1.0 **SAFETY REQUIREMENTS**

1.1 The entire performance of the Work shall comply with the standards authorized by the latest issue of the U.S. Department of Labor Occupational Safety and Health Act (OSHA), as well as state and local jurisdictional requirements.

A. This Safety and Health Plan (SAP) addresses the requirements of 35 Ill. Adm. Code 845.530 regarding the operation of Midwest Generation's coal combustion residuals (CCR) surface impoundments.

B. Midwest Generation complies with all applicable OSHA regulations as part of operating their generating stations. Health and Safety plans currently exist for the operation of the generating stations and will be complied with, as necessary, for work not associated with the CCR surface impoundments.

1.2 CONTRACTORS SAFETY MANUAL

A. The Contractor shall have on file with the Midwest Generation corporate safety office a copy of the most current Safety and Industrial Hygiene Manual. As a minimum, this Manual must address the following items when applicable to their trade: OSHA Compliance, Accident Investigation, Corrective Action, First Aid Treatment, Inspections and Reporting of Deficiencies, Material Handling and Rigging, Performance and Accountability, Personal Safety Equipment, Safety Guidelines, Safety Meetings, Training, Housekeeping, Hearing Protection, Respiratory Protection, Fire Prevention, Grounding Program, Confined Space Entry, Hazard Communication, Fall Protection, Working on or near water and Trenching and Shoring.

B. The Contractor's superintendent or other responsible person must have a copy of the Contractor's most current Safety and Industrial Hygiene Manual available at the job site.

1.3 PRE-MOBILIZATION MEETING

A. The Contractor shall meet with the Purchasers Representative(s) for a pre-mobilization meeting. The pre-mobilization meeting will include a review of safety requirements, job hazard identification, a job specific safety plan (to be developed by the Contractor and provided to Midwest Generation), submittal requirements for health & safety records, and scope and schedule. Hazard identification and assessment will include all chemical constituents found present in the analyses of the CCR and/or other waste streams within the impoundment(s). Recommendations within the NIOSH Pocket Guide to Chemical Hazards will be reviewed and considered. Applicable safety data sheets will be provided, as necessary.

B. Prior to the start of the work at the job site, Contractor shall contact Purchaser's Representative to arrange to receive Purchasers site safety orientation. This session will last approximately 2 hours. The Contractor will be provided with information on the potential hazardous constituents of the CCR.

C. The Contractor is required to receive the Purchasers site safety orientation on an annual basis.

D. Contractor shall provide his employees with orientation in all Contractor, and job specific safety requirements related to their work area. Contractor shall provide Purchaser with completed training documents showing date of training and each employees craft related training as it relates to OSHA requirements. (i.e. competent person, scaffold builder, fork truck and crane operators)

E. The Contractor Shall provide proof of training for all on site personnel in the following:
   - HAZWOPER 29 CFR 1910.120/29 CFR 1926.65
   - OSHA 10 Hour or 30 Hour Voluntary Compliance Training for Construction
   - Hazard Communication 29 CFR 1910.1200
   - Contractor's Safety Plan

F. A Competent Person shall be identified by name for Excavations, Fall Protection, etc. if applicable.

1.4 FITNESS FOR DUTY

A. The Contractor/Sub-Contractor/Supplier is required to have a drug and alcohol screening program for all employees assigned to work on Purchaser's property. The program must provide screening for pre-access testing, "for cause" testing and random testing. The Contractor/Sub-Contractor/Supplier shall certify that their employees have passed the appropriate screening test in accordance with their programs.

B. Personnel covered by this program shall be denied access to, or may be required to leave the Purchaser's location if there are reasonable grounds to believe that the individual is:
   1. Under the influence of using, possessing, buying, selling, or otherwise exchanging (whether or not for profit) controlled substances or drug paraphernalia.
   2. Under the influence of consuming, possessing, buying, selling, or otherwise exchanging (whether or not for profit) alcoholic beverages.

1.5 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

A. Prior to starting work, the contractor shall perform a Hazard assessment for PPE
   1. The Contractor will conduct a walk-through survey of each work area to identify sources of work hazards. Each survey will be documented in which it will identify the work area surveyed, the relevant task, the person conducting the survey, findings of potential hazards, control measures, and date of the survey.
   2. The Contractor will conduct, review, and update the hazard assessment for PPE whenever:
      - The scope of work changes
      - New equipment or process is installed
      - There has been an accident
      - Whenever a supervisor or employee requests it

- Or at least every year
- Any new PPE requirements that are developed will be added into the Contractors written safety program.

B. Head Protection/Hard Hats: Hard hats shall be worn in all work areas.
   1. Hard hats must not be more than 5 years old, and the harness shall not be more than 1 year old.
   2. Hard hats must be worn with brim forward
   3. Hard hats must be assigned and used in accordance with ANSI/ISEA Z89.1-2014(R2019)
   4. Hard Hats must be cleaned and maintained in accordance with the manufacturer's instruction.

C. Eye Protection: Eye protection shall be worn in all work areas.
   1. At a minimum, ANSI Z87-1-2020 compliant Safety Glasses shall be worn.
   2. Goggles and face shields shall be used for splash hazards.
   3. Fogging potential shall be considered for humid conditions and appropriate anti-fog materials may be used.
   4. Detachable side protectors (e.g. clip-on or slide on side shields) that meet OSHA Rule 29 CFR Part 1910.133 and ANSI Z87.1 specifications are also acceptable to wear with prescription glasses. Prescription glasses used with detachable side shields must conform to ANSI Z87.1
   5. Employees must keep eyewear in clean condition and fit for use at all times.

D. Protection Foot Wear
   1. All foot wear must be compliant with ASTM F2413-18: Performance Requirements For Protective (Safety) Toe Cap Footwear
   2. For work on or near the CCR impoundments, consideration shall be given to traction and slip issues.
   3. Safety shoes must be maintained and cleaned in accordance with the manufacturer's guidelines.
   4. Boot covers or Rubber boots shall be used in all areas that do or may contain CCR. These covers or boots must be cleaned or disposed of prior to leaving the work area.

E. Hand Protection
   1. Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.
   2. Impervious disposable gloves shall be used when working with CCR. Leather, Cotton or other readily absorbable gloves shall not be used.

F. Personal Flotation Devices
   1. When working with 10 feet of the water in the impoundments the following shall apply:
      a. All personnel shall wear a Coast Guard Approved PFD

- Type I: Off-Shore Life Jacket; effective for all waters or where rescue may be delayed.
- Type II: Near-Shore Buoyant Vest; intended for calm, inland water or where there is a good chance of quick rescue.
- Type III: Flotation aid; good for calm, inland water, or where there is a good chance of rescue.
- Type IV: PFD's are throwable devices. They are used to aid persons who have fallen into the water.
- Type V: Flotation aids such as boardsailing vests, deck suits, work vests, and inflatable PFD's marked for commercial use.

2. Serviceable condition: A PFD is considered to be in serviceable condition only if the following conditions are met.
   a. No PFD may exhibit deterioration that could diminish the performance of the PFD, including:

      1. Metal or plastic hardware used to secure the PFD on the wearer that is broken, deformed, or weakened by corrosion;

      2. Webbings or straps used to secure the PFD on the wearer that are ripped, torn, or which have become separated from an attachment point on the PFD; or

      3. Any other rotted or deteriorated structural component that fails when tugged;

      4. Rips, tears, or open seams in fabric or coatings, that are large enough to allow the loss of buoyant material;

      5. Buoyant material that has become hardened, non-resilient, permanently compressed, waterlogged, oil-soaked, or which shows evidence of fungus or mildew; or

      6. Loss of buoyant material or buoyant material that is not securely held in position.

1.6 EXISTING PLANT FACILITIES

A. Contractor shall be aware that Work may be performed in and around operating equipment.

B. The Contractor shall give proper notices, make all necessary arrangements, and perform all other services required to avoid damage to all utilities, including gas mains, water pipes, sewer pipes, electric cables, fire hydrants, lamp posts, etc., for which Purchaser could be held liable.

C. The Contractor shall barricade or cover any opening created during the course of work for excavations, or grating removal. Barricades shall be a "hard" barrier such as cable or pipe and clamp, safety barrier tape is unacceptable. In addition, any openings creating a fall hazard of 4 feet or more must have a permit authorized before the barrier can be removed. See section 11.4 below for permit requirements.

D. Housekeeping, walkways and tripping hazards: All equipment and material must be kept in an orderly manner. Aisles exits stairways and emergency equipment must never be obstructed. Hoses and welding cables must be tied above walkways so as to not pose as a trip hazard. Barricades, signs and notifications provided by the contractor when required. The owner and contractor will conduct periodic housekeeping audits to assure compliance.

E. Contractor's personnel shall observe all safety, warning, equipment identification instructional signs and tags. Do not remove any tag without prior consent of Purchaser's Representative.

F. When work has been completed, and Contractor decides equipment is ready to be returned to service, Contractor employees shall have all of their employees (working party members) sign off the permit. Contractor shall notify Purchaser's Representative in whose name the outage is being held.

1.7 WELDING, CUTTING and BURNING PERMITS

A. Contractor shall not start welding or cutting operations without a "Welding and Cutting Permit". Permits shall be obtained from Purchaser and posted in accordance with Station site-specific Safety Training requirements.

B. Contractor shall use non-asbestos, fire retardant blankets as required to protect Purchaser's equipment, cable trays, coal transport and storage areas, etc. and to cover gratings (for personnel safety) when welding, grinding and flame cutting processes are used overhead or in such close proximity as to pose a hazard.

C. Contractor shall supply appropriate portable fire extinguishers in welding and cutting areas.

D. Contractor shall furnish a designated “Fire-watch” employee to monitor the area above to the sides and below the cutting and burning area. The fire-watch is to extinguish fires started by sparks from the acts of cutting or welding. The fire-watch employee is to continue monitoring on the job 30 minutes after cutting or burning has been completed.

1.8 SAFETY DATA SHEETS

A. The Purchaser shall make Safety Data Sheets (SDS's) readily available to the Contractor for those substances to which the Contractor’s employees may be exposed during normal working conditions and which are under the Purchaser’s control.

B. The Contractor shall make Safety Data Sheets (SDS's) readily available to the Purchaser for those substances which are furnished by and under the control of the Contractor. These are to be available at the time of delivery of the substance to the Purchaser’s Premises.

C. It is the responsibility of the Contractor to train their employees on SDS's.

A. Midwest Generation uses an electronic SDS management system that is accessible by employees of the station as needed. The relevant SDS's for the CCR surface impoundments are included in Attachment 1. Additional SDS's can be accessed, as needed, through the electronic management system.

1.9 CHEMICALS, SOLVENTS AND GASES

A. Contractor shall comply with all federal, state and local regulations and codes pertaining to handling and storage of flammable liquids and gases.

B. Cleaning agents, solvents, or other substances brought by Contractor onto any of Purchaser's properties by Contractor shall be stored, handled and used in accordance with applicable standards.

C. Contractor shall ensure that liquids or solids will not be poured (disposed of) into Purchaser's drain, sewer systems, lake (where applicable), or onto ground. Contractor shall be liable for any damage and cleanup of improperly disposed liquids or solids.

D. The Contractor is to provide the Purchaser with the name and quantity of usage of any listed Section 313 Toxic Chemical of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372).

E. Signage must be posted detailing the presence of and hazards of CCR.

1.10 DISTURBANCE OF DUST

Contractor's work practices shall minimize dust generated while working with CCR. A fugitive dust mitigation plan shall be submitted to the facility prior to activities beginning.

1.11 FALL PROTECTION

Mandatory fall protection is required when working near and area where a fall hazard of **4** feet or more exits.

1.12 BARRIERS AND WARNING SYSTEMS

A. Warning and barricade systems shall be used to divert personnel from a work area. All warning barriers shall be tagged with yellow "Caution Cards". The caution card shall state the hazard, the date erected and a contact name, company and phone number. There are 2 levels of barricade systems. The barricade systems shall be taken down immediately when the hazard has been removed or at the end of the work shift.

B. A conditional warning is designated with 'Yellow" safety warning tape. This is used to warn workers of a hazard such as wet floors, welding and cutting in an area, or other hazards that with an awareness and proper PPE can be approached.

C. An Unconditional warning is designated with “Red” safety warning tape. This is used to worn workers of a hazard such as a crane lift or overhead work. Red safety tape barriers cannot be access or removed until permission is granted from the person responsible for installing it.

D. Fire and Evacuation warning sirens. Each plant has a siren for fire notification and evacuation notification. The response location and procedure will be addressed in the pre-mobilization meeting and plant site-specific orientation. The station’s Emergency Warning system is an electronic siren-toned system. The designated siren-tone alarms and the related emergency conditions are listed below:

1) **FIRE**: HI-LO siren-tone for approx. 60 seconds (Fires, explosions, releases, etc.)
2) **Evacuation**: Steady siren-tone for approx. 60 seconds
3) **Natural Disaster**: (Tornado, Etc.) WAIL (SLOW) siren-tone for approx. 60 seconds

E. A CCR health hazard sign is posted at the CCR Basins. The sign lists health hazard statements, PPE requirements, and precautionary measures.

1.13 For Contractor's and subcontractor's employees, visitors and any other individuals: Smoking is prohibited on the work site.

1.14 The Contractor is expected to pre-arrange medical emergency services for on-site and off-site treatment. This includes, but is not limited to, first aid and confined space rescue.

1.15 WORKING ON OR NEAR WATER:

A. Life jackets and work vests shall be inspected before and after each use.

B. Ring buoys or Class IV rescue device with at least 90 feet of line shall be provided and readily available for employee rescue operations.

C. The distance from ring buoys to each worker shall not exceed 200 feet.

D. At least one lifesaving skiff shall be immediately available at locations where employees are working over water and/or the local coast guard shall be notified when working in navigable waterways.

E. Under no circumstances will team members enter water bodies without protective clothing (e.g.; waders, wet suit)

F. At least one person should remain on shore as a lookout if other methods of rescue are not available.

1.16 EXCAVATIONS

A. A Competent person shall determine the proper slope or identify engineering controls for all excavations in the CCR area.

B. An inspection of the banks shall be made and documented at least daily to determine any impact of the excavation.

C. Excavation equipment shall be operated in accordance with the Contractor's Health and Safety Plan and the manufacturer's recommendations.

2.0 **CONTRACTOR'S FACILITIES**

2.1 Temporary chemical toilet accommodations shall be furnished and maintained by Contractor for the use of his employees. Location shall be as directed by Purchaser's Representative. Use of Purchaser's toilet facilities by Contractor's employees is not permitted.

2.2 Contractor shall provide his own storage vessels, coolers, ice, water containers, etc., as required for his own drinking water use. Contractor shall supply a trash can with each drinking water container to receive used paper cups. Contractor shall maintain drinking water container, supply suitable water cups and dispose of trash as required. Open drinking cups and containers in the plant areas are not permitted.

2.3 Each Contractor is expected to pre-arrange medical emergency services for on-site and off-site treatment. This includes, but is not limited to, first aid and confined space rescue.

2.4 FIRE PROTECTION FACILITIES

A. Contractor shall provide his own temporary fire protection facilities for the equipment and materials furnished by him or by Purchaser and for his temporary construction buildings and structures. This equipment shall be maintained and inspected in accordance with applicable NFPA codes.

B. Furnish a suitable quantity and type of portable fire extinguishers and equipment, to meet OSHA and applicable codes.

2.5 Purchaser will not furnish any additional illumination of aisles, passages in the buildings, floodlighting of outdoor areas or lighting inside equipment other than that which is existing. Any additional lighting required by the Contractor shall be provided by the Contractor.

2.6 Contractor shall provide and maintain suitably located distribution centers with fused switching equipment and Ground Fault Interruption protection. The equipment supplied shall comply with OSHA regulations and standards.

2.7 Contractor shall supply all adapters and equipment required to connect to station air, water, and electrical systems. All air hoses shall be safety clipped together.

2.8 Any heating facilities required for the performance of the Work shall be furnished, maintained, and removed by Contractor. Open fires WILL NOT BE PERMITTED at any time. Heating equipment shall be as approved by Purchaser's Representative.

3.0 **CONTRACTOR'S TOOLS AND EQUIPMENT**

3.1 TOOLS AND EQUIPMENT

A. Contractor shall maintain, inspect and store tools and equipment for safe and proper use. This includes guards, shields, safety switches and electrical cords.

B. Contractor shall provide hoisting equipment as required to perform the Work. Provide all the necessary guards, signals, and safety devices required for its safe operation. Construction and operation of hoisting equipment shall comply with all applicable requirements of ANSI A10.5, the AGC Manual of Accident Prevention in Construction, and to all applicable federal, state, and local codes. Hoisting equipment shall not be used to transport personnel.

3.2 RIGGING

A. Contractor shall design, furnish, and maintain rigging required for the Work. All rigging plans must be designed by an Illinois licensed structural engineer.

B. Purchaser reserves the right to examine Contractor's design calculations, engineering data, plans, and procedures. Contractor shall submit any documentation requested by the Purchaser for the purpose of this review, including, but not limited to, calculations, diagrams and documents associated with computer-aided analyses and programs. If requested information is considered proprietary by Contractor, Contractor shall allow the Purchaser to review the information at Contractor's offices with the understanding that no copies of proprietary information will be given to the Purchaser. Purchaser's review and approval of submitted information is for general detail only and will not relieve the Contractor of responsibility for meeting all requirements and for accuracy.

C. Lifting and rigging areas shall have the target area and corresponding personnel access landings barricaded with "red" safety tape or hard barriers. No one is allowed under the load or in the target area during lifts.

D. All cranes, hoists, or derricks shall be operated in compliance with existing State and Federal regulations or orders. Cranes and hoists shall be inspected in accordance with OSHA and ANSI requirements. Cranes and hoists shall not be operated near high voltage lines or equipment until a safe operating clearance plan has been established.

4.0 TRAINING PROGRAM

A. All Midwest Generation employees, contract workers, and third-party contractors must complete a training program before they are allowed to perform work on Midwest Generation property. The training program informs employees, contract workers, and third-party contractors of the hazards associated with the CCR surface impoundments.

B. The training program consists of the following components to ensure employees, contract workers, and third-party contractors understand and are able to respond effectively:

1. Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment,
2. Communications and alarm systems,
3. Response to fires or explosions,
4. Response to a spill or release,
    - Spills and releases to the ground
    - Spills and releases to water
    - Catastrophic releases
5. Contractor training;
    - OSHA 29 CFR 1910.120 – Employees are trained to first responder awareness level
    - 29 CFR 1926.65 – Contract works and third-party contractors must be trained by their employers prior to working at Midwest Generation stations
    - OSHA 10- or 30-hour construction safety training – Contractors must provide qualified personnel as appropriate along with specialized training documentation
6. Information about chemical hazards and hazardous materials
    - Surface impoundments contain CCR such as bottom ash and slag
    - CCR may be present in water or as respirable dust
    - CCR may contain heavy metals, such as arsenic, barium, cadmium, chromium, lead, mercury, and selenium
    - CCR exposure routes are skin contact and inhalation
    - Prolonged exposure potentially can cause illness
7. Use of engineering controls, administrative controls, and personal protective equipment (PPE
    - Engineering Controls – Suppress dust and availability of eye wash stations and safety showers
    - Administrative Controls – Housekeeping, respiratory protection, and use of PPE

C. This Safety and Health Plan along with the training program will be reviewed and updated on annual basis, as needed.

Revision Date	Description of Changes
October 2021	Initial Plan
October 2022	No changes
October 2023	No changes
January 2024	Section 1.1 - Administrative updates/clarifications Section 1.3 - Administrative updates/clarifications Section 1.5.A.2 - Administrative updates/clarifications Section 4.0 – Added Attachment 1 - Added
October 2025	No changes
October 2026	No changes

ATTACHMENT 1

Lafarge Fly Ash and Bottom Ash (Ash)

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations
Revision Date: 04/21/2015 Date of issue: 12/18/2014 Supersedes Date: 03/01/2014 Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: Lafarge Fly Ash and Bottom Ash (Ash)

Synonyms: Coal Fly Ash, Class F Fly Ash, Class C Fly Ash, Type CI Fly Ash, Type CH Fly Ash, Type F Fly Ash, Lignite Coal Fly Ash, Subbituminous Coal Fly Ash, Anthracite Coal Fly Ash, Bituminous Coal Fly Ash, Bottom Ash, Ash

1.2. Intended Use of the Product

Fly Ash and Bottom Ash are used as a supplementary cementitious or pozzolanic material for cement, concrete and concrete products. It is also used in soil stabilization and as filler in asphalt and other products that are widely used in construction.

1.3. Name, Address, and Telephone of the Responsible Party

Company

Lafarge North America Inc.
8700 West Bryn Mawr Avenue, Suite 300
Chicago, IL 60631
Information: 773-372-1000 (9am to 5pm CST)
email: SDSinfo@Lafarge.com
Website: www.lafarge-na.com

1.4. Emergency Telephone Number

Emergency Number : 1-800-451-8346 (3E Hotline)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Eye Irrit. 2B H320
Carc. 1A H350
STOT RE 1 H372
Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



GHS08

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) :
H320 - Causes eye irritation.
H350 - May cause cancer (Inhalation).
H372 - Causes damage to organs through prolonged or repeated exposure.

Precautionary Statements (GHS-US) :
P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe dust.
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P280 - Wear eye protection, protective clothing, protective gloves, and respiratory 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.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

2.3. Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) can be aggravated by exposure.

2.4. Unknown Acute Toxicity (GHS-US) No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ashes, residues	(CAS No) 68131-74-8	< 100	Eye Irrit. 2B, H320
Quartz	(CAS No) 14808-60-7	0 - 10	Carc. 1A, H350 STOT SE 3, H335 STOT RE 1, H372

Fly ash and bottom ash are byproducts from the combustion of coal. Trace amounts of chemicals may be detected during chemical analysis. For example the chemicals identified can include carbon and complex silicates or oxides of aluminum (Al), calcium (Ca), magnesium (Mg), sodium (Na), sulfur (S), potassium (K), titanium (Ti), iron (Fe) and phosphorus (P). Chemical identity: MxOySiO2 (M = Al, Ca, Mg and other minor metal, with bound silica (SiO2)). Chemical analysis of fly ash and bottom ash also indicate the presence of trace amounts of metals, such as: Arsenic (As), Barium (Ba), Beryllium (Be), Cobalt (Co), Lead (Pb), and Manganese (Mn).

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. If exposed or concerned: Get medical advice/attention.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Rinse mouth. Do NOT induce vomiting. Get medical advice and attention if you feel unwell.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Causes damage to organs through prolonged or repeated exposure.

Inhalation: May cause respiratory irritation. This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease.

Skin Contact: Ash may cause dry skin, discomfort, and irritation. Dust may cause irritation in skin folds or by contact in combination with tight clothing.

Eye Contact: Causes eye irritation. Symptoms may include: Redness, pain, swelling, itching, burning, tearing, and blurred vision.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: Causes damage to organs through prolonged or repeated exposure. May cause cancer by inhalation.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Non-combustible.

Explosion Hazard: Product is not explosive.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from fire fighting to enter drains or water sources. Do not breathe fumes or vapors from fire.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: None.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid all contact with skin, eyes, or clothing. Do not breathe dust.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Place spilled material into a container. Avoid actions that cause dust to become airborne. Avoid inhalation of dust. Wear appropriate protective equipment as described in Section 8. Do not wash product down sewage and drainage systems or into bodies of water (e.g. streams).

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely.

6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Cutting, crushing or grinding cement clinker, hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work. Wash hands and forearms thoroughly after handling. Do not eat, drink or smoke when using this product.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Ensure all national/local regulations are observed. Avoid creating or spreading dust.

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Storage Area: Store locked up.

7.3. Specific End Use(s)

Fly Ash and Bottom Ash are used as a supplementary cementitious or pozzolanic material for cement, concrete and concrete products. It is also used in soil stabilization and as filler in asphalt and other products that are widely used in construction.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Quartz (14808-60-7)		
Mexico	OEL TWA (mg/m³)	0.1 mg/m³ (respirable fraction)
USA ACGIH	ACGIH TWA (mg/m³)	0.025 mg/m³ (respirable fraction)
USA OSHA	OSHA PEL (STEL) (mg/m³)	250 mppcf/%SiO_2+5, 10mg/m^3/%SiO_2+2

USA NIOSH	NIOSH REL (TWA) (mg/m³)	0.05 mg/m³ (respirable dust)
USA IDLH	US IDLH (mg/m³)	50 mg/m³ (respirable dust)
Alberta	OEL TWA (mg/m³)	0.025 mg/m³ (respirable particulate)
British Columbia	OEL TWA (mg/m³)	0.025 mg/m³ (respirable)
Manitoba	OEL TWA (mg/m³)	0.025 mg/m³ (respirable fraction)
New Brunswick	OEL TWA (mg/m³)	0.1 mg/m³ (respirable fraction)
Newfoundland & Labrador	OEL TWA (mg/m³)	0.025 mg/m³ (respirable fraction)
Nova Scotia	OEL TWA (mg/m³)	0.025 mg/m³ (respirable fraction)
Nunavut	OEL TWA (mg/m³)	0.1 mg/m³ (respirable mass)
Northwest Territories	OEL TWA (mg/m³)	0.1 mg/m³ (respirable mass)
Ontario	OEL TWA (mg/m³)	0.10 mg/m³ (designated substances regulation-respirable)
Prince Edward Island	OEL TWA (mg/m³)	0.025 mg/m³ (respirable fraction)
Québec	VEMP (mg/m³)	0.1 mg/m³ (respirable dust)
Saskatchewan	OEL TWA (mg/m³)	0.05 mg/m³ (respirable fraction)
Yukon	OEL TWA (mg/m³)	300 particle/mL

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits. Power equipment should be equipped with proper dust collection devices.

Personal Protective Equipment: Protective goggles. Gloves. Protective clothing. Dust formation: dust mask.



Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, NIOSH approved respiratory protection should be worn.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Solid
Appearance	:	Gray/black or brown/tan powder which may contain solidified masses
Odor	:	None
Odor Threshold	:	Not available
pH	:	4 - 12
Evaporation Rate	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	> 1000 °C (1832 °F)
Flash Point	:	Not available
Auto-ignition Temperature	:	Not available
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	Not available
Relative Vapor Density at 20 °C	:	Not available

Relative Density	:	Not available
Specific Gravity	:	2 - 2.9
Solubility	:	Water: < 5 % (Slightly)
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity: Hazardous reactions will not occur under normal conditions.

10.2. Chemical Stability: Not available

10.3. Possibility of Hazardous Reactions: Not available

10.4. Conditions to Avoid: Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

10.6. Hazardous Decomposition Products: None.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity: Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Not classified

pH: 4 - 12

Serious Eye Damage/Irritation: Causes eye irritation.

pH: 4 - 12

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not classified.

Carcinogenicity: May cause cancer.

Specific Target Organ Toxicity (Repeated Exposure): Causes damage to organs through prolonged or repeated exposure.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: May cause respiratory irritation. This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease.

Symptoms/Injuries After Skin Contact: Ash may cause dry skin, discomfort, and irritation. Dust may cause irritation in skin folds or by contact in combination with tight clothing.

Symptoms/Injuries After Eye Contact: Causes eye irritation. Symptoms may include: Redness, pain, swelling, itching, burning, tearing, and blurred vision.

Symptoms/Injuries After Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: Causes damage to organs through prolonged or repeated exposure. May cause cancer by inhalation.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Quartz (14808-60-7)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rat	> 5000 mg/kg

Ashes, residues (68131-74-8)	
LD50 Oral Rat	> 2000 mg/kg

Quartz (14808-60-7)	
IARC Group	1
National Toxicology Program (NTP) Status	Known Human Carcinogens.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity No additional information available

Persistence and Degradability

Lafarge Fly Ash and Bottom Ash (Ash)	
Persistence and Degradability	Not established.

12.3. Bioaccumulative Potential

Lafarge Fly Ash and Bottom Ash (Ash)	
Bioaccumulative Potential	Not established.

12.4. Mobility in Soil Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, state, national, provincial, territorial and international regulations.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT Not regulated for transport

14.2. In Accordance with IMDG Not regulated for transport

14.3. In Accordance with IATA Not regulated for transport

14.4. In Accordance with TDG Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Lafarge Fly Ash and Bottom Ash (Ash)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard

Quartz (14808-60-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ashes, residues (68131-74-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

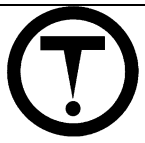
15.2. US State Regulations

Quartz (14808-60-7)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.

Quartz (14808-60-7)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

15.3. Canadian Regulations

Lafarge Fly Ash and Bottom Ash (Ash)	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects



Quartz (14808-60-7)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

Ashes, residues (68131-74-8)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class D Division 2 Subdivision B - Toxic material causing other toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 04/21/2015

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Carc. 1A	Carcinogenicity Category 1A
Eye Irrit. 2B	Serious eye damage/eye irritation Category 2B
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H320	Causes eye irritation
H335	May cause respiratory irritation
H350	May cause cancer
H372	Causes damage to organs through prolonged or repeated exposure

Party Responsible for the Preparation of This Document

Lafarge North America Inc.

+1 773-372-1000 (9am to 5pm CST)

An electronic version of this SDS is available at: www.lafarge-na.com under the Sustainability and Products sections. Please direct any inquiries regarding the content of this SDS to SDSinfo@Lafarge.com.

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NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE.

North America GHS US 2012 & WHMIS 2

Aluminum Sulfate Solution

SDS No. 011
21 Aug 2020

Safety Data Sheet

IDENTIFICATION

Product Identifier

Product Name **Aluminum Sulfate Solution**

Other means of identification

SDS # USALCO-002

UN/ID No UN3264

Synonyms ALUM.

Manufacturer

USALCO, LLC
2601 Cannery Ave
Baltimore, MD 21226

Recommended use of the chemical and restrictions on use

Recommended Use Water treatment coagulant, flocculent, alumina source for catalyst, pH control in papermaking/water treatment.

Emergency Telephone Number

Company Phone Number 410-918-2230
Emergency Telephone (24 hr) 800-282-5322

2. HAZARDS IDENTIFICATION

Appearance Colorless to clear amber or clear light green liquid **Physical State** Liquid **Odor** Negligible

Classification

Corrosive to Metal. 1	H290
Eye Dam. 1	H318
Aquatic Acute 3	H402

Signal Word
Warning



Hazard Statements
May be harmful if swallowed
Causes eye irritation
May be corrosive to metals

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves, and eye protection. Keep only in original container

Precautionary Statements - Response
If swallowed: Call a poison center or doctor if you feel unwell.
Rinse mouth.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical attention.

Precautionary Statements - Storage
Store in corrosive resistant container or container with a resistant inner liner

Precautionary Statements – Disposal
Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): May be D002 under §261.22(a)(2) due to the rate of corrosion of metal.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms ALUM.
Chemical Family Inorganic Salt.

Chemical Name	CAS No	Weight-%
Water	7732-18-5	>50
Aluminum Sulfate	10043-01-3	<50

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor/physician if irritation continues.

Skin Contact Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Inhalation If adverse effects occur, remove to fresh air and observe. If not breathing, give artificial respiration. Seek immediate medical attention/advice.

Ingestion If a large amount is swallowed, get medical attention immediately.

Most important symptoms and effects

Symptoms Causes serious eye damage. May cause skin irritation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Aluminum Sulfate will not burn. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Small Fire Move containers from fire area if you can do it without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Large Fire Same procedures as for small fires.

Specific Hazards Arising from the Chemical
Negligible fire hazard.

Hazardous Decomposition Products Oxides of sulfur.

Sensitivity to Mechanical Impact Not sensitive.

Sensitivity to Static Discharge Not sensitive.

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. Do not release runoff from fire control methods to sewers or waterways.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protection recommended in Section 8. Keep unnecessary people away, isolate hazard area and deny entry.

Environmental Precautions Do not release into sewers or waterways. For spills in excess of allowable limits (RQ) notify the National Response Center (800) 424-8802; refer to SARA Title III, Section 313 40 CFR 372, and CERCLA 40 CFR 302 for detailed instructions concerning reporting requirements. Notify Local Emergency Planning Committee (LEPC) and State Emergency Response Commission (SERC) for a release greater than or equal to Reportable Quantities (RQ). Refer to U.S. SARA Section 304. See Section 12 for additional Ecological Information.

Methods and material for containment and clean up

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

Methods for Clean-Up Small Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Avoid contact with skin, eyes or clothing. Handle in accordance with good industrial hygiene and safety practice. Wash face, hands and any exposed skin thoroughly after handling. Store and handle in accordance with all current regulations and standards.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store with acids. See original container for storage recommendations. Store away from incompatible materials.

Incompatible Materials Alkalis, metals. Alkalis (bases): Violent reaction. Metals: May be corrosive in the presence of moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines No exposure limits noted for product.
Exposure Limits for aluminum metal
NIOSH REL - TWA 10 mg/m3 (total) TWA 5 mg/m3 (resp)
OSHA PEL - TWA 15 mg/m3 (total) TWA 5 mg/m3 (resp)

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Ensure adequate ventilation, especially in confined areas. Maintain eye wash fountain and quick-drench facilities in work area.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Wear chemical tight goggles and full face shield.

Skin and Body Protection Wear appropriate chemical resistant clothing including chemical resistant gloves.

Respiratory Protection	Seek professional advice prior to respirator selection and use. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. WARNING!: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Colorless to clear amber or clear light green liquid
Odor	Negligible
Odor threshold	Not determined
pH	2.0-2.4
Relative density; (specific gravity)	±1.3 @15.5 °C
Melting point/freezing point	-13° C / 9° F
Initial boiling point and boiling range	Not relevant
Decomposition temperature	±1,400° F
Viscosity	5-25 centipoise
Auto-ignition temperature	Not flammable
Evaporation rate;	Similar to water
Flammability (solid, gas)	Not flammable
Flash point	Will not burn
Upper/lower flammability or explosive limits	Will not burn
Partition coefficient: n-octanol/water	Not relevant
Solubility	Soluble in water
Vapor density	Similar to water
Vapor pressure	Similar to water

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization
Hazardous polymerization does not occur.

Conditions to Avoid
Protect from freezing. Keep separated from incompatible substances.

Incompatible Materials
Alkalis, metals. Alkalis (bases): Violent reaction. Metals: May be corrosive in the presence of moisture.

Hazardous Decomposition Products
Thermal oxidative decomposition of Aluminum Sulfate occurs at temperatures greater than 1400°F and can produce sulfur oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Eye Contact Causes serious eye damage.
Skin Contact May cause skin irritation.
Inhalation Avoid breathing vapors or mists.
Ingestion Do not taste or swallow. May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Aluminum Sulfate 10043-01-3	= 1930 mg/kg (Rat)	-	-
Water 7732-18-5	> 90 mL/kg (Rat)	-	-

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

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

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Aluminum Sulfate 10043-01-3		100: 96 h Carassius auratus mg/L LC50 37: 96 h Gambusia affinis mg/L LC50 static		136: 15 min Daphnia magna mg/L EC50

Persistence/Degradability
Not determined

Bioaccumulation
Not determined

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

US EPA Waste Number
EPA Hazardous Waste Code: D002 (Corrosive) if the pH is <2. May be D002 per 40CFR261.22(a)(2) due to the rate of corrosion of steel. The U.S. EPA has not published waste codes for this products components.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Information also applies to TDG, ADR and RID.

DOT

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s., (Aluminum Sulfate)
Hazard Class	8
Packing Group	III
Reportable Quantity (RQ)	5000 lb

IATA

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s., (Aluminum Sulfate)
Hazard Class	8
Packing Group	III

IMDG

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s., (Aluminum Sulfate)
Hazard Class	8
Packing Group	III

15. REGULATORY INFORMATION

International Inventories
Not determined

US Federal Regulations

Aluminum sulfate (10043-01-3) is listed on the United States TSCA (Toxic Substances Control Act) inventory

CERCLA

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Aluminum Sulfate 10043-01-3	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	No

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

CWA (Clean Water Act)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Aluminum Sulfate 10043-01-3 (<50)	5000 lb			X

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
Aluminum Sulfate 10043-01-3	X	X	X

16. OTHER INFORMATION

	Health Hazards	Flammability	Instability	Special Hazards
NFPA	1	0	0	Not determined

Issue Date 20-Sep-2011
Revision Date: 6-June-2017; 21-Aug-2020

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

Safety Data Sheet

1 – PRODUCT IDENTIFICATION

PRODUCT NAME:.....CAPTIFLOC AEF 330 PWG
PRODUCT NUMBER: CAPTIFLOCAEF330PWG
DESCRIPTION:..... Polymer
OTHER MEANS OF INDENTIFATICATION:..... Viscous liquid, milky with an aliphatic.
RECOMMENDED USE:..... Processing aid for industrial applications.
RESTRICTIONS ON USE:..... Use only as directed.

COMPANY:..... CHEMTRON CORPORATION
3500 Harry S. Truman Blvd
St. Charles, MO 63301
636-940-5445 (Mon-Fri., 8:00-4:00)
www.chemtroncorporation.com
EMERGENCY PHONE: .....(800) 424-9300 (CHEMTREC)
REVISION DATE:.....MARCH 3, 2017

Certified to NSF/ANSI 60

2 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:..... Spills produce extremely slippery surfaces.

CLASSIFICATION 29 CFR 1910.1200: ..... This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard.

GHS SIGNAL WORD:.....None
GHS HAZARD STATEMENTS:..... None
GHS PRECAUTIONARY STATEMENTS:..... None

3 – COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENT	PERCENT	CAS NUMBER	Hazard Information
Distillates (petroleum, hydrotreated light	20-45	64742-47-8	Asp. Tox 1; H304
Poly(oxy-1, 2-ethanediyl), a-tridecyl-w-hydroxy, branched	<3	69011-36-5	Acute Tox 4; H302. Eye Dam 1; H318

The exact percent by weight of the ingredients in this formulation is proprietary.

Safety Data Sheet

4 – FIRST-AID MEASURES

BREATHING (INHALATION):.. Move to fresh air. No hazards which require special first aid measures.
SWALLOWING (INGESTION):. Rinse mouth with water. Do NOT induce vomiting. Call a physician or poison control centre immediately.
EYES: ..... Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention immediately.
SKIN (DERMAL): ..... Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. In case of persistent skin irritation, consult a physician.
ACUTE SYMPTOMS:..... None under normal use.
DELAYED EFFECTS: ..... None under normal use.
IMMEDIATE OR SPECIAL TREATMENT: ..... None reasonably forseeable.

5 – FIRE-FIGHTING MEASURES

FLASHPOINT:..... Does not flash.
EXTINGUISHING MEDIA:..... Water, water spray, foam, carbon dioxide (CO2), dry powder.
SPECIAL FIRE FIGHTING PROCEDURES: ..... Carbon oxides (COx), nitrogen oxides (NOx). Hydrogen chloride, Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.

6 – ACCIDENTAL RELEASE MEASURES

SPILL PROCEDURES:.....Small spills: Do not flush with water. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.
Large spills: Do not flish with water. Dam up. Clean up promptly by scoop or vacuum.
Residues: Soak up wih inert absorbent material. After cleaning, flush away traces with water.
PERSONAL PRECAUTIONS:.... Do not touch or walk through spilled material. Spills produce extremely slippery surfaces.

7 – HANDLING and STORAGE

STORAGE: ..... Keep away from heat and sources of ignition. Freezing will affect the physical condition and may damage the material. Incompatible with oxidizing agents.
HANDLING:..... Avoid contact with skin and eyes. Renders surfaces extremely slippery when spilled. When using, do not eat, drink or smoke.

Safety Data Sheet

8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS: ..... Do not allow uncontrolled discarge of product into the environment.

INGREDIENT	SOURCE & PARAMETER	EXPOSURE LIMIT
Distillates (petroleum) hydrotreated light	ACGIH	200 mg/m3 8 hr

PROTECTIVE CLOTHING: ..... Chemical goggles, face shield, always wear eye protection when working with any chemical. Impervious gloves, clean body covering, rubber apron, rubber boots

ADDITIONAL MEASURES:..... Ensure adequate ventilation, especially in confined areas. Use local exhaust if misting occurs. Natural ventilation is adequate in absence of mists.

9 – PHYSICAL / CHEMICAL PROPERITES

APPEARANCE: ..... Viscous liquid, milky.
ODOR: ..... Aliphatic.
BOILING POINT: .....> 100 (C)
VAPOR PRESSURE:.....2.3 kPa @ 20 (C)
VAPOR DENSITY (AIR=1): .....0.804 g/litre @ 20 (C)
SPECIFIC GRAVITY: 1.0-1.1
pH: .....5-8 @ 5 g/L
SOLUBILITY IN WATER: ..... Completely miscible in water.
FLAMMABILITY: ..... Not Flamable
EVAPORATION RATE:..... No data available.
MELTING POINT/FREEZING POINT: .....< 5 C

10 – STABILITY and REACTIVITY

REACTIVITY: ..... Stable under recommender storage conditions.
STABILITY:..... Stable under recommended storage conditions.
HAZARDOUS POLYMERIZATION: ..... None known.
INCOMPATIBILITY:..... Oxidizing agents.
HAZARDOUS REACTIONS: ..... Protect from frost, heat and sunlight.
HAZARDOUS DECOMP: ..... Thermal decompostion may produce, nitrogen oxides (NOx), carbon oxides (COx). Ammonia, Hydrogen, cyanide (hydrocyanic acid).

Safety Data Sheet

11 – TOXICOLOGICAL INFORMATION

LIKELY ROUTES OF EXPOSURE: ..... Skin and/or eye contact. Ingestion. Inhalation.
TOXICOLOGICAL CHARACTERISTICS: ..... The results of testing on rabbits showed this material to be non toxic even at high dose levels.
DELAYED EFFECTS: ..... No know effects.
IMMEDIATE EFFECTS: ..... May cause serious eye irritation.
CHRONIC EFFECTS: ..... Not Known.
LISTED CARCINOGEN: ..... Not carcinogenicity.

INGREDIENTS	DATA
Distillates (petroleum), hydrotreated light	Oral LD50 rat 5000 mg/kg
	Dermal LD50 rabbit 5000 mg/kg
	LC0 Inhalation 4 hours rat 4951 mg/m3
Poly(oxy-1, 2-ethanediyl), a-tridecyl-w-hydroxy-, branched	Inhalation LC50 rat 4951 mg/m3
	Oral LD50 rat 500-2000 mg/kg
	Dermal LD50 rabbit 2000 mg/kg

12 – ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND DISTRIBUTION:

PRODUCT	DATA
Distillates (petroleum), hydrotreated light	LC0 oncorhynchus mykiss 96 hrs >1000 mg/L
	EC0 daphnia magna 48 hrs >1000 mg/L
Poly(oxy-1, 2-ethanediyl), a-tridecyl-w-hydroxy-, branched	IC0 pseudokirchneriella subcapitata 72 hrs >1000 mg/L
	LC50 cyprinus carpio 96 hrs 1-10 mg/L
	EC50 daphnia 48 hrs 1-10 mg/L
	IC50 desmodesmus subspicatus 72 hrs 1-10 mg/L

PERSISTENCE AND DEGRADABILITY: ..... Not readily biodegradable.
BIOACCUMULATIVE POTENTIAL: ..... This product is not expected to bioaccumulate.
MOBILITY IN SOIL:..... No data available.
OTHER ADVERSE EFFECTS: .. None.

13 –DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: ..... Dispose of in accordance with all local, state, and federal regulations.

Safety Data Sheet

14 – TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:..... Not Regulated

15 - REGULATIONS

Contents of this MSDS comply with the OSHA Hazard Communication Standard 29CFR 1910.1200

EPA SRA Title III Chemical Listings:

TSCA STATUS: ..... All ingredients listed or exempt.
SECTION 311/312: ..... Not Hazardous.
US EPA CERLA: ..... None Hazardous

16 – OTHER INFORMATION

NFPA HAZARD RANKING

HEALTH	FIRE	REACTIVITY	SPECIAL
0	1	0	

HMIS HAZARD RANKING

HEALTH	FIRE	REACTIVITY	PPE
0	1	0	

Key or legend to abbreviations and acroynyms used:
Acute Tox. 4 – Acute Toxicity Category Code 4
Asp. Tox 1 – Aspiration hazard Category Code 1
Eye Dam 1 – Serious eye damage/eye irritation Category Code 1

Hazard Statements:
H302 – Harmful if swallowed
H304 – May be fatal if swallowed and enters airways
H318 – Causes serious eye damage

The information provided in this Safety Data Sheet is correct to the best of our knowledge, informatino and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportaiton, disposal and release and is not to be considered a warranty or quality specification. The iformation 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.

Material Safety Data Sheet

Dober Chemical Corp.
14461 S. Waverly
Midlothian, IL 60445

Product Name: PWR-FLOC CP-7

I. Identification

Revision Date: 9/24/02

Emergency Telephone: 800/323-4983
Information Telephone: 708/388-7700

Chemical Family: Cationic Acrylamide Copolymer Powder
DOT Hazard Class: N/A
DOT Shipping Name: N/A

II. Hazardous Ingredients

Material	%	TWA/Ceiling	CAS#

This product is not hazardous under Federal Regulation 29 CFR 1910.1200.

III. Physical Data

pH: 2.5 – 4.5 @ 5g/l
Melting Point: NA
Vapor Pressure (mmHg): NA
Solubility in Water: 10%
Evaporation Rate: N/A
Appearance and Odor: White granular solid, no odor

IV. Fire and Explosion Hazard Data

Flash Point (Test Method): NA
Flammable Limits in Air (% by volume): Lower= N/A **Upper=** N/A
Extinguishing Media: Water fog, foam, CO_2, dry chemical.
Special Firefighting Procedures: Wear self-contained breathing apparatus. Cool exposed containers with water spray. Aqueous solutions or powders that become wet render surfaces extremely slippery.
Unusual Fire and Explosion Hazards: N/A

Denotes a toxic chemical subject to SARA Title III Section 313 reporting requirements as specified in 40 CFR 372.

V. Reactivity Data

Stability: Stable: XXX **Unstable:**
Conditions to Avoid: N/A
Incompatibility (materials to avoid): Oxidizing agents.
Hazardous Combustion or Decomposition Products: Hydrogen chloride gas, nitrogen oxides and carbon dioxides.
Hazardous Polymerization: May Occur: Will Not Occur: XXX

VI. Health Hazard Data

Toxicity: Product has very low acute toxicity.

Ecotoxicity: Any aquatic toxicity is highly mitigated by hydrolysis as well as the presence of dissolved organic carbon and suspended matter present in natural waters. Tests show that the synergistic effect of hydrolysis and irreversible absorption onto suspended matter and dissolved organics (such as humic and other organic acids) present in natural waters, reduces the toxicity to aquatic organisms by a factor or over 100.

Ingredients Listed as Carcinogenic in NTP, IARC, or OSHA (specify): None

Acute Effects Of Overexposure

Eye Contact: Irritant.

Skin Contact: Irritant.

Inhalation: Not expected to be toxic by inhalation.

Ingestion: See Emergency and First Aid Procedures.

Principal Routes of Absorption: Skin contact, inhalation, eye.

Emergency and First Aid Procedures

Eyes: Rinse thoroughly with plenty of water. In case of persistent eye irritation, get medical attention.
Skin: Wash with water and soap as a precaution. In case of skin irritation, get medical attention.
Inhalation: Move to fresh air. If irritation persists, get medical attention.
Ingestion: No hazards which require special first aid measures.

VII. Spill or Leak Procedures

Steps to be Taken if Material is Released or Spilled: Avoid contaminating water. Do not flush with water. Clean up promptly by scoop or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water.

Waste Disposal Method: In accordance with federal, state, and local guidelines.

Persistance/Degradability: Abiotic degradability (hydrolysis) >70% in 28 days.

Environmental Fate: The product has a half-life of less than 12 hours in natural pH environments and so degrades almost totally due to hydrolysis. The degradation products are practically non-toxic to aquatic organisms and present no danger to the natural environment.

Bioaccumulation: This product is not expected to bioaccumulate.

VIII. Special Protection Information

Ventilation Requirements: General exhaust is sufficient when material is used as intended. Use local exhaust if dusting occurs.

Recommended Personal Protective Equipment

Respiratory: Dust safety masks are recommended where concentration of total dust is more than 15 mg/m3.

Eyes: Safety glasses with side shields. Do not wear contact lenses.

Gloves: Impervious.

Other Clothing and Equipment: Other protective clothing depending on degree of exposure. Eyewash and safety shower recommended.

IX. Special Precautions

Precautions to be Taken in Handling and Storing: For good industrial hygiene, avoid contact with skin and eyes, avoid forming dust/mist. Wash hands before breaks and at the end of the work day. Keep in a dry, cool place (0-35˚F).

Other Precautions: For industrial use only.

X. HMIS Ratings:

Health	**1**
Flammability	**0**
Reactivity	**0**
Personal Protection	

All information, recommendations, and suggestions appearing herein concerning this compound are based upon data obtained from the raw material manufacturers and/or recognized technical sources; however, Dober Chemical Corp. makes no warranty, representation, or guarantee as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of the product. Since actual use by others is beyond our control, Dober Chemical makes no warranty, express or implied, as to the effects of such use, the results to be obtained or the safety and toxicity of the product. The data in this MSDS relate only to the specific product designated herein and do not relate to use in combination with any other material or in any process.

Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **Sodium Hydroxide Solution - 50%**

Synonyms • Solutions of Caustic; Solutions of Caustic Soda; Solutions of Lye; Solutions of Sodium hydrate

CAS Number • 1310-73-2

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

Relevant identified use(s) • Neutralizing agent, industrial cleaning, pulp and bleaching, soap manufacturing

1.3 Details of the supplier of the safety data sheet

Manufacturer • Westlake Vinyls Company, LP
P.O. Box 228
36045 Highway 30 Geismar, LA 70734
United States
www.westlake.com

Telephone (General) • 225-673-0651

1.4 Emergency telephone number

Manufacturer • (800) 424-9300 - Chemtrec - Transportation emergency

Section 2: Hazards Identification

HMIS Rating:	Health: 3	Fire: 0	Reactivity: 1	PPE: X

EU/EEC
According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP • Skin Corrosion 1A - H314

DSD/DPD • Corrosive (C)
R35

2.2 Label Elements

CLP

DANGER



Hazard statements
- H314 - Causes severe skin burns and eye damage.

Precautionary statements

Prevention
- P260 - Do not breathe mist/vapours/spray.
  P264 - Wash thoroughly after handling.
  P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Response
- P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
  P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P310 - Immediately call a POISON CENTER or doctor/physician.
  P363 - Wash contaminated clothing before reuse.
  P321 - Specific treatment, see supplemental first aid information.
  P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage/Disposal
- P405 - Store locked up.
  P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD



Risk phrases
- R35 - Causes severe burns.

Safety phrases
- S36 - Wear suitable protective clothing.
  S37 - Wear suitable gloves.
  S39 - Wear 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

CLP
- According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD
- This product is considered dangerous according to the European Directive 67/548/EEC.

Canada
According to WHMIS

2.1 Classification of the substance or mixture

WHMIS • Corrosive - E

2.2 Label elements

WHMIS



- Corrosive – E

2.3 Other hazards

WHMIS • In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

Composition				
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**
Sodium hydroxide	**CAS:**1310-73-2 **EC Number:**215-185-5 **EU Index:**011-002-00-6	50%	NDA	**EU DSD/DPD:** Annex VI, Table 3.2: C R35 **EU CLP:** Annex VI, Table 3.1: Skin Corr. 1A, H314 **OSHA HCS 2012:** Skin Corr. 1B; Eye Dam. 1

3.2 Mixtures

- Material does not meet the criteria of a mixture in accordance with Regulation (EC) No 1272/2008.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation • Administer oxygen if breathing is difficult. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give artificial respiration if victim is not breathing. Move victim to fresh air.

Skin • For minor skin contact, avoid spreading material on unaffected skin. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Remove and isolate contaminated clothing and shoes.

Eye • In case of contact with substance, immediately flush eyes with running water for at least 20 minutes.

Ingestion • If swallowed, rinse mouth with water (only if the person is conscious) Do NOT induce vomiting. Do not use mouth-to-mouth method if victim ingested the substance. Obtain medical attention immediately if ingested.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician • All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media • In case of fire use media as appropriate for surrounding fire.

Unsuitable Extinguishing Media
- No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- In contact with moisture or water sufficient heat may be generated to ignite adjacent combustible materials.
  Sodium hydroxide solutions can react violently when in contact with chlorinated hydrocarbons and metals such as aluminum, zinc or materials galvanized with zinc with resultant generation of hydrogen.

Hazardous Combustion Products
- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive fumes.

5.3 Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
  Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
  Wear positive pressure self-contained breathing apparatus (SCBA).
  SMALL FIRES: Move containers from fire area if you can do it without risk.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions
- Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate enclosed areas.

Emergency Procedures
- Keep unauthorized personnel away. Stay upwind. Do not get water inside container.

6.2 Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures
- Absorb with earth, sand or other non-combustible material.
  Transfer the spilled material to caustic resistant containers labeled: CORROSIVE
  With careful handling, dilute acid, preferable acetic acid, may be used to neutralize final traces of caustic.
  Flush the cleaned area with water.
  LARGE SPILLS: Dike far ahead of liquid spill for later disposal.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling
- Handle and open container with care. Use only with adequate ventilation. Use caution when combining with water; DO NOT add water to corrosive liquid, ALWAYS add corrosive liquid to water while stirring to prevent release of heat, steam and fumes. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe mist, vapours and/or spray. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage
- Keep container tightly closed. Store in a cool/low-temperature, well-ventilated place. Store separate from the normal work area and away from materials that react with sodium hydroxide. Use corrosion resistant structural materials and lighting and ventilation systems in the storage area.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines				
	Result	**ACGIH**	**NIOSH**	**OSHA**
Sodium hydroxide (1310-73-2)	TWAs	Not established	Not established	2 mg/m3 TWA
	Ceilings	2 mg/m3 Ceiling	2 mg/m3 Ceiling	Not established

8.2 Exposure controls

Engineering Measures/Controls
- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory
- Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face
- Wear eye/face protection - Chemical goggles, - Full face shield.

Skin/Body
- Wear appropriate gloves. Wear protective clothing

Environmental Exposure Controls
- Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Colorless to gray, syrupy liquid with a mild, pungent odor.
Color	Colorless to gray.	Odor	Mild, slightly pungent.
Odor Threshold	Data lacking		
General Properties			
Boiling Point	148 C(298.4 F)	Melting Point	Data lacking
Decomposition Temperature	Data lacking	pH	14
Specific Gravity/Relative Density	1.49 Water=1 @ 65.6 C(150.08 F)	Water Solubility	Soluble
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	19 mmHg (torr) @ 65.5 F(18.6111 C)	Vapor Density	Data lacking
Evaporation Rate	Data lacking	Volatiles (Vol.)	50 %
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Not relevant.		

Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable

10.3 Possibility of hazardous reactions

- Hazardous polymerization will not occur.

10.4 Conditions to avoid

- Incompatible materials. Excess heat.

10.5 Incompatible materials

- This product reacts with water generating heat. This product reacts violently or explosively with chlorinated hydrocarbons. It attacks leather and wool resulting in destruction of those materials and possible chemical exposure to the individual. Caustic solutions can generate hydrogen gas on contact with aluminum, zinc or materials galvanized with zinc.

10.6 Hazardous decomposition products

- No data available.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Sodium Hydroxide Solution - 50% 1310-73-2								
Test Type	**Dosage**	**Route**	**Species**	**Duration**	**Results**	**Test Class**	**Target Organs**	**Comments**
Irritation	= 1 %	Eye	Rabbit	NDA	NDA	Severe irritation, reversible	NDA	NDA
Irritation	= 500 mg	Skin	Rabbit	24 Hour(s)	NDA	Severe irritation, reversible	NDA	NDA

GHS Properties	Classification
Acute toxicity	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Aspiration Hazard	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Carcinogenicity	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Germ Cell Mutagenicity	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Skin corrosion/Irritation	**EU/CLP**•Skin Corrosion 1A **OSHA HCS 2012**•Skin Corrosion 1B
Skin sensitization	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
STOT-RE	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met

STOT-SE	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Toxicity for Reproduction	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Respiratory sensitization	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Classification criteria not met
Serious eye damage/Irritation	**EU/CLP**•Classification criteria not met **OSHA HCS 2012**•Serious Eye Damage 1

Route(s) of entry/exposure
- Inhalation, Skin, Eye, Ingestion

Potential Health Effects

Inhalation

Acute (Immediate)
- May cause corrosive burns - irreversible damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive fumes may cause bronchial irritation with chronic cough.

Skin

Acute (Immediate)
- Causes severe skin burns and eye damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials will cause dermatitis.

Eye

Acute (Immediate)
- Causes serious eye damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials or fumes may cause conjunctivitis.

Ingestion

Acute (Immediate)
- May cause irreversible damage to mucous membranes.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials or fumes may cause gastrointestinal distrubances.

Section 12 - Ecological Information

12.1 Toxicity

Sodium Hydroxide Solution - 50%			1310-73-2		
Dosage	**Species**	**Duration**	**Results**	**Exposure Conditions**	**Comments**
144 to 276 mg/L	**Fish:** Poecilia reticulata (Guppy)	96 Hour(s)	LC50	NDA	NDA
= 125 mg/L	**Fish:** Gambusia affinis (Western mosquito fish)	96 Hour(s)	LC50	NDA	NDA

12.2 Persistence and degradability
- Material data lacking.

12.3 Bioaccumulative potential
- Material data lacking.

12.4 Mobility in Soil
- Material data lacking.

12.5 Results of PBT and vPvB assessment
- PBT and vPvB assessment has not been carried out.

12.6 Other adverse effects
- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1824	Sodium hydroxide solution	8	II	NDA
TDG	UN1824	SODIUM HYDROXIDE SOLUTION	8	II	NDA
IMO/IMDG	UN1824	SODIUM HYDROXIDE SOLUTION	8	II	NDA
IATA/ICAO	UN1824	Sodium hydroxide solution	8	II	NDA

14.6 Special precautions for user
- None specified.

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

Section 15 - Regulatory Information

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

SARA Hazard Classifications
- Acute

Inventory						
Component	**CAS**	**Australia AICS**	**Canada DSL**	**Canada NDSL**	**China**	**EU EINECS**
Sodium hydroxide	1310-73-2	Yes	Yes	No	Yes	Yes

Inventory (Con't.)						
Component	**CAS**	**EU ELNICS**	**Japan ENCS**	**Korea KECL**	**New Zealand**	**Philippines PICCS**
Sodium hydroxide	1310-73-2	No	Yes	Yes	Yes	Yes

Inventory (Con't.)		
Component	**CAS**	**TSCA**
Sodium hydroxide	1310-73-2	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

•Sodium hydroxide	1310-73-2	E (including 0.04% in aqueous solution, 0.08%, 0.4% in aqueous solution, 2%, 2.5%, 4% in aqueous solution, 5%, 10%, 16%, 20%, 40%, 50% in aqueous solution, 8.7N)

Canada - WHMIS - Ingredient Disclosure List

•Sodium hydroxide	1310-73-2	1 %

Environment

Canada - CEPA - Priority Substances List

•Sodium hydroxide	1310-73-2	Not Listed

Europe

Other

EU - Hazardous Substances Restricted or Prohibited in Electrical Equipment (2011/65/EU) (RoHS)

•Sodium hydroxide	1310-73-2	Not Listed

EU - Inventory of Cosmetic Ingredients Directive (INCI) (76/768/EEC) - Other Ingredients

•Sodium hydroxide	1310-73-2	Buffering; Denaturant

Japan

Environment

Japan - Pollutant Release Transfer Register (PRTR) - Class 1 Substances

•Sodium hydroxide	1310-73-2	Not Listed

Japan - Pollutant Release Transfer Register (PRTR) - Class 2 Substances

•Sodium hydroxide	1310-73-2	Not Listed

Inventory - Japan - Industrial Safety and Health Law Substances (ISHL)

•Sodium hydroxide	1310-73-2	Not Listed

Other Agency Information

Other

CONEG - Model Toxics in Packaging Legislation

•Sodium hydroxide	1310-73-2	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

•Sodium hydroxide	1310-73-2	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - CAA (Clean Air Act) - Class I Ozone Depletors

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - CAA (Clean Air Act) - Class II Ozone Depletors

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

•Sodium hydroxide	1310-73-2	1000 lb final RQ; 454 kg final RQ

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - TSCA (Toxic Substances Control Act) - Section 12(b) - Export Notification

•Sodium hydroxide	1310-73-2	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

•Sodium hydroxide	1310-73-2	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Female		
•Sodium hydroxide	1310-73-2	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
•Sodium hydroxide	1310-73-2	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Last Revision Date	• 24/July/2020
Preparation Date	• 05/May/2015
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Key to abbreviations

NDA = No data available