

<b>STN</b>	<b>Železnice</b> <b>Ochrana železničných vozidiel pred požiarom</b> <b>Skúška toxicity materiálov a komponentov</b>	<b>STN</b> <b>EN 17084</b>  28 2403
------------	---	--

Railway applications - Fire protection on railway vehicles - Toxicity test of materials and components

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/19

Obsahuje: EN 17084:2018

**128796**

EUROPEAN STANDARD

**EN 17084**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2018

ICS 13.220.40; 45.060.01

English Version

## Railway applications - Fire protection on railway vehicles - Toxicity test of materials and components

Applications ferroviaires - Protection contre les incendies dans les véhicules ferroviaires - Essai de toxicité des matériaux et des composants

Bahnanwendungen - Brandschutz in Schienenfahrzeugen - Prüfung der Toxizität von Materialien und Komponenten

This European Standard was approved by CEN on 1 October 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, 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**

**EN 17084:2018 (E)**

<b>Contents</b>	<b>Page</b>
European foreword.....	4
Introduction .....	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions .....	7
4 Principles .....	7
4.1 Product assessment for toxicity.....	7
4.1.1 General principles.....	7
4.1.2 Method 1: Smoke Chamber.....	8
4.1.3 Method 2: Tube Furnace.....	8
4.2 Analysis of fire effluents .....	8
5 Method 1 – Smoke chamber .....	9
5.1 Gas sampling test apparatus .....	9
5.2 Calibration .....	12
5.2.1 General calibrations.....	12
5.2.2 Chamber leakage test .....	12
5.2.3 Gas analyser calibration .....	12
5.3 Test environment.....	13
5.4 Conditioning of samples .....	13
5.5 Test specimen preparation.....	13
5.6 Gas testing.....	13
5.6.1 Pre-test conditions .....	13
5.6.2 Testing.....	13
5.6.3 Operation before each test .....	14
5.6.4 Operation during a test.....	14
5.6.5 Operation after each test.....	15
5.7 Data analysis.....	16
5.7.1 General.....	16
5.7.2 Calculation of corrected volume fraction .....	16
5.7.3 Calculation of time shift.....	16
5.7.4 Variability of test results .....	17
6 Method 2 – Tube furnace .....	17
6.1 Test apparatus.....	17
6.2 Test environment.....	17
6.3 Conditioning of samples .....	17
6.4 Test specimen preparation.....	17
6.5 Test for gases .....	17
7 Calculations of <i>CIT</i> .....	18
7.1 Introduction .....	18
7.2 Calculation of <i>CIT<sub>G</sub></i> – Method 1.....	19
7.3 Calculation of <i>CIT<sub>NLP</sub></i> – Method 2.....	20
8 Test report.....	20
8.1 For all product tests (according to Method 1 or Method 2).....	20

<b>8.2</b>	<b>For tests according to Method 1</b> .....	<b>21</b>
<b>8.3</b>	<b>For tests according to Method 2</b> .....	<b>22</b>
	<b>Annex A (informative) Calculations of FED/FEC</b> .....	<b>23</b>
<b>A.1</b>	<b>Calculation of <i>FED</i></b> .....	<b>23</b>
<b>A.2</b>	<b>Calculation of <i>FEC</i></b> .....	<b>23</b>
<b>A.3</b>	<b>Scaling term</b> .....	<b>24</b>
<b>A.4</b>	<b>Reporting</b> .....	<b>24</b>
	<b>Annex B (informative) Worked Example of Calculation of FED and FEC</b> .....	<b>25</b>
	<b>Annex C (informative) Typical calibration procedure using certified gas cylinder</b> .....	<b>40</b>
<b>C.1</b>	<b>General</b> .....	<b>40</b>
<b>C.2</b>	<b>Set up of apparatus</b> .....	<b>40</b>
<b>C.3</b>	<b>Calibration procedure</b> .....	<b>41</b>
	<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC aimed to be covered</b> .....	<b>43</b>
	<b>Bibliography</b> .....	<b>44</b>

**EN 17084:2018 (E)****European foreword**

This document (EN 17084:2018) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

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.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

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

## **Introduction**

This document has been developed with the aim to take over the content of EN 45545-2:2013+A1:2015, Annex C.

**NOTE** It is also based on the results of the European project TRANSFEU - Transport Fire Safety Engineering in the European Union - FP7 (Contract Number: 233786) [8], [9].

**EN 17084:2018 (E)****1 Scope**

This document describes the measurement of the toxicity potential of the products of combustion based on two test methods:

- Method 1: EN ISO 5659-2 Smoke chamber area-based test with Fourier transform infrared spectroscopy (FTIR) gas analysis techniques;
- Method 2: NF X70-100-2 Tubular furnace small mass-based test.

NOTE 1 This document also specifies test equipment and set out the calculation procedures for evaluation of toxicity data.

NOTE 2 This document can be used in addition to others for the determination of toxic gases from devices installed in tunnel.

**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 45545-1, *Railway applications — Fire protection on railway vehicles — Part 1: General*

EN ISO 5659-2:2017, *Plastics — Smoke generation — Part 2: Determination of optical density by a single-chamber test (ISO 5659-2:2017)*

EN ISO 13943, *Fire safety — Vocabulary (ISO 13943)*

ISO 8421-1, *Fire protection — Vocabulary — Part 1: General terms and phenomena of fire*

ISO 12828-1, *Validation method for fire gas analysis — Part 1: Limits of detection and quantification*

ISO 12828-2, *Validation method for fire gas analysis — Part 2: Intralaboratory validation of quantification methods*

ISO 19701, *Methods for sampling and analysis of fire effluents*

ISO 19702:2015, *Guidance for sampling and analysis of toxic gases and vapours in fire effluents using Fourier Transform Infrared (FTIR) spectroscopy*

NF X70-100-1, *Fire tests — Analysis of gaseous effluents — Part 1: Methods for analysing gases stemming from thermal degradation*

NF X70-100-2, *Fire tests — Analysis of gaseous effluents — Part 2: Tubular furnace thermal degradation method*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**