

MSDS 2020

Material safety data sheet

Bioversal® QF-R

Last update: MSDS_QF-R_EN_v24032020
Replaces version: MSDS_QF-R_EN_v28052019



MSDS

Material safety data sheet

Bioversal® QF-R

Company:	AIRFIRE WORLDWIDE, S.L.
Email:	s.muttoni@airfire.eu
Date:	18.05.2020
Version:	MSDS_QF-R_EN_v24032020

ENGLISH EDITION 2020

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Bioversal®

QF-R

- Fire Protection A/B/F (K)
- Explosion Protection
- Ecol. Oil Spill Clean-Up Agent^{1,4}
- S/W Anti Pollution Agent^{1,4}
- HC Bioremed. Effectiveness^{1,4}
- Sewage Plant Compatibility^{1,4}

MATERIAL SAFETY DATA SHEET
 In accordance with EC-Directive 1907/2006 EC, Art. 31 (REACH), CLP
 in compliance with 453/2010 & 2015/830 EU
 Last update: MSDS_QF-R_EN_v24032020
 Replaces version: MSDS_QF-R_EN_v28052019
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SECTION 1**IDENTIFICATION OF THE PREPARATION AND OF THE COMPANY****1.1 Product identifier:**

Product/ trade name:	Bioversal® QF-R		
Article no./code	FE 851 G	1000 l/IBC	1.000 kg
Container size/ Content [kg]:	FE 852 C	210 l/HDPE Barrel/Drum	210 kg
	FE 853 J	20 l/HDPE Jerry Can	20 kg

1.2 Relevant identified uses of the substance or mixture and uses advised against:

Relevant advised applications:	<ul style="list-style-type: none"> ■ Environment and operator safe high performance class A/B/F (K) fire extinguishing agent, liquid concentrate free of PFOS, PFOA and its persistent derivatives. ■ Multi purpose micelles encapsulation agent technology, low-medium expansion foam for sprinkler and water mist fire protection systems. ■ Designed for filling fire extinguishers and fire protection systems based on wet chemicals/aqueous premixes. ■ No adherence/crystallisation effects during storage and operation. Corrosion inhibiting properties deliver unmatched performance in durability and guarantee maximum reliability for valves and components resulting in prolonged system life cycle. ■ Ecological oil, fat, protein cleaner and degreaser for solid surfaces (effective on any alloys and natural construction material).^{1,4}
Field of applications:	<ul style="list-style-type: none"> ■ Class A/B/F (K) fire extinguishers at 6–7 %. ■ Class F (K) kitchen fire suppression systems at 10 %. ■ Class A/B water based fire protection systems at 3–6 %. ■ Class A/B water mist fire protection systems at 1 %–3 %. ■ High performance 3D fire knock-down capabilities. ■ Fuel micelles encapsulation results in temporary fuel neutralization and VOC mitigation. Eliminates adhesion properties of fuel on solid surfaces at 1 %–3 %. ■ Compatible with any alloys and material, non-corrosive. ■ High Performance Oil Cleaner, deoils, degreases any surface and material; applicable at any temperature and pressure range with standard equipment at 1 %–3 %.^{1,4} ■ Anti pollution agent with bioremediation effectiveness, bio-compatible miscellaneous oil spill control agent.^{1,4} ■ Compatibility with standard oil/water separators, sewage plant compatibility, does not create emulsions.^{1,4} ■ Safe to operate, skin friendly.
Applications advised against:	<ul style="list-style-type: none"> ■ Metal fires class D.⁶ ■ Requirements of frost resistant storage and conditions. ■ Blending with other fire extinguishing agents or chemicals.

1.3 Details of the supplier of the Safety Data Sheet:

Manufacturer/ Supplier:	BIOVERSAL International G.m.b.H
Street address:	Georg Sigl Str. 16
Postcode:	A-2384
Place:	Breitenfurt
Country:	Austria
Telephone:	+43 2239 4278-0
Telefax:	+43 2239 4278-18
Email contact:	info@bioversal.com
Responsible SDS:	Ioannis Athanasiou (General Manager)
Contact:	+43 699 17142099 ioannis.athanasiou@bioversal.com

1.4 Emergency telephone number:

During office hours:	Only available during the following office hours MO–FR 08:00–18:00 (+43 699 17142099)
Non office hours:	Present MSDS at any Anti Poison Center nearby

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SECTION 2**HAZARDS IDENTIFICATION****2.1 Classification of the mixture:**

Accordinging Article 31(3)(c):

The product is in conformity with Regulation (EC) No. 1907/2006 of the European Parliament and of the Council 18 December 2006 concerning the registration, evaluation, authorisation of chemicals (REACH). This product does not meet the criteria for classification in any hazard class according to Regulation (EC) No. 1272/2008, Article 40 (CLP) on classification, labeling and packaging of substances and mixtures.

2.2 Label elements:

Label elements acc. to the CLP Regulation (EC) 1272/2008: N/A

- **Hazard pictogram(s):** N/A
- **Signal word:** N/A
- **Hazard statement(s), H and EUH:** N/A
- **Precautionary statement(s), P:** N/A
- **Additional applicable label elements in accordance with Article 25 of CLP on "Supplemental information on the label":** N/A

2.3 Other hazards:

Mixture does not meet the criteria for PBT and vPvB acc. to Regulation (EC) No. 1907/2006, Annex XIII. No specific dangers are known. However, the product should be handled with care as generally required for biochemicals. Prevent foam entering in respiratory system and ways by using protective means as usually applied by trained and instructed fire protection professionals according their best practices and protocols when using fire extinguishing foam.

SECTION 3**COMPOSITION & INFORMATION ON INGREDIENTS****3.1 Substances:**

N/A

3.2 Chemical profile of the mixture:

Aqueous combination of biocompatible surfactants with low ecotoxicological impact, polyvalent compounds free of phosphates and nitrates and hetero-organic substances, modified glycol derivates as well as natural colors and fragrances.

Bioversal[®] QF-R contains a BioActivator of vegetal origin regulating biocompatibility during naturally occurring aerobic bioremediation mechanisms of residual oil pollution present in soil, waters, aquifer and sewage plant.

Bioversal[®] QF-R does not contain PFOS and PFOA or any of its persistent and bio-accumulative derivatives.

Bioversal[®] QF-R does not contain solvents, fertilizers/nutriments nor xenobiotics. Majority of ingredients derived from raw materials of vegetal origin or modified components assuring low ecotoxicological impact, high rates of biodegradation & effective bioremediation stimulation when applied on residual oil pollution in the environment. All ingredients under application conditions are not subject to classification or labelling according EC regulations and Directives (see SECTION 2.1).

Accordinging Regulation (EC) No. 648/2004 for Detergents/Labeling of ingredients:

Biocompatible surfactants:
 < 5 % anionic, < 5 % non-ionic,
 < 5 % amphoteric

<h1>Bioversal®</h1> <p>QF-R</p>	<input checked="" type="checkbox"/> Fire Protection A/B/F (K) <input checked="" type="checkbox"/> Explosion Protection <input checked="" type="checkbox"/> Ecol. Oil Spill Clean-Up Agent ^{1,4} <input checked="" type="checkbox"/> S/W Anti Pollution Agent ^{1,4} <input checked="" type="checkbox"/> HC Bioremed. Effectiveness ^{1,4} <input checked="" type="checkbox"/> Sewage Plant Compatibility ^{1,4}	<h2>MATERIAL SAFETY DATA SHEET</h2> <p>In accordance with EC-Directive 1907/2006 EC, Art. 31 (REACH), CLP in compliance with 453/2010 & 2015/830 EU Last update: MSDS_QF-R_EN_v24032020 Replaces version: MSDS_QF-R_EN_v28052019 Print date/Date posted: 18/05/2020</p>
	<p>SECTION 4 FIRST AID MEASURES</p>	

4.1 Description of first aid measures:

<p>■ General notes:</p>	In case of an accident or any discomfort always seek medical attention.
<p>■ Following inhalation:</p>	No specific measures. Product does not contain solvents or any other volatile compounds.
<p>■ Following skin contact:</p>	Product has been tested according cosmetic requirements on human patch test, and has been evaluated as harmless in contact with skin. <i>[Derma Consult GmbH, GLP, Human Patch Test according guidelines COLIPA, 1997]</i>
<p>■ Following eye contact:</p>	Product has been tested according EEC guidelines on eye irritation & has been evaluated as not irritating for the eyes. <i>[Hygiene Institute Gelsenkirchen, OECD Guidelines 405 & 92/69/EEC on eye]</i>
<p>■ Following ingestion:</p>	Not toxic. Drink plenty of water, consult a physician. Do not induce vomiting. Gastric lavage using a Defoamer, [e.g. Dimeticon]. <i>[Hygiene Institute Gelsenkirchen, Toxicity Evaluation and Assessment, page 5, section 5]</i>
<p>■ Self protection of the 1st aider:</p>	N/A See SECTION 2.3

4.2 Most important symptoms and affects, both acute and delayed:

N/A No specific dangers, symptoms and effects, both acute and delayed are known. However, the product should be handled with care as generally required with biochemicals.

4.3 Indication of any immediate medical attention and special treatment needed:

<p>Recommendation:</p>	If swallowed, gastric lavage with the aid of Dimeticon (Defoamer).
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SECTION 5

FIRE FIGHTING MEASURES

5.1 Extinguishing media:

Suitable:	N/A No specific measures.
Unsuitable:	N/A No specific measures.

5.2 Special hazards arising from the mixture:

N/A No specific measures.

5.3 Advise for fire fighters:

N/A No specific measures.

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SECTION 6**ACCIDENTAL RELEASE MEASURES****6.1 Personal precautions, protective equipment and emergency procedures:**

6.1.1 For non emergency personnel:

6.1.2 For emergency responders:

Bioversal[®] **QF-R** contains skin friendly surfactants of vegetal origin. However, the product should be handled with care as generally required with biochemical substances. Avoid prolonged contact with skin and with eyes.

Protective equipment:	<u>Recommendation:</u> Use goggles and rubber gloves. See indications above.
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Emergency procedures:	<u>Recommendation:</u> N/A
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See SECTION 6.1.1	<u>Recommendation:</u> N/A
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6.2 Environmental precautions:

6.2.1 Other information:

Bioversal[®] **QF-R concentrate** contains environmentally friendly and biocompatible surfactants of vegetal origin, which are rapidly, easily and more than 99,9 % biodegradable. As distinguished from synthetic surfactants, **Bioversal**[®] **QF-R** is characterized with a low ecotoxicological profile and is therefore particularly suitable for controlled applications in open and natural environment, where the release of fire extinguishing foam solution in soil, aquifer and waters can not be prevented. For the purpose of slip hazard elimination on pavement surfaces after traffic accidents, make sure of absorbing mechanically big quantities of oil/fuel before applying **Bioversal**[®] **QF-R** on residual oil pollution.

In case of oil pollution caused by oil spills on soil, aquifer, waters, sewer system and biological water treatment plants, apply **Bioversal**[®] **QF-R** on oil contaminated spots to induce bioremediation effectiveness, to promote and accelerate natural biodegradation mechanisms of oil pollution. The BioActivator of **Bioversal**[®] **QF-R** reduces ecotoxicity, generates biocompatible and biodegradable biocaps. The formation of oil-water-QF-R micelles (biocaps) reduces immediately VOC emissions and enhances natural attenuation processes of contaminated site.^{1,2,3}

Fire fighting, ecological oil spill clean-up and oil contamination anti-pollution applications with **Bioversal**[®] **QF-R** should be in accordance with local, state or national legislation. However, the accidental release of **Bioversal**[®] **QF-R concentrate** in the environment should be avoided.

6.3 Methods and material for containment and cleaning up:

6.3.1 For containment:

6.3.2 For cleaning up:

6.3.3 Other information:

Apply methods and materials generally required in best practices for non hazardous biochemicals.

Apply liquid-binding and absorbent, standard material and equipment.

Aspirate big quantities, flush small quantities with plenty of water.

Recommendation: Reuse collected spills for ecological cleaning.

6.4 Reference to other sections:

See SECTION 6.1

See SECTION 6.2

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SECTION 7**HANDLING AND STORAGE****7.1 Precautions for safe handling/protective measures:**

Comply with regulations applied for handling and storing non hazardous, biochemical products or materials.

Measures to prevent fire:	N/A No specific measures.
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Measures to prevent aerosols and dust generation:	N/A No specific measures.
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Measures to protect the environment:	N/A No specific measures.
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Advice on general occupational hygiene:	N/A No specific measures.
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7.2 Conditions for safe storage, including any incompatibilities:

Technical measures and storage conditions:	N/A No specific measures.
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Packaging materials:	N/A No specific measures.
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Requirements for storage rooms and vessels:	N/A No specific measures.
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Storage class:	N/A
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Further information on storage conditions:	N/A No specific measures.
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7.3 Specific end use(s):

Specific end use(s):	N/A No specific end use(s).
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Recommendations:	N/A No specific recommendations.
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Industrial sector specific solutions:	N/A No specific solutions.
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SECTION 8**EXPOSURE CONTROLS AND PERSONAL PROTECTION****8.1 Control parameters:**

N/A

No specific control parameters.

8.2 Exposure controls:

Bioversal [®] QF-R is not classified a hazardous product. However, comply with regulations of good occupational hygiene practices in conjunction with other control measures.
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8.2.1 Appropriate engineering controls:

N/A

Bioversal [®] QF-R is not classified a hazardous product. It does not require any appropriate engineering controls.
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SECTION 8**EXPOSURE CONTROLS AND PERSONAL PROTECTION** *continued*

Substance/mixture related measures to prevent exposure during identified uses:	N/A No specific measures.
Structural measures to prevent exposure:	N/A No specific measures.
Organisational measures to prevent exposure:	N/A No specific measures.
Technical measures to prevent exposure:	N/A No specific measures.

8.2.2 Personal protection equipment:

N/A Bioversal [®] QF-R is not classified a hazardous product. Precautionary measures despite positive evaluation of experts. See SECTION 4.	
8.2.2.1 Eye and face protection:	Wear eye / face protection.
8.2.2.2 Skin protection:	Wear suitable protective clothing. Wear suitable gloves.
▪ Hand protection:	N/A
▪ Other skin protection:	N/A
8.2.2.3 Respiratory protection:	N/A
8.2.2.4 Thermal hazards:	N/A

8.2.3 Environmental exposure controls:

N/A Bioversal [®] QF-R is not classified a hazardous product. Precautionary measures despite positive evaluation of experts. See SECTION 6.3	
Substance/mixture related measures to prevent exposure:	N/A
Instruction measures to prevent exposure:	N/A
Organisational measures to prevent exposure:	N/A
Technical measures to prevent exposure:	N/A

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SECTION 9**PHYSICAL AND CHEMICAL PROPERTIES****9.1 Information on basic physical and chemical properties:**

Appearance:.....	liquid/yellowish to brownish
Odor:.....	typical, pleasant
Odor threshold:.....	N/A
pH at 20 °C:.....	7,1 ± 0,3 acc. EN DIN 19268
Melting point:.....	N/A
Freezing point:.....	-7,0 °C
Initial boiling point and boiling range:.....	> 100 °C
Flash point:.....	N/A
Evaporation rate:.....	N/A
Flammability (solid, gas):.....	N/A Bioversal[®] QF-R is not flammable.
Upper/lower flammability or explosive limits:.....	Bioversal[®] QF-R is not flammable. Bioversal[®] QF-R is not explosive.
Vapour pressure:.....	N/A
Vapour density:.....	N/A
Relative density at 20 °C:.....	1,030 g/cm ³ ± 0,010 g/cm ³ acc. DEV C9
Solubility in water:.....	completely miscible
Partition coefficient n-octanol/water:.....	N/A
Auto ignition temperature:.....	Bioversal[®] QF-R does not auto ignite
Decomposition temperature:.....	N/A
Viscosity (concentrate) [mm ² /s]:.....	kinematic 20 °C 0 °C -5 °C 77,96 105,16 119,29
Explosive properties:.....	N/A Bioversal[®] QF-R does not have explosive properties.
Oxidizing properties:.....	N/A Bioversal[®] QF-R does not have oxidizing properties.

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SECTION 9**PHYSICAL AND CHEMICAL PROPERTIES** *continued***9.2 Other information:**

Refraction Index:.....	1,3635 ± 0,0025 acc. EN DIN 51423	
Surface tension..... [mN/m]:.....	at 3 %..... 18,16–18,25.....	at 6 %..... 17,20.....
Spreading coefficient..... [mN/m]:.....	at 3 %..... 4,51–4,96.....	at 6 %..... 5,74–6,14.....
Expansion values..... Potable water:.....	at 3 %..... 5,3–6,9.....	at 6 %..... 8,51–9,04.....
Expansion values..... Sea water:.....	at 3 %..... 4,98–5,85.....	at 6 %..... 7,55–8,04.....

Infrared spectrogram available upon request.

SECTION 10**STABILITY AND REACTIVITY****10.1 Reactivity:**

N/A

Bioversal[®] **QF-R** is considered non reactive under normal conditions and if used for its intended purpose.**10.2 Chemical stability:**

N/A

is considered stable under normal conditions and if used for its intended purpose. Freezing and thawing does not have any negative impact on the chemical stability of the product.

10.3 Possibility of hazardous reactions:

N/A

No hazardous reactions known if used for its intended purpose.

10.4 Conditions to avoid:

N/A

No special precautions are required for this product if used according the supplier's safety instructions.

10.5 Incompatible materials:

N/A

Bioversal[®] **QF-R** is compatible with any material and alloy.
Bioversal[®] **QF-R** inhibits naturally occurring corrosion effects of water.**10.6 Hazardous decomposition products:**

N/A

No hazardous decomposition products known.
 Under environmental conditions **Bioversal**[®] **QF-R (6 %)** biodegrades aerobically > 60 % in 5 days. The aerobic biodegradation process is completed > 99,9 % within 20 days. Organic decomposition end products are CO₂, H₂O and biomass.
[Wessling, Investigation on COD and BOD₅, COA No: CB012-007671-1/order No: CB0-02396-12/12.11.2012].

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SECTION 11**TOXICOLOGICAL INFORMATION****11.1 Information on toxicological effects:**

Mammalian acute toxicity:	At values LD50 (rats) > 2000 mg/kg no toxic effects have been observed. Bioversal[®] QF-R is not acute toxic. (see SECTION 12)
Skin corrosion/skin irritation:	Bioversal[®] QF-R does not cause serious skin corrosion/irritation. (see SECTION 4.1)
Serious eye damage/eye irritation:	Bioversal[®] QF-R does not cause serious eye damage/irritation. (see SECTION 4.1)
Respiratory or skin sensitization:	Bioversal[®] QF-R does not cause respiratory or skin sensitization. (see SECTION 4.1)
Germ cell mutagenicity:	Bioversal[®] QF-R does not cause germ cell mutagenicity.
Carcinogenicity:	Bioversal[®] QF-R is not carcinogenic.
Reproductive toxicity:	Bioversal[®] QF-R is not reproductive toxic.
Summary of evaluation of the CMR properties:	Bioversal[®] QF-R does not have CMR properties.
STOT single exposure:	Bioversal[®] QF-R is not toxic.
STOT repeated:	Bioversal[®] QF-R is not toxic.
Aspiration hazard:	Bioversal[®] QF-R is not volatile, and does not cause aspiration hazard effects.

NOTE:

Eyes irritation tests according OECD Guideline 405 have been conducted to evaluate the eye's irritation potential of **Bioversal[®] QF-R** concentrate. Test conducted on albino rats according Guideline 92/69/EEC.²

[Hygiene Institut Gelsenkirchen, Institut für Umwelthygiene und Umweltmedizin]

Skin sensitivity tests in form of human patch test have been conducted to evaluate skin irritation in contact with **Bioversal[®] QF-R** concentrate. Tests conducted according GLP/COLIPA guidelines and regulations.²

[Derma Consult GmbH, Gesellschaft zur Prüfung von Dermatika]

CONCLUSION:

On the basis of the test results and under the test conditions, the product **Bioversal[®] QF-R** concentrate is to be classified as harmless as regards the possibility of skin irritation.

On the basis of the test results and under the test conditions, the product **Bioversal[®] QF-R** concentrate is to be classified as non irritating for the eyes.

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SECTION 12**ECOLOGICAL INFORMATION^{2,3}****12.1 Toxicity:**

12.1.1 Bacteria:

Organism test object	Conc./Dil. Rates	Methodology	Guidelines Institute	Result of testing
Activated sludge organisms	Bioversal® QF-R: 0,2 %	Bacteria inhibition BOD inhibition [mg/l]	Austrian Standard ÖNORM 5105; IMU, Vienna;	At 0,2 % (2g/l) No Inhibition Observed
			4-hours incubation, including determination of ammonium N through capillary electrophoresis	
Activated sludge organisms	Bioversal® QF-R: 0,1% = 1ml/l 0,2 % = 2ml/l 0,3 % = 3ml/l	Nitrification inhibition at 20 °C in darkness	EU Norm EN ISO 9509; IMU, Vienna	EC50 > 0,2-0,3 % (incubation) corresponds EC50 > 2-3 g/l No Inhibition
Pseudomonas Sp.	Bioversal® QF-R: 6 %	Cell proliferation; inhibition test 16 h	HIG Germany DIN 38412 L8	EC10 (16 h) > 800 g/l EC50 (16 h) > 800 g/l No Inhibition Observed
Pseudomonas Sp.	Bioversal® QF-R: undiluted	Cell proliferation inhibition test 16 h	Conversion undiluted IZLUI Univ. Prof. Dr. Reinhard Dallinger	EC10 (16 h) > 384 g/l EC50 (16 h) > 384 g/l No Inhibition Observed

CONCLUSION:

- I. For LCO/ECO/NOEC limit values (at 6 % QF-R) not exceeding 700.000-800.000 mg/l the application of **Bioversal® QF-R** has to be considered non toxic/harmless for naturally occurring bacterial diversity in soil, aquifer, aquatic environment and sewage plants. Even in case of effects of the concentrate, it is safe to assume, that LCO, ECO, NOEC-limit values, pertinent to soil, waters, aquifer and sewage treatment plant, are not exceeded, due to adequate aqueous dilutions.
- II. The application of **Bioversal® QF-R** in nature has harmless ecotoxicological effects on bacterial biodiversity if 10 % dilution rates are not exceeded.
- III. The application of **Bioversal® QF-R** does not inhibit nitrification.

[IZLUI, Univ., Prof. Dr. R.Dallinger, Ecotoxicological Evaluation on the application of "Bioversal" in combating mineral oil contamination in soil and water; Expert report, 08/2001, Institute for Zoology and Limnology of the University of Innsbruck].

Synergistic ecotoxicity & inhibition effects of Bioversal® QF-R coated oil micelles:

Vibrio fischeri	Bioversal® QF-R: + 8,3 mg/l diesel	Luminescent bacteria test 30 min, 15 °C, Lumis Tox Dr. Lange	DIN 38412 IFA, Tulln, Department of Ecotoxicity	NOEC for synergistic effect: > = 100 mg/l
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CONCLUSION:

Bioversal® QF-R does not enhance bacterial ecotoxicity of treated hydrocarbons.

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SECTION 12**ECOLOGICAL INFORMATION^{2,3} continued****12.1 Toxicity:**

12.1.2 Algae:

Organism test object	Conc./Dil. Rates	Methodology	Guidelines Institute	Result of testing
Scenedesmus Subspicatus	Bioversal [®] QF-R: 6 %	Inhibition effect of the cell proliferation 23 °C 8000 Lux over 72 h	OECD 201 HIG, Germany	EC10 (72 h): 14.000 mg/l EC50 (72 h): 16.900 mg/l
Scenedesmus Subspicatus	Bioversal [®] QF-R: undiluted	Inhibition effect of the cell proliferation 23 °C 8000 Lux over 72 h	OECD 201 HIG, Germany	EC10 (72 h): 840 mg/l EC50 (72 h): 1.014 mg/l
Scenedesmus Subspicatus	Bioversal [®] QF-R: undiluted	Inhibition effect of the cell proliferation 23 °C 7000 Lux over 72 h	Pursuant enclosure No 2 Decree No 299/98 Slg. Czech Republic, ECOTEST company	EC50 (72 h) [growth speed]: > 100 mg/l EC50 (0–72 h) [biomass]: 64,65 mg/l

CONCLUSION:

- I. For LCO/ECO/NOEC limit values (at 6 % QF-R) not exceeding 13.000–13.500 mg/l the application of **Bioversal**[®] **QF-R** has to be considered non toxic/harmless for naturally occurring algae in soil, aquifer, aquatic environment and sewage plants. Even in case of effects of the concentrate, it is safe to assume, that LCO, ECO, NOEC-limit values, pertinent to soil, waters, aquifer and sewage treatment plant, are not exceeded, due to adequate aqueous dilutions.
- II. The application of **Bioversal**[®] **QF-R** in nature has harmless ecotoxicological effects on algae if 10 % dilution rates are not exceeded.

[IZLUI, Univ., Prof. Dr. R.Dallinger, Ecotoxicological Evaluation on the application of "Bioversal" in combating mineral oil contamination in soil and water, Expert report, 08/2001, Institute for Zoology and Limnology of the University of Innsbruck].

Synergistic ecotoxicity & inhibition effects of Bioversal[®] QF-R coated oil micelles:

Selenastrum capricornutum	Bioversal [®] QF-R: + 8,3 mg/l diesel	Acute inhibiting effect of the cell proliferation 72 h at 22 °C	DIN38412-L33; OECD 201; IFA Tulln Eco-Tox Dep.	NOEC for synergistic effect: 49,6 mg/l
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CONCLUSION:

Bioversal[®] **QF-R** does not enhance algae ecotoxicity of treated oil pollution.

Bioversal®

QF-R

- Fire Protection A/B/F (K)
- Explosion Protection
- Ecol. Oil Spill Clean-Up Agent^{1,4}
- S/W Anti Pollution Agent^{1,4}
- HC Bioremed. Effectiveness^{1,4}
- Sewage Plant Compatibility^{1,4}

MATERIAL SAFETY DATA SHEET

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SECTION 12**ECOLOGICAL INFORMATION^{2,3} continued****12.1 Toxicity:**

12.1.3 Invertebrates:

Organism test object	Conc./Dil. Rates	Methodology	Guidelines Institute	Result of testing
Daphnia Magna [STRAUS]	Bioversal® QF-R: 6 %	Immobility test 20 °C 48 h	OECD 202 HIG Germany	ECO (48 h): 2.000 mg/l EC50 (48 h): 4.500 mg/l EC100 (48 h): 7.000 mg/l
Daphnia Magna [STRAUS]	Bioversal® QF-R: undiluted	Immobility test 20 °C 48 h	Conversion undiluted IZLUI Univ. Prof. Dr. Reinhard Dallinger	ECO (48 h): 120 mg/l EC50 (48 h): 270 mg/l EC100 (48 h): 420 mg/l
Daphnia Magna [Own stock]	Bioversal® QF-R: undiluted	Immobility test 21 °C 48 h	Pursuant enclosure No 2 Decree No 299/98 Slg./Czech Republic, ECOTEST company	EC50 (48 h): > 100 mg/l

CONCLUSION:

- I. For LCO/ECO/NOEC limit values (at 6 % QF-R) not exceeding 2.500–3.000 mg/l the application of **Bioversal® QF-R** has to be considered non toxic/harmless for naturally occurring invertebrates in soil, aquifer, aquatic environment and sewage plants. Even in case of effects of the concentrate, it is safe to assume, that LCO, ECO, NOEC-limit values, pertinent to soil, waters, aquifer and sewage treatment plant, are not exceeded, due to adequate aqueous dilutions.
- II. The application of **Bioversal® QF-R** in nature has harmless ecotoxicological effects on invertebrates if 10 % dilution rates are not exceeded.

[IZLUI, Univ., Prof. Dr. R.Dallinger, Ecotoxicological Evaluation on the application of "Bioversal" in combating mineral oil contamination in soil and water, Expert report, 08/2001, Institute for Zoology and Limnology of the University of Innsbruck].

Synergistic ecotoxicity & inhibition effects of Bioversal® QF-R coated oil micelles:

Invertebrates [Daphniae magna]	Bioversal® QF-R: + 8,3 mg/l diesel	Acute toxicity test 48 h at 22 °C	DIN38412-L30; OECD 202; IFA Tulln Eco-Tox Dep.	NOEC for Synergistic Effect: 24,6 mg/l
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CONCLUSION:

Bioversal® QF-R does not enhance invertebrates ecotoxicity of treated oil pollution.

Bioversal[®]

QF-R

- Fire Protection A/B/F (K)
- Explosion Protection
- Ecol. Oil Spill Clean-Up Agent^{1,4}
- S/W Anti Pollution Agent^{1,4}
- HC Bioremed. Effectiveness^{1,4}
- Sewage Plant Compatibility^{1,4}

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SECTION 12**ECOLOGICAL INFORMATION**^{2,3} *continued***12.1 Toxicity:**

12.1.4 Fish:

Organism test object	Conc./Dil. Rates	Methodology	Guidelines Institute	Result of testing
Golden Orfe [Leuciscus Idus]	Bioversal [®] QF-R: 6 %	Acute fish toxicity 20 °C 48 h	DIN 38412 Part 15 HIG, Germany	LCO (48 h): 4.000 mg/l LC50 (48 h): 4.500 mg/l LC100 (48 h): 5.000 mg/l
Golden Orfe [Leuciscus Idus]	Bioversal [®] QF-R: undiluted	Acute fish toxicity 20 °C 48 h	Conversion undiluted IZLUI Univ. Prof. Dr. Reinhard Dallinger	LCO (48 h): 240 mg/l LC50 (48 h): 270 mg/l LC50 (48 h): 300 mg/l
Guppies [Poecilia Reticulata]	Bioversal [®] QF-R: undiluted	Acute fish toxicity 22 °C 96 h	Pursuant enclosure No. 2 Decree No 299/98 Slg. Czech Republic, ECOTEST company	LC50 (48 h): > 100 mg/l LC50 (96 h): > 100 mg/l

CONCLUSION:

- I. For LCO/ECO/NOEC limit values (at 6 % QF-R) not exceeding 3.500–4.000 mg/l the application of **Bioversal**[®] **QF-R** has to be considered non toxic/harmless for naturally occurring fish species in marine and freshwater ecosystems. Even in case of effects of the concentrate, it is safe to assume, that LCO, ECO, NOEC-limit values, pertinent to waters are not exceeded, due to adequate aqueous dilutions.
- II. The application of **Bioversal**[®] **QF-R** in nature has harmless ecotoxicological effects on fish species if 10 % dilution rates are not exceeded.

[IZLUI, Univ., Prof. Dr. R.Dallinger, *Ecotoxicological Evaluation on the application of "Bioversal" in combating mineral oil contamination in soil and water; Expert report, 08/2001, Institute for Zoology and Limnology of the University of Innsbruck*].

Synergistic ecotoxicity & inhibition effects of Bioversal[®] QF-R coated oil micelles:

Fish [Brachydanio rerio]	Bioversal [®] QF-R: + 8,3 mg/l diesel	Acute toxicity test 96 h at 21 °C	EEC Commission Directive 92/96, C.I.	NOEC for synergistic effect: > 100 mg/l
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CONCLUSION:

Bioversal[®] **QF-R** does not enhance fishes' ecotoxicity of treated oil pollution.

Bioversal[®]

QF-R

- Fire Protection A/B/F (K)
- Explosion Protection
- Ecol. Oil Spill Clean-Up Agent^{1,4}
- S/W Anti Pollution Agent^{1,4}
- HC Bioremed. Effectiveness^{1,4}
- Sewage Plant Compatibility^{1,4}

MATERIAL SAFETY DATA SHEET

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SECTION 12**ECOLOGICAL INFORMATION**^{2,3} *continued***12.1 Toxicity:**

12.1.5 Mammiferi:

Organism test object	Conc./Dil. Rates	Methodology	Guidelines Institute	Result of testing
Rats	Bioversal [®] QF-R: 6 %	Acute mammal toxicity dose per kg body weight	KZ20307 Limit Test UBA HIG, Germany	LD50 > 2.000 mg/kg
Rats	Bioversal [®] QF-R: undiluted	Acute mammal toxicity dose per body weight	HIG, Germany, calculated	LD50 > 200 mg/kg
Rabbits albino 2 kg body weight	Bioversal [®] QF-R: undiluted	Irritating effect on eyes	OECD 405 Assessment score system acc. EEC reg. 92/69/EEC; HIG, GER	Does not irritate the eyes
Human	Bioversal [®] QF-R: undiluted	Main compatibility, skin irritation Guidelines COLIPA, Walker A.P. et al.: Test guidelines for assessment of skin compatibilities of cosmetic finished products in mman. Food and chemical toxicology 34, 1996, 651-660.	GLP Derma Consult GmbH	Harmless in regards to skin irritation

CONCLUSION:

- I. For doses > 200 mg/kg (concentrate) and < 2.000 mg/kg (6 %). **Bioversal**[®] **QF-R** is non toxic and harmless for mammals when swallowed/ingested.
- II. **Bioversal**[®] **QF-R** is non irritating in contact with eyes and skin.
- III. **Bioversal**[®] **QF-R** concentrate is worldwide the only fire extinguishing foam that has been tested on human skin acc. international test guidelines for assessment of skin compatibilities of cosmetic finished products in man, certifying harmless and non irritating skin effects in contact with human skin.

Bioversal®

QF-R

- Fire Protection A/B/F (K)
- Explosion Protection
- Ecol. Oil Spill Clean-Up Agent^{1,4}
- S/W Anti Pollution Agent^{1,4}
- HC Bioremed. Effectiveness^{1,4}
- Sewage Plant Compatibility^{1,4}

MATERIAL SAFETY DATA SHEET

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SECTION 12**ECOLOGICAL INFORMATION^{2,3} continued****12.2 Persistence and degradability:**

Organism test object	Conc./Dil. Rates	Methodology	Guidelines Institute	Result of testing
Biological degradation by determining the BOD5 value activated sludge	Bioversal® QF-R: undiluted 1 ml in 1 l activated sludge	Manometric determination of the BOD5 with COD as calculation basis	Miti Test OECD 301c HIG, Germany	Biochemical degrad.-rates after: 5 days = 66 % 13 days = 98 % 21 days > 99,9 %
Biological degradation by determining the BOD5 value activated sludge	Bioversal® QF-R: 6 %	Manometric determination of the BOD5 with COD as basis	Miti Test OECD 301c HIG, Germany	Biochemical degrad.-rates after: 5 days = 87 % 11 days = 98 % 21 days > 99,9 %
Degradation rate of the anionic surface active agents; aerobic, polyvalent micro organisms	Bioversal® QF-R: undiluted 1 ml in 1 l activated sludge suspension	Determination of the content of anion active detergents in creep test; Initial content: 6,1 mg/l	DIN 38409 Part 23-1 HIG, Germany	Residual anion active detergents after: 7 days < 0,05 mg/l Elimination rate: > 99 %

Synergistic biodegradation effects of Bioversal® QF-R coated oil micelles:

Biological degradation of hydrocarbons (diesel oil) mixed with QF-R , activated sludge	Bioversal® QF-R: H ₂ O= 849 ml, Inoculant suspension of bacteria =150 ml QF-R=1 ml Diesel=870mg	Quantitative determination of hydrocarbons	DIN 38409 Part 18 HIG, Germany	TPH elimination rate: > 87,8 % in 5 days > 99 % in 11 days TPH average elimination rate =107 mg/day
Biological degradation of hydrocarbons (diesel oil) mixed with QF-R , micelles formation (biocaps) GC-FID Chromatography	H ₂ O=500 ml, N/P=4 ml, Activated sludge=5 ml, QF-R=0,5 ml, Diesel=1 ml	Biodegradation test diesel and GC-FID Chromatography measurement acc. DIN EN ISO 9377/2	DIN EN ISO 9888 (Zahn-Wellens Test), KfU Envirotech, Research Center for applied environmental technologies	TPH elimination rate: > 93,5 % in 6 days, 97,9 % in 16 days TPH average elimination rate =60,7 mg/day
Biological degradation of hydrocarbons (deep-frying fat/oil) mixed with QF-R .	H ₂ O=2.000 ml, N/P=16 ml, Activated sludge=20 ml, QF-R=4 ml, Fat/Oil=8 ml	Biodegradation test fat/oil and measurement of lipophilic substances acc. DIN 38409-56 & TOC acc. DIN EN 1484	KfU Envirotech, Research Center for applied environmental technologies	Elimination rate of lipophilic substances: > 66,6 % in 3 days, > 90,8 % in 13 days TOC average elimination rate: =60,62 mg/day

<h1 style="margin: 0;">Bioversal®</h1> <p style="margin: 0;">QF-R</p>	<input checked="" type="checkbox"/> Fire Protection A/B/F (K) <input checked="" type="checkbox"/> Explosion Protection <input checked="" type="checkbox"/> Ecol. Oil Spill Clean-Up Agent ^{1,4} <input checked="" type="checkbox"/> S/W Anti Pollution Agent ^{1,4} <input checked="" type="checkbox"/> HC Bioremed. Effectiveness ^{1,4} <input checked="" type="checkbox"/> Sewage Plant Compatibility ^{1,4}	<h2 style="margin: 0;">MATERIAL SAFETY DATA SHEET</h2> <p style="margin: 0;">In accordance with EC-Directive 1907/2006 EC, Art. 31 (REACH), CLP in compliance with 453/2010 & 2015/830 EU Last update: MSDS_QF-R_EN_v24032020 Replaces version: MSDS_QF-R_EN_v28052019 Print date/Date posted: 18/05/2020</p>
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SECTION 12**ECOLOGICAL INFORMATION^{2,3} continued****CONCLUSION:**

- I. **Bioversal® QF-R** is not persistent.
- II. **Bioversal® QF-R** is easily, rapidly and nearly completely biodegradable.
- III. **Bioversal® QF-R** is well tolerated by sewage plant treatment operation.
- IV. The biochemical composition of **Bioversal® QF-R** is similar to naturally occurring biotensides in waters and differs essentially from synthetic or environment friendly detergents. The biodegradation profile and behaviour of **Bioversal® QF-R**, theoretical calculations and empirical data support the assumption that harmful oxygen depletion in waters is not to be expected when product is applied acc. the instructions of the producer and when applied in less than 10 % dilution rate.
- V. **Bioversal® QF-R** treated/coated hydrocarbon micelles and deep-frying fat/oil (biocaps) are particularly bioavailable, biocompatible and highly biodegradable.
- VI. The formation of **Bioversal® QF-R** coated hydrocarbon micelles and deep-frying fat/oil (biocaps) does not create stable emulsions and is compatible with standard oil-water separator systems.
- VII. **Bioversal® QF-R** shows anti-pollution properties of treated hydrocarbon spills, raising bacterial ecotoxicity tolerance LCO/ECO/NOEC up to 1.000 mg/l.
- VIII. **Bioversal® QF-R** treated hydrocarbon spills show bioremediation effectiveness of up to 540–870 mg/l/day under aerobic conditions.

12.3 Bioaccumulative potential:

N/A

The product does not contain PFOS, PFOA and its derivatives.

[SGS Institut Fresenius, LC-MS/MS test method, Report Nr. 2000990-01a].²

The product is not bioaccumulative. See SECTION 12.

12.4 Mobility in soil:

N/A

Bioversal® QF-R is completely soluble in water.

Bioversal® QF-R is designed as a high performance fire extinguishing agent for class A fire and is especially effective in class B and class F fire applications. Mobility in soil is enhanced and foam water can enter soil, aquifer and open waters. Treat concerned area by spraying clean water till NOEC/ECO values are reached. See SECTION 12.2.

In case of class B fires collect/absorb/skim mechanically concerned area then spray clean water till NOEC/ECO values are reached. See SECTION 12.2. Monitor oil pollution. If necessary retreat with **Bioversal® QF-R** to stimulate bioremediation.¹ Avoid accidental release.

Applications on hydrocarbon pollutants present in soil and aquifer, enhances their mobility.

Application of **Bioversal® QF-R** on hydrocarbons polluted soil, waters and aquifer enhances their mobility and is an intended and crucial effect of the soil washing and bioremediation effectiveness of the product. **Bioversal® QF-R** makes pollution bioavailable to microorganisms, if used in a controlled way according the safety instructions of the supplier and environmental engineers' best practices. Product does not create stable emulsions with hydrocarbons.³ Application of the product should always be in accordance with local, state or national legislation.

12.5 Results of PBT and vPvB assessment:

N/A

Not a PBT and not a vPvB according to REACH Annex XIII.

12.6 Other adverse effects:

N/A

No other adverse effects.

12.7 Additional information:

N/A

No information available.

<h1>Bioversal®</h1> <p>QF-R</p>	<input checked="" type="checkbox"/> Fire Protection A/B/F (K) <input checked="" type="checkbox"/> Explosion Protection <input checked="" type="checkbox"/> Ecol. Oil Spill Clean-Up Agent ^{1,4} <input checked="" type="checkbox"/> S/W Anti Pollution Agent ^{1,4} <input checked="" type="checkbox"/> HC Bioremed. Effectiveness ^{1,4} <input checked="" type="checkbox"/> Sewage Plant Compatibility ^{1,4}	<h2>MATERIAL SAFETY DATA SHEET</h2> <p>In accordance with EC-Directive 1907/2006 EC, Art. 31 (REACH), CLP in compliance with 453/2010 & 2015/830 EU Last update: MSDS_QF-R_EN_v24032020 Replaces version: MSDS_QF-R_EN_v28052019 Print date/Date posted: 18/05/2020</p>
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SECTION 13**DISPOSAL CONSIDERATIONS**

13.1 Waste treatment methods:	Duly discharge at waste water treatment plant. Disposal should be in accordance with local, state or national legislation.		
13.1.1 Product and packaging disposal:	<ul style="list-style-type: none"> EU waste disposal code =07-06-01, aqueous surfactant solution. Discharge at sewage or any other biological water treatment facility. Cleaned, empty packages are reusable. Container waste disposal code: 20-01-39. 		
13.1.2 Waste treatment relevant information:	N/A See SECTION 13.1.3		
13.1.3 Sewage disposal-relevant information:	<table border="1"> <tr> <td> <ul style="list-style-type: none"> COD [mg/l] = BOD5 [mg/l] = Nitrification inhibition in activated sludge = Bacterial inhibition = Biological degradation in activated sludge = </td> <td> 200 mg/l, at 0,1 % diluted with water 120 mg/l, at 0,1 % diluted with water EC50 (incubation) > 0,2-0,3 % corresponds EC50 > 2-3 g/l, 6 % solution, no nitrification inhibition ECO <= 700-800 g/l, concentrate, no inhibition effects > 60 % in 5 days; > 98 % in 11 days, > 99,9 % in 20 days completed Ready biodegradable: easily, rapidly and almost completely </td> </tr> </table>	<ul style="list-style-type: none"> COD [mg/l] = BOD5 [mg/l] = Nitrification inhibition in activated sludge = Bacterial inhibition = Biological degradation in activated sludge = 	200 mg/l, at 0,1 % diluted with water 120 mg/l, at 0,1 % diluted with water EC50 (incubation) > 0,2-0,3 % corresponds EC50 > 2-3 g/l, 6 % solution, no nitrification inhibition ECO <= 700-800 g/l, concentrate, no inhibition effects > 60 % in 5 days; > 98 % in 11 days, > 99,9 % in 20 days completed Ready biodegradable: easily, rapidly and almost completely
<ul style="list-style-type: none"> COD [mg/l] = BOD5 [mg/l] = Nitrification inhibition in activated sludge = Bacterial inhibition = Biological degradation in activated sludge = 	200 mg/l, at 0,1 % diluted with water 120 mg/l, at 0,1 % diluted with water EC50 (incubation) > 0,2-0,3 % corresponds EC50 > 2-3 g/l, 6 % solution, no nitrification inhibition ECO <= 700-800 g/l, concentrate, no inhibition effects > 60 % in 5 days; > 98 % in 11 days, > 99,9 % in 20 days completed Ready biodegradable: easily, rapidly and almost completely		
13.1.4 Other disposal recommendations:	<p>QF-R foam solution and hydrocarbons do not form stable emulsions. On water surface floating hydrocarbon micelles can be effectively skimmed or separated and recycled by standard O/W separator systems and methods. Residual oil pollution in treated foam solution is highly biodegradable and is compatible with sewage plant operations.</p> <p><i>[KfU Envirotech, Research Center for applied environmental technologies, Compliance of deep-fried oil emulsions with respect to the treatment in domestic sewage treatment plants. Oil separator performance according to ÖNorm 85105 (2010) & biodegradability, Prof Dr. rer. nat habil. Marion Martienssen Head of dep. "Biotechnology of water treatment at Brandenburg University of technology/Report, Order No: Kf 19/2014].</i></p>		

SECTION 14**TRANSPORT INFORMATION**

14.1 UN number: Recommendations:	N/A
14.2 UN proper shipping name: Recommendations:	N/A
14.3 Transport hazard classes: Recommendations:	N/A On available data, Bioversal® QF-R is not classified as hazardous product.
14.4 Packing group: Recommendations:	N/A
14.5 Environmental hazards: Recommendations:	N/A On available data, Bioversal® QF-R is not harmful to the environment.
14.6 Special precautions for User: Recommendations:	N/A No special precautions are required for this product.

Bioversal[®]

QF-R

- Fire Protection A/B/F (K)
- Explosion Protection
- Ecol. Oil Spill Clean-Up Agent^{1,4}
- S/W Anti Pollution Agent^{1,4}
- HC Bioremed. Effectiveness^{1,4}
- Sewage Plant Compatibility^{1,4}

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SECTION 14**TRANSPORT INFORMATION** *continued*
14.7 Transport in bulk according to Annex II of MARPOL and the IBC code:

N/A

SECTION 15**REGULATORY INFORMATION**
15.1 Safety, health and the Environmental regulations/legislation specific for mixture:

Safety, health and environmental regulations/legislations for the substance or mixture:

- This product does not meet the criteria for classification in any hazard class according to Regulation (EC) No 1272/2008, Article 40 (CLP) on classification, labeling and packaging of substances and mixtures.
- This safety Data Sheet is provided in compliance with the EC Directive 1907/2006-453/2010.
- Composition information in accordance with EC Regulation 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents.

FIRE PROTECTION: International Certificates and Approvals

- I) EN1568-3: 2000-10/EN1568-3: 2001-03, Rating 1A/1A, low, medium expansion foam at 3 %.
[MPA, Test Report Nr. 2000-23-456/Bi 04, 08/06/2000]
- II) EN1568-3: 2008-08, Rating 1A/1A, low, medium expansion foam at 6 %.
[MPA, Certif.-Nr. SPO6/12, Test Rep.-Nr. 2011-F-2685/Bi 10, 21/06/2011]
- III) GESIP, Partie I, Hydrocarbures, émulseurs filmogènes, catég. 2 l.m-2.min-1 à 3 %. Testé au site d'essai Vernon, France, qualifié et listé, www.gesip.com
[GESIP, conformément au Circulaire du 06/05/1999/12, Rapport.-Nr. 99/02]
- IV) ICAO Level B, qualified according requirements Level B, low expansion foam at 3 %.
[SP, Sweden, Reference Nr. of Test Report P 00 6420, issue date 31/05/2000]
- V) ICAO Level C, qualified according requirements Level C, low expansion foam at 3 %.
[MPA, Germany, Reference Nr. of Test Report 20150783/Bi 11, issue date 07/07/2015]
- VI) IMO 1312, qualified according requirements IMO MSC.1/Circ. 1312: 2009/ Corr. 1: 2011, low expansion foam at 6 %.
[MPA, Germany, Reference Nr. of Test Report 201507831/Bi 12, issue date 07/07/2015]⁶
- VII) UL162, extinguishing qualities successfully tested at 3 % acc. UL162, 7th Edition.
[TNO, Netherlands, Test Report 97-CVB-R0859, issue date August 1997]

International Certificates und Approvals**ENVIRONMENT PROTECTION/OCCUPATIONAL & HYGIENE REGULATIONS/ROAD SAFETY REGULATIONS**

For relevant infos concerning certificates, approvals and export reports, refer to SECTION 11,12,13 highlighting the following properties of the product:

- biodegradation behaviour of **Bioversal[®] QF-R**
- toxicity profile of **Bioversal[®] QF-R**
- ecotoxicity profile of **Bioversal[®] QF-R**
- synergistic ecotoxicity profile of TPH-**Bioversal[®] QF-R** micelles (biocaps)
- disposal, canalisation release and sewage plant compatibility
- occupational health evaluation of **Bioversal[®] QF-R**



<h1 style="margin: 0;">Bioversal®</h1> <p style="margin: 0;">QF-R</p>	<input checked="" type="checkbox"/> Fire Protection A/B/F (K) <input checked="" type="checkbox"/> Explosion Protection <input checked="" type="checkbox"/> Ecol. Oil Spill Clean-Up Agent ^{1,4} <input checked="" type="checkbox"/> S/W Anti Pollution Agent ^{1,4} <input checked="" type="checkbox"/> HC Bioremed. Effectiveness ^{1,4} <input checked="" type="checkbox"/> Sewage Plant Compatibility ^{1,4}	<h2 style="margin: 0;">MATERIAL SAFETY DATA SHEET</h2> <p style="margin: 0;">In accordance with EC-Directive 1907/2006 EC, Art. 31 (REACH), CLP in compliance with 453/2010 & 2015/830 EU Last update: MSDS_QF-R_EN_v24032020 Replaces version: MSDS_QF-R_EN_v28052019 Print date/Date posted: 18/05/2020</p>
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SECTION 15	REGULATORY INFORMATION <i>continued</i>
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GERMANY, registration:

- Ministry of Environment, Environmental Agency: UBA No: 20780044

Test and classification acc. German water hazard class

- QF-R classification: WGK 0 "Generally not dangerous for waters" old norm
- QF-R classification: WGK 1 "Slightly dangerous for waters" new norm

In the new norm, WGK 0 has been substituted through nWGK (no water risk hazard), with the explanation, that all surfactants independent their measured environmental properties are to be automatically excluded from the classification nWGK. Any surfactants without consideration of their specific environmental characteristics are to be classified in the best case WGK 1 and hence are indistinguishable from synthetic surfactants with higher ecotoxicity. The current legislation respectively the classification and evaluation of surfactants are in so far misleading and contradictory, that biosurfactants, which are produced by naturally occurring microorganisms would have to be classified WGK1, slightly dangerous for waters.

[HIG, Classification and assessment of Water Risk Hazard of substances according to German regulation. (VwVWS).³

15.2 Chemical Safety Assessment	N/A
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SECTION 16	OTHER INFORMATION
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16.1 Disclaimer:	
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The information provided about the product on this Safety Data Sheet has been compiled based on knowledge of laboratory tests from accredited institutes and authorities according regional, local or national regulations and legislations or international standards, applicable in different countries, certificates, approvals academic studies and expert evaluations. Approvals certificates, expert evaluations available upon request.

The Data given here only applies when product used for proper application(s). The product is not sold as suitable for other applications. Do not use for other application(s) without seeking advice from Bioversal International. The Data given here is based on current knowledge and empirical data. This Safety Data Sheet describes the product in terms of safety requirements and does not signify or imply any warranty with regard to the product's properties.

16.2 Relevant P-Phrases:	
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Additional safety recommendations despite positive expert and certificates:	
<p>P100-Phrases: P102.....</p> <p>P300-Phrases: P301+P312.....</p> <p>P301+P330+P331..... P305+P351+P338.....</p> <p>P400-Phrases: P404..... P412.....</p>	<p>General Keep out of reach of children.</p> <p>Reaction IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. (use a defoamer e.g DIMETICON). IF SWALLOWED: rinse mouth. Do NOT induce vomiting. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>Storage Store in a closed container. Do not expose to temperatures exceeding 50 °C/122 °F.</p>

Bioversal[®]

QF-R

- Fire Protection A/B/F (K)
- Explosion Protection
- Ecol. Oil Spill Clean-Up Agent^{1,4}
- S/W Anti Pollution Agent^{1,4}
- HC Bioremed. Effectiveness^{1,4}
- Sewage Plant Compatibility^{1,4}

MATERIAL SAFETY DATA SHEET

In accordance with EC-Directive 1907/2006 EC, Art. 31 (REACH), CLP
in compliance with 453/2010 & 2015/830 EU
Last update: MSDS_QF-R_EN_v24032020
Replaces version: MSDS_QF-R_EN_v28052019
Print date/Date posted: 18/05/2020

SECTION 16**OTHER INFORMATION** *continued***16.3 Abbreviations and acronyms:**

LD50.....	Lethal dose 50 %
LC50.....	Lethal concentration 50 %
LCO.....	Lethal concentration 0 %
ECO.....	Effective concentration 0 %
EC50.....	Half maximal effective concentration
NOEC.....	Non Observed Effective concentration
COD.....	Chemical Oxygen Demand
BOD5.....	Biological Oxygen Demand 5 days
N/A.....	Not applicable
WGK.....	Water Hazard Class = Wasser Gefährdungsklasse
COLIPA.....	Walker A.P. et al.: Test Guidelines for Assessment of Skin Compatibility of Cosmetic Finished Products in Man. Food and Chem. Toxicology, 34, 1996, 651-660
UBA.....	Environmental Agency Germany/Umweltbundesamt
GLP.....	Good Laboratory Practice
HIG.....	Hygiene Institut Gelsenkirchen
IMU, Vienna.....	Institut für Mineralölprodukte und Umweltanalytik
IZLUI.....	Institute for Zoology and Limnology of the University of Innsbruck
HP.....	High Performance
VOC/voc.....	Volatile Organic Compound
S/W.....	Soil/Water
EEC.....	European Economic Community
OECD.....	Organization of Economic Cooperation & Development
O/W.....	Oil/Water
TPH.....	Total Petroleum Hydrocarbon
1.....	Application in accordance with Local, Regional and National Regulations.
2.....	Bioversal[®] QF-R is QF, which is modified with an additional active ingredient of vegetal origin inhibiting rarely occurring formation of organic odour due to aerobic or anaerobic biodegradation or fungal reactions in premixes or preparations diluted with water, typically for EN3-7 fireextinguishers. Evaluation is based on test data/reports of Bioversal[®] QF .
3.....	Bioversal[®] QF-R does not contain hazardous substances, which are subject to classification and labeling according EC Regulations, and hence would have to be assessed under SECTION 13. Nevertheless, Bioversal International provides precise ecotoxicological information of the product Bioversal[®] QF-R to ensure a transparent, responsible, decision making tool for the users when operating in an open environment and ecosystem. Evaluation and assessment of the available ecotoxicity data suggests, that the product is harmless for ecosystem if: <ul style="list-style-type: none"> ▪ if applications of Bioversal[®] QF-R concentrations of 10 % dilution rate are not exceeded <p><i>[IZLUI, Univ., Prof. Dr. R.Dallinger, Ecotoxicological Evaluation on the application of "Bioversal" in combating mineral oil contamination in soil and water; Expert report, 08/2001, Institute for Zoology and Limnology of the University of Innsbruck].</i></p>

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SECTION 16**OTHER INFORMATION** *continued*

- 4 In case of **Bioversal**[®] **QF-R** applications where foam spills on soil are inevitable, sprinkle sufficient water quantities to reach NOEC/ECO/LCO values of 1,0–1,5 % effective field dilution rates. In case of maritime operations or on waters, field dilution rates are reached naturally.
 In case of combined **Bioversal**[®] **QF-R**/oil spills after fire extinguishing operations, collect mechanically spilled hydrocarbons. The product does not form stable emulsions and floating hydrocarbons can be easily skimmed.
 Treat residual and non recoverable oil pollution by flushing of clean water to reach NOEC/ECO/LCO values of 0,1–1,5 %.
 Monitor analytically residual oil pollution in soil/waters/aquifer. Under optimum environmental conditions, **Bioversal**[®] **QF-R** bioremediation effectiveness is immediately activated through enhanced bioavailability and biocompatibility of encapsulated oil micelles. Aerobic biodegradation of residual hydrocarbon pollution is stimulated during the next 14–21 days. For further anti pollution measures on the spot, sprinkle **Bioversal**[®] **QF-R** at 0,5–1,0 %.
- 5 Certification and fireextinguishing performance are in the name of/ or describe the product **Bioversal**[®] **QF-R**. Fireextinguishing properties are identical with those of the mother product **Bioversal**[®] **QF**.
- 6 **The extreme cooling of Bioversal**[®] **QF-R** shows effective fireextinguishing results, when applied on metal fires or class D fires. If applied correctly by trained personal, metal fires can be extinguished through cooling. For that purpose use water mist application, to exploit maximum cooling efficiency. Volatile hydrogen gases are effectively encapsulated through a protective cooling water steam skin and separated from oxygen. H₂ and O₂ reaction is strongly inhibited during the cooling process. The encapsulation effect of **Bioversal**[®] **QF-R** can also be applied on polar liquids to control and extinguish by cooling. Highest rating in burnback resistance (> 10 minutes) acc. EN1568 IA/IA though, is only achievable for polar liquids, which do not surpass:
- Solubility ratios of polar liquid in water = 35 % at 20 °C
 - Solubility ratios of water in polar liquid = 50 % at 20 °C



Bioversal[®]

QF-R

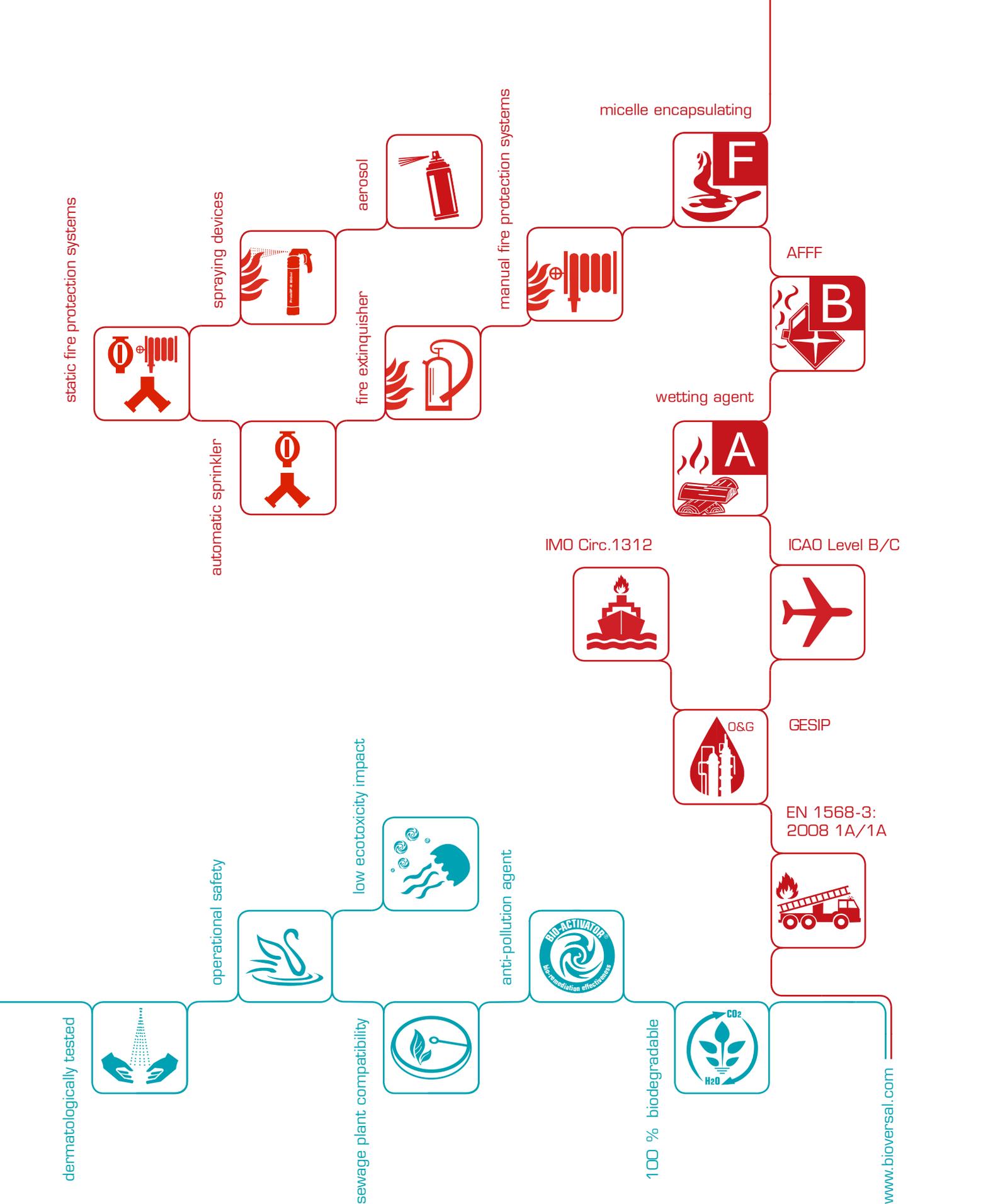
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SECTION 16**OTHER INFORMATION** *continued***16.4 Indication of changes:**

<u>Date of changes:</u>	<u>Document Identity:</u>	<u>Comments/Changes:</u>
01/08/2014.....	MSDS_QF-R_EN_v01082014.....	1. Creation new format
03/11/2014.....	MSDS_QF-R_EN_v03112014.....	1. Update 2014
08/01/2015.....	MSDS_QF-R_EN_v08012015.....	1. Update 2015
15/06/2015.....	MSDS_QF-R_EN_v15062015.....	2. Update 2015
22/10/2015.....	MSDS_QF-R_EN_v22102015.....	3. Update 2015 • CLP konform • ICAO Level C, IMO zertif.
15/01/2016.....	MSDS_QF-R_EN_v15012016.....	1. Update 2016
21/02/2016.....	MSDS_QF-R_EN_v21022016.....	2. Update 2016 • Update parameters
06/02/2017.....	MSDS_QF-R_EN_v06022017.....	1. Update 2017 • Further clarifications for polar liquids
03/01/2018.....	MSDS_QF-R_EN_v03012018.....	1. Update 2018
01/03/2019.....	MSDS_QF-R_EN_v01032019.....	1. Update 2019
28/05/2019.....	MSDS_QF-R_EN_v28052019.....	2. Update 2019
24/03/2020.....	MSDS_QF-R_EN_v24032020.....	1. Update 2020



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