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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 10066.10-2005

Replacing GB/T 6542-1986

**Test methods for electro-heat installations -- Part 10: Direct arc
furnaces
(English Translation)**

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Foreword

GB/T 10066 "Test methods for electric heating devices" has 12 parts.

--- Part 1. General part;

--- Part 2. Heart induction furnace;

--- Part 3. Unintentional induction furnace;

--- Part 4. Indirect resistance furnace;

---Part 5. Plasma device (GB/T 13535-1992 "Test method for plasma equipment for electric heating");

--- Part 6. Determination method of output power of industrial microwave heating equipment (GB/T 18662-2002 "Industrial microwave heating equipment Method for measuring the output power");

---Part 7. Electrothermal devices with electron guns;

---Part 8. Electrosag remelting furnace (GB/T 1020-1989 "Test method for electrosag remelting furnace");

---Part 9. Method for measuring the output power of high-frequency dielectric heating devices (GB/T 14809-2000 "High-frequency dielectric heating equipment transmission Measuring method of output power");

--- Part 10. Direct electric arc furnace;

--- Part 11. Submerged arc furnace;

--- Part 12. Method for measuring the output power of high-frequency induction heating devices (under development).

Note: Some existing electrothermal devices are tested without a segment number (as shown in parentheses) and will be changed to the segment number specified above when revised.

This part is part 10 of GB/T 10066 and should be used in conjunction with Part 1.

This part of the revision uses IEC 60676:2002 "Industrial Electric Heating Equipment - Test Method for Direct Electric Arc Furnace" (Second Edition, English version).

This section was redrafted in accordance with IEC 60676:2002. For the sake of comparison, the informative Appendix A lists the provisions of this section.

A checklist of IEC 60676:2002 clauses.

In order to maintain consistency with other industrial electrothermal device test method standards, this part was made when IEC 60676:2002 was adopted.

These modifications complement the test project and its test methods. These technical differences are identified by vertical single lines on the side of the terms they are involved in.

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For ease of use, the following editorial changes have been made to this part of IEC 60676:2002.

- a) the word "this standard" is replaced by the words "this part";
- b) remove the preface and preamble of international standards;
- c) Change "Industrial electric heating equipment - Test method for direct electric arc furnace" as "Test method for electric heating devices - Part 10. Direct electric Arc Furnace, the English name corresponds to the modification;
- d) The standard chapter number is corresponding to the chapter number of the test method standard of other types of industrial electric heating devices;
- e) classify the test items in cold and hot conditions;
- f) In the article, the words "quality" and "weight" are changed to "quality".

This part replaces GB/T 6542-1986 "Test Method for Direct Electric Arc Furnace", and the main technical changes compared with the latter are as follows.

- a) In "3 Terms and Definitions", the following terms have been added in accordance with IEC 60676:2002.

---Electric arc furnace device;

---Arc furnace shell;

---The rated capacity of the furnace;

--- rated capacity of the furnace;

--- The minimum cumulative proportion of scrap required to complete the maximum charge

at one time;

- The furnace high voltage switch;
- rated capacity of electric arc furnace transformer;
- The melting power that the electric arc furnace transformer can provide;
- Saturated reactor;
- DC reactor; (only for DC arc furnace)
- Controllable rectifier; (only for DC arc furnace)
- Arc furnace electrode;
- Electric arc furnace electrode holder;
- High current line;
- Net power-on time;
- productivity;
- Phase sequence.

The following terms have been modified.

- Electric arc furnace;
- Electric arc furnace transformer;
- Primary side asymmetry coefficient; (not applicable to DC arc furnace)
- The active power of the main circuit of the electric arc furnace equipment;
- Unit melting power consumption;
- The main circuit power factor of the electric arc furnace device;
- Cooling water flow;
- Run short circuit;
- The electric arc furnace device is cold;
- The furnace is hot.

b) According to GB/T 10066.1-2004 "Testing methods for electric heating equipment - Part 1. General part", the original test items are cold and hot.

State classification.

c) Supplementary provisions for general test conditions.

- Specify the test conditions according to the cold and hot state;

--- Increased requirements for process, charge and measuring instruments.

d) Revised the measurement of the original water consumption.

--- Change the water consumption measurement to the measurement of cooling water flow and loss.

e) Added Appendix A and Appendix B.

Appendix A and Appendix B of this part are informative annexes.

This part was proposed by China Electrical Equipment Industry Association.

This part is under the jurisdiction of the National Technical Committee for Standardization of Industrial Electric Heating Equipment.

This section drafted by: Xi'an Electric Furnace Research Institute.

1 Scope

This part of GB/T 10066 specifies the test conditions and methods for determining the main parameters and technical operating characteristics of a three-phase direct arc furnace.

This section applies to three-phase direct arc furnaces with rated capacity equal to or greater than 500kg, including three-phase AC electric arc furnace, ladle refining furnace, DC electric arc furnace, etc. These furnaces are suitable for melting solid charge and refining liquid charge at or near atmospheric pressure.

This section also applies to electric arc furnaces with one or more electrodes that are different from three-phase furnaces.

An electric arc furnace that melts ferrous metals (such as steel, iron) and non-ferrous metals (such as copper) can also be used as a holding furnace for liquid charge discharging.

Pre-heating and insulation.

The purpose of this section is to standardize the test conditions and methods for determining the main parameters and technical operating characteristics of an electric arc furnace.

Note 1: These tests are performed independently of the compensation equipment.

This section does not contain all the test methods that may be performed for EAF technology and economic evaluation.

Note 2: Supplemental test conditions are negotiated between the manufacturer and the user.

For the testing of some special equipment for DC arc furnaces, such as the test of controlled rectifiers, see GB/T 3859.1-1993.