
Železniške naprave – Klimatske naprave v železniških vozilih za mestni in primestni promet – 1. del: Parametri za zagotavljanje udobja

Railway applications - Air conditioning for urban and suburban rolling stock - Part 1: Comfort parameters

Bahnanwendungen - Luftbehandlung in Schienenfahrzeugen des innerstädtischen und regionalen Nahverkehrs - Teil 1: Behaglichkeitsparameter

Applications ferroviaires - Conditionnement de l'air pour matériel roulant urbain et banlieue - Partie 1: Parametres de bien-etre

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Railway applications - Air conditioning for urban and suburban rolling stock - Part 1: Comfort parameters

Applications ferroviaires - Conditionnement de l'air pour matériel roulant urbain et banlieue - Partie 1: Paramètres de bien-être

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This European Standard was approved by CEN on 27 April 2006.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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EN 14750-1:2006 (E)**Foreword**

This document (EN 14750-1:2006) 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of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

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 Directive 2004/17/EC of the European Parliament and of the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services¹⁾.

This series of European Standards includes the following parts:

- EN 14750-1, *Railway applications — Air conditioning for urban and suburban rolling stock — Part 1: Comfort parameters*;
- EN 14750-2, *Railway applications — Air conditioning for urban and suburban rolling stock — Part 2: Type tests*.

In the context of this series, there are two further series on air conditioning in rolling stock:

- EN 13129-1, *Railway applications — Air conditioning for main line rolling stock — Part 1: Comfort parameters*;
- EN 13129-2, *Railway applications — Air conditioning for main line rolling stock — Part 2: Type tests*;
- EN 14813-1, *Railway applications — Air conditioning for driving cabs — Part 1: Comfort parameters*;
- EN 14813-2, *Railway applications — Air conditioning for driving cabs — Part 2: Type tests*.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

1) Official Journal No L 134 of 30.4.2004.

Introduction

The object of this European Standard is to establish common comfort parameters for the European railways. It also specifies the performance of the air-conditioning installations.

If necessary, the revised requirements due to the operating constraints of the vehicle will be detailed in the contractual specification. This European Standard applies if there is no particular clause in the contractual specification.

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EN 14750-1:2006 (E)**1 Scope**

This European Standard is applicable to suburban and/or regional vehicles and also metro and tramway vehicles equipped with cooling and/or heating/ventilation systems. This European Standard excludes main line vehicles and driving cabs which are considered in separate European Standards.

This European Standard specifies comfort parameters for compartment or saloon (single level or double-decker).

These comfort parameters apply in a similar way to the areas reserved for train staff, with the exception of the catering service areas.

The conditions under which the physical parameters mentioned in this European Standard shall be measured are defined in EN 14750-2.

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 779:2002, *Particulate air filters for general ventilation — Determination of the filtration performance*

EN 14750-2, *Railway applications — Air conditioning for urban and suburban rolling stock — Part 2: Type tests*

EN 50126, *Railway applications — The specification and demonstration of reliability, availability, maintainability and safety (RAMS)*

3 Terms and definitions

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

3.1**comfort**

agreeable sensation perceived by a person concerning his climatic environment

3.2**air conditioning installations**

equipment intended for ventilation and/or heating and/or cooling and/or filtration

3.3**forced air ventilation**

air circulation generated by a mechanical action

3.4**natural ventilation**

air circulation generated without mechanical action

3.5**preheating**

process which enables the interior temperature to be raised without the presence of passengers

3.6**precooling**

process which enables the interior temperature to be lowered without the presence of passengers

3.7**heating**

process which enables the interior temperature to be raised or maintained

3.8**cooling**

process which enables the interior temperature to be lowered or maintained

3.9**dehumidification**

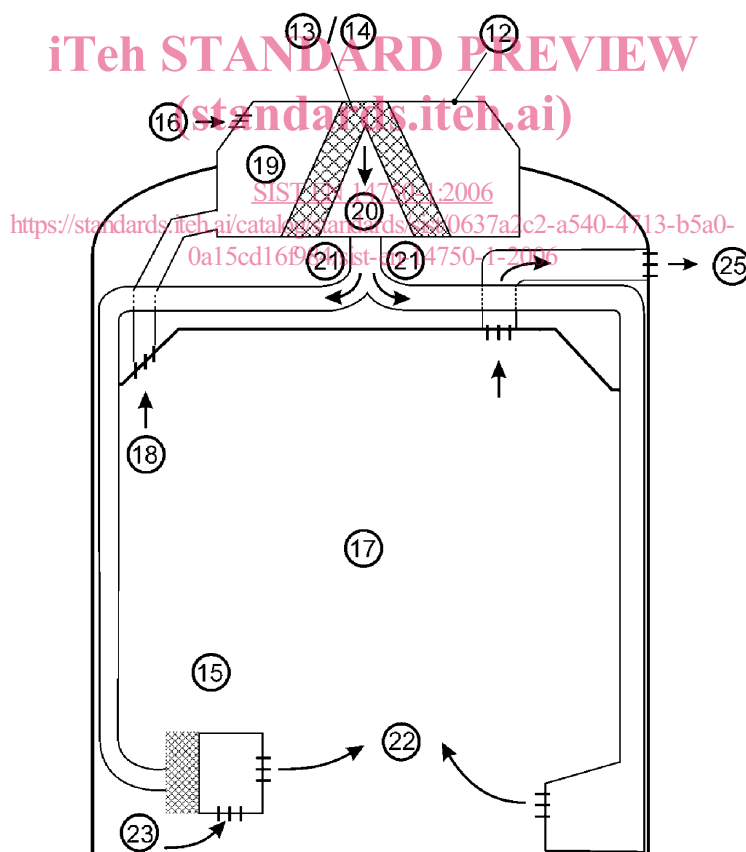
process which reduces the content of water in the interior air

3.10**air conditioning**

system which includes ventilation, heating, cooling and/or dehumidification

3.11**heating and ventilation**

system which includes ventilation and heating



NOTE 1 The representation is only given as an example and does not prejudice the design of the installation.

NOTE 2 Items 13 and 14 can be "and/or".

Figure 1 — Diagram explaining certain ventilation terms in railway environment

EN 14750-1:2006 (E)**3.12****air handling unit**

group of components designed to move, filter and/or mix, heat and/or cool the air (see Figure 1, No 12)

3.13**cooling unit**

system that carries out the cooling function in a centralised and/or decentralised manner (see Figure 1, No 13)

3.14**principal heating unit**

system that carries out the heating function in a centralised and/or decentralised manner with the use of heating elements associated or not with the forced air ventilation (see Figure 1, No 14)

3.15**auxiliary heating unit**

de-centralised heating element(s) for adding heat locally (see Figure 1, No 15)

3.16**outside air or fresh air**

air taken from outside (see Figure 1, No 16)

3.17**room air**

air contained in a specified space (see Figure 1, No 17)

3.18**re-circulated air**

air taken from the interior of a specified space and re-used (see Figure 1, No 18)

3.19**mixed air**

combination of fresh air and re-circulated air (see Figure 1, No 19)

3.20**treated (or conditioned) air**

air that may have been filtered and/or had energy exchanged as it passed through the air handling unit (see Figure 1, No 20)

3.21**primary air**

quantity of treated air entering the ducts (see Figure 1, No 21)

3.22**supply air**

treated air, that may be combined with some induced air, supplied to a specified space (see Figure 1, No 22)

3.23**induced air**

room air that is taken and re-used locally (see Figure 1, No 23)

3.24**transfer air**

air leaving a specified area (e.g. from a saloon to a vestibule, not shown in Figure 1)

3.25**exhaust air**

air rejected outside the vehicle (see Figure 1, No 25)

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3.26**interior temperature setting (Tic)**

theoretical temperature to be achieved by the room air

3.27**mean interior temperature (Tim)**

arithmetic mean of the interior temperatures measured 1,10 m above the floor as specified in the procedure described in EN 14750-2

3.28**mean exterior temperature (Tem)**

arithmetic mean of the exterior temperatures measured according to the procedure described in EN 14750-2

3.29**comfort envelope**

areas normally occupied by passengers. Areas of the vehicle which are intended only for passing through are excluded from the comfort envelope (e.g. gangways)

3.30**local annexes**

places where passengers stay temporarily

3.31**module**

longitudinal subdivision of a vehicle between any combination of cab wall, partition or articulation

NOTE This definition is only for the purposes of determining the location of the sensors during testing.

3.32**heat transfer coefficient (k)**

ratio between the density of the heat flow rate per unit of surface area and the prevailing difference in temperature (Tim) and (Tem) across the relevant walls of the vehicles

NOTE 1 The coefficient k takes account of the efficiency of the insulation of the exterior walls and the effect of the infiltration of air caused by the non-airtightness of the vehicle in motion (doors, windows, various openings) and is applicable to all or part of the vehicle.

NOTE 2 This value is expressed in W/m^2K .

3.33**overall transmission factor of the windows**

ratio between the overall energy flow transmitted to the interior of the vehicle through the window and the incident solar flow

3.34**equivalent solar load**

total heat received by $1 m^2$ surface perpendicular to the radiation emitted by a luminous source (solar equivalent) and this, when inclined at an angle of 30° to the horizontal

3.35**stabilised operation**

operation obtained when (Tim) remains within the tolerance band defined in 9.1.1

3.36**stand by operation**

mode under which a predetermined interior temperature different from the interior temperature setting (Tic) is maintained during non operational activity of the vehicle