American National Standard

ASSE 1010-2021

Performance Requirements for

Water Hammer Arresters

ASSE Board Approved: November 2021
ANSI Approved: November 2021
ICS Codes: 23 040 99, 91 140 60

General Information

No product may be said to be ASSE listed unless the manufacturer has applied to ASSE International, has had the product tested by an official ASSE recognized independent laboratory, according to the applicable ASSE standard, passed the test, and has been reviewed and approved by the consensus ASSE International Seal Control Board. Having completed the aforementioned, the manufacturer may then display the ASSE Seal on the product.

Instructions for receiving the authorization to display the Seal are available from the ASSE International Office. Organizations wishing to adopt or list any ASSE standard should print the ASSE standard number on the cover page first and in equal or larger type to that of the adopting or listing organization.

ASSE International
Mokena, Illinois

Foreword

Water hammer shock has long been known to be a destructive force in plumbing water supply systems. Water hammer is that condition which defines the destructive forces, pounding noises and vibration caused by the immediate cessation of water flowing in a pipeline. After years of study on this issue, the Plumbing and Drainage Institute published their findings in 1965 in a publication entitled Standard PDI-WH201, *Water Hammer Arresters*.

Water hammer forces can be controlled with a reduction of the intensity of the shock wave. Although some codes permit the use of an air chamber to temper the shock wave, the engineering community generally agrees that the installation of an engineered water hammer arrester to reduce the shock wave intensity. Air chambers are required to be oversized to be effective. Because they are subject to loss of the air cushion with each dissipation of a shock wave, the chamber must be periodically recharged.

The effective approaches to correction of water hammer are twofold. First, the proper sized engineered water hammer arrester must be selected. Second, the arrester must be properly installed.

This standard outlines the performance requirements for water hammer arresters and describes those performance requirements in terms of methods of testing applicable to all such units. Equivalent materials to those referenced which are intended to demonstrate compliance with these requirements shall be acceptable with proof of equivalence. Common design, types and sizes are defined or stated throughout this document for the basis of standardization with other industry components. Other designs, types and sizes falling outside the scope of this standard which may comply with the intent of the standard will be treated as special requirements when submitted for analysis.

It is recommended that all devices designed for plumbing systems, especially those which pertain to public health and safety, should be installed by qualified and trained mechanics.

Manufacturers who desire certification to this standard from ASSE International shall be required to have their products tested to this standard by an ASSE approved laboratory.

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Section I

1.0 General

1.1 Application

Water hammer arresters (herein referred to as “device”) are installed on water distribution system piping to prevent detrimental surge pressures within water distribution systems, thereby prolonging the service life of valves, piping, fittings, trim, equipment, appliances, appurtenances, and other devices which are part of the distribution system; and to eliminate noise. This standard addresses the test methods and performance requirements for water hammer arresters.

1.2 Scope

1.2.1 Description

This standard applies only to those devices classified as water hammer arresters having a permanently sealed cushion of gas isolated from the water way, and designed to provide continuous protection, without maintenance, against detrimental surge pressures within the water distribution system.

1.2.2 Arrester Size Range

The size of the device shall be within the range from Arrester Size AA which are used for “point of use” residential appliance applications to Arrester Sizes A through F which are used in applications as defined within Table 1 of this standard.

1.2.3 Pressure Range

These devices shall be designed to withstand a maximum pressure of at least 150.0 psi (1034 kPa). These devices shall operate at pressures from 0 psi (0 kPa) to 60.0 psi (413.7 kPa).

1.2.4 Temperature Range

These devices shall be capable of performing at temperatures from 33.0 °F (0.6 °C) to 180.0 °F (82.2 °C).

1.2.5 Connections

Pipe threads and other connections shall conform to the applicable standards.

- Bolts Screws and Nuts shall comply with ASME B1.1.
- Tapered pipe threads shall comply with ASME B1.20.1.
- Dry seal pipe threads shall comply with ASME B1.20.3.
- Compression assemblies shall comply with SAE J 512.
- Soldered connections shall comply with ASME B16.18 or ASME B16.22.
- Push fit connections shall comply with ASSE 1061.
- Press connections shall comply with ASME B16.51.
- PEX Crimp connections shall comply with ASTM F1807.
- PEX Expansion connections shall comply with ASTM F1960.
- CPVC connections shall comply with ASTM D2846.