ASME PTC 25-2018
(Revision of ASME PTC 25-2014)

Pressure Relief Devices

Performance Test Codes

AN AMERICAN NATIONAL STANDARD

The American Society of
Mechanical Engineers

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Two Park Avenue • New York, NY • 10016 USA

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The next edition of this Code is scheduled for publication in 2023.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Code. Interpretations are published on the Committee web page and under http://go.asme.org/InterpsDatabase. Periodically certain actions of the ASME PTC Committee may be published as Cases. Cases are published on the ASME website under the PTC Committee Page at http://go.asme.org/PTCcommittee as they are issued.

Errata to codes and standards may be posted on the ASME website under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The PTC Committee Page can be found at http://go.asme.org/PTCcommittee. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting “Errata” in the “Publication Information” section.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

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NOTICE

All Performance Test Codes must adhere to the requirements of ASME PTC 1, General Instructions. The following information is based on that document and is included here for emphasis and for the convenience of the user of the Code. It is expected that the Code user is fully cognizant of Sections 1 and 3 of ASME PTC 1 and has read them prior to applying this Code.

ASME Performance Test Codes provide test procedures that yield results of the highest level of accuracy consistent with the best engineering knowledge and practice currently available. They were developed by balanced committees representing all concerned interests and specify procedures, instrumentation, equipment-operating requirements, calculation methods, and uncertainty analysis.

When tests are run in accordance with a Code, the test results themselves, without adjustment for uncertainty, yield the best available indication of the actual performance of the tested equipment. ASME Performance Test Codes do not specify means to compare those results to contractual guarantees. Therefore, it is recommended that the parties to a commercial test agree before starting the test, and preferably before signing the contract, on the method to be used for comparing the test results to the contractual guarantees. It is beyond the scope of any Code to determine or interpret how such comparisons shall be made.

FOREWORD

In December 1948, the ASME Boiler and Pressure Vessel Committee recommended to the ASME Performance (then Power) Test Codes Committee that a code be prepared on the testing of safety and relief valves. This request resulted in the publication of the original test code for safety and relief valves (PTC 25-1958) and was applicable only to tests with atmospheric discharge. In June 1964, the ASME Performance (then Power) Test Code Committee authorized PTC Committee Number 25 on Safety and Relief Valves to prepare a single test code (PTC 25.2-1966) to cover testing of valves discharging to atmosphere, superimposed, or built-up back pressure. In March 1971, the ASME Performance Test Codes Committee authorized PTC Committee Number 25 on Safety and Relief Valves to prepare a general revision to the test code, the result of which was PTC 25.3-1976, approved as an American National Standard on August 19, 1976.

In 1978, the ASME Board on Performance Test Codes once again authorized the PTC Committee Number 25 to prepare a general revision of the test code. This revision, PTC 25.3-1988, approved by the ASME Board on Performance Test Codes on March 14, 1988, differed from its predecessors primarily by the omission of the section concerning theoretical relieving capacity and coefficient of discharge.

In 1991, the ASME Board on Performance Test Codes revised the name of PTC Committee Number 25 to "Pressure Relief Devices" and authorized the Committee to prepare a revised test code of the same name with a scope that was extended to include a broader range of closing and nonreclosing pressure relief devices and to broaden the discussion of in-service and bench testing.

The 2001 edition of this Code was approved and adopted by the American National Standards Institute as meeting the criteria as an American National Standard on May 25, 2001.

The 2008 edition of this Code was broken down into three parts. Each Part's title, and Sections included within it, are as follows:

(a) Part I, "General," includes Sections 1 and 2.

(b) Part II, "Flow Capacity Testing," includes the preceding Sections 1 and 2, along with Sections 3 through 6 and appendices.

(c) Part III, "In-Service and Bench Testing," includes the preceding Sections 1 and 2, along with Sections 7 through 10 and appendices.

The 2008 edition of PTC 25 was approved by the American National Standards Institute on September 16, 2008.

The 2014 edition of PTC 25 was approved by the American National Standards Institute on May 5, 2014.

This Code is available for public review on a continuing basis. This provides an opportunity for additional public review input from industry, academia, regulatory agencies, and the public-at-large.

This 2018 edition of PTC 25 was approved by the American National Standards Institute on October 24, 2018.

ASME PTC COMMITTEE
Performance Test Codes

(The following is the roster of the Committee at the time of approval of this Code.)

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CORRESPONDENCE WITH THE PTC COMMITTEE

General. ASME Codes are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Code may interact with the Committee by requesting interpretations, proposing revisions or a case, and attending Committee meetings. Correspondence should be addressed to:

Secretary, PTC Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Code and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Code to which the proposed Case applies.

Interpretations. Upon request, the PTC Standards Committee will render an interpretation of any requirement of the Code. Interpretations can only be rendered in response to a written request sent to the Secretary of the PTC Standards Committee.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at http://go.asme.org/InterpretationRequest. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the PTC Standards Committee at the above address. The request for an interpretation should be clear and unambiguous. It is further recommended that the Inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry in one or two words.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. Please provide a condensed and precise question, composed in such a way that a "yes" or "no" reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of "Yes" or "No," with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The PTC Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the PTC Standards Committee. Future Committee meeting dates and locations can be found on the Committee Page at http://go.asme.org/PTCcommittee.

INTRODUCTION

This Code provides standards for conducting and reporting tests on reclosing and nonreclosing pressure relief devices normally used to terminate an abnormal internal or external rise in pressure above a predetermined design value in boilers, pressure vessels, and related piping equipment. This Code covers the methods and procedures to determine relieving capacity and additional operating characteristics that may be required for certification or other purposes by other codes. This is accomplished by dividing the Code into three parts: Part I, "General"; Part II, "Flow Capacity Testing"; and Part III, "In-Service and Bench Testing."

This Code does not necessarily cover the methods and procedures to satisfy operating and other conditions as may be required by other codes. Establishment of pressure relief device ratings and rules of safe construction do not fall within the province of this Code.

PART I
GENERAL

Section 1
Object and Scope

1-1 OBJECT

The object of the test is to determine the performance of pressure relief devices. These tests determine one or more of the following:

(a) dimensional, operational, and mechanical characteristics

(b) relieving pressure

(c) relieving flow capacity at test pressure

(d) individual flow resistance

Procedures for conducting the tests, calculating the results, and making corrections are defined.

1-2 SCOPE

(a) This Code provides instructions in Part II for flow capacity testing and in Part III for in-service and bench testing. Testing of reclosing and nonreclosing pressure relief devices is conducted under various inlet and outlet conditions using steam, gases, and liquids for which valid physical properties are known.

(b) The validity of tests shall be determined in accordance to the requirements of subsection 1-3.

1-3 MEASUREMENT UNCERTAINTY

In order to qualify as a valid code test, the total uncertainties of the test, as calculated by the procedures of ASME PTC 19.1, must be equal to or less than the values of maximum acceptable uncertainty. The maximum acceptable uncertainty of the final flow measurement shall not exceed ±2.0% of the measured value. For results other than flow measurements, the maximum acceptable uncertainty shall not exceed ±0.5% of the measured value as determined in accordance with Part II or ±1.0% of the measured value as determined in accordance with Part III.

1-4 GENERAL

(a) It is assumed that the testing facility has adequate capacity and sufficient pressure to conduct the tests. However, the users of this Code are cautioned that the capacity and pressure limitations of the testing facility may restrict the determination of satisfactory operating conditions and other operational features of the pressure relief device.

(b) In addition, field installation and/or abnormal operating conditions may adversely affect the function of the pressure relief device. It is not the intent of this Code to attempt to assess the suitability or reliability of the pressure relief device under such conditions. It should also be noted that if the temperature of the medium used to test the pressure relief device differs substantially from the temperature to which the pressure relief device is subjected while in service, the functional characteristics will be different from the test pressures, i.e., opening, closing, blowdown, and bursting pressure. In this case, it is necessary to develop appropriate corrections for the pressure relief device under test to account for these differences, which is outside the scope of this Code.

(c) This Code provides recommended test procedures and instrumentation for testing devices. Other test procedures or instrumentation may be used provided they can be demonstrated as having accuracy and reliability at least equal to the requirements of this Code. If another procedure or instrumentation will be used, it is subject to written agreement by the parties to the test prior to the test.

(d) The test results shall be reported as measured and calculated. Only tests that comply fully with the mandatory requirements of this Code may be designated as tests conducted in accordance with ASME PTC 25. References to other codes, unless otherwise indicated, refer to ASME Performance Test Codes. Should any specific direction in this Code, or any particular measurement, differ from those given in other ASME Performance Test Codes for similar measurements, the instructions of this Code shall prevail.

(e) The requirements of ASME PTC 1 shall be met.

(f) In some cases, the testing of pressure relief devices may involve the use of high-pressure and high-temperature fluid. Hazards to personnel will exist unless adequate precautionary measures are taken. Special consideration