

Heat Recovery Steam Generators

API RECOMMENDED PRACTICE 534
SECOND EDITION, FEBRUARY 2007

REAFFIRMED, MARCH 2023



American
Petroleum
Institute

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Heat Recovery Steam Generators

1 General

1.1 SCOPE

This publication provides guidelines for the selection or evaluation of heat recovery steam generator (HRSG) systems. Details of related equipment designs are considered only where they interact with the HRSG system design. This publication does not provide rules for design, but indicates areas that need attention and offers information and description of HRSG types available to the designer or user to aid in the selection of the appropriate HRSG system.

The HRSG systems discussed are those currently in industry use. A general description of each HRSG system begins in Sections 2 and 3. Selection of an HRSG system for description does not imply other systems are not available nor recommended. Many individual features described in these guidelines will be applicable to any type of HRSG system.

Appendices A, B, and C refer to Sections 1 through 3.

1.2 REFERENCED PUBLICATIONS

1.2.1 The editions of the following standards, codes and specifications that are in effect at the time of publication of this publication shall, to the extent specified herein, form a part of this publication.

API/ISO¹

- Std 530/ISO 13704 *Petroleum and natural gas industries—Calculation of plate and tube thickness in petroleum refineries*
- RP 536 *Post Combustion NO_x Control for Fired Equipment in General Refinery Services*
- Std 560/ISO 13705 *Petroleum and natural gas industries—Fired heaters for general refinery service*
- Std 660/ISO 16812 *Petroleum and natural gas industries—Shell and-tube heat exchangers for general refinery service*

ABMA²

- Boiler 402 *Boiler Water Quality Requirements and Associated Steam Quality for Industrial/Commercial and Institutional Boilers*

ANSI³/ASME⁴

- ANSI 14.3 *Fixed Ladders—Safety Requirements*
- PTC 4.4 *Gas Turbine Heat Recovery Steam Generators Performance Test Code*

ASME

- Boiler and Pressure Vessel Code*, Section I: “Power Boilers” and Section VIII, Division 1, “Pressure Vessels.”
- Consensus Operating Practices for Control of Feedwater/Boiler Water Chemistry in Modern Industrial Boilers CRTD—Vol. 34*
- SA-106 *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service*
- SA-178/SA-178M *Standard Specification for Electric-Resistance-Welded Carbon Steel and Carbon-Manganese Steel Boiler and Superheater Tubes*
- SA-214/SA-214M *Specification for Electric-Resistance-Welded Carbon Steel Heat-Exchanger and Condenser Tubes*
- STS-1 *Steel Stacks*

ASTM⁵

- D 1068-97(2011) *Standard Practice for Sampling Steam*

NFPA⁶

- 850 *Standard for the Prevention of Furnace Explosions/Implosions in Multiple Burner Boilers*

¹International Organization for Standards, 25 West 43rd Street, 4 Floor, New York, New York, 10036, www.iso.org.

²American Boiler Manufacturers Association, 8221 Old Courthouse Road, Suite 207, Vienna, Virginia 22182, www.abma.com.

³American National Standards Institute, 25 West 43rd Street, 4th floor, New York, New York, 10036, www.ansi.org.

⁴ASME International, 3 Park Avenue, New York, New York, 10016, www.asme.org.

⁵ASTM International, 100 Bar Harbor Drive, West Conshohocken, Pennsylvania 19428, www.astm.org.

⁶National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, Massachusetts 02269-9101, www.nfpa.org.