AS/NZS ISO 14171:2013
ISO 14171:2010

AS/NZS ISO 14171:2013

Australian/New Zealand Standard™

Welding consumables—Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of non alloy and fine grain steels—Classification

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee WD-002, Welding Consumables. It was approved on behalf of the Council of Standards Australia on 25 January 2013 and on behalf of the Council of Standards New Zealand on 23 January 2013.
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The following are represented on Committee WD-002:

Australian Chamber of Commerce and Industry
Bureau of Steel Manufacturers of Australia
Business New Zealand
New Zealand Heavy Engineering Research Assoication
Welding Technology Institute of Australia

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This Standard was issued in draft form for comment as DR AS/NZS ISO 14171.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WD-002, Welding Consumables, to supersede (in part) AS 1858.1—2003, *Electrodes and fluxes for submerged-arc welding*, Part 1: *Carbon steels and carbon-manganese steels.*

The objective of this Standard is to specify requirements for manufacturers and users for the classification of electrode/flux combinations and weld metal as the as-welded condition and in the post-weld heat-treated condition for submerged arc welding of non-alloy and fine grain steels with a minimum yield strength of up to 500 MPa or a minimum tensile strength of up to 570 MPa.

This Standard is identical with, and has been reproduced from ISO 14171:2010, *Welding consumables—Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of non alloy and fine grain steels—Classification*.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text 'this International Standard' should read 'this Australian/New Zealand Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
ISO 13916	Welding—Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature	AS ISO 13916	Welding—Guide on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature

Only international references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

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INTRODUCTION

This International Standard recognizes that there are two somewhat different approaches in the global market to classifying a given electrode/flux combination, 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 International Standard.

This International Standard provides a classification system for the designation of solid wire electrodes in terms of their chemical composition, tubular cored electrodes in terms of the deposit composition obtained with a particular submerged arc flux and, where required, electrode/flux combinations in terms of the yield strength, tensile strength and elongation of the all-weld metal deposit. The ratio of yield to tensile strength of weld metal is generally higher than that of parent material. Users should note that matching weld metal yield strength to parent material yield strength does not necessarily ensure that the weld metal tensile strength matches that of the parent material. Thus, where the application of the material requires matching tensile strengths, selection of the consumable should be made by reference to column 3 of Table 1A or 1B, as appropriate.

Although combinations of electrodes and fluxes supplied by individual companies may have the same classification, the individual wire electrodes and fluxes from different companies are not interchangeable unless verified in accordance with this International Standard.

The mechanical properties of all-weld metal test specimens used to classify the electrode/flux combinations vary from those obtained in production joints because of differences in welding procedures such as electrode size and parent material composition.

AUSTRALIAN/NEW ZEALAND STANDARD

Welding consumables—Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of non alloy and fine grain steels—Classification

1 Scope

This International Standard specifies requirements for the classification of electrode/flux combinations and weld metal in the as-welded condition and in the post-weld heat-treated condition for submerged arc welding of non alloy and fine grain steels with a minimum yield strength of up to 500 MPa or a minimum tensile strength of up to 570 MPa. One flux can be classified with different solid wire electrodes and tubular cored electrodes. The solid wire electrode is also classified separately based on chemical composition.

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

a) Clauses, subclauses, and tables which carry the suffix letter “A” are applicable only to electrode/flux combinations and wire electrodes classified using the system based upon the yield strength and the average impact energy for weld metal of 47 J, in accordance with this International Standard.

b) Clauses, subclauses, and tables which carry the suffix letter “B” are applicable only to electrode/flux combinations and wire electrodes classified using the system based upon the tensile strength and the average impact energy for weld metal of 27 J, in accordance with this International Standard.

c) Clauses, subclauses, and tables which do not have either the suffix letter “A” or the suffix letter “B” are applicable to all electrode/flux combinations and wire electrodes classified in accordance with this International Standard.

Fluxes for the single-run and two-run techniques are classified on the basis of the two-run technique.

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

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

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

ISO 14174, *Welding consumables — Fluxes for submerged arc welding and electroslag welding — Classification*