

ISO 6145-6:2017-07 (E)

Gas analysis - Preparation of calibration gas mixtures using dynamic methods - Part 6: Critical flow orifices

Contents	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols	4
5 Principle	5
6 Calculation of mass flow rate and volume flow rate	6
6.1 General	6
6.2 Calculation under ideal conditions	7
6.2.1 Calculation of mass flow rate	7
6.2.2 Calculation of volume flow rates	7
6.3 Calculation of mass flow rate using flow calibration with pure nitrogen	8
6.4 Flow rate uncertainty calculation	9
6.4.1 General	9
6.4.2 Sources of uncertainty	9
6.4.3 Uncertainty estimation	10
7 Calculation of amount of substance fraction and volume fraction and associated uncertainty evaluation	10
7.1 General	10
7.2 Amount of substance fraction calculation and associated uncertainty	10
7.2.1 Case of gases with purity 99,99 %	10
7.2.2 Case of pre-mixtures	13
7.3 Remarks about uncertainty for the amount fraction	15
8 Application to the preparation of gas mixtures	15
8.1 Example of a mixing system	15
8.2 Conditions of operation	16
9 Calibration and verification	17
9.1 General	17
9.2 Calibration of the mixing system in the flow rate	17
9.3 Calibration of the mixing system with gas mixtures for a specific gas and concentration	17
9.4 Verification of the mixing system	17
Annex A (informative) Example of calculation of isentropic coefficient, viscosity and critical flow coefficient	19
Annex B (informative) Calculation of mass and volume flow rates under real conditions	21
Annex C (informative) Example of flow calculation for toroidal critical flow orifices under ideal and real conditions	23
Annex D (informative) Calculation of mass flow rate using flow calibration with pure nitrogen: examples	25
Bibliography	27