Health and Safety Data Sheet- Bio Kill

1. IDENTIFICATION OF THE PREPARATION AND OF THE COMPANY:

Commercial Product Name:	Bio-Kill
Responsible company:	Bio-Link Systems Ltd. PO Box 139 Thetford Norfolk
Information phone no:	Tel: 01842 754767 Fax: 01842 754981

2. INFORMATION ON INGREDIENTS

Chemical Nature: Preparation based on peracetic acid and hydrogen peroxide.
The preparation contains: Surfactant.

Hazardous Components:

Peracetic acid:		4.5% - < 5.5%	
CAS Number:	79-21-0	EC-Number:	201-186-8
Symbol(s):	O, Xn, C, N	R-phrase(s)	R7, R10, R20/21/22, R35, R50
Hydrogen peroxide:		20% - < 30%	
CAS number:	7722-84-1	EC-Number:	231-765-0
Symbol(s):	O, C	R-phrase(s)	R8, R34
Acetic Acid:		>=5%-<20%	
CAS number:	64-19-7	EC-Number:	200-580-7
Symbol(s):	C	R-phrase(s)	R10, R35

See chapter 16 for text of risk phrases

3. HAZARDS IDENTIFICATION

Causes burns. May cause fire.
Risk of decomposition in contact with incompatible substances, impurities, metals, alkalis, reducing agents.
Danger of decomposition if exposed to heat.
see also section 10.

4. FIRST AID MEASURES

General advice:	Move out of dangerous area. Take care of your own personal safety. Keep out unprotected persons.
Inhalation:	Move affected persons out into fresh air. Possible discomfort: Irritates skin and mucous linings of the eyes and respiratory tract, cough. If breathing difficulties occur (e.g. severe continual cough): Keep patient half sitting with upper body raised. Keep warm and in a quiet place. Call a doctor immediately.
Skin contact:	After contact with skin wash immediately with plenty of water for at least 15 minutes. Take all contaminated clothing off immediately . Consult a doctor.
Eye contact:	With eye held open, thoroughly rinse at once with a gentle stream of water for at least 10 minutes. Protect unharmed eye. Continue rinsing process with eye rinsing solution. Call ambulance (cue: caustic burn of the eyes) Immediate further treatment in ophthalmic hospital/ophthalmologist. Continue rinsing eye until arrival at hospital.

Ingestion:	Do not induce vomiting Danger of penetration of the lungs (danger to breathing) when swallowed or vomited, due to gas evolution and foam formation. Only when patient fully conscious: Have the mouth rinsed with water. Have patient drink plenty of water in small sips. Keep patient warm and at rest. Notify ambulance immediately. (keyword: acid burn).
Notes to physician:	Therapy as for chemical burn. Following inhalation: Formation of a toxic lung edema is possible if product continues to be inhaled despite acute irritative effect (e.g. if it is not possible to leave danger area). Prophylaxis of a toxical lung oedema with inhalative steroids (Dexamethasone aerosol dosing spray, f.ex auxilosone). If substance has been swallowed: Aspiration hazard! Risk of gaseous embolisms! In case of excessive strain on the stomach due to gas evolution, insert siphon tube. Early endoscopy in order to assess mucosa lesions in the oesphagus and stomach which may appear. If necessary, suck away leftover substance. Do not administer activated charcoal, since risk of release of large amounts of gas from hydrogen peroxide!

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Fine spray of water, foam, dry powder.
Extinguishing media which must not be used for safety reasons:	Organic compounds:
Protective equipment:	In case of fire, wear respiratory protective equipment independent of surrounding air and chemical protective suit.
Specific hazards:	Contact with the following substances may cause inflammation: flammable substances. Involved in fire, it may decompose yielding oxygen. Risk of overpressure and burst due to decomposition in confined spaces and pipes. Release of oxygen may support combustion. In case of fire, remove the endangered containers and bring to a safe place, if this can be done safely. Keep away from heat. If necessary: In case of fire, cool the containers that are at risk with water or dilute with water (flooding)
Further information:	Evacuate personnel to safe areas. Keep out unprotected persons. Keep unauthorised persons away. Water used to extinguish fire should not enter drainage systems, soil, or stretches of water. Ensure there are sufficient retaining facilities for water used to extinguish fire. Contaminated fire-extinguishing water must be disposed of in accordance with the regulations issued by the appropriate local authorities. Fire residues should be disposed of in accordance with the regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Product causes chemical burns. Wear personal protective equipment: see section 8. Evacuate personnel to safe areas. Keep out unprotected persons. Keep unauthorised persons away.
Environmental precautions:	Observe regulations on prevention of water pollution (collect, dam up, cover up). Do not allow to run into water channels, surface water, or into the ground.
Methods for cleaning up:	With small amounts: Dilute product with lots of water and rinse away. See section 12. or Absorb with liquid-binding material, e.g. chemisorption, diatomaceous earth, universal binder. Do not use: textiles, saw dust, combustible substances. Pick up mechanically. Collect in suitable containers. Keep away from incompatible substances. Keep away from flammable substances. See section 10. Clean contaminated surface thoroughly. Recommended cleaning agent: water. Dispose of absorbed material in accordance with the regulations. See section 13.
Additional advice.	Make safe or remove all sources of ignition. Isolate effective containers immediately, if possible and safe to do. Shut off leak, if possible and safe to do. Place defective containers in waste receptacle (waste packaging receptacle) made of plastic (not metal). Do not seal defective containers or waste receptacles airtight (danger of bursting due to product decomposition). Never return spilled product into its original containers for re-use. (Risk of decomposition).

7. HANDLING AND STORAGE

Handling:	Avoid contact with skin, eyes and clothing. Do not breathe in vapours, aerosols, sprays. For personal protection see section 8. Handle in accordance with good industrial hygiene and safety practice. Avoid impurities and heat effect. Ensure there is good room ventilation. Change moistened and saturated work clothes immediately. Rinse contaminated or saturated clothing with water immediately. Never return spilled product into its original container for re-use. (Risk of decomposition). Provide for installation of emergency shower and eye bath. Set up safety and operation procedures. Avoid sun rays, heat, heat effect. Keep away from sources of ignition – No smoking. Keep away from flammable substances. See section 10.

To cool, spray closed containers with water spray jet. In case of fire, remove the endangered containers and bring to a safe place, if this can be done safely. See section 5.

Storage: Requirements for storage areas and containers:
Cool, well ventilated, clean and lockable.
Recommendation: Acid-proof floor.
Use adequate venting devices on all packages, containers and tanks and check correct operation periodically.
Do not confine product in unvented vessels or between closed valves.
Risk of overpressure and burst due to decomposition in confined spaces and pipes.
Check containers and tanks at regular intervals to detect any special changes such as pressure build-up (distension), damage, leakage.
Transport and store container in upright position only.
Do not empty container by means of pressure.
Always close container tightly after removal of product.
Do not keep the container sealed.
Ensure tightness at all times. Avoid leakage.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Only use containers which are specially permitted for: Peracetic acid.
and/or
For transport, storage and tank installations only use suitable materials.

Suitable materials:	stainless steel (1.4571), polyethylene, polypropylene, polyvinyl chloride (PVC), polytetrafluoroethylene, glass, ceramics.
Unsuitable materials:	mild steel, iron, copper, brass, bronze, aluminium, zinc.

Further Information: Avoid sun rays, heat, heat effect.
Avoid impurities.
See also section 15.
Regularly verify the availability of water to deal with emergencies (for cooling, tank flooding, fire fighting) and check correct operation periodically.
For detailed information on design specifications for the construction of tank and dosing installations ask the producer for advice.
Do not store together with: alkalis, reductants, metallic salts (risk of decomposition).
Do not store together with: inflammable substances (risk of fire).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters:

Hydrogen peroxide:

CAS – No.	7722-84-1	EC-No:	231-765-0
Control parameters (EH	1ppm		Time Weighted Average (TWA) :
	1.4mg/m3		OES)
	2ppm		Short Term Exposure Limit (STEL) :
	2.8mg/m3		(EH40 OES)

Acetic acid:

CAS-No.	64-19-7	EC-No:	200-580-7
Control parameters (EH40	10ppm		TimeWeighted Average (TWA) :

	25mg/m3	OES)
	15ppm	Short Term Exposure Limit (STEL) :
	37mg/m3	(EH40 OES)
	10ppm	Time Weighted Average (TWA) : (EU ELV)
	25mg/3	

Other information

Suitable measuring processes are:

Hydrogen peroxide:	OSHA method ID 006	OSHA method VI-6
Acetic acid:	NIOSH method 1603	OSHA method ID 186

Engineering measures

Ensure suitable suction/aeration at the work place and with operational machinery.
See also section 7.

Personal protective equipment

Respiratory protection

If workplace exposure limit is exceeded apply Respiratory protective equipment.
In case of larger quantities: If open handling is unavoidable:
Wear respiratory protection.
Suitable respiratory equipment:
Respirator with ABEK-P2 combination filter.
Respirator with yellow E-type filter. (Germany)
If necessary: Local ventiliation.

Hand protection

Wear protective gloves made of the following materials: PVC, neoprene or rubber.

Eye protection

Basket-shaped glasses wear.

Skin and body protection

Wear protective clothing, acid-proof.
Suitable materials are:
PVC, neoprene, nitrile rubber (NBR), rubber.
Rubber or plastic boots.

Hygiene measures

Avoid contact with skin, eyes and clothing.
Do not inhale vapour, aerosols, mist.
Ensure there is good room ventilation.
Avoid contaminating clothes with product.
Change moistened and saturated work clothes immediately.
Rinse contaminated or saturated clothing with water immediately .
Any contaminated protective equipment is to be cleaned after use.
No eating, drinking, smoking, or snuffing tobacco at work.
Wash face and /or hands before break and end of work.
Preventive skin protection recommended.
Use barrier cream regularly.

Protective measures

Handle in accordance with good industrial hygiene safety practice.
The work-place related airborne concentrations have to be kept below of the indicated exposure limits.
If the limits at the workplace are exceeded and/or larger amounts are released (leakage, spilling, dust) the indicated respiratory protection should be used.
Wear suitable protective clothing, gloves and eye/face protection.
The personal protective equipment used must meet the requirements of directive 89/686/EEC and amendments (CE certification).
It should be defined in the work place in the form of a risk analysis according to directive 89/686/EEC and amendments.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Form:	Liquid
Colour:	Colourless, clear

Odour:	Stinging
Safety data:	
pH	ca. 0.3 (20°C)
Melting point/range:	ca. -28°C
Boiling point/range:	not applicable decomposition >60°C
Flash point:	>96°C Method: DIN 51 584
Ignition temperature:	430°C Method: DIN 51 794
Autoinflammability:	not spontaneously flammable
Lower explosion limit:	no data available
Upper explosion limit	no data available
Vapour pressure	ca. 27h Pa (20°C)
Density:	ca. 1.12 g/cm3 (20°C)
Bulk density:	not applicable
Water solubility:	completely miscible
Partition coefficient (n-octanol/water):	log Pow:- 1.25 (calculated)
Viscosity, dynamic:	not determined
Further information:	
Miscibility in water:	completely miscible
Other information:	oxidising agent oxidising (according to EC Directive 67/548/EEC)

10. STABILITY AND REACTIVITY

Conditions to avoid:	Sun rays, heat, heat effect.
Material to avoid:	Impurities, decomposition catalysts, metal salts, alkalis, reducing substances, metals, nonferrous heavy metal, aluminium, zinc. Possible hazardous reaction: decomposition. Flammable materials. Possible hazardous reaction: Spontaneous ignition. Organic solvents. Possible hazardous reaction: Danger of explosion.
Hazardous decomposition products:	Decomposition products Under conditions of thermal decomposition: steam, oxygen.
Hazardous reactions:	Product is an oxidizing agent and reactive. Stable under recommended storage conditions. Product is supplied in stabilised form. Danger of decomposition if exposed to heat. When coming in contact with the product, impurities, decomposition catalysts, metallic salts, alkalis, reducing agents may lead to self-accelerated, exothermic decomposition and the formation of oxygen. Risk of overpressure and burst due to decomposition in confined spaces and pipes. Release of oxygen may support combustion.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity:	LD50 rat: 2,392 mg/kg Method: literature Test substance: Peracetic acid 10%
Acute dermal toxicity:	LD50 rat: 1,147 mg/kg Method: literature
Skin irritation:	rabbit

	corrosive Method: OECD Test Guideline 404
Eye irritation:	rabbit highly irritative Method: literature Test substance: Peracetic acid 14%
Sensitization:	Draize-test guinea pig: not sensitising Method: literature Test substance: Peracetic acid 14%
Repeated dose toxicity:	dermal guinea pig Testing period: 90 d Target/organ effect: Irritative effect, liver, lung irritation. Method: literature
Gentoxicity in vitro:	Micronucleus test mouse predominantly negative Method: literature Mutagenicity: In vitro examinations (micro-organisms, cell cultures) show overwhelmingly negative results, literature. Micronucleus test Mouse, oral negative Method: EEC B 12 Test substance: Peracetic acid 5%
Gentoxicity in vivo:	Unschedued DNA synthesis – test (UDS) rat negative Method: literature Test substance: Peracetic acid 5%
Human experience:	Irritation and on occasion caustic effects to the skin and mucous membrances (eyes, respiratory channels, in the stomach/intestinal tracts after swallowing) are to be expected from local contact.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Biodegradability:	Readily biodegradable. Test substance: Peracetic acid 40% Exposure time: 28d Method: OECD TG 301E
Physico-chemical removability:	Method: literature Hydrolyses after 7 days by approx. 50%
Further information:	Under ambient conditions quick hydrolysis, reduction of decomposition occurs. The following substances are formed: oxygen, water, acetic acid. Acetic acid is easily biodegradable.

Behaviour in environmental compartments

Bioaccumulation:	low Log Pow: see chapter 9.

Ecotoxicity effects

Toxicity to fish	LC50 Pleuronectes platessa: 89.1 mg/l / 96 h Test substance: Peracetic acid 12% Method: literature NOEC Pleuonectes platessa: 56 mg/l / 96 h Test substance: Peracetic acid 12% Method: literature
Toxicity to daphnia:	EC50 Daphina magna: 3.3 mg/l / 48 h Test substance: Peractic acid 15% Method: OECD TG 202 NOEC Daphina magna: 1mg/l / 48 h

	Test substance: Peracetic acid 15% Method: OECD TG 202
Toxicity to algae:	IC 50 selenastrum capricornutum: ca. 0.18mg/l / 120 h Test substance: Peractic acid 5% Method: US-EPA-method Chronic
	NOEC selenastrum capricornutum: 0.12mg/l / 120 h Test substance: Peractic acid 5% Method: US-EPA-method Chronic
Toxicity to bacteria:	EC100 Pseudomonas aeruginosa: 9.9mg / l / 0.5 h Test substance: Peracetic acid 36% Method: literature
	The product is slightly biodegradable in sewage works when greatly diluted. Local activated sludge Test substance: Peracetic acid, greatly diluted easily biodegradable.

Further information on ecology

AOX	The product does not contain any organically bonded halogen.
Further information:	does not contain any heavy metals and compounds from EC directive 76/464: e.g. arsenic, lead, cadmium, Mercury, organic compounds organic halogen compounds

13. DISPOSAL CONSIDERATIONS

Product:	Dispose of in accordance with Local Authority regulations.
Recommendation:	Offer surplus and non-recyclable solutions to a licensed disposal company. Taking into account local regulations the product may be disposed of as waste water after neutralisation. If necessary contact the relevant authorities.
Uncleaned packaging:	Rinse empty containers before disposal: recommended cleaning agent: water. Offer rinsed packaging material to local recycling facilities.
Waste Key Number:	No waste code number in accordance with the European Waste Catalogue can be specified for this product since it can only be categorised on the basis of its use by the consumer. The waste code number is to be put on by arrangement with the disposal contractor, manufacturer or authority.

14. TRANSPORT INFORMATION

Land Transport ADR/RID	5.1(8)
Class:	5.1
UN-No:	3149
Item:	1
Letter:	b
Secondary hazard	8
Orange warning plate	58 / 3149
Description of goods:	Hydrogen peroxide and peroxyacetic acid mixture, stabilized (Technical name)

Sea Transport IMDG-Code

Class:	5.1
UN-N°:	3149
Packaging Group:	11
Secondary hazard	8

EmS:	F-H, S-Q
Proper technical name	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE, STABILIZED

Air Transport ICAO-TI/IATA-DGR

Class:	5.1
UN-N°:	3149
Packaging Group:	II
Proper technical name (Proper shipping name)	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE, STABILIZED

Loading Instructions/Remarks

IATA_C	Drill 5C
IATA_P	Drill 5C
IMDG	Protect from heat. Separate from metal powders and permanganates.

15. REGULATORY INFORMATION

Labelling according to EC Directive:

Hazard-defining component(s)	Peracetic acid	
Symbol:	C	Corrosive
	O	Oxidising
R-phrase(s):	R34	Causes burns
	R7	May cause fire.
S-phrase(s):	S 3/7	Keep container tightly closed in a cool place.
	S14	Keep away from impurities, decomposition catalysts, alkalis, reducing agents, flammable substances.
	S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
	S45	In case of accident or if you feel unwell, seek medical advice immediately (show labels where possible).
	S1/2	Keep locked up and out of the reach of children.

National legislation

Major Accident Hazard:	82/501/EWG
Legislation:	listing: Appendix III, Part 2 and/or. Appendix IV. The product is subject to the EC directive 82/501/EEC and amendments (see regulations concerning malfunctions).
Employment restriction:	Observe national regulations.
Prohibited Chemicals Ordinance:	Observe national regulations
Other regulations:	Other countries: observe the national regulations.

16. OTHER INFORMATION

Registration

Europe (EINECS/ELINCS)	listed/registered
Switzerland	listed/registered
USA (TSCA)	listed/registered

Risk phrase (R phrase) texts

Peracetic acid

R7	May cause fire.
R10	Flammable.
R20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
R35	Causes severe burns.
R50	Very toxic to aquatic organisms.

Hydrogen peroxide

R8	Contact with combustible material may cause fire.
R34	Causes burns.

Acetic acid

R10	Flammable.

R35 Causes severe burns.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.