

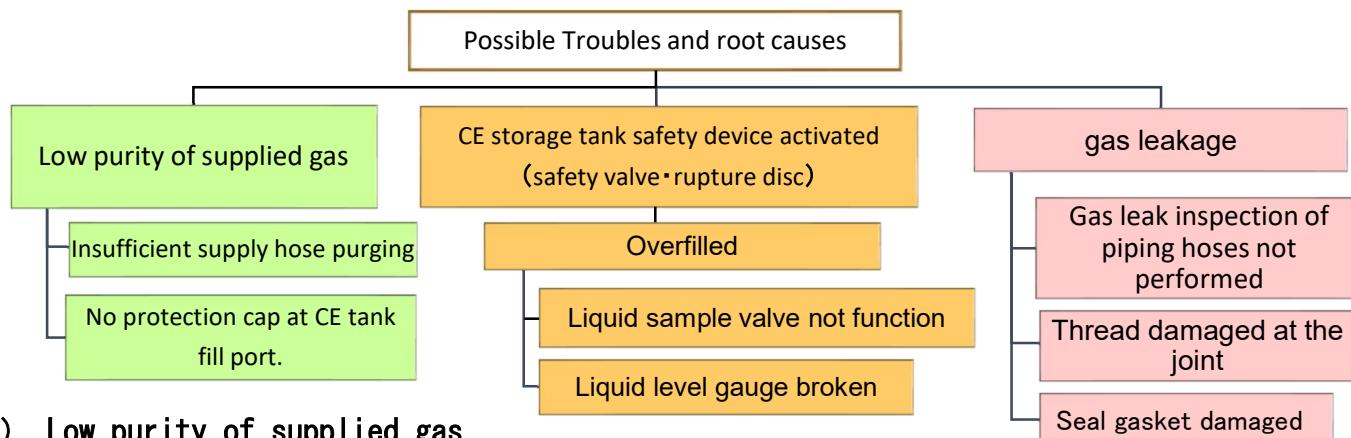
《 On-site monitoring and check items when receiving cryogenic tanker 》

- Cryogenic tanker is a transportable pressure vessels that can be loaded with large volumes of cryogenic liquid.
- When filling cryogenic liquid into the CE tank, There are troubles which can affect production and need to be cautious such as CE tank pressure increase, gas leak and low purity.
- Even the CE tank filling will be handled by gas supplier, but to prevent accidents from occurring at the premises, please do not put total responsible to the supplier and appoint on-site PIC to monitor during the work in progress.
- In this issue, we introduce the items that PIC should monitor during cryogenic liquid filling operation when receiving the tanker.



【 The important of on-site Person In Charge (PIC)】

Even tanker drivers had undergone specialize training of cryogenic liquid filling operation, in order to prevent accidents due to misjudgment, mishandling and in order to take quick action in case of trouble to minimize the impact on production, customer is requested to have a person in charge on-site while the tanker driver do the filling. Below is the list of possible problems and the root cause for on-site PIC reference when receiving cryogenic tanker.

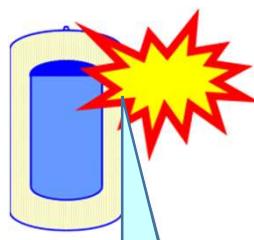


(1) Low purity of supplied gas

Root cause : ① If the supply hose is insufficiently purged, air, moisture, dust and other foreign matter can get into the storage tank, it will be the cause of low gas purity. (The hose flange get laid on the floor during connecting, there is possibility the seal gasket get dirt and affect gas purity.)

② If protection cap is not put on at the fill port of the CE tank, it will cause foreign matter to get in.

Control method : Always ensure to put on protection cap at the fill port everyday. During receiving, check the way of the operator handling the hose. Make sure that the hose is purged for more than 10 seconds.



If the gas space is too small it can cause the danger of CE tank get explode.

(2) Safety devices activated due to cryogenic liquid overfilled into the storage tank (safety valve・rupture disc)

Root cause : The tanker driver need to adjusts the filling valve and monitor CE tank pressure during filling. After that, open the trycock valve while monitor the liquid level gauge, once confirmed the cryogenic liquid came out, then prepare to stop filling operation. In case of the liquid level cannot be determined accurately due to liquid level gauge faulty, the trycock valve might be opened at the wrong timing and caused the possibility of overfill.

Control method : Periodic inspection and maintenance of safety valves and rupture disc to ensure that they are in good working order. When performing filling operations, please follow the operating procedures and take care not to overfilled.

(3) Liquid leakage during filling

Root cause : There are possibility of thread damaged at the hose joint, flange gasket got damaged or deformed.

Control method : Ensure to do liquid leak check during purging the filling hose. In case of the liquid is leaking during filling, request operator to stop the filling operation. Tightening bolts or nuts in the middle of liquid filling is dangerous, strictly do not do it.

【 Check items during receiving tanker 】

Below is the list of items to be checked when receiving tanker.

Item	Receiving PIC Action	
Tanker arrival	<p>Go to the CE tank yard right after received tanker arrival information. (Normally, the tanker driver will do filling preparation after receive permission from the customer's PIC.)</p> <p>※At the CE tank yard, ensure no other vehicle or obstruction around tanker parking lot.</p> <p>※Ensure to put wheel stopper and display "fill in-progress" signage.</p>	
Before filling preparation	<p>Check the CE tank liquid level and pressure. (Record)</p> <p>Check gas leakage at the hose joint and confirm that there are no gas leakage.</p> <p>※Confirm that the surrounding condition is good and safe for filling process.</p> <ul style="list-style-type: none"> Ensure the surrounding is safe from naked light, flammable objects, typhoon, rainstorm, lightning and etc. Filling operator must wear proper Personal Protective Equipment (PPE) such as helmets, leather gloves and etc. 	 
In the middle of filling process	<ul style="list-style-type: none"> Do not leave the site during filling process is on going, and check the condition frequently. In case of gas leakage, equipment trouble and etc. Contact relevant Person In Charge (PIC) from customer or supplier. <p>※ Create a list of internal and external emergency contact number and keep it up-to-date.</p>	   
After filling	<p>After check the storage tank pressure, liquid level, and valve open/closed condition, sign the Delivery Order (DO), Refilling Report and keep the documents copy. Key in tanker receiving record in the daily checklist.</p>	

【CE tank area daily control and etc.】

Please check the items below everyday to avoid any problems when doing filling process:

(1) Always put on CE tank fill port protection cap

When not in use, put on protection cap as shown in the photo to prevent dust, moisture and other foreign matter from get into the tank.

(2) Indicate the tanker parking location clearly and ensure the safeness of vehicle pathway within the premise

Make sure the tanker parking lot is clearly marked. Make sure everyday no other vehicles park at the parking lot or object left unattended that can be obstruction to the tanker. Also, please make sure that the road space are enough for other vehicle to go through within the premise area.



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