# GROUTING UNIFIED SAFE OPERATING PRACTICES PROGRAM

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## INTRODUCTION

NASSCO's Infiltration Control Grouting Committee (ICGC) is pleased that you have decided to use this Safe Operating Practices Program - SOPP for educational and safety purposes. The National Association of Sewer Service Companies (NASSCO), started with a safety grant from EPA and NASSCO, takes the safety of workers in the industry very seriously. We hope you find this guide to be helpful in maintaining a safe work environment.

This Safe Operating Practices Program (SOPP) has been developed in cooperation with industry suppliers, contractors, and vendors of grouting equipment. This SOPP is a tool for the industry to help protect employees using chemicals and the environment from potential hazards associated with the use of chemical grouts.

Despite its scope and breadth, the NASSCO SOPP is not an attempt to comprehensively address all safety considerations. This SOPP is designed to be the minimum standard for safety, training, and the use of personal protective equipment while handling and injecting chemical grouts for the sanitary sewer grouting industry. However, it is not intended to cover every situation. Please contact your grout supplier for additional information.

This SOPP provides guidance only and does not alter or determine legal compliance responsibilities, which are set forth in Occupational Safety and Health Administration (OSHA) standards and the Occupational Safety and Health Act. The reader must refer to the appropriate standards to ensure compliance. Moreover, because interpretations and enforcement policy may change over time, for additional guidance on OSHA compliance requirements, the reader should consult current administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the courts. The Environmental Protection Agency (EPA) has expressed an interest in the safe use and handling of chemical grouts, and recommendations that it has made concerning specific items of personal protective /equipment and other safety-enhancing measures have been incorporated into the SOPP.

This SOPP is the product of many years of experience with chemical grouts and industry professionals and suppliers. NASSCO is pleased to share it with the industry for whom it was developed. Neither NASSCO, its employees, nor consultants, however, makes any express or implied warranty about the completeness or accuracy of the information in the SOPP, nor assumes any liability or responsibility for any use, or the results of such use, of this information. Also, while NASSCO will endeavor to advise the industry of any significant changes in the content of the SOPP, please be aware that the information is subject to change without notice.

NASSCO hereby grants a nonexclusive, royalty-free license to the users of chemical grouts to retain a copy of the SOPP for reference and training purposes and to reproduce and distribute it for employee use, subject to the following conditions and limitations:

- The SOPP may not be altered, abridged, revised, translated, or otherwise modified without NASSCO's written consent. In the event that such consent is given, NASSCO assumes no responsibility for the completeness, or overall quality of any alteration, abridgment, revision, translation, or other modification of this SOPP. Thank you for your cooperation in maintaining a safe working environment for the industry.

## NASSCO's COMMITMENT TO SAFETY

As your industry partner, NASSCO pledges to provide the best information possible to provide guidelines for a safe work environment.

**The most important part of any safety program is management's commitment to safety**.
The company should operate with the safety of its employees as its highest priority. Management's support, training and continued proactive support are essential to any safety program.

**Personal Safety**

**Personal Protective Safety Equipment (PPE)**
The proper use of Personal Protective Equipment, commonly called PPE, requires the company and individual to recognize, accept, and implement the need for the use of PPE. If individuals do not understand the reason for wearing each piece of equipment, those individuals may be risking unnecessary exposure. Companies and individuals must also understand the relationship of how all of the PPE works together and complete hazard assessments to determine what is needed to protect them. Employees **must** wear the recommended PPE for a given operation to be properly protected. It is especially important to train employees to think of their PPE as a system and not individual pieces of equipment. This complete system approach is required so that all needed equipment is always worn during specific operations where exposure can occur, such as mixing or injecting materials. Your PPE should always be inspected prior to use, cleaned, reinspected, and properly stored afterward. Make sure that you are familiar with the procedures for each step of this process. The first rule of thumb to follow when it comes to PPE is that YOU are the one that is ultimately responsible for your own personal protection.

The hazard assessment on the grouting systems process discovered the two most common routes of exposure to chemicals in this process are inhalation hazards (the breathing of vapors or aerosols) and skin contact (dermal contact).

**Respiratory Protection Program**
OSHA's Respiratory Standard and Respiratory Protection Program – CFR 29 1910.134 Standard

When a situation requires the use of a respirator during specific operations, the provisions of OSHA's respiratory protection standard must be met. The respiratory protection standard requires employee medical evaluations, fit testing, and respirator training. The specific requirements can be found on OSHA's website: Respiratory Protection – 63:1152-1300 - https://www.osha.gov/laws-regs/federalregister/1998-01-08

In addition to meeting the terms of the standard, OSHA requires that your company (1) Develop a written respiratory program with procedures that are specific to your worksite; (2) Implement the program and update it as necessary; and 3) Assign a qualified program administrator to run and evaluate the program. You may access the applicable regulations on OSHA's website: Inspection procedures for the Respiratory Protection Standard - CPL 02-00-120 – CPL 2-0.120 - https://www.osha.gov/enforcement/directives/cpl-02-00-120.

For assistance, you may download a copy of OSHA's Small Entity Compliance Guide at https://www.osha.gov/sites/default/files/publications/3384small-entity-for-respiratory-protection-standard-rev.pdf. The Small Entity Compliance Guide includes a sample written respiratory protection program.

**Respirators and Cartridges**

Respirators and their associated cartridges are designed to protect the respiratory system. NASSCO recommends the use of respirators as a part of the personal protective equipment package during specific operations. The specific operations where respirators must be worn include transferring and mixing chemical grouts in the mixing tanks, cleaning tanks, cleaning chemical lines/packers and injecting grout (i.e., manhole or tunnel walls).

Full-face respirators offer protection of the face, eyes, and lungs. When properly fitted, without facial hair and properly sealed, an example of a full-face respirator is the 3M brand 6800 Full Facepiece Respirator. When used with the appropriate cartridge filter, the 3M brand 6800 Full Facepiece Respirator is designed to provide effective protection. Other full-face respirators that meet OSHA requirements could also be used.

Air purifying respirator (APR) requires a respirator cartridge, if using a 3M respirator, the 3M brand 60921 Organic Vapor Cartridge/P100 Filter. The 3M brand 60921 Organic Vapor Cartridge/P100 Filter is designed to be effective for use with acrylamide liquids and granules.

If a cartridge/filter becomes damaged or soiled, or if breathing becomes difficult, the employee should leave the area and follow safety protocols to replace the cartridge/filter. Replace the cartridge/filter per manufacturers recommendations or as jobsite conditions dictate. Employees should not share respirators and should clean and store their respirator in a sealed bag in a secure location when not in use.

**Chemical Protective Clothing - General**

As noted above, the various PPE recommendations and requirements should be addressed as a single unit. A unit approach to PPE requires that all PPE recommended for a specific operation should be worn during that operation. It is imperative that employees understand that PPE is not just a pair of goggles and gloves but should be thought of as a system that includes suits and boots, as well as head, eye protection, gloves, and respirators.

**Chemical Protective Clothing - Suits**

Chemical suits are designed as head and body protection. Even though physical contact with chemical grouting products is unlikely, chemical suits are an essential part of an employee's personal protective equipment package during sanitary sewer grouting operations. The hazard assessment recommends the **DuPont brand Tychem® model (SL**) protection suit provides excellent protection against potential acrylamide exposure hazards. This suit is a lightweight garment specifically designed for easy wear. It has been tested with acrylamide and shows an average normalized breakthrough time in minutes to be greater than 480. If other products offer protection comparable to that of **Tychem® SL** these products would be considered effective as well. The specific operations where **Tychem® SL** or comparable chemical suits must be worn, including but not limited to, transferring, and mixing chemical grouts into other

appropriate storage containers; and during cleaning operations of mixing tanks, chemical lines and/or packers. The use of such suits is also recommended during all in-manhole operations that involve grouting with chemical grouting products.

**Tychem®**-type suits are considered limited-use disposable garments. Once a garment is contaminated or damaged, it should be properly disposed of immediately. Please note: Tyvek suits are not the same as **Tychem** suits. Tyvek suits provide protection against dry particulates, **Tychem SL** suits provide protection against both Dry Particulates and Light Liquid Splashes.

**Chemical Protective Clothing - Gloves**

Chemical gloves are designed as protection of the hand, wrist, and forearm, and must be used for any operation where chemical grout is present. These operations include transferring and mixing grouts, handling the packer, and all cleaning and testing operations. A suitable glove will exhibit good resistance to chemical grouting products. It is also important to specify the proper thickness (gauge). When choosing a glove, it is important to specify the proper thickness (gauge). At this time, only the 15 mil (0.38 millimeter) Best Glove brand Nitri-Solve® Model 727 has been tested and reported effective for exposure to acrylamide. If other products offer protection comparable to that of the Best Nitri-Solve® Model 727 gloves in standardized laboratory testing with acrylamide; then these products would be considered effective as well.

Chemical resistant gloves should cover the wrist and forearm and fit properly, so the employee has the best dexterity possible. Due to the use of the glove, the chemical penetration and permeation may vary as a result the company must assess the gloves replacement as required.

**Chemical Protective Clothing - Boots**

Chemical resistant rubber boots are designed to protect the foot, ankle, and lower leg, and must be used for any operation where chemical grout is present. These operations include transferring and mixing grouts, handling the packer, cleaning, and testing operations, and all in-sewer activities. Chemical resistant rubber boots must exhibit good resistance to be effective and should be properly cleaned as discussed below in Use and Care of Personnel Protective Equipment on a daily basis if they have come into contact with chemical grout. Boots that are torn or are heavily worn should be replaced immediately.

Leather or other non-rubber footwear is NOT recommended to be worn during chemical grouting operations. Spills can be absorbed by leather or non-rubber footwear. which can cause exposure and irritation of the skin. Once leather or non-rubber footwear has become wet and contaminated, the employee shall immediately remove the boot.

**Chemical Protective Clothing – Full Face Shield**

A full-face shield and unvented chemical splash goggles should be worn for any operation where chemical grout is present if a full-face respirator is not being worn. These operations include transferring and mixing grouts, handling the packer, cleaning, and testing operations, and all in-sewer activities.

Damaged or severely scratched full-face shields, goggles or glasses must be discarded immediately. Full-face shields, splash goggles and glasses should be cleaned on a daily basis.

If the end user decides to perform their own risk assessment, then different PPE may be considered

according to the risk assessment. This assessment must be in accordance with the Respiratory Protection Program noted above.

**Use and Care of Personal Protective Equipment**

Properly maintaining and using personal protective equipment is an important step in the safe handling of chemical grouts. Follow general guidelines for PPE use and care as outline by the OSHA Construction Standard. Below are examples of general PPE guidelines:

- Inspect all PPE before each use.
- NEVER use damaged or contaminated items.
- Wear, store, and clean PPE according to manufacturers' guidelines.
- PPE fit is extremely important. If PPE does not fit well, employees tend not to use it, which defeats its basic purpose.

**The best equipment in the world will not protect an employee unless it is used correctly and consistently.**

Companies should monitor employees to ensure effective use of PPE and follow good safety procedures. Individuals should not be permitted to work independently with any of the chemical grouts until properly trained and fitted for PPE. The employee must be able to follow the procedures and required precautions.

Per the OSHA Standard. Employees **MUST** do their part to follow company safety policies. Some examples include the following:

- Wear clean clothes each workday and wash before re-use.
- Shower and wash, full body, face, and hair at end of each workday.
- Wash hands and face before eating, drinking, or smoking.
- Keep food and drinks out of the work area.
- Maintain a clutter-free workspace.
- Consult your supervisor if you do not understand how to use or maintain PPE correctly.

**PPE as a Protective System and Acrylamide Risk**

Respirators, chemical protective suits, gloves, boots, and goggles are all part of an integrated system to assure that operations with chemical grouts are undertaken and completed safely. It is essential that all elements of the employees' PPE system are clean, functioning properly and properly fitted. The employee is responsible for determining the status of each piece of their PPE. All PPE should be inspected before wearing it in an area or situation that may expose the wearer to hazardous chemicals. If any one piece of equipment is in unsatisfactory condition, the employee should not begin operations until the condition is corrected. PPE should be cleaned and inspected at the end of each shift and safely stored for future use.

NASSCO has listed specific brands of PPE, including chemical protective clothing, as examples and a convenience for informational purposes only. No specific products are endorsed by NASSCO. It is the responsibility of each company to conduct their own risk assessment of the grouting products to determine the type and brand of equipment that is appropriate for their specific work environment.

**Acrylamide Exposure**

Acrylamide exposure mode changes depending upon the type of work being performed. The potential routes of human exposure to Acrylamide are ingestion, dermal contact, and inhalation. The first signs of Acrylamide exposure are: skin rash on hands (feet in some cases), white fingers, and the sweating and peeling of skin on the hands and fingertips. Acrylamide exposure prevention aims to prevent the potential routes through the daily use of proper PPE. Poisoning is typically not caused by a single event - experience suggests that it is a cumulative exposure. This is the reason why wearing the proper PPE and following the SOPP daily when handling Acrylamide is extremely important.

## HOUSEKEEPING

Good housekeeping in the work area is as important as the safe handling of injection grouts. Grout rigs typically have small work areas and should be organized to allow employees the greatest freedom of movement and the ability to perform their jobs in a safe manner. Time allotted to the maintenance of the interior of the rig is as valuable as changing the oil or inspecting the tires.

Employees should become familiar with the checklist provided below and follow it as a minimum daily requirement for their housekeeping duties. The list is not meant to be exhaustive - any site-specific or operation-specific requirements should be added by the company as needed. Along with the proper storage location for chemicals being transported, the company should have designated locations for the disposal of empty bags and containers. Grouting equipment should be washed with clean water to limit accidental exposure from the handling of packers, scoops, mixing paddles, pitchers, cameras, and the hose reel.

Good housekeeping in the cab area of the rig is also important. Employees should refrain from storing food and beverages in the open cab areas of the grout rig. Do not eat or drink at or near the grout rig. Smoking should never be permitted in a grout rig.

**Housekeeping Checklist**

- Clean work area often and maintain it in good condition.
- Make sure water tank is full. This is important not only for mixing grout, but it can be used for cleanup and also can be used in case of an emergency.
- Mop the floors; wash down outside of grout tanks, and wash hose reel and packers with fresh water, making sure that excess water is directed into a sanitary sewer.
- Wash tools used to work on pumps, packers, and hoses with fresh water, making sure that excess water is directed into a sanitary sewer.
- Immediately wash down any spills that cannot be collected or gelled. (See Spill Section)
- Secure door to control room during the mixing process.
- When transporting the triethanolamine (TEA), it must always be kept away from ammonium persulfate (AP) and sodium persulfate (SP)
  **NOTE: If TEA and AP or SP are combined, it will create a potential fire hazard**
- Seal all chemical containers immediately after use.
- Secure all chemical containers to ensure they do not shift during transit.

- Always store chemicals in original containers.
- Operator should clean steering wheel and all door handles to prevent cross contamination.
- Remove empty chemical containers from the grout rig and dispose of properly. Refer to the disposal section of this document.
- Grouting system should be inspected for leaks while in use and repaired as necessary.
- Chemical protective clothing (CPC) should be cleaned thoroughly at the end of each shift.
- CPC should be stored in clean plastic bags away from the chemicals.
- CPC should be stored outside of the control room.
- CPC should be thoroughly inspected before being used.

## UNDERSTANDING TRANPORTATION – DEPARTMENT OF TRANSPORTATION (DOT) PLACARDS

**General Information - DOT**

DOT Placards are diamond-shaped signs on the back or sides of vehicles that provide details about the kind of cargo it is carrying. They also inform emergency responders of what substances are involved in case of an accident. They must be at least 250 mm x 250 mm (10 inches square). Hazard labels are designed identically to placards and are fixed to individual packages, drums, bags and are at least 100 mm x 100 mm (4 inches square).

A hazmat placard sign has six main parts:

- Hazard class number
- UN/NA number
- Compatibility letters
- Color
- Words
- Graphics

*Special note - not every sign includes all six.


Following are the nine (9) DOT hazard classes and their divisions.

- Class 1 – Explosives
  - 1.1: Products with the potential to create a mass explosion
  - 1.2: Products with the potential to create a projectile hazard
  - 1.3: Products with the potential to create a fire or minor blast
  - 1.4: Products with no significant risk of creating a blast
  - 1.5: Products considered very insensitive that are used as blasting agents
  - 1.6: Products considered extremely insensitive with no risk to create a mass explosion
- Class 2 – Gases
  - 2.1: Flammable gases
  - 2.2: Nonflammable gasses
  - 2.3: Toxic gases
- Class 3 – Flammable and combustible liquids
- Class 4 – Flammable materials

    - 4.1: Flammable solids
    - 4.2: Spontaneously combustible
    - 4.3: Dangerous when wet
- Class 5 – Oxidizer and organic peroxide
    - 5.1: Oxidizing substances
    - 5.2: Organic peroxides
- Class 6 – Poisons
    - 6.1: Toxic substances
    - 6.2: Infectious substances
- Class 7 – Radioactive
- Class 8 – Corrosive
- Class 9 - Miscellaneous

There are two tables of classification:

| Category of material (Hazard Class or division number and additional description, as appropriate) | Placard name |
|---|---|
| 1.1 | EXPLOSIVES 1.1 |
| 1.2 | EXPLOSIVES 1.2 |
| 1.3 | EXPLOSIVES 1.3 |
| 2.3 | POISON GAS |
| 4.3 | DANGEROUS WHEN WET |
| 5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled) | ORGANIC PEROXIDE |
| 6.1 (Materials poisonous by inhalation (see §171.8)) | POISON INHALATION HAZARD |
| 7 (Radioactive Yellow III label only) | RADIOACTIVE[1] |

*Table 1 Hazard Classification Requirements*

Table 1 hazard classification items require the posting of placards on vehicles transporting these materials at any weight.
NO Exceptions.

| Category of material (Hazard Class or division number and additional description, as appropriate) | Placard name |
|---|---|
| 1.4 | EXPLOSIVES 1.4 |
| 1.5 | EXPLOSIVES 1.5 |
| 1.6 | EXPLOSIVES 1.6 |
| 2.1 | FLAMMABLE GAS |
| 2.2 | NON-FLAMMABLE GAS |
| 3 | FLAMMABLE |
| Combustible Liquid | COMBUSTIBLE |
| 4.1 | FLAMMABLE SOLID |
| 4.2 | SPONTANEOUSLY COMBUSTIBLE |
| 5.1 | OXIDIZER |
| 5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled) | ORGANIC PEROXIDE |
| 6.1 (Other than materials poisonous by inhalation) | POISON |
| 6.2 | (None) |
| 8 | CORROSIVE |
| 9 | Class 9 (See §172.504(f)(9)) |
| ORM-D | (None) |

*Table 2 Hazard Classification Requirements based on Weight*

Table 2 hazard classification items require the posting of placards on vehicles transporting these materials when the aggregate gross weight is 1,001 lbs. and over. What is aggregate gross weight? It simply means that you add up the weight of all packages plus their contents and include that toward the 1,001 lbs. A good example is this: Suppose you have 600 lbs. of Toxic Substances (Class 6.1) and 600 lbs. of Oxidizing Substances (Class 5.1). You add these materials together and you get 1,200 lbs. of aggregate gross weight. In this case, you would have to display placards for both corrosive and flammable. Each material is below the 1,001 lbs. but together (in aggregate) they are over 1,001 lbs., meaning that the load would require placarding.

**DOT Hazmat Packaging: Bulk or Non-Bulk?**

When transporting Hazmat, the size of the package matters. If the hazardous material is in a bulk package, you MUST placard for it no matter what table it's listed on, unless there's an exception.

- A Bulk Hazmat:
  - More than 119 gal. for a liquid
  - Greater than 882 lbs. for a solid
  - Water capacity greater than 1,000 lbs. as a receptacle for gas.
- Non-Bulk hazmat is less than above figures.

**UN/NA Number**

The UN/NA Number is a four-digit number used by both the United Nations and the U.S. DOT. This number is assigned to a hazardous chemical or group of hazardous chemicals. Numbers can be searched here: HazMat Search / Database – HazMat Tool. Once the number is entered, the chemical name and hazard class will come up hyperlinked to more information on the chemical including the proper label, special provision, and quantity limits.

Colors

The color coding of the placard indicates which group of hazardous material the contents reside.

- RED – indicates a flammable material
- GREEN – indicates a nonflammable substance
- YELLOW – indicates an oxidizer
- BLUE – indicates dangerous when wet
- WHITE – indicates inhalation hazard and poison
- BLACK & WHITE – indicates corrosive (acid and caustic)

- RED & WHITE – indicates flammable solid or spontaneously combustible
- WHITE & YELLOW – indicates radiation or radioactive
- ORANGE – indicates explosives
- WHITE & BLACK STRIPES – indicate miscellaneous hazardous materials

## TRANSPORTATION

| DOMESTIC MOTOR SHIPMENT (USA) | | | | |
|---|---|---|---|---|
| **UN Number** | **Description** | **Motor Class** | **Hazmat Class** | **Packing Group** |
| 2074 | Acrylamide, solid | 77.5 | 6.1 | III |
| 3426 | Acrylamide, solution | 77.5 | 6.1 | III |
| 1444 | Ammonium persulfate | 65 | 5.1 | II |
| 1505 | Sodium persulfate | 65 | 5.1 | II |
| | Ethylene glycol | 70 | n/a | |

| INTERNATIONAL AIR SHIPMENT* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| UN Number | Description | Hazmat Class | Packing Group | Label Required | Ltd Qty. Packing Instruction | Ltd Qty. Maximum | Passenger Air Packing Instruction | Passenger Air Max. | Cargo Air Packing Instruction | Cargo Air Max. |
| 2074 | Acrylamide, solid | 6.1 | III | Toxic PGIII | Y645 | 10 kg | 670 | 30 kg | 677 | 30 kg |
| 3426 | Acrylamide, solution | 6.1 | III | Toxic PGIII | Y642 | 2 L | 655 | 30 L | 663 | 30 L |
| 1444 | Ammonium persulfate | 5.1 | II | | | Not Accepted | | Not Accepted | 563 | 30 kg |
| 1505 | Sodium persulfate | 5.1 | II | | | Not Accepted | | Not Accepted | 563 | 30 kg |
| None | Ethylene glycol | n/a | | | | | | | | |

*UPSAirDomesticTable_04.17.2021

**NOTE:**

- The above charts are not intended to be a complete summary of the requirements for packaging and shipping.
- Always refer to the Safety Data Sheet (SDS, formerly Material Safety Data Sheet or MSDS) for your state's/country's regulatory body for ground/truck shipment; ICAO/IATA regulations for air shipment; and International Maritime Dangerous Goods (IMDG) Code regulations for ocean shipment.

**Package Hazard Symbols**

As a result of updated OSHA chemical labeling requirements, 2016 was the first full year of adoption of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) in the US.

The GHS system, part of OSHA's Hazard Communication Standard (HCS), consists of nine symbols, or pictograms, providing recognition of the hazards associated with certain substances. Use of eight of the nine are mandatory in the US, with the exception being the environmental pictogram.

Each pictogram covers a specific type of hazard and is designed to be immediately recognizable to anyone handling hazardous material.

**Pictogram and Descriptions:**

Health Hazard: A cancer-causing agent (carcinogen) or substance with respiratory, reproductive or organ toxicity that causes damage over time (a chronic, or long-term, health hazard).

Flame: Flammable materials or substances liable to self-ignite when exposed to water or air (pyrophoric), or which emit flammable gas.

Exclamation Mark: An immediate skin, eye or respiratory tract irritant, or narcotic.

Gas Cylinder: Gases stored under pressure, such as ammonia or liquid nitrogen.

Corrosion: Materials causing skin corrosion/burns or eye damage on contact, or that are corrosive to metals.

Exploding Bomb: Explosives, including organic peroxides and highly unstable material at risk of exploding even without exposure to air (self-reactive).

Flame Over Circle: Identifies oxidizers. Oxidizers are chemicals that facilitate burning or make fires burn hotter and longer.

Skull and Crossbones: Substances, such as poisons and highly concentrated acids, which have an immediate and severe toxic effect (acute toxicity).

Environmental Hazard: Chemical toxic to aquatic wildlife (non-mandatory).

**Understanding SDS**

**Hazard Communication Standard: Safety Data Sheets**

The Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide SDS each hazardous chemical to downstream users to communicate information on these hazards. The information contained in the SDS is largely the same as the MSDS, except now the SDSs are required to be presented in a consistent user-friendly, 16-section format. This brief provides guidance to help workers who handle hazardous chemicals to become familiar with the format and understand the contents of the SDS. The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English (although it may be in other languages as well). In addition, OSHA requires that SDS preparers provide specific minimum information as detailed in Appendix D of 29 CFR 1910.1200. The SDS preparers may also include additional information in various section(s).

Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting). This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element. The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.

A description of all 16 sections of the SDS, along with their contents, is presented below:

**Section 1: Identification**

This section identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier. The required information consists of:

- Product identifier used on the label and any other common names or synonyms by which the substance is known.
- Name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.
- Recommended use of the chemical (e.g., a brief description of what it actually does, such as flame retardant) and any restrictions on use (including recommendations given by the supplier).

**Section 2: Hazard(s) Identification**

This section identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards. The required information consists of:

- The hazard classification of the chemical (e.g., flammable liquid, category[1]).
- Signal word.
- Hazard statement(s).
- Pictograms (the pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or be a description of the name of the symbol (e.g., skull and crossbones, flame).
- Precautionary statement(s).
- Description of any hazards not otherwise classified.
- For a mixture that contains an ingredient(s) with unknown toxicity, a statement describing how much (percentage) of the mixture consists of ingredient(s) with unknown acute toxicity. Please note that this is a total percentage of the mixture and not tied to the individual ingredient(s).

## Section 3: Composition/Information on Ingredients

This section identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed. The required information consists of:

**Substances**

- Chemical name.
- Common name and synonyms.
- Chemical Abstracts Service (CAS) number and other unique identifiers.
- Impurities and stabilizing additives, which are themselves classified and which contribute to the classification of the chemical.

**Mixtures**

- Same information required for substances.
- The chemical name and concentration (i.e., exact percentage) of all ingredients which are classified as health hazards and are:
  - Present above their cut-off/concentration limits or
  - Present a health risk below the cut-off/concentration limits.
- The concentration (exact percentages) of each ingredient must be specified except concentration ranges may be used in the following situations:
  - A trade secret claim is made,
  - There is batch-to-batch variation, or
  - The SDS is used for a group of substantially similar mixtures.

**Chemicals where a trade secret is claimed**

- A statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

## Section 4: First-Aid Measures

This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical. The required information consists of:

- Necessary first-aid instructions by relevant routes of exposure (inhalation, skin and eye contact, and ingestion).
- Description of the most important symptoms or effects, and any symptoms that are acute or delayed.
- Recommendations for immediate medical care and special treatment needed, when necessary.

## Section 5: Fire-Fighting Measures

This section provides recommendations for fighting a fire caused by the chemical. The required information consists of:

- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on specific hazards that develop from the chemical during the fire, such as any hazardous combustion products created when the chemical burns.
- Recommendations on special protective equipment or precautions for firefighters.

## Section 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment. It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard. The required information may consist of recommendations for:

- Use of personal precautions (such as removal of ignition sources or providing sufficient ventilation) and protective equipment to prevent the contamination of skin, eyes, and clothing.
- Emergency procedures, including instructions for evacuations, consulting experts when needed, and appropriate protective clothing.
- Methods and materials used for containment (e.g., covering the drains and capping procedures).
- Cleanup procedures (e.g., appropriate techniques for neutralization, decontamination, cleaning or vacuuming; adsorbent materials; and/or equipment required for containment/clean up).

## Section 7: Handling and Storage

This section provides guidance on the safe handling practices and conditions for safe storage of chemicals. The required information consists of:

- Precautions for safe handling, including recommendations for handling incompatible chemicals, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g., eating, drinking, and smoking in work areas is prohibited).
- Recommendations on the conditions for safe storage, including any incompatibilities. Provide advice on specific storage requirements (e.g., ventilation requirements).

## Section 8: Exposure Controls/Personal Protection

This section indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure. The required information consists of:

- OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.
- Appropriate engineering controls (e.g., use local exhaust ventilation, or use only in an enclosed system).
- Recommendations for personal protective measures to prevent illness or injury from exposure to chemicals, such as personal protective equipment (PPE) (e.g., appropriate types of eye, face, skin or respiratory protection needed based on hazards and potential exposure).
- Any special requirements for PPE, protective clothing or respirators (e.g., type of glove material, such as PVC or nitrile rubber gloves; and breakthrough time of the glove material).

## Section 9: Physical and Chemical Properties

This section identifies physical and chemical properties associated with the substance or mixture. The minimum required information consists of:

- Appearance (physical state, color, etc.);
- Odor;
- Odor threshold;
- pH;
- Melting point/freezing point;
- Initial boiling point and boiling range;
- Flash point;
- Evaporation rate;
- Flammability (solid, gas);
- Upper/lower flammability or explosive limits;
- Vapor pressure;
- Vapor density;
- Relative density;
- Solubility(ies);
- Partition coefficient: n-octanol/water;
- Auto-ignition temperature;
- Decomposition temperature; and
- Viscosity.

The SDS may not contain every item on the above list because information may not be relevant or is not available. When this occurs, a notation to that effect must be made for that chemical property. Manufacturers may also add other relevant properties, such as the dust deflagration index (Kst) for combustible dust, used to evaluate a dust's explosive potential.

## Section 10: Stability and Reactivity

This section describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other. The required information consists of:

**Reactivity**

- Description of the specific test data for the chemical(s). This data can be for a class or family of the chemical if such data adequately represent the anticipated hazard of the chemical(s), where available.

**Chemical stability**

- Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions while in storage and being handled.
- Description of any stabilizers that may be needed to maintain chemical stability.
- Indication of any safety issues that may arise should the product change in physical appearance.

**Other**

- Indication of the possibility of hazardous reactions, including a statement whether the chemical will react or polymerize, which could release excess pressure or heat, or create other hazardous conditions. Also, a description of the conditions under which hazardous reactions may occur.
- List of all conditions that should be avoided (e.g., static discharge, shock, vibrations, or environmental conditions that may lead to hazardous conditions).
- List of all classes of incompatible materials (e.g., classes of chemicals or specific substances) with which the chemical could react to produce a hazardous situation.
- List of any known or anticipated hazardous decomposition products that could be produced because of use, storage, or heating. (Hazardous combustion products should also be included in Section 5 (Fire-Fighting Measures) of the SDS.)

## Section 11: Toxicological Information

This section identifies toxicological and health effects information or indicates that such data are not available. The required information consists of:

- Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). The SDS should indicate if the information is unknown.
- Description of the delayed, immediate, or chronic effects from short- and long-term exposure.
- The numerical measures of toxicity (e.g., acute toxicity estimates such as the LD50 (median lethal dose)) - the estimated amount [of a substance] expected to kill 50% of test animals in a single dose.
- Description of the symptoms. This description includes the symptoms associated with exposure to the chemical including symptoms from the lowest to the most severe exposure.
- Indication of whether the chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions) or found to be a potential carcinogen by OSHA.

## Section 12: Ecological Information (non-mandatory)

This section provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment. The information may include:

- Data from toxicity tests performed on aquatic and/or terrestrial organisms, where available (e.g., acute or chronic aquatic toxicity data for fish, algae, crustaceans, and other plants; toxicity data on birds, bees, plants).
- Whether there is a potential for the chemical to persist and degrade in the environment either through biodegradation or other processes, such as oxidation or hydrolysis.
- Results of tests of bioaccumulation potential, making reference to the octanol-water partition coefficient ($K_{ow}$) and the bioconcentration factor (BCF), where available.
- The potential for a substance to move from the soil to the groundwater (indicate results from adsorption studies or leaching studies).
- Other adverse effects (e.g., environmental fate, ozone layer depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and/or global warming potential).

## Section 13: Disposal Considerations (non-mandatory)

This section provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices. To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS. The information may include:

- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities.

| Section 14: Transport Information (non-mandatory) |
|---|
| This section provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea. The information may include:<br>• UN number (i.e., four-figure identification number of the substance)[2].<br>• UN proper shipping name[2].<br>• Transport hazard class(es)[2].<br>• Packing group number, if applicable, based on the degree of hazard[2].<br>• Environmental hazards (e.g., identify if it is a marine pollutant according to the International Maritime Dangerous Goods Code (IMDG Code)).<br>• Guidance on transport in bulk (according to Annex II of MARPOL 73/78[3] and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code (IBC Code)).<br>• Any special precautions which an employee should be aware of or needs to comply with, in connection with transport or conveyance either within or outside their premises (indicate when information is not available). |

| Section 15: Regulatory Information (non-mandatory) |
|---|
| This section identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS. The information may include:<br>• Any national and/or regional regulatory information of the chemical or mixtures (including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations). |

| Section 16: Other Information |
|---|
| This section indicates when the SDS was prepared or when the last known revision was made. The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for an explanation of the changes. Other useful information also may be included here. |

**Company Responsibilities**

Companies must ensure that the SDSs are readily accessible to employees for all hazardous chemicals in their workplace. This may be done in many ways. For example, employers may keep the SDS in a binder or on computers as long as the employees have immediate access to the information without leaving their work area when needed and a back-up is available for rapid access to the SDS in the case of a power outage or other emergency. Furthermore, companies may want to designate a person(s) responsible for obtaining and maintaining the SDS. If the company does not have an SDS, then the company they should contact the manufacturer to obtain one.

If you are transporting or using a chemical, you should have a SDS sheet for each of the grouting chemicals and additives available for review on the jobsite.

For up-to-date Safety Data Sheets (SDS) for a product, visit the manufacturer's website or call the supplier directly:
American Chemical Grout Co. – 802-234-9911 – http://www.americanchemicalgroutco.com
Avanti International – 800-877-2570 – https://www.avantigrout.com
Prime Resins – 800-321-7212 – https://www.primeresins.com

**STORAGE**

Acrylamide or Acrylate chemical grout: Store in a cool dry area away from heat. Provide good ventilation. Keep container tightly closed and in an upright or proper position. Do not use pressure to empty containers. Wear proper PPE per hazard assessment when handling this product. Store away from TEA and AP or SP.

Ammonium Persulfate (AP): Store in a cool dry area away from heat. Provide good ventilation. Keep container tightly closed and in an upright position. Wear proper PPE per proper assessment when handling product. Store away from acids, alkalis, halides, reducing agents, combustible materials and heavy metals as violent reactions may occur if product comes in contact with these materials. Do not store near acrylamide or , acrylate chemical grout or catalyst TEA.

Sodium Persulfate (SP): Store in a cool dry area away from heat. Provide good ventilation. Keep container tightly closed and in an upright position. Wear proper PPE per hazard assessment when handling product. Store away from acids, alkalis, halides, reducing agents, combustible materials and heavy metals as violent reactions may occur if product comes in contact with these materials. Do not store near acrylamide or acrylate chemical grout or catalyst TEA.

Triethanolamine (TEA): Store in a cool dry area away from heat. Provide good ventilation. Keep containers tightly closed and in an upright position. Do not use pressure to empty containers. Store away from acids or oxides as violent reactions may occur if product comes in contact with these materials. Do not store near acrylamide or acrylate chemical grout or catalyst AP or SP.

**General:** Maintain first aid kit, gloves, respirators, aprons, and cleanup equipment in the storage area at all times. An emergency spill response kit should also be readily available. Foam, carbon dioxide, or dry chemical fire extinguishers should be easily accessible. Provide eyewash, shower, and a source of water in the storage area. Keep materials in original packaging whenever possible.

**DISPOSAL –**

**Introduction – Grout Products and their components can either be a liquid or a solid. The disposal for each is different. Do not touch damaged containers or spilled product unless wearing the appropriate personal protective equipment (PPE). Use the PPE recommended in the products respective SDSs.**

**LIQUID SPILLS:**

**Acrylamide or Acrylate chemical grout**: The best method for disposal is to gel the material. Collect as much liquid acrylamide or acrylate chemical grout as possible, add TEA, and gel with water and AP, in

this order. Gelled (catalyzed) materials pose little risk and may be sent to a landfill. Dike or dam the spilled product to prevent runoff. Gel or catalyze the acrylamide or acrylate liquid that has been diked or dammed using TEA and AP or SP (mixing or agitation may be required). Once cured,. collect the cured acrylamide or acrylate and dispose. Spray spill area after collection of cured acrylamide or acrylate lightly with AP or SP solution and sodium metabisulfite solution to cure remaining acrylamide or acrylate. Soak up the wetted area of acrylamide or acrylate, AP or SP solution and sodium metabisulfite solution with inert, absorbent material and collect in a suitable waste container for disposal. It may take multiple application of absorbent material to successfully collect a spill. Collect liquid and catalyzed acrylamide or acrylate material. Do not step in or onto the liquid chemical solution, catalyzed acrylamide or acrylate or absorbent material due to a slip and/or fall hazard.

**DRY/GRANULAR SPILLS Dry acrylamide (granules):** Collect/contain granules with a stainless steel or plastic shovel or scoop and place in suitable container for curing and disposal. Spray spill area light with AP or SP solution and sodium metabisulfite solution to cure any possible remaining acrylamide. Soak up the wetted area of acrylamide, AP or SP solution and sodium metabisulfite solution with inert, absorbent material and collect in a suitable waste container for disposal. It may take multiple applications of absorbent material to successfully collect a spill. Collect liquid and catalyzed acrylamide material. Do not step in or onto the liquid solutions, catalyzed acrylamide material or absorbent material. Gel or catalyze the granules by dissolving in water and using TEA and AP or SP to cure (mixing or agitation may be required). Cured acrylamide can be collected for disposal. Mixed or catalyzed acrylamide or acrylate:

- **Small Spill**: Soak up with inert absorbent material - collect in a waste container and cure with oxidizer (AP or SP solution). Spray spill area with AP or SP solutions and sodium metabisulfite solutions to cure any possible remaining acrylamide or acrylate. Soak up wetted area with inert absorbent material and collect in a suitable waste container for disposal. It may take multiple applications of absorbent material to successfully collect spill. Collect liquid mixed or catalyzed acrylamide or acrylate material. Do not step in or onto liquid mixed or catalyzed acrylamide or acrylate material or absorbent material while applied to area.

- **Large Spill:** Dike or dam up. Collect using appropriate stainless steel or plastic pumps into suitable containers and cure with oxidizer (AP or SP solution). Spray spill area with AP or SP solutions and sodium metabisulfite solutions to cure any possible remaining acrylamide or acrylate. Soak up wetted area with inert absorbent material and collect in a suitable waste container for disposal. It may take multiple applications of absorbent material to successfully collect spill. Collect liquid and catalyzed acrylamide or acrylate material. Do not step in or onto liquid mixed or catalyzed acrylamide or acrylate material or absorbent material while applied to area. CAUTION: Curing large amounts of catalyzed acrylamide or acrylate grout will cause an exothermic reaction generating high temperatures that could boil water or damage plastic containers.

**Environmental:** Do not allow material to contaminate surface or ground water. Prevent product from entering drains. Keep emptied drums, bags, and containers at a fixed place until proper disposal. No container should be reused for any other purpose. If you are uncertain about how to properly dispose of the product, bags, drums, or containers, contact a state-registered hazardous materials disposal facility or an appropriate consultant. State and local waste agencies can also be helpful. Dispose of container and unused contents in accordance with federal, state, and local requirements.

**Dry Ammonium Persulfate (AP) or Sodium Persulfate (SP):** Whatever cannot be saved for recovery or recycling should be handled in an appropriate RCRA-approved waste disposal facility. If the container is rinsed out properly it may be disposed of in an approved landfill. Processing, use, or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state, and local requirements. Collect/contain granules with a stainless steel, plastic shovel or scoop and place in a suitable container for disposal. Spray the area light with water. Keep granules and wetted material away from TEA. Soak up wetted area with inert absorbent material and collect in a suitable waste container for disposal. It may take multiple application for absorbent material to successfully collect spill. Collect liquid AP or SP. Do not step in or onto liquid AP or SP or absorbent material while applied to the area.

**Liquid Triethanolamine (TEA):** Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved RCRA waste disposal facility. Processing, use, or contaminationof this product may change the waste management options. State and local disposal regulations may differfrom federal disposal regulations. Dispose of container and unused contents in accordance with federal, state, and local requirements. Soak up with inert absorbent material and collect in a suitable waste container for disposal. It may take multiple applications of absorbent material to collect all spilled liquid TEA. Do not step or try to walk in or onto liquid TEA or absorbent material while applied to the area. Keep separated from AP or SP.

**Disposal of bags or containers:** Keep emptied drums, bags, and containers at a fixed place until proper disposal. No container should be reused for any other purpose. If you are uncertain about how to properly dispose of the product, bags, drums, or containers, contact a state-registered hazardous materials disposal facility or an appropriate consultant. State and local waste agencies can also be helpful. Dispose of container and unused contents in accordance with federal, state, and local requirements.

# BEST PRACTICES FOR CHEMICAL GROUT

## CHEMICAL GROUT (GRANULAR BLEND)

**Product Descriptions**

- Acrylamide, granular – a white granular solid mixture of acrylamide and N,N'-methylenebisacrylamide (MBA) used for injection grouting.
- Triethanolamine (TEA) blend – thick colorless liquid that is used as an activator for acrylamide grout.
- Ammonium persulfate (AP) – white powder that is used as a polymerization initiator for acrylamide grout
- Sodium persulfate (SP) - white powder that is used as a polymerization initiator for acrylamide grout

**Mixing Instructions** – The opportunity for dermal and respiratory exposure is elevated during the mixing process. See manufacturer's specific guidelines for mixing chemicals.

**Best Practices**

Grout Transfer Method

- The operator and staff are at the highest risk for exposure to acrylamide when the granular acrylamide is transferred from the bag into the grout tank.
- Every precaution should be taken to assure that the operator and other crewmembers are not exposed to the acrylamide granules either in the air or spilled.
- The following procedure, accompanied by the wearing of appropriate PPE, effectively reduces the possibility of chemical exposure.
    - Wear the appropriate PPE in accordance with manufacturer's SDS
    - Place the plastic neck of the acrylamide grout bag under the surface of the water as the grout is being poured into the grout tank.
    - Empty the bag of acrylamide grout as completely as possible and roll the bag from bottom to top before carefully removing from the grout tank. Immediately wrap up the bag and place it in another bag so that no granules or liquid on the grout bag is released.
    - Properly dispose of the bags. The empty bags must not be used for any other purposes. Refer to DISPOSAL section of this document.

## CHEMICAL GROUT (LIQUID)

**Product Descriptions:**

Acrylamide, liquid – clear liquid mixture of acrylamide and N,N'- methylenebisacrylamide (MBA)

- Triethanolamine (TEA) blend – thick colorless liquid that is used as an activator for acrylamide grout.
- Ammonium persulfate (AP) – white powder that is used as a polymerization initiator for acrylamide grout
- Sodium persulfate (SP) - white powder that is used as a polymerization initiator for acrylamide grout

**Mixing Instructions** – The opportunity for dermal and respiratory exposure is elevated during the mixing process. See manufacturer's specific guidelines for mixing chemicals.

**Best Practices**

Grout Transfer Method

- The use of a pump – hand or electric – to transfer liquid grout from the drum, tote, or pails to the grout tank is highly recommended. Using a pump when transferring a liquid minimizes worker exposure to grout spills or splashes.
- Another benefit of using a pump is that the empty grout drum will be rinsed and ready for disposal or recycling
- The following procedure, accompanied by the wearing of appropriate PPE, effectively reduces the possibility of chemical exposure:
    - Wear the appropriate PPE in accordance with manufacturer's SDS
    - Handling of pails, totes or drums should be as per OSHA regulations.
    - Wetted pump parts must be plastic or stainless steel only.
    - Place the hand pump suction tube into the drum, pail, or tote and secure by completely threading the down tube into the drum or tote.
    - Place pump discharge hose into grout tank extending the hose at least 1/3 of the way into the tank.
    - When the grout drum or tote is empty, add 5 -7 gallons of water to grout drum or tote through the small bung. Pump water from the grout drum or tote into the grout tank. Repeat this process until the drum or tote are effectively rinsed.
    - When pail is used, add 2 to 3 gallons of water to pail through small bung. Pour water from the pail, caution not to spill or splash, into the grout tank. Repeat this process until the pail is effectively rinsed.
    - Remove hose from grout tank and pump from grout drum or tote and wash/flush with water.
    - Properly dispose of pail, drum or tote or call a drum recycling company. The empty pail, drum or tote must not be reused for any other purpose.

## ADDITIVES

**Product Descriptions**

**Ethylene Glycol:** used as an acrylamide grout additive. Ethylene glycol is a clear, oily liquid (CAS number 107-21-1) that enhances grout's ability to undergo freezing and dehydration.

**Latex additive:** is typically a milky-white, liquid emulsion that increases compressive and tensile strength while increasing viscosity.

**Root Inhibitor:** The herbicide dichlobenil is no longer available in the sewer rehabilitation market as an additive.

**Potassium Ferricyanide (KFe)** is the chemical name of a grout additive. KFe is used to extend gel times of acrylamide grouts. KFe is an orange, crystalline powder.

**Dye** is the trade name for an acrylamide grout additive. Dye is a powder that enables you to trace the path of an injected solution.

**Storage Requirements**

**Ethylene Glycol:** Store in a cool dry area away from heat. Provide good ventilation. Keep containers tightly closed and in an upright position. Do not use pressure to empty containers. Store away from acids or oxides as violent reactions may occur if product contacts these materials. Do not store near acrylamide, triethanolamine or ammonium persulfate.

**Latex:** Store in a cool dry area away from heat. Provide good ventilation. Keep containers tightly closed and in an upright position. Do not use pressure to empty containers.

**Potassium Ferricyanide (KFe):** Store in a cool dry area away from heat. Provide good ventilation. Keep container tightly closed and in an upright condition.

**Dye:** Store in a cool dry area away from heat. Provide good ventilation. Keep containers tightly closed.

**General:** Maintain first aid kit, gloves, respirators, aprons, and cleanup equipment in the storage area at all times. An emergency spill response kit should also be readily available. Foam, carbon dioxide, or dry chemical fire extinguishers should be easily accessible. Provide eyewash, shower, and a source of water in the storage area. Keep materials in original packaging whenever possible.

**Disposal of Product Additives**

**Ethylene Glycol:** Whatever cannot be saved for recovery or recycling should be shipped to an approved RCRA waste disposal facility. Processing, use, or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Pails or drums must not be reused for any other purpose. If you are uncertain about how to properly dispose of the product or containers, contact your local state or federal regulatory agency. Dispose of container and unused contents in accordance with all federal, state, and local requirements.

**Latex:** Whatever cannot be saved for recovery or recycling should be shipped to an approved RCRA waste disposal facility. State and local disposal regulations may differ from federal disposal regulations. Pails or drums must not be reused for any other purpose. If you are uncertain about how to properly dispose of the product or containers, contact your local state or federal regulatory agency. Dispose of container and unused contents in accordance with all federal, state, and local requirements.

**Potassium Ferricyanide (KFe):** Whatever cannot be saved for recovery or recycling should be shipped to an approved RCRA waste disposal facility. Processing, use, or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Pails or drums must not be reused for any other purpose. If you are uncertain about how to properly dispose of the product or containers, contact your local state or federal regulatory agency. Dispose of container and unused contents in accordance with all federal, state, and local requirements.

**Dye:** Whatever cannot be saved for recovery or recycling should be shipped to an approved RCRA

waste disposal facility. Processing, use, or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Pails or drums must not be reused for any other purpose. If you are uncertain about how to properly dispose of the product or containers, contact your local state or federal regulatory agency. Dispose of container and unused contents in accordance with all federal, state, and local requirements.

**Safety Data Sheet Information**
Consult suppliers' SDS.

In the spirit of the SOPP, the following acrylamide grout suppliers are in complete agreement with best practice recommendations expressed in this document and can be reached at the following websites:

- American Chemical Grout Co – 802-234-9911 – http://www.americanchemicalgroutco.com
- Avanti International – 800-877-2570 – https://www.avantigrout.com
- Prime Resins, Inc. – 800-321-7212 – https://www.primeresins.com

To learn more about the Infiltration Control Grouting Committee (ICGC), visit www.nassco.org or www.sewergrouting .com