

| | | |
|------------|--|--|
| STN | Vybavenie letiskových plôch Osobitné požiadavky Časť 6: Odmrazovače a odmrazovacie zariadenie | STN EN 12312-6 31 9860 |
|------------|--|--|

Aircraft ground support equipment - Specific requirements - Part 6: Deicers and de-icing/anti-icing equipment

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/17

Obsahuje: EN 12312-6:2017

Oznámením tejto normy sa ruší
STN EN 12312-6+A1 (31 9860) z augusta 2009

125218

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2017
Podľa zákona č. 264/1999 Z. z. o technických požiadavkách na výrobky a o posudzovaní zhody a o zmene a doplnení niektorých zákonov v znení neskorších predpisov sa slovenská technická norma a časti slovenskej technickej normy môžu rozmnožovať alebo rozširovať len so súhlasom slovenského národného normalizačného orgánu.

EUROPEAN STANDARD

EN 12312-6

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2017

ICS 49.100

Supersedes EN 12312-6:2004+A1:2009

English Version

Aircraft ground support equipment - Specific requirements - Part 6: Deicers and de-icing/anti-icing equipment

Matériel au sol pour aéronefs - Exigences particulières
- Partie 6: Dégivreuses, matériels de dégivrage et
d'antigivrage

Luftfahrt-Bodengeräte - Besondere Anforderungen -
Teil 6: Enteiser und Enteisungs-
/Vereisungsschutzgeräte

This European Standard was approved by CEN on 23 January 2017.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

| Contents | Page |
|--|-------------|
| European foreword..... | 5 |
| Introduction | 8 |
| 1 Scope..... | 9 |
| 2 Normative references..... | 10 |
| 3 Terms and definitions | 10 |
| 4 List of significant hazards | 11 |
| 5 Safety requirements and/or measures | 11 |
| 5.1 General requirements | 11 |
| 5.2 Spray system..... | 12 |
| 5.3 Stability and strength | 12 |
| 5.4 Safeguards and safety devices..... | 13 |
| 5.5 Emergency systems | 14 |
| 5.6 Operator's cabin | 15 |
| 5.7 Controls, monitoring devices and displays..... | 15 |
| 5.8 Lights | 15 |
| 5.9 Fire protection | 16 |
| 5.10 Protection against heat..... | 16 |
| 5.11 Protection against poisoning..... | 16 |
| 5.12 Special requirements for deicers | 17 |
| 5.13 Operating speeds..... | 17 |
| 5.14 Warning devices for stationary de-icing/anti-icing equipment | 17 |
| 6 Information for use | 17 |
| 6.1 Marking..... | 17 |
| 6.2 Additional marking | 18 |
| 6.2.1 Additional marking for deicers..... | 18 |
| 6.2.2 Additional marking for stationary de-icing/anti-icing equipment..... | 18 |
| 6.3 Instructions | 18 |
| 7 Verification of requirements | 19 |
| Annex A (normative) List of hazards..... | 21 |
| Annex B (informative) Fluid system..... | 25 |
| B.1 General..... | 25 |
| B.2 Functional information..... | 25 |
| B.2.1 General..... | 25 |
| B.2.2 Size/design of de-icing equipment | 25 |
| B.3 Recommendations for fluid systems..... | 26 |
| B.3.1 General..... | 26 |
| B.3.2 Fluid tanks | 26 |
| B.3.3 Pipe and pump system | 26 |
| B.3.4 Nozzle, spraying equipment..... | 27 |

| | |
|---|-----------|
| B.3.5 Heating | 27 |
| B.3.6 Mixing systems | 27 |
| B.4 Verification of fluid system functions | 28 |
| B.4.1 General | 28 |
| B.4.2 Verification of accuracy of a fluid mixing system | 28 |
| B.4.3 Verification of fluid system concerning degradation of Non-Newtonian (pseudoplastic) fluid | 28 |
| B.4.4 Verification of accuracy of a fluid metering system | 29 |
| Annex C (informative) Toxicological aspects of using de-icing/anti-icing equipment | 30 |
| C.1 General | 30 |
| C.2 Systems and training of operators | 30 |
| C.2.1 General | 30 |
| C.2.2 Design of the spraying equipment | 31 |
| C.2.2.1 Short spraying distance | 31 |
| C.2.2.2 Mixing systems | 31 |
| C.2.3 Training of operators | 31 |
| C.2.3.1 Theoretical training | 31 |
| C.2.3.2 Practical training | 31 |
| C.2.3.3 Composition of the de-icing staff | 31 |
| C.2.3.4 Recording operation data (statistics) | 31 |
| C.3 Effects on humans | 32 |
| C.3.1 Toxicity of glycols | 32 |
| C.3.1.1 General | 32 |
| C.3.1.2 Mono propylene glycol (MPG) – CAS number 57-55-6 | 32 |
| C.3.1.3 Mono ethylene glycol (MEG) – CAS number 107-21-1 | 32 |
| C.3.1.4 Diethylene glycol (DEG) – CAS number 111-46-6 | 32 |
| C.3.2 Work environment considerations | 33 |
| C.3.3 Aircraft internal environment considerations | 33 |
| C.4 Recommendations | 33 |
| Annex D (informative) Environmental aspects of de-icing/anti-icing at airports | 34 |
| D.1 General | 34 |
| D.2 Environmental protection | 34 |
| D.2.1 General | 34 |
| D.2.2 Collection of glycol | 35 |
| D.2.2.1 General | 35 |
| D.2.2.2 Mobile collection | 35 |
| D.2.2.3 Central collection | 35 |

| | |
|--|-----------|
| D.2.3 Treatment of glycol | 35 |
| D.2.3.1 General..... | 35 |
| D.2.3.2 Recycling | 36 |
| D.2.3.3 Destruction..... | 36 |
| D.2.3.4 Decomposition | 36 |
| D.2.3.5 Summary | 37 |
| D.3 Environmental effects of de-icing/anti-icing fluids..... | 37 |
| D.3.1 General..... | 37 |
| D.3.2 Effects on aquatic environment..... | 37 |
| D.3.2.1 Biodegradation | 37 |
| D.3.2.2 Toxicity | 38 |
| D.3.3 Effects on soil environment..... | 38 |
| D.3.3.1 Biodegradation | 38 |
| D.3.3.2 Toxicity | 38 |
| D.4 Recommendations | 38 |
| Annex E (informative) Loading control..... | 39 |
| Annex ZA (informative) Relationship between this European Standard and the essential requirements of EU Directive 2006/42/EC aimed to be covered..... | 40 |
| Bibliography..... | 41 |

European foreword

This document (EN 12312-6:2017) has been prepared by Technical Committee CEN/TC 274 "Aircraft ground support equipment", 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 September 2017, and conflicting national standards shall be withdrawn at the latest by September 2017.

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 12312-6:2004+A1:2009.

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 2006/42/EC on machinery.

For relationship with EU Directive 2006/42/EC on machinery, see informative Annex ZA which is an integral part of this document.

EN 12312, *Aircraft ground support equipment – Specific requirements*, consists of the following parts:

- *Part 1: Passenger stairs;*
- *Part 2: Catering vehicles;*
- *Part 3: Conveyor belt vehicles;*
- *Part 4: Passenger boarding bridges;*
- *Part 5: Aircraft fuelling equipment;*
- *Part 6: Deicers and de-icing/anti-icing equipment (the present document);*
- *Part 7: Aircraft movement equipment;*
- *Part 8: Maintenance or service stairs and platforms;*
- *Part 9: Container/Pallet loaders;*
- *Part 10: Container/Pallet transfer transporters;*
- *Part 11: Container/Pallet dollies and loose load trailers;*
- *Part 12: Potable water service equipment;*
- *Part 13: Lavatory service equipment;*
- *Part 14: Disabled/incapacitated passenger boarding vehicles;*
- *Part 15: Baggage and equipment tractors;*

EN 12312-6:2017 (E)

- *Part 16: Air start equipment;*
- *Part 17: Air conditioning equipment;*
- *Part 18: Nitrogen or Oxygen units;*
- *Part 19: Aircraft jacks, axle jacks and hydraulic tail stanchions;*
- *Part 20: Electrical ground power units.*

The main changes compared to the previous edition EN 12312-6:2004+A1:2009 are:

- a) Amendment A1:2009 was incorporated;
- b) the Introduction was updated in relation to the deviation from recommended criteria;
- c) the Scope was updated to cover reasonably foreseeable misuse and an informative reference was added;
- d) Clause 2, *Normative references*, was updated;
- e) In Clause 3, *Terms and definitions*, the definition for the operator's cabin was clarified;
- f) List of hazards was updated to exclude hazards due to traffic and repair and was moved to Annex A;
- g) Subclause 5.1, *General requirements* was changed to include slip-resistance requirements and a Performance level of the speed limitation interlocking system;
- h) Subclause 5.3, *Stability and strength* was changed to a minimum rated load of the basket of 205 kg and the required tests were clarified;
- i) In subclause 5.4, *Safeguards and safety devices* clarification was given regarding the requirement of harness anchorage points;
- j) Subclause 5.5, *Emergency systems* safety measures has been changed and a Performance Level for the control system of the overheating and overpressure safety device has been introduced;
- k) Subclause 5.6, *Operator's cabin* was changed and contains a more detailed clarification of the basket/cabin door closing/folding requirements with subclause 5.6.4 being divided into three subclauses 5.6.4, 5.6.5 and 5.6.6;
- l) Subclause 5.8, *Lights* was updated;
- m) Subclause 5.11, *Protection against poisoning* was changed and contains new requirements and clarifications for filters;
- n) Subclause 6.2.1, *Additional marking for deicers* was updated with markings for permissible jet blast, the use of a harness and the prohibited use of open baskets in combination with toxic fluids;
- o) Subclause 6.3 *Instructions* was changed and now includes information about safety measures when using open basket deicers in combination with toxic de-icing fluids, maintenance of the filtration system, bystanders and the procedure of cleaning spray liquid tanks;
- p) Clause 7, *Verification* was updated;

- q) Normative Annex A, *List of Hazards* was updated;
- r) Informative Annex B, *Fluid system* was updated and contains information about further civil aviation regulations, an increased spraying temperature, of which the operator shall know from the cabin;
- s) Informative Annex C, Subclause C.3, *Effects on humans* was updated and contains a clarification about the variety and toxicity of glycols used in de-icing, Table C.1 *Acute toxicity of glycols and EU classification* was updated and Table C.2 *Some occupational exposure limits for glycol* was deleted;
- t) Annex ZA referring to the Machinery directive 98/37/EC was replaced by Annex ZA referring to the new Machinery directive 2006/42/EC;
- u) the Bibliography was updated.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard specifies health and safety requirements, as well as some functional and performance requirements, for deicers and equipment intended for de-icing/anti-icing of all aircraft types commonly in service in civil air transport. It contains functional and environmental aspects of de-icing in the informative Annexes B, C and D.

The minimum essential criteria are considered to be of primary importance in providing safe, serviceable, economical, and practical deicers and de-icing/anti-icing equipment. Deviations should occur only after careful consideration, extensive testing, risk assessment and thorough service evaluation have shown alternative methods or conditions to be satisfactory. Such deviations are outside the scope of this standard and a manufacturer should be able to demonstrate an equivalent level of protection.

This European Standard is a Type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous 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. Deviations from requirements do not fall within the presumption of conformity given by the standard.

1 Scope

This European Standard specifies the technical requirements to minimize the hazards listed in Clause 4 which can arise during the commissioning, the operation and the maintenance of deicers and equipment designed exclusively for de-icing and washing of aircraft with de-icing/anti-icing/washing liquids when used as intended, including misuse reasonably foreseeable by the manufacturer, when carried out in accordance with the specifications given by the manufacturer or his authorized representative. It also takes into account some requirements recognized as essential by authorities, aircraft and ground support equipment (GSE) manufacturers as well as airlines and handling agencies.

NOTE 1 Safety of aircraft in connection with de-icing/anti-icing operations is not dealt with in this European Standard. Any, even minor, aircraft de-icing or anti-icing operation directly affects flight safety on take-off. Prevention of aeronautical accidents resulting from in-flight icing principally concerns the fluids and methods used, but it may in certain cases also concern de-icing or anti-icing equipment design or operation. These aeronautical aspects are controlled by the applicable Civil Aviation regulations ICAO 9640-AN/940, *Manual of aircraft ground de-icing/anti-icing operations* and EASA EU-OPS Subpart D 1.345 and its Acceptable Means of Compliance (AMC) and covered in ISO 11076:2012 (AEA Recommendations). They are not covered in this European Standard.

This European Standard applies to:

- a) self-propelled deicers with fixed or mobile platform or hinged boom;
- b) towable deicers with fixed or mobile platform or hinged boom;
- c) stationary de-icing/anti-icing equipment (e.g. fixed boom, gantry or tower cranes equipped with aircraft de-icing/anti-icing fluid systems).

This European Standard does not apply to:

- d) fixed installations, such as separate storage tanks or heating and filling stations, which are not an integrated part of the stationary de-icing equipment;
- e) hydraulic control systems;
- f) pneumatic systems;
- g) flow generating systems as such.

No extra requirements on noise and vibration are provided other than those in EN 1915-3 and EN 1915-4.

NOTE 2 EN 1915-3 and EN 1915-4 provide the general GSE vibration and noise requirements.

This European Standard is not dealing with hazards in respect to a standard automotive chassis and the traffic on the apron.

This part of EN 12312 is not applicable to deicers and de-icing/anti-icing equipment which are manufactured before the date of publication of this standard by CEN.

This part of EN 12312 when used in conjunction with EN 1915-1, EN 1915-2, EN 1915-3 and EN 1915-4 provides the requirements for deicers and de-icing/anti-icing equipment.

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.

EN 795:2012, *Personal fall protection equipment - Anchor devices*

EN 1915-1:2013, *Aircraft ground support equipment - General requirements - Part 1: Basic safety requirements*

EN 1915-2:2001+A1:2009, *Aircraft ground support equipment - General requirements - Part 2: Stability and strength requirements, calculations and test methods*

EN 1915-3, *Aircraft ground support equipment — General requirements — Part 3: Vibration measurement methods and reduction*

EN 1915-4, *Aircraft ground support equipment — General requirements — Part 4: Noise measurement methods and reduction*

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

EN ISO 13732-1, *Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces (ISO 13732-1)*

EN ISO 13849-1:2015, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)*

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

ISO 4305, *Mobile cranes — Determination of stability*

ISO 11076:2012, *Aircraft — De-icing/anti-icing methods on the ground*

DIN 51130:2014-02, *Testing of floor coverings — Determination of the anti-slip property — Workrooms and fields of activities with slip danger — Walking method — Ramp test*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN