Fired Heaters for General Refinery Service

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Introduction

Direct-fired heaters are used extensively in oil refineries, chemical, petrochemical, and other industrial plants to heat fluids within tubes at high temperatures not achievable by other methods. Heat is provided by combustion of fuel in burners. API 560 is the industry-recognized standard for design and fabrication of direct-fired heaters. This document defines common terms and requirements for the design, fabrication, and inspection of direct-fired heaters for general refinery service.

This standard also has applicability to specific aspects to steam reformers, pyrolysis furnaces, and other fired equipment in the areas of design, fabrication, and inspection of components common to direct-fired heaters.

Two annexes to this standard provide information and guidance to owners related to the operating characteristics of new and existing fired-process heaters. These annexes are Annex G (Measurement of Efficiency of Fired-process Heaters) and Annex I (Measurement of Noise from Fired-process Heaters).

Users of this standard should be aware that further or differing requirements may be needed for individual applications. This standard is not intended to inhibit a supplier from offering or the purchaser from accepting alternative equipment or engineering solutions for the individual application. This may be particularly applicable where there is innovative or developing technology. Where an alternative is offered, the supplier should identify any variations from this standard and provide details.

In API standards, the metric (SI) system of units is used. In this standard, where practical, U.S. customary (USC) units are also included in brackets.

A bullet [●] at the beginning of a section or subsection indicates that either a decision is required or further information is to be provided by the purchaser. This information should be indicated on the purchaser's checklist (see Annex B) or stated in the inquiry or purchase order.

Fired Heaters for General Refinery Service

1 Scope

This standard specifies requirements and guidance for the design, specification, materials, refractory lining systems, fabrication, inspection, testing, and preparation for shipment of direct-fired heaters, including air preheaters, fans, and burners for general refinery service.

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.

NOTE 1 See F.2 for normative references specific to air preheat and ducting systems.

NOTE 2 See M.2 for normative references specific to ceramic coatings.

API Standard 530, *Calculation of Heater-tube Thickness in Petroleum Refineries*

API Recommended Practice 535, *Burners for Fired Heaters in General Refinery Services*

API Standard 673, *Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services*

API Standard 936, *Refractory Installation Quality Control—Inspection and Testing Monolithic Refractory Linings and Materials*

API Standard 975, *Refractory Installation Quality Control—Inspection and Testing of Refractory Brick Systems and Materials*

API Standard 976, *Refractory Installation Quality Control—Inspection and Testing of AES/RCF Fiber Linings and Materials*

ASME STS-1 [1], *Steel Stacks*

ASTM A123/A123M [2], *Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products*

ASTM A143/A143M, *Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement*

ASTM A153/A153M, *Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*

ASTM A240/A240M, *Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications*

ASTM A387/A387M, *Standard Specification for Pressure Vessel Plates, Alloy Steel, Chromium-Molybdenum*

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[1] American Society of Mechanical Engineers, Two Park Ave, New York, NY 10016, www.asme.org.
[2] ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428, www.astm.org.