OxyChem®

Basic Chemicals

Sodium Chlorite
Bulk Storage of Solutions

Introduction
The following information on equipment for handling and storing sodium chlorite is meant to serve as a general guideline only. Consult product Safety Data Sheet (SDS) for additional information.

The physical properties of the product are of prime importance when designing unloading and storage areas for sodium chlorite. In addition, the storage area and all other areas where sodium chlorite is present should be kept as clean as possible.

Storage System Requirements
A number of factors will influence the selection of materials and equipment for the storage of liquid sodium chlorite. Because extreme heat and cold can affect sodium chlorite solutions, it is important to maintain proper temperatures in storage areas. Storage temperatures should not exceed 212 °F (100°C). The storage area should not be exposed to direct sunlight or ultraviolet light. It should be fire resistant and have an effective sprinkler system and good ventilation. Consult National Fire Prevention Association 400 Standard for storage of Class 2 liquid oxidizers.

Sodium chlorite solutions of 31% concentration or higher have a greater potential to crystallize at ambient temperatures. (See Figure 1 at end of document). Normally, these products should be diluted prior to storage. Where bulk storage of concentrated solutions is required, the tank must layer is mixed with resin. The selection of the resin is extremely important, and the manufacturer should specify how each layer will be constructed and specify the correct type of resin for the specific application.

Sodium chlorite solution storage tanks normally should be 20% larger than the largest expected delivery quantity. A full truck load is approximately 4,200 gallons and a full railcar load be placed in a temperature-controlled location to ensure that the product is maintained at a temperature above its crystallization point. Direct heat should not be applied to the storage tank. Containers with crystals can be placed in an area where temperature is above crystallization point and the container agitated to bring crystals back into solution.

All equipment purchased for handling and storing sodium chlorite solutions should be verified by the manufacturer or vendor to be suitable for use with sodium chlorite.

A Piping and Instrument Diagram (P&ID) for a typical sodium chlorite solution storage system is included for reference. (See Figure 2)

Storage Tanks
Any containers used to store sodium chlorite solutions should be constructed of one of the following materials:

1. Fiberglass reinforced polyester with Hetron 922 resin or equivalent, color natural with UV protection, and no internal insulation.
2. High density polyethylene (HDPE) with UV resistance
3. Titanium

Sodium chlorite solution is most commonly stored in tanks constructed of fiber-glass-reinforced plastic (FRP). A FRP tank is constructed in layers of fiberglass and each
is approximately 16,000 gallons. The storage tank should be of closed top construction to prevent product contamination. The tank vapor space should be adequately vented to prevent chlorine dioxide gas accumulation above explosive decomposition limits. Fiberglass tanks are not always designed to withstand pressure or vacuum so proper venting is critical, especially if the product is to be trans-loaded into the tank with air pressure. The tank manufacturer should be

Wichita Technical Service Department
6200 South Ridge Road, Wichita, KS 67215
Tel: 800-733-1165 ext. 1
OxyChem_Tech_Service@oxy.com

consulted for a recommendation on proper vent openings and pressure/vacuum relief systems.

Tanks should be provided with nozzles to allow local level and temperature indication. Nozzles should include truck-unloading vent, and pump suction as a minimum. Manways should also be provided to allow access to the interior of the tank. The tank manufacturer should be consulted for a recommendation on proper vent openings and pressure/vacuum relief systems.

Insulation is not normally required. Sodium chlorite storage tanks should never be insulated using organic-based or absorbent type (fiberglass) insulation.

Instrumentation
All instrumentation should be local. The level transmitter should be of the extended diaphragm type to prevent possible solution freezing in the nozzle. All wetted parts should be Tantalum or equivalent. The local temperature transmitter should have a five-inch fall with a range of 0°F (–18°C) to 150°F (65 °C).

Pumps
Pumps should be a centrifugal type with all 316 SS wetted parts. The seal for the pump should be a double mechanical type. Motor for the pump should meet local requirements and codes.

Pumps are a typical source of leakage around glands and packing. This type of spillage should be promptly cleaned up and the area washed down with water. The water should then be drained into an industrial sewer in accordance with the regulations that govern wastewater discharges in your area or absorbed with inert materials, which are then disposed of properly. Greaseless lubricants should be used in areas where spilled material or dust from dried material may come in contact with the lubricants or the housings containing those lubricants.

Pumps should not be operated against closed valves. This may result in heating the sodium chlorite solution to above its decomposition temperature 180-200°C

Piping
The recommended material is CPVC piping. Other materials such as vinyl ester FRP and Teflon piping may be used. Carbon steel and stainless steel are not recommended. Minimum pipe size should be 1½ inches. If smaller diameter piping is used, be sure to provide sufficient structural support.

Design the piping system to avoid spaces which may trap gases. The piping system should be designed to accommodate thorough flushing or complete drain down especially in cold climates where low temperatures may induce crystallization of the liquor in the piping system.

Heat tracing and insulation (calcium silicate or equivalent) may be appropriate where the solution freezing point is exceeded. However, if that approach is used, a temperature controller should be used to keep from generating any "hot" spots in the piping. Heat tracing temperature settings should be specific for the product being used.

Gaskets
Non-asbestos composition gaskets are commonly used in sodium chlorite liquid service. Gaskets constructed of Teflon®, EPDM (ethylene-propylene diene monomer), cross linked polyethylene, and Viton® are also used.

Spill and Leak Procedures
In the event of a spill or release, isolate the spill area and deny entry to unnecessary or unprotected personnel. Remove all sources of ignition, such as flames, hot glowing surfaces, or electric arcs. Stop source of spill as soon as safe to do so and notify appropriate personnel. Cleanup personnel must wear proper protective equipment. Notify all downstream water users of possible contamination if spill contaminated waterway.

Create a dike or trench to contain all liquid material. Spill materials may be absorbed using clay, soil, or non-flammable commercial absorbents. Absorbent material must be kept

damp. If allowed to dry, dried material can ignite if in contact with combustible materials.

Sodium chlorite may represent an explosion hazard if it contacts acids or chlorine. If such contact is possible, evacuation procedures must be placed into effect. Evacuate all non-essential personnel. Hazardous concentrations in air may be found in local spill area and immediately downwind.

Do not place spill materials back in their original container. Containerize and label all recovered materials properly. Decontaminate all clothing by thoroughly rinsing with water and then washing with detergent. If permitted, decontaminate the spill area using large amounts of water.

Disposal

Dispose in accordance with all applicable regulations. Do not put product, spilled product, or filled or partially filled containers into the trash or waste compactor. Contact with incompatible materials could cause a reaction and fire. Contact Technical Service to obtain neutralization instructions. Sodium chlorite is toxic to fish and aquatic organisms. Keep out of water supplies and sewers. If sodium chlorite is spilled or becomes a waste, it must be disposed of in accordance with local, state, and Federal regulations by a NPDES permitted out-fall or in a permitted hazardous waste treatment, storage, and disposal facility.

Further Information

More detailed information on sodium chlorite is available on request through the OxyChem Technical Service Department. Call or write:

OxyChem, Tech Service Department
6200 S. Ridge Rd.
Wichita, KS 67215
800-733-1165 option #1
OxyChem_Tech_Service@oxy.com

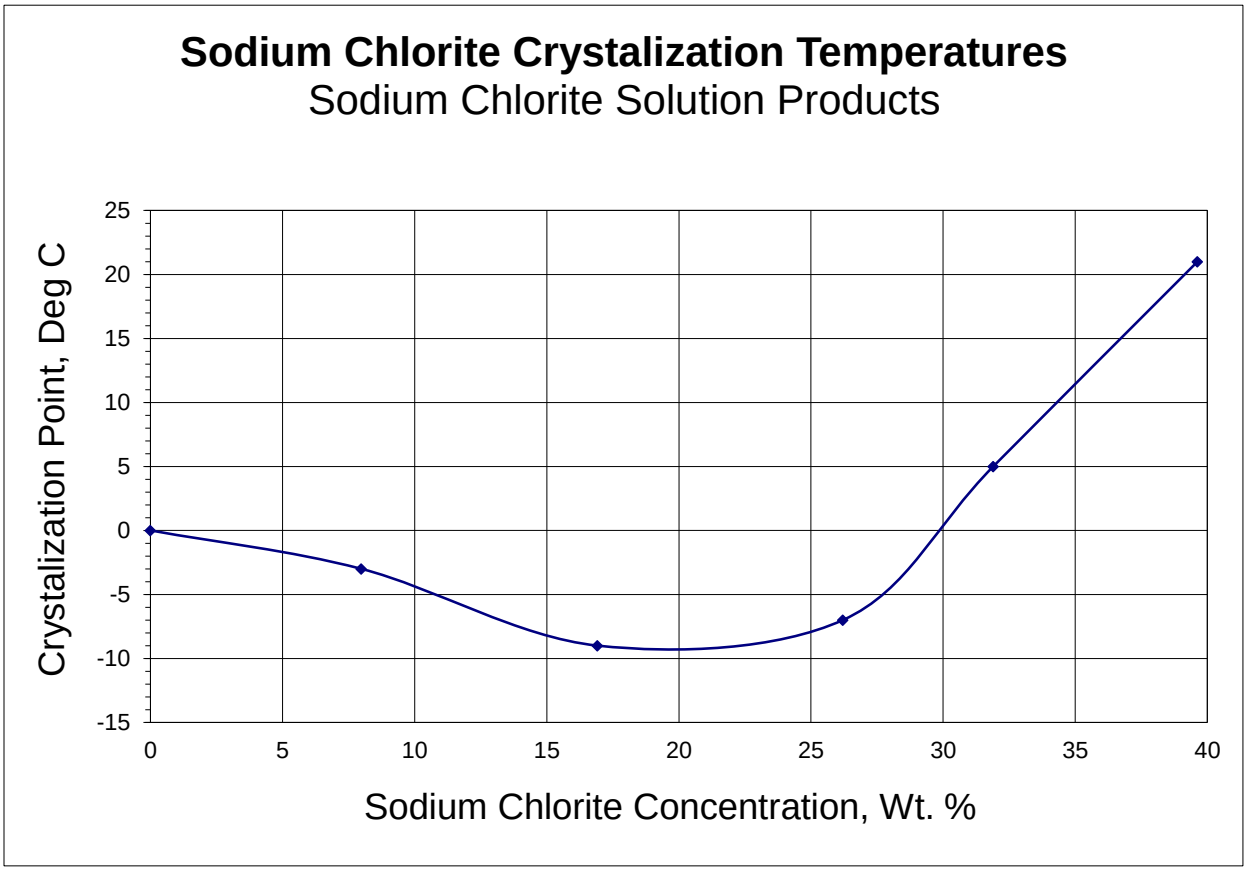
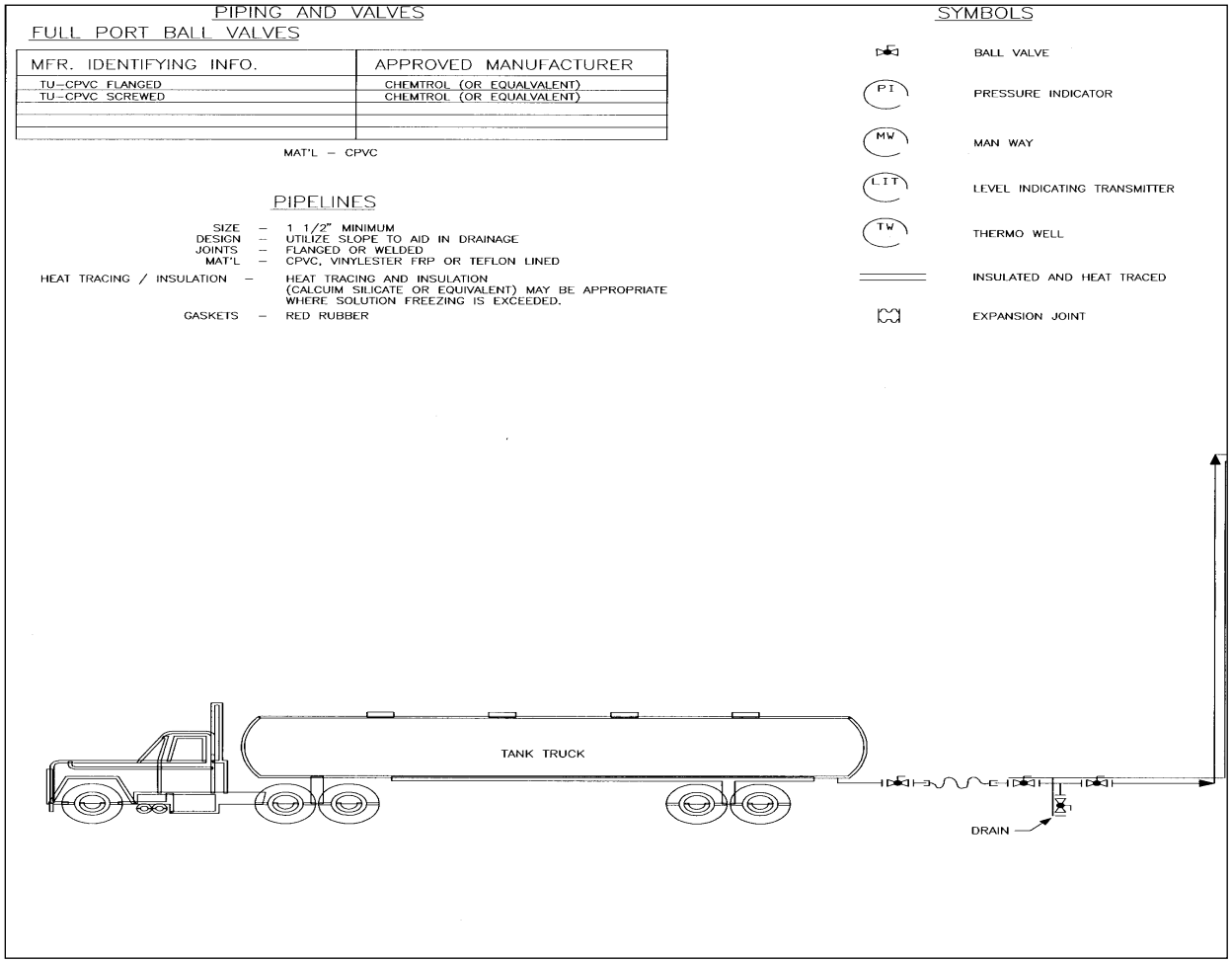


Figure 1: Crystalization Temperatures

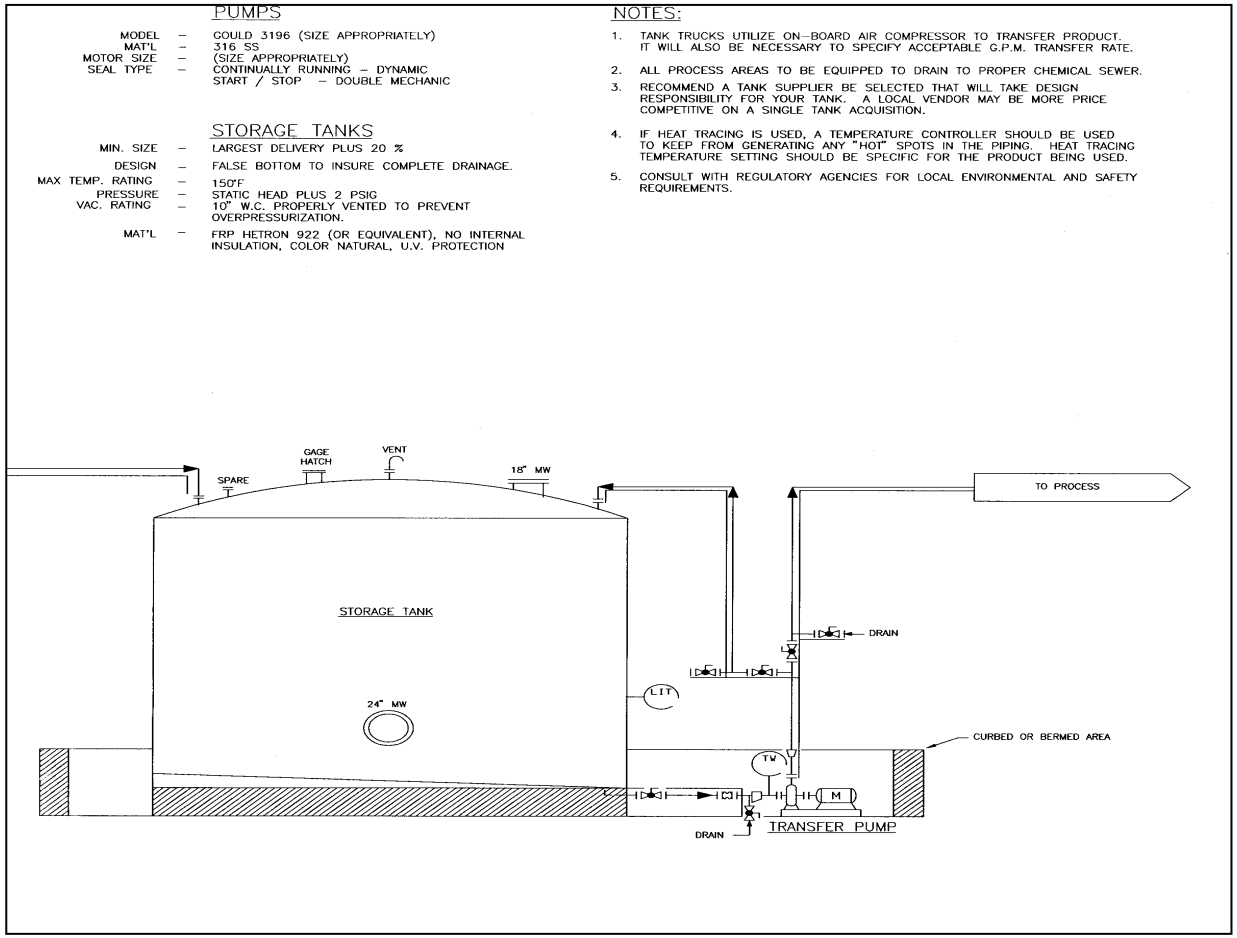
Wichita Technical Service Department
6200 South Ridge Road, Wichita, KS 67215
Tel: 800-733-1165 ext. 1
OxyChem_Tech_Service@oxy.com

Figure 2: P&ID for Typical Storage Configuration



Wichita Technical Service Department
6200 South Ridge Road, Wichita, KS 67215
Tel: 800-733-1165 ext. 1
OxyChem_Tech_Service@oxy.com

Figure 2: P&ID for Typical Storage Configuration Continued



Wichita Technical Service Department
6200 South Ridge Road, Wichita, KS 67215
Tel: 800-733-1165 ext. 1
OxyChem_Tech_Service@oxy.com