ASME A112.4.1-2009
[Revision of ASME A112.4.1-1993 (R2008)]

Water Heater Relief Valve Drain Tubes

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

ASME
SETTING THE STANDARD

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This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

Periodically certain actions of the ASME A112 Committee may be published as Cases. Cases are published on the ASME Web site under the Committee Pages at http://cstools.asme.org as they are issued.

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

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FOREWORD

There are potential hazards associated with the heating of water in a closed vessel, as the potential for excessive temperature or pressure development within such closed systems is always present. In order to reduce the hazards associated with water heating, two special amendments have been added to the plumbing codes and standards over the past few decades that have resulted in much safer installations. The first requirement involved the installation of a high limit control in the water heating assembly, which deactivates the fuel gas control mechanism if the water heating device exceeds a specific temperature. The second requirement involved the installation of a temperature and pressure relief valve, which is designed to open to atmosphere if the water temperature or pressure within a vessel exceeds the defined specifications of the valve. Properly inspected and maintained, these devices provide the "state-of-the-art" in water heater safety.

For many years, relief valve drains were field-fabricated from metallic piping. With the increasing use of plastics and the need for more expedient installations of plumbing components, the ASME A112 Committee undertook the task of developing criteria for the performance of water heater relief valve drains.

It is intended that this Standard serve as a uniform reference document for use by manufacturers, inspectors, contractors, and installers to identify criteria applicable to water heater relief valve drain tubes.

When this Standard was first developed in 1993, the standard relief valve rating of residential water heaters was 100,000 Btu/hr. Today the common industry rating is 105,000 Btu/hr for the relief valves. This revision reflects this change.

Suggestions for improvement of this Standard are welcome. They should be sent to The American Society of Mechanical Engineers, Attn: Secretary, A112 Standards Committee, Three Park Avenue, New York, NY 10016-5990. The ASME A112 Standards Committee approved the Standard and it was subsequently adopted as an American National Standard by the American National Standards Institute on July 10, 2009.

ASME A112 COMMITTEE
Standardization of Plumbing Materials and Equipment

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

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CORRESPONDENCE WITH THE A112 COMMITTEE

General. ASME standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the committee by requesting interpretations, proposing revisions, and attending committee meetings. Correspondence should be addressed to:

Secretary, A112 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

Proposing Revisions. Revisions are made periodically to this 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 edition, the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal including any pertinent documentation. When appropriate, proposals should be submitted using the A112 Project Initiation Request Form.

Proposing a Case. Cases may be issued for the purpose of providing 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 standard, 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 standard to which the proposed Case applies.

Interpretations. Upon request, the Committee will render an interpretation of any requirement of the standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the A112 Standards Committee.

The request for 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.
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. 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 this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

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 A112 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the A112 Standards Committee.

WATER HEATER RELIEF VALVE DRAIN TUBES

1 GENERAL

1.1 Scope

This Standard establishes performance requirements and test methods applicable to water heater relief valve drain (or runoff) tubes for use with relief valves having a steam rating of 105,000 Btu/hr or less.

1.2 Reference Standards

The following reference standards shall be used to evaluate the product, and are cited herein. Unless indicated, the latest edition of these standards shall be applicable for certification to this Standard.

ANSI Z21.22, Relief Valves for Hot Water Supply Systems

Publisher: International Association of Plumbing and Mechanical Officials (IAPMO), 20001 Walnut Drive, South Walnut, CA 91789-2825 (www.iapmo.org)

ASME B1.20.1, Pipe Threads, General Purpose (Inch)

Publisher: The American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990; Order Dept: 22 Law Drive, P. O. Box 2900, Fairfield, NJ 07007-2900 (www.asme.org)

2 REQUIREMENTS

2.1 Size

The drain tube shall have a minimum inside diameter of $\frac{3}{4}$ in. and a minimum length of 48 in.

2.2 Material

The material that is used in the composition of the drain tube shall be capable of withstanding the temperature tests cited in section 3 without collapse or permanent distortion. Materials shall be corrosion resistant.

2.3 Joints

Any joints within the tube shall be firmly affixed and shall withstand the temperature tests without separation or leakage. Assembly of the drain tube to the relief valve shall be possible by hand-tightening only. Connecting threads shall comply with ASME B1.20.1 for $\frac{3}{4}$ in. NPT pipe threads.

2.4 Installation Instructions

Installation instructions, including post-installation relief valve testing procedures, shall be provided with the unit. A permanent tag or label relating to the relief valve test procedures shall be provided with the device.

2.5 Marking and Identification

2.5.1 The manufacturer's name or trademark shall be permanently marked on the drain tube.

2.5.2 For products intended for other than OEM applications, the limitations of installation for the drain tube shall be permanently marked on the tube in lettering not less than 0.125 in. in height. For example, "HAND-TIGHTEN ONLY," "USE ONLY ON T & P VALVES WITH 105,000 Btu/hr OR LESS RATING," or "NO PIPE SEALANTS."

3 TEST METHODS AND PERFORMANCE REQUIREMENTS

3.1 Temperature Test

3.1.1 Test Equipment. A steam-generating source capable of producing 105,000 Btu/hr at 15 psig pressure and 250°F temperature shall be used to conduct this test. The steam source shall be fitted with instruments that measure pressure and temperature. The steam source shall be connected to a $\frac{3}{4}$-in. relief valve that complies with ANSI Z21.22. The relief valve shall be mounted horizontally and the drain tube shall be installed in a downward position. For drain tubes intended for installation in relief valve locations at the top of a water heater, the test assembly shall be installed with the relief valve in a vertical position and the drain tube connected and tested accordingly.

3.1.2 Test Method. Prior to conducting this test, the inside diameter and length of the drain tube shall be measured and recorded. A thermocouple shall be attached to the outside surface of the drain tube within 3 in. ± 0.5 in. of the relief valve in order to measure the equilibrium temperature. The steam generator shall be

activated and the relief valve shall be manually locked in an open position. Steam discharge conditions of 105,000 Btu/hr ± 5% Btu/hr, pressure ratings of 15 psig, and temperature values of 250°F shall be established. When the thermocouple on the drain tube assembly indicates equilibrium temperature has been attained, the test shall continue for 15 min. After 15 min, the steam generator shall be deactivated and the drain tube shall be allowed to cool. The drain tube shall be evaluated against its original baseline dimensions.

3.1.3 Performance Requirements. The drain tube shall maintain its original inside diameter and shall not exceed ±0.25 in. from its original length.

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