**Summary of Substantive Changes**
**between the 2009 and the 2020 edition of**
# ASSE 1003 "Performance Requirements for Water Pressure Reducing Valves for Potable Water Distribution Systems"

**Presented to the IAPMO Standards Review Committee on May 17, 2021**

**General:** The changes to this standard may have an impact on currently listed products. The significant changes are:

- Replaced all mm dimensions with DN throughout the Standard (see Sections 1.2.2, Table 1, and Table 2)
- Editorially revised language throughout the Standard for clarification purposes (see Sections 1.4, 2.3, 2.4, 3.1.2, and 3.3.2)
- Added installation, maintenance and marking requirements (see Section 4.2)

Section 1.2, Scope: Replaced mm dimensions with DN as follows:

***1.2.1 Description***

*Devices covered by this standard are self-contained, direct acting, single diaphragm types. Devices shall be permitted to have an integral strainer, separate strainer connected to the valve inlet, or be without strainer. Devices shall be permitted to be with or without an integral by-pass relief valve.*

***1.2.2 Size Range***

*~~Connection pipe~~ Nominal device sizes shall be ½ ~~NPS~~, ¾ ~~NPS~~, 1 ~~NPS~~, 1¼ ~~NPS~~, 1½ ~~NPS~~, 2 ~~NPS~~, 2½ ~~NPS~~, ~~and~~ 3 ~~NPS~~ and 4 inches (~~12.7 mm, 19.1 mm, 25.4 mm, 31.8 mm, 38.1 mm, 50.8 mm, 63.5 mm and 76.2 mm~~ DN 15, DN 20, DN 25, DN 32, DN 40, DN 50, DN 65, DN 80, and DN 100).*

***1.2.3 ~~Minimum Working~~ Pressure Range***

*Devices shall be designed for a minimum working pressure of 250.0 psi (1723.8 kPa).*

Section 1.4, Referenced Standards: The referenced standards were revised as follows:

*Reference industry Sstandards* shall ~~mean~~ be to the revision ~~in effect on the date this standard is issued~~ *revision stated below*.

*~~• ANSI/ASME B1.20.1-83 , Pipe Threads, General Purpose, Inch.~~*
*~~• ANSI/ASME B1.20.3-76, Dryseal Pipe Threads, Inch~~*
*~~• ASTM A126-04, Standard Specification for Gray Iron Castings for Valves, Flanges & Pipe Fittings~~*
*~~• ASTM A153/A153M-05, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware~~*
*~~• ASTM A536-84(1999)e1, Standard Specification for Ductile Iron Castings~~*
*~~• ASTM B584-06a, Standard Specification for Copper Alloy Sand Castings for General Applications~~*
*• NSF/ANSI 61-2020, Drinking Water System Components – Health Effects*
*• NSF/ANSI 372-2016, Lead Free Plumbing Products*
*• UL 969-2017, Marking and Labeling Systems*

Section 2, Test Specimens and Test Laboratory: Revised language for clarification purposes as follows:

***2.3 Drawings***

*Assembly ~~drawings,~~ and installation drawings and any other data ~~needed~~ necessary to ~~enable a testing agency to~~ determine compliance with this standard shall accompany ~~devices~~ the device submitted ~~for examination and performance tests~~ to the testing agency.*

***2.4 Rejection***

*Failure of one ~~(1)~~ device shall ~~be cause for~~ result in a rejection of that type or model and size.*

Section 3, Performance Requirements and Compliance Testing: Revised language for clarification purposes as follows:

***3.1.2 Procedure***

a. *~~Turn the~~ Adjust the ~~A~~adjusting screw's ~~to remove all adjusting~~ position for minimum spring compression.*
b. *Install the device per Figure 1. With both valve #1 and valve #2 open, open the supply valve filling the system and purge it of air.*
c. *Close valve #1 and valve #2 and raise the supply pressure to 250.0 psi (1723.8 kPa), or the manufacturer's rated pressure, whichever is higher.*
d. *Observe and record pressure indicated by gauge #2.*
e. *Hold inlet pressure at 250.0 psi (1723.8 kPa), or the manufacturer's rated pressure, whichever is higher, for not less than five (5) minutes.*

***3.3 Temperature Range Testing***

***3.3.1 Purpose***

*The purpose of this test is to verify that when exposed to water 140° F or at the manufacturer's maximum recommended temperature whichever is greater, none of the materials within the device shall be adversely affected.*

***3.3.2 Procedure***

a. *Install the device per Figure 2 with a heater capable of maintaining a temperature equal to 140° F or the manufacturer's maximum temperature whichever is greater for the device,*
b. *a reservoir located above the heater, and a pump capable of circulating water continuously through device at the rate listed in Table 1.*
c. *The reservoir shall be closed but vented to atmosphere.*
   *Note: A closed recirculating system shall be permitted to be used instead of the vented reservoir at the option of the testing laboratory.*
d. *Water shall be circulated through the device for 8 hours per day for a total of 10 days (total of 80 hours).*
e. *The laboratory, at its option, shall be permitted to test the unit for 80 hours continuously.*
f. *The device and associated piping shall be insulated in order for the device to be maintained at the required temperature throughout this test procedure.*

*At the end of ~~eighty~~ 80 hours, ~~run~~ flow water maintained at 40°F (4.4°C) through the device for ~~one~~ 1 hour at the minimum ~~capacity~~ flow rate for the device size listed in Table 1.*

***3.5 Minimum Reduced Pressure Test***

***3.5.1 Purpose***

*The purpose of this test is to determine if the device is capable of being adjusted to a reduced flowing pressure of 25.0 psi (172.4 kPa) at the rates shown in Table 2 when the supply pressure is maintained at 250.0 psi (1723.7 kPa). Note: this test assumes a 10:1 reduction ratio in pressure.*

***3.8 By-Pass Relief Valve Opening Pressure Differential Test (Only required for devices with by-pass relief valve)***

***3.8.2 Procedure***

a. *With the device installed per Figure 3*
b. *with valves #4, #5 and #6 closed,*
c. *open the supply valve #3 and regulate the supply pressure at 100.0 psi (689.5 kPa).*
d. *Open throttling valve #4, purge the system of air and then close valve #4.*
e. *Record the exact pressure registered on gauge #3.*
f. *Open valves #6 and #7, then use valve #7 to adjust the pressure shown on gauge #5 to read 5.0 psi (34.5 kPa) less than the pressure shown on gauge #3.*
g. *Slowly raise the pressure in the downstream line until the pressure registered by gauge #3 first starts to rise. At this point, observe the pressure registered on gauge #4. The difference between the pressures on gauge #3 and gauge #4 is what is needed to start opening the by-pass check relief valve. ~~This pressure difference shall not exceed 10.0 psi (68.9 kPa).~~*

Section 4.0, Detailed Requirements: Revised potable water language to match current requirements with NSF 61 and 372, and also revised connection language to match the current requirements as follows:

***4.1 Materials***

***4.1.1 Material in Contact with Potable Water***

*~~Solder and fluxes containing lead in excess of 0.2% shall not be used in contact with potable water. Metal alloys in contact with potable water shall not exceed 8% lead.~~ Devices where the water is intended for human consumption shall comply with NSF 372 and NSF 61 as applicable.*

***~~4.1.2 Non-ferrous Cast Parts~~***

*~~Non-ferrous cast parts shall have a corrosion resistance at least equal to ASTM B584 Alloy UNS #C84400.~~*

***~~4.1.3 Ferrous Cast Parts~~***

*~~Parts shall conform to ASTM A126 Class B for gray iron or ASTM A536 Grade 65-45-12 for ductile iron. Parts in contact with the water flowing through the device shall be protected against corrosion by hot dip galvanizing, ASTM A153 Class A or B, or by other proven methods.~~*

***~~4.1.4 Internal Non-Cast Parts~~***

*~~Internal non-cast parts shall be of a material having a corrosion resistance at least equal to a non-ferrous alloy of not less than fifty-eight percent (58%) copper.~~*

***~~4.1.5 Stainless Steel or Nickel Alloys~~***

*~~Stainless steel shall be ANSI type 300 series or equal in corrosion resistance. Monel metal or other nickel alloys with corrosion resistance equal to type 300 series stainless steel are acceptable.~~*

***~~4.1.6 Seat Ring~~***

*~~The seat assembly in the device body shall be replaceable. It shall be made of series 300 stainless steel or equal corrosion resistance material.~~*

~~***4.1.7 Springs - ASTM Grade***~~

~~*Springs not in contact with the water flowing through the device shall be of a recognized ASTM grade.*~~

~~***4.1.8 Springs - Corrosion Resistance***~~

~~*Springs in contact with the water flowing through the device shall have a corrosion resistance at least equal to stainless steel, series 300.*~~

~~***4.1.9 Screen Material***~~

~~*The strainer shall be of corrosion resistant material equal to monel metal or stainless steel, type 300 series.*~~

~~***4.1.10***~~ ***4.1.2 Bolts, Nuts and Screws***

~~*Bolts, nuts and screws used in the device shall be of an approved corrosion resistant material or have an approved corrosion resistant coating.*~~ Threads shall be in accordance with American Standard Unified Screw Thread ANSI/ASME B1.1 and/or metric ISO threads.

~~***4.1.11 Pipe Threads***~~

~~*(a) Taper pipe threads, except dryseal, shall be in compliance with ANSI/ASME B1.20.1.*~~

~~*(b) Dryseal threads shall be in compliance with ANSI/ASME B1.20.3.*~~

***4.1.3 Pipe Threads***

*Connections shall conform with nationally or internationally recognized standards.*

Section 4.2, Installation and Maintenance Instructions: Added installation ,maintenance and marking requirements as follows:

~~***4.3***~~***4.2 Installation and Maintenance Instructions***

~~***4.3.1***~~***4.2.1***

~~*Complete i*~~*Instructions for ~~installation and adjustment of~~ installing, adjusting, and maintaining the device shall be ~~packaged~~ included with ~~it~~ each device. Drawings or schematic sketches which would be useful to the installer shall be part of these instructions.*

~~***4.3.1.1***~~*a. Installation instructions shall state that the device shall be installed in an accessible location.*

~~***4.3.1.2***~~*b. Installation instructions shall state that for devices without an integral strainer, it is recommended that a suitable strainer be installed upstream of the device.*

~~***4.3.2 Complete detailed maintenance instructions shall be furnished.***~~

*The installation instructions for the device shall include the following information:*

*a. Inlet and outlet connection sizes.*

*b. Manufacturer's maximum working pressure.*

*The instructions shall indicate that the device shall be accessible for replacement and repair.*

***4.2.2 Method of Markings***

*The external markings of the BFTK shall be etched, cast, molded, stamped or engraved on the body of the BFTK; on a corrosion resistant plate securely attached to the BFTK with a corrosion resistant material; on a decal that is alcohol wipe resistant/weather resistant securely attached to the BFTK; or printed on the dial plate.*

~~***4.2***~~***4.3 Identification and*** *Markings*

*Each device shall have the following information permanently marked on it where it will be visible after the device has been installed:*

*a) Name of manufacturer or trademark.*
*b) Type and model number of the device.*
*c) Maximum working pressure.*
*d) Maximum water temperature for which the device is designed.*
*e) The direction of water flow through the device.*
*f) Nominal device size.*

*Labels shall comply with UL 969 for permanence.*

***5.0 Definitions***

*Definitions not ~~shown~~ located in this section are ~~found in the latest edition of~~ located in the Plumbing Dictionary, Sixth Edition, published by ASSE International.*

***Integrated Type***

*One which is a complete and independent device which is assembled with, but is separate and independent of, any working part of the device.*

***Integral Strainer***

*A strainer within the body or within an extension of the body of the device.*

***No-Flow Set (Lock-Up) Pressure***

*Pressure setting at device outlet with no water flowing through the device.*

*Table 1, Thermal conditioning flow rates for given device sizes: The table was revised to add a title/name to the table and requirements for a 4-inch device. The table was also revised to replace the mm conversion to a DN conversion.*

*Table 2, Flow rates for minimum reduced pressure test: The table was revised to add a title/name to the table and requirements for a 4-inch device. The table was also revised to replace the mm conversion to a DN conversion.*