SAFETY DATA SHEET

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH) & 1272/2008 (CLP)

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name	Bioquell HPV-AQ
Chemical Name	Hydrogen Peroxide
Molecular Formula	H2O2
Type of Product	Mixture

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

Identified use(s)	To be used in conjunction with Bioquell Hydrogen Peroxide Vapour Generating Equipment. Product is for professional use only

Details of the supplier of the Safety Data Sheet

1.3

Company Identification	Bioquell UK Limited
Address	52 Royce Close West Portway Andover Hampshire SP10 3TS
Telephone	+44 (0) 1264 835 835
Fax	+44 (0) 1264 835 836
E-Mail (competent person)	consumables@bioquell.com

1.4 Emergency telephone number out of hours

	Europe 1-760-476-3961
Emergency Phone No. during office hours	+44 (0) 1264 835 835 (08.00 – 17.00 GMT Monday - Friday)

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 Regulation (EC) No. 1272/2008 (CLP)

Acute Tox. 4, Oral. H302, Inhalation H332
Skin Irrit. 2, H315
Serious Eye Dam. 1, H318
STOT SE 3. Inhalation. H335

2.1.2 Directive 67/548/EEC & Directive 1999/45/EC

Xn, R22
Xi, R37/38, R41

2.2 Label elements

2.2.1 Label elements

According to Regulation (EC) No. 1272/2008 (CLP)

Name(s) on Label	
Hazardous components	Hydrogen peroxide (35%)
Signal Word	DANGER

Hazard Pictogram

Hazard statement(s)

H302: Harmful if swallowed
H315: Causes skin irritation
H332: Harmful if inhaled
H318: Causes serious eye damage
H335: May cause respiratory irritation

Precautionary statement(s)

Prevention

P261: Avoid breathing gas/mist/vapours/spray.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

Repsonse

P310: Immediately call a POISON CENTRE or doctor/physician
P301 + **P312**: IF SWALLOWED: call a POISON CENTRE or doctor/physician if you feel unwell.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.2.2 Label elements

According to Directive 67/548/EEC & Directive 1999/45/EC

Hazard Symbol

Risk Phrases

R22: Harmful if swallowed.
R37/38: Irritating to respiratory system and skin.
R41: Risk of serious damage to eyes.

Safety Phrases

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S-27/S-28: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water.
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 the label where possible).

2.3 Other hazards

None

2.4 Additional Information

None

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures
3.2.1. Concentration

Substance Name:	Concentration
Hydrogen peroxide CAS-No.: 7722-84-1 / EC-No.:231-765-0 / Index-No.: 008-003-00-9 REACH Registration Number: 01-2119485845-22	Ca. 35%

EC Classification No. 1272/2008

Hazardous ingredient(s)	Hazard Class	Hazard Category	Route of exposire	H Phrases	Hazard pictogram(s) and Hazard statement(s)
Hydrogen Peroxide	Oxidizing liquids	Category 1		H271	Oxidising Liq. 1, H271 Acute Tox. 4 (Inhalation), H332 Acute Tox. 4 (Oral), H302 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE3, H335
	Acute toxicity	Category 4	Inhalation	H332	
	Acute toxicity	Category 4	Oral	H302	
	Skin corrosion	Category 1A		H314	
	Serious eye damage	Category 1		H318	
	Specific target organ toxicity – single exposiure	Category 3	Inhalation	H335	

Hazardous ingredient(s)	Classification	Hazard category	R-phrase(s)
Hydrogen Peroxide			R5
	O	Oxidising	R8
	C	Corrosive	R35
	Xn	Harmful	R20/22

3.3 Additional Information
For full text of H/P and R/S phrases see section 16.

4. SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

If inhaled — Move the exposed person to fresh air immediately. Seek medical attention when anyone has symptoms apparently due to inhalation.

In case of skin contact — Wash with plenty of water and soap.

		Remove and wash contaminated clothing before re-use. If symptoms persist seek immediate medical attention.
	In case of eye contact	Seek immediate medical attention. Eyes should be washed immediately with plenty of water for at least 10-15 minutes. Also wash under eyelids for at least 15 minutes In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine)
	If swallowed	Seek immediate medical attention. Wash out mouth with water, and drink plenty of water (200-300ml). DO NOT INDUCE VOMITING. Oxygen or artificial respiration if needed
4.2	**Most important symptoms and effects, both acute and delayed**	
	Inhalation	Inhalation of vapours is irritating to the respiratory system, may cause throat pain and cough Risk of: Nose bleeding, chronic bronchitis
	Skin Contact	Irritation Risk of: Burn
	Eye Contact	Severe eye irritation Risk of serious damage to eyes Symptoms: Redness, Lachrymation, swelling of tissue
	Ingestion	Severe irritation Symptoms: Nausea, Abdominal pain, Vomiting, Diarrohea, Risk of chemical pneumonitis from product inhalation
4.3	**Indication of immediate medical attention and special treatment needed**	Consult with an ophthalmologist immediately in all cases If accidently swallowed obtain immediate medical attention When symptoms persist or in all cases of doubt, seek medical attention

5. SECTION 5: FIRE-FIGHTING MEASURES

5.1	**Extinguishing Media**	
	Suitable Extinguishing Media	Use water spray. Fire water contaminated with this material must be contained and prevented of discharge to any waterway, sewer or drain.
	Unsuitable Extinguishing Media	None known
5.2	**Special hazards arising from the substance or mixture**	Has a fire-promoting effect due to release of oxygen. Hazards of over-pressurisation in containers exposed to heat: explosion risk. Contact with combustible material may cause fire
5.3	**Advice for fire-fighters**	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA).

Wear chemical resistant oversuit
Cool containers/tanks with water spray
Prevent fire extinguishing water from contaminating surface water of the ground water system

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel

Avoid contact with spilled material.
Prevent further leakage or spillage if safe to do so

Advice for emergency responders

Wear suitable protective equipment. Refer to section 5 for fire-fighting; section 4 for first-aid advice; and section 8 for minimum requirements for personal protective equipment.
Evacuate personnel to safe areas
Keep people away from and up wind of spill/leak

6.2 Environmental precautions

Do not allow to enter drains, sewers or watercourses.
Should not be released into the environment

6.3 Methods and material for containment and cleaning up

Dam up
Do not mix waste streams during collection
Soak up with inert absorbant material
Keep in suitable, closed containers for disposal
Never return spills in original containers for re-use

6.4 Reference to other sections

Section 1 for emergency contact. Section 8 for information on appropriate personal protective equipment.

6.5 Additional Information

None

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid ingestion, inhalation and contact with skin and eyes
Use only with adequate ventilation.
Keep away from heat and sources of ignition.
Keep container tightly closed.
Wear protective gloves/clothing and eye/face protection.
Keep away from incompatible products
Use only clean and dry utensils

7.2 Conditions for safe storage, including any incompatibilities

Storage Temperature

Store between 4^{o}C to 25^{o}C

Storage Conditions

Protect from light.
Keep only in original container
Keep away from combustible materials and sources of ignition and heat.
Store in a receptacle equipped with a vent
Keep container closed
Regularly check the conditions and temperature of the containers.

	Incompatible materials	Strong acids, strong alkalies, strong oxidising agents, strong reducing agents, organic material, acetone and metals.
	Suitable material	Aluminium 99,5% Stainless steel 304L/316L Approved grades of HDPE
7.3	**Specific end use(s)**	Apart from the use mentioned in Section 1.2 no other specific uses are stipulated. For further information please contact supplier

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Exposure Limit Values

Hydrogen Peroxide

UK. EH40 Workplace Exposire Limits (WELs) 2007
Time weighted average = 1ppm
Time weighted average = 1.4 mg/m3
UK.EH40 Workplace Exposire Limits (WELs) 2007
Short term exposure limit = 2ppm
Short term exposure limit = 2.8mg/m3
US. ACGIH Threshold Limit Values 2009
Time weighted average = 1ppm

8.1.2 Other information on limit values

Predicted No Effect Concentration

Fresh water, .0.13 mg/l
Marine water, 0.013 mg/l
Sewage treatment plants, 4.7 mg/l

Derived No Effect Level/Derived minimal effect level

Workers, inhalation, acute exposure, 3 mg/m3, local effects
Workers, inhalation, chronic exposure, 1.4 mg/m3, local effects
Consumers, inhalation, acute exposure, 1.93 mg/m3, local effects
Consumers, inhalation, chronic exposure, 0.21 mg/m3, local effects

SUBSTANCE.	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note:
Hydrogen Peroxide ≥35% - ≤50%	7722-84-1	1	1.4	2	2.8	EH 40

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Ensure adequate ventilation
Apply technical measures to comply with the occupational exposure limits

8.2.2 Personal protection equipment

Eye/face protection

Wear chemical safety glasses with side shields, or splash-proof goggles

	Skin protection (Hand protection/ Other)	
		Impervious gloves Suitable material: PVC, natural rubber, butyl-rubber, nitrile rubber Any specific glove information provided is based on published literature and glove-manufacturer data. Contact the glove manufacturer for glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. Chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet–style gloves. Nitrile, CEN standards EN 420 and EN 374 provide general requirements and list of glove types.
	Respiratory protection	If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements. Types of respirator to be considered for this mixture include: Half-face filter respirator; Type A filter material CEN standards EN136, EN140 and EN 405 provide respirator masks and EN 149 and EN 143 provide filter recommendations
		
	Hygiene Measures	Eye wash bottles or eye wash stations in compliance with applicable standards Take off contaminated clothing and shoes immediately Wash contaminated clothing before re-use When using do not eat, drink or smoke Wash hands before breaks and at the end of workday Handle in accordance with good industrial hygiene and safety practice.
	Thermal hazards	None Known
8.2.3	**Environmental Exposure Controls**	Dispose of rinse water in accordance with local and national regulations See sections 6,7,12,13

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Liquid
Colour	Colourless
Odour	Pungent
Molecular weight	34 g/mol
pH (Value)	2.02 (H_2O_2 50%)
Melting Point (°C) / Freezing Point (°C)	-33°C (H_2O_2 35%)
Boiling point/boiling range (°C):	108°C (H_2O_2 35%)
Flash Point (°C)	Not applicable
Evaporation rate	No data available
Flammability (solid, gas)	Not applicable

	Explosive limit ranges.	No data available
	Vapour Pressure (mm Hg)	1 mbar (H_2O_2 50%) at 30°C
	Vapour Density (Air=1)	1
	Density (g/ml)	1.1 - 1.2
	Solubility (Water)	Miscible with water
	Solubility (Other)	No data available
	Partition Coefficient (n-Octanol/water)	Log Pow: -1.57, Method: calculated value
	Auto Ignition Temperature (°C)	Not flammable
	Decomposition Temperature (°C)	>60°C, Self-accelerating decomposition temperature (SADT) <60°C, Slow composition
	Viscosity (mPa.s)	1.17 mPa.s (H_2O_2 50%), at 20°C
	Explosive properties	Not explosive
	Oxidising properties	Mixture classified as oxidising with sub-category 2
9.2	**Other information**	Surface tension – 75.6 mN/m (H_2O_2 50%) at 20°C

10. SECTION 10: STABILITY AND REACTIVITY

10.1	**Reactivity**	Stable under normal conditions of use Decomposes on heating Potential for exothermic hazard
10.2	**Chemical stability**	Stable under recommended storage conditions Sensitive to heat and light.
10.3	**Possibility of hazardous reactions**	Contact with combustible material may cause fire Contact with flammables may cause fire or explosions Risk of explosion if heated under confinement Fire or intense heat may cause violent rupture of packages
10.4	**Conditions to avoid**	Protect from freezing Contamination To avoid thermal decomposition, do not overheat
10.5	**Incompatible materials**	Acids, bases, metals, Heavy metal salts, powdered metal salts, reducing agents, organic materials, flammable materials
10.6	**Hazardous Decomposition Product(s)**	Oxygen

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

11.1.2 Mixtures

Acute toxicity	Acute oral toxicity: LD50, Rat: 1,270 mg/kg (H_2O_2 35%) Acute inhalation toxicity: LC50 4h, rat, >0.17 mg/l, vapour (H_2O_2 50%) Acute dermal toxicity LD50, Rabbit, >2,000 mg/kg (H_2O_2 35%)
Skin corrosion/Irritation	Rabbit: skin irritation (H_2O_2 35%) Irritating to skin. Effects may include: discolouration, Erythema, Odema.
Serious eye damage/eye irritation	Rabbit, Severe eye irritation (H_2O_2 10%)
Corrosivity	Corrosive to eyes. May cause irreversible eye damage.

	Sensitisation	Guinea pig, did not cause sensitization on laboratory animals
	Repeated dose toxicity	Oral, 90-day, mouse, Gastrointestinal tract, 300 ppm LOAEL Oral, 90-day, mouse, 100 ppm NOAEL Inhalation, 28-day rat, respiratory system, 10ppm, LOAEL, vapour Inhalation, 28-day, rat 2ppm, NOAEL, Vapour
	Carcinogenicity	Oral, Prolonged exposure, mouse, Target organs: Duodenum, carcinogenic effects Dermal, prolonged exposure, mouse, animal testing did not show any carcinogenic effects
	Mutagenicity	In vitro tests have shown mutagenic effects In vivo tests did not show mutagenic effects
	Toxicity for reproduction	Substance is totally biotransformed (metabolized) Study scientifically unjustified
	Specific target organ toxicity – single exposure	Inhalation, mice, 665 mg/m3, Remarks: RD 50, Irritating to respiratory system, H2O2 50%
11.2	**Other information**	None

12. SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

- LC50, 96hours, Pimephales promelas (fathead minnows): 16.4 mg/L
- NOEC 96hours, Pimephales promelas 4.3mg/l
- Crustaceans, Daphnia pulex, EC50, 48 h, 2.4 mg/l, fresh water, semi static test
- Crustaceans, Daphnia pulex NOEC, 48 h, 1mg/l, fresh water, semi-static test
- Algae, skeletonema costatum, EC50, growth rate, 72h, 2.6 mg/l
- Algae, skeletonema costatim, NOEC, 72h, 0.63 mg/l
- EC 50, 48 hours, Daphnia pulex (water flea): 2.4mg/L
- Algae, chlorella vulgaris, NOEC, 72h, 0.1 mg/l

12.2 Persistence and degradability

Abiotic Degradation	Air, indirect photo oxidation, t 1 /2 24h Conditions: sensitizer: OH radicals Water, redox reaction, t 1 /2, 120h Conditions: mineral and enzymatic catalysis, fresh water, salt water Soil, redox reaction, t 1 /2 12h. Conditions: mineral and enzymatic catalysis
Biodegradation	Aerobic, t 1/2 < 2 min Conditions: biological treatment sludge Readily biodegradable Aerobic t 1/2 from 0.3 – 5 d

		Conditions: fresh water Readily biodegradable Anaerobic, conditions: soil/sediments Not applicable
12.3	**Bioaccumulative potential**	Bioaccumulative potential: Log Pow -1.57 Result – does not bioaccumulate
12.4	**Mobility in soil**	
	Water	Considerable solubility and mobility
	Soil/sediments	Log KOC: 0.2, non significant evaporation and adsorption
	Air	Volatility, Henry's law constant (H), = 0.75 kPa.m^3/mol Conditions 20°C Not significant
12.5	**Results of PBT and VPVB assessment**	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT) This substance is not considered to be very persistent nor very bioaccumulating (vPvB)
12.6	**Other adverse effects**	No data available

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1	**Waste treatment methods**	Handle in accordance with good industrial hygiene and safety practice. Refer to protective measures listed in sections 7 and 8. Empty containers retain residue (liquid and/or vapour) and can be dangerous. Do not burn, or use a cutting torch on, the empty drum. Dispose of in accordance with the European Directives on waste and hazardous waste. Waste must be classified and labelled prior to recycling or disposal. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.
13.2	**Additional Information**	None

14. SECTION 14: TRANSPORT INFORMATION

14.1 Land transport (ADR/RID)

UN number	UN 2014
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Transport hazard class(es)	5.1
ADR/RID-Labels	5.1 – Oxidizing substances 8 - Corrosive
Packing Group	II
Hazard label(s)	 
Environmental hazards	None
Special precautions for user	None

14.2 Sea transport (IMDG)

UN number	UN 2014
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Transport hazard class(es)	5.1
IMDG Labels	5.1 – Oxidizing substances 8 - Corrosive
Marine Pollutant	No
Special precautions for user	None

14.3 Air transport (ICAO/IATA)

UN number	UN 2014
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Transport hazard class(es)	5.1
ICAO labels	5.1 – Oxidizing substance 8 – corrosive
Packing Group	II
Environmental hazards	None
Special precautions for user	None

14.4 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code — Not applicable

15. SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture substance or mixture

1907/2006 – REACH
1272/2008 – CLP
67/548/EEC –DSD
199/45/EC – DPD
98/8/EC -BPD

15.1.1 EU regulations

Authorisations and/or restrictions on use — Refer to EU regulation for details of any actions or restrictions by the above regulations or directives

15.1.2 National regulations

Refer to national regulation for details of any actions or restrictions by the above regulations or directives

Inventory Information	Status
Toxic Substance Control Act List (TSCA)	- In compliance with inventory
Australian Inventory of Chemical Substances (AICS)	- In compliance with Inventory
Canadian Domestic Substances List (DSL)	- In compliance with Inventory
Korean Existing Chemicals Industry (KECI(KR))	- In compliance with Inventory
EU list of existing chemical substances (EINECS)	- In compliance with Inventory
Japanese Existing and New Chemical Substances (MITI List) (ENCS)	- In compliance with Inventory
Inventory of Existing Chemical Substances (China) (IECS)	- In compliance with Inventory
Philippine Inventory of Cehemicals and Chemical Substances (PICCS)	- In compliance with Inventory
New Zealand Inventory of Chemicals	- In compliance with Inventory

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this mixture (hydrogen peroxide)

16. SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1-16.

LEGEND

LTEL Long Term Exposure Limit
STEL Short Term Exposure Limit
STOT Specific Target Organ Toxicity
DNEL Derived No Effect Level
PNEL Predicted No Effect Concentration

References: Sources of information used in preparing this SDS included one or more of the following: results from in-house or supplier toxicology studies; publications from trade associations; ECHA publications; EU guidelines and other sources as appropriate

Risk Phrases and Safety Phrases

R5: Heating may cause an explosion.
R8: Contact with combustible material may cause fire.
R20/22: Harmful by inhalation and if swallowed.
R35: Causes severe burns.
R37/38: Irritating to respiratory system and skin.
R41: Risk of serious damage to eyes.
S1/2 - Keep locked up and out of reach of children
S17 – keep away from combustible material
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S27/28: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water.
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 the label where possible).

Hazard statement(s) and Precautionary statement(s)
H302: Harmful if swallowed.
H315: Causes skin irritation.
H318: Causes serious eye damage.
H332: Harmful if inhaled
H335: May cause respiratory irritation.
P220: Keep/store away from clothing/combustible materials
P261: Avoid breathing gas/mist/vapours/spray
P270: Do not eat, drink or smoke when using this product
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P310: Immediately call a POISON CENTRE or doctor/physician if you feel unwell
P303 + P361 + P353: IF ON SKIN (or hair) Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Training advice: All users should be trained

Additional Information: None