



# Sulfuric Acid Bulk Handling Policy

Health and Safety FCX-HS28 | Release Date 1/18/2019

## POTENTIAL FATAL RISKS

Exposure to Hazardous Substances - Acute  
 Uncontrolled Release of Energy  
 Vehicle Impact on Person  
 Rail Impact on Person

## CRITICAL CONTROLS

- Access Control
- Alarm Systems
- Engineered Controls
- Handling Requirements
- Loading and Unloading Protection
- Mechanical Integrity of Storage and Distribution
- PPE
- Energy Isolation/LOTOTO
- Guards, Barriers and Barricades
- Hose Coupling Lock System
- Positive Communication System
- Segregation
- Signage and Demarcation
- Fundamentally Stable Parking
- Securing Rolling Stock

## TRAINING REQUIREMENTS

Site specific training and operator technical training (i.e. Hazardous Materials handling training, Driver/Carrier Training, etc.). Third party carriers of concentrated sulfuric acid shall receive equivalent technical training and must attend Sulfuric Acid Bulk Handling training. Contact site training department for additional requirements.  
 SFT\_FCX1017C Bulk Sulfuric Acid Handling Training

## POLICY

### OVERVIEW

Set the standards to protect employees and contractors from exposure to concentrated (93% or greater) sulfuric acid during loading and unloading of trucks and rail cars. All individuals entering bulk acid containment areas will be trained according to this policy.

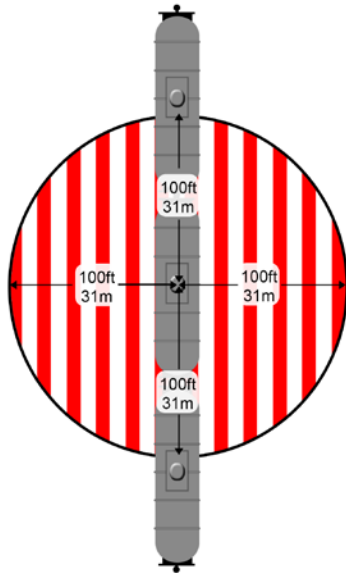
### ACTIONS TO STAY SAFE

- Hot Zone and Warm Zone areas shall be signed and demarcated.
- A pre-task review, workplace exam and equipment inspection must be completed prior to loading/unloading bulk concentrated acid.
- Ensure communication device(s) are working.
- Test safety showers and eyewashes prior to performing work.
- Maintain unobstructed access between the task and shower/eyewash.
- Verify location of emergency stop button for acid transfer pumps.
- Maintain unobstructed access between task and emergency stop.
- Ensure tanks have storage capacity before offloading.
- Acid resistant PPE is to be inspected and properly worn prior to entering the Hot or Warm Zones. Reference the PPE Technical Supplement for additional details.
- Employees and contractors will wear personal gas monitors in designated areas and be trained in their use.
- Offloading of acid by gravity should be used whenever possible.
- Visually inspect all hoses and fittings prior to unloading.
- Ensure all lines are drained after loading/unloading.
- Be vigilant for leaking acid. Contact appropriate personnel immediately.
- Ensure chocks, blocks or stops are in place for all railcars and trucks as required.
- Isolate loading/unloading rail sections from other sections of rail to prevent incoming cars as required.
- Always review site-specific processes and procedures prior to starting work.
- Ensure camlock splash-guards are in place and serviceable for truck offloading.

# HOT AND WARM ZONES FOR RAIL AND TANKERS

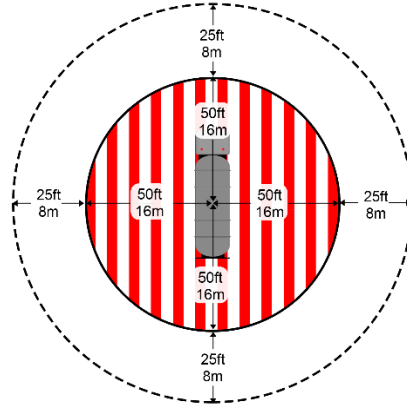
All Zone boundaries will be demarcated and signage will be present. Zone requirements will be adhered to during all loading and unloading operations. No person will be permitted in any zone without the appropriate acid handling PPE.

## RAIL CARS

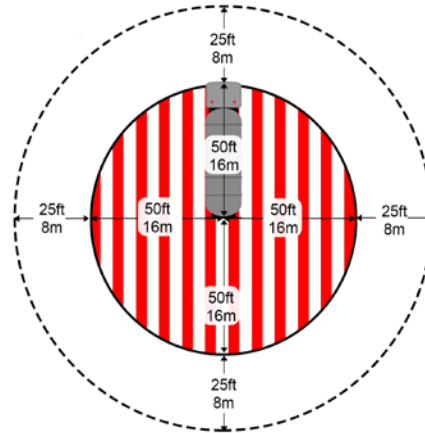


**Hot Zone: 100ft or 31m**

## TANKERS Loading



## Unloading



**Hot Zone: 50ft or 16m**  
**Warm Zone: 25ft or 8m**



# Technical Supplement

Sulfuric Acid Bulk Handling FCX-HS28- Personal Protective Equipment | Release Date 1/18/2019

## Hot Zone Minimum Requirements

- The following minimum PPE requirements must be **properly worn** in Hot Zones:
  - Acid Protective Garment
  - Chemical Resistant Boots and Gloves
  - Head, Eye and Face Protection meeting one of the three options listed below
  - Respiratory protection meeting the requirements below
- Protective garments will be worn with all closures fastened, hood donned, and wrist and ankle openings cinched.

## Warm Zone Minimum Requirements

- The following minimum PPE requirements must be **properly worn** in Warm Zones:
  - Acid Protective Garment (jacket may be removed, or overalls/coveralls unzipped and open to waist)
  - Chemical Resistant Boots
  - Hard hat
  - Safety glasses
- The following minimum PPE requirements must be readily available in Warm Zones:
  - Chemical Resistant Gloves
  - Head, Eye and Face Protection meeting one of the three options listed below
  - Respiratory protection meeting the requirements below

## Acid Protective Garments

- All personal protective equipment must be cleaned and stored per manufacturer recommendations.
- Acid protective garment shall cover the entire body (coveralls or overalls with jacket), have **closures** (Velcro, elastic, etc.) **for wrists and ankles**, and have an attached hood.
- The garments shall be resistant to sulfuric acid of  $\geq 93\%$  concentration for > 60 minutes per the ASTM F 903 testing method or equivalent.
- The style of protective garment will be purchased in a configuration that is suitable for strong acids (i.e. taped or heat sealed seams instead of stitched, acid resistant drawstrings, etc.).
- Alterations to garments is not permitted. Homemade accessories such as helmet mounted neck guards, re-purposed face shields are not permitted.
- The following protective garment brands are currently approved:
  - SteelGrip STEDAIR TX 4202 Nomex/Gore
  - Ansell SAWYER-TOWER polyester/Gore
  - Ansell SAWYER-TOWER Nomex/Gore
  - TyChem QC 127T (or) TyChem QC 122T
- **Note:** If contract/carrier organizations choose to use other protective garments that meet the above standard, they may do so; however, the driver must have the specifications from the manufacturer of the protective garment readily available (in their truck) and be able to provide when requested by site personnel.

## Chemical Resistant Gloves

- All personal protective equipment must be cleaned and stored per manufacturer recommendations.
- Must be impermeable and resistant to sulfuric acid of  $\geq 93\%$  concentration for > 480 minutes per the ASTM F 903 or equivalent testing method.
- Be gauntlet style and extend beyond at least 4" of protective garment and worn inside the garment sleeves.
- When acid resistant garment has a dual sleeve, the gloves are to be worn between the two layers of sleeve.

## Chemical Resistant Boots

- All personal protective equipment must be cleaned and stored per manufacturer recommendations.
- Must be impermeable and resistant to sulfuric acid of  $\geq 93\%$  concentration for > 480 minutes per the ASTM F 903 testing method or equivalent.
- Be at least mid-calf high, with a minimum of 4" overlap with protective garment pant leg.
- Pants should be worn over the boots.
- Meet ANSI or equivalent approved safety boot with safety toe and non-slip sole, of the pull-over type.

## Head, Eye and Face Protection

- All personal protective equipment must be cleaned and stored per manufacturer recommendations.
- All eye and face protection shall comply with ANSI Z87.1, 2010. All head protection shall comply with ANSI Z89.1, 2003 or equivalent.
- A hood shall be worn that is either integrated into the protective garments, or that has been designed to layer under face shield and over protective garments. Hood is to be worn over a full-face respirator, and snug to the skin.
- The hood shall fit closely enough to prevent flaring or create pockets that trap acid.
- Hoods are worn under the hard hat.
- At a minimum to ensure that no skin is exposed, the following head, eye, and face protection will include:
  - Option 1:
    - A clear face shield that is non-reactive to strong acid and completely covers the face and exposed skin on the neck and
    - Chemical resistant splash goggles and
    - Half-face respirator.
  - Option 2:
    - Full-face respirator.
  - Option 3:
    - Helmet style PAPR with chemical resistant shroud or hood and
    - Chemical resistant safety glasses or goggles.

## Respirators

- Respirators shall be worn at all times during loading and unloading processes.
- Acid gas P100 cartridges or equivalent must be used with all respiratory protection.
- Respirators must be maintained according to manufacturer recommendations.

*Note: Respiratory protection regulations require affected workers be enrolled in a Respiratory Protection Program that complies with 29CFR 1910.134. Employees or contractors wearing tight fitting respirators with a seal must be clean-shaven **(in that facial hair will not interfere with the seal of a respirator)** per the requirement of the program. Carriers must have a written program, provide medical evaluation, annual fit testing; and ensure issued respirators are maintained in a sanitary manner.*