

FINAL
DRAFT

INTERNATIONAL
STANDARD

ISO/FDIS
24147

ISO/TC 195/SC 2

Secretariat: DIN

Voting begins on:
2023-09-22

Voting terminates on:
2023-11-17

Road operation machinery and associated equipment — Sweepers — Commercial specifications

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ISO/FDIS 24147

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Reference number
ISO/FDIS 24147:2023(E)

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Published in Switzerland

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Foreword

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This document was prepared by Technical Committee ISO/TC 195, *Building construction machinery and equipment*, Subcommittee SC 2, *Road operation machinery and associated equipment*.

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.

Introduction

This document defines commercial specifications for road surface cleaning machines which are designed to clean debris from improved road and pavement surfaces. These machines are typically equipped with a pick-up system and can convey the spoil into the hopper which can be then be discharged at a dumping ground, unload station, in a debris container or refuse reload stations. Road surface cleaning machines are equipped with sweep gear to scarify debris.

Chassis-mounted sweepers typically have a large capacity hopper and are designed to operate on streets, highways, airports and large vehicle parking areas (i.e. traffic areas) or industrial plants where a larger volume of debris needs to be swept.

Self-propelled sweepers and pedestrian-controlled sweepers typically have a lesser capacity hopper and, by design, are more manoeuvrable to clean debris from narrow streets, pedestrian zones or small parking lots.

Towed sweepers (e.g. towed by a tractor or other vehicle) can be used for similar applications as mentioned above.

Additional equipment for special cleaning applications can also be attached to a sweeper.

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Road operation machinery and associated equipment — Sweepers — Commercial specifications

1 Scope

This document establishes content for commercial specifications for sweepers that are self-propelled (see [Annex A](#)) with an integrated chassis, chassis-mounted, towed behind a vehicle or are pedestrian-controlled.

This document applies to road surface cleaning machines used in outdoor improved surface applications for cleaning debris from public areas, roads, airports and industrial plants. This document does not specifically cover the carrier vehicle or towing vehicle (e.g. lorry).

This document does not apply to:

- cleaning machines for winter maintenance;
- cleaning machines for indoor applications;
- rotary road brush attachments which can be coupled to tractors and other machinery;
- machines or components that are specifically designed for cleaning tram lines and rail tracks;
- industrial sweepers.

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 22242, *Road construction and road maintenance machinery and equipment — Basic types — Identification and description*

ISO 14396, *Reciprocating internal combustion engines — Determination and method for the measurement of engine power — Additional requirements for exhaust emission tests in accordance with ISO 8178*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22242 and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

road surface cleaning machine sweeper

machine designed for cleaning debris from improved surfaces

Note 1 to entry: Road surface cleaning machines can move debris to a *hopper* (3.3) or other type of disposal container which is attached to the machine by mechanical or pneumatic means, or by combination of each.

Note 2 to entry: Combinations of these types of road surface cleaning machines are possible.

3.1.1

chassis-mounted sweeper

sweeper (3.1), where the sweeping attachments are fixed or mounted on a carrier vehicle chassis

EXAMPLE Truck.

Note 1 to entry: Chassis-mounted sweepers are classified as large or small depending on the net volume capacity.

Note 2 to entry: See [Table 1](#).

3.1.2

self-propelled sweeper

sweeper (3.1) with a specially designed chassis, where the sweeping attachments are integrated

Note 1 to entry: This machine can be a ride-on machine, operator-assisted machine or pedestrian-controlled machine fitted with a seat or a sulky. See [Figures A.1](#) to [A.3](#) for further information.

Note 2 to entry: Self-propelled sweepers are categorized as maxi-compact, compact, midi-compact, or mini-compact depending on the net volume capacity.

Note 3 to entry: See [Figures A.1](#) to [A.6](#).

3.1.3

mechanical sweeper

machine whereby debris collected by a *sweeping gear* (3.4) from the road surface is transported and deposited into the *hopper* (3.3) by means of a mechanical device

EXAMPLE A conveyor system is used.

Note 1 to entry: See [Figure A.4](#).

3.1.4

vacuum sweeper

machine whereby debris collected by a *sweeping gear* (3.4) from the road surface is transported and deposited into the *hopper* (3.3) by means of air movement, provided by an impeller or a fan, with the air subsequently ventilated to atmosphere

Note 1 to entry: See [Figure A.6](#).

3.1.5

regenerative air sweeper

machine whereby debris collected by a *sweeping gear* (3.4) from the road surface is transported and deposited into the *hopper* (3.3) by means of air movement, provided by an impeller or a fan, with the air recirculating back to the pick-up device

Note 1 to entry: See [Figure A.5](#).

3.1.6

street-washing machine

machine that deposits water under pressure onto the road surface from an onboard water tank

3.1.7

street-flushing machine

machine that deposits water without pressure onto the road from an onboard water tank

3.1.8

suction machine

machine whereby debris collected from the road surface by an air suction system with pickup heads is transported and deposited into the *hopper* (3.3) by means of air movement, provided by an impeller or a fan

3.1.9**towed sweeper**

sweeper (3.1) with a *sweeping gear* (3.4) with or without a collecting system

EXAMPLE Trailer sweeper as shown in [Figure A.8](#).

3.1.10**pedestrian-controlled sweeper**

self-propelled sweeper (3.1.2) normally controlled by the operator walking with the unit

Note 1 to entry: See [Figure A.7](#).

3.2**traffic area**

paved area in which there is vehicular and or pedestrian traffic

Note 1 to entry: Not included are railway tracks, which are solely for rail-mounted traffic, as well as traffic areas inside buildings and underground.

3.3**hopper**

container to collect debris

3.4**sweeping gear**

gear that transports road debris to the pick-up location of the *sweeper* (3.1)

Note 1 to entry: Sweeping gear is the collective name for all components such as *broom(s)* (3.5) and related control systems.

3.5**broom**

brush

device with bristles that rotates to move debris

Note 1 to entry: Broom(s) can be of various types and be used in various configurations. Rotation axis of broom(s) can be horizontal or vertical.

3.6**water recirculation system**

system which allows water to return to the sweeping process after separating debris, e.g. by filters or sieves and, in some cases, by a separator

3.7**debris pick-up system**

air suction system with pick-up heads, tubes, hoses and fan system or mechanical pick-up system with *broom(s)* (3.5) and conveyer belts with any hybrid system in between to transport the debris into the *hopper* (3.3)

Note 1 to entry: See [Figure E.1](#).

Note 2 to entry: The debris pick-up system can either be an air suction system or a mechanical pick-up system with broom(s) and conveyer belts.

3.8
shipping mass

SM
mass of the *sweeper* (3.1) without an operator, with the fuel level at 10 % of tank capacity or with the minimum fuel level needed for machine shipping purposes as specified by the manufacturer, whichever is higher, with all fluid systems at the levels specified by the manufacturer and with empty water tank(s), when applicable, and with or without equipment, attachment(s) as stated by the manufacturer

Note 1 to entry: If the manufacturer intends that the machine be partially disassembled for shipping purposes, the masses of the disassembled items are also be stated and included in any transportation skid (e.g. wooden pallets) and protective packaging.

3.9
gross volume capacity of the hopper

total inner volume of the *hopper* (3.3)

Note 1 to entry: See [Figure E.1](#).

Note 2 to entry: The volume is measured by calculation by determining the inner volume below the screen (if not fitted, then up to roof level) minus the volume of all mechanical parts, which are placed inside the hopper, e.g. fan, suction-tube, exhaust-filter and actuators and separate dirt water storage.

3.10
net volume capacity of the hopper

maximum solid and liquid debris contents that can be held by the *hopper* (3.3)

Note 1 to entry: See [Figure E.1](#).

Note 2 to entry: The volume is measured by calculation by determining the inner volume below the screen minus the volume of all mechanical parts, which are placed inside the hopper, e.g. fan, suction-tube, exhaust-filter and actuators and separate *debris water storage* (3.13).

3.11
loading capacity

useful load (net load) indicated in kilograms which is the gross mass of the vehicle minus the *shipping mass* (3.8) of the vehicle

Note 1 to entry: See also *gross volume capacity of the hopper* (3.9).

[SOURCE: EN 15429-1:2007, 4.4, modified — Note 1 to entry has been added.]

3.12
fresh water tank capacity

maximum usable volume of the fresh water tank

3.13
debris water storage

maximum usable debris water volume

3.14
sweeping path width

maximum cleaned width behind the *sweeper* (3.1) in the straight direction of motion with new *broom(s)* (3.5) in the maximum working position, without leaving debris trails between broom(s) and *debris pick-up system* (3.7)

Note 1 to entry: See also *shipping mass* (3.8).

3.15 turning and sweeping dimensions

circles of the chassis and *broom(s)* (3.5) measured to the outer and innermost parts in the working position

Note 1 to entry: External turning circle of the machine and *sweepers* (3.1) are relevant for sweeping between walls. For an illustration of the dimensions, see [Figure B.1](#).

Note 2 to entry: Each vehicle has right-hand and left-hand turning clearance circles.

3.16 working area

area for working operations of units as side gutter *broom(s)* (3.5), side roller broom(s) as far as a *debris pick-up system* (3.7)

Note 1 to entry: The working area can also be outside of the vehicle profile and can be adjustable.

Note 2 to entry: The working area for *sweepers* (3.1) can be public *traffic area* (3.2).

EXAMPLE Right-hand or left-hand driven debris pick-up.

3.17 brush inclination

angle between the brush drive shaft and the vertical reference line

Note 1 to entry: Brush inclination angles shall be in accordance with [Annex C](#).

EXAMPLE Right-hand or left-hand driven debris pick-up.

3.18 hopper discharge angle

maximum angle under which the tipped *hopper* (3.3) can be discharged

Note 1 to entry: The hopper discharge angle shall be in accordance with [Annex D](#).

Note 2 to entry: The hopper discharge angle is measured between the inner hopper bottom and the ground.

3.19 hopper dumping height

vertical distance measured between the ground and the lowermost edge of *hopper* (3.3) dumping lip or any other parts of the dumping mechanism at the maximum discharge angle under unladen conditions that indicates maximum height of piled debris

Note 1 to entry: The hopper dumping height shall be in accordance with [Annex D](#) and [Annex E](#).

3.20 hopper dumping clearance

vertical distance measured between the ground and the lowermost edge of the *hopper* (3.3) or any other parts of the dumping mechanism at the maximum discharge angle under unladen conditions that clears the maximum height of mating container

Note 1 to entry: The hopper dumping clearance shall be in accordance with [Annex D](#) and [Annex E](#).

3.21 hopper dumping reach

horizontal distance measured between rear end of the machine and *hopper* (3.3) discharge door that enables closer access to mating container

Note 1 to entry: The hopper dumping reach shall be in accordance with [Annex D](#) and [Annex E](#).

3.22

dust suppression water system

device or set of components used to reduce the amount of fugitive dust emission from a *sweeper* (3.1) by using water sprays

3.23

gross vehicle mass

GVM

gross vehicle weight

GVW

maximum machine mass as approved by the manufacturer, which combines the *operating mass (OM)* (3.24) of the machine with the heaviest combination of equipment and attachments, the heaviest combination of optional equipment, the *loading capacity* (3.11), as specified by the manufacturer, and, when applicable, full water tank(s), full *debris water storage* (3.13) and the rated ballast mass (BM)

Note 1 to entry: The gross vehicle mass may be regulated by laws or regulations for the respective region

3.24

operating mass

OM

mass of the *sweeper* (3.1), with equipment (and attachment) and empty *hopper* (3.3) and *debris water storage* (3.13) in the most usual configuration as specified by the manufacturer, and with the operator mass, full fuel tank(s) and all fluid systems (i.e. hydraulic oil, transmission oil, engine oil, engine coolant) at the levels specified by the manufacturer and, when applicable, with full water tank(s)

Note 1 to entry: The mass of the operator can differ depending on the respective region.

Note 2 to entry: The mass of the operator is not included for pedestrian-controlled-sweepers.

3.25

overall length

distance between front and rear outermost fixed parts

Note 1 to entry: Wander hoses and high-pressure cleaner and other mounted attachments are fixed parts.

3.26

overall width

distance between left and right outermost fixed parts

Note 1 to entry: Wander hoses and high-pressure cleaner and other mounted attachments are fixed parts.

3.27

overall height

distance from ground level up to uppermost edge of fix parts

EXAMPLE Roof or fixed beacon.

Note 1 to entry: If warning beacon is tiltable, then the distance is in between ground level and uppermost edge of the fix parts.

4 Classification

Sweepers covered by this document are classified in [Table 1](#).