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Road construction and maintenance equipment — Paver-finishers — Commercial specifications

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 195, *Building construction machinery and equipment*.

This second edition cancels and replaces the first edition (ISO 15878:2008), which has been technically revised. It also incorporates the Technical Corrigendum ISO 15878:2008/Cor 1:2008.

The main changes compared to the previous edition are as follows:

— clarification of the Scope;

— update of terminology to align with the state of the art;

— introducing definitions of different compaction types;

— combining the clauses ‘Operating principle’ and ‘Description of an asphalt paver’ into ‘Commercial specifications’.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Paver-finishers are used in road construction and for maintenance to place and pre-compact paving materials using the floating/self-levelling screed method. The weight of the screed and its forward motion combined with additional vibrating and reciprocating elements are used to pre-compact the mixture to form a mat.

The design type of a paver-finisher is typically determined according to the following criteria.

— Type of tractor:

  — wheeled (see Figure A.1);

  — steel crawler-mounted with replaceable track plates (see Figure A.2);

  — rubber crawler-mounted (see Figure A.3).

— Method of mixture transfer from hopper to the screed:

  — by slat conveyor (see Figure A.4);

  — by screw conveyor (see Figure A.12);

  — by gravity.

— Screed type:

  — fixed width (see Figure A.4);

  — extendable (see Figure A.13).

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Road construction and maintenance equipment — Paver-finishers — Commercial specifications

1 Scope

This document establishes the content for commercial specifications for paver-finishers used in road construction and maintenance processes for the placement and pre-compaction of paving materials. It covers the machine and its components and establishes parameters for technical characteristics for both.

This document does not cover commercial specifications for road wideners which can perform similarly to a paver-finisher under certain conditions.

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.

ISO 3046-1, *Reciprocating internal combustion engines — Performance — Part 1: Declarations of power, fuel and lubricating oil consumptions, and test methods — Additional requirements for engines for general use*

ISO 3911, *Wheels and rims for pneumatic tyres — Vocabulary, designation and marking*

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 https://www.iso.org/obp

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

3.1
paver-finisher
mobile self-propelled machine consisting of a *tractor* (3.66) and a free floating *screed* (3.45) intended for the placement and pre-compaction of the paving material using the floating/self-levelling screed method

3.1.1
pre-compaction screed paver-finisher
tractor (3.66) equipped with a *pre-compaction screed* (3.45.1)

3.1.2
compaction screed paver-finisher
tractor (3.66) equipped with a *compaction screed* (3.45.2)

3.1.3
high-compaction screed paver-finisher
tractor (3.66) equipped with a high-*compaction screed* (3.45.3)

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3.2
adjustable width strike-off
adjustable width mouldboard
movable blade at the leading edge of a *fixed width screed* (3.22) for varying paving width

Note 1 to entry: For an example, see Figure A.6.

3.3
angle of approach
angle between the *GRP* (3.25) and a plane tangent to the forward tyres or tracks of the machine and passing through the lowest point of any structure or component forward of the tyres or tracks which limits the magnitude of the angle

Note 1 to entry: See Figure A.20, angle α_1.

3.4
angle of departure
angle between the *GRP* (3.25) and a plane tangent to the rear tyres or tracks of the machine and passing through the lowest point of any structure or component behind the tyres or tracks which limits the magnitude of the angle

Note 1 to entry: See Figure A.20, angle α_2.

3.5
apron
area of the *hopper* (3.26) in front of the *conveyor* (3.14)

Note 1 to entry: For an example, see Figure A.10.

3.6
emission reducing device
ERD
system to extract or reduce emissions from bitumen or other volatile or suspended substances from the *screed* (3.45) area and the *paver-finisher operator stations* (3.8)

3.7
paver-finisher operator
person whose primary functions are to control paver speed, direction and laying of the paving material

3.8
paver-finisher operator station
designated location from which the *paver-finisher operator* (3.7) controls the functions of the paver

3.9
automatic feeder system control
system for automatic control of the flow of the paving material to the *screed* (3.45)

3.10
automatic screed control
system for automatic control of the *mat* (3.32) profile in relation to an external physical reference or 3D coordinates

3.11
bevel edger
attachment for putting a sloped surface on the edge of the *mat* (3.32)

3.12
bracing
device for reinforcing the *screed* (3.45) when built up for large working widths

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3.13
cut-off plate
attachment used in conjunction with the *screed end plate* (3.47) to reduce the effective *screed* (3.45) width

3.14
conveyor
device for transferring the paving material from the *hopper* (3.26) to the *spreading auger* (3.56)/*screed* (3.45)

Note 1 to entry: Examples include slat-type or screw-type.

Note 2 to entry: For examples, see Figure A.4 and Figure A.12.

3.15
conveyor tunnel
passageway through which the paving material moves from the *hopper* (3.26) to the *spreading auger* (3.56)/*screed* (3.45)

Note 1 to entry: For an example, see Figure A.4.

3.16
conveyor capacity
C
capacity in t/h, derived from the following formula:

$$C = D \cdot A \cdot S \cdot E$$

where:

- D is the paving material bulk density (1,75 t/m^3);
- A is the tunnel area, in m^2, as measured at the tunnel opening [total for all *conveyors* (3.14)];
- S is the maximum conveyor speed, in m/min, in paving mode, multiplied by 60;
- E is coefficient of conveyor efficiency (noting the conveyor efficiency used in the calculation)

3.17
conveyor flow gate
device for adjustment of the height of the paving material being transferred by the *conveyor* (3.14)

Note 1 to entry: For an example, see Figure A.4.

3.18
crown
angle between a section of *screed* (3.45) and the horizontal

Note 1 to entry: A positive crown is defined as the outer end of the screed lower than the inner end.

Note 2 to entry: See Figure A.25.

3.19
crown control
device that shapes the *screed* (3.45) to form a *mat* (3.32) with the desired *crown* (3.18)

Note 1 to entry: For an example, see Figure A.10.

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3.20
extendable screed
screed (3.45) with permanently mounted extensions that can be extended or retracted to change the *mat* (3.32) width when the paver is in operation

Note 1 to entry: For an example, see Figure A.13.

3.21
extension slope
angle (maximum positive to maximum negative) between the extension and the adjacent section of the *screed* (3.45)

Note 1 to entry: Positive slope is defined as the outer end of the extension lower than the inner end.

Note 2 to entry: See Figure A.26.

3.22
fixed width screed
screed (3.45) with a constant width that can only be changed by adding or removing *screed extensions* (3.48)

Note 1 to entry: For an example, see Figure A.10.

3.23
automatic grade control
automatic grade and slope control
system for control of the longitudinal profile of the *mat* (3.32) following a physical reference

Note 1 to entry: Examples include a joint, a string line, a curb, the base, a mobile reference, a *slope beam* (3.54) or following a 3D coordinate reference.

3.23.1
three-dimensional grade control
3D grade control
system that uses a three-dimensional coordinate as a reference to control the profile of the pavement

Note 1 to entry: This can include lateral control of the *tractor* (3.66) or *screed* (3.45).

Note 2 to entry: For an example, see Figure A.10.

3.23.2
three-dimensional paver control
3D paver control
system that uses a three-dimensional coordinate as a reference to control the profile of the pavement and the width and/or direction of the pavement

3.24
grade control sensor
device that provides a vertical reference measurement

3.24.1
physical referenced grade controller
grade control sensor (3.24) using physical reference

3.24.2
3D coordinates referenced grade controller
grade control sensor (3.24) using 3D coordinates as reference

Note 1 to entry: For an example, see Figure A.10.

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3.25
ground reference plane
GRP
plane on which the machine is placed for measurements: in the case of the base machine, a hard, level surface; in the case of equipment and attachments, either a hard, level surface or compacted earth

Note 1 to entry: The surface used depends on the intended use of the machine and its equipment and attachments.

[SOURCE: ISO 6746-1:2003, 3.2]

3.26
hopper
component of the *paver-finisher* (3.1) which receives the paving material from an external source

Note 1 to entry: For an example, see Figure A.4.

3.27
hopper capacity
struck volume of the *paver-finisher* (3.1) *hopper* (3.26) including the volume of the *conveyor* (3.14) in front of the rear hopper wall

3.28
hopper insert
device to increase *hopper capacity* (3.27)

3.29
machine clearance circle
radius of the smallest circle which encloses the outermost point of the machine projection with the machine in operating configuration while executing its sharpest practical turn

Note 1 to entry: See Figure A.22, dimension R_1.

3.30
operating mass
mass of the machine in operating configuration with a 75 kg *paver-finisher operator* (3.7)

Note 1 to entry: On wheeled machines, the mass of the tyre ballast is included (if provided or recommended by the machine manufacturer).

3.31
shipping mass
mass of the machine as shipped by the manufacturer including the standard components detached and shipped loose with the machine

3.32
mat
paving material that has been placed by a *screed* (3.45) or *strike-off* (3.59)

3.33
material feed system
combined *conveyor* (3.14) and auger components that transfer the paving material from the *hopper* (3.26) and distribute it in front of the *screed* (3.45)

Note 1 to entry: For an example, see Figure A.4.

3.34
material feed sensor
device used to detect the quantity of the paving material in front of the *screed* (3.45)

Note 1 to entry: For an example, see Figure A.4.

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3.35
material retaining plate
material limiting plate
attachment installed in front of a *spreading auger* (3.56) extension to prevent the paving material from flowing forwards

3.36
mobile grade reference
towed attachment that provides an independent reference for the *automatic grade control* (3.23)

Note 1 to entry: For an example, see Figure A.10.

3.37
overall operating height
vertical distance from the *GRP* (3.25) to the highest point of the machine with the machine in operating configuration

Note 1 to entry: See Figure A.21, dimension H_3.

3.38
overall shipping height
vertical distance from the *GRP* (3.25) to the highest point of the machine in shipping configuration

Note 1 to entry: See Figure A.23, dimension H_4.

3.39
overall operating length
longitudinal distance between the extreme front and rear points of the machine with the machine in operating configuration

Note 1 to entry: See Figure A.23, dimension L_1.

3.40
overall shipping length
longitudinal distance between the extreme front and rear points of the machine with the machine in shipping configuration

Note 1 to entry: See Figure A.23, dimension L_2.

3.41
overall operating width of the tractor
minimum transverse distance between the extreme points of either side of the *tractor* (3.66) with the machine in operating configuration, but with the *hopper* (3.26) wings lowered

Note 1 to entry: See Figure A.24, dimension W_2.

3.42
overall shipping width
transverse distance between the extreme points on the sides of the machine with the *tractor* (3.66) in shipping configuration

Note 1 to entry: See Figure A.21, dimension W_6.

3.43
paving speed
forward speed over a hard, horizontal surface in the designated range

3.44
push-roller
device that contacts the tyres of the paving material delivery vehicle

Note 1 to entry: For an example, see Figure A.4.

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3.45
screed
device towed behind the *tractor* (3.66) to strike off, compact, contour and smooth the paving material

Note 1 to entry: For an example, see Figure A.13.

3.45.1
pre-compaction screed
screed (3.45) that compacts the paving material by the profile of the front of the *screed plate* (3.52), the angle of attack and its weight

Note 1 to entry: For an example, see Figure A.14.

3.45.2
compaction screed
screed (3.45) fitted with a single compaction system in addition to the pre-compacting system.

Note 1 to entry: The additional compaction system can include vibrators, *tamper bars* (3.60) or *pressure bars* (3.73).

Note 2 to entry: For examples see Figure A.15 and Figure A.16.

3.45.3
high-compaction screed
screed (3.45) fitted with at least two compaction systems in addition to the pre-compacting system

Note 1 to entry: The additional compaction systems can include vibrators, *tamper bars* (3.60) or *pressure bars* (3.73).

Note 2 to entry: For examples see Figure A.17, Figure A.18 and Figure A.19.

3.46
tow arm
attachment by which the *screed* (3.45) is connected to and towed by the *tractor* (3.66)

Note 1 to entry: For an example, see Figure A.4.

3.47
screed end plate
vertically adjustable plate at the outboard end of the *screed* (3.45), which retains the paving material and forms the edge of the *mat* (3.32)

Note 1 to entry: For an example, see Figure A.4.

3.48
screed extension
bolt-on attachment to the *screed* (3.45) to increase the width of the *mat* (3.32)

Note 1 to entry: For an example, see Figure A.2.

Note 2 to entry: The screed extension can be fixed or adjustable.

Note 3 to entry: Screed extensions can be used to extend fixed or *extendable screeds* (3.20).

3.49
screed heater
device to heat the *screed plate* (3.52) to minimize adhesion of the paving material

3.50
screed lift
device used to raise the *screed* (3.45)

Note 1 to entry: For an example, see Figure A.10.

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3.51
screed mounted paver-finisher operator control
device used to control some of the paving functions of the *screed* (3.45)

3.52
screed plate
component of the *screed* (3.45) that shapes and smoothes the top surface of the *mat* (3.32)

Note 1 to entry: For an example, see Figure A.14.

3.53
screed travel lock
device that secures the *screed* (3.45) in the raised position

Note 1 to entry: For an example, see Figure A.11.

3.54
slope beam
component on which the *slope sensor* (3.55) is mounted

Note 1 to entry: For an example, see Figure A.10.

3.55
slope sensor
device that reports gravity-based angles

Note 1 to entry: For an example, see Figure A.10.

3.56
spreading auger
screw *conveyor* (3.14) used for transverse distribution of paving material ahead of the *screed* (3.45)

Note 1 to entry: For an example, see Figure A.2.

3.57
spreading auger ground clearance
vertical distance [*screed* (3.45) position up/down] from the *GRP* (3.25) to the lowest point of the auger, including reversing paddles

Note 1 to entry: See Figure A.20, dimension H_1.

3.58
steering guide
sighting device to enable the *paver-finisher operator* (3.7) to follow a predetermined course

Note 1 to entry: For an example, see Figure A.4.

3.59
strike-off
height-adjustable mouldboard
attachment at the front of a *screed* (3.45) for metering the paving material flowing under the screed

Note 1 to entry: For an example, see Figure A.5, Figure A.6, Figure A.7, Figure A.8 and Figure A.9.

3.60
tamper bar
component on the *screed* (3.45), used to provide additional compaction of the paving material

Note 1 to entry: For an example, see Figure A.16.

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3.61
thickness control
device to manually adjust the *mat* (3.32) thickness

Note 1 to entry: See Figure A.4.

3.62
three-dimensional positioning system
3D positioning system
system that provides positional data based on a three-dimensional coordinate system

3.63
tow point
pull point
point at which the *tow arm* (3.46) is attached to the *tractor* (3.66)

Note 1 to entry: For an example, see Figure A.4.

3.64
track length
track length on ground
longitudinal distance of a track in contact with the *GRP* (3.25)

Note 1 to entry: See Figure A.23, dimension L_3.

3.65
track width
transverse width of the track in contact with the *GRP* (3.25)

Note 1 to entry: See Figure A.24, dimension W_4.

3.66
tractor
component of a paver which provides propulsion and can also receive, convey and distribute the paving material

Note 1 to entry: For an example, see Figure A.4.

Note 2 to entry: The tractor can be either wheeled, steel crawler-mounted or rubber crawler-mounted.

3.67
maximum travel speed
maximum forward speed over a hard, horizontal surface in the highest speed range

3.68
truck-hitch
device used to hold a paving material delivery vehicle in the proper position relative to the paver when unloading the material into the *hopper* (3.26)

3.69
turning radius
distance from the turning centre to the centre of contact with the ground of the wheel describing the largest circle while the machine is executing the sharpest practical turn

Note 1 to entry: See Figure A.22, dimension R_2.

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3.70
truck entry clearance height
vertical distance from the *GRP* (3.25) to the highest non-removable point on the *hopper* (3.26) or *apron* (3.5) which would restrict the entry of a truck into the hopper, with the machine in operating configuration

Note 1 to entry: Points more than 1,3 m on either side of the longitudinal centre or more than 1,0 m rearward of the front of the *push-rollers* (3.44) shall be disregarded.

Note 2 to entry: See Figure A.23, dimension H_5.

3.71
truck entry clearance width
transverse distance between the innermost points of the *hopper* (3.26) sides which would restrict the entry of a truck into the hopper, measured at or above the *truck entry clearance height* (3.70), with the machine in operating configuration

Note 1 to entry: Points more than 1,0 m rearward of the front of the *push-rollers* (3.44) shall be disregarded.

Note 2 to entry: See Figure A.24, dimension W_5.

3.72
wheel base
longitudinal distance from the centre of the rear tyre to the centre of the front tyre

Note 1 to entry: For bogie front suspension, the distance is measured to the bogie pivot.

Note 2 to entry: For tandem drive axles, the distance is measured to a point midway between the axles.

Note 3 to entry: See Figure A.20, dimension L_4.

3.73
pressure bar
component on the *screed* (3.45), used to provide additional compaction of the paving material

4 Commercial specifications

4.1 Type of paver-finisher

The type of the paver-finisher, for example, wheeled, steer crawler-mounted or rubber crawler-mounted with fixed width screed or extendable screeds with or without bolt-on extensions, shall be specified. The method of mixture transfer from hopper to the screed (material feed system) and the type of material compaction system (e.g. pre-compaction screed paver-finisher, compaction screed paver-finisher, high-compaction screed paver-finisher) shall also be specified.

Annex A gives examples of various types of paver-finishers, screed types and other features.

NOTE The examples of specifications for different types of asphalt paver-finisher are presented in Figure A.4, Figure A.10, Figure A.11 and Figure A.12.

4.2 Basic characteristics of paver-finishers

The following parameters shall be specified:

a) Laying performance:

— maximum laying capacity t/h

— minimum paving width mm

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