# Regulatory Related FAQs

**Process Safety Management (PSM)**
**Shipping Regulations**
**Environmental Issues**
**Waste Disposal**
**Decontamination and Cleaning**

## Process Safety Management (PSM)

**Q.**
Do you need to follow OSHA PSM standards for sulfuric acid?
**A.**
Sulfuric acid is not a listed chemical for OSHA PSM regulations. It is advised to use the PSM regulations as guidelines for activities involving non-fuming sulfuric acid.

**Q.**
Is sulfuric acid regulated under OSHA PSM?
**A.**
Non-fuming sulfuric acid is not listed as an OSHA PSM chemical. It could be covered under the "General Duty" clause. It is good practice to use many of the principles of OSHA PSM when dealing with sulfuric acid. Oleums 65% and above are specifically covered by OSHA PSM Rules.

## Shipping Regulations

**Q.**
What is the UN placard number for sulfuric acid?
**A.**
Non-fuming sulfuric acid uses placard UN 1830. Spent sulfuric acid is UN 1832, and fuming sulfuric acid (oleum) is UN 1831.

**Q.**
How is it classified by DOT?
**A.**
DOT classifies sulfuric acid as a Hazard Class 8 "CORROSIVE".

**Q.**
What kind of trucks do you use to ship sulfuric acid?
**A.**
MC 312 or MC 412 trailers, made of stainless steel, are generally preferred for sulfuric acid service.

**Q.**
What kinds of rail cars are used to ship sulfuric acid?
**A.**
DOT 111A100W2 rail cars are typically used for non-fuming sulfuric acid. The rail cars are usually lined with a baked phenolic coating. The DOT classification is for both insulated and non-insulated rail cars.

**Q.**
What is the rupture disc setting for rail cars?
**A.**
The rupture disks used for sulfuric acid rail cars has a burst pressure of 165 pounds per square inch (psia).

**Q.**
Is sulfuric acid regulated by DOT?
**A.**
Sulfuric acid is regulated as a Hazard Class 8 "CORROSIVE" by DOT.

**Q.**
Can you ship samples with the truck?
**A.**
Samples can be shipped with the truck, providing these procedures are followed: The sample must be packaged to meet DOT regulations (sample bottle inside a metal can inside a cardboard or wood box). The sample must be properly labeled. The sample must be stored outside the cab of the truck (away from the driver). The sample must be identified on a "Bill of Lading", with the proper shipping information.

**Q.**
What is the "proper shipping name" for sulfuric acid?

**A.**
The proper shipping name is "Sulfuric Acid", Hazard Class 8, UN No. 1830, DOT/IMO label "CORROSIVE," packing group II.

**Environmental Issues**

**Q.**
How do you mitigate a spill?
**A.**
The spill should be contained with diking to keep it out of waterways. Dry dirt, clay, sand or limestone are usually acceptable materials for diking. Once the spill is contained, it should be slowly diluted with water (fine spray) to a concentration of about 15%. It can then be neutralized using alkalis, such as caustic soda, soda ash, baking soda, lime, or limestone.

**Q.**
Is sulfuric acid hazardous to marine life?
**A.**
Sulfuric acid is a strong inorganic acid. It will lower the pH of water and can be hazardous to marine life, depending on how low the pH of the water goes. Therefore, it is important to try to keep sulfuric acid from reaching rivers or streams.

**Q.**
Are the fumes dangerous?
**A.**
Sulfuric acids less than 100% are essentially fume-free. The vapor pressure is well below 1 psia. Fuming sulfuric acid (or oleum) is sulfuric acid greater than 100% and will emit sulfuric acid mist, which can cause respiratory irritation or injury, depending on the exposure.

**Q.**
What is the shelf life/half-life of sulfuric acid?
**A.**
Sulfuric acid is an inorganic chemical. It has essentially an "infinite" shelf life, and will remain intact until it is reacted with other chemicals.

**Q.**
Is it biodegradable?
**A.**
Sulfuric acid is an inorganic chemical, and as such, is not biodegradable in the normal definition. It is a highly reactive chemical, though, and will react with most other chemicals.

**Q.**
Is the mercury level in the acid high enough to cause concern?
**A.**
Sulfuric acid produced by the sulfur-burning process is essentially "mercury-free". Sulfuric acid produced by the "smelter" process may have varying levels of mercury. Check with the specific production plant to obtain the latest mercury levels (depending on the metal ore used).

**Q.**
What is the pH of the acid?
**A.**
Sulfuric acid is a strong inorganic acid. The pH of pure sulfuric acid is well below 1 (pH scale is 0-14). Diluted sulfuric acid (around 4%) will still be very acidic, with a pH of 1 or less.

**Waste Disposal**

**Q.**
How do you dispose of acid residue?
**A.**
Sulfuric acid residue is considered a "hazardous waste" due to the acidic nature, and should be disposed in a secure landfill designated for "hazardous wastes. If the pH of the residue can be adjusted to between 2 and 12 (by mixing in alkalis, such as caustic soda, soda ash, baking soda, lime or limestone) the residue can usually be treated as a non-hazardous waste. Check with your local, state and federal regulations regarding "hazardous" and "non-hazardous" wastes.

**Q.**
What do you use to neutralize acid spills?

**A.**
Generally the best approach is to contain the spill with diking (dirt, clay, limestone, etc.,) slowly dilute the acid the below 15%, then neutralize the spill using an alkali (caustic soda, soda ash, baking soda, lime or limestone).

**Q.**
Is it a hazardous waste?
**A.**
Sulfuric acid residue is considered a "hazardous waste" due to the acidic nature, and should be disposed in a secure landfill designated for "hazardous wastes. If the pH of the residue can be adjusted to between 2 and 12 (by mixing in alkalis, such as caustic soda, soda ash, baking soda, lime or limestone) the residue can usually be treated as a non-hazardous waste. Check with your local, state and federal regulations regarding "hazardous" and "non-hazardous" wastes.

**Q.**
Where can I dispose (legally) of acid waste?
**A.**
Untreated sulfuric acid wastes should be disposed at a secure "hazardous waste" landfill or treatment plant. Treated wastes (pH adjusted between 2-12) can be disposed at a non-hazardous waste disposal site or treatment facility, as long as it meets all the other criteria for non-hazardous waste.

**Decontamination and Cleaning**

**Q.**
How do you decontaminate an acid tank?
**A.**
Most sulfuric acid storage tanks are made of carbon steel. Over the years they will accumulate iron sulfate sludge in the bottom of the tank. To clean out this sludge, pump out the liquid acid from the tank as low as possible. Open a large (18" minimum) entranceway on the tank top or side. Depending on the consistency of the sludge, it can be removed from the tank using a vacuum truck, or may have to be manually shoveled. The longer it has been since the tank has been cleaned, the more difficult it will be to remove the sludge - it may develop the consistency of wet clay. The sludge is considered a hazardous waste, unless it is treated to bring the pH between

2-12. After all the sludge is removed, the tank can be washed with water. The key is to get a lot of water into and then out of the tank as fats as possible - weak sulfuric acid is very corrosive to carbon steel, so you want to minimize the time that the steel is exposed to weak sulfuric acid. A weak caustic solution can also be used to neutralize the residual acid. Make sure the tank is dried, with no standing liquid remaining in the tank as it is inspected.

**Q.**
How do you "moth-ball" acid facilities?
**A.**
Sulfuric acid facilities are "moth-balled" by blowing dry air or nitrogen through the equipment (including piping) to get as much liquid drained from the equipment as possible. DO NOT WASH THE EQUIPMENT WITH WATER if at all possible. Weak sulfuric acid is very corrosive to most metals, and it is very difficult to get all the weak acid drained from the equipment. General guidelines are that the equipment is not washed with water unless it is going to be dismantled. Also, care must be taken to ensure that liquid acid is not trapped between valves. If the pipeline is liquid full, the acid will expand as it heats up (from the sun) and may overpressure the valves and develop leaks.

**Q.**
Who can clean an acid tank for me?
**A.**
There are a number of contractors that have successfully cleaned sulfuric acid storage tanks. Call DuPont Technical Service for the names of the contractors.

**Q.**
Do you have written procedures for cleaning acid equipment?
**A.**
There are generic procedures for cleaning acid equipment. Each equipment cleaning is different, though. These procedures should be used as a guideline to develop specific procedures for the individual piece of equipment involved. See DuPont Technical Service personnel for more details.

**Q.**
How do you prepare acid line for maintenance work?
**A.**
For most maintenance work on acid lines, the lines are drained then blown with dry air or nitrogen to remove as much liquid acid as possible. The maintenance worker(s) then break into the line wearing a full acid suit. Appropriate personal protective equipment (PPE) is used throughout the entire job to make sure the worker is not exposed to the acid. THE PIPELINE IS NOT FLUSHED WITH WATER UNLESS IT IS TO BE DISMANTLED. Weak sulfuric acid is very corrosive to most metals and will significantly shorten the expected life of the piping.

**Q.**
Do you wash acid equipment with water before working on it?
**A.**
Acid-containing equipment is not usually washed with water before maintenance work. Weak sulfuric acid is very corrosive to most metals. In general, the equipment is only washed with water if it is being dismantled.

**Q.**
How much alkali (soda ash/limestone/lime/caustic) is needed to neutralize acid?
**A.**
A good "rule-of-thumb" is that is takes about two pounds of alkali to neutralize one pound of sulfuric acid.

**Q.**
Can I use water to wash down spills/leaks?
**A.**
Water can be used to wash down spills/leaks if the diluted acid can be collected and treated. DO NOT wash the acid to the ground or to waterways. Follow your specific local, state and/or federal regulations for disposal. When adding the water, a fine mist or spray is best. DO NOT plunge a full water stream into the acid. A violent reaction may occur, with considerable splattering and heat generated.