INTERNATIONAL STANDARD

ISO 3822-3

Third edition
2018-01

Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations —

Part 3: Mounting and operating conditions for in-line valves and appliances

Acoustique — Mesurage en laboratoire du bruit émis par les robinetteries et les équipements hydrauliques utilisés dans les installations de distribution d'eau —

Partie 3: Conditions de montage et de fonctionnement des robinetteries et des équipements hydrauliques en ligne

Reference number
ISO 3822-3:2018(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics*.

This third edition cancels and replaces the first edition (ISO 3822-3:1997), which has been technically revised. It also incorporates the Amendment ISO 3822-3:1997/Amd 1:2009.

A list of all the parts in the ISO 3822series can be found on the ISO website.

Introduction

The method of measurement for laboratory tests on noise emission from appliances and equipment used in water supply installations is specified in ISO 3822-1.

This document gives detailed descriptions for mounting and operating in-line valves and appliances, which control the flow, pressure or temperature of the water in water supply installations in such laboratory tests.

NOTE An in-line valve is one through which water flows and which is permanently installed in a system of rigid pipework upstream of the outlet fitting.

These in-line valves and appliances are for use with cold and/or hot water in buildings (stop valves, check valves, in-line thermostatic and mechanical mixing valves, domestic water meters, valve combinations for installation in water heater feed pipes, pressure reducing valves, flow restrictors, water governors, service valves, in-line temperature and pressure relief valves, etc.).

Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations —

Part 3: Mounting and operating conditions for in-line valves and appliances

1 Scope

This document specifies the mounting and operating conditions to be used for in-line valves and appliances which control the flow, pressure or temperature of the water in water supply installations, when measuring noise emission resulting from water flow.

It is applicable to in-line valves and appliances of maximum nominal size DN 32 and to systems in which the maximum water flow rate does not exceed 1,6 l/s.

NOTE See ISO 6708; DN is the symbol for "nominal size". The number of the nominal size is loosely related to the inside diameter (in millimetres) of the in-tine valves and appliances.

The procedures described are for general use for all types of in-line valves of conventional design.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 49, *Malleable cast iron fittings threaded to ISO 7-1*

ISO 3822-1, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 1: Method of measurement*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Mounting

4.1 General

4.1.1 General

In-line valves shall be inserted between two straight pieces of pipe of the type and sizes appropriate to the end-connections of the valve. Each straight piece of pipe shall be at least ten diameters long.

4.1.2 Installation

The in-line valves or appliance shall be installed in its normal working position, which is generally vertical or horizontal.

The test shall be carried out for the noisier of the two positions, which shall be determined by a short preliminary test.

If the manufacturer specifies that the appliance may be installed in other positions, then the short preliminary test shall be carried out for these positions.

4.1.3 Connection

The in-line valves or appliance shall be connected to the test pipe in accordance with the appropriate description in 4.3 to 4.7. The connection shall be made so that no air will be trapped therein.

In-line valves or appliances fitted with connections not covered by 4.3 to 4.5 inclusive shall be connected to the test pipe and to the discharge system so as to provide a rigid and watertight connection in accordance with good practice and workmanship.

4.2 Fitting to the test pipe

The test pipe shall end with a galvanised (hot-dip zinc coated) union, taper seat size 1, U11 complying with ISO 49.

In-line valves and appliances, including connecting pipe (see 4.1) shall be connected to the union using if necessary a combination of galvanised (hot-dip zinc coated) fittings complying with ISO 49. Changes in direction shall be accomplished by means of long sweep bends size 1 only.

Reduction or enlargement of size shall only be made at the inlet connection of the connecting pipe. The combination of fittings used shall result in the appliance being in the normal position of use.

4.3 Mounting of in-line valves and appliances with screwed conditions

In-line valves and appliances with screwed connections for galvanised pipes (see 4.1) shall be connected to the test pipe as specified in 4.2.

4.4 Mounting of in-line valves and appliances with provision for soldering in copper connecting pipes

In-line valves and appliances with provision for soldering in copper connecting pipes shall have a piece of copper pipe of the appropriate diameter and at least ten diameters in length, though not more than 300 mm, soldered in each connection. This copper pipe shall be connected to the test pipe as specified in 4.2 and 4.5.

4.5 Mounting of in-line valves and appliances fitted with copper connecting pipes

In-line valves and appliances fitted with copper connecting pipes, which shall be extended, if necessary, to at least ten diameters in length, though not more than 300 mm, shall be connected to the test pipe, as specified in 4.2, using couplings made either by soldering a nipple on to the pipe and using a cap nut or by means of a compression fitting.

4.6 Mounting of in-line valves or appliances with two inlets

In-line valves or appliances with two inlets shall be connected to the test pipe, as specified in 4.3, 4.4 or 4.5, by means of a twin outlet (see ISO 3822-1).

4.7 Discharge connection

The discharge system specified in 5.1.4 shall be connected to the outlet of the in-line valve or appliance by one of the methods specified in 4.3 to 4.5.

5 Test procedure

5.1 General test conditions

5.1.1 General

In-line valves and appliances shall be tested by the method specified in ISO 3822-1.

5.1.2 Water temperature

All in-line valves and appliances, including those which are normally operated with both hot and cold water, shall be tested with water at a temperature not exceeding 25 °C at all inlets.

5.1.3 Outlets

In-line valves and appliances with more than one outlet shall be tested for each outlet separately. The unused outlet(s) shall be closed by a drain cock for venting the valve or appliance.

5.1.4 Flow regulating and discharge system

In-line valves and appliances shall be tested with an adjustable low noise flow resistance connected downstream of the valve.

The noise produced by this flow resistance, including the intrinsic noise of the test arrangement, shall be lower than that of the appliance to be tested by at least 10 dB. An example of such a low noise flow resistance is given in Annex A.

If the specified water flow rate cannot be obtained by adjusting the low noise flow resistance connected to the valve under test, the flow resistance shall be replaced by 1 m of smooth bore flexible hose of the same bore as the outlet of the valve.

5.1.5 Test pressures

The procedures specified in 5.2, 5.3, 5.4, 5.6 or 5.7 shall be carried out at a flow pressure of 0,3 MPa and then at a flow pressure of 0,5 MPa, without altering the specified setting of the adjustable flow resistance.

NOTE 1 MPa = 10 bar.

5.1.6 Water flow rate

The procedures specified in 5.2, 5.3, 5.4, 5.6 or 5.7 shall be carried out at a flow rate according to Table 1.

Table 1 — Water flow rates

Nominal size of in-line valve or appliance (DN)	Water flow rates, q_{V1} q_V = 2 m/s l/s	Water flow rates, q_{V2} q_V = 1 m/s l/s
6	0,06	0,03
8	0,10	0,05
10	0,20	0,10
15	0,33	0,17
20	0,63	0,32
25	1,00	0,50
32	1,60	0,80

5.2 Procedure for stop valves

5.2.1 For stop valves and appliances having an external control which stops the flow, operate this control so that the maximum water flow rate is obtained.

5.2.2 Adjust the water flow pressure (see 5.1.5) at the inlet and keep this pressure constant at this value throughout the following steps.

5.2.3 Adjust the low noise flow resistance which is connected to the stop valve so that the water flow rate, q_{V1}, specified in Table 1 is obtained and, if required by the relevant product standard, the water flow rate, q_{V2}, (see Table 1) shall also be done.

5.2.4 Measure the water flow rate and the sound pressure level in the test room.

5.3 Procedure for control valves

5.3.1 For control valves having an external control which regulates and stops the flow, carry out the procedure specified in 5.2.

5.3.2 Operate (close) the control until the flow of water has stopped. Determine the maximum sound pressure level during this closing procedure and measure the water flow rate at which this maximum occurs.

5.4 Procedure for valves and appliances operated by water flow

NOTE For valves and appliances operated by water flow (for example, water meters, check valves, combined check and stop valves), the flow rate during the test depends on the water flow pressure and the setting of the low noise flow resistance.

5.4.1 Adjust the water flow pressure (see 5.1.5) at the inlet and keep the pressure constant at this value throughout the following steps.

5.4.2 Adjust the low noise flow resistance which is connected to the valve or appliance so that the water flow rate, q_{V1}, specified in Table 1 is obtained and, if required by the relevant product standard, the water flow rate, q_{V2}, (see Table 1) is also obtained.

5.4.3 Measure the water flow rate and the sound pressure level in the test room.

5.4.4 Adjust the low noise flow resistance until the flow of water has stopped. Determine the maximum sound pressure level during this closing procedure and measure the water flow rate at which this maximum occurs.

5.5 Procedure for automatic in-line valves or appliances operated by water pressure

NOTE For in-line valves or appliances that are operated by water pressure (for example, pressure reducing valves and pressure limiting valves) the water flow rate during the test depends on the inlet and outlet pressures and the setting of the low noise flow resistance.

5.5.1 For valves intended for use over a range of inlet and/or outlet pressures, maintain the inlet pressure at 0,8 MPa. In the following procedure, set the outlet pressure adjustment, if any, at 0,3 MPa, if this pressure is within the range of outlet pressures. Otherwise set the outlet pressure adjustment, if any, at 0,1 MPa.

5.5.2 Fully open the low noise flow resistance which is connected to the pressure reducing valve. Then adjust simultaneously the outlet pressure adjustment, if any, of the test sample to 0,3 MPa, or 0,1 MPa, and the water flow rate to the appropriate value given in Table 1.

Carry out the tests at water flow rate, q_{V1}, (see Table 1) and, if required by the relevant product standard, also at water flow rate, q_{V2}, (see Table 1).

5.5.3 Measure the upstream and downstream pressures, the water flow rate and the sound pressure level in the test room.

5.5.4 Adjust the low noise flow resistance until the flow of water has stopped. Determine the maximum sound pressure level during this closing procedure and measure the water flow rate at which this maximum occurs.

5.6 Procedure for automatic in-line valves and appliances operated by water temperature

NOTE For automatic in-line valves and appliances that are operated by water temperature (for example, thermostatic mixing valves), the water flow rate during the test depends on the water flow pressure and the setting of the low noise flow resistance.

5.6.1 Set the temperature control, if any, to its cold setting. Adjust the water flow pressure (see 5.1.5) at the inlet and keep the pressure constant at this value throughout the following steps.

5.6.2 Adjust the low noise flow resistance which is connected to the valve under test so that the water flow rate, q_{V1}, specified in Table 1 is obtained and, if required by the relevant product standard, the water flow rate, q_{V2}, (see Table 1) is also obtained.

5.6.3 Measure the water flow rate and the sound pressure level in the test room.

5.6.4 Operate the temperature control, if any, over the whole of its range in both directions, returning it to its cold setting. Determine the maximum sound pressure level in the test room during this procedure and the water flow rate at which this maximum occurs.

5.7 Procedure for “safety groups”

NOTE Various combinations of in-line valves are used in cold feed pipes to unvented water heaters. When these are incorporated together into a single unit, this unit is known as a “safety group”. Such safety groups typically incorporate stop valves, check valves, expansion valves and pressure relief valves, pressure reducing valves and pressure gauges in various combinations.

5.7.1 Safety groups without a pressure reducing valve

Safety groups that do not include a pressure reducing valve shall be tested as described in 5.2.

5.7.2 Safety groups with a pressure reducing valve

Safety groups that include a pressure reducing valve shall be tested as described in 5.5 with any stop valves or flow regulators fully open.

6 Test report

The test report shall include the following information:

a) the information required by ISO 3822-1;

b) the mounting of the appliance tested;

c) the flow pressure and water flow rate(s) used, the outlet used and the maximum sound pressure levels obtained;

d) a description and/or drawing of the in-line valve or appliance tested, including the type, nominal size, manufacturer and manufacturer's number;

e) the number of the clauses of this document relevant to the in-line valve or appliance tested, and in accordance with which the tests were carried out, together with descriptions of any peculiarities observed.