

BIOVERSAL International

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BIOVERSAL International

- Product development 1997 to 2002
- Foundation of BIOVERSAL International GmbH
date 05/2003
- Exclusive rights for worldwide sale
- Austria, 12384 Breitenfurt/Vienna,
Georg Sigl-Straße 16
- www.bioversal.com

The product (\')

Singularly, new technology:

BIOVERSAL contains biocompatible surfactants, which accelerates the regenerations of nature.



The product (۲)

- Mild characteristics of a surfactants with prompt effect following an oil spill
- Accelerates the decontamination of soil and water by stimulating the bacterial degradation
- Low ecotoxicity
- High environmental compatibility
- High environmental effectiveness

Intact ecosystem

A functioning and intact ecosystem with fauna and flora also includes micro-organisms in a stable interrelationship with their environment.

They fulfill an important function for sustaining the ecological equilibrium.



Oil pollution disturbs the structure

Spilled fuel, oil, grease and other organic pollutants have a massively negative effect on the ecological equilibrium in water and soil structures.



Natural regeneration takes time

Natural regeneration takes place without using BIOVERSAL products, but it takes much longer and subsequent ecological damage will not be prevented.



Use for decontamination

BIOVERSAL technology accelerates biological regeneration by enlarging the oil surface.

The simultaneous encapsulation of the oil particles impedes the characteristic adhesive power of the oil to accumulate on solid surfaces.

Special surfactants produce oil particles which are easy to use biologically and have a large working surface.



Oxygen exchange becomes possible again

Oil slicks covering large areas can no longer form and natural oxygen exchange is ensured.

Animals and plants can survive.



Biological breakdown begins

The BIOVERSAL product contains stimulating substances and a vegetable active substance (activator).

These create the best possible living conditions for the micro-organisms present, resulting in accelerated population development.



Degradation takes place

Two important factors in the degradation process include:

- The interplay between the enlarged pollutant surface and
- The simultaneously increasing population growth of the micro-organisms.



Accelerated pollutant degradation

The two factors enormously accelerate the natural regenerations of the contaminated area and restore ecological equilibrium more rapidly.



The ecosystem is restored

BIOVERSAL technology helps restore an endangered ecosystem quickly and efficiently.



Product family

- Due to the singular and intelligent product attributes of BIOVERSAL, it can be used in many different markets.
- Special products have been developed for different circumstances. They all contain the same excellent biological characteristics.
- The products adjust to each special circumstances.

Product family

- **Product groups**

- BIOVERSAL QF
- BIOVERSAL HC
- BIOVERSAL FW
- BIOVERSAL Manteq
- BIOVERSAL Oiltec
- BIOVERSAL MX

- **Application**

- fire & oil contamination
- ground/water contamination
- Oil accident streets/waters
- Tool cleaning and industrial spills
- Cleaning fuel stations
- Filling fire extinguisher

Authorization & Certificates

- BIOVERSAL fulfills the most important European and Intern. standard within the fire extinguishing technique (EN ۱۵۶۸-۳, ICAO).
- BIOVERSAL was tested in many countries worldwide and approved for use in nature when used according to directions.

Internationally accepted experts confirm the effects of BIOVERSAL

Institute	Test	Subject	Result
District Government of Lower Austria Group: WA ² Dept.: water management	Examined and documented by experts	Chemical-technical evaluation as fire and cleaning and/or decontamination product	Official endorsement for the application of products for the recovery of incidents with mineral oil derivatives in unprotected free nature
TNO – Netherlands TNO – Letter from 6. April 1999	Acc.: EN 3 und UL 162 § 15 Test object: 4,63 m ² 200 l N Heptan 185 l Isop. Alcohol	BIOVERSAL QF Extinguishing Capacity as Foam	100% extinguished, Heptan 1 min 25 sek. Alcohol 2 min 55 sek. No Reignition Consumption: Heptan 2,31 l/min/ m ² = 1/8 l BIOVERSAL QF Alcohol 3,89 l/min/ m ² = 1/4 l BIOVERSAL QF
APRAGAZ Brussels, Belgium	Examination for the permission of portable hand fire-extinguishing devices acc. EN 3 Part 1 § 7.2 and 7.3	Examination for Europe for the equipment with 6 and 9 litres contents	Examination results according to EN 3

Internationally accepted experts confirm the effects of BIOVERSAL

Institute	Test	Subject	Result
Institute for Fire Protection and Safety Research, state approved laboratory	Long term examination according to Ö-standard F 1050 for the BIOVERSAL fire-extinguishing equipment	BIOVERSAL-Portable Extinguisher S 10	Permission of the portable extinguisher according to ÖN-standard F 1050
Materialprüfungsamt Nordrhein-Westfalen MPA/NRW Dortmund	Acc.: GMBI 1991 S. 681	Procedure for the removal of oil trail on roads	Corresponds to the requirements of the testing method
Derma Consult GmbH Gesellschaft zur Prüfung von Dermatika Deutschland	Acc.: Patch Test	Human Skin Compatibility	Concentrate is to be classified as harmless
Hygiene-Institut des Ruhrgebietes Gelsenkirchen, Institut für Umwelthygiene und Umweltmedizin	Eye and Skin irritations	Industrial Medical Examination and Assessment	No doubts about application

Internationally accepted experts confirm the effects of BIOVERSAL

Institute	Test	Subject	Result
Hygiene-Institut des Ruhrgebietes Gelsenkirchen, Institut für Umwelthygiene und Umweltmedizin	Determining of WGK Acc.: T.T.C.-DEV.L ³	Bacteria toxicity	Water pollution class: WGK · in the application concentration
	Acc.: K.20/212	Fish toxicity	
	Acc.: OECD 201 C	Biological degradation	
	Acc.: KZ 20 / 207	Mammal toxicity	
Hygiene-Institut des Ruhrgebietes Gelsenkirchen, Institut für Umwelthygiene und Umweltmedizin	Acc.: OECD Guideline	Biological Degradation of BIOVERSAL- Detergents	Elimination rate: > 99% within 7 days

Internationally accepted experts confirm the effects of BIOVERSAL

Institute	Test	Subject	Result
Institute for Agrarbio- technology „IFA Tulln“ Univ. f. Bodenkultur, Vet. Med. Universität und Techn. Universität Wien	DECHEMA Guideline Laboratory methods for the evaluation of feasible bioremediation of contaminated soil	Biological degradation accelerator in the soil matrix	Excellent biological degradation achievement and/or degradation accelerator of the pollutants in soils after crude oil damage
Italianische Energie- Verbundgesellschaft ENEL Riccera, Area Ambiente Via Reggio Emilia, 39 I-20090 Segrate (MI)	Evaluation of the product BIOVERSAL HC on its environmental-friendliness and efficiency in relation to hydrocarbons in the soil and water by means of laboratory test	Investigation of a toxic long- term effect regarding the accelerated biological degradation behaviour of hydrocarbons with BIOVERSAL HC	The supporting effect of BIOVERSAL HC with the biological dismantling of hydrocarbons in soil and water was clarified. No toxic long-term effect
I.M.U., Institute for Crude oil products and Environmental Analysis Schindelbauer-Hutter Ingenieuracceinschaft Rosasgasse 27 1120 Wien	acc.: ÖNORM B 5105 (Issue 1996) BIOVERSAL QF BIOVERSAL HC	The cleaning agent is suitable for application to the waste water purification system by using gravity force oil separators	Corresponds to all requirements of ÖNORM B 5105

Internationally accepted experts confirm the effects of BIOVERSAL

Institute	Test	Subject	Result
Hygiene-Institut des Ruhrgebietes Gelsenkirchen, Institut für Umwelthygiene und Umweltmedizin	Material test with following investigation	Pollution with hydraulic oil and lubricants in drinking water within reinforced concrete pipes and cleaned with BIOVERSAL HC	The cleaning results are successful with BIOVERSAL products after oil pollutions in drinking water pipes.
Municipality of the City of Vienna Dept. 44: Hydraulic Engineering	Examination by Experts and Documentation	Removal of oil spills on roads and water surface; treatment of contaminated soils and ground water	Application granted after approval by an expert for water protection
Spanish Ministry for Marine, Traffic Security and Sea contamination	Analysis of BIOVERSAL by Spanish Institute for Oceanography.	Request for permission of ecological cleaning by BIOVERSAL in open waters	No environmental damage of organisms found. Permitted until 31. Dec. 2005 with possibility for extension
MPA Dresden 09599 Freiberg	(pr) EN 1568 part 3 European Standard	BIOVERSAL QF High expansion foam 3%	Test successful
MPA Dresden 09599 Freiberg	DIN 14272 part 2 German Standard	BIOVERSAL QF High expansion foam 3%	Test successful

Internationally accepted experts confirm the effects of BIOVERSAL

Institute	Test	Subject	Result
Swedish National Testing and Research Institute (SP) Sweden	ICAO Doc 9137-AN/898 Part 1 International Civil Aviation Organisation	Aircraft fire fighting with BIOVERSAL QF Low expansion foam 3%	Test corresponds acc. Level B
Austrian Federal Fire Brigade Association Laboratory for Fire Protection Technology	Statement after examination of documents as to the applicability of BIOVERSAL QF	BIOVERSAL QF as a heavy foam agent and oil bonding agent	Application possibility for the fire-brigade range given
KEMA Laboratory for High Voltage Arnhem, Netherlands	Test acc Standard NEN-EN 3-2	Measurement of leakage, current Part 4 of NEN-EN 3-2	The examination surpassed expectation
Institute f. Zoologie and Limnologie of University Innsbruck, a. o. Univ. Prof. Dr. Reinhard Dallinger	Ecotoxicological evaluation of BIOVERSAL and its impact on oil degradation in soils and water	Evaluation of BIOVERSAL, including all existing experts and examinations	BIOVERSAL fought Crude oil ecologically compatible and manner.

Internationally accepted experts confirm the effects of BIOVERSAL

Institute	Test	Subject	Result
ARPA - Toscana Florence & Italy	Cleaning of railway tracks and rolling material with HC	Use in free nature	Application acc Safety Data Sheet approved
Kanton Bern Dept. for water protection and waste managment		Application of QF in Kanton Bern	Employment acc. the instruction and under supervision of the local authority
Ministry of Environmental Czech Republic	Test acc MZP Nr. ۷/۲۰۰۰	Evaluation of BIOVERSAL including all existing experts and examinations	Bioversal corresponds to MZP Nr. ۷/۲۰۰۰
Ministry of Environmental Czech Republic	Permission as extinguishing agent	Permission of Bioversal QF as extinguishing agent acc. EN ۱۵۶۸-۳	Certificate Nr.: ۲۲۱/۰۲۸/۲۰۰۴
Institute f. Zoology und Limnology of University Innsbruck, a. o. Univ. Prof. Dr. Reinhard Dallinger	Ecotoxicological evaluation for application of BIOVERSAL against crude oil within the maritime range	Ecotoxicological expertise concerning the use of surfactants for remediation of oil spills in marine ecosystems in Italy	Changes of regulations of the Italian Ministry of Environment for the use of detergents in maritime waters around Italy

Higher customer benefit

- One product for various applications
- Fulfills the EU-directive 91/155/EWG (no special security advice necessary on packages)
- Not relevant to the ADR-regulations
- No advice necessary for any handling of dangerous materials
- Long durability
- No ecotoxic relevance
- Environmental authorities accept the use of BIOVERSAL products



Markets for BIOVERSAL

- Fire brigades: fire/oil-accident
- Petrol industry & exploration (off-shore)
- Land reclamation & water body restoration
- Industry and ship- or dockyards
- Train stations and maintenances area, airports, ports, garages, cable car, etc.
- Cities & communities



fire / oil-accident

- Higher customer benefit:
One product for various applications
- **extinguishing**
- **cleaning**
- **proactiv environmental
protection**



fire (۱)

- Fulfills EN ۱۵۶۸-۳
- Fulfills ICAO level-B (Int. Civil Aviation Org.)
- Outstanding effectiveness extinguishing three-dimensional fires classes A and B
- Lower cost in environment revitalisation, recovery and clean-up costs



fire (۲)

- Outstanding effectiveness in cooling and fire extinguishing
 - ➔ higher security for the firefighter
 - ➔ higher probability of life-saving
 - ➔ lower influence on static stability of buildings and constructions
- Medically & dermatologically harmless
- Less smoke emission
- No corrosive activity



Fire extinguishing Example

- Vehicle fire
- Tire burning
- Forest fire
- Tunnel fire
- Fuel fire



Oil accident (\\)

- Fulfills MPA-NRW GMBL 1991
(no slip hazard)
- Unique and new possibility of oil spill control
- Deep-down effective cleansing
- Medically & dermatologically harmless
- Better for cleaning fauna and flora than products used to date.



Oil accident (۲)

- Cost advantage due to higher application speed
- Complete elimination of oil trails
- Low oxygen consumption in water bodies
- Lower cost in environment at revitalization, recovery and clean-up costs

Example oil accident

- Removal of oil trail
- Oil film on water surfaces
- Deep-down effective cleansing of roads and rails
- Cleaning of shoreline after oil accident
- Cleaning of animals



Petrol industry & exploration (off-shore) (\\)

- Fulfills EN ۱۵۶۸-۳
- Fulfills ICAO level- B (Int. Civil Aviation Org.)
- Outstanding fire extinguishing three dimensional fires classes A and B
- Less smoke emission
- Complete elimination of oil trails
- Low oxygen consumption in water bodies



Petrol industry & exploration (off-shore) (۲)

- Outstanding effectiveness in cooling and fire extinguishing
 - ➔ higher security for the user
 - ➔ higher probability of saving life
 - ➔ lower influence on static stability of buildings and constructions
- Cost advantage due to higher efficiency in application speed
- Lower cost in environment revitalization, recovery and clean-up costs



Example petrol industry

- Fuel burning
- Plant and installation burning
- Preventive application of fire extinguishing foam
- Conserving sewage treatment plant during water treatment process
- Cleaning of oil trails
- Fights oil films on water surfaces
- Deep-down effective cleansing of roads & rails



Bioremediation

- Possibility of real on-site bioremediation
- Revaluation of properties due to everlasting remediation
- High cost advantages due to
 - Low excavation cost
 - Low transportation cost
 - Low waste dumping cost
 - No more cost of interim protection measures
- Possibility of new application in bioremediation (patented foam application)



Example for bioremediation

- On-site clean up operation in Vienna, Panalpina (forwarding company)
- Lake Goldegg, Salzburg
- On-site clean-up operation in Neunkirchen, garage “Raiffeisenlagerhaus”

Industry

- Conserving sewage treatment plant during water treatment process
- Positive stimulation of micro organisms in wastewater treatment plants
- Cost advantages in waste management
- Deep-down effective cleansing
- Medically & dermatologically harmless
- No corrosive activity



Example for industry

- Basic purification
- Cleaning of tools and parts, industrial spills
- Cleaning of roads and rails
- Cleaning of fuel stations
- Bioreactor
 - ➔ possibility of local cleaning of oil polluted wastewater
 - ➔ cleaning station for train and truck fuel tanks,
Reference: KVG train maintenance Hannover



Cities & communities

- Best for use in cleaning oil trails
- Conserving sewage treatment plant during water treatment process
- Positive stimulation of micro organisms in wastewater treatment plants
- Cost advantages in waste management
- Deep-down effective cleansing
- Medically & dermatologically harmless



Examples for cities and communities

- Wastewater treatment plants
- Cleaning traffic areas



Why to sell BIOVERSAL

- Innovative product
- Possible to sell in many markets
- High political acceptance
- Possibility to distinguish for the actors
- High profits due to high margins
- Intelligent marketing and sales concept



Why to sell BIOVERSAL

- Cost savings through environment protection
- Proactive environmental protection with high success in problem solving
- High economic efficiency
- A positive intelligent product



Up to now BIOVERSAL was used in:

- Austria
- Balticum
- Benelux
- Czech Republic
- France
- Great Britain
- Germany
- Hungary
- Ireland
- Italy
- Kazakhstan
- Liechtenstein
- Romania
- Russia
- Scandinavia
- Slovakia
- Slovenia
- South Korea
- Spain
- Switzerland