SLOVENSKI STANDARD
SIST EN 15612:2020

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Nadomešča:
SIST EN 15612:2009+A1:2011

Železniške naprave - Zavore - Pospešilnik praznjenja glavnega zavornega voda

Railway applications - Braking - Brake pipe accelerator

Bahnanwendungen - Bremse - Schnellbremsbeschleuniger

Applications ferroviaires - Freinage - Accélérateur de vidange de conduite

Ta slovenski standard je istoveten z: EN 15612:2020

ICS:

45.040	Materiali in deli za železniško tehniko	Materials and components for railway engineering

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

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Supersedes EN 15612:2008+A1:2010

English Version

Railway applications - Braking - Brake pipe accelerator

Applications ferroviaires - Freinage - Accélérateur de vidange de conduite

Bahnanwendungen - Bremse - Schnellbremsbeschleuniger

This European Standard was approved by CEN on 13 April 2020.

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

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

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European foreword

This document (EN 15612:2020) 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of an identical text or by endorsement, at the latest by December 2020, and conflicting national standards shall be withdrawn at the latest by December 2020.

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 supersedes EN 15612:2008+A1:2010.

The main changes compared to EN 15612:2008+A1:2010 are:

a) the standard’s title has been modified;

b) normative references have been updated;

c) terms and definitions have been revised;

d) requirements on design and manufacture have been revised;

e) requirements on materials have been removed;

f) requirements on type tests have been revised;

g) requirements on routine test and inspection have been removed;

h) requirements on documentation have been removed;

i) requirements on identification and marking have been revised;

j) Annex ZA has been updated.

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 2016/797/EU.

For relationship with EU Directive 2016/797/EU, 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, 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.

1 Scope

This document is applicable to brake pipe accelerators designed to vent the brake pipe of railway vehicles when an emergency braking is initiated, without taking the type of vehicles and track-gauge into consideration.

This document specifies the requirements for the design, manufacture and testing of brake pipe accelerators.

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 14478:2017, *Railway applications – Braking – Generic vocabulary*

EN 14601:2005+A1:2010, *Railway applications – Straight and angled end cocks for brake pipe and main reservoir pipe*

EN 15355:2019, *Railway applications – Braking – Distributor valves and distributor-isolating devices*

EN 45545-2:2013+A1:2015, *Railway applications – Fire protection on railway vehicles – Part 2: Requirements for fire behaviour of materials and components*

EN 50125-1:2014, *Railway applications – Environmental conditions for equipment – Part 1: Rolling stock and on-board equipment*

EN 60721-3-5:1997, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 5: Ground vehicle installations (IEC 60721-3-5:1997)*

EN 61373:2010, *Railway applications – Rolling stock equipment – Shock and vibration tests (IEC 61373:2010)*

EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

ISO 8573-1:2010, *Compressed air – Part 1: Contaminants and purity classes*

3 Terms and definitions

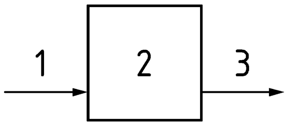
For the purposes of this document, the terms and definitions given in EN 14478:2017 and the following apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp/ui

3.1
brake pipe accelerator
component connected to the brake pipe that, in response to a brake command, assists the propagation of the brake command throughout the train by locally venting the brake pipe (see Figure 1)



Key

1 input pressure (brake pipe)

2 brake pipe accelerator

3 exhaust

Figure 1 — Brake pipe accelerator, main function and block diagram

[SOURCE: EN 14478:2017, 4.10.3.7, modified – Note 1 to entry has been deleted; “(see Figure 1)” has been added at the end of the definition; Figure and key have been added to the definition.]

3.2
normal litre
Nl
unit of amount of a gas equal to the amount of 1 l at a pressure of 1,0 bar and at a standard temperature, at 20 °C

Note 1 to entry: Airflow is often stated in normal litres per minute (Nl/min).

3.3
quick service function
function of a distributor valve which allows, when applying the brake both from stand-by and released position, the local fast venting of brake pipe pressure by a certain specified amount and at a certain specified gradient, to provide pneumatic brake signal transmission through a train

3.4
quick service device
device that fulfils the quick service function

3.5
emergency braking
brake pipe pressure fall at the accelerator valve as a result of a demand for an emergency braking from any source

3.6
overcharge
increase in brake pipe pressure above normal working pressure

4 Design and manufacture

4.1 General

The design and manufacture of the brake pipe accelerators shall comply with this document.

4.2 Functional requirements

4.2.1 General

Brake pipe accelerators shall be able to operate with all distributors valves that conform with EN 15355:2019 and all existing brake pipe accelerators that comply with the requirements of this document.

The brake pipe accelerator shall be ready to operate when the brake pipe has reached the normal working pressure. The brake pipe accelerator shall operate in response to a defined rapid fall of brake pipe pressure to ensure a continuing rapid fall to below 2,5 bar.

4.2.2 Operating requirements

The following operating requirements are defined in relation to the normal working pressure of (5,00 ± 0,05) bar. When an emergency braking occurs, the brake pipe accelerators shall create a sufficiently rapid reduction in brake pipe pressure to ensure the rapid increase in brake cylinder pressure on every vehicle in the train set. When the pressure in the brake pipe has fallen quickly to below 2,5 bar, and within no more than 4 s after the brake pipe accelerator commences operation, the brake pipe accelerator shall stop venting air so that the brake pipe can rapidly be refilled. This requirement shall be proven by testing in accordance with 5.2.4.4.

No functional errors shall occur in the operation of the brake pipe accelerator at input pressures of (5,00 ± 1,00) bar. This requirement shall be proven by testing in accordance with 5.2.4.10.

4.2.3 Train behaviour

The brake pipe accelerator shall exhaust the air from the brake pipe without causing any adverse effect on train behaviour. This requirement shall be proven by testing in accordance with 5.3.

4.2.4 Effect of overcharge

4.2.4.1 Overcharge after full service braking

The brake pipe accelerator shall not come into operation due to the effect of a normal working pressure overcharge after a full service braking, which allows a build-up of brake pipe pressure above normal working pressure to 6,00 bar. It shall be taken into account that this overcharge can be present for up to 40 s in brake mode “G” and 10 s in brake mode “P” after a full service braking. This requirement shall be proven by testing in accordance with 5.2.4.8.

4.2.4.2 Overcharge starting from normal working pressure

The brake pipe accelerator shall not come into operation if the brake pipe pressure, starting from the normal working pressure, is raised to 6,0 bar for 2 s, then is reduced to 5,2 bar in 1 s, followed by a return to the normal working pressure at a rate of 0,15 bar in 60 s. This requirement shall be proven by testing in accordance with 5.2.4.9.

4.2.5 Effect of individual vehicle

The operation of the brake pipe accelerator shall not be affected by an individual vehicle with a brake pipe volume not exceeding 25 l, where a brake pipe accelerator is not fitted or the brake has been isolated. This shall apply irrespective of the position of that vehicle in the train consist. This requirement shall be proven by testing in accordance with 5.3.

4.2.6 Subsequent emergency braking

The brake pipe accelerator shall come into operation when an emergency braking is applied after a full service braking. This requirement shall be proven by testing in accordance with 5.2.4.7.

4.2.7 Sensitivity

The brake pipe accelerator shall come into operation as response to a drop in brake pipe pressure with a gradient of 1,80 bar in (3,0 + 0,1) s starting from input pressure of (5,00 ± 0,05) bar with a maximum delay of 2 s.

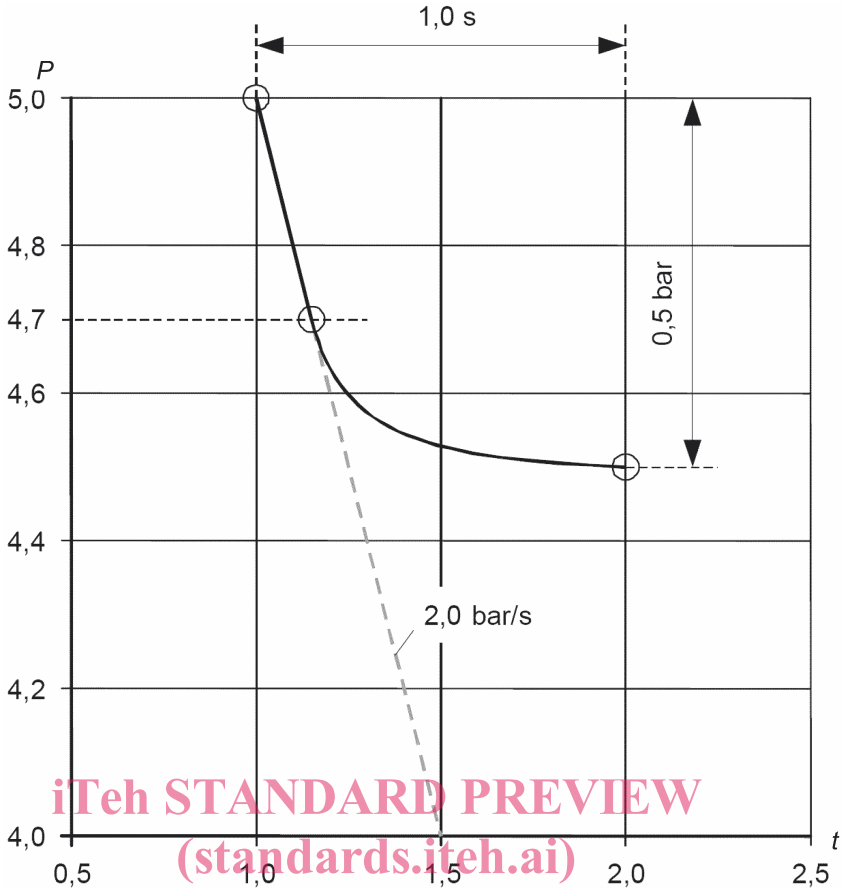
This requirement shall be proven by testing in accordance with 5.2.4.4.

4.2.8 Insensitivity to brake pipe pressure fall

The brake pipe accelerator shall not come into operation as response to a drop in brake pipe pressure with a gradient of 1,80 bar in (6,0 + 0,3) s starting from input pressure of (5,00 ± 0,05) bar. Continuing the pressure fall down to 2,5 bar shall not cause the brake pipe accelerator to operate. This requirement shall be proven by testing in accordance with 5.2.4.5.

4.2.9 Insensitivity to distributor valve quick service device operation

The brake pipe accelerator shall not operate during the initial stage of service braking due to operation of the distributor valve internal quick service device. The initial stage of service braking is characterized by a drop of the brake pipe pressure starting at (5,00 ± 0,05) bar by (0,50 ± 0,05) bar within 1,0 s, with the initial rate of 2,0 bar/s during the first pressure drop of (0,30 ± 0,05) bar as shown in Figure 2.



Key

P pressure, expressed in bar

t time, expressed in s

Figure 2 — Brake pipe pressure fall for insensitivity test

This requirement shall be proven by testing in accordance with 5.2.4.6.

4.2.10 Tightness

Tightness of the brake pipe accelerator shall be such that technical performance as specified by this document is met without restrictions.

The sealing arrangement within the brake pipe accelerator shall prevent loss of air as follows when considering a brake pipe pressure of 6,0 bar:

— At an environmental temperature of (20 ± 5) °C, the brake pipe accelerator shall not have a leakage rate of greater than 0,005 Nl/min. This requirement shall be proven by testing in accordance with 5.2.4.3;

— At –25 °C ≤ environmental temperature < 15 °C, also at 25 °C < environmental temperature ≤ 70 °C, the brake pipe accelerator shall not have a leakage rate of greater than 0,01 Nl/min. This requirement shall be proven by testing in accordance with 5.2.5;

— At –40 °C ≤ environmental temperature < –25 °C, the brake pipe accelerator shall not have a leakage rate of greater than 0,1 Nl/min. This requirement shall be proven by testing in accordance with 5.2.5.