



# ECO-Spill FLUID ECO-Spill POWDER

## APPLICATIONS AND TECHNICAL GUIDE



## Eco-Spill Fluid (X01801CU)

### General Description and Information

Eco-Spill Fluid is a safe, environmentally friendly cleaner/degreaser with multiple applications.

It is:

- NON-HAZARDOUS
- NON-TOXIC

It requires:

- No special emergency or first aid procedures other than washing/flushing with water
- No special handling equipment or PPE
- No special precautions for storage

It is safe on:

- anything that is compatible with water e.g. plastics, fabrics, paints, leathers, metals, wood, glass, rubber and ceramics
- hard, soft or salt water

It contains no:

- phosphates, nitrates, NTA, sulphates, sulphonates, caustics, chlorinated solvents or other known pollutants

Eco-Spill Fluid is readily biodegradable.

Eco-Spill Fluid in its natural form has passed the Modified STURM Test, which is OECD 30m approved, achieving 67.54% of THCO (at 10 mg C/L) and 31.73% of THCO (at 20 mg CIL) within the 28 day test period. Additionally, Eco-Spill Fluid (diluted 50% with water) has passed the EPA1600/4-90/027 USEPA EMSL protocol for aquatic toxicology using pimephales promelas.

### Note:

Only 3-5% of all products claiming the term biodegradable pass the Modified STURM Test.

Eco-Spill Fluid is not a soap, detergent or petroleum solvent. It is a homogenous blend of colloids, sequestrants, hyper-wetting agents and a pure, super concentrated microbial culture of bacillus subtilis that becomes active when processed together. The cleaning action lifts, separates and holds in suspension the oils, greases, etc. for the microbes to digest. Eco-Spill Fluid will continue to work as long as there is moisture present.

**It is critical that Eco-Spill Fluid is diluted with water.**

### Mode of Application

Eco-Spill Fluid can be sprayed, brushed, wiped or mopped. Some mechanical agitation and soak time may be necessary as water-based cleaners need dwell time or agitation to penetrate and release soiling.

## Oil Spills - Open Water

**Note.** It is good practice to inform the Environment Agency or the Coast Guard of any oil spills in open waters or water courses and inform them of the remediation plan in place.

Ratio: Use 1 part Eco-Spill Fluid to approximately 40 parts water.

### Application

1. The above solution should be sprayed under pressure upon the entire area of the oil spill.
2. Begin at the outer edge, spraying the above mixture onto the oil slick. Continue spraying on oil slick in decreasing concentric pattern until entire oil slick has been sprayed.
3. Normal open water wave and wind action will provide agitation and aid in dispersion.

**Note:** For heavy spills, several applications or increased ratios may be required.

### Efficiency in Use

1. Oil spill should be sprayed with above mixture as soon as possible for best results and economy of operations.
2. The amount of Eco-Spill Fluid required to disperse or clean-up an oil spill may vary with wind and sea conditions, amount, type and thickness of the oil spill and time delay from spill to application of the Eco-Spill Fluid.
3. For best results, spray mixture of Eco-Spill Fluid and water upon the spill. Undiluted Eco-Spill Cleaners ARE NOT as effective and will take longer and increase the costs of the clean-up operation.

## Oil Spills - Restricted Water

**Note. It is good practice to inform the Environment Agency or the Coast Guard of any oil spills in open waters or water courses and inform them of the remediation plan in place.**

Ratio: 1 part Eco-Spill Fluid to approximately 40 parts water.

### Application

1. The above solution should be sprayed under pressure upon the entire area of the oil spill.
2. Begin at the outer edge, spraying the above mixture onto the oil slick. Continue spraying on the oil slick in decreasing concentric pattern until entire oil slick has been sprayed.
3. If in quiet waters - use high pressure sprayer or other means of open water agitation to replace normal wave action at sea.

### How Often Applied:

As required for complete dispersion.

## Vehicle Applications

For cleaning vehicle engine blocks and engine bays, dilute 1 part Eco-Spill Fluid to 3 parts water. Apply by spray, brush or cloth to a warm engine and allow to stand for 10 minutes, then rinse with clean water. This removes oil, grease and grime.

For wheels and undercarriages, dilute 1 part Eco-Spill Fluid to 5 parts water. Spray or brush on and let stand for 5 minutes, then rinse with clean, high-pressure water.

For vehicle bodywork, Eco-Spill Fluid makes an excellent shampoo at a 1:30 dilution. When applied with a soft brush or sponge it will remove road film, insects, salt and diesel smoke. Rinse with clean water.

Vehicle interiors may also be cleaned with a solution of 1 part Eco-Spill Fluid to 40 parts water by using a brush on upholstery and carpets and a towel for removing most of the moisture and dirt. It will also help to remove foul odours.

Fascias and instrument panels should use a dilution of 1:80.

## General Industrial Applications

### Pressure Washing

Eco-Spill Fluid provides a superior performance when combined with a high pressure warm, hot or tap temperature spray. Atomisation poses no problem as the blend of Eco-Spill Fluid is nonhazardous.

In spray washing, best results are obtained by using high pressure, low volume equipment,

The best method of application is to wet the surface to be cleaned with Eco-Spill Fluid and water at the correct dilution and let stand until the soil on the surface is loosened. Always start at the bottom of the vertical surface to be cleaned and apply the solution upward. The actual cleaning is accomplished by rinsing with water. Using the equipment described above, start the rinse operation at the top of the surface and rinse downward. Hold the spray nozzle of the gun 6-8 inches from the surface at a 45 degree angle and move forward. This action causes the water to penetrate under the loosened soil and roll it forward in front of the nozzle.

### Heavy Equipment

Eco-Spill Fluid can be used to clean and/or degrease oil industry equipment; engine blocks; heavy road construction equipment; floors; or any other surface where extra grease deposits or staining occur.

For heavy soiling, mix 1 part Eco-Spill Fluid to 3 parts water. Apply by a spray or brush method or soak smaller pieces of equipment. Eco-Spill Fluid in a concentrated solution usually works in about 5 minutes. When grease starts to slide, rinse with high pressure water.

For light to medium grease, mix 1 part Eco-Spill Fluid with 10 parts water.

To inhibit flash rusting after cleaning, a light oil film may be applied to the surface of the metal.

### Hand Cleaner

Used at full strength, Eco-Spill Fluid will remove dirt, grease and simple paints. It is odourless and non-irritating. Eco-Spill Fluid is completely miscible and free rinsing with water. Eco-Spill Fluid is excellent for the hands of mechanics, oil field workers and any other people whose hands are routinely extremely dirty or stained. Use a lanolin hand lotion to restore natural fats to the skin after prolonged use. Do not use on hands with large cuts or abrasions.

Rub the full strength Eco-Spill Fluid into the hands, add a little water and rub hands together again. Allow a few seconds before rinsing thoroughly. This may be repeated, if necessary. This will keep the skin from absorbing most oils; grease and grime making cleaning easier and quicker.

### Steam Cleaner and Pressure Wash

Eco-Spill Fluid is non-clogging, non-caking and non-scaling and is highly effective for all steam cleaning applications. It contains a special blend of surfactants and sequestering agents to lift soil and provide superior rinsing.

The concentration may be as high as 1 part Eco-Spill Fluid to 1 part water in the solution tank but concentration may be varied to suit the job. Eco-Spill Fluid is safe on any surface that will tolerate steam or water. Because of its colloid action, Eco-Spill Fluid keeps scale from forming in the steam coils thus reducing maintenance of the steam cleaner.

## Maritime Applications

### General Marine Cleaner – Commercial and Leisure

Eco-Spill Fluid is very effective as a hand wiping material in cleaning the engine room or engine bay where fuel, oil, smoke, etc. are a problem. Mix 1 part Eco-Spill Fluid to 5 parts water and wipe down the area with a wet cloth. No rinsing or further wiping is necessary.

Eco-Spill Fluid is excellent for swabbing down decks, cowlings, hulls, windshields and bulkheads. It will not damage painted or wooden surfaces and helps prevent rust on exposed surfaces. This mixture should be 1 part Eco-Spill Fluid to 30 parts water.

Eco-Spill Fluid is a proven wooden deck cleaner on yachts, sailboats, etc., removing grease, grime, moulds and staining used at a 1:10 ratio.

Small amounts of cleaner may be introduced into the ship's ventilation system by means of an atomising spray to dispel foul air odours. A mixture of 1 part Eco-Spill Fluid to 25 parts water is an effective dilution for this application.

A concentration of 1 part Eco-Spill Fluid to 10 parts water very effectively removes mildew and moulds from lines, canopy, sails, rigging, upholstery, etc.

Eco-Spill Fluid are completely safe to use throughout the vessel and on any surface.

Eco-Spill Fluid works well when diluted with fresh or salt water and is one of the few cleaning solutions which may be used in any body of water without harming marine aquaculture, flora or fauna and does not alter marine eco-environmental systems. In addition, it contains no nitrates, sulphates, phosphates, sulphonates, caustics or chlorides.

Eco-Spill Fluid may be used for all purposes in the food services areas and galleys.

### Heavy Duty Cleaning – Commercial Marine

Eco-Spill Fluid can be used for the heavy-duty cleaning of cargo holds, fuel tanks, refrigerated containers, engine rooms and boiler fireside wash downs with no toxic or polluting properties. A 1:1 to 1:5 dilution rate is recommended.

For removal of crude oil and other petroleum products from the holds of tankers, Eco-Spill Fluid should be sprayed into the holds by low volume, high pressure pumps through the use of revolving spinner heads, which can be lowered into the hold.

The process of spraying should commence as soon as possible after the ship is empty, to prevent the formation of volatile gases from remaining crude oil or other petroleum residue. Continue the pumping process until Eco-Spill Fluid has covered the entire surface.

For best results this solution should be allowed to set about one hour. It is important to note, at this point, that Eco-Spill Fluid can be left on the interior of the holds for time periods longer than one hour with no problem. The initial hour is simply recommended to give it time to break down the crude oil or other petroleum products.

Cleaning engine rooms with a mixture of 1 part Eco-Spill Fluid to 5 parts water will degrade grease and oil and act as a fire preventative as the product is non-flammable and non-explosive.

Refrigerated containers may be cleaned with a solution of 1 part Eco-Spill Fluid to 10 parts (or greater for lighter soil) water. Cleaning with Eco-Spill Fluid will help to eliminate and control odours, as well. Also, successive cleaning should be easier once all the soil has been removed.

Since Eco-Spill Fluid is non-fuming, enclosed areas such as engine rooms, holds and ship interiors will

not be subject to additional gases and fumes making cleaning less hazardous to the personnel.

Always wear PPE when using any cleaner in confined workspaces.

### **Bilge Cleaning**

Use approximately 1 litre of Eco-Spill Fluid for every 100 litres of oil in the ship's bilge. Agitate with fresh or salt water at the rate of 1:1, water:oil. If at sea, the roll of the ship will agitate the solution sufficiently. If in the harbour, agitate with high pressure water until the oil goes into solution. When the Eco-Spill Fluid has completely absorbed the oil, the mixture should look milky. Eco-Spill Fluid is very efficient on residual fuel oils.



## Floor Cleaning Applications

### General Floor Cleaning

As an interior floor cleaning solution for factories, warehouses, offices, public buildings, etc. dilute 1 part Eco-Spill Fluid to 5 parts water and apply with mop, brush, spray or specialist floor cleaning equipment. It is safe on all flooring surfaces including paint and vinyls and is very effective in removing most hydrocarbon soil.

Use a 1:3 dilution for exterior surfaces such as driveways, car parks, loading bays, yards, fuel station forecourts, etc. or on heavily soiled internal surfaces such as vehicle workshops.

### Dust Reduction Applications

Because of the excellent wetting ability of Eco-Spill Fluid it is useful in areas where dust is a problem. Use a concentration of approximately 1 part Eco-Spill Fluid to 80 to 100 parts water. Spray on. When using in bowsters, fill with water first, then Eco-Spill Fluid. Do not reverse the procedure as foaming may cause filling problems.

The use of Eco-Spill Fluid should gradually reduce the frequency and amount of water needed to control dust in construction, sand and rock crushing operations, dirt race tracks, and similar areas.

The combined action of colloids and wetting agents suggest the use of Eco-Spill Fluid in areas where dust particles in the air create a potentially explosive environment such as manufacturing operations. Use 1 part Eco-Spill Fluid to 100 parts water and atomise into the air.

## Housekeeping Applications – Domestic and Commercial

Eco-Spill Fluid can be used for general cleaning in both a domestic and commercial setting. Eco-Spill Fluid is economic and effective on heavy-duty institutional applications. It is people and plant safe and safe to use on all surfaces when used as directed.

### Walls, Woodwork and Windows

As a wall cleaner, Eco-Spill Fluid does an exceptional job on virtually any surface. It is safe on paint, vinyl and acrylic. For cleaning walls, it is recommended that the washing always be done from the bottom up, and the rinsing from the top down. This will eliminate any potential streaking. For walls mix 1 part Eco-Spill Fluid to 80 parts water. Rinse with water or just wipe off.

As a wood cleaner, Eco-Spill Fluid is completely safe with no adverse effects such as spotting, streaking or raising the grain. It can be used on doors, desks, table, chairs, cabinets, railings, patio decking, etc. Use 1 part Eco-Spill Fluid to 80 parts water.

As a window and glass cleaner very little is required, and if too much is used, filming or streaking will occur. Use 1 part Eco-Spill Fluid to 100 parts water and squeegee or leather off. Glass will be cleaner and stay cleaner longer.

### Upholstery, Carpets and Rugs

A solution of 1 part Eco-Spill Fluid to 40 parts water is a good solution for stuffed upholstery - brushing on and then toweling off. Stains and spots may take a higher concentration, but avoid getting furniture too wet or using more than a concentrate of 1 part Eco-Spill Fluid to 20 parts water.

Use 70 parts water to 1 part Eco-Spill Fluid for cleaning rugs and carpets with cleaning machines. For spotting, use 20 parts water to 1 part Eco-Spill Fluid – sponging it on, agitating with soft bristle brush, and then wipe thoroughly with a towel.

Do not allow the carpets to become overly saturated Eco-Spill Fluid solution. Since the Eco-Spill

Fluid will not completely evaporate, and carpets cannot be rinsed off like walls or floors, care must be taken not to use too heavy of a concentration – the carpets become ‘tacky’.

Residue left in the carpet will continue to clean even the bottom of people’s shoes causing large dirty spots to appear where the concentrations have been too high or too wet in the cleaning. Should this happen, the addition of water to the spots will clean them, then towel thoroughly, fan, or vacuum out all moisture.

### Bathroom

Although Eco-Spill Fluid will not remove limescale, at 1 part Eco-Spill Fluid to 50 parts water it can be used as a general cleaner for bathroom floors, walls, sinks, toilet bowls, décor cleaning, light fixtures, shower trays and screens, etc.

### Fabrics - Spotting and Laundry

For bedspreads, curtains; towels; sheets; or any fabrics, Eco-Spill Fluid becomes an effective stain and spot remover. It is effective on the following types of stains: alcohol, food, milk, ammonia, fruit, mustard, beer, fruit juices, nail polish, blood, nicotine, butter, glue, oil, candy, grass, ointment, chewing gum, grease, light rust, chocolate, household cement, ice cream, cocktails, smoke, coffee, inks, ketchup, cooking oil, pet stains and many more.

Eco-Spill Fluid should be used at a 1:1 dilution with water, allowed to sit 15 minutes, brushed and agitated into stain and then rinsed. If it is an old stain, or very stubborn, repeat the process allowing to sit for 15 – 30 minutes after agitating; then rinse. Several applications may be necessary, but usually will be removed after one application.

**Note:** that certain stains such as coffee, tea, or beverages which have been previously washed with caustics may have no remaining hydrocarbon which is necessary for Eco-Spill Fluid to attack and remove.

Eco-Spill Fluid may be added to the laundry at the same time as laundry powder at a rate of 30ml per 5 litres of water. It increases the cleaning power of the detergent or soap and assists in removing heavy oils, soils, inks, etc. For lighter cleaning, it may be used alone in domestic laundry applications. Fabric conditioners are compatible with Eco-Spill Fluid.

**Note:** Washing machines that have accumulations of residues from the soap powders and detergents previously used will be cleaned by Eco-Spill Fluid. There will be occasions when this cleaning has left the washer filled with "gunk" which has been lifted from under the agitator of the machine. It is recommended, therefore, that machines with heavy encrusting be run through a wash cycle with only Eco-Spill Fluid and water.

## **Appliances**

Use 1 part Eco-Spill Fluid to 100 parts water for the exteriors. On fridges, freezers, stoves, grills, fans, vents, filters, etc. where heavy accumulations of grease and oil exist, use a ratio of 1 part Eco-Spill Fluid to 5 to 20 parts water depending on the soiling. Always apply cleaner from bottom up and remove from top down to avoid streaking.

## **Dish Washing**

Use Eco-Spill Fluid (un-diluted) to replace conventional liquid dishwashing soaps.

Add 30ml of Eco-Spill Fluid to wash water, rinse dishes under hot water and let dry. Due to the microbial action of Eco-Spill Fluid regular use will help reduce clogging of kitchen drains.

**Note:** About 10ml of Eco-Spill Fluid to the load in an automatic dishwasher will act as a wetting agent and do an excellent job of cleaning. Too much will cause foaming.

## Restaurant and Kitchen Applications

Eco-Spill Fluid is an effective, efficient and economical general purpose cleaner for all types of restaurant and kitchen cleaning jobs. It is safe to use in food preparation areas, serving areas and as a dishwashing liquid. It is 100% rinsable, removing bacteria that can feed germs, mould and mildew.

### Extractor Hoods

Eco-Spill Fluid is excellent for cleaning vents and hoods over kitchen ovens and ranges. Since it is completely non-flammable, the danger of grease fires resulting from inadequately cleaned vents, etc., is greatly reduced.

For cleaning washable hood vent filters, a solution of 1 part Eco-Spill Fluid to 10 parts water makes an effective solution to soak extractor filters in. Let the filter soak for up to 3 hours before rinsing. Dry thoroughly then reinstall.

For hood vents, etc, use 1 part Eco-Spill Fluid to 20 parts water in order to degrease and de-film.

### Nicotine Stains

A solution of 1 part Eco-Spill Fluid to 80 parts water sprayed onto ceilings and walls and allowed to drip on a catch cloth will remove nicotine accumulations. Spray with water to rinse using a light mist.

### Ornamental Metals

Silver, brass and other ornamental objects may be soaked in a 1 part Eco-Spill Fluid to 5 part water solution to remove light tarnish, or prolonged soaking will remove and release most tarnish so that polishes may work even better and bring out higher luster.

### Kitchen Utensils

Eco-Spill Fluid may be used for soaking utensils before washing, resulting in a renewed shine and brilliance to their surfaces. 1 part Eco-Spill Fluid to 80 parts water produces excellent results. Burned pots and pans may also be soaked in a solution of 1 part Eco-Spill Fluid to 40 parts water.

### Stainless Steel

A dilution ratio of 20 parts water to 1 part Eco-Spill Fluid should be used for cleaning and wiping down all stainless steel appliances and surfaces.

### Ovens and Fryers

To clean ovens and fryers, best results are obtained by applying Eco-Spill Fluid at a dilution of 1:1 with the equipment at a temperature 40-50°C. If possible, let stand overnight and rinse down the following day when convenient, using a stiff brush, if necessary.

**Note:** At temperatures above 50°C the microbial action of the product will cease.

### Sinks and Drains

Eco-Spill Fluid has proven useful in relieving clogged sink traps and drains. However, since conditions vary from one situation to another, results will likewise vary. It is recommended that light ratios of Eco-Spill Fluid to water be used initially, gradually increasing the ratio until satisfactory results are obtained, or until it becomes obvious that professional plumbing assistance is required.

### Steam Cleaning

Eco-Spill Fluid is a concentrate which may be used in steam cleaners and other cleaning equipment, as well as all food processing areas and equipment in any food processing capacity. Typical dilution rates are 1 part Eco-Spill Fluid to 10 parts water.

Eco-Spill Fluid is safe on any surface that will tolerate steam. Because of its colloid action, it will keep scale from forming in the steam coils and prolong the life of the cleaning equipment.

## Aircraft Exterior and Interior

Eco-Spill Fluid is an effective, safe product to use for all cleaning of aircraft. It is non-fuming, nonflammable and non-toxic to personnel. Requires no safety gear and is safe and non-drying for normal skin.

Most cleaners, if sold to the government, military or aircraft service agencies, must meet or exceed U.S. Mil-C specification, Boeing, Douglas or Lockheed specifications or be on the federal QPL (Qualified Products List). Eco-Spill Fluid colloid release agent mixed with water meets Douglas CDSI and Boeing Aircraft specifications for exterior surface cleaning.

Eco-Spill Fluid passes Boeing D6-17487 Revision M, Exterior and general cleaners and liquid waxes, polishes and polishing compounds.

Eco-Spill Fluid passes Douglas Aircraft Company Customer Service Document CSD #1, Revised August 2nd, 1988, Type 1: Materials and procedures for general exterior cleaning of painted and unpainted surfaces.

Eco-Spill Fluid passes AMS 1526B, Cleaner for aircraft exterior surfaces water miscible, pressurespraying type.

## Eco-Spill Powder (XO1802CU)

### General Description and Information

Eco-Spill Powder is the leading premium absorbent on the market today. It is manufactured from 100% renewable resources and is certified 100% bio-organic. Comprising of agricultural byproducts, Eco-Spill provides the user with a high capacity absorbent which absorbs up to eight times more oil than clay type absorbents.

What Eco-Spill Powder does for you?

Reduces shop down time by 80%

Reduces absorbent cost by 70-90%

Reduces disposal cost by 66-75%

Reduces handling, storage, and operator fatigue.

Reduces slip/fall potential

Eco-Spill Powder is different in the fact that active cultures and an organic nutrient package have been introduced. The purpose of this package is to assist in the bio-remediation of organic spills.

Eco-Spill Powder is ideal for any maintenance, repair or operation facility that deals with spilled or sometimes loose petroleum liquids. Essentially, if there is the potential of a spill, then Eco-Spill Powder should be your absorbent of choice.

### Eco-Spill Powder:

- Absorbs petroleum based products on contact
- Reduces "Time On Spill"
- Is 8 times more absorbent than clay-based products
- Reusable up to saturation
- Safe for the environment
- Non-leaching up to saturation

The main benefit to Eco-Spill Powder over conventional absorbents is that **you only dispose of what you use** as opposed to throwing away perfectly good absorbent as you would with clay, paper pulp and polypropylene absorbents.

### Certified 100% Bio-Organic and 100% renewable resource material

The basis for Eco-Spill Powder is grown, harvested and processed every year.

## Industrial and Commercial Applications

### Absorbing of oils and fuels

Eco-Spill Powder absorbent is perfect for absorbing all free petroleum-based products that have been spilled on a hard surface. Eco-Spill Powder will absorb a variety of spilled liquids, but is most suited for hydrocarbon-based or petroleum spills like oils and fuels. Eco-Spill Powder is not meant for use on water, it is for land-based spills only.

### Directions for use

Apply enough Eco-Spill to completely cover the spill and work in the absorbent to the spill with a stiff bristled brush or the backside of a non-ferrous shovel (flat blade works best). It is important to remember to sweep the spill in multiple directions to remove any absorbent from cracks, crevasses or holes that may be present in the surface material.

If the absorbent becomes very dark or “wet” looking, you may need to add more Eco-Spill absorbent. The absorbent will turn a darker brown when absorbing, but should be dry to the touch and not “wet” or “shiny” looking. If the absorbent is “wet” looking then the absorbed liquid will leach back into the environment. Eco-Spill Powder may be re-used up to saturation.

Recover the spent absorbent with a shovel and return to a proper recovery bin or HAZMAT drum for final disposal. Unused Eco-Spill Powder may be separated from the used absorbent by classifying through a classification system. This will allow the user to extend the use of the absorbent by only disposing of the used absorbent.

NOTE- Eco-Spill Powder is shipped in Rough-Duty bags which also make an excellent temporary storage bin for recovered absorbent.

Because Eco-Spill Powder is a “fine-fibre” absorbent it is always important to apply the absorbent as close to the spill as possible. Never dump the product from a height greater than your knees unless collateral “dusting” is not a concern.

### Storage of Eco-Spill Powder

Eco-Spill Powder should be stored in dry, covered conditions protected from the weather. If the bag becomes wet or damaged the product may be dried out and repackaged into another container. Since Eco-Spill Powder contains an active culture package, wet absorbent may activate the bacteria. A discoloured spot may appear on the outside of the bag as well as the product becoming warm. The warm product is from the energy generated by the microbial growth. If this occurs, simply dry out the product by mixing it and repackaging in a dry container. The bacteria will revert to a dormant state when the moisture level is removed by re-mixing.

## Using Eco-Spill Powder as a Bio-Remedial Agent

Eco-Spill Powder contains an active-culture package (a.k.a. microbes or bacteria) which has been engineered to break down a wide variety of hydrocarbon chains. The cultures, however, provide a proactive ecological solution to reducing environmental collateral damage from spilt oils and fuels. To assist in the growth on the cultures which is important for any remediation to take effect, there is also a certified 100% bio-organic nutrient added. The nutrient provides essential nutrient needed by the cultures to populate as well as providing additional growth and support for the indigenous plant life.

Eco-Spill Powder is ideal as a first-line defence for providing additional environmental impact due to spills in soil environments. Although Eco-Spill Powder contains an active culture package to help breakdown (remediate) hydrocarbons, it should not be used as the sole product for remediation of large spills or contaminated sites. It is always important first comply with all local regulations and guidelines before attempting any sort of bio-remediation to the soil.

### Basic guidelines to remediation

- Always absorb and remove free standing fluids before starting any remediation efforts with Eco-Spill Powder.
- Baseline testing in the form of a TPH (Total Petroleum Hydrocarbon) test (TPH 418.1) should be performed before inoculation of the site with any bio-remedial agent, to determine the amount of contamination. This test can be performed by most any local testing facility found in the phone book.
- Eco-Spill Powder can be mechanically tilled into the soil to absorb and prevent further soil contamination.
- The soils should be kept at a 20-30% moisture rate to provide ample water content for microbial reproduction.
- Consult professional advice before starting any remediation project.

### Before you start

Bio-remediation is more than just using products, it is a commitment to clean the environment properly. If you have no experience in bio-remediation, please consult with a professional before starting a project.

### General Remediation Protocol

The following information is a general outline for “product to contaminated soil” ratios and is not a formula to follow for every remediation site. This document is a general guideline and actual application rates and dosing should be confirmed by a remediation expert.

**For spills in the environment that are fresh and still damp with the possibility of further leaching into the soil.**

### Visual conditions

- Soil looks wet and may have puddles of free-standing hydrocarbons.

### Application rates and bio-cell management

- Apply two bags of Eco-Spill Powder per cubic metre of contaminated soil. The contents need to be mechanically mixed with the soil. If the top surface of the soil has standing hydrocarbons, apply enough Eco-Spill Powder to completely absorb the standing hydrocarbons, before any excavation begins.
- Bio-cells should be roto-tilled every week and watered daily. May vary depending on climate conditions
- Soil moisture levels should be kept at 20-30%.

Additional applications may be required to meet established environmental guidelines for soil clean-up.



## Carbon Staining on Concrete

One of the most popular questions that we are asked is, "if my concrete is clean, then why is there still a stain?". First, let's look at what caused the stain... oil and in 99% of the cases, it's from used motor oil. So why does it stain? For this we need to understand what oil is really made from?

Motor oils are derived from petroleum-based and non-petroleum synthesized chemical compounds. Motor oils today are mainly blended by using base oils composed of hydrocarbons (mineral, polyalphaolefins (PAO), poly internal olefins (PIO), thus organic compounds consisting entirely of carbon and hydrogen.

The majority of hydrocarbons that are found naturally occur in crude oil, where decomposed organic matter provides an abundance of carbon and hydrogen which, when bonded, can catenate (to form a long chain structure) into seemingly limitless formulation of oil, gas, grease, gasoline, diesel fuel, etc.

The primary ingredients found in crude oil are: Carbon 83-87%, Hydrogen 10-14%, Nitrogen 0.1-2%, Oxygen 0.1-1.5%, Sulfur 0.5-6% and metals which typically are less than 1000ppm. Used motor oil turns darker as the lubricity additives and gas molecules break down from heat, leaving a higher concentration of carbon (that's why it is darker than new oil).

With that said, you noticed that carbon is the main ingredient in oil; it's what makes crude oil so black. You also noticed that there are several gases involved as well as other organic materials like metals which are the result of trace minerals that exist in soil like iron, copper, zinc, but these percentages are very low compared to carbon.

When we have an oil stain on a surface like concrete (which contains millions of very small pores for the oil to get trapped in) the oil penetrates into and under the surface until it is extracted out. Many people use absorbents like Eco-Spill Powder which has a

unique wicking capability that draws the oil to the surface, helping to reduce staining and collateral environmental impact. Many shop applications use a mop and bucket system immediately and again, this helps to reduce staining and collateral environmental impact.

Then there are the ones that choose to respond to the spill several days, weeks or months later. When this happens, that oil sits in the pores and begins to oxidize. Oxidation occurs when an additional oxygen molecule is added to the hydrocarbon molecule. With one extra oxygen molecule, the hydrogen (gas), nitrogen (gas) and additional oxygen molecule (gas) are released into the atmosphere... essentially evaporation is occurring.

As the oil is oxidized, more and more carbon is left behind which is organic just like the concrete, but now the concentration level is closer to 90-95% and it's very dark now. When you use a cleaner like Eco-Spill Fluid for concrete cleaning you are breaking down the residual oil that hasn't oxidize completely. If you use the right dilution ratio (yes, you need to dilute and rinse with water for efficacy) you will effectively clean the hydrocarbons (carbon + hydrogen + nitrogen + oxygen + sulfur + oil additives + sludge + dirt) from the surface!

But you still have a stain, right? The remaining stain is more of a combination of residual oil under the surface and staining from the high levels of carbon left behind from oxidation. Carbon is an excellent dye. Did you know that tires are naturally white? Carbon is used to dye them black. Coal is composed primarily of carbon along with variable quantities of other elements, mainly sulfur, hydrogen, oxygen and nitrogen (sound familiar?). Charcoal is primarily carbon, burnt wood turns black as the only thing that remains from the cellulose and lignin is the carbon. All of these items are dry to the touch, but leave behind a black stain, the same stain that remains in concrete after you've cleaned it up.

So is the surface really free of oils? Is the surface slip free? When you touch it do you get oil on your fingers? Proper use of Eco-Spill Fluid should have removed as much oil as it came in contact with (remember there are millions of pores in concrete). Repeated use and a good housekeeping protocol will help to clean any remaining sub surface oils and the stain will lighten with time, but it may never truly go away.

There are other ways to remove concrete staining, but these are either very caustic or acidic solutions, which in turn damage the concrete. These quick and dirty methods will cost you more in the long run as you will have to eventually replace the concrete or resurface it. The best method is to clean the spill up when it occurs. If your stain is old and dry to the touch, you will need to be patient as it will take a long time to remove, but it can be done.

### **General Floor Cleaning Protocol**

When trying to remove oil compounds and heavy soil from concrete, there needs to be the understanding of how long that stain has been there and that RESULTS MAY NOT BE IMMEDIATELY OBSERVED. The longer the time, the more difficult that it will be to remove.

#### **Initial Treatment:**

1. Pre-treat the surface with heated (40°C) Eco-Spill Fluid (non-diluted).
2. Let it soak in for a minimum of 5 minutes.
3. Use mechanical agitation to loosen oil and soils.
4. Recover liquids using a vacuum system or absorbent material.

#### **Daily Maintenance:**

Mop Bucket and light soils- Use a dilution ratio of 1:20-1:50 of Eco-Spill Fluid (dilution ratios may vary) and mop as required.

Mop Bucket and medium soils- Use a dilution ratio of 1:10-1:20 of Eco-Spill Fluid (dilution ratios may vary) and mop as required.

Mop Bucket and heavy soils- Use a dilution ratio of 1:3-1:5 of Eco-Spill Fluid (dilution ratios may vary) and mop as required.

- The same dilution ratios can be used in mechanical walk behind systems.

It is important to respond to spills immediately to minimize surface contamination.

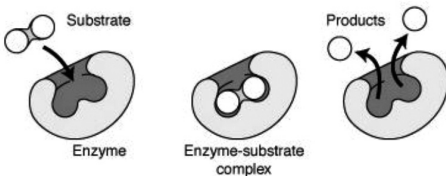
## Simplified Microbiology

### How bacteria eat/consume/digest/degrade/convert

Bacteria have special channels in their cell walls and cell membranes which allow, or even assist some molecules to pass through. Once the molecules are inside the cell, they can be broken down into their component parts before being rebuilt into the macromolecules the bacteria needs in order to build and repair its self, or generate energy. Unfortunately for the bacteria, the surrounding environment is not always full of free-floating molecules of the correct sort.

To solve this problem bacteria have evolved the ability of leaking enzymes out into the environment around them. These enzymes then attack specific tissues and molecules (proteases attack proteins, cellulases attack cellulose etc) and break them up into smaller units. These smaller units can then be absorbed by the bacteria through the channels mentioned above.

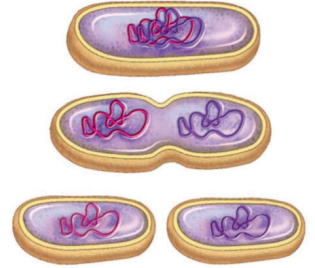
A common mistake in education is that enzymes “eat” things. Enzymes act like a fork and knife for the bacteria, cutting up their food into smaller pieces for intake. Enzymes are also beneficial in the fact that they break apart grease and grime build up commonly found in drain line systems. However, this practice only transfers the “grease” somewhere else in the system and does not degrade it, only bacteria will.



### How they reproduce

The simplest form of bacterial reproduction is called binary fission. Essentially, this is where a bacterium grows to about twice the size of the smallest bacterium and then splits in two. First, the DNA in the cell makes a copy of itself. The two copies separate in the cell and the cell grows two new cell membranes and two new cell walls through its middle, effectively

cutting the cell in half, to make two cells. This is asexual (the “a” in front meaning without) reproduction because both the daughter cells have exactly the same DNA as the original cell and only one cell is involved. Bacteria are not quite the same as the higher animals but they do transfer DNA from one individual to another.



### How they are modified for specific purposes.

Some methods of DNA transfer between cells seem almost accidental. When one bacterial cell dies and its cell wall is ruptured, the contents of the cell are released into the environment. This includes the DNA which may be complete or broken into bits. Other nearby bacterial cells can absorb this DNA and add it to their own and in this way they gain extra DNA, if the dead cells DNA codes for a property they do not have, then they have gained this property. This is how bacteria evolve into multi-purpose degraders or single source degraders.

exocet® Eco-Spill products only use bacteria that are class one, ATCC certified bacterium, which it is non-mutating, non-pathogenic and non-carcinogenic. What does this mean? It means that our bacteria are no more dangerous than yeast for bread, yogurt, beer and wine. In an effort to prevent the word “bacteria” from getting an unpopular association with disease, we like to use the word “active culture”, which is commonly associated with something good, like yogurt and cheese.

## **Bacteria profile**

- Reproduce Quickly
- Safe, non-pathogenic, naturally occurring in the environment
- Form spores for long term stability
- High level production of multiple enzymes
- Function in or under diverse environmental conditions

## **Basic requirements of the active culture**

Active cultures require three items in order to sustain life; these are water, a food source and oxygen.

Environmental conditions are also important for the growth and success of bacteria. Temperatures between 30-45°C provide optimal conditions as well as a neutral pH level.

This application manual constantly changes and is updated on a quarterly basis. If you have a new use and success for any Eco-Spill product that may be of benefit to others, please let us know so that we can expand this manual.





# Eco-Spill Fluid

## SUMMARY DILUTION CHART

All ratios Eco-Spill:water

### Oil Spill Applications 1:40

#### Vehicle Applications

- Engine bays, blocks 1:3
- Wheels and undercarriage 1:5
- Bodywork 1:30
- Screenwash bottle 1:100
- Interiors 1:40
- Fascias 1:80

#### Industrial Applications

- Heavy soiling 1:3
- Light to medium 1:10
- Hand cleaning 1:1
- Steam cleaning and pressure washing 1:1

#### Maritime Applications

- Engine rooms, etc 1:5
- Decks, cowlings, windshields, hulls and bulkheads 1:30
- Wooden decks 1:10
- Ventilations systems 1:25
- Upholstery, sails, rigging, canopies 1:10
- Refrigerated compartments 1:10
- Bilge cleaning (see guide) 1:1

#### Floor Cleaning Applications

- General interior cleaning 1:5
- General exterior cleaning 1:3
- Heavily soiled 1:2
- Dust reduction 1:80

## Housekeeping Applications

- Walls and woodwork 1:80
- Windows and mirrors 1:100
- Upholstery, carpets and rugs - general 1:40
- o with cleaning machine 1:70
- o spotting 1:20
- Bathrooms/washrooms 1:50
- Fabric and laundry (spotting) 1:1
- Washing machines (with powder) 1:200
- Appliances - Exteriors 1:100
- Degreasing 1:5 to 1:20
- Dishwashing 1:200

## Restaurant and Kitchen Applications

- Air filters 1:10
- Vents and hoods 1:20
- Nicotine stains 1:80
- Ornamental metals 1:5
- Kitchen utensils 1:80
- Burnt pots and pans 1:40
- Stainless steel surfaces 1:20
- Ovens and fryers 1:1
- Sinks and drains (see guide) 1:10
- Steam cleaning 1:10

## Aircraft Applications

- See Vehicle and Kitchen Applications



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