

ISO 19230:2020 (E)

Gas analysis — Sampling guidelines

Contents

| | |
|-----------|---|
| | Foreword |
| | Introduction |
| 1 | Scope |
| 2 | Normative references |
| 3 | Terms and definitions |
| 4 | Sampling plan |
| 5 | Sampling classification |
| 5.1 | Sampling classification of gases |
| 5.2 | Sampling classification of liquefied gas |
| 6 | Technical specifications |
| 6.1 | Overview |
| 6.2 | General considerations for gas sampling |
| 6.2.1 | Adsorption, reaction and permeation of sampling system |
| 6.2.2 | Leaks and atmospheric diffusion in the sampling system |
| 6.2.3 | Leak testing of the sampling system |
| 6.2.4 | Purging of the sampling system |
| 6.2.4.1 | Overview |
| 6.2.4.2 | Continuous purging method |
| 6.2.4.3 | Fill-empty cycle purging method |
| 6.2.4.4 | Evacuation-gas purging cycles |
| 6.2.5 | Homogeneity of gas |
| 6.2.6 | Inert-gas purging |
| 6.3 | Possible condensation during compressed gas sampling |
| 6.4 | Main considerations for liquefied gas sampling |
| 6.5 | Samples that are not feasible in containers or cannot be used for analysis directly |
| 7 | Safety guidance in sampling |
| 7.1 | Overview |
| 7.2 | General recommendation |
| 7.3 | Specific recommendation for sampling a certain substance |
| 8 | Sampling devices |
| 8.1 | General provision |
| 8.2 | Sample container |
| 8.2.1 | Sample container material |
| 8.2.1.1 | Metal containers |
| 8.2.1.2 | Non-metallic containers |
| 8.2.1.2.1 | General provision |
| 8.2.1.2.2 | Glass containers |
| 8.2.1.2.3 | Composite membrane airbag |
| 8.2.1.2.4 | Polymer airbags |
| 8.2.1.2.5 | Rubber airbag |
| 8.2.2 | Structure of sample container |
| 8.2.2.1 | Commonly used sample containers |
| 8.2.2.2 | Floating piston cylinders |
| 8.2.3 | Volume of sample container |
| 8.3 | Sample probe |

- 8.4 Pressure reducer and flow controller
- 8.5 Sample pump
- 8.6 Sample line
 - 8.6.1 Material of sample line
 - 8.6.2 Length and diameter of sample line
- 8.7 Connecters and seals
- 8.8 Cleaning and drying of the sampling device
- 8.9 Connection of sampling devices
- 9 Sampling
 - 9.1 Sampling method block diagram
 - 9.1.1 Overview
 - 9.1.2 Block diagram of compressed gas sampling method
 - 9.1.3 Block diagram of liquefied gas sampling method
 - 9.2 Quality assessment of the sampling system
 - 9.3 Sampling from the gaseous phase and sampling after evaporation of liquefied gas
 - 9.4 Direct sampling
 - 9.4.1 General provisions
 - 9.4.2 Direct sampling of gas in pressure receptacles
 - 9.4.3 Direct sampling of gas in pipelines
 - 9.5 Indirect sampling
 - 9.5.1 Indirect sampling of gas in pressure receptacles
 - 9.5.1.1 General
 - 9.5.1.2 Fill-empty sampling
 - 9.5.1.3 Evacuation sampling
 - 9.5.1.3.1 Overview
 - 9.5.1.3.2 Evacuated-container sampling
 - 9.5.1.3.3 Evacuated-system sampling
 - 9.5.1.4 Sampling using floating piston cylinders
 - 9.5.2 Indirect sampling of gas in pipelines
 - 9.5.2.1 Spot sampling
 - 9.5.2.2 Incremental sampling
 - 9.5.3 Leakage test of sample container
 - 9.5.4 Storage of samples
 - 9.6 Sampling records
- Annex A (informative) Examples of estimation of the purging time and purging cycles for sampling system
 - A.1 Examples of estimation of the purging time needed for continuous purging
 - A.2 Example of estimation of the purging cycles needed for fill-empty cycle purging
- Annex B (informative) Direct sampling for gas in pressure receptacles
 - B.1 Direct sampling for compressed gas in pressure receptacles
 - B.1.1 Sampling with a vacuum pump
 - B.1.2 Sampling without a vacuum pump
 - B.2 Direct sampling in liquid form from the liquefied gas in pressure receptacles
- Annex C (informative) Direct sampling of gas in pipelines
 - C.1 Direct sampling of compressed gas in pipelines
 - C.2 Direct sampling of liquefied gas in pipelines
- Annex D (informative) Fill-empty sampling method
- Annex E (informative) Evacuated-container sampling
 - E.1 Evacuated-container sampling of compressed gas
 - E.2 Evacuated-container sampling for liquefied gas in liquid form
 - E.3 Evacuated-container sampling of small volumes of liquefied gas after evaporation
- Annex F (informative) Evacuated-system sampling
 - F.1 Evacuated-system sampling of gases at pressure equal to or less than atmospheric pressure and low-pressure gases
 - F.2 Evacuated-system sampling of high-pressure gas
- Annex G (informative) Indirect sampling using floating piston cylinders