughterhouse, paper and pulp mill activities etc.

Improved effluent quality through the better biodegradation of organic compounds including polysaccharides, proteins and fats oils and grease.

APPLICATIONS

- Municipal wastewater
- Industrial wastewater
- Trade effluents
- Organic rich effluents
- General asset performance improvement

PRODUCT SPECIFICATION

Pack size

20 litre
200 litre
1,000 litre

Count

1.06E+9 CFU/g *Bacillus*

Appearance

Straw coloured liquid

pH

pH 7.5 – 8.5

Shelf life

24 months (unopened)
if opened store in a cool dry place
to maintain product integrity.

ENVIRONMENTAL CONDITIONS

Salinity

Freshwater to seawater and above
(no impact upon performance
between 0 – 50 g/L)

pH

pH 5 – to pH 8.5 (optimum
between pH 6 and pH 7.5)

Temperature

10 °C – 40 °C (optimum
between 20 °C and 35 °C)

Effluent type

Organic rich effluents, (municipal,
paper and pulp, dairy, bakery)

Parameter	Value
Y (gDW/gBOD)	0.390
Qmax (gBOD/gVSS/day)	25.855
Umax (per day)	10.084

Table showing the kinetic parameters of the *Bacillus* component of Evogen Multiuse Liquid under optimal municipal wastewater conditions at pH 7 and 21°C. Please note performance may vary under operating conditions due to biological and physiochemical influences.

BIOBLOCK

An **Evogen Microbial** product



KEY FEATURES

Aslow release block containing floc forming *Bacillus* with strong heterotrophic growth properties.

Ideal for organic rich effluents such as municipal, dairy and slaughterhouse effluents.

Diverse hydrolytic enzyme profiles give wide substrate specificity for the degradation of both animal and plant products.

The presence of secondary metabolite clusters encoding for biosurfactants allows *Bacillus* to degrade FOG completely.

Bacillus are able to retain themselves within the system via formation of flocs with excellent settling properties.

APPLICATIONS

- Municipal and industrial wastewater plants
- Lift stations and wet wells
- Ponds, lagoons and other large body systems
- Suited to effluents rich in organic materials
- Tackling FOG related filamentous issues such as *Nocardia* or *Microthrix* bulking and foaming

PRODUCT SPECIFICATION

Pack Size

5kg (packed 4 x 5kg per case)
15kg (packed 1 x 15kg per case)

Count

5E+9 CFU/g *Bacillus*

Floc

Expect SVI around or below 100 under optimal conditions

Appearance

Solid Block

Shelf life

24 months

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater (no impact upon performance between 0 - 50 g/L)

pH

pH 4 - to pH 10

Temperature

10 °C - 45 °C

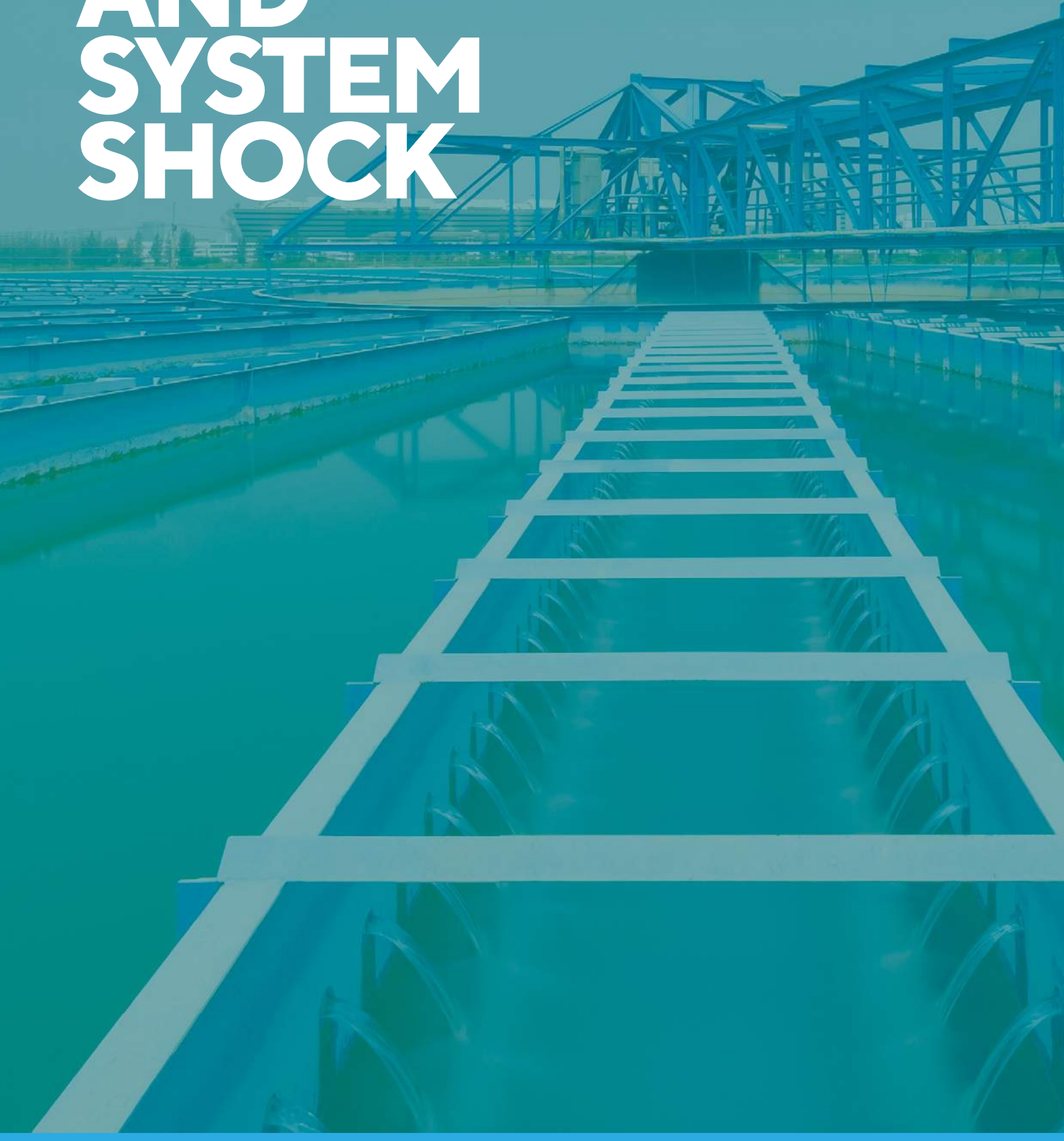
Effluent type

Organic rich (Protein, FOG, carbohydrates containing effluents such as municipal, dairy, slaughterhouse etc.)

Parameter	Value
Y (gDW/gBOD)	0.543
Qmax (gBOD/gVSS/day)	27.000
Umax (per day)	14.661

Table showing the kinetic parameters of the *Bacillus* consortium in Evogen Bioblock under optimal municipal wastewater conditions at pH 7 and 21°C. Please note performance may vary under operating conditions due to biological and physiochemical influences.

RESEEDING AND SYSTEM SHOCK



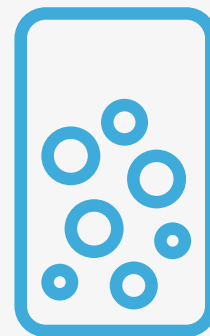


THE PROBLEM

- > For a Wastewater Treatment Plant to work to maximum efficiency following start-up or following chemical upset, there needs to be an established microbial community at a level required to remove organics within the hydraulic retention time. In order for this microbial community to be effectively retained the microbial community needs to form flocs with good settling properties.
-
- > If either of these events do not take place the start-up period can take a considerable time, causing delays and possible production hold-ups for industrial wastewater treatment plants.
-
- > Use of activated imported sludge can reduce the start-up / recovery time however it often requires a long acclimation phase and can introduce undesirable organisms to the system such as filamentous bacteria, that can cause foaming and poor sludge compaction.

GENERAL EFFLUENT STARTER

An **Evogen Microbial** product



KEY FEATURES

A powder designed for improving the start-up of activated sludge systems through *Bacillus* bioaugmentation.

For use in organic rich effluents (protein, carbohydrates, fats oils and grease) such as municipal effluents or industrial effluents from bakery, dairy, slaughterhouse, paper and pulp mill activities etc.

Robust heterotrophic growth parameters allow for growth across a range of conditions conferring resilience against system shocks.

Can be used to improve plant performance when dealing with cellulosic rich effluents such as those generated from paper and pulping activities or vegetable processing.

APPLICATIONS

- Municipal wastewater
- Industrial wastewater
- Trade effluents
- Organic rich effluents
- Cellulosic rich effluents
- Shock recovery
- Start up of activated sludge systems

PRODUCT SPECIFICATION

Pack Size

20kg, 100kg
200g/400g water soluble sachets

Count

Bacillus 1E+10 CFU/g
Fungal count 1E+6 CFU/g

Floc

Expect SVI below 100 when used with carrier

Appearance

Tan coloured free flowing powder

Shelf life

24 months (unopened)
If opened store in a cool dry place to maintain product integrity.

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater (no impact upon performance between 0 - 50 g/L)

pH

pH 5 - pH 8.5

Temperature

10 °C - 40 °C

Effluent type

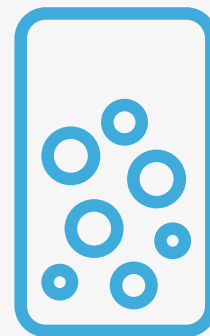
Organic rich (Protein, FOG, carbohydrates containing effluents such as municipal, dairy, bakery etc)

Parameter	Value
Y (gDW/gBOD)	0.390
Qmax (gBOD/gVSS/day)	25.855
Umax (per day)	10.084

Table showing the kinetic parameters of the *Bacillus* component of Evogen General Effluent Starter under optimal municipal wastewater conditions at pH 7 and 21°C. Please note performance may vary under operating conditions due to biological and physiochemical influences.

GENERAL EFFLUENT IMPROVER

An **Evogen Microbial** product



KEY FEATURES

A powder designed for improving the effluent and sludge parameters of an activated sludge system through *Bacillus* bioaugmentation.

For use in organic rich effluents such as municipal effluents or industrial effluents from bakery, dairy, slaughterhouse activities etc.

Robust heterotrophic growth parameters allow for growth across a wide range of conditions conferring resilience against system shocks and improving system recovery from upsets.

APPLICATIONS

- Municipal wastewater
- Industrial wastewater
- Trade effluents
- Organic rich effluents
- Shock recovery
- General asset performance improvement

PRODUCT SPECIFICATION

Pack Size

5kg (packed 4 x 5kg per case)
15kg (packed 1 x 15kg per case)

Count

Standard: 1E+9 CFU/g *Bacillus*
XL: 1E+10 CFU/g *Bacillus*

Floc

Expect SVI around or below 100 under optimal conditions

Appearance

Tan coloured free flowing powder

Shelf life

24 months

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater (no impact upon performance between 0 - 50 g/L)

pH

pH 4 - to pH 10

Temperature

10 °C - 45 °C

Effluent type

Organic rich (Protein, FOG, carbohydrates containing effluents such as municipal, dairy, slaughterhouse etc.)

Parameter	Value
Y (gDW/gBOD)	0.543
Qmax (gBOD/gVSS/day)	27.000
Umax (per day)	14.661

Table showing the kinetic parameters of the *Bacillus* consortium in Evogen Bioblock under optimal municipal wastewater conditions at pH 7 and 21°C. Please note performance may vary under operating conditions due to biological and physiochemical influences.

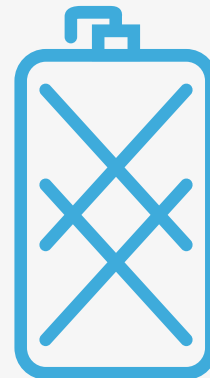
An aerial photograph of a wastewater treatment plant. The image shows several large, circular clarifiers arranged in a circular pattern. Each clarifier has a central mechanical arm with a rotating platform. The water in the clarifiers is a dark, murky brown. The surrounding area is a mix of green grass and grey gravel paths. In the top left corner, there are some industrial buildings and pipes. The word "FOG" is written in large, white, bold, sans-serif capital letters in the upper left quadrant of the image.

FOG



THE PROBLEM

- > Fats, Oils and Grease in wastewater systems cause a range of problems including: excess BOD/ COD contributions, clogging and fouling, foaming and floc floatation as well as promoting the growth of filamentous bacteria.
- > In many wastewater systems the native microbial population may not have the necessary tools to deal with growing challenge of FOG.
- > Enzymes, chemical and poorly designed products may only facilitate the dislodging of FOG moving it downstream and causing the formation of hard FOG scale.
- > The *Bacillus* consortia in Evogen WWT FOG treatment products not only have the tools to make FOG more bioavailable, but also fully degrade FOG and its intermediates to CO₂ and water.



BIOBRICK

An **Evogen Microbial** product

KEY FEATURES

A slow release brick containing floc forming *Bacillus* strains with strong heterotrophic growth properties capable of degrading fats, oils and grease fully to CO₂ and water.

Ideal for organic rich effluents such as municipal, dairy and slaughterhouse effluents.

The bacteria have diverse lipase, esterase and biosurfactant capabilities making FOG deposits more bioavailable and breaking them down into more digestible components.

Fully degrades the common components of FOG deposits such as palmitic, stearic, oleic and linoleic fatty acids.

Able to improve COD, bulking and floatation issues associated with fats, oils and grease.

Bacillus able to retain themselves within system via formation of flocs with excellent settling properties.

Wide temperature and pH profile and tolerance of organic strength variations enables growth in variable conditions.

APPLICATIONS

- Municipal and industrial wastewater plants
- Grease traps and interceptors
- Suited to effluents rich in organic materials

PRODUCT SPECIFICATION

Pack Size

0.5kg (packed 12 x 0.5kg per case)
1kg (packed 4 x 1kg per case)
5kg (packed 4 x 5kg per case)

Count

5E+9 CFU/g *Bacillus*

Floc

Expect SVI around or below 100

Appearance

Solid Block

Shelf life

24 months

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater (no impact upon performance between 0 - 50 g/L)

pH

pH 4 - to pH 10

Temperature

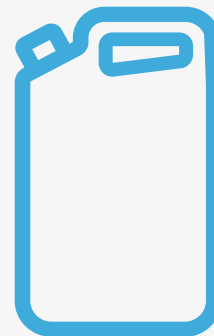
10 °C - 45 °C

Effluent type

Organic rich (protein, FOG, carbohydrates containing effluents such as municipal, dairy, slaughterhouse etc.)

Parameter	Value
Y (gDW/gBOD)	0.543
Qmax (gBOD/gVSS/day)	27.000
Umax (per day)	14.661

Table showing the kinetic parameters of the Evogen Biobrick consortium under optimal municipal wastewater conditions at pH 7 and 21°C. Please note performance may vary under operating conditions due to biological and physiochemical influences.



GDL 10X

An **Evogen Microbial** product

KEY FEATURES

A liquid product containing **chemical and biological mechanisms for FOG degradation.**

Ideal for organic rich effluents such as municipal, dairy and slaughterhouse effluents.

The bacteria have diverse lipase, esterase and biosurfactant capabilities making FOG deposits more bioavailable and breaking them down into more digestible components.

Contains beneficial bacteria capable of fully degrading the common components of FOG deposits such as palmitic, stearic, oleic and linoleic fatty acids.

Able to improve COD, bulking and floatation issues associated with fats, oils and grease

APPLICATIONS

- FOG deposit issues in grease traps, interceptors, wet wells and lift shafts
- COD contributions from FOG in effluents
- Municipal and industrial wastewater plants
- In pipe dosing
- Suited to effluents rich in organic materials

PRODUCT SPECIFICATION

Pack size

20 litre
200 litre
1,000 litre

Count

10X= 2e9 CFU/g

Appearance

Opaque liquid

Shelf life

24 month

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater (no impact upon performance between 0 - 50 g/L)

pH

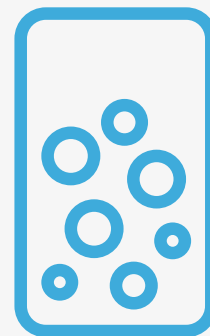
pH 5 - to pH 8.5

Temperature

15 °C - 40 °C

Effluent type

Organic rich (protein, FOG, carbohydrates containing effluents such as kitchen waste, municipal, dairy, slaughterhouse etc.)



KEY FEATURES

A soluble powder product for FOG degradation in systems such as grease traps and interceptors.

Ideal for organic rich effluents such as municipal, dairy and slaughterhouse effluents.

The bacteria have diverse lipase, esterase and biosurfactant capabilities making FOG deposits more bioavailable and breaking them down into more digestible components.

Contains beneficial bacteria capable of fully degrading the common components of FOG deposits such as palmitic, stearic, oleic and linoleic fatty acids. This prevents the formation of FOG issues further downstream.

Able to improve COD, bulking and floatation issues associated with fats, oils and grease.

Reduces instances of blockages and number of call outs to maintain grease traps and interceptors.

APPLICATIONS

- FOG deposit issues in grease traps and interceptors
- Reducing COD contributions from FOG in effluents
- Municipal and industrial wastewater plants
- Grease traps and interceptors
- Suited to effluents rich in organic materials

PRODUCT SPECIFICATION

Pack Size

20kg, 100kg
200g/400g water soluble sachets

Count

1E+9 CFU/g *Bacillus*

Appearance

White powder

Shelf life

24 months

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater (no impact upon performance between 0 - 50 g/L)

pH

pH 5 - to pH 8.5

Temperature

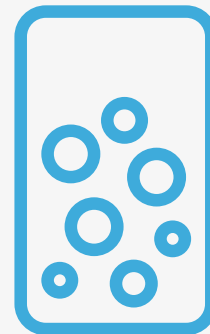
15 °C - 40 °C

Effluent type

Organic rich (protein, FOG, carbohydrates containing effluents such as kitchen waste, municipal, dairy, slaughterhouse etc.)

Parameter	Value
Y (gDW/gBOD)	0.543
Qmax (gBOD/gVSS/day)	27.000
Umax (per day)	14.661

Table showing the kinetic parameters of the Evogen Biobrick consortium under optimal municipal wastewater conditions at pH 7 and 21°C. Please note performance may vary under operating conditions due to biological and physiochemical influences.



FOG

An **Evogen Microbial** product

KEY FEATURES

A powder product containing application-specific *Bacillus* and enzymes for FOG degradation in grease traps and interceptors.

Ideal for organic rich effluents such as kitchen waste, municipal, dairy and slaughterhouse effluents.

The bacteria have diverse lipase, esterase and biosurfactant capabilities making FOG deposits more bioavailable and breaking them down into more digestible components.

Contains beneficial bacteria capable of fully degrading the common components of FOG deposits such as palmitic, stearic, oleic and linoleic fatty acids. This prevents the formation of FOG issues further downstream.

Able to improve COD, bulking and floatation issues associated with fats, oils and grease.

The enzymes within the product give immediate response whilst the *Bacillus* provide a longer sustained solution.

Reduce instances of blockages and number of call outs to maintain grease traps and interceptors.

APPLICATIONS

- FOG deposit issues in grease traps, interceptors, wet wells and lift shafts
- COD contributions from FOG in effluents
- Municipal and industrial wastewater plants
- Grease traps and interceptors
- Suited to effluents rich in organic materials

PRODUCT SPECIFICATION

Pack Size

20kg, 100kg
200g/400g water soluble sachets

Count

5E+9 CFU/g *Bacillus*

Floc

Expect SVI around or below 100

Appearance

Tan free flowing powder

Shelf life

24 month

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater and above (no impact upon performance between 0 - 50 g/L)

pH

pH 5 - to pH 8.5

Temperature

10 °C - 45 °C

Effluent type

Organic rich (protein, FOG, carbohydrates containing effluents such as municipal, dairy, slaughterhouse etc.)

ODOUR CONTROL



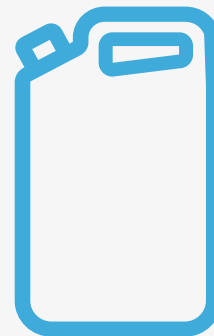


THE PROBLEM

- > Industrial wastewater and sewage treatment plants are a common source of malodour that can have a big impact on the nearby communities and commercial centres.
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- > Volatile compounds and amines are organic compounds that confer a range of malodours from body odour to rotting fish, and their production can outstrip the capacity of plants to contain or treat them.
-
- > Many WWT plant odours are caused by biological sulfur-based compounds like hydrogen sulfide (H_2S) and mercaptans which are detectable at very low concentrations and are often caused by nuisance bacteria that grow in anaerobic environments.

GENERAL ODOUR CONTROLLER

An **Evogen Microbial** product



KEY FEATURES

A liquid product designed to tackle odours via a multi-pronged approach, using a combination of eco-benign® chemistry, fragrance and microbiology.

Contains a chemical counteractant that binds malodours and prevents the nose from detecting them, providing immediate odour control.

Formulated with a novel *Bacillus* consortia with broad metabolic capabilities that are able to degrade a wide range of odour

causing compounds such as amines, volatile fatty acids and sulphur containing organics.

The *Bacillus* consortia produce a wide range of extracellular enzymes which help to degrade various organic solids helping combat the long term causes of odour generation.

Can be used to improve plant performance to meet emissions directives.

Supplied in both ready to use (1X) and 10X concentrations.

APPLICATIONS

- Municipal and industrial wastewater plants
- Landfill
- Slurry pits
- Refuse management
- Piggeries and poultry farming

PRODUCT SPECIFICATION

Pack size

20 litre
200 litre
1,000 litre

Count

1X 6.73E+7 CFU/g
10X 6.73E+8 CFU/g

Appearance

Straw coloured turbid liquid

Fragrance

Fragranced Fresh
Unfragranced Neutral

Shelf life

12 months in unopened package
If opened store in a cool dry place to maintain product integrity

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in water types ranging from freshwater to seawater and above (no impact upon performance between 0 - 50 g/L)

pH

pH 5 - pH 8.5

Temperature

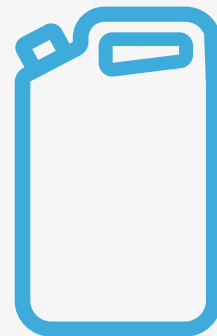
10 °C - 40 °C

Effluent type

Organic rich (Protein, FOG, carbohydrates containing effluents such as municipal, dairy, bakery etc)

SULPHIDE CONTROLLER

An **Evogen Microbial** product



KEY FEATURES

A liquid product designed to help combat odours associated with reduced sulphur compounds.

Contains a mixture of chemical and biological components that work synergistically to impact sulphate reducing bacteria.

The chemical component gives bacteria a better option for metabolic activities resulting in nitrogen generation instead of sulphide.

The biological component outcompetes sulphate reducing bacteria for resources and space.

Can impact the formation of biofilms upon surfaces that may harbour sulphate reducing bacteria.

The broad metabolic capability of *Bacillus* consortia able to degrade wide range of COD sources including Fats, Oils and Grease. This can help improve effluent parameters as well as tackling odours.

Can be used to improve plant performance to meet emissions directives.

APPLICATIONS

- Municipal and industrial wastewater plants
- Lagoons and ponds
- Cess and slurry pits
- Tackling sulphate reducing biofiling
- Areas suffering with anaerobic issues

PRODUCT SPECIFICATION

Pack size

20 litre
200 litre
1,000 litre

Count

1E+9 CFU/g *Bacillus*

Appearance

Tan coloured liquid

Fragrance

Fresh (eucalyptus and mint)

pH

pH 7.0 – 8.8

Shelf life

24 month (unopened)
if opened store in a cool dry place

ENVIRONMENTAL CONDITIONS

Salinity

Freshwater to seawater and above
(no impact upon performance between 0 – 50 g/L)

pH

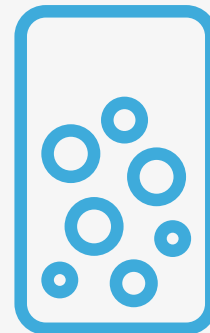
pH 5 – to pH 8.5 (Optimum between pH 6 and pH 7.5)

Temperature

10 °C – 40 °C (Optimum between 20 °C and 35 °C)

Effluent type

Organic rich effluents, (municipal, paper and pulp, dairy, bakery)



CLARITY

An **Evogen Microbial** product

KEY FEATURES

A powder designed to tackle septic and anaerobic conditions through use of an inorganic carrier that delivers oxygen to the local area when hydrated.

Can be applied in ponds, lakes and lagoons or directly into problem areas such as septic tanks or lift stations.

The product uses a specially designed blend of *Bacillus* to out-compete sulphate reducing bacteria and degrade sludge and organic matter.

Contains application-specific *Bacillus* which possess anti-algae properties and can tackle harmful algal bloom species through the production of algicidal compounds such as Bacilysin.

The *Bacillus* consortia have robust heterotrophic growth parameters which allow for growth across a range of conditions from pond water to industrial wastewater systems.

APPLICATIONS

- Municipal and industrial wastewater plants
- Lagoons and ponds
- Cess and slurry pits
- Septic tanks
- Areas with organic rich effluents
- Areas suffering with anaerobic issues

PRODUCT SPECIFICATION

Pack size

20kg

Count

5E+9 CFU/g *Bacillus*

Appearance

Off white powder

Shelf life

24 month (unopened)

if opened store in a cool dry place to maintain product integrity

ENVIRONMENTAL CONDITIONS

Salinity

Freshwater to seawater and above (no impact upon performance between 0 - 50 g/L)

pH

pH 5 - to pH 8.5

Temperature

10 °C - 40 °C

Effluent type

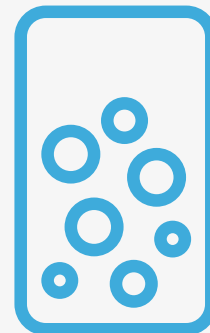
Organic rich (Protein, FOG, carbohydrates containing effluents)



HYDROCARBON REMOVAL

THE PROBLEM

- > Surfactant, phenol and hydrocarbons can pose a significant contamination issue in Municipal and Industrial wastewater effluents and surrounding soils.
- > Recalcitrant COD can drive up costs associated with effluent disposal and pollute receiving water bodies.
- > Overloading of compounds such as phenol could lead to toxic shocks and reduced system performance.



PCH

An **Evogen Microbial** product

KEY FEATURES

A *Bacillus* and *Pseudomonas* based powder product designed to degrade a range of hydrocarbon, phenol and surfactant species.

Scientifically proven to help remediate effluent streams containing poly aromatic hydrocarbons, phenol and cyanide.

Formulated specifically with microbes that have robust heterotrophic growth parameters allowing for growth across a range of conditions from soil based systems to industrial wastewater systems.

APPLICATIONS

- Municipal and industrial wastewater plants
- Land remediation
- Contaminated water sources
- Tackling oil, diesel and other petrochemical contamination
- Heavy industry

PRODUCT SPECIFICATION

Pack size

20kg
200g/400g water soluble sachets

Count

Bacillus 5E+9 CFU/g
Pseudomonas Approx. 1E+9 CFU/g

Floc

Expect SVI around or below 100

Appearance

Tan free flowing powder

Shelf life

Bacillus component 24 months in unopened package
If opened store in a cool dry place to maintain product integrity

Pseudomonas component
12 months at 4°C

ENVIRONMENTAL CONDITIONS

Salinity

Can be used in a wide range of water types from freshwater to seawater (no impact upon performance between 0 - 50 g/L)

pH

pH 5 - to pH 8.5 (Optimum between pH 6 and pH 7.5)

Temperature

10 °C - 40 °C (Optimum between 20 °C and 35 °C)

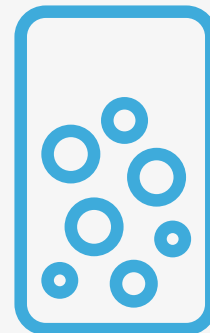
Effluent type

Industrial (hydrocarbon, phenol, surfactant and FOG) and municipal.

SEPTIC TANK OPTIMISATION

THE PROBLEM

- > The continued build-up of waste in septic tanks challenges the natural digesting activity of micro-organisms which normally break them down.
- > Household detergents and other chemicals discharged down the waste system can further interfere with the natural biological action inside the tank septic tanks by killing the natural micro-organisms that digest the waste materials.
- > This build-up of deposits will eventually lead to blockages in the system, resulting in bad or strong odours coming up from the drains or septic tank, slow flushing or overflowing toilets, gurgling of drains and in severe cases, septic tank effluent surfacing on your property/facility.
- > Septic-PLUS recharges the septic tank with billions of application-specific bacteria to reset the balance and encourage efficient digestion of the waste. Reducing solids and preventing odours, blockages and overflows.



SEPTIC-PLUS

An **Evogen Microbial** product

KEY FEATURES

A highly effective blend of beneficial bacteria designed to accelerate degradation of organic wastes and toilet paper, reduce odours and keep the septic system operating efficiently.

Evogen Septic-PLUS is supplied in pails containing 12 water soluble sachets which are simply deposited directly in to the toilet.

The *Bacillus* strains in Evogen Septic Plus have been scientifically developed to promote the rapid

breakdown and digestion of various forms of black and grey water waste including organic waste matter, toilet paper, detergents, greases, fats, oils, paper, and other organic waste materials commonly found in these systems.

The *Bacillus* strains in the products are fast growing for commissioning and upset recovery of septic tank devices. They are proven to enhance floc formation for rapid plant start up and create biomass that is more resistant to chemical loads such as bleach.

PRODUCT SPECIFICATION

Pack size

12 x 114g water soluble sachets per pail

Count

1E+4CFU/g *Bacillus*

Appearance

Tan powder

Shelf life

24 month (unopened)

if opened store in a cool dry place to maintain product integrity

ENVIRONMENTAL CONDITIONS

Salinity

Freshwater to seawater and above (no impact upon performance between 0 - 50 g/L)

pH

pH 5 - to pH 8.5

Temperature

10 °C - 40 °C

Effluent type

Organic rich (Protein, FOG, carbohydrates containing effluents)

APPLICATIONS

- Commercial Septic tanks
- Domestic Septic tanks
- Marine sanitation devices

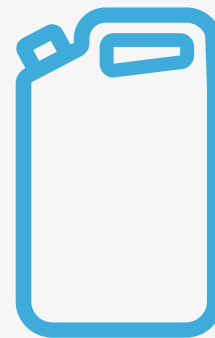
BIOFILM SUPPRESSION

THE PROBLEM

- > Microbial biofilms present a significant challenge to plant and can result in bio-clogging and bio-fouling issues. Which can lead to blockages and impaired equipment.
- > The protective coating of the biofilm allows increased resistance to biocides and prolonged persistence of pathogens such as legionella.
- > Biofilm can act as reservoirs for re-inoculation of a system and a hotbed for the generation of biocide resistant bacteria.

BIOFILM SUPPRESSION FLUID

A **Biosan Series** product



KEY FEATURES

A liquid additive designed to prevent biofilm formation through disruption of quorum sensing and by providing a direct biocidal challenge.

Easy to dose and suitable for use in a wide range of systems.

Environmentally responsible and provides a safer approach to the use of traditional biocides.

Long standing demonstrated success in demanding industrial conditions against multispecies biofilms.

Economic product engineered using sound knowledge of microbiology and chemistry.

Experienced technical support on hand to help with installation and potential compatibility issues.

APPLICATIONS

- Liquid recirculation systems
- Cooling towers
- Condensates
- Biofouling control
- *Legionella* control
- Air conditioning systems

PRODUCT SPECIFICATION

Pack size

100 litres

Appearance

Orange to yellow liquid

Fragrance

Cinnamon

Form

Semi-viscous liquid

Dosage

Between 400ppm and 600ppm depending upon severity of problem

Materials

Neat BSF should not be used with LDPE or PMMA plastics

Shelf life

24 months unopened
If opened use within 6 months

Stability in water

Stable in standing 20°C water for >8 weeks. Expect ~5% per week in standing water at 37 °C. Stability will decline as temperatures increase, for high or low temperature stability concerns contact our Technical Department.

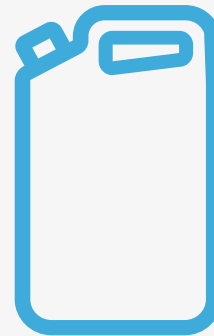
DESCALING

THE PROBLEM

- > Traditional solutions to the removal of scale include treatment with dangerous chemicals containing concentrated mineral acid such as hydrochloric acid, or weaker organic acids such as sulphamic acid
- > Sulphamic acid is safer than mineral acid but it is significantly less effective than hydrochloric acid and it is also classified as 'harmful to aquatic organisms', and 'may cause long-term adverse effects in the aquatic environment'.
- > The use of these de-scaling preparations in situations where the scale is contaminated with oil or grease also requires a preliminary clean with a de-greasing chemicals.

EVOGEN AR3000

An **eco-benign®** product



KEY FEATURES

A liquid acid-replacement technology for descaling pipes and equipment.

Evogen AR3000 is safer to use than traditional acidic products such as hydrochloric, phosphoric and sulphamic acids.

The product performs better than other organic acid products such as those based on citric acid.

Breaks down into components able to be degraded within wastewater systems and is not classified as corrosive towards metals when diluted.

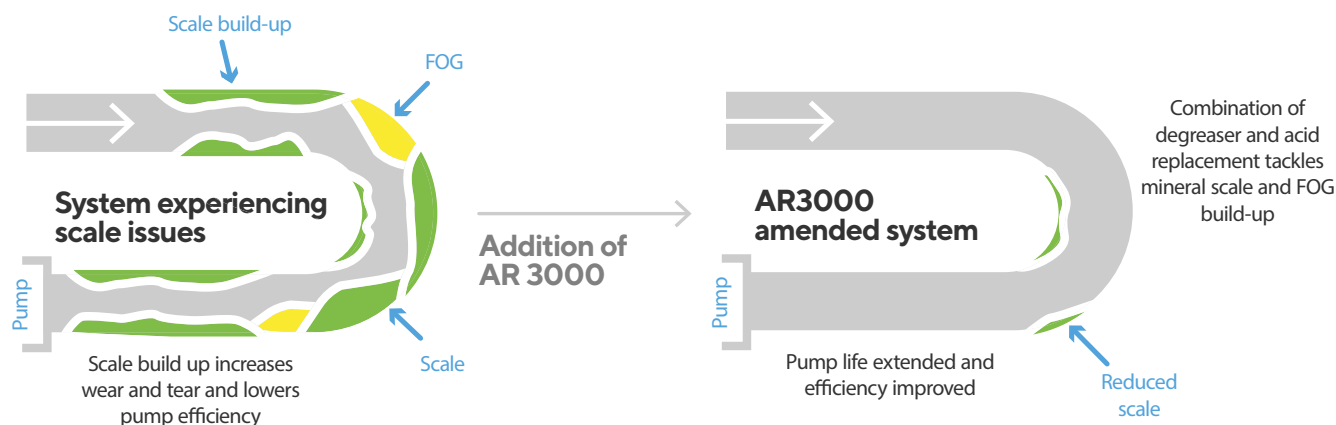
Makes CIP procedures safer by minimising risks to staff, equipment and the environment.

Contains powerful degreaser for use in areas rich in fats, oils and grease.

Can be used on a wide range of scales including calcium carbonates and struvite.

APPLICATIONS

- Industrial and municipal wastewater systems
- Pipes, valves, pumps and other machinery
- Safe CIP approaches



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BOD/COD
RESEEDING AND SYSTEM SHOCK
FOG
ODOUR DEGRADATION
HYDROCARBON REMOVAL
SEPTIC TANK OPTIMISATION
BIOFILM SUPPRESSION
DESCALING



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