

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**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC TS 61827:2004](https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004)

<https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004>



Reference number
IEC/TS 61827:2004(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** (www.iec.ch)

- **Catalogue of IEC publications**

The on-line catalogue on the IEC web site (http://www.iec.ch/searchpub/cur_fut.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

This summary of recently issued publications (http://www.iec.ch/online_news/justpub/jp_entry.htm) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

Email: custserv@iec.ch
Tel: +41 22 919 02 11
Fax: +41 22 919 03 00

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**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC TS 61827:2004](https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004)

<https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004>

© IEC 2004 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

T

For price, see current catalogue

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references.....	6
3 Terms, definitions and abbreviations.....	7
3.1 Terms and definitions.....	7
3.2 Abbreviations.....	9
4 Classification.....	9
4.1 Dielectric rigidity.....	9
5 General requirements.....	9
5.1 General.....	9
5.2 Dimensional requirements.....	9
5.3 Environmental requirements.....	11
5.4 Construction requirements.....	12
5.5 Structural requirements.....	12
5.6 Interface requirements.....	13
5.7 Drainage requirements.....	13
5.8 Electrical requirements.....	14
5.9 Photometric requirements.....	14
5.10 Optical requirements.....	14
5.11 Maintenance requirements.....	14
5.12 Accelerated life of luminaires.....	15
5.13 Lamp life requirements.....	15
5.14 Instruction manual.....	15
6 Test procedures for airfield lighting luminaires.....	15
6.1 General test requirements.....	17
6.2 Dimensional tests.....	17
6.3 Environmental tests.....	17
6.4 Structural tests.....	18
6.5 Electrical tests.....	21
6.6 Functional tests.....	21
6.7 Endurance tests.....	22
Bibliography.....	25

STANDARD PREVIEW
 (standards.iteh.ai)

[IEC TS 61827-2004](#)

<https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004>

[0b683080a258/iec-ts-61827-2004](#)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
<https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-10181c1e5358/iec-61827-2004>
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a Technical Specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- 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.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[IEC TS 61827:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004>

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, fano 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:2002¹, *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*

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*

[IEC TS 61827:2004](https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004)

<https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004>

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

3.1.4

omni-directional luminaires

luminaire with a fixed light output that shows light about a vertical angle for the specified application at all angles in the azimuth

3.1.5

lamp

source made in order to produce an optical radiation, usually visible

(IEV 845-07-03)

3.1.6

incandescent (electric) lamp

lamp in which light is produced by means of an element heated to incandescence by the passage of an electric current

(IEV 845-07-04)

3.1.7

base

installation accessory made to be fastened into a pavement possessing structural strength equal to the surrounding pavement and properties allowing to transfer the heating from the luminaire and the load imposed by standing or moving aircraft

3.1.8

interface

standard flange connection between the base and the luminaire or other accessory intended to remain firmly fastened when exposed to forces acting on them

iTeh STANDARD PREVIEW

(standards.iteh.ai)

[IEC TS 61827:2004](https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004)

3.1.9

type test

test to ascertain that one or more luminaires, made to a certain design, meet(s) applicable specifications

<https://standards.iteh.ai/catalog/standards/sist/536fab62-a894-4be8-874d-0b683080a258/iec-ts-61827-2004>

3.1.10

acceptance test

agreed procedure between any manufacturer and his customer, which allows the customer to check if the supplied equipment meets the technical specifications of the product

3.1.11

type test sample

sample consisting of one or more similar units submitted by the manufacturer for the purpose of a type test

3.1.12

lamp life

life of a batch of lamps with the lamps operated at rated current and/or voltage

3.1.13

useful lamp life

time during which the lamp, installed in the luminaire and operated at rated current and/or voltage, will produce 50 % of the required luminous intensity as specified in ICAO Annex 14

3.1.14

standard useful lamp life

under given conditions, the operating time of a lamp, installed in the luminaire and powered at rated current and/or voltage, beginning at a given instant of time and ending when the photometric intensity becomes unacceptable

3.2 Abbreviations

Abbreviations used in this Technical Specification include:

- O DIA Outer diameter of a luminaire
 BC DIA Bolt circle diameter of a luminaire
 IC DIA Inner clearance diameter of a luminaire

The explanation of each term is shown in Figure 1.

4 Classification

Classification for inset luminaires used in this Technical Specification includes:

Table 1 – Inset luminaires classification

Classification	Maximum height above ground mm
Style 1	40
Style 2	25
Style 3	13
Style 4	6

STANDARD PREVIEW
 (standards.iteh.ai)

4.1 Dielectric rigidity

The luminaires shall be classified according to Section 10 of IEC 60598-1.
<https://standards.iteh.ai/catalog/standards/sis/5361a602-ab94-46c6-874d-0b683080a258/iec-ts-61827-2004>

5 General requirements

5.1 General

This Technical Specification covers the requirements for inset and elevated luminaires used on aerodrome and heliport runways and taxiways.

5.1.1 Marking

A nameplate shall be securely attached to the luminaire and contain at least the following information:

- manufacturer's name and luminaire identification;
- lamp type number and wattage;
- serial number.

5.2 Dimensional requirements

5.2.1 Inset luminaires

The slope α of the top surface of the luminaire, which protrudes above finish grade, shall not exceed 20° as shown in Figure 1. All recesses shall be provided with «running-on surfaces» on all sides. The construction of the recesses shall have no influence on the slope of the run-on surface.