# TECHNICAL SPECIFICATION

# IEC TS 61827

## Pre-Standard

First edition
2004-05

**Electrical installations for lighting and beaconing of aerodromes – Characteristics of inset and elevated luminaires used on aerodromes and heliports**



Reference number
IEC/TS 61827:2004(E)

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International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE T

*For price, see current catalogue*

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

# ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES – CHARACTERISTICS OF INSET AND ELEVATED LUMINAIRES USED ON AERODROMES AND HELIPORTS



## FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 61827, which is a Technical Specification, has been prepared by IEC technical committee 97: Electrical installations for lighting and beaconing of aerodromes.

The text of this Technical Specification is based on the following documents:

| Enquiry draft | Report on voting |
|---|---|
| 97/98A/DTS | 97/99/RVC |

Full information on the voting for the approval of this Technical Specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this Technical Specification may be issued at a later date.

# INTRODUCTION

Aeronautical ground lighting (AGL) at an aerodrome or heliport provides the pilot of an aircraft with location, orientation and alignment information in adverse visibility conditions and at night. This includes those aircraft in flight, i.e. on approach to or take off from the aerodrome, and those aircraft and other vehicles moving on the aerodrome surface. The type of lighting is dependent upon the aerodrome operations, type and density of traffic, aerodrome layout and other environmental considerations and may be realised in many different forms. For the purpose of this Technical Specification, the various types of lighting, referred to as AGL services, are considered as components of the overall AGL system.

This Technical Specification describes the system component requirements and it deals with the inset and elevated luminaires used in AGL.

This Technical Specification should be considered with the AGL requirements produced by the International Civil Aviation Organisation (ICAO). ICAO requirements are published in the form of annexes to the Chicago Convention on International Civil Aviation (1944) to which signatory nations apply to the air traffic and navigation services within their control regions. The annexes contain Standards and Recommended Practices (SARPs), describing performance requirements, based on operational requirements, for the safety, regularity or efficiency of international air navigation. Other ICAO publications contain additional procedures, performance specifications and guidance material for the interpretation and implementation of the SARPs.

Annex 14, Aerodromes (Volumes I and II), to the Convention contains the requirements for aerodrome and heliport operations and includes those aspects relating to AGL. The Aerodrome Design Manual Doc. 9157 Part 4 (Visual Aids) contains guidance material on the interpretation of the AGL requirements in Annex 14, Aerodromes. Part 5 of the Aerodrome Design Manual Doc. 9157 (Electrical Systems) contains technical information on the electrical supply and installation of AGL Systems. Recommended maintenance policies and practices for AGL Systems are contained in Part 9 of the Airport Services Manual Doc. 9137 (Airport Maintenance Practices).

The safety and technical specifications, requirements and working practices within this International Technical Specification are intended to be compatible with the Standards and Recommended Practices contained in Annex 14, Aerodromes and to complement the information contained in the Aerodrome Design Manual Doc. 9157 and the Aerodrome Services Manual Part 9 (Aerodrome Maintenance Practices).

The AGL system will evolve with the introduction of new technology and the implementation of new operational requirements. The general requirements for the AGL system in this Technical Specification are therefore to be considered generic.

To conform to this Technical Specification, it should be demonstrated to the relevant bodies that the requirements have been satisfied and therefore that the clause objective(s) has been met.

NOTE 1 Examples of relevant bodies would include the following:

- aerodrome management;
- certification and licensing authorities;
- safety regulators;
- notified bodies for international or European directives;
- national standards bodies.

# ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES – CHARACTERISTICS OF INSET AND ELEVATED LUMINAIRES USED ON AERODROMES AND HELIPORTS



## 1 Scope

This Technical Specification defines the requirements and testing procedures for inset and elevated luminaires with lamps used in aeronautical ground lighting systems and excluding luminaires for general lighting.

This Technical Specification is applicable to inset or elevated luminaires used for:

– approach lights: centreline, crossbars, supplementary approach;

– runway lights: runway guard, threshold, threshold wingbar, centreline, edge, touch down zone, runway end, stopway lights;

– taxiway lights : centreline, edge, stopbar, intermediate holding position lights;

– heliports: aiming point, perimeter, fato luminaires.

The purpose of this Technical Specification is to provide a set of requirements and tests, which are applicable to the luminaires and their control equipment. In general, this Technical Specification includes safety requirements for the luminaires.

This Technical Specification is not applicable to visual approach slope indicator systems (PAPI (precision approach path indicators) etc.) and signs. Any other equipment not described in this Technical Specification is excluded from its scope.

## 2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60068-2-5, *Environmental testing – Part 2: Tests. Test Sa: Simulated solar radiation at ground level*

IEC 60068-2-9, *Environmental testing – Part 2: Tests. Guidance for solar radiation testing*

IEC 60068-2-11, *Environmental testing – Part 2: Tests. Test Ka: Salt mist*

IEC 60068-2-52, *Environmental testing – Part 2: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60417-DB:2002[1], *Graphical symbols for use on equipment*

IEC 60598-1: 2003, *Luminaires – Part 1: General requirements and tests*

IEC 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

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1 "DB" refers to the IEC on-line database.

IEC 61000-6-4, *Electromagnetic compatibility (EMC) – Part 6: Generic standards – Section 4: Emission standard for industrial environments*

IEC 61821, *Electrical installations for lighting and beaconing of aerodromes – Maintenance of aeronautical ground lighting constant current series circuits*

IEC 61822, *Electrical installations for lighting and beaconing of aerodromes – Constant current regulators*

IEC 61823, *Electrical installations for lighting and beaconing of aerodromes – AGL series transformers*

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*

ICAO Annex 14: *Aerodromes – Volume I: Aerodrome Design and Operations [Annex 14 to the Convention on International Civil Aviation, International Standards and Recommended Practices]*

ICAO Annex 14: *Aerodromes – Volume II: Heliports [Annex 14 to the Convention on International Civil Aviation, International Standards and Recommended Practices]*

ICAO 9137, *Airport Services Manual (Doc 9137) Part 9 — Airport Maintenance Practices*

ICAO 9157, *Aerodrome Design Manual (Doc 9157) Part 4 — Visual Aids*

ICAO 9157, *Aerodrome Design Manual (Doc 9157) Part 5 — Electrical Systems*

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## 3 Terms, definitions and abbreviations

### 3.1 Terms and definitions

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

**3.1.1**
**(aerodrome and heliport) luminaire**
apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, aiming, fixing and protecting the lamps, but not the lamps themselves and, where necessary, circuit auxiliaries together with the means for connecting them to supply

NOTE Aerodrome luminaires will be identified as luminaires in this Technical Specification.

**3.1.2**
**elevated luminaire**
luminaire above ground in values more than 40 mm and designed to break, distort or yield on impact so as to present the minimum hazard to aircraft

**3.1.3**
**inset luminaire**
luminaire installed inside the pavement of the movement area of an aerodrome and heliport, protruding 40 mm or less above grade and capable of withstanding the load of a standing or moving aircraft