
**Welding — Recommendations for
welding of metallic materials —**

**Part 5:
Welding of clad steels**

*Soudage — Recommandations pour le soudage des matériaux
métalliques —*

Partie 5: Soudage des aciers plaqués



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Foreword

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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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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

ISO/TR 17671-5 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Unification of requirements in the field of metal welding*.

ISO/TR 17671 consists of the following parts, under the general title *Welding — Recommendations for welding of metallic materials*:

- *Part 1: General guidance for arc welding*
- *Part 2: Arc welding of ferritic steels*
- *Part 3: Arc welding of stainless steels*
- *Part 4: Arc welding of aluminium and aluminium alloys*
- *Part 5: Welding of clad steels*
- *Part 6: Laser beam welding*
- *Part 7: Electron beam welding*

Introduction

This Technical Report is based on the European Standard EN 1011-5:2003, *Welding — Recommendations for welding of metallic materials — Part 5: Welding of clad steel*.

Requests for official interpretations of any aspect of this Technical Report should be directed to the Secretariat of ISO/TC 44/SC 10 via your national standards body, a complete listing which can be found at www.iso.org.

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Welding — Recommendations for welding of metallic materials —

Part 5: Welding of clad steels

1 Scope

This part of ISO/TR 17671 gives general recommendations for welding of clad steels by means of appropriate arc welding processes and electroslag strip cladding.

It is generally applicable to all clad steels and is appropriate regardless of the type of fabrication involved, although the application standard may have additional requirements. Non-ferrous claddings, such as titanium, tantalum, zirconium and their alloys are not covered by this part of ISO/TR 17671.

Examples for joint preparation are given in ISO 9692-4.

This part of ISO/TR 17671 covers welding of cladding deposits as well as welding of the transition zone(s), when existing, between parent metal and cladding. These transition zones are metal combinations of non-alloyed ferrous parent metal with high alloyed stainless steels, nickel alloys or other non-ferrous metals.

The mechanical and physical design of the joints is not covered by this part of ISO/TR 17671. Methods of testing and acceptance levels are not included because they depend on the service conditions of the fabrication. These details should be obtained from the design specification. The corrosion resistance of the cladding depends on many factors and is not part of this part of ISO/TR 17671.

For general guidelines see ISO/TR 17671-1.

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 2553, *Welded, brazed and soldered joints — Symbolic representation on drawings*

ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 8249, *Welding — Determination of Ferrite Number (FN) in austenitic and duplex ferritic-austenitic Cr-Ni stainless steel weld metals*

ISO 9692-4:2003, *Welding and allied processes — Recommendations for joint preparation — Part 4: Clad steels*

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

ISO 14175, *Welding consumables — Shielding gases for arc welding and cutting*

ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules*

ISO/TR 15608:2000, *Welding — Guidelines for a metallic materials grouping system*

ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding*

ISO 15614-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*

ISO/TR 17671-1, *Welding — Recommendations for welding of metallic materials — Part 1: General guidance for arc welding*

ISO/TR 17671-3, *Welding — Recommendations for welding of metallic materials — Part 3: Arc welding of stainless steels*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

clad steel

combination of two or more dissimilar metals bonded inseparably by different cladding processes

4 Materials

4.1 Clad steels

Clad steels can be produced by several cladding processes such as:

- hot roll cladding;
- explosive welding;
- surfacing by welding;
- combined weld/hot roll cladding.

The inseparable cladding (commonly $t_2 \geq 2$ mm wall thickness), which will be in contact with the adjacent medium, is designed to meet requirements such as corrosion resistance, abrasion and/or heat resistance at different working temperatures.

4.2 Parent metal

The parent metal is a weldable steel, commonly in accordance with those referenced in groups 1 to 6 of ISO/TR 15608:2000. The parent metal should provide the required strength and toughness to maintain mechanical integrity.

- Stainless steels (e.g. see EN 10088-1).
- Nickel and nickel alloys.
- Copper and copper alloys.
- Cobalt alloys (stellites).