



SLOVENSKI STANDARD
oSIST prEN 17106-3-1:2017
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**Obratovanje cestnih strojev - Varnost - 3-1. del: Stroji za storitve zimske službe -
Zahteve za stroje za čiščenje snega z vrtljivimi orodji in snežnimi plugi**

Road operation machinery - Safety - Part 3-1: Winter service machines - Requirements
for snow clearing machines with rotating tools and snow ploughs

Maschinen für den Straßenbetriebsdienst - Sicherheit - Teil 3-1 Maschinen für den
Winterdienst - Anforderungen für Schneeräumgeräte mit rotierenden Werkzeugen

Machines d'exploitation des routes - Sécurité - Partie 3-1 : Machines de service hivernal
- Exigences pour les Fraises à neige

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43.160 Vozila za posebne namene Special purpose vehicles

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EUROPEAN STANDARD
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English Version

Road operation machinery - Safety - Part 3-1: Winter service machines - Requirements for snow clearing machines with rotating tools and snow ploughs

Machines d'exploitation des routes - Sécurité - Partie 3-1 : Machines de service hivernal - Exigences pour les Fraises à neige

Maschinen für den Straßenbetriebsdienst - Sicherheit - Teil 3-1 Maschinen für den Winterdienst - Anforderungen für Schneeräumgeräte mit rotierenden Werkzeugen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 151.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17106-3-1:2017) has been prepared by Technical Committee CEN/TC 151 “Construction equipment and building material machines - Safety”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13019:2001+A1:2008, EN 13021:2003+A1:2008, EN 13524:2003+A2:2014.

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(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

prEN 17106 consists of the following parts, under the general title road operation machinery:

- Part 1: General requirements
- Part 2: Requirements for road surface cleaning machines
- Part 3-1: Winter service machines - Requirements for snow clearing machines with rotating tools and snow ploughs
- Part 3-2: Winter service machines - Requirements for spreading machines
- Part 4-1: Road service area maintenance machines - Requirements for grass and brush/hedge cutting machines
- Part 4-2: Road service area maintenance machines - Requirements for mechanical plant/branch cutting machines

prEN 17106-3-1:2017 (E)**Introduction**

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situation and events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those, which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

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1 Scope

This European Standard, together with part 1, deals with all significant hazards for winter service machines – snow cleaning machines with rotating tools when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer associated with the whole life time of the machine (see Clause 4).

The requirements of this part are complementary to the common requirements formulated in prEN 17106-1:2017.

This document does not repeat the requirements from prEN 17106-1:2017, but adds or replaces the requirements for application for winter service machines – snow cleaning machines with rotating tools.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 17106-1:2017, *Road operation machinery - Safety - Part 1: General requirements*

EN ISO 6682:2008, *Earth moving machinery — Zones of comfort and reach for controls (ISO 6682:1986, including Amendment 1:1989)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN 15583-2:2012, *Winter maintenance equipment - Snow ploughs - Part 2: Testing criteria and their requirements*

ISO/DIS 5006:2016, *Earth-moving machinery — Operator's field of view — Test method and performance criteria*

ISO 14401-1:2009, *Earth-moving machinery — Field of vision of surveillance and rear-view mirrors — Part 1: Test methods*

ISO 14401-2:2009, *Earth-moving machinery — Field of vision of surveillance and rear-view mirrors — Part 2: Performance criteria*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

3.1

snow removing machine with rotating tool

self-propelled and attached machine with which snow can be removed from traffic areas by rotating means, accelerated and ejected by blower means, e.g. snow cutter, snow blower, snow cutter-blower and snow sweeper

prEN 17106-3-1:2017 (E)**3.1.1****snow cutter**

machine for snow clearing with the rotary tools set at a right angle to the longitudinal axis of the vehicle

3.1.2**snow blower**

machine for snow clearing with the rotary tools set parallel to the longitudinal axis of vehicle

3.1.3**snow cutter blower**

combination of a snow cutter and snow blower; snow is collected by the cutter and expelled by the blower

3.1.4**snow sweeper**

machine for snow clearing with rotating brushes

3.2**reject ring**

cover having the shape of a ring or a disk which is attached to a rotating body (e.g. sideways of rotary plough tool) to provide protection against drawing-in or trapping

3.3**operating area**

area in which the work procedures are carried out e.g. removal of snow by pre-cutting tools, rotating plough or blower equipment

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4 List of additional significant hazards

Clause 4 of prEN 17106-1:2017 applies with the following Table 1.

Table 1 of prEN 17106-1:2017 and Table 1 of this document contains all hazards and hazardous situations as far as they are dealt with in this European Standard, identified by risk assessments significant to this type of machinery that require action to eliminate or reduce risk.

Table 1 — List of additional significant hazards

	Hazard	Hazardous situation/event	Subclause of this part of prEN 17106-3-1
A.1	Mechanical hazards		
A.1.1	Crushing hazard	— Controls — Power transmission — Working tools	5.3 5.4 5.4, 5.6
A.1.2	Shearing hazard	— Controls — Platforms — Power transmission — Working tools	5.3 5.4 5.4 5.6
A.1.3	Cutting or severing hazard	— Working tools	5.4, 5.5
A.1.4	Entanglement hazard	— Power transmission parts — Working tools — Starting/stopping the engine	5.4 5.4, 5.5 5.3.1, 5.3.2

	Hazard	Hazardous situation/event	Subclause of this part of prEN 17106-3-1
A.1.5	Drawing-in or trapping hazard	— Power transmission parts — Working tools — Starting/stopping the engine	5.4 5.4, 5.5 5.3.1, 5.3.2
A.6	Hazards generated by neglecting ergonomic principles in machinery design		
A.6.4	Inadequate local lighting	— Visibility	5.2
A.6.6	Human error, human behaviour	— Operator's manual	7
A.6.7	Inadequate design, location or identification manual controls	— Controls	5.3
A.7	Combination of hazards	— Operator's manual	7
A.8	Unexpected start-up, unexpected overrun/overspeed		
A.8.1	Failure/disorder of the control system	— Service and maintenance — Electrical equipment	5.3.3
A.8.5	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities)	— Controls — Operator's manual	5.3 7
A.9	Impossibility of stopping the machine in the best possible conditions	— Controls — Starting/stopping the engine	5.3 5.3.1, 5.3.2
A.13	Errors of fitting	— Operator's manual	7
A.15	Falling or ejected objects or fluids	— Supports	5.4.3, 5.6
Additional hazards, hazardous situations and hazardous events due to mobility			
A.18	Related to the travelling function		
A.18.1	Movement when starting the engine	— Starting/stopping the engine	5.3.1, 5.3.2
A.19	Link to the work position		
A.19.5	Insufficient visibility from the work positions	— Visibility	5.2, 5.7
A.19.6	Inadequate lighting	— Visibility	5.2
A.20	Due to the control system		
A.20.1	Inadequate location of manual controls	— Controls	5.3, 5.9
A.20.2	Inadequate design of manual controls and their mode of operation	— Controls	5.3, 5.9
A.22	Due to the power source and to the transmission of power		
A.22.1	Hazards from the engine and the batteries	— Starting/stopping the engine	5.3.1, 5.3.2
A.22.3	Hazards from coupling and	— Mounting of machines	5.10.1

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	Hazard	Hazardous situation/event	Subclause of this part of prEN 17106-3-1
	towing		
A.23	From/to third persons		
A.23.1	Unauthorized start-up and use	— Starting/stopping the engine	5.3.1, 5.3.2
A.24	Insufficient instructions for the driver/operator	— Operator's manual	7

5 Safety requirements and/or measures

5.1 General

Winter service machines – snow cleaning machines with rotating tools shall comply with the requirements of prEN 17106-1:2017, as far as not modified or replaced by the requirements of this part.

5.2 Visibility

Subclause 5.1.4 in part 1 applies with the following modification(s):

Snow cleaning machines with rotating tools shall be designed in accordance with ISO/DIS 5006:2016 so that the operator has sufficient visibility from the operator's station in relation to the travel and work areas of the machine that are necessary for the intended use of the machine.

The travel mode as specified in ISO/DIS 5006:2016 is considered to be representative for testing visibility in both travel and operating modes.

NOTE It is sufficient to measure the machine with the most challenging standard attachment within the limits of the intended use.

Snow cleaning machines with rotating tools shall be equipped with rear view mirrors according to ISO 14401-1:2009 and ISO 14401-2:2009.

Snow cleaning machines with rotating tools shall meet the performance criteria (see Table 2) on the visibility test circle according to Table 1 of ISO/DIS 5006:2016.

Table 2 — Visibility performance criteria on the visibility test circle

Type	Clearing head height (EN 15906)	A	B	C	D	E	F	RB
Self-propelled snow clearing machines with rotating tools snow clearing machines with rotating tools	h < 1500	65	205	205	205	205	65	See Table 4
		1 - 3500 and 1 - 700	1 - 2200 and 1 - 1000	1 - 2200 and 1 - 1000	No specific criteria ^a	No specific criteria ^a	2 - 3000 or 1 - 5500	
Self-propelled snow clearing machines with rotating tools snow clearing machines with rotating tools	1500 ≤ h	65	205	205	205	205	65	
		1 - 3500 and 1 - 700	1 - 2200 and 1 - 1000	1 - 2200 and 1 - 1000	No specific criteria ^a	No specific criteria ^a	2 - 3000 or 1 - 5500	

^a No specific criteria are specified in this Table when no significant hazards exist for the machine sector, e.g. due to machine speed, distance to the test circle, machine manoeuvrability

Table 3 — Rectangular boundary

	RB front	RB rear	RB left	RB right
Self-propelled snow clearing machines with rotating tools snow clearing machines with rotating tools	405 4000 mm distance 1 - 3500 and 1 - 700	405 1 - machine width and 2 - 500	405 1-1200 and 1-500	405 1 - 500
Test object height	1500 mm	1500 mm	1500 mm	1500 mm

5.3 Controls

5.3.1 Starting

Subclause 5.1.4.3, 3rd paragraph in part 1 applies with the following addition:

Automatic lifting of attached equipment (e.g. snow ploughs, snow cleaning machines with rotating tools) when starting reversing of the carrier vehicle/self-propelled machine is seen as intended actuation.

Automatic lowering of attached equipment and starting of rotating tools when starting forward movement of the carrier vehicle/self-propelled machine shall not be possible.

Subclause 5.1.4.3, 4th paragraph in part 1 does not apply.