

ICS 25.160.20

CCS J 33



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

GB/T 5117-2012

Replacing GB/T 5117-1995

**Covered electrodes for manual metal arc welding of non-alloy
and fine grain steels**

非合金钢及细晶粒钢焊条

(English Translation)

Issued on: November 5, 2012

Implemented on: March 1, 2013

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China, Standardization
Administration of the People's Republic of China**

Table of Contents

Foreword

1 Covered Electrodes for Manual Metal Arc

2 Normative References

Foreword

This Standard was drafted in accordance with the regulations of GB/T 1.1- 2009.

This Standard is the revision of GB/T 5117-1995 "Carbon Steel Covered Electrodes".

Compared with GB/T 5117-1995, the main revised contents of this Standard are as follows.

- Standard name was revised as "Covered Electrodes for Manual Metal Arc Welding of Non-alloy and Fine Grain Steels";
- Technical specifications of covered electrodes for weathering steel was added and listed as covered electrodes of non-alloy steel together with original covered electrode for carbon steel;
- According to the scope of tensile strength specified in this Standard, technical specifications of electrode model for all the carbon molybdenum steel, nickel steel, nickel molybdenum steels specified in GB/T 5118-1995 "Low Alloy Steel Covered Electrodes", as well as electrode models of E5515-D3, E5516-D3, E5518-D3 for manganese-molybdenum steel, and electrode models of E5018W, E5518W for other low alloy was added. Aforesaid electrode models were revised according to the requirements of ISO 2560:2009.
- Electrode models of E4322, E4323, E5018M and E5023 was deleted, and the others covered electrodes was classified according to the requirements of ISO 2560:2009;
- Compilation methods of international standards was adopted for this Standard, and the models of E4300, E4301 and E5001 specified in GB/T 5117-1995 was revised as E4340, E4319 and E5019 respectively;
- Technical requirements for water content of electrode coating were deleted;
- For the electrode models with a tensile strength code number of "43", according to the requirements of ISO 2560:2009, the minimum value of tensile strength of their deposited metal was changed from 420 MPa into 430 MPa.
- According to the technical requirements for covered electrodes specified in ISO 2560:2009, chemical composition of deposited metal was adjusted, and the requirements for percentage elongation after fracture of deposited metal was adjusted accordingly.

This Standard was redrafted and modified in relation to International Standard ISO 2560:2009 "Welding Consumables - Covered Electrodes for Manual Metal arc Welding of Non-alloy and Fine Grain Steels - Classification" (English edition).

Major technical differences and their causes between this Standard and ISO 2560:2009 are as follows.

- For the purpose of convenient for implementation, international standards quoted in "Normative references" was deleted and replaced with corresponding national standards of China;
- For the purpose of meet the technical conditions of China, tensile strength code number of deposited metal was changed from "49" into "50"; for the code number of heat treatment state, code number of welding state was changed from "A" into "no mark ";
- For the purpose of meet the technical conditions of China, electrode models of E4315 and E 4328 were reserved; electrode models of E5003-A1 (model compilation as E5003-1M3), E5515-C1 (model compilation as E5515-N), E5515-C2 (model compilation as E5515-N2) and E5515-D3 (model compilation as E5515-3M3) specified in GB/T 5118-1995 were incorporated in this Standard. Technical requirements of aforesaid covered electrode models were revised according to the requirements of ISO 2560:2009;
- For the purpose of meet the requirements of types of electrode coating in China, electrode models of E5015-N1, E5515-N1, E5015-N2, 5015-N3, E5515-N3, E5515-N7, E5515-N13 were added in this Standard, and the technical requirements of aforesaid electrode models as the same of corresponding EXX 16-XX covered electrodes;
- For the purpose of meet the technical conditions in China, chemical composition content of P and S in deposited metal with electrode models of E4303, E4310, E4311, E4312, E4313, E4315, E4316, E4319, E4320, E4324, E4327, E4328, E4340 and E5003 shall be. $P \leq 0.040$, $S \leq 0.035$;
- For the purpose of meet the technical conditions in China, chemical composition content of P and S in the deposited metal with electrode models of E5012 and E5013, shall meet the requirements of other electrode models and shall be intended to be. $P \leq 0.035$, $S \leq 0.035$;
- For the purpose of meet the technical conditions in China, chemical composition content of Mn in the deposited metal with a electrode model of E5016 was changed from "Mn ≤ 1.25 " into "Mn ≤ 1.60 ";
- For the purpose of convenient for actual operation, for the specimen preparation of mechanical property test, technical requirement of "for the electrode length greater than 450 mm, test plate length shall be 500 mm minimum" was reserved.
- For the purpose of meet the requirements of practical applications, hydrogen relief treatment of tensile test specimen of deposited metal was reserved;

- For the purpose of meet the technical conditions in China, radiographic inspection requirements of weld metal specified in GB/T 5117-1995 was reserved;
- For the purpose of convenient for operation, technical requirements for eccentricity of covered electrodes specified in GB/T 5117-1995 was reserved;

For the purpose of convenient for application, the following editing revisions are made in this Standard.

- The standard structure was redacted according to the classification and type, technical specifications, test methods, inspection rules, packing, marking and quality certificate of covered electrodes.

This standard was proposed by and is under the jurisdiction of National Technical Committee on Welding of Standardization Administration of China (SAC/TC 55).

Drafting organizations of this Standard. Harbin Welding Institute, Tianjin Bridge Welding Materials Group Co., Ltd., Tianjin Golden Bridge Welding Materials Group Co., Ltd., Jiande Xin'anjiang Welding Electrodes Co., Ltd., Atlantic China Welding Consumables, Inc., Wuhan Temo Welding Consumable Co., Ltd., Zibo Qilu Welding Industry Co., Ltd.

Drafting staffs of this Standard. Chu Jijun, Li Chunfan, Gao Shengping, Hou Laichang, Shao Haijian, Jiang Yong, Wang Daliang, Song Cheng and Li Yong.

This Standard replaces GB/T 5117-1995.

All previous versions of GB/T 5117-1995 are as follows.

- GB/T 5117-1967, GB/T 5117-1976, GB/T 5117-1985.

1 Covered Electrodes for Manual Metal Arc

Welding of Non-alloy and Fine Grain Steel

1 Scope

This Standard specifies requirements for classification and type, technical specifications, test methods, inspection rules, packing, marking and quality certificate of covered electrodes for non-alloy and fine grain steels.

This Standard is applicable to the covered electrodes for non-alloy and fine grain steels with a minimum yield strength of up to 500 MPa.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 700 Carbon Structural Steels (GB/T 700-2006, ISO 360:1995, NEQ) GB/T 1951 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 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, ISO 6947:1993, IDT) GB/T 20878 Stainless and Heat-resisting Steels - Designation and Chemical Composition GB/T 25774.1 Test Methods for Welding Consumables - Part 1...