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Sweepers —

Part 1: Classification and Terminology

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ICS 01.040.43; 43.160

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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

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Contents

Page

Foreword 3
Introduction 4
1 **Scope** 5
2 **General terms and definitions** 5
3 **Terms and definitions for characteristics of functional components** 6
4 **Terms and definitions for machine and functional component characteristics** 7
5 **Classification** 11
Annex A (informative) 12
Bibliography 13

Foreword

This document (EN 15429-1:2007) has been prepared by Technical Committee CEN/TC 337 “Winter maintenance and road service area maintenance equipment”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 2008, and conflicting national standards shall be withdrawn at the latest by April 2008.

Part 2 of this European Standard specifies the performances and the test methods

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Introduction

Generally all road surface cleaning machines are designed to clean paved surfaces. Most of these machines are equipped with a pick-up system and can convey the spoil into the hopper. The hopper can be discharged at dumping grounds, unload stations, in container or refuse reload stations. Road surface cleaning machines are equipped with sweep gear to scarify debris.

Sweepers are working at traffic and industrial areas with most different kinds of surface fixation. Applications are depending mainly on dimensions of sweepers. Sweepers with bigger volume are designed to operate mainly to clean streets, highways, motorways, ordinary roads and bigger parking places or industrial plants.

Sweepers with smaller volume and dimensions are designed for the cleaning of streets, pedestrian zones, pavements, bicycle lanes, parking lots, market places or industrial plants etc. Manoeuvrability is a main characteristic of such kind of sweeper.

Depending on dimensions attached sweeping equipment’s (e.g. mounted at a tractor or other machines) are used in similar applications as mentioned above.

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

1 Scope

This document applies to surface cleaning machines for outdoor applications on public areas, roads, airports and industrial plants. Cleaning machines for winter maintenance or indoor applications are not under the scope of this European Standard. Surface cleaning machines in terms of this Standard are self propelled, truck mounted, attached sweeping equipment or pedestrian controlled.

This document deals with the classification of sweeping equipment and its performance specifications when they are used as intended and under the conditions foreseen by the manufacturer.

This document does not include the carrier vehicles (e.g. truck). These will be handled in national or EC Directives for vehicles.

This document does not apply to road surface cleaning machines such as front mounted on tractors according to EN 13524, or other vehicles.

This document does not apply to machines or components that are specifically designed for cleaning tram lines and rail tracks.

This document applies to machines that are manufactured after the date of approval of this standard by CEN.

Industrial sweepers within the scope of EN 60335-2-72 are excluded.

2 General terms and definitions

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

2.1
sweeper
machine primarily for sweeping material from airports, highways or other traffic areas (e. g. parking areas, market places pedestrian zones, pavements, bicycle lanes, parking lots). These machines are fixed or dismountable attached on a carrier vehicle, on a specially designed chassis, on a pedestrian controlled vehicle or on a towed vehicle.

Sweeper can move material to a hopper or other type of container attached to the machine by mechanical or pneumatic means, or by combination of each.

Sweeper can be grouped into several sub-types

2.1.1
truck mounted sweeper
sweeping machine, where the sweeping attachments are fixed or mounted on a standard vehicle-chassis, e.g. truck.

Truck mounted sweepers are subdivided into:

— large;

— small;

primarily depending on the net volume capacity

2.1.2
self-propelled sweeper
compact sweeper with a specially designed chassis, where the sweeping attachments are integrated. This machine can be a ride-on machine, operator-assisted machine or pedestrian controlled machine fitted with a seat or a sulky.

Self-propelled machines are subdivided into:

— maxi-compact-sweeper;

— compact-sweeper;

— midi-compact sweeper;

— mini-compact-sweeper;

primarily depending on the net volume capacity.

2.1.3
attached sweeping equipment
towed sweeping attachments, with sweeping gear with or without a collecting system (e.g. trailer sweeper)

2.1.4
pedestrian controlled sweeping equipment
self propelled sweeping machine, normally controlled by the operator walking with the unit

2.2
traffic areas
paved areas on which there is vehicular and or pedestrian traffic. Not included are railway tracks, which are solely for rail-mounted traffic, as well as traffic areas inside buildings and underground

3 Terms and definitions for characteristics of functional components

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

3.1
hopper
container to collect sweepings

3.2
sweeping gear
sweeping gear that transports road dirt to the pick-up location of the sweeper and is the collective name for all components such as brushes, brooms and related control systems. Brushes can be of various types and be used in various configurations

3.3
water recirculation system
system which after separating dirt, e.g. by filters or sieves and, in some cases, by a separator, allows water to return to the sweeping process

3.4
dirt pick-up system
dirt pick-up system can either be an air suction system with pick-up heads, tubes, hoses and fan system or a mechanical pick-up system with brushes and conveyer belts with any hybrid system in between to transport the dirt into the hopper

4 Terms and definitions for machine and functional component characteristics

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

4.1
unladen weight
weight of the most standard equipped sweeper (as defined by the manufacturer) with full fuel, hydraulic and cooling systems, an operator of 75 kg, without accessory parts and without load, indicated in kilograms

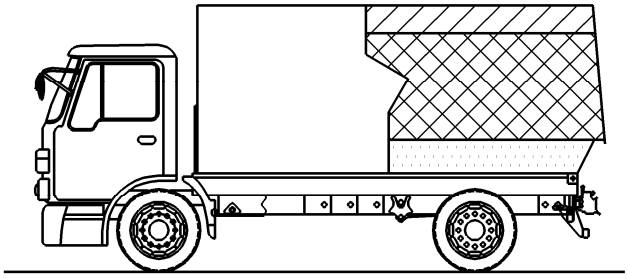
4.2
gross volume capacity of the hopper
complete inner volume of the hopper, indicated in metres cubed. The volume will be measured arithmetically (see Figure 1)

4.3
net volume capacity of the hopper
maximum solid and liquid dirt contents, that can be held by the hopper, indicated in m^3. The volume will be measured arithmetically. It is 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 dirt water storage (see Figure 1)

4.4
loading capacity
useful load (net load) indicated in kilograms is the gross weight of the vehicle minus the unladen weight of the vehicle

4.5
content of the fresh water tank
maximum usable volume of the fresh-water-tank measured in litres (see Figure 1)

4.6
content of the dirt water storage
maximum usable dirt-water-volume measured in litre



Key

Gross volume capacity of the hopper

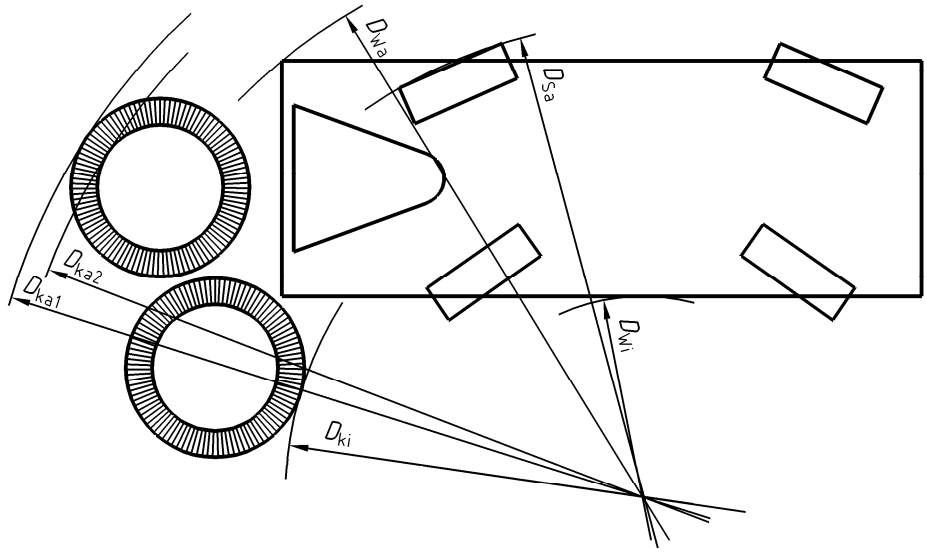
Net volume capacity of the hopper

Volume of the water tank

Figure 1 — Hopper capacity and water tank volume

4.7
sweeping width
maximum cleaned width behind the sweeper in the straight direction of motion with new broom(s) in the maximum working position, without leaving dirt trails between brush and dirt pick-up system, indicated in metres

4.8
turning and sweeping dimensions



Key

D_{ka1} = external sweeping circle of machine, measured to the outermost brush in working position (relevant for sweeping between walls)

D_{ka2} = external turning circle of machine, measured to the non-flexible parts of the outermost brush in transport position (relevant for turning between walls)

D_{ki} = inner sweeping circle of machine, measured to the innermost brush in working position without interruption of the sweeping and steering operation

D_{Sa} = turning circle of machine, measured at the outside of the outermost wheel

D_{Wa} = turning circle of the machine, measured at the outermost front machine contour

D_{Wi} = turning circle of the machine, measured at the innermost machine contour

NOTE Each vehicle has right-hand and left-hand turning clearance circles.

Figure 2 —Turning and sweeping dimensions

4.9
working area
area for working operations of units as gutter broom, roller broom as far as a dirt pick-up system. The working area can also be outside of the vehicle profile and can be adjustable (for example right or left-hand dirt pick-up)

4.10
brush inclination
angle between the brush drive shaft and the vertical reference line

The inclination is specified by two angle components (see Figure 3):

Angle on the vertical longitudinal plane of the vehicle (forward angle): β

Angle on the vertical transversal plane of the vehicle (sideward angle): γ

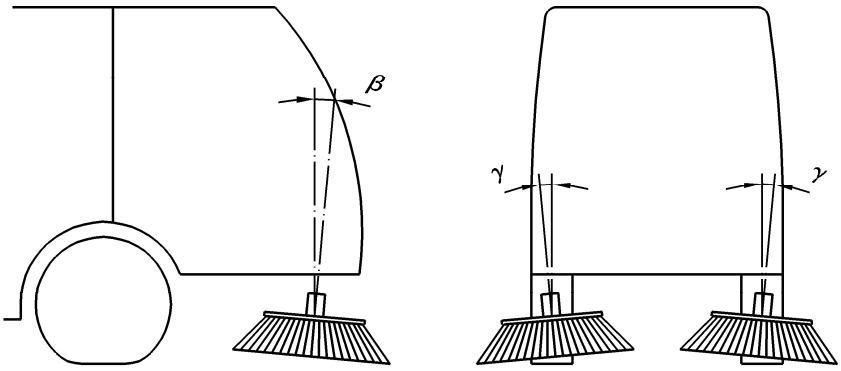
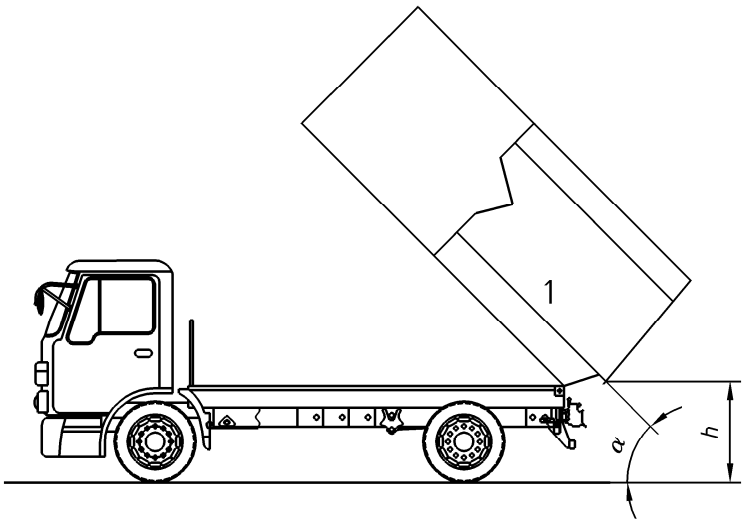


Figure 3 — Brush inclination angles

If the brushes are transversally able to be relocated, angles have to be specified in maximum extended and retracted position

4.11
hopper discharge angle (α)
max. angle α (°) under which the tipped hopper can be discharged measured between the inner hopper bottom and the ground ((see Figure 4)

4.12
hopper dump height (*h*)
height *h* (mm) measured between ground and the lower edge of hopper dumping lip, during max. discharge angle under unladen conditions (see Figure 4)



Key

1 hopper bottom
α discharge angle
h hopper dump height

Figure 4 — Hopper discharge angle and dump height

5 Classification

Sweepers can be divided into three machine types (see Table 1).

Table 1 — Classification of Sweeper

Machine type	Sub-Type	Net Volume Capacity m^3
Truck mounted sweeper	Large	> 4
	Small	≤ 4
Self-propelled sweeper	Maxi-Compact-Sweeper	> 2,5
	Compact-Sweeper	≤ 2,5
	Midi-Compact-Sweeper	≤ 1
	Mini-Compact-Sweeper	≤ 0,2
Attached sweeping equipment	with hopper	≤ 1

Annex A
(informative)

The following table shows possible applications of sweepers depending on design and volume.

Table A.1

Machine type	Sub Type	Net Volume Capacity m^3	Application									
			pedestrian areas	pavements	covered park stores	market places	streets	ordinary roads	parking places	Highways / Motorways	Airport (Runways)	industrial cleaning
Truck mounted sweeper	**Large**	**> 4**										
	Small	**≤ 4**										
Self-propelled sweeper	**Maxi-Compact-Sweeper**	**> 2,5**										
	Compact-Sweeper	**≤ 2,5**										
	Midi-Compact-Sweeper	**≤ 1**										
	Mini-Compact-Sweeper	**≤ 0,2**										
Attached sweeping equipment	**with collection-system**	**…**										
	without collection-system	**…**										

Likely **Possible** **Not likely**

Bibliography

[1] EN 13019, Machines for road surface cleaning — Safety requirements

[2] EN 13524, Highway maintenance machines — Safety requirements

[3] EN 60335-2-72, Safety of household and similar electrical appliances — Part 2-72: Particular requirements for automatic machines for floor treatment for commercial and industrial use (IEC 60335-2- 72:1995, modified)

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