



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

中华人民共和国国家标准

**GB/T 8110-2008
Replace GB/T 8110-1995**

**Welding Electrodes and Rods for Gas Shielding
Arc Welding of Carbon and Low Alloy Steel
气体保护电弧焊用碳钢、低合金钢焊丝**

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China**

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Foreword

Modification of this standard adopts American standard AWS A5.18M:2005 *Specifications of Arch Welding & Filling Wires for Gas Welding* and AWS A5.28M:2005 *Specifications of Welding Wires for Gas Shielding Arc Welding of Low Alloy Steel and Filling Wires*

Considering the actual conditions of welding Wires for gas shielding arc welding of carbon and low alloy steel in China, we modified the following technical items while adopting AWS A5.18M:2005 and AWS A5.28M:2005:

- Deleted American standards like A36/A36M, A285/A285M, E29 and E350;
- In model compiling method, we follow original standard to compile the content of carbon steel welding wire, and the diffusible hydrogen code grade was modified from “16, 8, 4 or 2” to “15, 10 or 5” based on ISO standard.
- S content of carbon steel welding wire was modified from “ ≤ 0.035 ” into “ ≤ 0.025 ” according to requirements in GB/T3429 *Wire Rod for Electrode*;
- Tensile strength and yield strength of carbon steel welding wire in deposited metal tensile experiment shall follow original standards.
- Added Table B. 1 (the reference table of main standard models)
- This standard does not cover the requirements for composite welding wire

For the convenience of usage, this standard modifies the following items:

- Standard name was changed into *Welding Electrodes and Rods for Gas Shielding Arc Welding of Carbon and Low Alloy Steel*;
- Standard structure is compiled according to classification, model, technical requirements, experimental methods, test rules, packing, labels, and quality certificate.

This standard is the modified edition of GB/T8110—1995 *Welding Electrodes and Rods for Gas Shielding Arc Welding of Carbon and Low Alloy Steel*, and compared to GB/T8110—1995, the main modifications are as follows:

- Welding wire is classified according to AWS A5.18M: 2005 and AWS A5.28M: 2005, and diffusible hydrogen code grade was added.
- Canceled three models of welding wires like ER50-5, ER69-2, and ER69-3, and added six models like ER49-A1, ER55-B6, ER55-B8, ER62-B9, ER62-D2, and ER55-1. In addition, chemical components of some models of welding wires are adjusted according to AWS standard.
- S content of carbon steel welding wire was modified from “ ≤ 0.035 ” into “ ≤ 0.025 ” according to requirements in GB/T3429 *Wire Rod for Electrode*;

- The requirements for deposited metal strength of low-alloy steel welding wire featuring low carbon content was reduced according to AWS standard.
- Impact experiment temperature of welding wire's deposited metal was adjusted according to AWS standards.
- Thickness of shim plate in mechanical performance experiment was adjusted from 12mm to ≥ 10 mm。
- The “X-ray detection of welding seam shall follow Level-II stipulations in GB/T3323” is modified into “X-ray detection of welding seam shall follow Level-II stipulations of Table C4 in Annex C of GB/T3323”.
- maximum weight of Model ER50-X, ER49-1 welding wire was modified from “30t” into “200t”.
- Modified 7.3 “Chemical analysis shall be made to at least two rolls of welding wires in each batch of welding wires (or 3% of the total welding wires)” and 7.5 “examination to copper plating layer, welding wire's tensile strength, welding wire's slack diameter and curl distance shall be conducted to 1% of each batch of welding wires (not less than two rolls)” into “examination to welding wires' chemical components, mechanical performance, X-ray detection, dimension, and surface quality shall be conducted to any roll of the welding wires and any minimum packing unit in each batch of bar welding wire.
- Added the packing means of wire reel (diameter: 270mm and 610mm) and cancelled the packing means of wire reel (diameter 35mm). In addition corresponding adjustment was made to packing requirements for wire reel (diameters: 560mm, 610mm and 760mm) and wire spool.
- Packing quality was adjusted according to AWS standard.
- Cancelled the requirements for bonding strength of welding wire's copper plating layer.
- Cancelled the requirements for welding wire's tensile strength
- Briefing of welding wires was added in Annex A
- Annex B depicted the correlation of main standard models in international arena.

As of the implementation date, this standard shall replace GB/T 8110—1995.

Annex A and Annex B in this standard are informative annex.

This standard is put forward and classified by National Welding Standardization Technical Committee.

This standard is drafted by the following enterprises: Harbin Welding Institute, Changzhou Huatong Welding Wire Co., Ltd., Tianjin Bridge Welding Materials Group Co., Ltd., Tianjin Golden Bridge Welding Materials Group Co., Ltd., Shanghai Welding Equipments & Consumables Co., Ltd., Tianjin Permanent Welding Consumables Co., Ltd. Sichuan

Atlantic Welding Consumables Co., Ltd., Shandong Juli Welding Material Co., Ltd.,
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This standard is mainly drafted by the following persons: Zhu Jijun, Li Zhenhua, Cui Wei,
Wang Daliang, Wu Shengqun, Liu Hongbin, Chen Yigang, Qiao Jichun, Ji Yihao.

This standard replaces the following versions:

-GN/T 8110—1987, GB/T 8110—1995

Welding Electrodes and Rods for Gas Shielding Arc Welding of Carbon and Low Alloy Steel

1 Scope

This standard prescribes the classification, model, technical requirements, experimental methods, test rules, packing, label, and quality certificate of welding wires for gas shielding arc welding of carbon and low alloy steel and filling wires.

This standard is applicable to carbon steel and low-alloy steel solid wire and filling wire (abbreviated as welding wire below) used in gas metal arc welding, gas tungsten arc welding, and plasma arc welding

2. Normative References

The articles contained in the following documents have become this standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB/T 223 (All parts) Chemical Analysis Methods of Steel and Alloy

GB/T 700 Carbon structural steel (GB/T 700—2006, ISO630: 1995, NEQ)

GB/T 1591 High strength low alloy structural steel (GB/T 1591—1994, neq ISO 4950: 1981)

GB/T 2650 Method of Impact Test for Welded Joint (GB/T 2650—2008, ISO 9016: 2001, IDT)

GB/T 2652 Method of Tensile Tests for Weld and Deposited Metal (GB/T 2652—2008, ISO 5178: 2001, IDT)

GB/T 3323—2005 Radiographic Examination of Fusion Welded Joints in Metallic Materials

GB/T 3965 Methods for Determination of Diffusible Hydrogen in Deposited Metal of Covered Electrodes

3. Classification and Model

3.1. Classification of welding wire

Based on chemical components, the welding wire falls into the following six categories, namely, carbon steel, carbon molybdenum steel, chrome molybdenum steel, nickel steel, and manganese molybdenum steel.

3.2: Model classification:

Welding wire model's classification shall base on chemical components and mechanical



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