

TECHNICAL REPORT

IEC
TR 62157

First edition
2001-06

Cylindrical machined carbon electrodes – Nominal dimensions

*Electrodes cylindriques en carbone usiné –
Dimensions nominales*

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CYLINDRICAL MACHINED CARBON ELECTRODES – NOMINAL DIMENSIONS

FOREWORD

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Technical reports do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful by the maintenance team.

IEC 62157, which is a technical report, has been prepared by IEC technical committee 27: Industrial electroheating equipment.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
27/246/CDV	27/264/RVC

Full information on the voting for the approval of this technical report 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 3.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

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- withdrawn;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

This document which is purely informative is not to be regarded as an International Standard.

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

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CYLINDRICAL MACHINED CARBON ELECTRODES – NOMINAL DIMENSIONS

1 Scope and object

This technical report applies to cylindrical carbon electrodes, manufactured from upgraded coal, for use in electric direct-arc and submerged-arc furnaces, for melting silicium and carbide and for other purposes.

This technical report covers

- dimensions and tolerances on the length and diameter of carbon electrodes;
- dimensions and thread details for carbon electrode heads and sockets.

2 Designation

Cylindrical carbon electrode with a diameter of 700 mm and a length of 2 400 mm; carbon electrode 700 mm × 2 400 mm.

3 Specific characteristics

3.1 Electrode surface

The surface of the electrode has to be machined.

3.2 Electrode structure

An electrode punched with a 200 g steel hammer should develop a clear tone, close to a metallic one. Places with attenuated tone are allowed at a distance of not less than 200 mm from the socket bottom or the bottom surface of the electrode head.

4 Dimensions

4.1 Electrode dimensions

Table 1 indicates tolerances in relation to the range of electrode dimensions.

Carbon electrodes are machined in order to obtain the desired diameter over the whole electrode length. It may happen that part of the surface remains untouched by the tool when machining the electrodes. This part is called a “low spot”. The depth of the low spot shall not be greater than the value given in table 1.

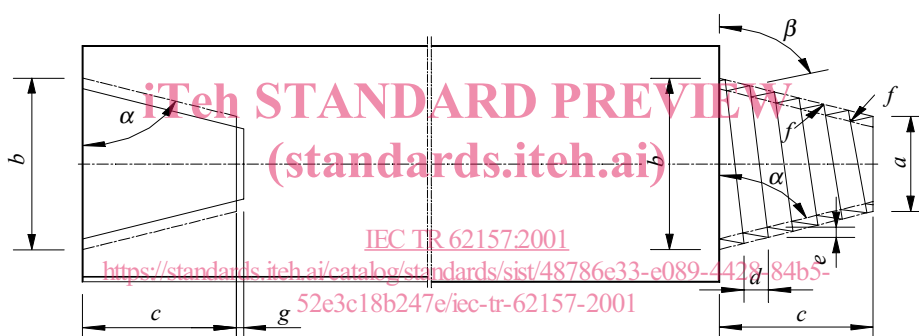
Table 1 – Tolerances of electrode dimensions

Electrode diameter mm	Diameter tolerances mm	Electrode length mm	Length tolerances mm	Admissible oval (low spot) mm
200 – 500	± 2	2 000 – 3 000	+40 –150	1
550 – 750	± 3			2
800 – 1 500	± 4			2

NOTE The length of the electrode is subject to agreement between manufacturer and user. Electrodes which are 10 % shorter are allowed in the lot but they should not be shorter than 1 500 mm.

4.2 Dimensions of the socket and conical head of cylindrical electrodes

The shape and standardized dimensions of sockets and cylindrical heads are shown in figure 1. The particular dimensions are given in table 2.



IEC 645/01

Figure 1 – Electrode shape and dimensions of the sockets and conical heads

Table 2 – Particular dimensions of the sockets and conical heads according to figure 1

<i>D</i> mm	<i>α</i>	<i>a</i> mm	<i>b</i> mm	<i>c</i> mm	<i>d</i> mm	<i>e</i> mm	<i>f</i> mm	<i>g</i> mm	<i>β</i>
200	70°	70	150	110	25	16	3	4	75°
225	70°	75	170	130	25	16	3	4	75°
250	70°	81	190	150	30	19	3	4	75°
285	70°	92	220	175	30	19	3	4	75°
300	70°	92	220	175	30	19	3	4	75°
325	70°	110	245	185	30	19	3	4	75°
350	70°	110	245	185	30	19	3	4	75°
360	70°	110	245	185	30	19	3	4	75°
400	70°	136	300	225	40	25	4	4	75°
450	70°	149	320	235	40	25	4	4	75°
500	70°	179	375	270	40	25	4	4	75°
550	70°	179	375	270	40	25	4	4	75°
600	70°	206	435	315	50	32	5	4	75°
650	70°	206	435	315	50	32	5	4	75°
700	70°	289	500	290	50	32	5	4	75°
750	70°	289	500	290	50	32	5	4	75°
800	70°	317	550	320	50	32	5	4	75°
850	70°	317	550	320	50	32	5	4	75°
900	70°	342	590	340	50	32	5	4	75°
950	70°	343	590	340	50	32	5	4	75°
1 000	70°	368	630	360	50	32	5	4	75°
1 100	70°	443	720	380	50	32	5	4	75°
500	55°18'13"	151	416	191	30	31,6	3	4	70°
550	55°18'13"	151	416	191	30	31,6	3	4	70°
600	55°18'13"	191	510	230	30	31,6	3	4	70°
650	55°18'13"	191	510	230	30	31,6	3	4	70°
700	55°18'13"	208	600	283	50	52,8	5	4	70°
750	55°18'13"	208	600	283	50	52,8	5	4	70°
800	55°18'13"	228	685	330	50	52,8	5	4	70°
850	55°18'13"	228	685	330	50	52,8	5	4	70°
900	55°18'13"	247	770	378	50	52,8	5	4	70°
950	55°18'13"	247	770	378	50	52,8	5	4	70°
1 000	55°18'13"	346	900	400	50	52,8	5	4	70°
1 050	55°18'13"	346	900	400	50	52,8	5	4	70°
1 100	55°18'13"	277	900	450	50	52,8	5	4	70°
1 200	55°18'13"	408	1 100	500	50	52,8	5	4	70°
1 300	55°18'13"	408	1 100	500	50	52,8	5	4	70°
1 400	55°18'13"	388	1 150	550	50	52,8	5	4	70°
1 500	55°18'13"	419	1 250	600	50	52,8	5	4	70°
700	55°18'18"	143	600	330	50	52,8	5	4	70°
750	55°18'18"	143	600	330	50	52,8	5	4	70°
850	55°18'18"	181,5	770	425	50	52,8	5	4	70°
900	55°18'18"	271,5	770	360	50	52,8	5	4	70°
1 050	55°18'18"	276,9	900	450	50	52,8	5	4	70°
850	55°18'18"	323,8	670	250	40	52,7	5	50	58°
900	55°18'18"	365	750	278	40	52,7	5	50	58°
1 050	55°18'18"	404,6	820	300	40	52,7	5	50	58°

5 Manufacturing defects

The following defects are allowed:

- a) cavities and unmachined places having a depth within the tolerances;
- b) lamination along, or inclined with, a total length of less than 30 % of the electrode length, and at the same time single lamination should not exceed 10 % of the electrode length; the inclination angle to the electrode axis should not exceed 30°; lamination cannot occur at electrode sockets;
- c) one defect of head and socket thread of a depth of up to 15 mm and length up to 50 mm for a thread length of 1 m.

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