ISO/TS 20177:2018-06 (E)

Vacuum technology - Vacuum gauges - Procedures to measure and report outgassing rates

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 2

4 Symbols and abbreviated terms 3

5 Measurement systems 4
5.1 General 4
5.1.1 Overview 4
5.1.2 Recommendations for systems 4
5.1.3 Vacuum chambers and pumps 5
5.1.4 Vacuum gauges 6
5.1.5 Purity of gases 6
5.2 Systems applying the throughput method 6
5.2.1 General 6
5.2.2 Continuous expansion system as flow comparator 6
5.2.3 Throughput system with calculated conductance element 8
5.2.4 Throughput system with measured effective pumping speed 10
5.2.5 Throughput system with modulated conductance 12
5.3 Accumulation systems 13
5.3.1 General 13
5.3.2 Basic accumulation system 13
5.3.3 Accumulation system with gas analysis system (extended accumulation system) 13

6 Measurement procedures 14
6.1 General 14
6.2 Recommended sample preparation 15
6.3 Course and time period of measurement 16
6.4 Measurement procedures 16
6.4.1 Procedure with continuous expansion system as flow comparator 16
6.4.2 Procedure with throughput system with calculated conductance element (pressure difference system) 17
6.4.3 Procedure with throughput system with measured effective pumping speed 18
6.4.4 Procedure with throughput system with modulated conductance 19
6.4.5 Procedure with accumulation systems 20

7 Measurement uncertainties 23
7.1 General 23
7.2 Continuous expansion system as flow comparator (5.2.2) 23
7.3 Throughput system with calculated conductance element (5.2.3) 23
7.4 Throughput system with measured effective pumping speed (5.2.4) 24
7.5 Throughput system with modulated conductance (5.2.5) 24
7.6 Basic accumulation system (5.3.2) 24
7.7 Accumulation system with gas analysis system (5.3.3) 25

8 Reporting results 28

Annex A (informative) Schemes of principles of measurement systems 30

Annex B (informative) Applicability and characteristics of the different measurement system 36

Annex C (informative) Traceability of the different measurement systems to the SI 37

Bibliography 39