Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries

Part I—Sizing and Selection

API STANDARD 520
EIGHTH EDITION, DECEMBER 2008

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Downstream Segment

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Foreword

API Standard 520, *Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries*, is the result of several years' work by engineers in the petroleum industry. The information in this standard is intended to supplement the information contained in Section VIII—*Pressure Vessels*, of the ASME *Boiler and Pressure Vessel Code*. The recommendations presented in this publication are not intended to supersede applicable laws and regulations.

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Shall: As used in a standard, “shall” denotes a minimum requirement in order to conform to the specification.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required in order to conform to the specification.

The current edition of this standard, published in two parts, has been updated with respect to the practices generally used in the installation of all devices covered in the previous editions; the current edition also contains additional information based on revisions suggested by many individuals and several organizations.

The 1st Edition of this standard was initially released as a recommended practice in 1955. The 2nd Edition was published in two parts: Part I, *Design*, in 1960 and Part II, *Installation*, in 1963. The 3rd Edition of Part I was issued in November 1967 and reaffirmed in 1973. The 4th edition was issued in December 1976, the 5th Edition was issued in July 1990, the 6th Edition was issued in March 1993, and the 7th Edition was issued in January 2000.

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Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually and updated quarterly by API, 1220 L Street, N.W., Washington, D.C. 20005.

Suggested revisions are invited and should be submitted to the Downstream Segment, API, 1220 L Street, NW, Washington, D.C. 20005, standards@api.org.

Contents

Page

Tables

Page

Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries Part I—Sizing and Selection

1 Scope

This standard applies to the sizing and selection of pressure relief devices used in refineries and related industries for equipment that has a maximum allowable working pressure of 15 psig (103 kPag) or greater. The pressure relief devices covered in this standard are intended to protect unfired pressure vessels and related equipment against overpressure from operating and fire contingencies.

This standard includes basic definitions and information about the operational characteristics and applications of various pressure relief devices. It also includes sizing procedures and methods based on steady state flow of Newtonian fluids.

Pressure relief devices protect a vessel against overpressure only; they do not protect against structural failure when the vessel is exposed to extremely high temperatures such as during a fire. See API 521 for information about appropriate ways of reducing pressure and restricting heat input.

Atmospheric and low-pressure storage tanks covered in API 2000 and pressure vessels used for the transportation of products in bulk or shipping containers are not within the scope of this standard.

The rules for overpressure protection of fired vessels are provided in ASME Section I and ASME B31.1, and are not within the scope of this standard.

2 Normative References

The following referenced documents are cited in this document for informational purposes. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API RP 520, *Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries, Part II—Installation*

API Std 521/ISO 23251, *Guide for Pressure-relieving and Depressuring Systems*

API Std 526, *Flanged Steel Pressure Relief Valves*

API Std 527, *Seat Tightness of Pressure Relief Valves*

API Std 2000, *Venting Atmospheric and Low-pressure Storage Tanks: Nonrefrigerated and Refrigerated*

ASME *Boiler and Pressure Vessel Code* [1], *Section I—Power Boilers*

ASME *Boiler and Pressure Vessel Code, Section VIII—Pressure Vessels, Division 1*

ASME *BPVC* Code Case 2091-3 [2], *Nonreclosing Pin Pressure Relief Devices*

ASME *BPVC* Code Case 2203, *Omission of Lifting Device Requirements for Pressure Relief Valves on Air, Water Over 140°F, or Steam Service*

ASME *BPVC* Code Case 2487, *Breaking Pin Pressure Relief Devices*

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

2 Code Cases are temporary in nature and may not be acceptable in all jurisdictions. The user should verify the current applicability of the referenced Code Cases.