Steaming and Unloading Procedure for High Freeze Point Alkylphenols in Isotanks

The following is a suggested steaming and unloading procedure for high freeze point alkylphenols transported in an isotank. The intent of this steaming and unloading procedure is to give experienced material handlers, who are knowledgeable with their equipment, a general outline. The procedure should be modified to accommodate each plant's unique unloading system.

All personnel who work with high freeze point alkylphenols should read all of the information provided in the Material Safety Data Sheet (MSDS). The proper Personal Protective Equipment (PPE) for unloading these materials includes, but is not limited to:

- Rubber gloves
- Hard hat
- Respirator
- Slicker suit
- Full face shield
- Safety glasses with side shields

Container Acceptance

When the isotank is received:

1. Check shipping papers (product name, quantity, container number, certificate of analysis)
2. Place the isotank in a specified unloading position. Position the isotank at a slight angle so the discharge valve is the lowest point of the tank. This will promote proper drainage of the tank and minimize cleaning costs and waste disposal.

Preparing The Isotank For Steaming

1. Record the isotank's temperature. If the temperature is below the desired value, the container will have to be steamed prior to unloading.
2. Connect the steam pipe to the isotank steam inlet fitting and a steam trap to the steam outlet fitting.
3. Visually inspect the external valve and piping for possible frozen product. If any, frozen product is detected in the valve and piping it must be cleared.
4. Check that the isotank vents and vacuum valves are free of any frozen product and are working properly.
5. Provide a positive vent for the isotank by opening the man-way and propping the lid open on one of the closure bolts to prevent the container from building pressure.
6. If the material has no freeze point but needs to be heated due to product viscosity the man-way may be left closed but a vent valve should be opened to prevent the container from building pressure.

SI Group Inc., 2750 Balltown Road, Schenectady, NY 12309 PH: 518.347.4200 www.siigroup.com

Steaming The Isotank

1. Open the steam source valve.
2. Monitor the isotank temperature.
3. Begin the isotank steaming procedure at 3 to 3.5 bars and maintain the pressure until the product approaches the desired temperature. Assure that the steam trap is working properly by observing the trap alternately discharging steam condensate and then a small burst of steam pressure.
4. Discontinue the steaming process when the temperature reaches the desired value, listed below.

Product	Unloading temperature	
	°C	°F
Para-tert-butylphenol (PTBP)	110°	230°
Para-tert-amylphenol (PTAP)	110°	230°
Para-tert-octylphenol (PTOP)	105°	220°*
Para-cumylphenol (PCP)	95°	205°*
2,4-Di-cumylphenol (2,4-DCP)	85°	185°
2,4-Di-tert-butylphenol (2,4-DTBP)	80°	175°*
2,6-Di-tert-butylphenol (2,6-DTBP)	55°	130°*
2,4-Di-tert-amylphenol (2,4-DTAP)	45°	115°*

*Suggested temperature for unloading

Distances from shipping container to storage tank vary. For longer distances we suggest heating the container 5-8C/10-15F hotter. The dissolution time varies according to the container size, and seasonal conditions.

Unloading The Isotank

1. All valves, lines and equipment to be used during unloading should be free of obstructions and hot (steam tracing, if available)
2. Before hooking the receiving line to the isotank, open the external valve slowly to be sure there are no leaks. Open it up fully, and steam heat the valve until it is very hot.
3. Blow the moisture out with inert gas, close the valve, and hook up the line.
4. Re-check the isotank temperature to ensure it is the proper temperature.
5. The isotank may be unloaded by pressure or by a pump. When using a pump the "manway" must be open, or enough inert gas must be fed into the isotank to prevent the isotank from collapsing.
6. After the isotank is hooked up, and the system is ready to receive the product, open the external valve first.
7. Rapidly and completely open the internal valve. If the material flow is stopped during unloading, repeat steps 1 – 6.
8. Purge the unloading system with inert gas after unloading to clear the system of residual product towards the product storage tank.
9. Secure all discharge valves on the container and valves to the storage facility. Close, vent and disconnect the nitrogen purge supply.
10. If the container has been pressurized with nitrogen during the unloading process, vent the container. If residual nitrogen pressure is allowed to stay in the container, place a caution tag on the man-way indicating that the tank was left under pressure.

NOTE: If unloading or delivery of the isotank is delayed, and the product is molten, leave an appropriate level of steam on the isotank to maintain the unloading temperature (±5ºC/±9ºF). The product quality (ie., color) may be compromised if it cools and requires substantial re-steaming.

IMO TYPE 1 (HAZARDOUS) ISOTANK

CAPACITY: 23-24,000 L