

PUBLIC COMPANY ORLEN LIETUVA

APPROVED BY
Deputy Director of Quality, Labor Safety
and Environmental Control Director

30 November 2017
Order No TV1(1.2-1)-457

OCCUPATIONAL HEALTH AND SAFETY PROCEDURE BDS-12 USE OF PORTABLE GAS ANALYZERS

I. GENERAL

Purpose and Scope of Application

1. Occupational health and safety procedure BDS-12 Use of portable gas analyzers (hereinafter – manual) purpose – to define the use of portable gas analyzers when doing measurements on dangerous chemical substances before beginning hazardous works (fire, equipment unsealing and other works) as well as their using procedure for personal safety in Public Company ORLEN Lietuva (hereinafter - Company).

2. This Procedure shall apply to each employee of the Company as well as to each employee of contracting organization (hereinafter – Contractor), if respective works fall within the scope of contract concluded with the Company for Contractor employee working with portable gas analyzers.

II. REFERENCES

3. The below listed regulations (as amended) shall apply in conjunction with this Procedure:

3.1. Safety Regulations for Employees Working in Potentially Explosive Environment approved by the Minister of Social Security and Labor of the Republic of Lithuania by Order No. A1-262 of 30 September 2005.

3.2. Lithuanian Hygienic Norm HN 23:2011 Occupational Exposure Limits for Chemical Substances. General Requirements for Measurement and Impact Assessment, as approved by Order No. V-824/A1-389 of 1 September 2011 by the Minister of Social Security and Labour of the Republic of Lithuania;

3.3. List of Measuring Instrument Groups Assigned to Legal Metrology and Time Intervals between Verifications as approved by Order No. 4-523 of 1 August 2014 by the Minister of Economy of the Republic of Lithuania;

3.4. LST EN 60079-29-2:2008 Explosive Atmospheres. Part 29-2. Gas detectors. Selection, installation, use and maintenance of detectors for flammable gases and oxygen (IEC 60079-29-2:2007);

3.5. S9 - Measurements of hazardous substances PKN ORLEN Standard as of 28 February 2017.

III. ABBREVIATIONS, TERMS AND DEFINITIONS

4. Terms and definitions used in this Procedure:

Portable gas analyzer (hereinafter – gas analyzer) – an instrument carried by an employee meant for measuring of the concentration of combustible and toxic gases as well as

oxygen in the air, and warning by means of an audible or visual signal about danger faced upon reaching hazardous concentration limits. Gas analyzers may be used to make measurements on dangerous chemical substances before beginning hazardous works (hot, equipment unsealing and other works) and for purposes of personal safety.

Lower explosive limit (LEL) or lower flammability limit (LFL) – the concentration of flammable substances in the air below which no explosive atmosphere is formed. LEL is measured in percent by volume and appears in the gas analyzers monitor as % LEL.

Bump Test – periodical check of gas analyzer used to inspect functionality of analyzer in accordance to manufacturer requirements.

Working environment – a part of the space closely surrounding an employee where the employee may be exposed to hazardous and/or dangerous factors.

User – Company employee or Contractor employee using gas analyzer in accordance with procedure established by the Company.

Setting gas analyzer sensor value to zero (hereinafter – **resetting**) – resetting of sensors of gas analyzer in accordance with manufacturer requirements using clean air.

Gas analyzer pump test – testing of gas analyzer pump in accordance with manufacturer requirements used for checking whether the pump is working properly (e.g., closing the air inlet).

MFRB – Mažeikiai Fire and Rescue Board for Protection of Facilities.

Potentially explosive atmosphere – an atmosphere which might become explosive due to local or operational conditions. Entries into such Company territories are marked with Ex signs.

Unit managers – heads of the Company's organizational units of all kinds and levels (Divisions, Departments, Groups, Operations Subdivisions, Complexes, Shops, process units, Sections, etc.).

IV. DUTIES AND RESPONSIBILITIES OF EMPLOYEES

5. The head of an organizational unit shall be responsible for:

5.1. Acquisition of the necessary number of gas analyzers, as well as for training of employees how to use gas analyzers;

5.2. Determination of cases (work places, works, etc.) when gas analyzers have to be used for personal safety;

5.3. Issuance of gas analyzers for testing (metrological inspection, Bump test) and organization of maintenance.

6. Before starting to use gas analyzers the users shall get familiar with the requirements for use thereof, as provided by the manufacturer of a gas analyzer, and comply with such.

V. REQUIREMENTS FOR GAS ANALYZER USAGE AND CALIBRATION

7. The threshold values of gas analyzer have to be set according to type of work and established requirements. Usually these threshold values are set to gas analyzers: LEL - 5%, oxygen - upper limit 23.5%, lower limit 19.5%, hydrogen sulfide (hereinafter – H_2S) – 7 mg/m^3 , carbon monoxide (hereinafter – CO) – 40 mg/m^3 .

8. At least once every 6 months the used gas analyzers shall undergo inspection according to the requirements of relevant legal acts effective in the Republic of Lithuania. It shall be prohibited to use a gas analyzer if it does not have a sticker attached to it with an effective date of inspection.

9. Gas analyzers used by Company employees shall undergo a Bump test at least once per month at MFRB.

10. When measuring concentrations of specific substances, the measurements shall be made using gas analyzers designed for these substances, e.g., hydrogen concentration must be measured with a hydrogen gas analyzer, etc.

11. Before starting measurement works the user of gas analyzer must turn it on in a clean work environment (office, control room, outside the limits of a process unit) and if the gas analyzer manual suggests a reset and a pump test shall be performed.

12. Use of visually damaged and/or broken gas analyzers (a cracked body or display, the readings are not resetting to default values irrespective of changed working environments, the manufacture-provided functions such as audible or visual alert signals out of order, etc.) shall be prohibited.

13. An employee using a gas analyzer must make sure the air suction inlet of the instrument as well as its audible, visual alarm devices are not covered with work tools or personal protective equipment.

14. With a gas analyzer in use, its air suction inlet shall be protected from the entry of petroleum products, water. Also gas analyzer shall be protected against direct physical effects (welding sparks, hot surfaces, mechanical impacts, etc.).

15. After finishing using a gas analyzer, it must be turned off and the battery charged.

VI. MEASUREMENTS OF HAZARDOUS SUBSTANCES

General Requirements for Measurements of Hazardous Substances

16. Cases when it is required to perform measurements of hazardous chemical substances and their hazardous concentrations have been established in these Occupational Health and Safety (hereinafter – OHS) Procedures of the Company: OHS Procedure BDS-6/1 Unit Unsealing and Maintenance Works, OHS Procedure BDS-6/2 Works in Confined Spaces, OHS Procedure BDS-7 Hot Works, OHS Procedure BDS-8 Sampling, OHS Procedure BDS-10 Use of Work Equipment in Potentially Explosive Atmospheres, OHS Procedure BDS-31 Earthworks.

17. Gas analyzers for personal safety must be used in the following cases (but not limited to):

17.1. during draining of hazardous chemical substances and sampling for laboratory testing;

17.2. while igniting burners in process heaters;

17.3. while doing unsealing works, installing and demounting blinds.

18. PPE must be used for sampling before beginning the hazardous works and during them, which are chosen by the person issuing a Work Permit after assessing hazardous substances and other dangers.

Requirements for hazardous substance measurements during hot works

19. Before performing category 1 hot works:

19.1. at least 11 meter radius territory around the place of hot works must be checked;

19.2. during measurements the concentration of hazardous chemical substances shall be measured in hazardous areas (at flanged connections, drain valves, valve packing glands, industrial sewer wells, etc.);

19.3. during works at height, hazardous substance concentration must be additionally measured in the lower working platforms and at zero level.

20. During sampling operation the employee must stand with back turned to the wind to avoid inhalation of vapors hazardous to health. It is forbidden to perform sampling operations during lightning, also it is forbidden to perform sampling from storage tanks, tank tops during storm (heavy rainfall or snowfall, lightning, when wind speed is 20 m/s and higher).

Requirements for hazardous substance measurements when performing unsealing works and works in confined spaces

21. Substance concentrations in the air of confined spaces must be measured through existing process openings (hatches, air vents, connecting pipes, etc.) using special gas analyzers with pumps and samplers (probes).

22. When performing measurements of hazardous substances inside containers with oxygen-free environment (e.g., filled with nitrogen) gas analyzers with infrared LEL sensors have to be used.

23. While sampling from confined spaces the construction of the container has to be taken into consideration, e.g., whether there are any parts enclosed with walls where hazardous gases or vapors may accumulate. Additional samples have to be taken from these places.

24. Before performing measurements of hazardous chemical substance in a confined space, its mechanical ventilation (if it's present) must be turned off at least 10 minutes prior to measurement.

25. Air samples from inside of the tower, before starting the works have to be taken from every open hatch. Once inside, continuous air monitoring has to be maintained using gas analyzer, which constantly analyses the selected parameters of the work environment and alerts by audible signal about deviations from the set values.

26. At least 3 vertical samples have to be taken from the inside of storage tanks and containers: from the storage tank/container bottom or just above the liquid level in the tank (about 0.5 - 1 m from the surface), from the middle of the storage tank and under the roof of the storage tank (on top of storage tank). Sampling points have to be as far as possible from the existing openings (hatches, air vents, connecting pipes, etc.).

27. Concentration measurements of oxygen, substances hazardous in terms of explosion and harmful substances must be performed inside confined space.

VII. MAINTENANCE AND SERVICING OF GAS ANALYZERS

28. Bump test has to be performed if the gas analyzer gets in contact with water/dirt, falls from height above 1 m on a hard surface or shows incorrect readings.

29. Gas analyzer sensors may be damaged with higher (above measurement scale) gas concentrations. It is forbidden to perform measurements with a gas analyzer if the unit (pipeline, container, etc.) was not prepared in accordance with the Company OHS procedure requirements and it contains a high amount of hazardous substance vapors or gases.

30. If the analyzer reads more than 50 ppm of CO and H₂S or more than 50% LEL concentration, the measurement must be stopped immediately and the sensors must be ventilated in fresh air (perform resetting).

31. If the gas analyzer was not used for longer than one month, gas analyzer battery (at least once a month) must be fully charged.

32. Charging of a gas analyzer battery in a potentially explosive atmosphere shall be prohibited.

33. Gas analyzer sensors are adversely affected (poisoned) by silicon, alcohol and other solvent vapors as well as aerosols (e.g., dyes, detergents, lubricants, sealing materials, etc.). It is forbidden to store the gas analyzer in places where works with these substances are performed or where they are stored.

VIII. ACTIONS OF EMPLOYEES IN CASE OF DANGER

34. In case the alarm of gas analyzer for personal safety activates and the work environment has become hazardous, the employee must:

34.1. immediately suspend the works;

34.2. switch off any electrical equipment;

34.3. switch off motor vehicles (freight vehicles, truck cranes, fork-lift trucks, etc.) and motorized equipment (compressors, grass mowers, etc.);

34.4. leave the work site;

34.5. immediately call in emergency ambulance if feeling unwell;

34.6. inform immediate superior.

35. If the alarm of gas analyzer used for hazardous substance measurements activates the user of gas analyzer must:

35.1. suspend works/measurements, inform immediate superior and Work Permit issuing person;

35.2. resume works/measurements only when Work Permit issuing person allows it.

IX. EMPLOYEE TRAINING

36. Employees performing air testing must be trained how to properly use gas analyzers and understand their readings, as well as be familiar with usage instructions and comply with them.

X. FINAL PROVISIONS

37. Responsibility for periodic review and updating of this Procedure, if needed, shall lie with Director of Quality, Labour Safety and Environmental Control.

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29-11-2017

AGREED WITH:
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