



SLOVENSKI STANDARD

SIST EN 60357:1999

01-julij-1999

Tungsten halogen lamps (non-vehicle) (IEC 60357:1982+A1:1984, modified)

Tungsten halogen lamps (non-vehicle)

Halogen-Glühlampen (Fahrzeuglampen ausgenommen)

Lampes tungstène-halogène (véhicules exceptés)

Ta slovenski standard je istoveten z: EN 60357:1988

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ICS:

29.140.20	Žarnice z žarilno nitko	Incandescent lamps
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EUROPEAN STANDARD

EN 60 357

NORME EUROPEENNE

January 1988

EUROPAISCHE NORM

UDC: 621.327.534:620.1

KEY WORDS: Lighting fitting; tungsten filament lamp; halogen lamp;
electrical characteristic; dimension; maximum pinch
temperature; condition of use

ENGLISH VERSION

TUNGSTEN HALOGEN LAMPS (NON VEHICLE)
(IEC 357 (1982 - 2nd edition
+ Amendment No 1 (1984), modified))

Lampes tungstène-halogène
(véhicules exceptés)
(CEI 357 (1982 - 2ème édition
+ Modification n° 1 (1984),
modifiée))

Halogen-Glühlampen
(Fahrzeuglampen ausgenommen)
(IEC 357 (1982 - 2. Ausgabe
+ Änderung Nr. 1 (1984),
modifiziert))

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This European Standard was ratified by CENELEC on 1986-09-10.
CENELEC members are bound to comply with the requirements of the 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 CENELEC Central Secretariat or to any
CENELEC 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 CENELEC member into its own language and notified to CENELEC Central
Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria,
Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg,
Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue Bréderode 2, B-1000 Brussels

BRIEF HISTORY

The CENELEC Questionnaire Procedure performed for finding out whether or not IEC 357 (2nd edition, 1982) with Amendment No. 1 (1984) could be accepted without textual changes, has shown that common modifications were necessary for the acceptance as European Standard (EN). The Reference Document was submitted to the CENELEC members for vote and acceptance by CENELEC.

TECHNICAL TEXT

The text of the International Standard IEC 357 (2nd edition, 1982) with Amendment No. 1 (1984) was approved by CENELEC on 10th September 1986 as a European Standard with agreed CENELEC common modifications. For the sake of clarity, the places in the text of IEC 357 to which the CENELEC common modifications apply have been marked by a vertical line in the left-hand margin and details of the original IEC text affected are given in Appendix C (informative).

The following dates were fixed:

doa: 1987-03-15

dolp/dow: 1988-03-15

Appendices designated "normative" are part of the body of the standard. Appendices designated "informative" are given only for information.

In this European Standard, Appendix A from the Reference Document is normative and also Appendix B added by CENELEC.
Appendix C added by CENELEC is informative.

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Lamp standard sheets

SECTION FIVE - AIRFIELD LAMPS

INFORMATION as to original IEC text

A second line is included

It reads: Lamp standard sheets

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Lamp standard sheets

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APPENDIX B (normative) - Other international publications quoted in this standard

APPENDIX C (informative) - Information as to original IEC text

INFORMATION as to original IEC text:

The Foreword of IEC Publication 357 (1982) is not part of this European Standard.

Appendix B (normative) and Appendix C (informative) are not included in IEC 357 (1982).

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TUNGSTEN HALOGEN LAMPS (NON-VEHICLE)

INFORMATION as to original IEC text

The Foreword of IEC Publication 357(1982) is not part of this European Standard. It reads:

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.
- 4) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

Preface of IEC Publication 357(1982)

This standard has been prepared by Sub-Committee 34A: Lamps, of IEC Technical Committee No. 34: Lamps and Related Equipment.

It forms the second edition of IEC Publication 357 and replaces the first edition of 1971 and its supplement of 1973.

Drafts were discussed at the meetings held in The Hague in 1975 and in Brussels in 1977. As a result of these meetings, several drafts, Documents 34A(Central Office) 114, 115, 117, 129, 130, 131, 144, 145, 148, 149 and 150, were submitted to the National Committees for approval under the Six Months' Rule between November 1976 and September 1978.

The National Committees of the following countries voted explicitly in favour of publication of these documents:

Countries \ Documents 34A(CO)	114	115	117	129	130	131	144	145	148	149	150
Austria	X	X	X								
Belgium	X	X	X	X	X	X	X	X	X	X	X
Brazil				X	X	X					
Canada			X	X	X	X	X	X	X	X	X
Denmark	X	X	X	X	X	X	X	X			
Egypt	X	X	X	X	X	X	X	X			
Finland	X	X	X	X	X	X	X	X	X	X	X
France		X		X	X	X	X	X	X	X	X
Germany	X	X	X	X	X	X	X	X	X	X	X
Hungary	X	X	X	X	X	X	X	X	X	X	X
Israel					X		X	X			
Italy	X	X	X	X	X	X	X	X	X	X	X
Japan	X	X	X	X	X	X	X	X	X	X	X
Korea (Democratic People's Republic of)									X	X	X
Korea (Republic of)							X	X			
Netherlands	X	X	X	X	X	X	X	X	X	X	X
Norway				X		X	X	X			
Poland				X	X	X	X	X	X	X	X

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Documents 34A(CO) Countries	114	115	117	129	130	131	144	145	148	149	150
Romania	X	X	X	X	X	X			X	X	X
South Africa (Republic of)	X	X	X	X	X	X			X	X	X
Sweden	X			X	X	X	X	X			
Switzerland	X	X	X	X	X	X	X	X	X	X	X
Turkey	X	X	X				X	X	X	X	X
United Kingdom	X	X	X	X	X	X	X	X	X	X	X
United States of America		X	X				X	X	X	X	X
Union of Soviet Socialist Republics	X	X	X	X	X	X	X	X	X	X	X
Yugoslavia	X	X	X	X	X	X					

Note. - Other international publications quoted in this standard are given in Appendix B (normative). Where those publications have been implemented as Harmonization Documents (HD) or European Standards (EN), reference to the relevant HD/EN has been included.

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TUNGSTEN HALOGEN LAMPS (NON-VEHICLE)

INTRODUCTION

Since the publication of the first edition of IEC Publication 357, a number of documents have been approved under the Six Months' Rule, which have resulted in expanding its scope. The title has had to be amended to include additional types of lamps.

For convenience, the publication has been divided into sections according to lamp application.

Lamp standard sheet numbers have had to be revised.

SECTION ONE — GENERAL

1. Scope

This standard specifies dimensions and characteristics of tungsten-halogen lamps.

The lamps covered by this standard are designed specifically for the following applications:

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PROJECTION
PHOTOGRAPHIC (including studio)
FLOOD-LIGHTING
SPECIALIZED AIRFIELD PURPOSES
GENERAL PURPOSE

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Lamps for automobile, aircraft and similar applications are not covered by this standard.

Note. — Projection lamps include those used for cinematograph and still projection applications.

The specific requirements for tubular low-pressure tungsten halogen lamps are given in Clause 9.

The requirements for lamp caps are given in IEC Publication 61-1: Lamp Caps and Holders together with Gauges for the Control of Interchangeability and Safety, Part 1: Lamp Caps.

2. Limits on maximum watts

Lamps covered by this standard shall have a maximum wattage at rated voltage as follows:

Voltage ratings above 65 V	= nominal wattage + 8%
Voltage ratings 65 V or less	= nominal wattage + 12%

For each type, 95% of the production shall comply with this requirement.

3. The effect on lamp performance of fluctuations in mains supply voltage

Projection lamps have a high efficiency and a corresponding short design life and thus any increase in operating voltage will result in a significant reduction in achieved life.

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So far as possible, therefore, lamps should be operated at all times at a voltage close to the rated voltage marked on the lamp. In any event, the applied voltage should not exceed 110% of the rated voltage and preferably should not exceed 105%.

In the case of those projection lamps operated from a transformer, the effect of increases in primary voltage on the secondary (output) voltage can be minimized by suitable design of the transformer regulation.

4. Cautionary notice for photographic and floodlight lamps

It is recommended that cautionary notices should be supplied with tungsten-halogen photographic and floodlight lamps. These notices should cover at least the following minimum requirements and should be based on the wording shown below:

Caution. — To ensure maximum safety, the following precautions should be observed:

- a) Disconnect the plug from the power supply before removing or replacing the lamp, or the equipment fuse.
- b) If the lamp has been provided with a protective cover, do not remove the cover until after the lamp has been inserted in the equipment.

If the quartz bulb is touched by the bare hands, it shall be cleaned with a lint-free cloth moistened with methylated spirit (methyl alcohol).

- c) Always operate the lamp in series with a suitable fuse which meets the standard requirements for quick-acting, large breaking capacity fuses and rated for a current of _____ amperes. (The rated current for this fuse should be in accordance with the values specified in Table I or Table II of Clause 5.)

- d) Avoid improper operation of the lamp, such as:
 - i) burning positions other than those recommended by the manufacturer;
 - ii) operation at over-voltage, or for a longer period than specified, or

- iii) in conjunction with improper fuses or equipment not specifically designed for that type and rating of lamp.

Non-observance of these precautions may lead to damage to the lamp and equipment and, in extreme cases, to bursting of the lamp.

Note to equipment manufacturers

Since specific conditions may have to be observed in order to ensure correct and safe operation of the lamp, equipment manufacturers should request the latest detailed information from the lamp manufacturers.

5. Use of external fuses

5.1 Photographic lamps

The current ratings for the fuses that are recommended in the cautionary notices (Item c) of Clause 4 of the cautionary notices) should be in accordance with Table I:

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TABLE I
Fuse values for photographic lamps

Lamp		Fuse
Voltage (V)	Wattage (W)	Rated current (A)
100 ... 135	500	6.3
200 ... 250	500	4.0
100 ... 135	600	6.3
200 ... 250	600	4.0
100 ... 135	650	6.3
200 ... 250	650	4.0
100 ... 135	800	10.0
200 ... 250	800	6.3
100 ... 135	1 000	10.0
200 ... 250	1 000	6.3
200 ... 250	1 250	6.3

Recommendations for fuses for lamps of other wattage and voltage ratings are under consideration.

The fuses recommended for these lamps should be of a quick-acting large breaking-capacity type. Specifications for miniature fuses of this type are given in IEC Publication 127: Cartridge Fuse-links for Miniature Fuses, or in the equivalent national standards.

5.2 Floodlight lamps

The current ratings for the fuses that are recommended in the cautionary notices (Item c) of Clause 4 of the cautionary notices) should be in accordance with Table II:

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TABLE II

Fuse values for floodlight lamps

Lamp		Fuse	
Voltage (V)	Wattage (W)	Rated Current (A)	
		a)	b)
100 ... 135	300	4.0**	—
200 ... 250	300	2.0**	—
100 ... 135	500	6.3	—
200 ... 250	500	4.0	—
100 ... 135	750	10.0*	10.0
200 ... 250	750	6.3	6.0
100 ... 135	1 000	10.0*	10.0
200 ... 250	1 000	6.3	6.0
100 ... 135	1 500	—	20.0
200 ... 250	1 500	—	10.0
100 ... 135	2 000	—	25.0
200 ... 250	2 000	—	10.0

a) "Quick-acting" miniature fuses 250 V with large-breaking capacity. (IEC Publication 127: Cartridge Fuse-links for Miniature Fuses, or the equivalent national standard.)

b) "Quick-acting" D-fuses, 500 V. (IEC Publication 241: Fuses for Domestic and Similar Purposes, or the equivalent national standard.)

* Not included in IEC Publication 127, but in common use.

** Under consideration.

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6. Maximum pinch temperatures for tungsten halogen lamps

Maximum permissible pinch temperatures of quartz lamps measured according to the method prescribed in IEC Publication 682: Standard Method of Measuring the Pinch Temperature of Quartz-tungsten-halogen Lamps, are specified for each lamp on the relevant data sheet.

Compliance with the maximum pinch temperature requirement will avoid premature lamp failure. Moreover, it will reduce the risk and violence of a possible explosion caused by increased internal pressure due to excessive temperature.

The maximum permissible pinch temperature is related to the rated lamp life and to its operating conditions. The following relation between the above parameters should be used as a guideline.

TABLE III

Maximum pinch temperatures

Lamp rated life (h)	Operating conditions	Maximum pinch temperature (°C)
≥ 300	Normal	350
≥ 200	Normal photographic use	
Any	Unprotected operation in humid environment	
Between 15 and 300 (both excluded)	Normal	400
≤ 15	Normal	450

Note. — Higher maximum pinch temperatures may be specified in the relevant lamp standard sheets for certain lamp types of special design, provided the same level of safety is ensured.

7. Numbering system for lamp standard sheets

The first number represents the number of this publication (357) followed by the letters “IEC”.

The second number represents the lamp group and sheet number within that group.

Projection lamps	2000-2999
Photographic lamps	3000-3999
Floodlight lamps	4000-4999
Airfield lamps	5000-5999
General purpose lamps	6000-6999

The third number indicates the edition of the sheet. Example:

357-IEC-2101-1

refers to the first edition of a standard sheet for halogen projection lamps.

~~357 Amend. 1 © IEC 1984~~**8. Principles of dimensioning**

See the following standard sheets which follow at the end of Section One:

Title	Sheet number
Principle of dimensioning of tubular tungsten halogen lamps fitted with caps R7s and RX7s	357-IEC-1001-1
Principle of dimensioning of tubular tungsten halogen lamps fitted with Fa4 caps	357-IEC-1002-1
Centring principle for 50 mm integral mirror tungsten halogen lamps with base GZ6.35	357-IEC-1003-2
Centring principle for 2 in integral mirror tungsten halogen lamps	357-IEC-1004-1
External dimensions of tungsten halogen protection lamps having a 2 in integral reflector and a GX5.3 or GY5.3 base	357-IEC-1005-1

9. Tubular low-pressure tungsten halogen lamps**9.1 Definition**

Low-pressure tungsten halogen lamps have a working gas pressure below 10^5 Pa (1 bar).

9.2 Dimensions

In order to obtain non-interchangeability with existing high-pressure tungsten halogen lamps, the low-pressure lamps are longer than the existing lamps.

9.3 Marking

The packing of low-pressure tungsten halogen lamps shall be provided with a marking indicating clearly that it contains one or more low-pressure lamps.

9.4 Filling-gas pressure

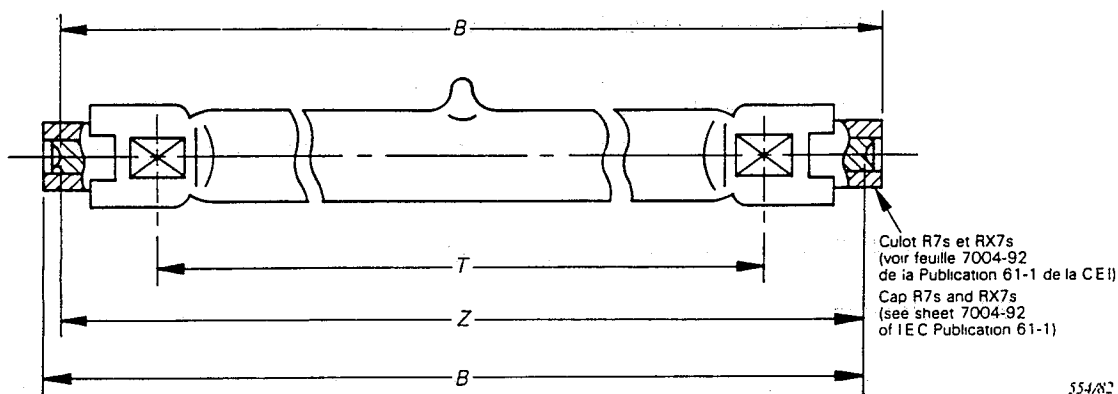
The filling-gas pressure shall not exceed 10^5 Pa (1 bar) either during operation or in any other circumstances.

Compliance is checked by determining the normal room temperature filling-gas pressure which is multiplied by the factor 4.3 related to a maximum bulb temperature of 950 °C. A recommended method for testing is specified in Appendix A.

**PRINCIPE DE DIMENSIONNEMENT DES LAMPES
TUBULAIRES TUNGSTÈNE-HALOGÈNE MUNIES DES
CULOTS R7s ET RX7s**

**PRINCIPLE OF DIMENSIONING OF TUBULAR TUNGSTEN
HALOGEN LAMPS FITTED WITH CAPS R7s AND RX7s**

Dimensions en millimètres — Dimensions in millimetres



Z nom. indique la distance entre les fonds des contacts et est indiquée sur la feuille relative à la lampe.

Z nom. denotes the distance between the bottoms of the contacts and is shown on the appropriate lamp sheet.

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Z min. = Z nom. - 1,6 mm (0,063 in)
Z max. = Z nom. + 1,6 mm (0,063 in)
B max. = Z nom. + 3,4 mm (0,134 in)
T nom. = Z nom. - 28,0 mm (1,102 in)

La dimension *T* s'applique seulement aux lampes pour projecteurs d'éclairage ayant une dimension *Z* supérieure ou égale à 114,2 mm (4,500 in) et correspond à la distance entre les lignes médianes des surfaces planes prévues pour l'utilisation de refroidisseurs (voir feuille 7004-92 de la Publication 61-1 de la CEI).

Dimension *T* is applicable only for floodlight lamps from and including a *Z* nom. = 114.2 mm (4.500 in) and is the distance between the centre-lines of the flat areas intended to accommodate heat sinks (see sheet 7004-92 of IEC Publication 61-1).

Il n'est pas nécessaire que ces surfaces soient positionnées symétriquement par rapport aux fonds des contacts.

It is not necessary for these areas to be positioned symmetrically with respect to the bottoms of the contacts.

Cette dimension est indiquée seulement à l'intention des fabricants de douilles et n'a pas à être vérifiée sur la lampe.

This dimension is solely for lampholder design and is not to be gauged on the lamp.

Les refroidisseurs devront être ajustables et flexibles.

The heat sinks have to be adjustable and flexible.

Les dimensions *Z* nom., *B* max. et *T* nom. sont indiquées sur la feuille relative à la lampe.

Dimension *Z* nom., *B* max. and *T* nom. are shown on the appropriate lamp sheet.

L'axe de la lampe est, par définition, la droite passant par les centres des contacts.

The lamp axis is defined as the line through the centres of the contacts.

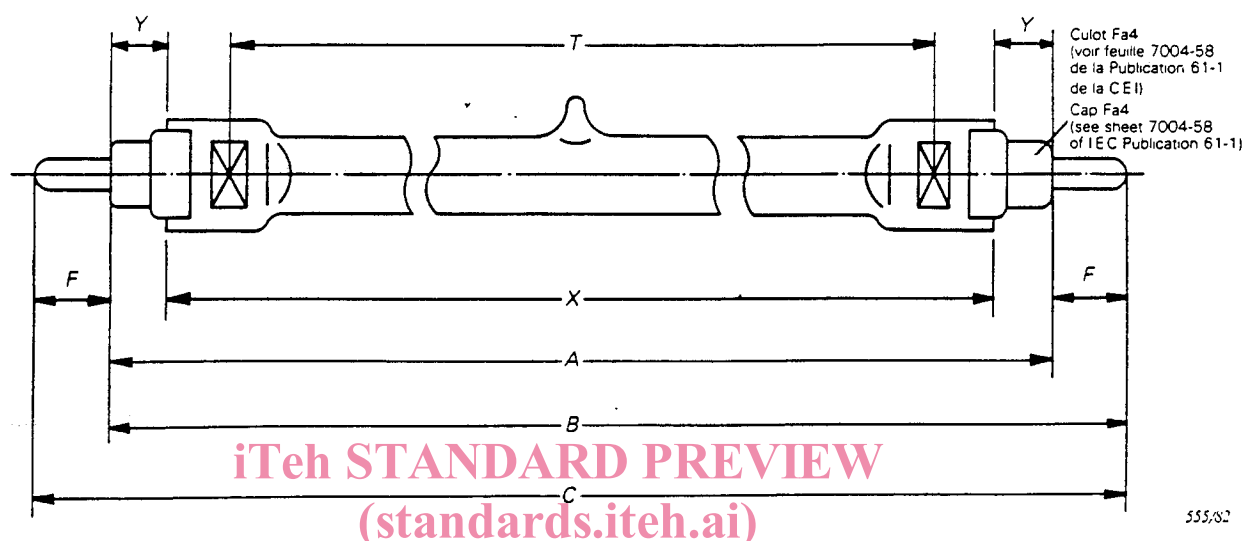
L'adoption de la dimension *T* signifie qu'il n'est pas toujours possible d'utiliser complètement la tolérance sur la dimension *S* de la feuille 7004-92 de la Publication 61-1 de la CEI.

Adoption of dimension *T* means that advantage cannot always be taken of the full tolerance on dimension *S* of sheet 7004-92 of IEC Publication 61-1.

**PRINCIPE DE DIMENSIONNEMENT DES LAMPES
TUBULAIRES TUNGSTÈNE-HALOGÈNE MUNIES DE
CULOTS Fa4**

**PRINCIPLE OF DIMENSIONING OF TUBULAR TUNGSTEN
HALOGEN LAMPS FITTED WITH Fa4 CAPS**

Dimensions en millimètres — Dimensions in millimetres



X est la valeur nominale de la longueur de l'ampoule tubulaire. La tolérance pour X est de $\pm 1,5$ mm. On admet pour Y une longueur de $7,5 \pm 0,15$ mm. X et Y sont seulement indiquées pour expliquer le système de dimensionnement de la lampe. Leurs valeurs ne doivent pas être contrôlées sur celle-ci.

X denotes the nominal length of the envelope. The tolerance on X is ± 1.5 mm. Dimension Y is taken as 7.5 ± 0.15 mm. Dimensions X and Y are indicated only to explain the principle of lamp dimensioning and are not to be checked on the lamp.

Les dimensions diverses sont déterminées comme suit:

The various dimensions are determined as follows:

$$A \text{ max.} = X \text{ max.} + 2 Y \text{ max.} = X + 16,8$$

$$B \text{ max.} = A \text{ max.} + F \text{ max.} = X + 27,1$$

$$B \text{ min.} = A \text{ max.} + F \text{ min.} - \text{Tol. sur } X - 2 \text{ Tol. sur } Y = X + 22,9$$

$$C \text{ max.} = A \text{ max.} + 2 F \text{ max.} = X + 37,4$$

$$* T \text{ nom.} = X - 21,0$$

* La dimension T est la distance entre les axes des surfaces planes prévues pour l'utilisation des refroidisseurs (voir la feuille 7004-58 de la Publication 61-1 de la CEI). Il n'est pas nécessaire que ces surfaces soient placées symétriquement par rapport aux extrémités des broches. (Cette dimension s'applique seulement à la douille et ne doit pas être vérifiée sur la lampe.)

* Dimension T is the distance between the centre-lines of the flat areas intended to accommodate the heat-sinks (see sheet 7004-58 of IEC Publication 61-1). It is not necessary for these areas to be positioned symmetrically with respect to the pins. (This dimension is solely for lampholder design and is not to be gauged on the lamp.)

Les dimensions A max., B max., C max. et T nom. sont indiquées sur la feuille relative à la lampe. La dimension F max. a une valeur de 10,3 mm (voir la feuille 7004-58 de la Publication 61-1 de la CEI).

Dimensions A max., B max., C max. and T nom. are shown on the appropriate lamp sheet. Dimension F max. has a value of 10.3 mm (see sheet 7004-58 of IEC Publication 61-1).