Hazard Communication Program

DARTMOUTH

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Section 1 - Purpose

The Hazard Communication Program ensures that employees are aware of the hazardous chemicals present in the workplace and provides them with information about the potential risks associated with exposure. The goal of this program is to reduce and control the risks linked to the use of potentially hazardous chemicals, protecting Dartmouth employees, the surrounding community, and the environment.

Section 2 - Scope and Application

This program applies to all college faculty, staff, and student employees who work with chemicals in a non-laboratory setting (area) and may come in contact with a hazardous chemical as part of their work. They are subject to the requirements outlined in the program. To comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200), the program must include the following elements:

- A written hazard communication program.
- Precautionary labels on containers.
- An inventory of known chemicals present in the workplace.
- Posted area warning signs.
- Availability of Safety Data Sheets (SDSs).
- Initial chemical safety training, and when new chemicals are introduced into the workplace.
- To advise outside contractors of any hazardous chemicals to which their employees may be exposed.

Individuals who work with chemicals in laboratories must follow the OSHA Occupational Exposure to Hazardous Chemicals in Laboratories (29 CFR 1910.1450), more commonly known as the Laboratory Standard.

Section 3 – Definitions

SciSure (commonly known as BioRAFT): The training, laboratory management, and compliance system deployed at Dartmouth and used by the EHS department and researchers.

Hazardous Chemical: Any chemical classified as a health hazard or simple asphyxiant per the Hazard Communication Standard 29 CFR §1910.1200.

LD50: The dose at which a substance is lethal for 50% of the animals tested. LD50 values ≤50mg/kg are of particular concern and are required to be identified during a hazard analysis (SEE Section 5)

Non-Routine Tasks: An infrequent event or activity, and the details of the hazards and protective measures may not be fully developed or known by the persons performing the tasks.

PPE: Personal Protective Equipment. Gloves, ear protection, face shield, etc.

SDS: A **S**afety **D**ata **S**heet has information about the properties of each chemical, including the physical, health, and environmental hazards, protective measures, and safety precautions for

handling, storing, and transporting the chemical. The information contained in the SDS must be in English. OSHA requires that an SDS provide a specific minimum amount of information detailed in 16 sections.

SOP: Standard Operating Procedure. A process used for a particular task.

Section 4 – Roles and Responsibilities

The Hazard Communication Program roles and responsibilities are delineated in this section. The success of the entire Hazard Communication Program relies on and charges Dartmouth employees to adhere to and support this Program.

4.1 Environmental Health and Safety (EHS)

- Develop, implement, and maintain an OSHA-compliant Hazard Communication Program.
- Review and audit the Program elements annually and revise as needed.
- Aid supervisors and managers in identifying and evaluating hazardous chemicals in the work area.
- Aid supervisors in the interpretation and implementation of this Program.
- Provide Hazard Communication training.
- Give technical advice as needed to identify, evaluate, and control potential chemical hazards.
- Make recommendations on resource commitments necessary to ensure the program's viability.
- Maintain necessary records as required for OSHA compliance.
- Participate in accident investigations.
- Recommend proper engineering controls, administrative controls, and personal protective equipment (PPE).

4.2 Supervisor

- Conduct and document an initial evaluation of their area of responsibility and related activities and determine the applicability of this Program.
- Attend Hazard Communication training, either online or in-person.
- Ensure employees who work with or may be exposed to hazardous chemicals complete Hazard Communication training.
- Develop and maintain a list of hazardous chemicals used within their area of responsibility. See section 5. Dartmouth College uses a cloud-based platform, VelocityEHS, to house safety data sheets (SDS) for chemicals used by the Campus Services division. To access the site, click here. You can find additional resources, including user guides, a Help Center, and a training video accessible here. To view the site on a mobile device, download the SDS/Chemical Management app from the Apple App Store or Google Play and log in with the company link above.
    - Manage SDS stored in a binder or digital form (accessible from the worksite) and inform employees of the location and means to obtain the SDS.
    - How to obtain an SDS:
        - Contact the manufacturer's customer service department.

        - Many manufacturers have their SDS freely available on their website.
        - Contact EHS for further assistance.
- Provide oversight into controlling exposures to potentially hazardous chemicals by establishing standard operating procedures (SOPs). See section 5.4 below on SOPs.
- Coordinate and take part in accident investigations if an employee is exposed to and harmed by chemicals as part of their work. See section 5.5.
- Identify when a supervisee/employee is required to perform a non-routine task involving hazardous chemicals.
- Initiate the process of having their supervisors attend special training to inform them of the potentially hazardous chemicals they may be exposed to during the non-routine task and the proper measures to avoid exposure. Contact EHS for training assistance.

4.3 Employees

- Attend Hazard Communication training, either online or in-person.
- Know the locations of SDS binders or electronic copies of the SDSs in their work area(s).
- Conduct work safely and responsibly according to established SOPs and information from container labels and SDSs.
- Use required personal protective equipment (PPE) consistently and correctly.
    - Dartmouth College supplies PPE via your department.
    - EHS can aid with PPE selection for the best protection from specific hazards.
- Protect others by considering any exposures that may affect nearby work areas.
- Inform your supervisor when a non-routine task has been assigned and the proper training for awareness and protection from exposure to a hazardous chemical has not occurred.
- Protect community health and the environment by following established waste disposal practices.
    - Employees who generate hazardous waste must complete Hazardous Waste Management Training.

4.4 Contractors and Project Managers

- Contractors who use chemicals as part of their work must have an OSHA-compliant Hazard Communication Program.
- As part of the requirements around multiple employer worksites, contractors working for Dartmouth College must have SDSs on-site for all chemicals brought to the worksite.
- Contractors must provide the Project Manager with SDSs for chemicals that Dartmouth employees may be exposed to. The Project Manager is responsible for planning and coordinating advance notification of areas that may be affected.
- The contractor must take reasonable and prudent precautions when using chemicals, such as increasing ventilation, off-hours scheduling, posting signs, adding barricades, and providing other forms of warning while chemicals are in use, and work with Project Managers to establish what is needed.
- If a contractor may encounter chemicals owned by Dartmouth as part of their work, the Project Manager must provide copies of the SDSs and a copy of this Program to the

contractor, or the Project Manager must arrange for the chemicals to be moved elsewhere before the start of the contractor's work.

- Contractors must remove all unused construction materials and general construction debris from the job site upon completion of work.
- Any hazardous waste generated during the contractor's work must be collected and disposed of through Dartmouth College EHS. Hazardous waste may include, but is not limited to, waste paint, chalk, materials contaminated with lead, and cleanups of hydraulic/motor oil spills. Notify EHS of any spills that occur on Dartmouth College property.
- The discovery of suspect asbestos-containing materials requires the notification of Dartmouth EHS, which will determine the next steps for proper abatement.
- Contact EHS with any questions regarding the disposal of suspected hazardous waste materials. 603-646-1762.

Section 5 - Program Components

5.1 Chemical Inventory and Identification of Hazardous Chemicals or Procedures

The Hazard Communication Standard requires a list of all hazardous chemicals present in the workplace. Also known as a chemical inventory, this list must be readily available and include any associated SDSs.

The chemical inventory **must** include the following for each chemical:

- Chemical name
- Product name
- Most current SDS
- Manufacturer's name
- Manufacturer's address, city, and state
- Manufacturer's telephone number and emergency telephone number

Chemicals that **must** be included in the inventory are the following:

- Aerosol products – *pressurized spray cans.*
- Compressed gases – *gases under pressure in a cylinder.*
- Flammables and combustibles – *chemicals that easily ignite.*
- Oxidizers – *materials that supply oxygen and can intensify a fire (e.g., hydrogen peroxide).*
- Organic peroxides – *materials that are potentially unstable and can react. They can easily burn.*
- Poisons – *substances capable of causing illness or death.*
- Corrosives – *acidic or caustic materials that can cause chemical burns.*

5.2 Additional Requirements

- The supervisors and employees who work with hazardous chemicals should review the considerations below in detail for each chemical to decide if there is potential exposure or if certain safety work practices are necessary. This is also called a hazard assessment.

- Quantity of chemicals used.
  - Does the work require a large volume of chemicals?
- Physical properties of the chemical.
  - Does it have a noxious smell or easily evaporate? Flammable/corrosive?
- Potency and toxicity of the chemical.
  - Is it Toxic? Particularly Hazardous? (LD50≤50mg/kg or carries "skin" designation? LD50
- How the chemical is used.
  - Should it not contact certain things (e.g., skin, metal, other chemicals)?
- What is needed to use the chemicals properly and safely?
  - Do I need gloves, other PPE, or a certain machine?
- Emergency response procedures: **Employees must also be aware of the protective measures available at their workplace.**
  - What do I do if I get it on me or if there is a spill? Where is the nearest eye wash?

- Hazards associated with non-routine tasks must also be identified by supervisors and communicated to employees.
- Chemical inventory best practices:
  - Keep the inventory with the SDSs.
  - Update the inventory and the SDS when a new chemical arrives at the workplace.
  - Note the locations of each chemical.
  - Note the types and sizes of the chemical containers.
  - Record the total amount of chemicals stored in the workplace.

5.3 Labels

- Supervisors or managers are responsible for ensuring that all known hazardous chemicals in the workplace display a precautionary label.
- Labels on chemical containers provide an immediate source of information on the chemical's hazards. Under the Hazard Communication Standard, chemical manufacturers, distributors, and importers must use labels that include the chemical name, signal word, hazard and precautionary statements, manufacturer information, and pictograms.
  - **Product Identifier/Chemical Name**: Simply identify the product or chemical name.
  - **Signal word**: Use to indicate the relative level of the severity of the hazard and alert the reader to a potential hazard. The signal words are "Danger" for more severe hazards and "Warning" for less severe hazards.
  - **Hazard statement: These phrases describe the hazardous chemical's nature and degree of hazard(s).** Examples are toxic if swallowed, may cause skin irritation.

- **Precautionary Statement:** Is a phrase that describes recommended measures to minimize or prevent adverse effects resulting from exposure to or improper storage or handling.

- **Supplier/Manufacturer Information:** Identifies the manufacturer's company name, address, and phone number.

- **Pictograms:** These are used to identify hazardous products with symbols. They convey health, physical, and environmental hazards information assigned to a GHS hazard class and category.

- If the chemical label on the original container becomes damaged, illegible, or inadvertently removed, it must be replaced at once. The person using the chemical is responsible for ensuring proper labeling of all containers, including stock (primary), in-house mixtures, and secondary containers.

5.4 Secondary Container Labels

- Chemicals transferred from an original container into a new secondary container shall be identified by a label on the secondary container.
  - The replacement label must include the same information that the manufacturer's label initially provided. All labels must be legible, in English, and prominently displayed on the container.
- All containers must be dedicated to a single chemical to avoid incompatible mixing that could produce highly toxic fumes or create an extremely corrosive product.
  - **Do <u>NOT</u> mix chemicals.**

- The secondary label must include:
  - **Chemical Name**
    - Commonly acceptable name or names that correspond to the SDS are acceptable.
  - **General Hazard Information**
    - The physical and health hazards of the material must be present. Following the GHS Labeling guidelines: words, pictures, symbols, or any combination thereof is acceptable. (see SDS of the chemical for hazard statements).
  - **Individual Responsible**
    - The person who transferred the material and made the label.
  - **Date Made**
    - Including the day, month, and year the bottle was filled.

- Containers that are "in immediate use" (and will not be left unattended or unused for more than eight hours, or one work shift with a duration of eight hours or fewer) are exempt from these labeling requirements.
- OSHA explicitly states the following about these containers.
  - All the contents are to be used (i.e., empty bottle) by the shift's end.

- Only one person can use the container (i.e., no sharing of immediate-use containers).
- Containers **CANNOT** be passed from one employee to another.
- Containers **CANNOT** be left unlabeled, partially filled overnight.

5.5 Safety Data Sheet

The Hazard Communication Standard requires the chemical manufacturer or distributor to develop a Safety Data Sheet for all potentially hazardous chemicals. SDS has more detailed information than a label. An example can be found in Appendix A.

A Safety Data Sheet is a 16-section document that provides information on the safe handling of a chemical.

- Sections 1-8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting).
- Sections 9-11 and 16 provide other technical and scientific information, such as physical and chemical properties, stability, reactivity, toxicological information, and exposure control.
- Sections 12-15 contain ecological, transportation, and other regulatory information and disposal considerations.

In addition to other hazard identifications, Section 2 contains signal words and pictograms designed to give the reader a high-level, quick understanding of the chemical's potential hazards. Appendix B provides a brief description of the information conveyed with each pictogram.

An SDS must be obtained for each hazardous chemical that arrives at the workplace. SDS are to be kept in a labeled binder at the work site or in a centrally accessible location. The SDS binder must be kept with the most recent versions of each SDS.

The OSHA Hazard Communication Standard states that the manufacturer must include an SDS with the first shipment of a particular chemical for the employer, not every shipment. This could result in a hazardous chemical arriving with no SDS. The standard also states manufacturers must provide a new SDS upon request or if there is a significant change in hazard designation within 3 months.

Due to the possibility of an updated version of an SDS existing for a particular chemical, it is a **requirement** to check the version of the associated SDS whenever there is a delivery of a chemical, even if there is an existing SDS. If a newer version exists, all binders in all locations must be updated before the chemical can be used.

> **Note**: For best practice, a copy of the SDS for chemicals involved in an incident should be copied and kept with the incident report.

Section 6 – Employee Training

All employees who handle or work with hazardous chemicals must be trained to ensure their knowledge, understanding, and skills are necessary for the safe performance of their duties.

Training describes the necessary measures and precautions that must be taken when working around chemicals. Employee training records showing the training date, employee attendance, and the name and signature of the instructor(s) will be kept by EHS.

6.1 Training Includes

The training must be specific to the work to be done, yet sufficiently broad to enable the individual to apply their knowledge in similar situations.

The Hazard Communication Program training must include the following (but is not limited to):

- Inform employees of the hazards associated with chemicals in their workplace.
- Explanation of how chemicals can enter the body.
- Inform employees of the location of the written Hazard Communication Program.
- Explanation of the purpose of SDS.
- Explanation of information contained in SDS.
- Explanation of Primary container labeling.
- Explanation of Secondary container labeling.
- Interpretation of GHS pictograms.
- Safe work practices.
- Emergency procedures for exposure.

6.2 Training Frequency Initial/Re-training

Initial training on hazardous chemicals in their work area is required for each employee before they are assigned any duties and when new hazards are introduced.

In addition to the training provided by EHS, the supervisor or qualified individual must provide instruction and information specific to the employee's responsibilities and assigned tasks. This focused training must be provided before they begin working with potentially hazardous chemicals. The information provided to the employee must be specific, based on established SOPs, and appropriate for the needs of the individual(s). As new chemicals are introduced into the workplace or potential hazards change, the supervisor is responsible for ensuring that existing safety information and training are updated to reflect these changes. Training must be recorded on the Training Record Form (Appendix C).

Supervisors are responsible for ensuring employees' Hazard Communication Program re-training whenever one of the following situations occurs:

- A new hazard is introduced to the work area.
- A non-routine task is identified.
- If changes in the OSHA rule occur.
- A supervisor has reason to believe an employee’s knowledge or use of established training/SOPS is inadequate.

Section 7 – Standard Operating Procedures

Supervisors are responsible for writing SOPs that describe how employees should use a specific chemical. SOPs, in addition to step-by-step instructions, must include the following:

- Proper labeling of chemical containers.
- Outline the requirements for using available engineering controls and PPE (i.e., ventilation, process enclosures).

- Consider and control exposures that may affect nearby work areas through planning and prior notification.

Section 8 - Exposure Incident and Follow-Up
Instructions on how to report an employee injury can be found on the Dartmouth Department of Risk and Insurance website.

Should an exposure incident occur, employees and supervisors should do the following:

- **Seek medical care immediately, if needed.** No matter how minor the injury, the top priority is ensuring the employee receives proper medical care. If possible, the employee should provide the medical provider with copies of the SDS for the chemicals involved in the incident.
- **The employee may seek treatment from any provider of their choice.**
- **Employees need to notify their supervisor** if they are immediately available.
- **Employees need to provide information about the exposure incident to supervisors and other relevant parties**.
- **The supervisor needs to record all the information given to them by the Employee.**
- **The employee, who was exposed, and their supervisor need to complete their portions of the Employee Injury Report** available at: https://www.dartmouth.edu/finance/documents/financial_management_tab_documents/rm/employeeinjuryreport.pdf
- **Within 24 hours, the report must be emailed to the following:**
  - Lisa.A.Roche@Dartmouth.edu
  - Risk.Management@Dartmouth.edu
- **Do not delay in submitting the report due to missing information.**

Appendix A: Example Safety Data Sheet

THE CLOROX COMPANY

SAFETY DATA SHEET

Issuing Date January 5, 2015 **Revision Date** June 12, 2015 **Revision Number** 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name **Clorox® Regular-Bleach$_1$**

Other means of identification

EPA Registration Number 5813-100

Recommended use of the chemical and restrictions on use

Recommended use Household disinfecting, sanitizing, and laundry bleach

Uses advised against No information available

Details of the supplier of the safety data sheet

Supplier Address
The Clorox Company
1221 Broadway
Oakland, CA 94612

Phone: 1-510-271-7000

Emergency telephone number

Emergency Phone Numbers For Medical Emergencies, call: 1-800-446-1014
For Transportation Emergencies, call Chemtrec: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

GHS Label elements, including precautionary statements

Emergency Overview

Signal word **Danger**

Hazard Statements
Causes severe skin burns and eye damage
Causes serious eye damage

Appearance Clear, pale yellow **Physical State** Thin liquid **Odor** Bleach

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling.
Wear protective gloves, protective clothing, face protection, and eye protection such as safety glasses.

Precautionary Statements - Response
Immediately call a poison center or doctor.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
Wash contaminated clothing before reuse.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
Specific treatment (see supplemental first aid instructions on this label).
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Precautionary Statements - Storage
Store locked up.

Precautionary Statements - Disposal
Dispose of contents in accordance with all applicable federal, state, and local regulations.

Hazards not otherwise classified (HNOC)
Although not expected, heart conditions or chronic respiratory problems such as asthma, chronic bronchitis, or obstructive lung disease may be aggravated by exposure to high concentrations of vapor or mist.

Product contains a strong oxidizer. Always flush drains before and after use.

Unknown Toxicity
Not applicable.

Other information
Very toxic to aquatic life with long lasting effects.

Interactions with Other Chemicals
Reacts with other household chemicals such as toilet bowl cleaners, rust removers, acids, or products containing ammonia to produce hazardous irritating gases, such as chlorine and other chlorinated compounds.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %	Trade Secret
Sodium hypochlorite	7681-52-9	5 - 10	*

* The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

First aid measures

General Advice Call a poison control center or doctor immediately for treatment advice. Show this safety data sheet to the doctor in attendance.

Eye Contact Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Skin Contact Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Inhalation Move to fresh air. If breathing is affected, call a doctor.

Ingestion Have person sip a glassful of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. Call a poison control center or doctor immediately for treatment advice.

Protection of First-aiders Avoid contact with skin, eyes, and clothing. Use personal protective equipment as required. Wear personal protective clothing (see section 8).

Most important symptoms and effects, both acute and delayed

Most Important Symptoms and Effects Burning of eyes and skin.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically. Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media
CAUTION: Use of water spray when fighting fire may be inefficient.

Specific Hazards Arising from the Chemical
This product causes burns to eyes, skin, and mucous membranes. Thermal decomposition can release sodium chlorate and irritating gases and vapors.

Explosion Data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Avoid contact with eyes, skin, and clothing. Ensure adequate ventilation. Use personal protective equipment as required. For spills of multiple products, responders should evaluate the MSDSs of the products for incompatibility with sodium hypochlorite. Breathing protection should be worn in enclosed and/or poorly-ventilated areas until hazard assessment is complete.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental Precautions This product is toxic to fish, aquatic invertebrates, oysters, and shrimp. Do not allow product to enter storm drains, lakes, or streams. See Section 12 for ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes, and clothing. Do not eat, drink, or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Store away from children. Reclose cap tightly after each use. Store this product upright in a cool, dry area, away from direct sunlight and heat to avoid deterioration. Do not contaminate food or feed by storage of this product.

Incompatible Products Toilet bowl cleaners, rust removers, acids, and products containing ammonia.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium hypochlorite 7681-52-9	None	None	None

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health.

Appropriate engineering controls

Engineering Measures Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/Face Protection If splashes are likely to occur: Wear safety glasses with side shields (or goggles) or face shield.

Skin and Body Protection Wear rubber or neoprene gloves and protective clothing such as long-sleeved shirt.

Respiratory Protection If irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice. Wash hands after direct contact. Do not wear product-contaminated clothing for prolonged periods. Remove and wash contaminated clothing before re-use. Do not eat, drink, or smoke when using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Physical State	Thin liquid		
Appearance	Clear	**Odor**	Bleach
Color	Pale yellow	**Odor Threshold**	No information available

Property	**Values**	**Remarks/ Method**
pH	~12	None known
Melting/freezing point	No data available	None known
Boiling point / boiling range	No data available	None known
Flash Point	Not flammable	None known
Evaporation rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limits in Air		
Upper flammability limit	No data available	None known
Lower flammability limit	No data available	None known
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Specific Gravity	~1.1	None known
Water Solubility	Soluble	None known
Solubility in other solvents	No data available	None known
Partition coefficient: n-octanol/water	No data available	None known
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known
Explosive Properties	Not explosive	
Oxidizing Properties	No data available	

Other Information

Softening Point	No data available
VOC Content (%)	No data available
Particle Size	No data available
Particle Size Distribution	No data available

10. STABILITY AND REACTIVITY

Reactivity
Reacts with other household chemicals such as toilet bowl cleaners, rust removers, acids, or products containing ammonia to produce hazardous irritating gases, such as chlorine and other chlorinated compounds.

Chemical stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to avoid
None known based on information supplied.

Incompatible materials
Toilet bowl cleaners, rust removers, acids, and products containing ammonia.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information .

Inhalation Exposure to vapor or mist may irritate respiratory tract and cause coughing. Inhalation of high concentrations may cause pulmonary edema.

Eye Contact Corrosive. May cause severe damage to eyes.

Skin Contact May cause severe irritation to skin. Prolonged contact may cause burns to skin.

Ingestion Ingestion may cause burns to gastrointestinal tract and respiratory tract, nausea, vomiting, and diarrhea.

Component Information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium hypochlorite 7681-52-9	8200 mg/kg (Rat)	>10000 mg/kg (Rabbit)	-

Information on toxicological effects

Symptoms May cause redness and tearing of the eyes. May cause burns to eyes. May cause redness or burns to skin. Inhalation may cause coughing.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization No information available.

Mutagenic Effects No information available.

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Sodium hypochlorite 7681-52-9	-	Group 3	-	-

IARC (International Agency for Research on Cancer)
Group 3 - Not Classifiable as to Carcinogenicity in Humans

Reproductive Toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure No information available.
Chronic Toxicity Carcinogenic potential is unknown.
Target Organ Effects Respiratory system, eyes, skin, gastrointestinal tract (GI).

Aspiration Hazard No information available.

Numerical measures of toxicity - Product Information

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)
54 g/kg
ATEmix (inhalation-dust/mist)
58 mg/L

12. ECOLOGICAL INFORMATION

Ecotoxicity
Very toxic to aquatic life with long lasting effects.

This product is toxic to fish, aquatic invertebrates, oysters, and shrimp. Do not allow product to enter storm drains, lakes, or streams.

Persistence and Degradability
No information available.

Bioaccumulation
No information available.

Other adverse effects
No information available.

13. DISPOSAL CONSIDERATIONS

Disposal methods
Dispose of in accordance with all applicable federal, state, and local regulations. Do not contaminate food or feed by disposal of this product.

Contaminated Packaging
Do not reuse empty containers. Dispose of in accordance with all applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

DOT	Not restricted.
TDG	Not restricted for road or rail.
ICAO	Not restricted, as per Special Provision A197, Environmentally Hazardous Substance exception.
IATA	Not restricted, as per Special Provision A197, Environmentally Hazardous Substance exception.
IMDG/IMO	Not restricted, as per IMDG Code 2.10.2.7, Marine Pollutant exception.

15. REGULATORY INFORMATION

Chemical Inventories

TSCA	All components of this product are either on the TSCA 8(b) Inventory or otherwise exempt from listing.
DSL/NDSL	All components are on the DSL or NDSL.

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act
This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium hypochlorite 7681-52-9	100 lb			X

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Sodium hypochlorite 7681-52-9	100 lb	–	RQ 100 lb final RQ RQ 45.4 kg final RQ

EPA Statement
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

> **DANGER: CORROSIVE.** Causes irreversible eye damage and skin burns. Harmful if swallowed. Do not get in eyes, on skin, or on clothing. Wear protective eyewear and rubber gloves when handling this product. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the restroom. Avoid breathing vapors and use only in a well-ventilated area.

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Rhode Island	Illinois
Sodium hypochlorite 7681-52-9	X	X	X	X	
Sodium chlorate 7775-09-9	X	X	X		

International Regulations

Canada
WHMIS Hazard Class
E - Corrosive material

16. OTHER INFORMATION

NFPA **Health Hazard** 3 **Flammability** 0 **Instability** 0 **Physical and Chemical Hazards** -

HMIS **Health Hazard** 3 **Flammability** 0 **Physical Hazard** 0 **Personal Protection** B

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General Disclaimer
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.

End of Safety Data Sheet

Appendix B: Hazard Communication Standard Pictograms and Hazards

Health Hazard  Carcinogen Mutagenicity Reproductive Toxicity Respiratory Sensitizer Target Organ Toxicity Aspiration Toxicity	Flame  Flammables Pyrophoric Self-Heating Emits Flammable Gas Self-Reactive Organic Peroxides	Exclamation Mark  Irritant (skin and eye) Skin Sensitizer Acute Toxicity Narcotic Effects Respiratory Tract Irritant Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  Gases Under Pressure	Corrosion  Skin Corrosion/Burns Eye Damage Corrosive to Metals	Exploding Bomb  Explosives Self-Reactive Organic Peroxides
Flame Over Circle  Oxidizers	Environment (Non-Mandatory)  Aquatic Toxicity	Skull and Crossbones  Acute Toxicity (fatal or toxic)

Appendix C: Example Training Log

DARTMOUTH COLLEGE ENVIRONMENTAL HEALTH & SAFETY (EHS) GROUP TRAINING RECORD FORM	
TOPIC:	DATE:
LOCATION:	TIME:
AUDIO-VISUALS USED:	INSTRUCTOR:
BRIEF DESCRIPTION OF TRAINING:	

	PRINT NAME	CAMPUS	DEPARTMENT	SIGNATURE
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				