



SLOVENSKI STANDARD

SIST-TS CEN/TS 45545-7:2009

01-april-2009

Železniške naprave - Zaščita pred ognjem na železniških vozilih - 7. del: Varnostne zahteve za vnetljive tekočine in inštalacije z vnetljivimi plini

Railway applications - Fire protection on railway vehicles - Part 7: Fire safety requirements for flammable liquid and flammable gas installations

Bahnanwendungen - Brandschutz in Schienenfahrzeugen - Teil 7: Brandschutzanforderungen an Anlagen für brennbare Flüssigkeiten und Gase

Applications ferroviaires - Protection contre les incendies dans les véhicules ferroviaires - Partie 7: Exigences de sécurité incendie relatives aux installations de liquides inflammables et de gaz inflammables

<https://standards.iteh.ai/catalog/standards/sist/7bbdc3e-e465-4758-905f-d6b8b7145616/sist-ts-cen-ts-45545-7-2009>

Ta slovenski standard je istoveten z: **CEN/TS 45545-7:2009**

ICS:

13.220.20	Požarna zaščita	Fire protection
45.060.01	Železniška vozila na splošno	Railway rolling stock in general

SIST-TS CEN/TS 45545-7:2009 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST-TS CEN/TS 45545-7:2009

<https://standards.iteh.ai/catalog/standards/sist/7bbdc3e-e465-4758-905f-d6b8b7145616/sist-ts-cen-ts-45545-7-2009>

TECHNICAL SPECIFICATION
 SPÉCIFICATION TECHNIQUE
 TECHNISCHE SPEZIFIKATION

CEN/TS 45545-7

January 2009

ICS 45.060.01

English version

**Railway applications - Fire protection on railway vehicles - Part
 7: Fire safety requirements for flammable liquid and flammable
 gas installations**

Applications ferroviaires - Protection contre les incendies
 dans les véhicules ferroviaires - Partie 7: Exigences de
 sécurité incendie relatives aux installations de liquides
 inflammables et de gaz inflammables

Bahnanwendungen - Brandschutz in Schienenfahrzeugen -
 Teil 7: Brandschutzanforderungen an Anlagen für
 brennbare Flüssigkeiten und Gase

This Technical Specification (CEN/TS) was approved by CEN on 8 June 2008 for provisional application.

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

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

<https://standards.iteh.ai/catalog/standards/sist/7bbbdc3e-e465-4758-905f-d6b8b7145616/sist-ts-cen-ts-45545-7-2009>



CEN Management Centre:
 Avenue Marnix 17, B-1000 Brussels

CENELEC Central Secretariat:
 Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Terminology	5
5 General system requirements	6
6 Flammable liquids and gas tanks	7
6.1 General.....	7
6.2 Tanks for flammable liquids	7
6.3 Portable liquefied petroleum gas installation for catering purposes.....	8
7 Pipe work and associated fittings.....	8
7.1 Requirements for flammable liquids.....	8
7.2 Flexible connections	9
7.3 Gas distribution system requirements.....	9
7.4 Ventilation devices for tanks for flammable liquids.....	10
8 Combustion engines, heaters and auxiliary equipment.....	10
8.1 General.....	10
8.2 Engines located in the inside of vehicles.....	10
8.3 Heating equipment.....	10
8.4 Exhaust devices.....	10
9 Liquefied petroleum gas installations	11
9.1 General.....	11
9.2 Installation	11
9.3 Operation instructions	11
10 Evaluation of conformity.....	11
Annex A (normative) Signs	12
Annex ZA (informative) Relationship between this Technical Specification and the Essential Requirements of EU Directive 96/48/EC, as amended by 2004/50/EC	14
Bibliography.....	15

Foreword

This document (CEN/TS 45545-7:2009) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, 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 [and/or CENELEC] 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 EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

This series of Technical Specifications *Railway applications — Fire protection on railway vehicles* consists of:

- Part 1: General;
- Part 2: Requirements for fire behaviour of materials and components;
- Part 3: Fire resistance requirements for fire barriers;
- Part 4: Fire safety requirements for railway rolling stock design;
- Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation vehicles;
- Part 6: Fire control and management systems;
- Part 7: Fire safety requirements for flammable liquid and flammable gas installations.

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

Introduction

This part is based on existing fire safety regulations for railway vehicles from the International Union of Railways (UIC) and different European countries.

In using the Operation and Design Categories defined in CEN/TS 45545-1, the requirements laid down in this part take into account the current operating conditions for European public rail transport.

1 Scope

This part specifies requirements for flammable liquids and liquefied petroleum gas installations, e.g. for traction, auxiliary power units, heating or cooking, to cover the objectives defined in CEN/TS 45545-1. This part is not applicable to technical liquids themselves, e.g. hydraulic liquid, transformer oil, except where guidance is given as to dealing with spillages, leakage and spray generation.

The measures and requirements specified in this Technical Specification aim to protect passengers and staff in railway vehicles by preventing a fire from occurring and spreading by leakage of flammable liquids or gases.

It is not within the scope of this Technical Specification to describe measures for flammable gases, other than liquefied petroleum gases.

It is not within the scope of this Technical Specification to describe measures that ensure the preservation of the vehicles in the event of a fire.

[SIST-TS CEN/TS 45545-7:2009](https://standards.iteh.ai/catalog/standards/sist/7bbbdc3e-e465-4758-905f-d6b8b7145616/sist-ts-cen-ts-45545-7-2009)

<https://standards.iteh.ai/catalog/standards/sist/7bbbdc3e-e465-4758-905f-d6b8b7145616/sist-ts-cen-ts-45545-7-2009>

2 Normative references

The following referenced documents are indispensable for the application 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 10204, *Metallic products — Types of inspection documents*

CEN/TS 45545-1:2009, *Railway applications — Fire protection of railway vehicles — Part 1: General*

CEN/TS 45545-3, *Railway applications — Fire protection of railway vehicles — Part 3: Fire resistance requirements for fire barriers*

CEN/TS 45545-6, *Railway applications — Fire protection of railway vehicles — Part 6: Fire control and management systems*

EN 50153, *Railway applications — Rolling stock — Protective provisions relating to electrical hazards*

EN ISO 13943, *Fire safety — Vocabulary (ISO 13943:2000)*

ISO 11014-1, *Safety data sheet for chemical products — Part 1: Content and order of sections*

3 Terms and definitions

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

3.1

flammable liquid

liquid with a flash point as determined in accordance with EN ISO 2719 of less than 55 °C and fuel intended for combustion in thermal machines

3.2

flammable gas

for the purpose of this standard, flammable gas means any fuel which is in a gaseous state at a temperature of 15 °C under a pressure of one bar

NOTE Council Directive 90/396/EEC.

3.2.1

Liquefied Petroleum Gas

LPG

defined as propane, propene, butane, butene, and mixtures of these gases

3.3

flammable atmosphere

gaseous mixture, is a mixture in which the vapour from a flammable liquid generates a concentration in air which lies between the upper and lower flammability limits, for the vapour concerned

3.4

tank for flammable liquid

container for a flammable liquid stationary or portable installed

3.5

Liquefied Petroleum Gas tank

LPG tank

container of liquefied petroleum gases stationary or portable installed

3.6

cylinder cabinet

dedicated cabinet containing gas cylinders

3.7

technical cabinet

cabinet containing mechanical and / or electrical equipment which is normally not occupied during operation and which can generate fire resulting from technical defects according to CEN/TS 45545-1:2009, 4.3

NOTE See CEN/TS 45545-6.

3.8

qualified person

person who has sufficient knowledge and is sufficiently acquainted with the relevant technical rules because of his/her technical training and experience, so that he/she is able to make a valid assessment of fire safety

4 Terminology

For fire specific terms used in this Technical Specification, other than those defined in Clause 3, see EN ISO 13943.

CEN/TS 45545-7:2009 (E)**5 General system requirements**

The normal design requirements used for railway vehicles are supplemented by the design requirements to this part of the Technical Specification.

The following factors shall be considered in a design assessment:

- possible sources and paths of leakage, and for LPG the means of detecting leakage;
- flammability characteristics of flammable liquids and gases including the effects of any combustible or absorbing materials;
- possible ignition sources, including electrical faults, overheating of equipment, and malfunctioning of protective devices;
- means available for detecting, controlling or extinguishing a fire, such as stopping the flow of flammable liquids, shutting down equipment, fire resisting containment, or the use of extinguishing media.

The design of flammable liquid, gas and LPG installations shall take into account static and dynamic conditions.

Flammable liquid spray, flammable atmosphere or LPG shall be prevented from coming into contact with potential ignition sources, e.g. hot surfaces or high power electrical switch gear.

Leakage of fuel and oil shall be minimized under normal operation conditions. Any leakage of flammable liquids shall be collected, contained and removed as soon as practicable.

In each area where flammable liquids or gases might escape, there shall be means to minimize:

- a) the probability of ignition, and
- b) the consequences if ignition does occur.

Some materials that have a fire prevention function may be operating at an elevated temperature as a result of being near equipment operating at high temperatures (e.g. exhaust pipe insulation). In such cases, degradation of the material could impair its ability to perform its function, and its propensity to ignite may be increased. Care shall be taken to ensure that such materials will not degrade in this manner.

In addition to the design requirements of this Technical Specification, equipment shall be designed to withstand the normal operation requirement.

Metal containers and pipes fixed permanently on railway vehicles or stored movable containers shall be bonded to rail via the body and the chassis in accordance with EN 50153.

These bonding connections shall not give rise to corrosion, which could lead to high resistance connections.

For each metal used for flammable liquid or flammable gas installations, certified material test reports or work's test certificates according to EN 10204 shall be submitted.

When selecting materials used in the vicinity of equipment which may generate flammable liquids or gases, care shall be taken to ensure that the material surface cannot absorb these species and hence become hazardous.

6 Flammable liquids and gas tanks

6.1 General

Tanks shall be built, located or protected so that they or their piping cannot be punctured or fractured by debris thrown up from the track.

Tanks shall not be installed in:

- energy absorption zones;
- passenger areas;
- luggage compartments;
- driver's cabs.

For tanks that are divided internally by partition walls, the complete tank shall fulfil these listed requirements.

6.2 Tanks for flammable liquids

Tanks constructed to the following requirements are deemed to satisfy the minimum impact performance. If other materials are used, equivalent safety shall be demonstrated.

The thickness of walls shall have a minimum according to Table 1.

Table 1 — Minimum thickness of walls

Volume	Steel	Aluminium
≤ 2 000 l	2,0 mm	3,0 mm
> 2 000 l	3,0 mm	4,0 mm

Tanks for flammable liquid shall be located and designed, that no ignition can occur under normal temperature conditions.

The design of flammable liquid tanks shall ensure, as far as reasonably practicable, that during filling or draining or in the event of leakage from a tank or its pipe work, flammable liquids cannot:

- come into contact with rotating machinery which might result in a spray;
- be drawn into any device in suction e.g. ventilators and coolers;
- come into contact with hot components, or electrical devices which may produce electrical spark;
- penetrate into layers of thermal or acoustic insulation material.

Tanks for flammable liquids shall not be filled more than 90 % of their nominal volume. Filling limit indicators shall be provided.

The output from a limit indicator device shall be easy to read from the filling position.

To avoid confusion, the kind of appropriate flammable liquid shall be clearly labelled at the filling pipe of the tank. The labelling of the flammable liquid shall be given textual in accordance to safety data sheets according to ISO 11014-1.