SLOVENSKI STANDARD
SIST ENV 50235:1999

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Aviation ground lighting electrical installation - Signs: Equipment specifications and tests

Aeronautical ground lighting electrical installation - Signs: Equipment specifications and tests

Ta slovenski standard je istoveten z: **ENV 50235:1997**

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English version

Aeronautical ground lighting electrical installation Signs: Equipment specifications and tests

This European Prestandard (ENV) was approved by CENELEC on 1996-07-02 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CENELEC will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard (EN).

CENELEC members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This European Prestandard was prepared by the CENELEC BTTF 72-3, Lighting fittings for aerodromes.

The text of the draft was submitted to the CENELEC questionnaire and vote and was approved as ENV 50235 on 1996-07-02.

The following date was fixed:

- latest date by which the existence of the ENV has to be announced at national level (doa) 1996-12-01

Contents

1 Scope, object and fundamental principles

This standard covers signs installed in the movement area to provide pilots and vehicle operators with information. The Standard is applicable to signs with built-in illumination arrangements using tungsten filament, tubular flourescent and other discharge lamps on supply voltages not exceeding 1000 V.
The standard shall not apply to non-illuminated signs or signs illuminated by external light sources.

The object is to provide design and construction specifications for the signs that are considered necessary to meet the operational standards adopted by ICAO and to cover all aspects of safety (electrical, thermal and mechanical).

The signs may be energised from parallel power supply or by connection to a constant current series circuit used for taxiway or runway lighting systems.

2 Normative references

This prestandard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter.
For dated references, subsequent amendments to or revisions of any of these publications apply to this prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 356	Glass in building. Security glazing. Testing and classification of resistance against manual attack
EN 50081-2	Electromagnetic compatibility - Generic emission standard Part 2: Industrial environment
EN 50082-2	Electromagnetic compatibility - Generic immunity standard Part 2: Industrial environment
ENV 50232	Aviation ground lighting electrical installation Isolating transformer: Equipment specifications and tests
IEC 50(191)	International Electrotechnical Vocabulary Chapter 191: Dependability and quality of service
EN 60598-1	Luminaires - Part 1: General requirements and tests
EN 60920	Ballasts for tubular flourescent lamps - General and safety requirements
EN 60924	DC supplied electronic ballasts for tubular flourescent lamps General and safety requirements
EN 60928	AC supplied electronic ballasts for tubular flourescent lamps General and safety requirements
ICAO	International standards and recommended practices Aerodromes Annex 14 to the Convention on International Civil Aviation, Volume 1 and 2, Aerodrome Design and Operations (Issued by International Civil Aviation Organisation)

3 Definitions

For the purpose of this prestandard the following definitions apply, as well as those given in EN 60598-1.
For definitions taken from Annex 14 to the Convention on International Civil Aviation, Volume 1, Aerodrome Design and Operations, ICAO reference numbers have been added (refers to ICAO Doc 9569).

3.1 ICAO
International Civil Aviation Organisation

3.2 taxiway (T11)
A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another.

3.3 movement area (M 41)
That part of an aerodrome to be used for take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

3.4 manoeuvring area (M 4)
The movement area, excluding aprons.

3.5 apron (A 119)
A defined area, on a land aerodrome, intended to accommodate aircraft for the purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

3.6 taxiing guidance signs
Guidance signs installed on an aerodrome to provide pilots and vehicle drivers with information. The signs are classified as Mandatory Instruction Signs and Information Signs.

3.7 mandatory instruction sign
A mandatory instruction sign is provided when it is intended to identify, by a sign, a location beyond which an aircraft or vehicle shall not proceed unless authorised by air traffic control.

3.8 information sign
An information sign is provided when it is intended to indicate, by a sign, a specific location, or routing information.

3.9 luminaire
Apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, fixing and protecting the lamps, but not the lamps themselves, and where necessary circuit auxiliaries together with the means for connecting them to the supply.

NOTE: This definition is given in EN 60598-1 but is repeated here for the purpose of clarity and since taxiing guidance signs may in several aspects be regarded as luminaires.

3.10 frangibility (F 36)
An object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

3.11 rated current
The supply current assigned to the sign by the manufacturer.

3.12 optical component
Any item used for controlling the light from a light source by means of reflection, refraction, absorption or transmission.

3.13 routine test
A test to which each individual sign is subjected.

3.14 MTBF - Mean Time Between Failures
The expectation of operating time between failures.

3.15 MRT - Mean repair Time
The expectation of the repair time.

3.16 repair time
That part of the active corrective maintenance time during which repair actions are performed on an item.

3.17 useful life
Under given conditions, the time interval beginning at a given instant of time, and ending at when the failure rate becomes unacceptable or when the item is considered unrepairable as a result of a fault.

4 Classification and designation

Signs are classified according to service conditions, operational use, and methods for electrical supply.

4.1 Classification according to service conditions

The signs shall be designed for continuous outdoor use under specified service conditions.
Type 1 signs are designed for operation down to - **20 °C.**
Type 2 signs are designed for operation down to - **55 °C.**

4.1.1 Signs designed for normal service conditions

4.1.2 Signs with provisions for unusual service conditions

4.2 Classification according to operational use

Classification according to operational use is based on standards and recommended practices published in Annex 14 to the Convention on International Civil Aviation.

4.2.1 Mandatory instruction signs

Mandatory instruction signs shall have the following characteristics:
Mandatory instruction signs shall have a face with a red background and white lettering. The legend height shall be either **400 mm** or **300 mm** depending on the operational use.

4.2.2 Information signs

Information signs shall have the following characteristics:

a) Location signs shall have a black face with a surrounding yellow border and with yellow lettering. The minimum legend height shall be either **200 mm** or **300 mm** depending of the operational use.

b) Other information signs shall have a yellow face with a black lettering. The minimum legend height shall be **200 mm, 300 mm or 400 mm** depending on the operational use. A minimum legend height of **400 mm** is required for runway exit signs.

4.2.3 Sign dimensions

The dimensions of signs shall be in accordance with table 1. Sign lengths shall be sufficient to include the complete message including a boarder of background colour of at least half legend height.

Table 1: Sign dimensions

SIZE	LEGEND MINIMUM HEIGHT mm	FACE PANEL MINIMUM HEIGHT mm
1	400	800
2	300	600
3	200	400

4.3 Classification according to electrical supply

4.3.1 Signs energised from a parallel circuit

Signs designed for direct supply from a low voltage switchgear.

4.3.2 Signs energised by connection to a constant current series circuit

The sign shall be connected to an isolation transformer, conforming to ENV 50232. This isolation transformer shall be installed outside the sign and is normally not supplied with the sign.

4.4 Markings

The following information shall be distinctly and durably marked on the sign in a position where it can be seen during maintenance, if necessary after removal of covers or similar components.

Such information shall not be marked on parts likely to be removed when the sign is being installed.

- Mark of origin (this may take the form of a trade mark, manufacturer's identification mark or the name of the responsible vendor).
- Maker"s model number or type reference.
- Rated voltage(s) in volts.
- Rated current in ampere (on signs intended to be connected to a constant current series circuit).
- Type and ratings of the light source.
- The identification number of this standard as a declaration of compliance.
- The EC Conformity Mark completed by the year of affixing.

NOTE: The EC Conformity Mark is a declaration of compliance with relevant EC-Directives.
The Low Voltage Directive (73/23/EEC) become compulsory 1 January 1997.
The CE Marking and EMC Directive (89/336/EEC) becomes compulsory 1 January 1996.

5 General requirements

5.1 Components of signs

Components, other than integral components, shall comply with the requirements of the relevant EN or IEC standards, if any.

Components that have been shown to comply with the requirements of the relevant EN or IEC standards for those components, shall be tested only to those requirements of this standard which are not covered by the component standard.

Components for which no appropriate EN or IEC standards exists shall satisfy the relevant requirements of this standard as part of the sign. Lampholders and starter holders shall additionally comply with the gauging and interchangeability requirements of the appropriate EN or IEC component standard where applicable.

5.2 Service conditions

The signs, including all required components, shall be designed for continuous outdoor use under normal service conditions.

5.2.1 Normal service conditions

This standard gives detailed requirements for taxiing guidance signs for use under the conditions described below. In addition, the effects of solar heating, jet efflux, vibration, dust or sand, heavy rain, ice, snow and de-icing agents should be taken into account in the design of the signs.

a) Altitude:

An elevation above mean sea level not exceeding **1000 m**.

b) Ambient temperatures:

An ambient temperature in the range from **- 20 °C to + 40 °C** is considered a normal service condition for a type 1 sign.

An ambient temperature in the range from **- 55 °C to + 40 °C** is considered a normal service condition for a type 2 sign.

Signs designed for normal service conditions do not have to meet the performance requirements specified in this standard in ambient temperatures exceeding **+ 40 °C** but shall survive temperatures up to **+ 55 °C** without any reduction of the total service life.

c) Wind loading:

A wind loading, from any direction, caused by natural wind or jet blast, not exceeding **60 m/s (117 knots)** is considered a normal service condition. Occasionally a sign may be installed at a location where it may be exposed to a vibrating wind force in the form of aircraft engine blast with a magnitude reaching **70 m/s (136 knots)**. This load is cyclic in nature and can be experienced several times throughout the life of the sign. Signs designed for normal service conditions are expected to withstand such wind loads without fracture, indication of fatigue or substantial deformation.

5.2.2 Provision for unusual service conditions

The purchaser shall specify in his enquiry any conditions not covered by the normal conditions specified in 5.2.1. The manufacturer shall make the necessary provisions to cater for the unusual service conditions.