PRODUCT SPECIFICATION

Product Name	Sodium Hypochlorite Solution, 14-15% Available Chlorine
Alternative Name	Bleach Liquor
Specification Reference	HYPO/6 (19/09/IHJK)

	Units	Specification Range	Typical Analysis
Available Chlorine	% w/w	>14.0	14.8
Density at 20°C	kg/litre	1.24 – 1.27	1.25
Sodium Hypochlorite	% w/w	>14.7	15.5
Sodium Hydroxide	% w/w	0.2 – 1.0	0.7
Sodium Carbonate	% w/w	<1.5	0.3
Iron, Fe	ppm	<2	0.4

Methods of Analysis

Methods of analysis are given in BS4426:1969

Additional Information

Quality Standard

This product meets the requirements of BS EN 901:2013 chemicals for the treatment of water intended for human consumption

The strength specification is that at the time of supply. Sodium Hypochlorite solution is inherently unstable and slowly loses strength, producing Sodium Chloride and Oxygen, therefore time/light/foreign matter all contribute (sometimes to significant effect) to a reduction in strength. We recommend no more than 2-3 months stock on hand in cool/dark storage conditions.

NOTES

Exclusion of Liability

Information contained in this publication is accurate to the best of the knowledge and belief of Fluid Science Ltd.

Any information or advice obtained from Fluid Science Ltd otherwise than by means of this publication and whether relating to Fluid Science Ltd materials or other materials, is also given in good faith. However, it remains at all times the responsibility of the customer to ensure that Fluid Science Ltd materials are suitable for the particular purpose intended.

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Health and Safety

A Material Safety Data Sheet has been issued describing the health, safety and environmental properties of this product, identifying the potential hazards and giving advice on the handling precautions and emergency procedures. This must be consulted fully before handling, storage and use.

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

1.1 Product Identifier

Trade Name	Sodium Hypochlorite
Substance Name	Hypo. Bleach, concentrated. Sodium hypochlorite liquor, concentrated.
Index Number	017-011-00-1
CAS Number	7681-52-9
EINECS Number	231-668-3
REACH Registration Number	01-2119488154-34-XXXX

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

Identified use(s)	Bleaching agent, oxidising agents, intermediate, Industrial and professional cleaning
Uses advised against	None identified

1.3 Details of the supplier of the safety data sheet

Fluid Science Limited
Unit 3b Arbour Ct, Arbour Lane,
Knowsley Industrial Park
Kirkby
L33 7XE
+44 (0) 1244 506 860
sales@fluidscienceltd.com

1.4 Emergency telephone number

Tel: 0870 190 6777 (National Chemical Emergency Centre) +44 (0)1270 502891

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

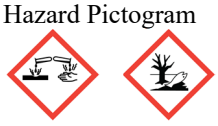
Aquatic Acute 1: Very toxic to aquatic life.
Aquatic Chronic 2: Toxic to aquatic life with long lasting effects.
Eye Dam. 1: Causes serious eye damage.
Met. Corr. 1: May be corrosive to metals.
Skin Corr. 1B: Causes severe skin burns and eye damage.

For the full text of the H-Statements mentioned in this Section, see Section 16

2.2 Label elements

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

Hazard Pictogram



Signal word(s): Danger.
Hazard statement(s)
H290: May be corrosive to metals.
H314: Causes severe skin burns and eye damage.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P260: Do not breathe vapour
P273: Avoid release to the environment
P280: Wear protective gloves/protective clothing/eye protection/face protection
P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353: IF ON SKIN (or hair): 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.

Additional Labelling:

EUH031: Contact with acids liberates toxic gas

2.3 Other hazards
None known

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances
- **Chemical nature:** Sodium hypochlorite
  Aqueous solution

Chemical Name	Identification Number		Amount (%)
Sodium hypochlorite, solution	Index No. CAS No. EC No. REACH Reg. No. Classification	017-011-00-1 7681-52-9 231-668-3 01-2119488154-34-xxxx Met. Corr. 1 H290 Skin Corr. 1B H314 Aquatic Acute 1 H400 Aquatic Chronic 2 H411 EUH031	12 – 16%

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation
Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary. Obtain medical attention.

Skin contact
Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If symptoms develop, obtain medical attention.

Eye contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor.

Ingestion
Do NOT induce vomiting. Provided the patient is conscious, wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Immediately call a POISON CENTRE/doctor.

4.2 Most import symptoms and effects, both acute and delayed
Inhalation: May cause breathing difficulty. Cough. Gas (chlorine) produced under fire or acidic conditions is toxic by inhalation.
Skin Contact: Causes burns.
Eye Contact: Risk of serious damage to eyes.
Ingestion: Will cause corrosion of and damage to the upper gastrointestinal tract.

4.3 Indication of any immediate medical attention and special treatment needed
In cases of severe exposure, pulmonary oedema may develop. Fluid build up on the lung (pulmonary oedema) may occur up to 48 hours after exposure and could prove fatal. Immediately call a POISON CENTER/doctor. Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media
Suitable extinguishing media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture
Non-combustible. May decompose in a fire, giving off toxic and irritant vapours. (chlorine). Chlorine is an oxidising agent.

5.3 Advice for fire-fighters
Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Use water spray or fog to knock down and absorb corrosive fumes. Keep fire exposed containers cool by spraying with water. Dike fire control water for later disposal.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Provide adequate ventilation. Do not use metal containers for spilled liquid. Wear appropriate personal protective equipment, avoid direct contact.

6.2 Environmental precautions
Avoid release to the environment. Spillages or uncontrolled discharges into watercourses must be alerted to the appropriate regulatory body.

6.3 Methods and material for containment and cleaning up
Collect spillage. Small spillages: Wash the spillage area with water. Large spillages: Contain spillages with sand, earth

or any suitable adsorbent material. Earth may be shovelled to contain spillage and to avoid contamination of sewers and watercourses.

6.4 Reference to other sections
See also Section 8, 13

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of mists. Wear protective gloves/protective clothing/eye protection/face protection. Ensure adequate ventilation.

7.2 Conditions for safe storage, including any incompatibilities
For small quantities - vented containers made from glass or PVC are suitable.
For large quantities - glass reinforced plastic tanks with a PVC lining, rubber lined mild steel or high density polyethylene tanks are suitable. Storage tanks should be completely enclosed except for vents and overflows. Provision should be made to wash tanks clear of sludge, which can build up due to salting out of solids during natural decomposition.
Storage temperature: Ambient. Keep away from heat and direct sunlight.
Storage life: Stable under normal conditions.
Incompatible materials: Do not mix with acid. Avoid contact with other cleaning agents.

7.3 Specific end use(s)
No further relevant information

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Sodium Hypochlorite Not Listed (UK HSE EH40).
In case of chlorine emission the occupational exposure limit for chlorine should be observed.

Chlorine: CAS No. 7782-50-0 STEL 0.5 ppm 1.5 mg/m^3

Region	Source
Europe	EU Occupational Exposure Limits
United Kingdom	
Workplace Exposure Limits (WEL)	
Remark Notes	

Sodium Hypochlorite solution
Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)

DNEL / DMEL	Oral	Inhalation	Dermal
Industry - Long Term - Local effects		1.55 mg/m³	0.5%
Industry - Long Term - Systemic effects		1.55 mg/m³	
Industry - Short term - Local effects		3.1 mg/m³	
Industry - Short term - Systemic effects		3.1 mg/m³	
Consumer - Long Term - Local effects		1.55 mg/m³	
Consumer - Long Term - Systemic effects		1.55 mg/m³	
Consumer - Short term - Local effects	0.26 mg/kg bw/day	3.1 mg/m³	
Consumer - Short term - Systemic effects		3.1 mg/m³	

Predicted No Effect Concentration (PNEC)

Environment	PNEC
Aquatic Compartment (including sediment)	0.21 µg/l Fresh water, 0.042 µg/l Marine water, 0.26 µg/l Intermittent releases, 30 µg/l Sewage treatment plant
Terrestrial Compartment	No data
Atmospheric Compartment	No data

8.2 Exposure controls

Appropriate engineering controls
Provide adequate ventilation, including appropriate local extraction. A washing facility/water for eye and skin cleaning purposes should be present.

Respiratory protection
Normally no personal respiratory protection is necessary. When required to spray sodium hypochlorite solutions or to work in mists adequate respiratory protection should be provided. Where a cartridge/canister respirator is suitable use: Type B P3

Eye protection
Wear eye protection with side protection (EN166). Goggles giving complete protection to eyes. If splashes are likely to occur: Full face shield.

Skin and body protection
Wear protective clothing and gloves: The following materials are suitable for protective gloves (permeation time >= 8 hours): PVC (0.5mm), Neoprene (0.5mm), Butyl rubber (0.5mm), Nitrile rubber (0.35mm), Natural rubber (0.5mm).

Thermal hazards
None known.

Environmental Exposure Controls
Spillages or uncontrolled discharges into watercourses must be alerted to the appropriate regulatory body.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Greenish-yellow
Odour	Faintly chlorinous
Odour threshold	Not known.
pH	>12.5
Melting point/freezing point	-17 °C Initial boiling point and boiling range 110 °C
Flash Point	Not applicable.
Evaporation rate	Not available.
Flammability (solid, gas)	Not flammable
Upper/lower flammability or explosive limits	Not applicable.
Vapour pressure	2.5 kPa (20°C)
Vapour density	2.5
Density (g/ml)	Not available.
Relative density	1.26 approx (20°C)
Solubility(ies)	Solubility (Water) : Miscible
Solubility (Other)	Not available.
Partition coefficient: n-octanol/water	Log Pow: -3.42 (20°C)
Auto-ignition temperature	Not applicable.
Decomposition Temperature (°C)	Not available.
Viscosity	2.6mPa.s (20°C)
Explosive properties	Not explosive.
Oxidising properties	May liberate chlorine under certain conditions: chlorine is an oxidising agent.

9.2 Other information

Molecular weight	74.44 g/mol

10. STABILITY AND REACTIVITY

10.1 Reactivity
Contact with acids liberates very toxic gas. (chlorine). Chlorine is an oxidising agent

10.2 Chemical stability
Stable under normal conditions. Stability of the solution decreases with the action of heat, light and in the presence of some trace impurities.

10.3 Possibility of hazardous reactions
Contact with acids liberates very toxic gas. (chlorine). Chlorine is an oxidising agent.
Reacts with ammonia solutions and amines to form explosive compounds. Can react violently if in contact with methanol. Decomposition with evolution of oxygen is accelerated by light and heat and also by contact with many metals, particularly copper, nickel, iron and 'monel'.

10.4 Conditions to avoid
Incompatible materials. Keep away from heat and direct sunlight.

10.5 Incompatible materials
Decomposition with evolution of oxygen is accelerated by light and heat and also by contact with many metals, particularly copper, nickel, iron and 'monel'.

10.6 Hazardous decomposition products
Chlorine. Oxygen.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Ingestion

Not classified.

Data from sodium hypochlorite solution, at the highest industrially produced concentration of around 15%, shows low oral toxicity. LD50 value (rat, oral) used for Chemical Safety Assessment , 1100 mg/kg bw (as available chlorine)

Will cause corrosion of and damage to the upper gastrointestinal tract.

Skin contact

Not classified.

LD50 (rat) >20,000 mg/kg bw

Inhalation

Not classified.

LC50 (rat) (1 hr) >10,500 mg/m³ (as available chlorine)

Skin corrosion/irritation

Calculation method: Causes severe skin burns and eye damage.

Serious eye damage/irritation

Self classification: Causes serious eye damage.

Skin sensitisation data

Not classified.

Human Patch testing suggests that sodium hypochlorite is unlikely to be a skin sensitiser. Reliable test data indicates that sodium hypochlorite has no potential for skin sensitisation in animals.

Respiratory sensitisation data

Not classified.

May be irritant to the respiratory tract.

Germ cell mutagenicity

Not classified.

On the basis of a weight of evidence approach, sodium hypochlorite should not be classified as genotoxic as the majority of the relevant in-vitro and in-vivo mutagenicity studies were negative.

Carcinogenicity

Not classified.

On the basis of a weight of evidence approach, sodium hypochlorite has been shown not to be carcinogenic in animal studies or in humans.

Reproductive toxicity

Not classified.

There is no evidence from animal studies that sodium hypochlorite has any adverse effects on development or fertility.

Lactation

Not classified.

STOT - single exposure

Not classified. May be irritant to the respiratory tract.

Note: ≥20% solution Classified as irritating to the respiratory system.(STOT SE 3)

STOT - repeated exposure

Not classified.

Studies in animals have shown that repeated exposures produce no significant effects

Aspiration hazard

Self classification: Not an aspiration hazard

12. ECOLOGICAL INFORMATION

12.1 Acute Toxicity

Aquatic invertebrates

Acute aquatic toxicity

Daphnia magna, Fresh water. EC50 (48 hour): 0.141 mg/l (Crassostrea virginica), Marine water. EC50 (48 hour): 0.026 mg/l Ceriodaphnia dubia, Fresh water. EC50 (48 hour): 0.035 mg/l

Chronic

Oyster, Marine water. NOEC (7 day): 0.007 mg/l

Fish

Acute aquatic toxicity

Fish, Fresh water. LC50 (96 hour): 0.06 mg/l Fish, Marine water. LC50 (96 hour): 0.032 mg/l

Chronic

Fish, Marine water. NOEC (28 days): 0.04 mg/l

Algae

Acute aquatic toxicity

Algae (Pseudokirchnerella subcapitata) (Liedtke, 2013) EC50: 0.04 mg/l Myriophyllum spicatum, Fresh

water. EC50 (96 hour): 0.1 mg/l

Chronic

Algae (Pseudokirchnerella subcapitata) (Liedtke, 2013)ErC10: 0.03 mg/l; NOEC: 0.017 mg/l

Algae (periphyton), Fresh water. NOEC (7 days): 0.0021 mg/l

Toxicity

Sediment Compartment Not classified.

Terrestrial Compartment Not classified.

12.2 Persistence and degradability

Sodium hypochlorite is a strong oxidiser. It will react with organic substances present in soil and sediments and degrades rapidly to chloride. Sodium hypochlorite is substantially removed in biological treatment processes.

12.3 Bio accumulative potential

Sodium hypochlorite has low potential for bioaccumulation and decomposes in water. log P (calculated) -3.42

12.4 Mobility in soil

Sodium hypochlorite is mobile in soil and sediments.

12.5 Results of PBT and vPvB assessment

Not classified as PBT or vPvB.

12.6 Other adverse effects

Sodium hypochlorite is substantially removed in biological treatment processes. There is evidence of inhibition to the aerobic treatment process at a concentration (mg/l) of 0.05 mg/l.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose of contents in accordance with local, state or national legislation. Send to a licensed recycler, reclaimer or incinerator. Dispose of this material and its container to hazardous or special waste collection point.

Additional information

Disposal should be in accordance with local, state or national legislation.

14. TRANSPORT INFORMATION

14.1 UN Number	
ADR	1791
RID	1791
IMDG	1791
14.2 UN Proper Shipping Name	
ADR	HYPOCHLORITE SOLUTION
RID	HYPOCHLORITE SOLUTION
IMDG	HYPOCHLORITE SOLUTION
14.3 Transport hazard class	
ADR/RID Class	8
IMDG Class	8
IMDG EMS	Not available
ICAO/IATA	
Excepted Quantities	E2
Passenger and Cargo Aircraft Limited Quantities Packing Instructions	Y840
Passenger and Cargo Aircraft Limited Quantities Max net Qty	0.5L
Passenger and Cargo Aircraft Packing Instructions	851
Passenger and Cargo Aircraft Max net Qty	1L
Cargo Aircraft Packing Instructions	855
Cargo Aircraft Max net Qty	30L
Special Provisions	A3
Emergency Response Guidebook (ERG) Code	8L
ADR Classification Code	C9
ADR HIN	80
ADR Transport Category	2
Tunnel Restriction Code	E
Emergency Action Code	2X
APP Advice on Additional Personal Protection (APP)	Not applicable
14.4 Packing group	
Packing group	II
Labels	8

	
Special provision	521
Limited quantities	1L
Mixed Packing Instructions for Packages	P001 IBC02
Special Packing Provisions for Packages	PP10 B5
Mixed Packing Instructions for Packages	MP15

14.5 Environmental hazards

Environmentally hazardous — Classified as a Marine Pollutant

14.6 Special precautions for users

Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Product Name	SODIUM HYPOCHLORITE SOLUTION
Ship Type	2
Pollution Category	Y
Packing Instructions for Portable Tanks	T7
Special Provisions for Portable Tanks TP2	
TP24 Tank Code for Tanks	L4BV(+)
Special Provisions for Tanks	TE11
Vehicle for Tank Carriage	AT
Special Provisions for Carriage – Packages	Not applicable
Special Provisions for Carriage - Bulk Loading	Not applicable
Special Provisions for Carriage - Loading, Unloading and Handling	Not applicable
Special Provisions for Carriage – Operation	Not applicable

15. REGULATORY INFORMATION

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

European Regulations - Authorisations and/or Restrictions On Use. Not listed
Candidate List of Substances of Very High Concern for Authorisation REACH: ANNEX XIV list of substances subject to authorisation. Not listed
REACH: Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles. Not listed
Not listed Not listed Not listed
Community Rolling Action Plan (CoRAP) Not listed
Regulation (EC) N° 850/2004 of the European Parliament and of the Council on persistent organic pollutants
Regulation (EC) N° 2037/2000 on substances that deplete the ozone layer. Not listed
Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals. Not listed

15.2 Chemical safety assessment

A Chemical Safety Assessment has been performed

16. OTHER INFORMATION

Hazard Statements

H290: May be corrosive to metals.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.
H411: Toxic to aquatic life with long lasting effects.

Abbreviations and acronyms

ADN : European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS : Chemical Abstracts Service
CLP : Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DNEL : Derived No Effect Level EC : European Community
EINECS : European Inventory of Existing Commercial Chemical Substances
IATA : International Air Transport Association
IBC : Intermediate Bulk Container
ICAO : International Civil Aviation Organization

IMDG : International Maritime Dangerous Goods
LTEL : Long term exposure limit
PBT : Persistent, Bioaccumulative and Toxic
PNEC : Predicted No Effect Concentration
REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals
RID : Regulations concerning the International Carriage of Dangerous Goods by Rail
STEL : Short term exposure limit
STOT : Specific Target Organ Toxicity
UN : United Nations
vPvB : very Persistent and very Bioaccumulative

Source of key data used to compile the data sheet
Supplier information

Modifications from last revision
The Specification has been updated. The Safety Data Sheet remains the same. **Date** 04/09/22