Product Application Sheet – WASTEWATER TREATMENT

TRIPLE 7's Colloidal solutions are plant based, non-ionic, linear alcohol surfactant systems with distinct advantages in waste water treatment and management areas. TRIPLE 7's bio-based products are free of toxic and hazardous traditional treatment chemicals.

Unique micelle action simply displaces long chain hydrocarbons to the surface of a water column without reacting with organic structures. This relatively short period is indicative of long chain C64 non-aromatic fatty alcohol surfactants which actually reduce overall total oxygen demand.

Primary Treatment Stage

TRIPLE 7 Colloidal Concentrate is ideal for use in restaurants and food establishments because fats are easily solubilised and dispersed evenly across the surface, breaking fat balls and solid fatty mats down to individual molecular units. This organic surfactant system will not cause emulsions to form but simply breaks-down fatty emulsions and separates complex fatty structures into their various components. When combined with TRIPLE 7 Odourex in a 0.001% solution, TRIPLE 7 Colloidal Concentrate separates hydrogen sulphide and related odours from organic solids.

Values for solids and BOD in domestic sewage are approximately 50% carbohydrates, 40% protein and 1% fat. The pH can range from 6.5 to 8.0. TRIPLE 7 organic surfactants can lower BOD by as much as 5% in a typical domestic sewage treatment system, reduce the persistence of insoluble matter and help to separate it out of solution with a consequent lowering of system COD.

In cases of industrial waste, eg; food processing or heavy manufacturing, these surfactants separate long chain hydrocarbons, floating them to the water surface and keeping them separated to prevent emulsion forming. In slaughter houses where BOD normally ranges from 5 to 25 PE per animal, the BOD can be lowered dramatically by eliminating emulsion formation or oxygen encapsulation.

TRIPLE 7 bio-based surfactants reduce clogging at grinders, along with improved grit, gravel and sand removal including elemental ion particles. Organic surfactants can improve flocculants or coagulator performance and may also help reduce the need for ferric chloride, aluminium sulphate or polyelectrolyte by more than 50% by effectively separating organics, based upon density and aromatic buoyancy. Overall sedimentation efficiency should increase by 3% to 5% using the surfactants at similar concentration while reducing traditional chemical usage.

Those systems using flotation rather than sedimentation can increase their efficiency from 75% to 88% using organic surfactants. Additionally, they speed the release of methane, carbon dioxide and ammonia and in the digester process, are able to reduce overall transit time (usually 10 to 30 days) by as much as 30%.

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In open digester tanks, TRIPLE 7 Colloidal Concentrate together with TRIPLE 7 Odourex at a 50/50 ratio is sprayed over the organic sludge at the rate of 3.8 litres per (450m2) of surface area to reduce or eliminate discharge odours.

Secondary Treatment Stage
This stage of treatment further reduces remaining liquid effluent to residual organic content using aerobic bacteria in the presence of oxygen to convert matter to stable forms such as carbon dioxide, water, nitrates, phosphates and other organic materials. Organic surfactants continue to solubilise organic matter, accelerate gas release, buffer acid and separate remaining hydro-carbons. In alternative trickling filtration and activated charcoal systems, the products improve wetting, reduce fouling by organic solids and eliminate latent odours.

In the case of stabilisation ponds or lagoons, TRIPLE 7 Odour Control at a 90/10 ratio at the rate of 3.8 litres per 450m2 of surface area reduces pond odour without affecting aerobic performance.

Tertiary Treatment Stage
If the receiving body of water requires a higher degree of treatment than the secondary process can provide or if the final effluent is intended for reuse, tertiary treatment may be necessary. In this process, other dissolved solids are removed. Breakpoint chlorination may follow and/or ozonation to eliminate bacteria for human applications. Numerous gases from water including carbon dioxide, methane etc. can be eliminated using organic surfactants.

Organic surfactants are used in septic tank systems to solubilise fats and float organic solids to the surface to improve aerobic action and soil penetration. Concentrations of 1:1000 parts water or higher are used to settle elemental sand muds without affecting aerobic action.

The use of TRIPLE 7 Colloidal Concentrate in existing waste water treatment systems reduces the costly maintenance of lift stations, pump cleaning and replacement. It also reduces odour, breaks down solids and minimizes blockages.

Lift Stations operate with less trouble
Using TRIPLE 7 Colloidal Concentrate in lift stations and pipelines will result in less build-up of greases and fats around the internal concrete pipes and pumps. Additionally, labour costs involved to continually scrape and clean wells can be gradually reduced over time.

Gravity systems will flow easier with less build up of solidified fats and greases if TRIPLE 7 Colloidal Concentrate is added, allowing degradability to commence sooner. The product continues cleaning from discharge point to the treatment facility.

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TRIPLE 7 surfactants also retard hydrogen/sulphide formation. These products can assist in reducing the volume of effluent to be treated at the waste water plant. Product may be added to the system at the 'end runs' of lift stations via high pressure hoses, pump well cleaners or drip systems and no special equipment or handling procedures are required.

Advantages and Benefits

> TRIPLE 7 Colloidal Concentrate may be used to buffer acid solutions and emissions. The product is used for fuel spills in sewers to reduce vapours and hydrocarbon flammability curves to zero along with a major reduction in VOC's.
> TRIPLE 7 Colloidal Concentrate is economical to use and requires no special storage facilities.
> The product aids in corrosion control and carries more liquefied oils, greases and fats, preventing solidification and stopping them from going into solution until destroyed.

Suggested Dilutions

#1 Initial purge of lift stations: use TRIPLE 7 Colloidal Concentrate at 1:600 or approximately 20 litres and agitate with high pressure water jet or washer.

#2 'End Runs' that flow to lift stations may also be purged with approximately 4-5 litres upstream. This method will then flush all effluent into the lift stations and the entire system can be cleaned.

#3 To clean lift stations and pumps, we suggest a 10% dilution via high pressure cleaners or well washers.

#4 A drip injection of TRIPLE 7 Colloidal Concentrate into the system set at 1% to 0.01%, to flow volume of waste water is a recommended dilution for routine sewer cleaning maintenance.

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To break up the crust, which forms on top of water in sewage treatment plants, organic surfactants may be added at the plant. Since water and effluent conditions vary widely, add a very light ratio of the product to the water initially, gradually adding more until satisfactory results are obtained.
Introduce a condenser (Cooler) to retrieve free fatty acids, the primary contributor contaminant and install a holding cisten and force biodegradation by introducing bacteria into the discharge stream. If discharge is 20,000 litres per day, we recommend a series of 20,000 litre holding tanks passing through three steps of biodegradation over a one week period. Introduce air into the effluent to hasten biological degradation. Alternatively, the food solids and sugars can be easily filtered using 5 micron string wound poly filters.

Dilutions
The concentration of solutions is typically between 1:10,000 parts and 1:50,000 parts in settling tanks and effluent concentration in mains typically does not exceed 1:1,000,000 parts. At dilutions of 1:1,000 parts water, TRIPLE 7 products actually feed aerobic bacteria. Where water hardness is high it is recommended to use bio-based surfactants in the boilers as a water treatment.

TRIPLE 7 ODOUR CONTROL V. CAUSTIC
In the application of waste water systems, TRIPLE 7 products react differently to caustic when added to effluent.

> Caustic will generally create emulsions with fat and water. TRIPLE 7 surfactants separate and breakdown emulsions.
> Caustic will create a high pH level which is extremely harsh. TRIPLE 7 ODOUR CONTROL is an acid buffer and will not create a harsh environment.
> Caustic reacts with ammonia and chlorine. TRIPLE 7 products do not react.
> The recommended usage rate of TRIPLE 7 ODOUR CONTROL should be 0.5 to 1.0%.
> Application of TRIPLE 7 ODOUR CONTROL to 20,000 litres of volume discharge per day is 0.005% (approximately 1 litre per day), depending upon the desired pH range. If increased buffering is required then the amount of product needed will increase.

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TRIPLE 7 ODOUR CONTROL AND WASTE WATER

TRIPLE 7 Odour Control is used by water boards for sewer odours either in-line, at drying windrows or anywhere in between.

> Dosing into problem points at 10-50 ppm.
> Pouring/spraying into pump stations daily or weekly.
> Spraying into windrows at drying fields when being turned or when needed.
> Spraying into transit bins while filling with solid waste.

Eliminate:

> Phosphates & Caustics
> Chlorine
> Petroleum fractions
> Glycol ethers & Sulphonics
> Borates
> Brighteners
> Salts
> Ammonia
> Terpenes & Phenolics
> Silicones & Aldehydes
> Metasillicates
> Synthetics & Builders
> Heavy metals and many other traditional toxic chemistries.

Benefits:

> Improved trade waste performance
> Efficient media systems
> Lower salt loadings
> Cleaner production
> Less corrosion
> Reduced TDS, BOD and COD levels
> Better solids separation
> Reduced grinder clogging
> H_2S reduction
> Odour control
> Increased productivity
> Cleaner environments
> Reduced disposal costs
> Improved worker safety
> Improved fat & grease removal
> Hinders emulsion mat formation
> Improved grit & gravel removal

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TRIPLE 7 product success stories

Filter Media Cleaning

TRIPLE 7's bio-based surfactant chemistries have been successfully used to clean filter media. At one Water Authority waste water treatment plant, the media filters were no longer being effectively backwashed and through-put was approximately 40-45 litres per second. Also the backwash was causing channeling, so the effluent was not properly filtered.

TRIPLE 7 Colloidal Concentrate was added to each filter at 1:600 and air sparged to help penetration. The solution was left for 40 minutes and then backwashed.

The result was a increase of almost 100% in through-put, at a cost approximately 10% of that to replace the entire media.

The use of TRIPLE 7 bio-based chemistries saved time, effort and money which would have involved the replacement of the media.

Recycled Water Systems

TRIPLE 7 products have been used to improve the function of self contained recycled water systems.

A national park tourist facility had a recycle system that was odiferous and inefficient to the point of no water being recycled. Solids were not settling and emulsions were causing problems. The facility included a restaurant, laundry and amenities block.

TRIPLE 7 bio-based products were used to treat the recycled system with a noticeable improvement within one week and full system function was achieved by 3 weeks.

Call today to discuss your trade waste issues.

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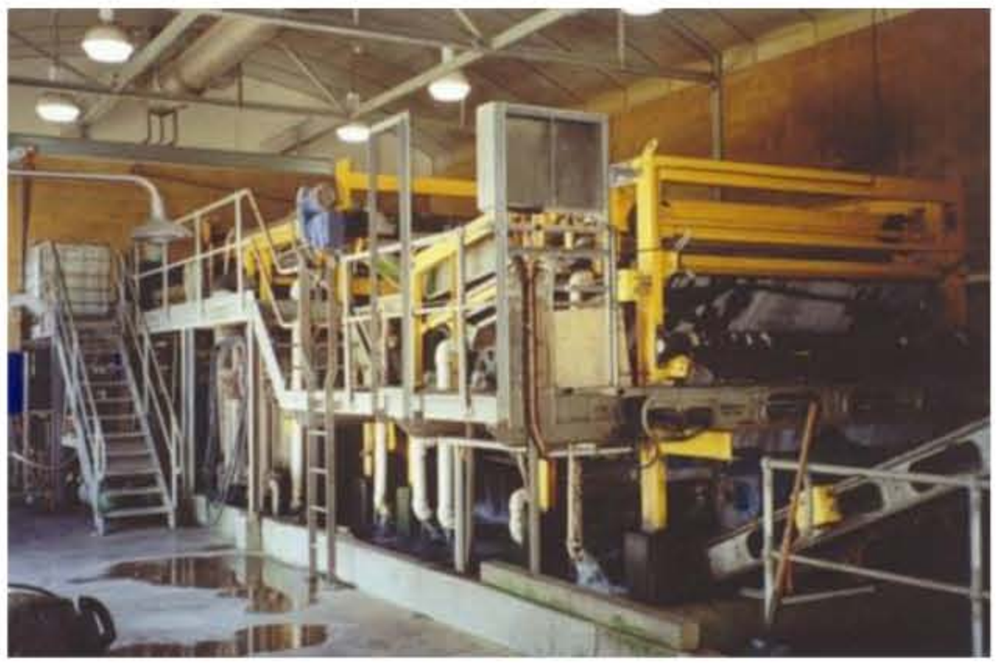
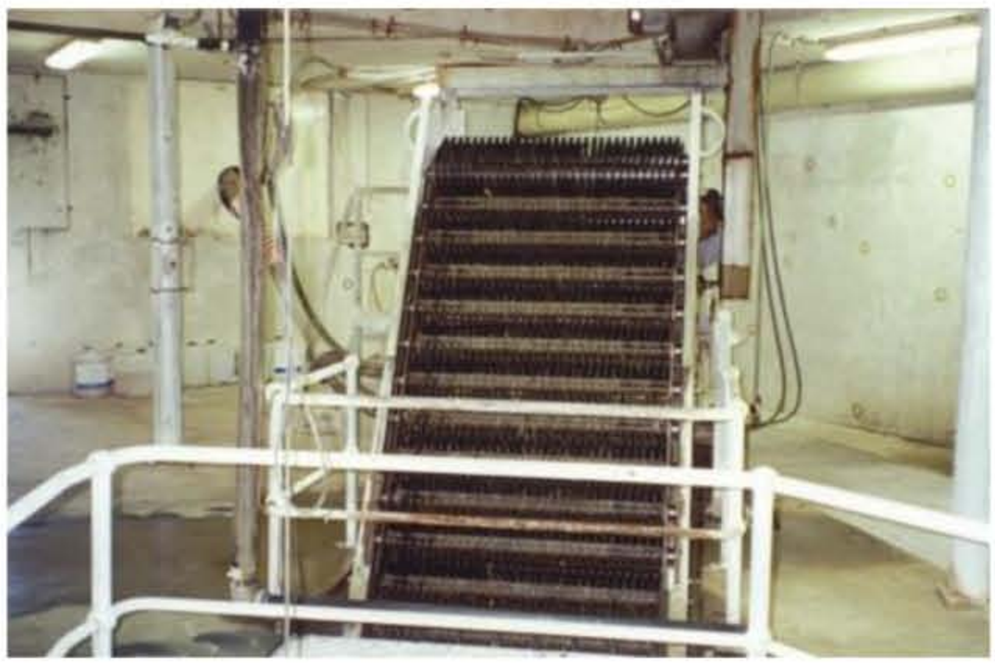


Sewage Treatment Plant (internal shot)



Screening Plant

Sewage Treatment Plant (external shot)

Belt Press

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