Australian Standard™

Electrodes and fluxes for submerged-arc welding

Part 1: Carbon steels and carbon-manganese steels

Standards Australia

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WD-002, Welding Consumables, to supersede AS 1858.1—1986.

The objective of this Standard is to provide classification and designation systems, as well as requirements, for solid and composite welding electrodes and fluxes for submerged-arc welding of carbon steels and carbon manganese steels.

This Standard is based on ANSI/AWS A5.17, *Specification for Carbon Steel Electrodes and Fluxes for Submerged-arc Welding.*

The principle behind the classification and designation systems adopted was that each of the three factors involved, electrodes, flux and weld metal, should be capable of individual selection and identification. In particular, the concept of the classification of weld metal as a separate entity is regarded as being of great significance. For ease of selection, the weld metal is classified according to its tensile strength and divided into grades related to its Charpy V-notch impact energy value. The Standard, therefore, separately deals with electrodes, fluxes, weld metal and testing.

Because of the large number of electrode/flux combinations available, guidance is frequently needed on the suitability of the process for a specific weldment. The intent here is that the designer should only need to specify on the drawing the weld metal designation, thereby nominating the mechanical properties required for the satisfactory functioning of the welded joint. The fabricator, taking into account recommendations by the manufacturer of the consumables, can select the electrode/flux combination that are appropriate to the materials of construction and the conditions pertaining at the time.

If procedure qualification is called up in the relevant application code, it may be necessary for the chosen electrode/flux combination to be qualified by procedure testing.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for solid and composite electrodes and fluxes for the submerged-arc welding of carbon steels and carbon manganese steels. It defines classification and designation systems for electrodes, fluxes and weld metal, and specifies their chemical and physical properties. It also specifies, where appropriate, requirements for testing, packaging, marking and storage.

NOTES:

1 The electrodes and fluxes specified herein may also be used under appropriate conditions, for the welding of certain alloy steels.

2 Guidance on the classification system and the selection of electrodes and fluxes is given in Appendix A.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
1544 Methods for impact tests on metals
1544.2 Part 2: Charpy V-notch
1674 Safety in welding and allied processes
1674.1 Part 1: Fire precautions
1674.2 Part 2: Electrical
2177 Non-destructive testing—Radiography of welded butt joints in metals
2177.1 Part 1: Methods of test
2205 Methods of destructive testing of welds in metal
2205.2.2 Method 2.2: All-weld-metal tensile test
2205.7.1 Method 7.1: Charpy V-notch impact fracture toughness test
2812 Welding, brazing and cutting of metals—Glossary of terms

AS/NZS
1050 Methods for the analysis of iron and steel (all methods)
3678 Structural steel—Hot-rolled plates, floorplates and slabs
3752 Welding—Methods for determination of the diffusible hydrogen content of ferritic weld metal produced by arc welding

ANSI/AWS
A5.01 Filler metal procurement guidelines

WTIA (Welding Technology Institute of Australia)
Technical Note 3—Care and conditioning of arc-welding consumables
Technical Note 7—Health and safety in welding
Technical Note 22—Welding—Electrical safety