Australian Standard™

Shielding gases for welding

Standards Australia

This Australian Standard was prepared by Committee WD-002, Welding Consumables. It was approved on behalf of the Council of Standards Australia on 15 July 2003 and published on 5 September 2003.

The following are represented on Committee WD-002:

Australian Chamber of Commerce and Industry
Australian Industry Group
Bureau of Steel Manufacturers of Australia
Business New Zealand
CSIRO Manufacturing and Infrastructure Technology
Welding Technology Institute of Australia

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee WD-002, Welding Consumables. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

This Standard is based on ANSI/AWS A5.32/A5.32M–97, *Specification for welding shielding gases*.

The objective of this Standard is to specify a classification system for shielding gases for welding.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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FOREWORD

This Standard prescribes a system of classification whereby all shielding gases, with the same classification, can be expected to give identical welding characteristics and results using identical welding procedures. This means that where a shielding gas is an essential variable of a qualified welding procedure it may be interchanged, without further qualification, by another gas from any source with the same classification.

Gases may be supplied in either gaseous or liquid form but, when used in welding, the shielding is always in the gaseous form.

The prime function of a shielding gas is to protect the molten weld pool from the atmosphere; however, a gas that gives perfect protection from the air, as some gases like inert argon are capable of doing, will not necessarily be the best for arc welding.

Gases, like other forms of matter, have certain properties and each gas has properties that distinguish it from every other gas. Properties such as relative density, thermal conductivity and ionization potential (which influences arc initiation, stability and power) can be very important for shielding gases.

There are very few gases suitable for welding and even fewer that are economically practicable. Only six gases are commonly used for welding and only two of these gases (argon and CO_2) are used alone in Australia/New Zealand. The rest are used to make up the 25 or so mixtures on the Australian market, with most mixtures being argon based. Very small amounts of additive gases to the argon base gas can often cause significant changes to the welding characteristics.

Selection of a shielding gas is determined by the material to be welded (e.g., aluminium) and by striking a balance between other characteristics required such as weld profile, penetration, spatter, etc. Gas suppliers and their literature should be consulted.

STANDARDS AUSTRALIA

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Shielding gases for welding

1 SCOPE

This Standard specifies the requirements for shielding gases and the tolerances on the nominal value of constituent gases in mixtures. This Standard applies, but is not limited to the following processes:

(a) Gas tungsten arc welding (GTAW).

(b) Gas metal arc welding (GMAW).

(c) Flux cored arc welding (FCAW).

(d) Plasma arc welding (PAW).

NOTES:

1 For further information on shielding gases for GTAW and GMAW, refer to Appendix A.

2 For information on safety in the use of shielding gases, see Appendix B.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

2030 The verification, filling, inspection, testing and maintenance of cylinders for storage and transport of compressed gases

2030.1 Part 1: Cylinders for compressed gases other than acetylene

ISO

17025 General requirements for the competence of testing and calibration laboratories

3 CLASSIFICATION

The shielding gases covered by this Standard shall be classified using a designation system (independent of metric or imperial units) in accordance with Clause 4.

NOTE: Gases classified under one classification are not classified under any other classification in this Standard.

Individual gases shall meet or exceed the requirements of Table 1.