

# Welding consumables — Wire electrodes and deposits for gas shielded metal arc welding of non alloy and fine grain steels — Classification

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## National foreword

This British Standard is the UK implementation of EN ISO 14341:2008. It is identical with ISO 14341:2002. It supersedes BS EN 440:1995 which is withdrawn.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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Classification (ISO 14341:2002)

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et dépôts pour le soudage à l'arc sous protection gazeuse  
des aciers non alliés et à grains fins - Classification (ISO  
14341:2002)

Schweißzusätze - Drahtelektroden und Schweißgut zum  
Metall-Schutzgasschweißen von unlegierten Stählen und  
Feinkornstählen - Einteilung (ISO 14341:2002)

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## Foreword

The text of ISO 14341:2002 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 14341:2008 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of an identical text or by endorsement, at the latest by November 2008, and conflicting national standards shall be withdrawn at the latest by November 2008.

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 440:1994.

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, 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 14341:2002 has been approved by CEN as a EN ISO 14341:2008 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 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14341 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

## Introduction

This International Standard recognizes that there are two somewhat different approaches in the global market to classifying a given wire electrode, and allows for either or both to be used, to suit a particular market need. Application of either type of classification designation (or both where suitable) identifies a product as classified according to this International Standard.

This International Standard provides a classification in order to designate wire electrodes in terms of their chemical composition and, where required, in terms of the yield strength, tensile strength and elongation of the all-weld metal. 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 material. Where the application of the material requires matching tensile strength, therefore, selection of the consumable should be made by reference to column 3 of Table 1A or 1B.

It should be noted that the mechanical properties of all-weld metal test specimens used to classify the 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 material composition.

Requests for official interpretation of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 3 via the member body in the user's country, a complete listing of which can be found at [www.iso.org](http://www.iso.org).

# Welding consumables — Wire electrodes and deposits for gas shielded metal arc welding of non alloy and fine grain steels — Classification

## 1 Scope

This International Standard specifies requirements for classification of wire electrodes in the as-welded condition and in the post weld heat-treated condition for gas shielded metal arc welding of non alloy and fine grain steels with a minimum yield strength of up to 500 N/mm<sup>2</sup> or a minimum tensile strength of up to 570 N/mm<sup>2</sup>. One wire electrode can be tested and classified with different shielding gases.

This document constitutes 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 wire 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 wire 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 wire electrodes classified in accordance with this International Standard.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

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

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*



### 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 sections. In most cases, a given commercial product can be classified to the classification requirements in both systems. Then either or both classification designations can be used for the product.

A wire electrode shall be classified according to its chemical composition as in Table 3A or Table 3B. A weld deposit shall be classified with additional symbols according to the mechanical properties of its all-weld metal, using a shielding gas from a specific group.

#### 3A Classification by yield strength and 47 J impact energy

The classification is divided into five parts:

- 1) the first part gives a symbol indicating the product/process to be identified;
- 2) the second part gives a symbol indicating the strength and elongation of the all-weld metal (see Table 1A);
- 3) the third part gives a symbol indicating the impact properties of all-weld metal (see Table 2);
- 4) the fourth part gives a symbol indicating the shielding gas used (see 4.4);
- 5) the fifth part gives a symbol indicating the chemical composition of the wire electrode used (see Table 3A).

#### 3B Classification by tensile strength and 27 J impact energy

The classification is divided into five parts:

- 1) the first part gives a symbol indicating the product/process to be identified;
- 2) the second part gives a symbol indicating the strength and elongation of the all-weld metal in either the as-welded or post weld heat-treated condition (see Table 1B);
- 3) the third part gives a symbol indicating the impact properties of all-weld metal in the same condition as specified for the tensile strength (see Table 2). The letter "U" after this symbol 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 shielding gas used (see 4.4);
- 5) the fifth part gives a symbol indicating the chemical composition of the wire electrode used (see Table 3B).

## 4 Symbols and requirements

### 4.1 Symbol for the product/process

The symbol of weld deposit by the gas shielded metal arc welding process shall be the letter "G" placed at the beginning of the designation.

The symbol of a wire electrode for the gas shielded metal arc welding shall be the letter "G" placed at the beginning of the wire electrode designation.