Safety Data Sheet

Revision date: 05.2015 *Version: 1.1*

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name/designation:	Hydrogen peroxide, BDH Aristar® Ultra
Product No.:	87003-224
Other means of identification:	EU Index # 008-003-00-9

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

Relevant identified uses: For laboratory use only. Not for drug, food, or household use.

1.3. Details of the supplier of the safety data sheet

Manufactured for	VWR International, LLC Radnor Corporate Center 100 Matsonford Road Radnor, PA 19087-8660	VWR International Co 2360 Argentia Road Mississauga, ON L5N 5Z7 CANADA
Telephone	610.386.1700	800.932.5000

1.4. Emergency Telephone number

CHEMTREC	800.424.9300
CANUTEC	613.996.6666

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) and WHMIS HPR

For the full text of the H-Statement(s) and P-Statement(s) mentioned in this Section, see Section 16.

Hazard classes and hazard categories	Hazard statements
Serious eye damage, category 1	H318
Acute toxicity, oral, category 4	H302
Acute toxicity, inhalation, category 4	H332

2.2. GHS Label elements, including precautionary statements

Pictograms:

Signal word: Danger

Hazard statements	
H318	Causes serious eye damage.
H302+H332	Harmful if swallowed or if inhaled.

Precautionary statements	
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor.
P301+P312	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
P501	Dispose of contents/containers in accordance with local, state and federal regulations.

2.4. Hazards not otherwise classified (HNOC) or not covered by GHS or WHIMS

None known.

SECTION 3: Composition / information on ingredients

3.1. Hazard components

Chemical name	Formula	Molecular weight	CAS#	Weight%
Hydrogen peroxide	H_2O_2	34.01	7722-84-1	30-32%
Water	H_2O	18.02	7732-18-5	Balance

SECTION 4: First aid measures

4.1. General information

In case of inhalation: If symptoms are experienced, remove source of exposure or move person to fresh air and keep comfortable for breathing. Call a Poison Centre or doctor if you feel unwell or are concerned.

In case of skin contact: Take off immediately contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water/shower for 5 minutes or until product is removed. If skin irritation occurs or you feel unwell, get medical advice/attention. Store contaminated clothing under water and wash before re-use or discard.

In case of eye contact: Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses if present, and easy to do. Continue rinsing for up to 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a Poison Center or doctor.

In case of ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a Poison Centre or doctor.

4.2. Most important symptoms and effects, both acute and delayed

Hydrogen peroxide solutions can form a vapor at normal temperatures. The airborne concentrations reached depend on the concentration of the solution and how the product is used. The vapor or mists from solutions are irritating to

corrosive to the nose, throat, and respiratory tract depending on the airborne concentration and the duration of exposure. In very severe cases, bronchitis or a potentially life-threatening accumulation of fluid in the lungs (pulmonary edema) may occur. The symptoms of pulmonary edema include coughing, chest pain, and shortness of breath, and can be delayed for up to 24 or 48 hours after exposure. Long-term lung damage may result from a severe short-term exposure.

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

Consult a doctor and/or the nearest Poison Control Centre for all exposures except minor instances of inhalation or skin contact.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Hydrogen peroxide does not burn. Use extinguishing media suitable for the surrounding fire. Use large quantities of water as fog to fight fires in which this material is involved.

5.2. Special hazards arising from the substance or mixture

Hydrogen peroxide solutions of 20% to less than 35% do not burn, but are moderate to strong oxidizing agents. Concentrations of 27.5% and above can cause combustible materials such as wood, paper, oils and grease to burst into flames and will support, accelerate and intensify the burning of combustible materials in a fire. Some substances that do not normally burn in air will ignite or explode upon contact with hydrogen peroxide.

Hydrogen peroxide decomposes to molecular oxygen, which can accelerate the burning of flammable materials or cause spontaneous combustion. Closed containers may rupture violently due to rapid decomposition, if exposed to fire or excessive heat for a sufficient period of time, or if contaminated with certain metals or dirt. Large amounts of oxygen gas may be released to form an oxygen-rich atmosphere. No part of a container should be subjected to a temperature higher than 49 °C (120 °F).

5.3. Special protective equipment for firefighters

Hydrogen peroxide solutions 20% to less than 35% are mild skin irritants. Firefighters may enter the area if positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) and full Bunker Gear is worn.

5.4. Hazardous combustion products

Hydrogen peroxide decomposes to molecular oxygen.

5.5. Advice for firefighters

Use extreme caution. Evacuate area and fight fire from a safe distance or a protected explosion-resistant location or maximum possible distance. Approach fire from upwind to avoid hazardous vapors and decomposition products. Do not enter without wearing specialized protective equipment suitable for the situation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personal protective equipment. Ventilate area. Eliminate all ignition sources. Remove all flammable and combustible materials.

6.2. Environmental precautions

Notify government environmental agencies if material is released into the environment.

6.3. Methods and material for containment and cleaning up

Do not touch spilled material. Stop or reduce leak if safe to do so. Prevent material from entering sewers, waterways or confined spaces.

SMALL SPILLS: Flush area with water.

LARGE SPILLS: Dike with earth, sand or inert sorbent material to contain spill. Remove liquid with compatible pumps or vacuum equipment. Place in suitable, covered, labeled, vented containers. Flush area with excess water. Keep materials that can burn away from spilled material. Contaminated absorbent material may pose the same hazards as the spilled product.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

This material is a MODERATE OXIDIZER and is CORROSIVE to the eyes. Before handling, it is very important that engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use. Maintenance and emergency personnel should be advised of potential hazards. Wear appropriate personal protective equipment, if necessary, to prevent eye contact.

Eliminate all ignition sources (sparks, smoking, flames, hot surfaces). Keep away from heat. Never allow contact with materials which can burn. Post "NO SMOKING" signs in the area.

Consider using closed handling systems for processes involving this material. If a closed handling system is not possible, use hydrogen peroxide in the smallest possible amounts, in an area separate from the storage area. Avoid generating vapors or mists. Prevent the release of vapors or mists into the air. Immediately report leaks, spills or failures of the engineering controls.

Do not use with incompatible materials such as organic compounds (e.g. alcohols, ethers). See Section 10 for more information. Do not return unused or contaminated material to the original container. Prevent contamination of peroxide solutions by any source including dust, metals and organic materials. Do not allow water to evaporate from the solution. Do not perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all material has been cleared. Maintain handling equipment. Prevent leaks of grease or other lubricants from equipment where this chemical is used. Do not allow contact with materials such as cleaning solvents, paints or thinners.

Inspect containers for damage or leaks before handling. Label containers. Cautiously, dispense into sturdy containers made of compatible materials. Use corrosion-resistant transfer equipment when dispensing. Whenever possible, use self-closing, portable containers for dispensing small amounts of this material. The use of a self-priming siphon is preferred to pouring. Add to cold water slowly, in small amounts and stir frequently to avoid excessive heat generation. Never transfer by pressurizing the original shipping container with air or inert gas. Secondary protective containers must be used when this material is being carried.

Avoid damaging containers. Keep containers closed when not in use. Always assume that empty containers contain hazardous residues. Never reuse empty containers, even if they appear to be clean. Have suitable emergency equipment for fires, spills and leaks readily available. Practice good housekeeping. Comply with applicable regulations.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, well-ventilated area, out of direct sunlight, away from heat and ignition sources and away from combustible materials. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Keep storage area separate from work areas. Store away from elevators, building and room exits or main aisles leading to exits. Post warning signs. Inspect periodically for damage or leaks.

Ground floor storage facilities are usually recommended. For large scale operations, consider the installation of leak

and fire detection equipment along with a suitable, automatic fire suppression system. When storing large quantities, store in an isolated, fireproof building, if possible. Keep quantities stored as small as possible.

Storage facilities should be made of fire resistant materials. Construct walls, floors, shelving and fittings in storage areas from non-combustible materials that resist attack from hydrogen peroxide. Avoid bulk storage indoors. Store away from incompatible materials, such as organic compounds. See Section 10 for more information.

Inspect all incoming containers to make sure they are properly labeled and not damaged. Store in suitable, labeled containers (usually the shipping container). Containers should be equipped with an adequately sized vent or other relief device to prevent over-pressurization due to decomposition or fire exposure. Protect from damage.

Have appropriate fire extinguishers and spill clean-up equipment in storage area. Contain spills or leaks by storing in trays made from compatible materials. Keep absorbents for leaks readily available. Provide raised sills or ramps at doorways or create a trench which drains to a safe location. Storage tanks should be above ground and surrounded with a dike capable of holding entire contents.

Store oxidizing materials according to the occupational health and safety regulations and fire and building codes with will describe the kind of storage area and the type of containers for a specified amount of the material.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Chemical Name	Limit Value Type	Exposure Limit Value	Source
Hydrogen peroxide	TLV-TWA	1 ppm	USA ACGIH
	PEL-T-TWA, REL-TWA	1 ppm (1.4 mg/m^3)	USA OSHA, USA NIOSH
	IDLH	75 ppm	USA NIOSH
Water	None listed.	Not applicable	Not applicable

8.2. Exposure controls

Appropriate engineering controls: Engineering methods to control hazardous conditions are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions and process modification (e.g. substitution of a less hazardous material).

Because of the potential hazard associated with this substance, control measures such as enclosure or isolation should be considered for large scale operations. Supply sufficient replacement air to make up for air removed by exhaust systems. Do not use organic or combustible materials such as wood in the construction of ventilation or control systems.

Personal protective equipment:

Eye/face protection: Chemical safety goggles suitable for splash protection and/or a face shield. Have an eye-wash fountain readily available in the immediate work area.

Skin protection: Chemical protective gloves, coveralls, boots, and/or other chemical protective clothing to prevent repeated or prolonged contact.

Respiratory protection: NIOSH RECOMMENDATIONS FOR HYDROGEN PEROXIDE CONCENTRATIONS IN AIR:

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS: Any self-contained breathing apparatus that has a full face piece and is operated in a pressure-demand or other positive-pressure mode; OR Any supplied-air respirator that has a full face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

ESCAPE: Any air-purifying, full face piece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern; OR Any appropriate escape-type, self-contained breathing apparatus

Hygiene measures: Remove contaminated clothing promptly. Drying of concentrated material on clothing may cause fire. Immerse contaminated clothing in water, and keep thoroughly wet until discarded or laundered. Inform laundry personnel of contaminant's hazards. Do not eat, drink or smoke in work areas. Wash hands thoroughly after handling this material. Maintain good housekeeping.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

a)	Appearance:	
	Physical state	Liquid
	Color	Clear, colorless
b)	Odor	Slightly sharp and irritating odor
c)	Odor threshold	No information available.
d)	pH	3.3 (30% solution)
e)	Melting point/freezing point	30% (w/w): -25.7 °C (-14.3 °F); 35% (w/w): -33.0 °C (-27.4 °F)
f)	Boiling point/boiling range	30% (w/w): 106.2 °C (223.2 °F); 35% (w/w): 108 °C (226 °F)
g)	Flash point	Does not burn, but is a moderate oxidizing material and can increase the risk of fire or the intensity of a fire.
h)	Evaporation rate	No information available.
i)	Flammability (solid, gas)	Not applicable
j)	Upper/lower flammability/explosive limits	Not applicable
k)	Vapor pressure (Partial pressure at 30 °C)	35% (w/w): 48 Pa
l)	Vapor density	1.17 (air = 1) (calculated)
m)	Relative density (at 25 °C)	30% (w/w): 1.11 g/cm^3
n)	Solubilities	Soluble in all proportions in water. Soluble in all proportions in many polar solvents, e.g. low molecular weight alcohols, glycols and ketones. Soluble in diethyl ether. (NOTE: Concentrated hydrogen peroxide solutions can react explosively with these solvents.)
o)	Partition coefficient (n-Octanol/Water)	Log P(oct) = -0.70 to -1.33 (estimated); -1.57 (estimated)
p)	Auto-ignition temperature	Not applicable
q)	Decomposition temperature	150-152 °C (302-305.6 °F) (pure hydrogen peroxide)
r)	Viscosity	No information available.
s)	Explosive properties	Not applicable
t)	Oxidizing properties	Class 2 oxidizer

SECTION 10: Stability and reactivity

10.1. Reactivity

The National Fire Protection Association (NFPA) lists hydrogen peroxide solutions (greater than 8% up to 27.5%) as a Class 1 Oxidizer and hydrogen peroxide solutions (greater than 27.5% up to 52%) as a Class 2 Oxidizer. NFPA defines an oxidizer as any material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and can undergo a vigorous self-sustained decomposition due to contamination or heat exposure. NFPA rates oxidizers on a scale of Class 4 to Class 1, with Class 4 being the most severe and Class 1 the least severe. Class 1 Oxidizers do not moderately increase the burning rate of combustible materials with which they come into contact. Class 2 Oxidizers cause a moderate increase in the burning rate of

combustible materials with which they come into contact.

10.2. Chemical stability

Solutions that are completely free of contamination are relatively stable. Stability depends upon many factors including temperature, pH, and the presence of impurities. Alkaline solutions are less stable than acidic ones (the optimum pH is 3.5-4.5). Can decompose in sunlight. Readily liberates oxygen, water and heat.

10.3. Possibility of hazardous reactions

Hazardous polymerization does not occur. See Section 10.5 for incompatible materials.

10.4. Conditions to avoid

Heat, open flames, contamination, pH greater than 4.5.

10.5. Incompatible materials

Hydrogen peroxide solutions (30% or greater) are strong oxidizing agents capable of reacting explosively with many substances. Some organic compounds form unstable peroxides.

COMBUSTIBLE MATERIALS (e.g. wood, paper, textiles, oil, grease) - may cause fire or explosion upon contact.

STRONG BASES (e.g. potassium hydroxide or sodium hydroxide) - can explode violently.

NITRIC ACID (more than 50%) or SULFURIC ACID - mixtures with 35% and above hydrogen peroxide can explode violently.

ORGANIC COMPOUNDS (e.g. carboxylic acids and anhydrides, nitrogen-containing bases, aldehydes, ketones, ethers, alcohols, charcoal, organic dust) – spontaneous combustion, violent decomposition and/or explosion may occur.

METALS (powdered or metal surfaces), METAL OXIDES, METAL SULFIDES METAL SALTS, or IODATES - may cause violent decomposition.

REDUCING AGENTS (e.g. metal hydrides) - may react violently.

POTASSIUM PERMANGANATE - can explode when in contact with very concentrated hydrogen peroxide.

10.6. Hazardous decomposition products

Molecular oxygen (O_2)

SECTION 11: Toxicology

11.1. Information on toxicological effects

Acute toxicity

Oral LD50: 910 mg/kg (rat) (hydrogen peroxide, 20% to 60%)

Inhalation LC50: No information available.

Dermal LD50: 3 g/kg (rat) (hydrogen peroxide, 30%)

Other information on acute toxicity: RTECS# MX0899500 (20-60%), MX0899000 (30%)

Skin corrosion/irritation: Hydrogen peroxide solutions of 20% to less than 35% are very mild skin irritants. Prolonged contact (e.g. 24-hours) can cause moderate to severe irritation. Whitening or bleaching of the skin may occur after contact with dilute solutions.

Serious eye damage/eye irritation: Hydrogen peroxide solutions of 20% to less than 35% can cause serious eye damage. These solutions are capable of producing severe eye burns, and permanent injury, including blindness, depending on the concentration of the solutions and duration of contact.

Respiratory or skin sensitization: Hydrogen peroxide is not known to be an occupational respiratory or skin sensitizer.

Germ cell mutagenicity: The information available is insufficient to conclude that hydrogen peroxide is a mutagen.

Carcinogenicity: Hydrogen peroxide is not known to be a carcinogen.

Reproductive toxicity: Hydrogen peroxide is not known to cause reproductive toxicity.

Specific target organ toxicity-single exposure: No information available.

Specific target organ toxicity-repeated exposure: No information available.

Aspiration hazard: No information available.

Additional information: Prolonged or repeated exposure may cause eye and throat irritation, corneal damage, dermatitis, and gradual bleaching of hair. To the best of our knowledge the chronic toxicity of this substance has not been fully investigated.

SECTION 12: Ecological information

12.1. Ecotoxicity: Carp: LC50 = 42 mg/L/48H; Channel catfish: LC50 = 37.4 mg/L/96H; Fathead minnow: LC50 = 16.4 mg/L/96H (fresh water)

12.2. Persistence and degradability: Persistent.

12.3. Bioaccumulative potential: Bioaccumulation is not anticipated for inorganic compounds that are miscible with water.

12.4. Mobility in soil: No information available.

12.5. Results of PBT and vPvB assessment: Not applicable for inorganic substances.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Review federal, provincial and local government requirements prior to disposal. After dilution with excess water, draining to sewer may be acceptable.

SECTION 14: Transport information

Land Transport DOT (U.S.)

UN Number	UN2014
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with not less than 20 percent but not more than 40 percent hydrogen peroxide (stabilized as necessary)
Class(es)	5.1 (8)
Hazard Label(s)	Oxidizer
Packing Group	II
Environmental Hazard(s)	--

Sea Transport IMDG

UN Number	UN2014
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)
Class(es)	5.1 (8)
Hazard Label(s)	Oxidizer & Corrosive
EMS- No.	F-H, S-Q

Packing Group	II
Environmental Hazard(s)	--
Segregation Group	Category D

Air Transport IATA

UN Number	UN2014
Proper Shipping Name	**Hydrogen peroxide, aqueous solution** with 20% or more but 40% or less hydrogen peroxide (stabilized as necessary)
Class(es)	5.1 (8)
Hazard Label(s)	Oxidizer & Corrosive
Packing Group	II

SECTION 15: Regulatory information

OSHA Hazards: CAS #7722-84-1 meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

SARA 302 Extremely Hazardous Substances: This material contains Hydrogen peroxide (CAS# 7722-84-1, 30-32%), which is not subject to the reporting requirements.

SARA 313 (TRI reporting): This material contains Hydrogen peroxide (CAS# 7722-84-1, 30-32%), which is subject not to the reporting requirements of Section 313 of SARA Title III.

SARA 311/312 Hazardous Chemicals: This material contains Hydrogen peroxide (CAS# 7722-84-1).

Massachusetts Right-To-Know Substance List: CAS# 7722-84-1 is listed, 1 lbs RQ.

Pennsylvania Right-To-Know Hazardous Substances: CAS# 7722-84-1 is listed.

New Jersey Worker and Community Right-To-Know Components: CAS# 7722-84-1 is listed, RTK# 1015.

California Proposition 65: CAS# 7722-84-1 is not subject to this act. CAS# 7732-18-5 is not subject to this act.

Inventory Status:

Canada DSL/NDSL Inventory List: CAS# 7722-84-1 is listed. CAS# 7732-18-5 is listed.

US TSCA Inventory List: CAS# 7722-84-1 is listed. CAS# 7732-18-5 is listed.

EINECS, ELINCS or NLP: CAS# 7722-84-1 is listed, EC# 231-765-0. CAS# 7732-18-5 is listed, EC# 231-791-2.

SECTION 16: Other information

Full text of H-Statement(s) and P-Statement(s)

H318	Causes serious eye damage.
H302+H332	Harmful if swallowed or if inhaled.
P261	Avoid breathing fumes/gas/mist/vapours/spray.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor.

P330	Rinse mouth.
P501	Dispose of contents/containers in accordance with local, state and federal regulations.

Canadian Carcinogenicity hazard class: Not applicable.

PHNOC hazard class: Not applicable.

HHNOC hazard class: Not applicable.

Biohazardous Infectious Materials hazard class: Not applicable.

NFPA Rating:

Health: 3
Flammability: 0
Reactivity: 1
Special Hazard: Oxidizing material

DISCLAIMER

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. VWR International and its Affiliates shall not be held liable for any damage resulting from handling.