



SLOVENSKI STANDARD
oSIST prEN ISO 17633:2024
01-april-2024

Dodajni in pomožni materiali za varjenje - Strženske žice in palice za obločno varjenje nerjavnih in ognjeodpornih jekel v zaščitnem plinu in brez zaščite - Razvrstitev (ISO/DIS 17633:2024)

Welding consumables - Tubular cored electrodes and rods for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels - Classification (ISO/DIS 17633:2024)

Schweißzusätze - Fülldrahtelektroden und Füllstäbe zum Metall-Lichtbogenschweißen mit und ohne Gasschutz von nichtrostenden und hitzebeständigen Stählen - Einteilung (ISO/DIS 17633:2024)

Produits consommables pour le soudage - Fils et baguettes fourrés pour le soudage à l'arc avec ou sans protection gazeuse des aciers inoxydables et des aciers résistant aux températures élevées - Classification (ISO/DIS 17633:2024)

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Welding consumables — Tubular cored electrodes and rods for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels — Classification

Produits consommables pour le soudage — Fils et baguettes fourrés pour le soudage à l'arc avec ou sans protection gazeuse des aciers inoxydables et des aciers résistant aux températures élevées — Classification

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

This fourth edition cancels and replaces the third edition (ISO 17633:2017) which has been technically revised.

The main changes are as follows:

— to be added after DIS ballot

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 3 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

ISO/DIS 17633:2023(en)**Introduction**

This document provides a classification system for tubular cored electrodes and rods for welding stainless and heat resisting steels.

It recognizes that there are two somewhat different approaches in the global market to classifying a given tubular stainless steel welding consumable, and allows for either or both to be used, to suit a particular market need. Application of either type of classification designation (or of both, where suitable) identifies a product as classified in accordance with this document. The classification in accordance with system A was mainly based on EN 12073:1999. The classification in accordance with system B is mainly based upon standards used around the Pacific Rim.

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Welding consumables — Tubular cored electrodes and rods for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels — Classification

1 Scope

This document specifies requirements for classification of tubular flux and metal cored electrodes and rods, based on the all-weld metal chemical composition, the type of core, shielding gas, welding position and the all-weld metal mechanical properties, in the as-welded or heat-treated conditions, for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels.

This document is a combined standard providing for classification utilizing a system based upon nominal composition or utilizing a system based upon alloy type.

- a) Clauses, subclauses, and tables which carry the suffix letter “A” are applicable only to products classified using the system based upon nominal composition.
- b) Clauses, subclauses, and tables which carry the suffix letter “B” are applicable only to products classified using the system based upon alloy type.
- c) Clauses, subclauses, and tables which do not have either the suffix letter “A” or the suffix letter “B” are applicable to all products classified in accordance with this document.

This document does not use pulsed current for determining the product classification.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 544, *Welding consumables — Technical delivery conditions for filler materials and fluxes — Type of product, dimensions, tolerances and markings*

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

ISO 6947, *Welding and allied processes — Welding positions*

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

ISO 14175, *Welding consumables — Gases and gas mixtures for fusion welding and allied processes*

ISO 14344, *Welding consumables — Procurement of filler materials and fluxes*

ISO 15792-1:2020, *Welding consumables — Test methods — Part 1: Test methods for all-weld metal test specimens in steel, nickel and nickel alloys.*

ISO 15792-3:2011, *Welding consumables — Test methods — Part 3: Classification testing of positional capacity and root penetration of welding consumables in a fillet weld*

ISO 80000-1:2022, *Quantities and units — Part 1: General*

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3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Classification

4.1 General

Classification designations are based upon two approaches to indicate the chemical composition of the all-weld metal deposit obtained with a given electrode or rod.

The “nominal composition” approach uses designation components indicating directly the nominal levels of certain alloying elements, given in a particular order, and some symbols for low but significant levels of other elements, whose levels are not conveniently expressed as integers. The “alloy type” approach uses tradition-based three- or four-digit designations for alloy families, and an occasional additional character or characters for compositional modifications of each original alloy within the family.

This clause includes the symbols for the type of product, the chemical composition of all-weld metal, the type of core, the shielding gas and the welding position, in accordance with the symbols defined in [Clause 5](#).

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.

4.1.1 Classification systems

Each classification system, A and B, is split into five parts as given in [Table 1](#).

Table 1 — Parts of the classification systems, A and B

Part of classification designation	Classification system	
	A Classification according to nominal composition	B Classification according to alloy type
1	symbol indicating the product to be identified (see 5.2);	symbol indicating the tubular cored electrode and rod (see 5.2);
2	symbol indicating the chemical composition of the all-weld metal (see Table 2);	symbol indicating the chemical composition of the all-weld metal (see Table 3 to Table 6);
3	symbol indicating the type of core (see Table 9);	symbol indicating the type of core (see Table 10);
4	symbol indicating the shielding gas (see 5.5);	
5	symbol indicating the welding position (see Table 11).	

The full identification (see [Clause 11](#) and examples in [Clause 12](#)) shall be used on packages and in the manufacturer’s literature and data sheets.

5 Symbols and requirements

5.1 General

A given tubular cored electrode may be classified with more than one shielding gas. In such cases, each shielding gas results in a separate classification.

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5.2 Symbol for the product

5.2.1 Classification according to nominal composition – A

The symbol for tubular cored product used in the metal arc welding process shall be the letter “T”.

5.2.2 Classification according to alloy type – B

The symbol for tubular cored product used in the metal arc welding process shall be the letters “TS”. The initial letter, where:

- a) T indicates tubular cored electrode or rod as distinguished from covered electrodes and from solid electrodes and rods;
- b) S indicates that the alloy system is stainless or heat-resisting steel.

5.3 Symbol for the chemical composition of all-weld metal

5.3.1 Classification according to nominal composition – A

The symbols in [Table 2](#) identify the chemical composition of all-weld metal determined in accordance with [Clause 7](#).

The all-weld metal obtained with the tubular cored product in [Table 2](#) under conditions given in [Clause 6](#) shall also fulfil the requirements given in [Table 7](#). (See [Annex A](#).)

5.3.2 Classification according to alloy type – B

The symbols in [Table 3](#) identify the chemical composition of all-weld metal for gas shielded flux cored electrodes determined in accordance with [Clause 7](#).

The symbols in [Table 4](#) identify the chemical composition of all-weld metal for non-gas shielded flux cored electrodes determined in accordance with [Clause 7](#).

The symbols in [Table 5](#) identify the chemical composition of all-weld metal for gas shielded metal cored electrodes determined in accordance with [Clause 7](#).

The symbols in [Table 6](#) identify the chemical composition of all-weld metal for cored products for gas tungsten arc welding determined in accordance with [Clause 7](#).

The all-weld metal obtained with the tubular cored electrodes and rods in [Table 3](#), [Table 4](#), [Table 5](#) and [Table 6](#) under conditions given in [Clause 6](#) shall also fulfil the requirements given in [Table 8](#). (See [Annex A](#).)