



Installation of Stainless Chromium-Nickel Steel and Nickel-Alloy Roll-Bonded and Explosion-Bonded Clad Plate in Air Pollution Control Equipment

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ABSTRACT

This standard practice provides technical and quality assurance guidelines for the fabrication, welding, and installation of clad plate bonded in air pollution control or other equipment such as flue gas desulfurization (FGD) systems, ducts, and stacks. Also included are procedures for the qualification of welders and the inspection and repair of welds, as well as an appendix on handling clad plate components. Detailed figures on weld joint design are included.

This standard is intended for use by architect-engineers, designers, fabricators, and personnel from electric utilities.

KEYWORDS

Welding, FGD, air pollution, chromium-nickel steel alloys, explosion-bonded clad plate, nickel alloys, TG 199.

Foreword

In NACE standards, the terms “shall,” “must,” “should,” and “may” are used in accordance with the definitions of these terms in the NACE Publications Style Manual. The terms “shall” and “must” are used to state a requirement, and are considered mandatory. The term “should” is used to state something good and is recommended, but is not considered mandatory. The term “may” is used to state something considered optional.

The purpose of this standard practice is to provide technical and quality assurance guidelines for the fabrication, welding, and installation of stainless chromium-nickel steel and nickel-alloy roll-bonded and explosion-bonded clad plate in air pollution control equipment. It is intended for use by personnel including architect-engineers, designers, fabricators, and personnel from electric utilities.

This standard was originally prepared in 1999 by NACE Task Group T-5F-6, a component of Unit Committee T-5F, “Corrosion Problems Associated with Pollution Control.” It was revised in 2004, 2009, and 2018 by Task Group (TG) 199, “Stainless Chromium-Nickel Steel and Nickel-Alloy Roll-Bonded and Explosion-Bonded Clad Plate for Air Pollution Control Equipment, Installation: Review of NACE SP0199.” TG 199 is administered by Specific Technology Group (STG) 45, “Pollution Control, Waste Incineration, and Process Waste.” This standard is issued by NACE International under the auspices of STG 45.

NACE International Standard Practice (SP0199-2018)

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Section 1: General

- 1.1** This standard provides technical and quality assurance guidelines for the fabrication, welding, and installation of stainless chromium-nickel steel and nickel-alloy roll-bonded and explosion-bonded clad plate conforming to ASTM⁽¹⁾ A264¹ or A265² in air pollution control equipment (e.g., flue gas desulfurization [FGD] absorbers, ducts, and stacks). It is intended to be the basis for preparation of a specification to be agreed on by contracting parties.
- 1.2** For the purposes of this standard, the term *alloy* is used to describe either the stainless chromium-nickel steel or nickel-alloy portion of clad-steel plate or the equivalent solid stainless chromium-nickel steel or nickel-alloy material.
- 1.3** It is the responsibility of users of this standard to determine the suitability of the construction materials specified for particular applications.
- 1.4** This standard is only applicable to materials that conform to the following standards or to comparable material specifications as agreed on by contracting parties. In all cases, the latest revision of the standard shall be used: ASTM A264, ASTM A265, AWS⁽²⁾ A5.1,³ AWS A5.4,⁴ AWS A5.9,⁵ AWS A5.11,⁶ AWS A5.14,⁷ AWS A5.17,⁸ AWS A5.18,⁹ AWS A5.20,¹⁰ AWS A5.22,¹¹ AWS A5.34.¹²
- 1.5** Standard terms and conditions and safety considerations are beyond the scope of this standard. It is assumed that users will establish and incorporate these aspects within the specification in accordance with their individual requirements.
- 1.6** The following codes and specifications supplement this standard. They may be useful in the development of the specification for this work.
- ASME⁽³⁾ Boiler and Pressure Vessel Code: Section II,¹³ Parts A, B, C, and D; and Section IX¹⁴
 - ASNT⁽⁴⁾ SNT-TC-1A¹⁵
 - ASTM specifications for various metals and alloys
 - AWS specifications for testing procedures (AWS B1.10,¹⁶ AWS B2.1¹⁷)
 - Applicable ISO,⁽⁵⁾ European, and regional standards and regulatory documents
- 1.7** This standard uses fabrication practices that incorporate full-penetration welds. Alternative fabrication practices, such as use of partial-penetration welds covered by batten strips in accordance with NACE SP0292,¹⁸ are not addressed in this standard.
- 1.8** New and improved welding techniques as well as new alloys are being developed. References to specific weld designs and techniques in this standard are not intended to preclude the use of newer technology. The use of alternative methods should be mutually agreed on by all contracting parties.
- 1.9** For the purposes of this standard, ASME material specifications may be used instead of ASTM material specifications.

⁽¹⁾ ASTM International (ASTM), 100 Barr Harbor Dr., West Conshohocken, PA 19248-2959.

⁽²⁾ American Welding Society (AWS), 8669 NW 36th St., Ste. 130, Miami, FL 33166-6672.

⁽³⁾ ASME, Two Park Avenue, New York, NY 10016-5990.

⁽⁴⁾ American Society for Nondestructive Testing (ASNT), 1711 Arlingate Lane, Columbus, OH 43228-0518.

⁽⁵⁾ International Organization for Standardization (ISO), Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.