**Safe Work Requirement**

Nitrogen Filling Procedure

Table of Content

[1. PURPOSE 1](#_Toc477079781)

[2. SCOPE 1](#_Toc477079782)

[3. RESPONSIBILITIES 1](#_Toc477079783)

[4. GUIDELINES 1](#_Toc477079784)

[4.1 Pre-test requirement 1](#_Toc477079785)

[4.2 the purity test 3](#_Toc477079786)

[4.3 Purity Tester Limitations 3](#_Toc477079787)

[5. record 4](#_Toc477079788)

|  |
| --- |
| PURPOSE It is possible that a Nitrogen cylinder is contaminated with oxygen with a risk of fire and explosion and potential catastrophic consequences on personnel and assets. The Purpose of this Procedure is to provide ECDC employees with a minimum standard for checking the purity of Nitrogen compressed gas cylinders and confirm they are 99.5% pure before they are used in ECDC sites. SCOPE This Procedure applies to all nitrogen compressed gas cylinder owned, rented or leased by ECDC RESPONSIBILITIES Operation Manager: Operation Manager is responsible for ensuring that this work instruction has been communicated and fully implemented in all rigs, yards and support bases.  Rig Manager: Rig Manager is responsible for ensuring that this Work Instruction has been communicated and fully implemented at the Rig.  Logistics Manager: Logistics Manager is responsible for assisting the operation team source with the most reliable supplier for compressed gas cylinders. He is also responsible for communicating this work instruction to logistics department and to the supplier. GUIDELINES Specific Nitrogen tester will be the authorized instrument to test Nitrogen purity in the compressed gas cylinders. Pre-test requirement  1. The gas cylinders must be visually inspected when there is delivery to ascertain the right content, for segregation purpose and to comply with ECDC standard. 2. The nitrogen bottle should be put in an upright position and placed in a rack or secured with brackets to a wall. 3. Nitrogen cylinder valves come in different types and designs from country to country. The Rig Manager and Rig Mechanic shall check the valve and order a proper regulator or flow meter and necessary fittings to be safely connected to the nitrogen cylinder valve and to the nitrogen tester. The regulator or flow meter shall be able to reduce pressure to 5 psi. 4. DO NOT over pressurize the sensor. Doing so may destroy the sensor and void the warranty. To avoid over pressurization only allow 5 psi (or 2 liters per minute) of gas to come in contact with the sensor membrane. 5. Prior to turning on the Nitrogen Tester, a protective film covering the threaded sensor face must be removed. After removing the film, wait approximately 20 minutes for the sensor to reach equilibrium. 6. Pre-assembly, if required. 7. Thread the barbed adapter onto the oxygen sensor. 8. Connect the clear tubing to the barbed adapter. 9. Using the ON/OFF key, make sure the Nitrogen Tester is in the power ON mode. 10. Press and hold the Calibration Key for three seconds until the display reads “CAL”. This will calibrate the Nitrogen Tester to room air. Thereafter, calibration is recommended on a weekly basis. 11. A new calibration is required when: 12. The measured N2 percentage is above 80.1 percent N2 13. The measured N2 percentage is below 78.1 percent N2 14. If unsure about the displayed N2 percentage (see Factors influencing accurate readings). 15. Changes in elevation result in a reading error of approximately 1 percent of reading per 250 feet. In general, calibration of the Nitrogen Tester should be performed when elevation at which the product is being used changes by more than 500 feet.  the purity test  1. Hold a pre-job meeting with all involved personnel and review the JSA for the task. 2. Check that the entire pre-test requirements have been met. 3. Check the nitrogen cylinder valve thread is not damaged and free of dust or dirt. Do not proceed with the test if the valve thread is damaged. 4. Connect the regulator (or flow meter) to the cylinder. 5. Open Cylinder valve. 6. Adjust the low pressure output to 5 psi. 7. Connect the nitrogen tester (or flow meter) to the regulator. 8. Wait for 2 to 3 minutes or until the reading stabilizes. 9. If the reading exceeds 99.5%, the cylinder is safe for use and shall be marked as such. 10. If reading is below 99.5%, the cylinder shall be quarantined, marked as “Not safe for use” and shall be shipped back to the supplier for discharge and refilling. 11. Using the Nitrogen cylinder purity test register F0857, the Mechanic is responsible for recording the cylinder serial number, date and time of the test and the N2 purity tester reading.  Purity Tester Limitations The instrument display corresponds directly to the oxygen sensor. The oxygen diffuses through the membrane and an electrical current is generated that is proportional to the partial pressure of oxygen in the gas sample. The oxygen percentage is subtracted from 100, with the remainder being displayed as percent nitrogen. The sensor has a minimal response to gases other than oxygen. Therefore, the unit can only provide the user with the level of contamination with oxygen but will not be able to detect other gases.  The Nitrogen Tester will hold calibration and read correctly within ±3 percent when in thermal equilibrium within the operating temperature range. The device must be thermally stable when calibrated and allowed to thermally stabilize after experiencing temperature changes before readings are accurate. For these reasons, the following is recommended:   1. For best results, perform the calibration procedure at a temperature close to the temperature where analysis will occur. 2. Allow adequate time for the sensor to equilibrate to a new ambient temperature.   **Over Range Indicator**: The appearance of a decimal point after the first digit means that the Nitrogen Tester is reading in excess of 99.9 percent.  Examples:   1. 0.0.0 = 100% 2. 0.0.1 = 101% 3. 0.0.2 = 102% (etc).  record Reference Nitrogen Purity Test Register record |