Burners for Fired Heaters in General Refinery Services

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Introduction

Burners are devices that mix air and fuel to provide stable combustion and hot gas for the transfer of heat to process fluids in general refinery services. A burner design basis is developed in consideration of the specified performance expectations, functional requirements, and mechanical details required to fulfill the operating goals established for each application. This standard provides the basis for design, functional and mechanical requirements, and burner testing requirements to provide safe, reliable, and efficient combustion of fuel to enable the heater to satisfy its operating requirements.

The burner types addressed in this standard are commonly used and available in a variety of configurations and sizes. Burner types generally include premix, raw gas, staged air, staged fuel, and others. Most types are available in either natural-draft or forced-air arrangements, or both. The burner types listed are not intended to imply that other burner types are not available or applicable. Many of the individual features described in this standard are applicable to most burner types.

Burners designed to this standard are used in a wide range of petrochemical and refinery applications, and are influenced by the fired heater design. These burners may need to be capable of handling a large variation in fuel composition, be subjected to different ignition methods, and be monitored by a variety of different flame-detection techniques. Generally, burners built to this standard are engineered for the specific application while addressing the owner specifications/standards and the jurisdictional regulatory requirements to which the owner's facility is subjected.

For new designs, the development of a design can be advanced using the direction and examples of good engineering practice identified in this standard.

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 vendor 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 vendor should identify any variations from this standard and provide details.

In API standards, the International System of Units (SI) is used. In this standard, where practical, U.S. Customary (USC) units are included in brackets for information.

A bullet [●] at the beginning of a clause or sub-clause 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 C) or stated in the inquiry or purchase order.

Burners for Fired Heaters in General Refinery Services

1 Scope

This standard provides requirements and direction for the selection, specification, materials, and testing of new burners for fired heaters in general refinery services designed in accordance with API 560. Details of fired heater and related equipment designs are considered only where they interact with the burner selection.

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.

API 556, *Instrumentation, Control, and Protective Systems for Gas Fired Heaters*

API 560, *Fired Heaters for General Refinery Services*

3 Terms, Definitions, and Abbreviations

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

3.1 General Terms and Definitions

The following general definitions are provided to better define and distinguish the multidisciplined workforce and the typical areas of responsibility involved in the specification, design, and supply work processes required in the overall procurement process for burners in fired heaters in general refinery services. These definitions are intended to build upon the typical definitions of “purchaser” and “vendor” normally used in API standards.

Recognizing that the work process and areas of responsibility may differ between projects and owner organizations, the terms and definitions contained in the purchaser’s procurement documentation take precedence over definition of parties of the multidisciplined workforces and their respective areas of responsibility.

3.1.1
owner
purchaser
The owner or purchaser is the party with responsibility for all or part of the process and thermal design/definition, the mechanical specification, procurement, and installation of the purchased equipment.

NOTE The owner or purchaser may, at times, work through an engineering contractor (contractor) as an agent undertaking the owner’s requirement for the engineering, procurement, and/or construction phases of work, including representation of the owner on decisions related to operation and maintenance as may be required. The term “purchaser” within this document will be considered synonymous with the terms “contractor” or “owner.”

3.1.2
vendor
The party that supplies the design, manufacturing, equipment, and any services required as specified by the purchaser.

NOTE 1 The vendor typically has the prime responsibility for the detailed engineering, material procurement, project management, and manufacturing processes involved in the physical supply of the burner, including all aspects of quality assurance and quality control for work of their own and others whom they qualify for providing work, products, or services on their behalf.