



**NSAI**  
Standards

Irish Standard Recommendation  
S.R. CEN/TS 17340:2020

Stationary source emissions -  
Determination of mass concentration of  
fluorinated compounds expressed as HF -  
Standard reference method

**S.R. CEN/TS 17340:2020**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):*

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.*

*This document is based on:*

CEN/TS 17340:2020

*Published:*

2020-09-30

*This document was published under the authority of the NSAI and comes into effect on:*

2020-10-22

ICS number:

13.040.40

NOTE: If blank see CEN/CENELEC cover page

NSAI  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

Sales:  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

## National Foreword

S.R. CEN/TS 17340:2020 is the adopted Irish version of the European Document CEN/TS 17340:2020, Stationary source emissions - Determination of mass concentration of fluorinated compounds expressed as HF - Standard reference method

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

**Compliance with this document does not of itself confer immunity from legal obligations.**

*In line with international standards practice the decimal point is shown as a comma (,) throughout this document.*

This page is intentionally left blank

**TECHNICAL SPECIFICATION**  
**SPÉCIFICATION TECHNIQUE**  
**TECHNISCHE SPEZIFIKATION**

**CEN/TS 17340**

September 2020

ICS 13.040.40

English Version

**Stationary source emissions - Determination of mass  
concentration of fluorinated compounds expressed as HF -  
Standard reference method**

Émissions de sources fixes - Détermination de la  
concentration massique en composés fluorés, exprimée  
en HF - Méthode de référence normalisée

Emissionen aus stationären Quellen - Bestimmung der  
Massenkonzentration fluorierter Verbindungen,  
angegeben als HF - Standardreferenzverfahren

This Technical Specification (CEN/TS) was approved by CEN on 17 August 2020 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword.....	5
<b>1 Scope</b> .....	<b>6</b>
<b>2 Normative references</b> .....	<b>6</b>
<b>3 Terms and definitions</b> .....	<b>6</b>
<b>4 Symbols and abbreviations</b> .....	<b>12</b>
4.1 Symbols.....	12
4.2 Abbreviations.....	14
<b>5 Measuring principle</b> .....	<b>14</b>
5.1 General.....	14
5.2 Measuring principle.....	14
<b>6 Sampling equipment</b> .....	<b>15</b>
6.1 General.....	15
6.2 Sampling line with side stream (first case).....	15
6.3 Sampling line without side stream (second case).....	16
6.4 Sampling probe.....	16
6.5 Filter housing.....	16
6.6 Particle filter.....	16
6.7 Temperature controller.....	16
6.8 Absorbers.....	17
6.9 Sample gas pump.....	17
6.10 Gas volume meter.....	18
<b>7 Field operation</b> .....	<b>18</b>
7.1 Measurement planning.....	18
7.2 Sampling strategy.....	18
7.2.1 General.....	18
7.2.2 Measurement section and measurement plane.....	18
7.2.3 Minimum number and location of measurement points.....	19
7.2.4 Sampling time and volume sampled.....	19
7.2.5 Measurement ports and working platform.....	19
7.3 Preparation of the glassware and the absorption solution.....	19
7.4 Assembling the equipment.....	20
7.5 Field blank.....	20
7.6 Heating of the sampling line.....	20
7.7 Leak test.....	20
7.8 Performing sampling.....	21
7.8.1 Introduction of the sampling probe in the duct.....	21
7.8.2 Sampling.....	21
7.8.3 Rinsing of the sampling system and preparation of the samples.....	21
<b>8 Analysis</b> .....	<b>22</b>
8.1 General.....	22
8.2 Preparing samples of absorbers.....	22
8.3 Methods for treatment of dust collected in the probe and on the filter.....	22
8.4 Analysis.....	23
<b>9 Determination of the characteristics of the method: sampling and analysis</b> .....	<b>23</b>

9.1	General .....	23
9.2	Performance characteristics for the method and applicable performance criteria .....	23
9.2.1	General .....	23
9.2.2	Sampling procedure .....	24
9.2.3	Analysis procedure .....	24
9.2.4	Performance criterion of analysis .....	25
9.3	Establishment of the uncertainty budget.....	26
10	Expression of results .....	27
10.1	Volume of dry sampled gas .....	27
10.1.1	General .....	27
10.1.2	For the main line (bound to particulate fluorides) .....	27
10.1.3	For the secondary line (gaseous Fluorides).....	27
10.2	Calculation of HF concentration on dry gas basis .....	28
10.3	Expression of results on wet gas basis under standard conditions .....	28
10.4	Expression of results with respect to a reference O <sub>2</sub> content.....	28
11	Test report .....	29
Annex A (informative) Types of sampling devices .....		30
Annex B (normative) Treatment of filters method (first case) .....		31
B.1	Filter treatment with sodium carbonate.....	31
B.2	Modus operandi in case of presence of elements sequestering fluorides .....	31
B.3	Alkaline attack.....	31
B.4	Pyrohydrolysis.....	31
Annex C (normative) Description of the three analytical techniques for the determination of HF .....		34
C.1	Matrix interferences.....	34
C.2	Ionometry.....	34
C.3	Spectrophotometry.....	36
C.4	Ion chromatography.....	39
C.5	Equipment.....	40
C.6	Operating procedure .....	41
C.7	Expression of the results.....	42
Annex D (informative) Example of evaluation of compliance of the reference method for HF with emission measurement requirements – First case: the measurand is the concentration of hydrofluoric acid and gaseous and bound to particulates fluorides .....		43
D.1	Uncertainty estimation process .....	43
D.2	Site specific conditions .....	44
D.3	Performance characteristics of the method.....	45
D.4	Calculation of standard uncertainty of the measured concentration.....	47
Annex E (informative) Example of evaluation of compliance of the reference method for HF with emission measurement requirements - Second case: the measurand is the concentration of hydrofluoric acid and gaseous fluorides.....		55
E.1	Uncertainty estimation process .....	55

## CEN/TS 17340:2020 (E)

E.2	Specific conditions in the field.....	56
E.3	Performance characteristics of the method.....	56
E.4	Calculation of standard uncertainty of concentration measured.....	57
E.5	Calculation of the overall (or expanded) uncertainty .....	60
E.6	Uncertainty associated to the mass concentration of gaseous fluorides at O <sub>2</sub> reference concentration .....	60
Annex F (normative)	Determination of water vapour concentration for water saturated gas, at $p_{std} = 101,325$ kPa.....	62
Annex G (informative)	Calculation of the uncertainty associated with a concentration expressed on dry gas and at an oxygen reference concentration .....	66
G.1	Uncertainty associated with a concentration expressed on dry gas .....	66
G.2	Uncertainty associated with a concentration expressed at an oxygen reference concentration .....	68
Bibliography	.....	71



## **European foreword**

This document (CEN/TS 17340:2020) has been prepared by Technical Committee CEN/TC 264 “Stationary source emissions”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## CEN/TS 17340:2020 (E)

### 1 Scope

This document specifies a manual method for the determination of the concentration of fluorinated compounds expressed in HF. Two cases are presented:

- first case: the measurand is the concentration of gaseous and bound to particulates fluorides;
- second case: the measurand is the concentration of gaseous fluorides.

Three analytical techniques are proposed: ionometry, spectrophotometry and ion-exchange chromatography.

This document specifies the performance characteristics to be determined and the performance criteria to be fulfilled when it is used as the Standard Reference Method (SRM) for periodic monitoring and for calibration or control of Automated Measuring Systems (AMS) permanently installed on a stack, for regulatory or other purposes.

This document applies to fluoride concentrations which may vary between 0,1 mg HF/m<sup>3</sup> and 10 mg HF/m<sup>3</sup>, at standard conditions of pressure and temperature (see NOTE). The limit of quantification of the method is estimated at 0,1 mg/m<sup>3</sup> for a sampled volume of 0,1 m<sup>3</sup>.

Interference may occur for some matrices. Known elements that may lead to interference are mentioned in Annex C.

NOTE The Emission Limit Values (ELV) for HF are expressed in mg/m<sup>3</sup>, for dry gases at the standard conditions ( $T_{\text{std}} = 273 \text{ K}$  and  $P_{\text{std}} = 101,3 \text{ kPa}$ ).

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies..

EN 13284-1, *Stationary source emissions - Determination of low range mass concentration of dust - Part 1: Manual gravimetric method*

EN 15259, *Air quality - Measurement of stationary source emissions - Requirements for measurement sections and sites and for the measurement objective, plan and report*

EN ISO 10304-1, *Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate (ISO 10304-1)*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **absorber**

device in which the compound to be trapped is absorbed into the absorption solution

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-