

**Welding consumables - Tubular cored electrodes
for gas shielded and non-gas shielded metal arc
welding of non-alloy and fine grain steels -
Classification**

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gas shielded and non-gas shielded metal arc welding
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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 17632:2008 sisaldab Euroopa standardi EN ISO 17632:2008 ingliskeelset teksti. Standard on kinnitatud Eesti Standardikeskuse 20.06.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas. Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 07.05.2008. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 17632:2008 consists of the English text of the European standard EN ISO 17632:2008. This standard is ratified with the order of Estonian Centre for Standardisation dated 20.06.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation. Date of Availability of the European standard text 07.05.2008. The standard is available from Estonian standardisation organisation.
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English Version

Welding consumables - Tubular cored electrodes for gas
shielded and non-gas shielded metal arc welding of non-alloy
and fine grain steels - Classification (ISO 17632:2004)

Produits consommables pour le soudage - Fils-électrodes
fourrés pour soudage à l'arc avec ou sans gaz de
protection des aciers non alliés et des aciers à grains fins -
Classification (ISO 17632:2004)

Schweißzusätze - Fülldrahtelektroden zum Metall-
Lichtbogenschweißen mit und ohne Schutzgas von
unlegierten Stählen und Feinkornstählen - Einteilung (ISO
17632:2004)

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Foreword

The text of ISO 17632:2004 has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 17632:2008 by Technical Committee CEN/TC 121 "Welding" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2008, and conflicting national standards shall be withdrawn at the latest by November 2008.

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Endorsement notice

The text of ISO 17632:2004 has been approved by CEN as a EN ISO 17632:2008 without any modification.

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Introduction

This International Standard provides a classification system for tubular cored electrodes in terms of tensile properties, impact properties, chemical composition of the all-weld metal, type of electrode core, shielding gas and welding position. The ratio of yield to tensile strength of weld metal is generally higher than that of parent metal. Users should note that matching weld metal yield strength to parent metal yield strength will not necessarily ensure that the weld metal tensile strength matches that of the parent metal. Where the application requires matching tensile strength, therefore, selection of the consumable should be made by reference to column 3 of Table 1A or Table 1B.

It should be noted that the mechanical properties of all-weld metal test specimens used to classify the tubular cored electrodes will vary from those obtained in production joints because of differences in welding procedure such as electrode size, width of weave, welding position and parent metal composition.

The classification according to system A is mainly based on EN 758:1997, *Welding consumables — Tubular cored electrodes for metal arc welding with and without a gas shield of non alloy and fine grain steels — Classification*. The classification according to system B is mainly based upon standards used around the Pacific Rim.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 3 via your national standards body, a complete listing of which can be found at www.iso.org.

Welding consumables — Tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels — Classification

1 Scope

This International Standard specifies requirements for classification of tubular cored electrodes with or without a gas shield for metal arc welding of non-alloy and fine grain steels in the as-welded condition or in the post-weld heat-treated condition with a minimum yield strength of up to 500 MPa or a minimum tensile strength of up to 570 MPa. One tubular cored electrode can be tested and classified with different shielding gases, if any.

This International Standard is a combined specification providing classification utilizing a system based upon the yield strength and the average impact energy of 47 J of all-weld metal, or utilizing a system based upon the tensile strength and the average impact energy of 27 J of all-weld metal.

- 1) Paragraphs and tables which carry the suffix letter “A” are applicable only to tubular cored electrodes classified to the system based upon the yield strength and the average impact energy of 47 J of all-weld metal in accordance with this International Standard.
- 2) Paragraphs and tables which carry the suffix letter “B” are applicable only to tubular cored electrodes classified to the system based upon the tensile strength and the average impact energy of 27 J of all-weld metal in accordance with this International Standard.
- 3) Paragraphs and tables which have neither the suffix letter “A” nor the suffix letter “B” are applicable to all tubular cored electrodes classified in accordance with this International Standard.

It is recognized that the operating characteristics of tubular cored electrodes can be modified by the use of pulsed current, but for the purposes of this International Standard, pulsed current is not permitted for determining the electrode classification.

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.

ISO 31-0:1992, *Quantities and units — Part 0: General principles*

ISO 544, *Welding consumables — Technical delivery conditions for welding filler materials — Type of product, dimensions, tolerances and marking*

ISO 3690, *Welding and allied processes — Determination of hydrogen content in ferritic steel arc weld metal*

ISO 6847, *Welding consumables — Deposition of a weld metal pad for chemical analysis*

ISO 6947:1990, *Welds — Working positions — Definitions of angles of slope and rotation*

ISO 13916, *Welding — Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature*

ISO 14175:1997, *Welding Consumables — Shielding gases for arc welding and cutting*

ISO 14344, *Welding and allied processes — Flux and gas shielded electrical welding processes — Procurement guidelines for consumables*

ISO 15792-1:2000, *Welding Consumables — Test methods — Part 1: Test methods for all-weld metal test specimens in steel, nickel and nickel alloys*

ISO 15792-2:2000, *Welding Consumables — Test methods — Part 2: Preparation of single-run and two-run technique test specimens in steel*

ISO 15792-3, *Welding Consumables — Test methods — Part 3: Classification testing of positional capacity and root penetration of welding consumables in a fillet weld*

3 Classification

Classification designations are based upon two approaches to indicate the tensile properties and the impact properties of the all-weld metal obtained with a given electrode. The two designation approaches include additional designators for some other classification requirements, but not all, as will be clear from the following. In most cases, a given commercial product can be classified in both systems. Then either or both classification designations can be used for the product. See Annex A.

The classification includes all-weld metal properties obtained with a tubular cored electrode and appropriate shielding gas combination as given below. With the exception of the symbol for welding position which is based on ISO 15792-3, the classification of gas shielded tubular cored electrodes is based on the 1,2 mm electrode size or, if this size is not manufactured, the next larger diameter manufactured. The classification of self-shielded tubular cored electrodes is based on the 2,4 mm diameter or the largest diameter manufactured if less than 2,4 mm.

3.1A Classification by yield strength and 47 J impact energy

The classification is divided into eight parts:

- 1) the first part (T) indicates a tubular cored electrode;
- 2) the second part gives a symbol indicating the strength and elongation of all-weld metal for multi-run technique or the strength of the parent material used in classification for the single-run technique (see Table 1A or Table 2A);
- 3) the third part gives a symbol indicating the impact properties of all-weld metal or welded joint (see Table 3);
- 4) the fourth part gives a symbol indicating the chemical composition of all-weld metal (see Table 4A);
- 5) the fifth part gives a symbol indicating the type of electrode core (see Table 5A);

3.1B Classification by tensile strength and 27 J impact energy

The classification is divided into nine parts:

- 1) the first part (T) indicates a tubular cored electrode;
- 2) the second part gives a symbol indicating the strength and elongation of all-weld metal for multi-run technique or the strength of the parent material used in classification for the single-run technique (see Table 1B or Table 2B);
- 3) the third part gives a symbol indicating the impact properties of all-weld metal (see Table 3). The symbol "U", added as an optional supplemental designator at or near the end of the complete tubular cored electrode designation, indicates that the deposit meets an average optional requirement of 47 J at the designated Charpy test temperature;
- 4) the fourth part gives a symbol indicating the usability characteristics of the electrode (see Table 5B);
- 5) the fifth part gives a symbol indicating the welding position (see Table 6B);