



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

GB/T 10045-2018

Tubular cored electrodes for non-alloy and fine grain steels

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Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 10045-2001 "Carbon steel flux cored electrodes for arc welding". Compared with GB/T 10045-2001 "Carbon steel flux cored electrodes for arc welding", the main content changes are as follows:

- CHANGE the standard name to "Tubular cored electrodes for non-alloy and fine grain steels";
- According to the tensile strength range of this Standard, ADD all non-metal powder type molybdenum-steel electrode models of GB/T 17493-2008 "Low alloy steel flux cored electrodes for arc welding", E43XT1-Ni1C, E43XT1-Ni1M, E49XT1-Ni1C, E49XT1-Ni1M, E49XT6-Ni1, E49XT8-Ni1, E55XT1-Ni1C, E55XT1-Ni1M, E55XT5-Ni1C, E55XT5-Ni1M, E49XT8-Ni2, E55XT8-Ni2, E55XT1-Ni2C, E55XT1-Ni2M, E55XT5-Ni2C, E55XT5-Ni2M, E55XT5-Ni3C, E55XT5-Ni3M, and E55XT11-Ni3 of non-metal powder type nickel-steel electrode models, E55XT5-K1C, E55XT5-K1M, E49XT4-K2, E49XT7-K2, E49XT8-K2, E49XT11-K2, E55XT1-K2C, E55XT1-K2M, E55XT5-K2C, E55XT5-K2M, E55XT8-K2, E49XT5-K6C, E49XT5-K6M,

E43XT8-K6, E49XT8-K6, E55XT1-W2C, and E55XT1-W2M of non-metal powder type other low-alloy steel electrode models, and E55C-Ni1, E49C-Ni2, E55C-Ni2, E55C-Ni3, and E55C-W2 of metal powder type electrode models. These models are re-developed in accordance with ISO 17632:2015. The technical requirements are adjusted;

- According to the actual production situation in China, ADD two classifications of chemical composition: NCC2 and NCC3;
- MAKE corresponding adjustments to the requirements for model division, mechanical properties, T-joint fillet weld, and chemical composition etc. according to ISO 17632:2015;
- For the symbols for usability characteristics, according to ISO 17632:2015, delete T9 and add T15;
- Delete the bending test requirements for a single-run welded joint.

This Standard uses redraft law to modify and adopt ISO 17632:2015 "Welding consumables - Tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels - Classification".

Compared with ISO 17632:2015, this Standard has more adjustments in structure. Annex A lists a table for comparison between the clause-subclause Tubular cored electrodes for non-alloy and fine grain steels

1 Scope

This Standard specifies the models, technical requirements, test methods, retests, and technical delivery conditions, etc. of tubular cored electrodes for non-alloy and fine grain steels.

This Standard applies to tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels with a minimum tensile strength requirement of not more than 570 MPa (hereinafter referred to as "electrodes").

2 Normative references

The following documents are indispensable for the application of this document.

For the dated references, only the editions with the dates indicated are applicable to this document. For the undated references, the latest edition (including all the amendments) are applicable to this document.

GB/T 700 Carbon structural steels (GB/T 700-2006, ISO 630:1995, NEQ)

GB/T 1591 High strength low alloy structural steels

GB/T 2650 Impact test methods on welded joints (GB/T 2650-2008, ISO 9016:2001, IDT)

GB/T 2651 Tensile test methods on welded joints (GB/T 2651-2008, ISO 4136:2001, IDT)

GB/T 2652 Tensile test methods on weld and deposited metal (GB/T 2652-2008, ISO 5178:2001, IDT)

GB/T 3323 Radiographic examination of fusion welded joints in metallic materials

GB/T 3965 Determination of diffusible hydrogen in deposited metal (GB/T 3965-2012, ISO 3690:2000, MOD)

GB/T 16672 Welds - Working positions - Definitions of angles of slope and rotation (GB/T 16672-1996, idt ISO 6947:1990)

2) The second part: Indicate the symbol for tensile strength of the deposited metal under as-welded or post-weld heat treatment condition when used for multi-run welding; see Table 1. Or indicate the symbol for tensile strength of the welded joint under as-welded condition when used for single-run welding; see Table 2;

3) The third part: Indicate the symbol for test temperature when the impact absorbed energy (KV2) is not less than 27J; see Table 3. For electrodes only applicable to single-run welding, this symbol is not available;

4) The fourth part: Indicate the symbol for usability characteristics; see Table

4;

5) The fifth part: Indicate the symbol for welding position; see Table 5;

6) The sixth part: Indicate the symbol for type of shielding gas. The symbol for non-gas shielding is "N". The symbol for shielding gas shall be in accordance with ISO 14175; see Annex D. For electrodes only applicable to single-run welding, ADD the letter "S" after the symbol;

7) The seventh part: Indicate the symbol for post-weld state; where "A" indicates the as-welded condition, "P" indicates the post-weld heat treatment state, and "AP" indicates both the as-welded condition and the post-weld heat treatment state;

8) The eighth part: Indicate the classification of chemical composition of deposited metal; see 4.3.

In addition to the above compulsory symbols, optional symbols may be added after them:

a) The letter "U" indicates that, at the specified test temperature, the impact absorbed energy (KV2) shall not be less than 47J;

b) The symbol "HX" for diffusible hydrogen; where "X" may be the number 15, 10, or 5, representing the maximum (mL) of diffusible hydrogen content per 100g of deposited metal respectively; see 4.6.

The examples of electrode model in this Standard are as follows:

5.1.1 Dimension

For the inspection of electrode diameter, USE a measuring tool with an accuracy of 0.01 mm to measure in the directions perpendicular to each other at the same position. The measurement positions is not less than 2.

5.1.2 Surface quality

The surface quality of electrodes shall be visually inspected for any part of the electrodes according to the provisions of GB/T 25775.