

DIN EN 17359:2020-10 (E)

Stationary source emissions - Bioaerosols and biological agents - Sampling of bioaerosols and collection in liquids - Impingement method

Contents		Page
European foreword		5
1 Scope		6
2 Normative references		6
3 Terms and definitions		7
4 Symbols and abbreviations		11
5 Principle of method		13
6 Theoretical fundamentals		14
6.1 Isokinetic sampling		14
6.2 Determination of concentration and load of the microorganisms		14
7 Device and materials		16
7.1 General		16
7.2 Device and methods for measurement of the exhaust air parameters for the calculation of the main volume flow		16
7.2.1 General		16
7.2.2 Device for determination of the exhaust air velocity		16
7.2.3 Device for determination of pressure, temperature and humidity		17
7.3 Device for the sampling of bioaerosols		17
7.3.1 General		17
7.3.2 Material properties		18
7.3.3 Entry nozzle, bend and sampling probe		18
7.3.4 Emission impinger		18
7.3.5 Suction device and device for measurement of the gas volume or respectively the gas volume flow		20
8 Sampling		20
8.1 General		20
8.2 Preparation of the sampling equipment		20
8.2.1 General		20
8.2.2 Preparation of the emission impinger		20
8.2.3 Preparation of the entry nozzle and the sampling probe		21
8.2.4 Determination of appropriate sampling probe and sampling flow		21
8.3 Performing bioaerosol sampling		24
8.3.1 Leak test and sampling		24
8.3.2 Recovery of deposits upstream of the emission impinger		25
8.3.3 Determination of the mass of the sampling liquid		26
8.3.4 Field blank value		26
8.3.5 Analytical blank value		27
8.4 Transport and storage		27
9 Analysis		27
10 Evaluation		27
10.1 General		27
10.2 Transfer of the results by the analytical laboratory		28

10.3	Sample gas volume during sampling	28
10.4	Microorganism number calculation	30
10.5	Load calculation	31
11	Performance characteristics	31
11.1	Measurement uncertainty	31
11.2	Parameters for the determination of measuring uncertainty in practice	32
12	Maintenance and quality assurance	37
13	Sampling efficiency and limits of the method	37
14	Interferences	38
	Annex A(informative) Practical example for moulds and bacteria	39
A.1	General	39
A.2	Determination of the measurement points	39
A.3	Devices and materials	39
A.3.1	General	39
A.3.2	Devices and methods for measurement of the exhaust air parameters for the calculation of the main volume flow	39
A.3.2.1	General	39
A.3.2.2	Devices for determination of the exhaust air velocity	39
A.3.2.3	Devices for determination of pressure, temperature and humidity	40
A.3.3	Devices for sampling of bioaerosols	40
A.3.3.1	General	40
A.3.3.2	Material properties	40
A.3.3.3	Entry nozzle, bend and sampling probe	40
A.3.3.4	Emission impinger	40
A.3.3.5	Measurement system for isokinetic sample volume flow abstraction	40
A.4	Sampling process	40
A.4.1	General	40
A.4.2	Preparation of the sampling equipment	40
A.4.2.1	General	40
A.4.2.2	Preparation of the emission impinger	41
A.4.2.3	Preparation of the entry nozzle, band and sampling probe	41
A.4.3	Measurement of the exhaust air parameters for isokinetic sampling	41
A.4.4	Sampling	42
A.4.4.1	General	42
A.4.4.2	Recovery of deposits upstream of the emission impinger	42
A.4.4.3	Field blank value	42
A.4.5	Transport and storage	43
	Annex B(informative) Measurement uncertainty	49
B.1	General	49
B.2	Determination of measurement uncertainty	49
B.2.1	Moulds	49
B.2.2	Mesophilic bacteria	50
B.2.3	Total cell count	50
B.2.4	Measurements in the bioaerosol test channel	50
B.3	Field blank value	51
	Annex C(normative) Summary of the requirements to the emission measurement	52
	Annex D(informative) Sample protocol for sampling and analysis	54
D.1	Sampling	54
D.2	Analysis	55
	Bibliography	56