

BS EN ISO 18274:2010



BSI Standards Publication

Welding consumables — Solid wire electrodes, solid strip electrodes, solid wires and solid rods for fusion welding of nickel and nickel alloys — Classification (ISO 18274:2010)

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National foreword

This British Standard is the UK implementation of EN ISO 18274:2010. It supersedes BS EN ISO 18274:2004 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee WEE/39, Welding consumables.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Welding consumables - Solid wire electrodes, solid strip electrodes, solid wires and solid rods for fusion welding of nickel and nickel alloys - Classification (ISO 18274:2010)

Produits consommables pour le soudage - Fils-électrodes pleins, feuillards pleins, fils pleins et baguettes pleines pour le soudage par fusion du nickel et des alliages de nickel - Classification (ISO 18274:2010)

Schweißzusätze - Draht- und Bandedelektroden, Massivdrähte und -stäbe zum Schmelzschiessen von Nickel und Nickellegierungen - Einteilung (ISO 18274:2010)

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Foreword

This document (EN ISO 18274:2010) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with 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of an identical text or by endorsement, at the latest by June 2011, and conflicting national standards shall be withdrawn at the latest by June 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 18274:2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 18274:2010 has been approved by CEN as a EN ISO 18274:2010 without any modification.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 18274 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

This second edition cancels and replaces the first edition (ISO 18274:2004), of which it constitutes a technical revision. It also incorporates the Technical Corrigenda ISO 18274:2004/Cor.1:2005 and ISO 18274:2004/Cor.2:2006.

Requests for official interpretation 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 these bodies can be found at www.iso.org.

Introduction

For nickel welding consumables, there is no unique relationship between the product form (solid wire electrode, solid strip electrode, solid wire or solid rod) and the welding process used (e.g. gas shielded metal arc welding, gas tungsten arc welding, plasma arc welding, submerged arc welding, strip overlay welding, laser welding or other welding processes). For this reason, the solid wire electrode, solid strip electrode, solid wire or solid rod may be classified on the basis of any of the above product forms and can be used as appropriate, for more than one of the above processes.

Welding consumables — Solid wire electrodes, solid strip electrodes, solid wires and solid rods for fusion welding of nickel and nickel alloys — Classification

1 Scope

This International Standard specifies requirements for classification of solid wire electrodes, solid strip electrodes, solid wires and solid rods for fusion welding of nickel and nickel alloys. The classification of the solid wire electrodes, solid strip electrodes, solid wires and solid rods is based on their chemical composition.

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 544, *Welding consumables — Technical delivery conditions for filler materials and fluxes — Type of product, dimensions, tolerances and markings*

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

ISO 80000-1:2009, *Quantities and units — Part 1:General*

3 Classification

The classification is divided into two parts:

- a) the first part indicates the product form, being solid wire electrode, solid strip electrode, solid wire or solid rod, see 4.1;
- b) the second part gives a numerical symbol indicating the chemical composition of the solid wire electrode, solid strip electrode, solid wire or solid rod, see Table 1.

4 Symbols and requirements

4.1 Symbols for the product form

The symbol for the solid wire electrode, solid wire or solid rod shall be “S”. The symbol for the solid strip electrode shall be “B”.

NOTE One product form can be used for more than one welding process.

4.2 Symbol for the chemical composition

The initial symbol "Ni" in Table 1 identifies the welding consumable as a nickel base alloy. The following four digits indicate the chemical composition of the solid wire electrode, solid strip electrode, solid wire or solid rod, determined under conditions given in Clause 6. The first digit is an indicator of the alloy group as follows:

- 1 significant molybdenum addition without significant chromium addition (nickel-molybdenum alloys);
- 2 no significant alloy addition;
- 4 significant copper addition (nickel-copper alloys);
- 5 significant copper additions with aluminium and titanium for precipitation hardening;
- 6 significant chromium addition, with iron less than 25 % (by mass) (nickel-chromium-iron and nickel-chromium-molybdenum alloys);
- 7 same as 6, but with aluminium and titanium for precipitation hardening;
- 8 significant chromium addition, with iron more than 25 % (by mass) (nickel-iron-chromium alloys).

The remaining digits indicate the alloy composition of the welding consumable. A description of common uses of each welding consumable alloy is given in Annex A. The basis of the system of designation is described in Annex B.

NOTE In addition, the chemical symbol can be used.

Table 1 — Symbols and chemical composition requirements for solid wire electrodes, solid strip electrodes, solid wires and solid rods

Alloy symbols		Chemical composition, % (by mass) ^a													Others ^{d, e}
Numerical	Chemical	C	Mn	Fe	Si	Cu	Ni ^b	Co	Al	Ti	Cr	Nb ^c	Mo	W	
Nickel															
Ni 2061	NiTi3	0,15	1,0	1,0	0,7	0,25	≥92,0	—	1,5	2,0 to 3,5	—	—	—	—	P 0,03
Nickel-Copper															
Ni 4060	NiCu30Mn3Ti	0,15	4,0	2,5	1,2	28,0 to 32,0	≥62,0	—	1,2	1,5 to 3,0	—	0,3	—	—	—
Ni 4061	NiCu30Mn3Nb	0,15	4,0	2,5	1,25	28,0 to 32,0	≥60,0	—	1,0	1,0	—	3,0	—	—	—
Ni 5504	NiCu25Al3Ti	0,25	1,5	2,0	1,0	≥20,0	63,0 to 70,0	—	2,0 to 4,0	0,3 to 1,0	—	—	—	—	P 0,03
Nickel-Chromium															
Ni 6072	NiCr44Ti	0,01 to 0,10	0,20	0,50	0,20	0,50	≥52,0	—	—	0,3 to 1,0	42,0 to 46,0	—	—	—	—
NI 6073	NiCr38AlNbTi	0,03	0,50	1,0	0,30	0,30	≥63,0	1,0	0,75 to 1,20	0,25 to 0,75	36,0 to 39,0	0,25 to 1,00	0,50	—	P 0,02 S 0,015 B 0,003 Zr 0,02
Ni 6076	NiCr20	0,08 to 0,15	1,0	2,00	0,30	0,50	≥75,0	—	0,4	0,15 to 0,50	19,0 to 21,0	—	—	—	P 0,03
Ni 6082	NiCr20Mn3Nb	0,10	2,5 to 3,5	3,0	0,5	0,5	≥67,0	—	—	0,7	18,0 to 22,0	2,0 to 3,0	—	—	P 0,03
Nickel-Chromium-Iron															
Ni 6002	NiCr21Fe18Mo9	0,05 to 0,15	1,0	17,0 to 20,0	1,0	0,5	≥44,0	0,5 to 2,5	—	—	20,5 to 23,0	—	8,0 to 10,0	0,2 to 1,0	P 0,04 S 0,03
Ni 6025	NiCr25Fe10AlY	0,15 to 0,25	0,5	8,0 to 11,0	0,5	0,1	≥59,0	1,0	1,8 to 2,4	0,1 to 0,2	24,0 to 26,0	—	—	—	Y 0,05 to 0,12; Zr 0,01 to 0,10