PROBIO RANGE: **FACTS**

GREENSPEED™
crazy about cleaning

DEEP CLEANING AND ODOUR CONTROL

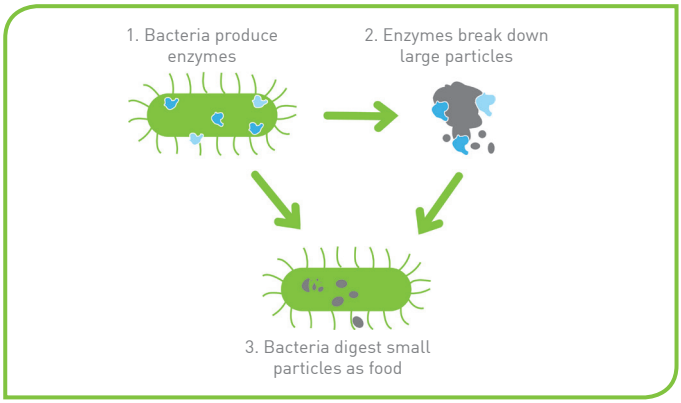
The probiotics in the Greenspeed products are very active producers of a wide range of enzymes, which are commonly known to actively break down organic pollution (carbohydrates, proteins, fats ...).

As a result, odours are actively controlled and remove substances that other micro-organisms can turn into odours. Above this probiotics remove grime and organic dirt even deep in the surface.

HOW IT WORKS

During cleaning the probiotic cleaning agents leave behind a layer of probiotics (good bacteria) on the cleaned surface. These probiotics require nutrients to survive. They search for nearby nutrients in the shape of organic grime. The probiotics secrete enzymes to be able to utilise this grime as a nutrient source. Probiotics are capable of creating many different enzymes, as each type of organic grime requires its own specific enzyme. Some examples:

- Proteases break down any grime consisting primarily of proteins such as blood, urine, foodstuffs, faeces, beverages, etc.
- Lipases break down fat molecules such as oil and grease
- Amylases break down carbohydrates such as those found in sugar, sauces, ice cream, etc.



Once the enzymes have broken the organic grime into fragments, the probiotics can absorb and digest these fragments as nutrients.

As the probiotics continue to function for days after cleaning, the effect of these products is long-lasting. Moreover, the probiotics and the enzymes they produce are 100% organic and natural, and completely harmless.

One result is that the probiotics are capable of deep-cleaning the treated surface much more thoroughly, allowing even stubborn grime to disappear. For an example, see the included picture of grout that was stained black, but is completely clean again after two weeks of probiotic cleaning.

Greenspeed's probiotic products contain a complex mix of probiotics that are very active in the production of all kinds of enzymes, enabling them to tackle a wide range of organic grime.

WHY ENVIRONMENT BENEFICIAL?

The Probio range of Greenspeed is the first professional cleaning range of probiotic cleaning products obtaining the EU Ecolabel. The use of probiotics as ingredients in Ecolabel cleaning products is new since 2017 and provides a wide range of benefits, such as longterm odour control and microscopic deep cleaning. One additional benefit is that the probiotics actively contribute to improve the environment, making these products 'environment beneficial'!

1. Environment beneficial vs Environment friendly

- **Environmentally friendly** (eco-friendly, nature-friendly, and green) is a sustainability and marketing terms referring to products that claim reduced, minimal, or no harm upon ecosystems or the environment.
- **Environment beneficial** refers to products that positively and actively contribute to a cleaner environment.

2. Environment benefits

The probiotics used in the Greenspeed Probio range are all biosafety level 1, food grade, organisms. They are originating from soil and water, 100% natural. Because of this natural origin they integrate well in a natural microbial ecosystem and will help to restore and maintain a healthy natural microflora in the environment.

The Greenspeed Probio products contain a broad

range of Bacillus probiotics, which are known to have the following environment beneficial properties:

Removing oil contaminations

Soil and water are often polluted with oil. Several Bacillus species are capable of biodegrading oil pollutants. Such biological removal of oil from soil or water is referred to as bioremediation. The Greenspeed Probio products contain Bacillus species that are capable of degrading oil pollutants.

Example 1: Removal of palm oil from waste water.

Lipase production from a novel thermo-tolerant and extreme acidophile Bacillus pumilus using palm oil as the substrate and treatment of palm oil-containing wastewater. Saranya P, Sukanya Kumari H, Prasad Rao B, Sekaran G. Environ Sci Pollut Res Int. 2014 Mar;21(5):3907-19.

Example 2: Removal/recovery of light and heavy crude oil.

Biosurfactant production by Bacillus subtilis B30 and its application in enhancing oil recovery. Al-Wahaibi Y, Joshi S, Al-Bahry S, Elshafie A, Al-Bemani A, Shibulal B. Colloids Surf B Biointerfaces. 2014 Feb 1;114:324-33

Treatment of diesel- and kerosene-contaminated water by B. subtilis SPB1 biosurfactant-producing strain. Mnif I, Ellouze-Chaabouni S, Ayedi Y, Ghribi D. Water Environ Res. 2014 Aug;86(8):707-16.

Removing toxins from soil or water

Water and soil can become contaminated with a wide range of toxins, originating from microbial, plant or animal activity. Certain Bacillus species are capable of neutralizing/degrading such toxins, making water and soil safer.

Example: Cyanide removal from (waste) water.

An effective method for the detoxification of cyanide-rich wastewater by Bacillus sp. CN-22. Wu CF, Xu XM, Zhu Q, Deng MC, Feng L, Peng J, Yuan JP, Wang JH. Appl Microbiol Biotechnol. 2014 Apr;98(8):3801-7

Removing harsh chemicals from soil or water

Often resulting from industry or agriculture, water and soil may be contaminated with chemicals that are not naturally present in nature. Such chemical may be referred to as xenobiotics. Bacillus species are well-known to be able to absorb/degrade a range of xenobiotics in order to purify water and soil.

Example 1: Treatment of tannery wastewater with Bacillus.

Integrated Bacillus sp. immobilized cell reactor and Synechocystis sp. algal reactor for the treatment of tannery wastewater. Sekaran G, Karthikeyan S, Nagalakshmi C, Mandal AB. Environ Sci Pollut Res Int. 2013 Jan;20(1):281-91

Example 2: Removal of Fipronil from soil.

Bioremediation of fipronil by a Bacillus firmus isolate from soil. Mandal K, Singh B, Jariyal M, Gupta VK. Chemosphere. 2014 Apr;101:55-60.

Removing heavy metals from soil or water

A toxic heavy metal is any relatively dense metal or metalloid that is noted for its potential toxicity, especially in environmental contexts. The term has particular application to cadmium, mercury,

lead and arsenic, all of which appear in the World Health Organisation's list of 10 chemicals of major public concern. Heavy metals are found naturally in the earth, and become concentrated as a result of human caused activities. Common sources are from mining and industrial wastes; vehicle emissions; lead-acid batteries; fertilisers; paints; treated woods; aging water supply infrastructure; and microplastics floating in the world's oceans

Example 1: Removal of lead from wastewater.

Characteristics of Bacillus sp. PZ-1 and its biosorption to Pb(II). Ren G, Jin Y, Zhang C, Gu H, Qu J. Ecotoxicol Environ Saf. 2015 Jul;117:141-8.

Example 2: Removal of heavy metals from waste water by Bacillus subtilis.

Biosorption of heavy metals from aqueous solution by UV-mutant Bacillus subtilis. Wang T, Sun H. Environ Sci Pollut Res Int. 2013 Oct;20(10):7450-63.

Conclusion: The Greenspeed Probio products contain a wide range of Bacillus species that are known to remove pollutants from water and soil. When applying these products, the environment beneficial probiotics will end up in the environment and contribute to a safer and cleaner world.

YES IT IS SAFE!

All bacteria used in the Greenspeed Probio products are natural probiotics, also used in food industry as dietary supplements. As such, these probiotics are food grade (meaning allowed for human consumption).

The wide range of probiotic bacteria used, Bacillus species, are classified and recognized as probiotic food supplements. This classification is officially done by two institutions:

1. ATCC (American Type Culture Collection)

All bacteria that were ever discovered are listed in the official international collection of bacteria. This collection is called the American Type Culture Collection (ATCC) and maintains samples of all bacteria, together with all of the scientific data available about them. www.atcc.org - for all information.

ATCC classifies every existing micro-organism in a biosafety level, level 1 being safe micro-organisms and level 4 being very contagious pathogens.

This biosafety classification is based on U.S. Public Health Service Guidelines: http://www.cdc.gov/biosafety/publications/bmbl5/index.htm

All the probiotics used in the Greenspeed products classify under Biosafety level 1 and as such, are safe!

2. EFSA (European Food Safety Authority)

The second part of the safety classification is done by the European Food Safety Authority (EFSA) who publish a list of micro-organisms that are allowed for human consumption. This list is called the QPS list (Qualified Presumption of Safety) and can be found via this link: https://www.efsa.europa.eu/en/topics/topic/qps

All probiotic bacteria used in the Greenspeed products are on the QPS list and are as such, safe for human consumption.

Conslusion: All probiotics in the Greenspeed products are of natural origin and not GMO (Genetically Modified Organisms). They are classified in Biosafety Level 1 (ATCC) and are on the QPS list (EFSA). These official classifications guarantee that Greenspeed uses only 100% safe probiotics.

WOULD YOU LIKE MORE INFORMATION?
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