



WMTS-501:2016

Anti-infiltration overflow-relief device

WaterMark Technical Specification

2016



ABCBC



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Anti-infiltration overflow-relief device

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On 25 February 2013 management and administration of the WaterMark Certification Scheme transferred to the Australian Building Codes Board (ABCB). From this date all new technical specifications will be named WaterMark Technical Specifications (WMTS). Within two years all existing ATS will be renamed WMTS. During this initial period both terms may be used and accepted. All new and recertified Certificates of Conformity will reference WMTS. Certificates of Conformity that currently reference ATS will be re-issued referencing the equivalent WMTS during this initial period. The WaterMark Schedule of Specifications lists all current WMTS and, where appropriate, the former ATS name.

This Technical Specification supersedes Standards Australia ATS 5200.501–2011.

The rebranding of this Technical Specification has included additional information about the transition as well as changes to specific details including replacing references to Standards Australia and the National Plumbing Regulators Forum (NPRF) with the ABCB, changing the term Australian Technical Specification (ATS) to WaterMark Technical Specification (WMTS), replacing references to technical committees WS-014 and WS-031 with the WaterMark Technical Advisory Committee (WMTAC).

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PREFACE

WaterMark Technical Specification WMTS-501:2016 Technical Specification for plumbing and drainage products, Anti-infiltration overflow-relief device was originally prepared by the Joint Standards Australia/Standards New Zealand Committee WS-031, Technical Procedures for Plumbing and Drainage Products Certification.

The objective of this Technical Specification is to enable product certification in accordance with the requirements of the Plumbing Code of Australia (PCA).

The word 'VOID' set against a clause indicates that the clause is not used in this Technical Specification. The inclusion of this word allows a common use clause numbering system for the WaterMark Technical Specifications.

The term 'normative' has been used in this Technical Specification to define the application of the appendices to which they apply. A 'normative' appendix is an integral part of a Technical Specification.

The test protocol and information in this Technical Specification was arranged by committee members to meet the authorization requirements given in the PCA.

The WaterMark Schedule of Specifications and List of Exempt Products are dynamic lists and change on a regular basis. Based on this function, these lists have been removed from the WaterMark Certification Scheme document known as Technical Specification for Plumbing and Drainage Products and are now located on the ABCB website (www.abcb.gov.au). These lists will be version controlled with appropriate historic references.

ACKNOWLEDGEMENTS

Australian Technical Specification ATS 5200.501–2011, on which this technical specification is based, was prepared by Standards Australia Committee WS-031, Technical Procedures for Plumbing and Drainage Products Certification. It was approved on behalf of the Council of Standards Australia on 6 April 2011.

The following organisations were represented on Committee WS-031 in the preparation of Australian Technical Specification ATS 5200.501–2011.

- Australian Building Codes Board
- Australian Industry Group
- Australian Stainless Steel Development Association
- Copper Development Centre – Australia
- CSIRO Manufacturing and Infrastructure Technology
- National Plumbing Regulators Forum
- Plastics Industry Pipe Association of Australia
- Plumbing Products Industry Group
- South Australian Water Corporation
- Water Services Association of Australia

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1 SCOPE

This Technical Specification sets out requirements for moulded PVC-U anti-infiltration overflow-relief devices, of nominal size DN 100, that are intended, upon installation in an overflow relief gully (ORG), to prevent the infiltration of surface waters to the sewerage and drainage systems and provide for the overflow relief of any surcharge of the sewerage and drainage systems.

Anti-infiltration overflow-relief devices require certification to WaterMark Level 2.

2 APPLICATION

This Technical Specification will be referenced on the WaterMark Certification Scheme Schedule of Specifications.

Appendix A sets out the means by which compliance with this Technical Specification shall be demonstrated by a manufacturer for the purpose of product certification.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Technical Specification:

AS

- 1646 Elastomeric seals for waterworks purposes
- 2888 Methods of testing plastics waste fittings
- 2888.6 Part 6: Method for load testing of plastics waste outlets

ABCB

- Plumbing Code of Australia (PCA)
- Procedure for Certification of Plumbing & Drainage Products

AS/NZS

- 1260 PVC-U pipes and fittings for drain, waste and vent applications
- 1462 Methods of test for plastics pipes and fittings
- 1462.1 Part 1: Method for determining the dimensions of pipes and fittings
- 1462.11 Part 11: Method for high temperature stress-relief testing of fittings
- 3500 Plumbing and drainage
- 3500.0 Part 0: Glossary of terms
- 3500.2 Part 2: Sanitary plumbing and drainage
- 3500.5 Part 5: Domestic installations

4 DEFINITIONS

For the purpose of this Technical Specification, the definitions given in AS/NZS 3500.0 and the one below apply.

4.1 Overflow relief

The relief of any possible surcharge from a sewer or drain.

NOTE: For the purposes of this WMTS, the word 'drain' is used throughout and is equally applicable to 'sewer'.

5 MATERIALS

5.1 General

The composition of PVC-U formulations used to manufacture fittings in accordance with this Technical Specification shall meet the requirements of AS/NZS 1260.

5.2 Elastomeric materials

Elastomeric seals shall comply with AS 1646.

NOTE: In selecting the type of elastomer, any exposure of the elastomer to ultraviolet light should be considered or suitable protection be provided.

5.3 Other materials

Other materials utilized in the product shall be suitable for use in the intended environment and, in particular, provide resistance to corrosion and outdoor exposure (UV resistance).

6 MARKING

Each device shall be legibly and permanently marked with the following:

- (a) Manufacturer's name, brand or trademark.
- (b) WaterMark.
- (c) Certificate number.
- (d) Batch identification.
- (e) The number of this Technical Specification, i.e. WMTS-501.
- (f) The letters 'DWV' and 'PVC-U'.

NOTE: DWV = drainage waste vent.

- (g) 'DO NOT COVER' and 'DO NOT REMOVE' on the top of the device.

7 PACKAGING

Devices shall be suitably packaged to prevent damage during transportation and handling.

8 DESIGN

8.1 General

The device shall be designed so that—

- (a) in the event of surcharge conditions (see Clause 9.2) the device shall not be captive and will allow the free overflow of the drain;
- (b) in the event of surcharge conditions, the device shall be capable of maintaining a clear bore of not less than nominal size DN 100;
- (c) the ingress of surface water is not greater than the permissible leakage rate as specified in Clause 9.1;
- (d) it can be positively located in the drainage socket, as specified in the manufacturer's installation instructions; and
- (e) in the installed position, the top of the device is domed and extends above the overflow level.

8.2 Dimensions

The wall thickness of any exposed parts of the device when installed, and measured in accordance with AS/NZS 1462.1, shall be ≥ 3.0 mm.

8.3 Connections

The device shall have a connecting end capable of making a watertight joint when jointed with the type of pipe socket recommended by the manufacturer.

8.4 Freedom from defects

The finished device shall be free from blisters or heat marks, chips and rough edges. Sharp edges shall be removed. Defects that do not affect the performance, function or safe handling of the device shall be deemed acceptable, provided the performance requirements of this Technical Specification can be met.

9 PERFORMANCE REQUIREMENTS AND TEST METHODS

9.1 Infiltration test

When tested in accordance with Appendix B, infiltration shall not exceed 100 mL/h.

9.2 Overflow-relief test

When tested in accordance with Appendix C, the device shall allow the free flow of water when the surcharge level reaches the overflow level of the device.

9.3 Load test

When tested in accordance with AS 2888.6 the device shall withstand a force of 1.0 +0.1, -0 kN for 60 +5, -0 min without cracking, breaking or otherwise being rendered unserviceable. This test shall be applied to all top surfaces when in the installed position.

On completion of the infiltration test (Clause 9.1), the overflow-relief test (Clause 9.2) shall be repeated.

9.4 High temperature stress-relief test

When determined in accordance with AS/NZS 1462.11 at a temperature of 150 ± 4°C for 60 +3, -1 min, the high temperature stress-relief properties of the unrestrained fitting shall comply with the following:

- (a) There shall be no evidence of inclusions in the fitting.
- (b) Delamination or damage at the injection point shall not have reduced the wall thickness to less than 50% of the minimum wall thickness specified in Clause 8.2.
- (c) The weld line shall not open to a depth of more than 50% of the wall thickness.

NOTE: The weld line is likely to become prominent, and the fitting distorted; however, this does not constitute a failure.

- (d) Not more than 5% of the total internal and external surface of the fitting shall exhibit blisters and/or surface delamination.

9.5 Performance test for foot ventilation of overflow relief and disconnecter gullies

When tested in accordance with Appendix D, the foot ventilation for an overflow relief gully (ORG), fitted with an anti-infiltration overflow-relief device, shall be equal to or better than—

- (a) an ORG located external to a building and fitted with a standard ORG grate; and
- (b) a disconnecter gully located internal to a building and fitted with a DN 50 breather vent.

10 TEST SEQUENCE AND TEST SAMPLE PLAN

Two samples shall be used and the following tests shall be carried out in the sequence shown:

- (a) *Sample 1* High temperature stress-relief test.
- (b) *Sample 2*:
 - (i) Infiltration test.
 - (ii) Overflow-relief test.
 - (iii) Load test.
 - (iv) Infiltration test.
 - (v) Overflow-relief test.

11 PRODUCT DOCUMENTATION

Installation instructions shall be provided with each unit, which shall include the following:

- (a) Instructions that the installation be carried out in accordance with AS/NZS 3500.2 and AS/NZS 3500.5.
- (b) Instructions that the device be fitted only to an overflow relief gully (ORG) located outside a building that only has ground floor fixtures or other approved discharge connected to maintain the water seal of the trap.
- (c) Detailed step-by-step instructions for each specific installation option.
- (d) Maintenance and service instructions.
- (e) Contact details for all service/spare parts requirements.

Appendix A MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS TECHNICAL SPECIFICATION

(Normative)

A.1 SCOPE

This Appendix sets out the means by which compliance with this Technical Specification has to be demonstrated by a manufacturer under the WaterMark Certification Scheme.

A.2 RELEVANCE

The long-term performance of plumbing systems is critical to the durability of building infrastructure, protection of public health and safety, and protection of the environment.

A.3 PRODUCT CERTIFICATION

The purpose of product certification is to provide independent assurance of the claim by the manufacturer that products comply with this Technical Specification.

The certification scheme serves to indicate that the products consistently conform to the requirements of this Technical Specification.

The sampling and testing plan, as detailed in Paragraph A5 and Table A1, shall be used by the WaterMark Conformity Assessment Body. Where a batch release testing program is required, it shall be carried out by the manufacturer as detailed in Paragraph A5 and Table A2.

A.4 DEFINITIONS

A.4.1 Batch release test

A test performed by the manufacturer on a batch of components, which has to be satisfactorily completed before the batch can be released.

A.4.2 Production batch

Clearly identifiable collection of units, manufactured consecutively or continuously under the same conditions, using material or compound to the same specification.

A.4.3 Sample

One or more units of product drawn from a batch, selected at random without regard to quality.

NOTE: The number of units of product in the sample is the sample size.

A.4.4 Sampling plan

A specific plan that indicates the number of units of components or assemblies to be inspected.

A.4.5 Type test batch

Schedule of units of the same type, identical dimensional characteristics, all the same nominal diameter and wall thickness, from the same compound.

NOTE: The batch is defined by the manufacturer.

A.4.6 Type testing (TT)

Testing performed to demonstrate that the material, component, joint or assembly is capable of conforming to the requirements given in the WaterMark Technical Specification.

A.5 TESTING

A.5.1 Type testing

Table A1 sets out the requirements for type testing and frequency of re-verification.

A.5.2 Batch release testing

Table A2 sets out the minimum sampling and testing frequency plan for a manufacturer to demonstrate compliance of product(s) to this WaterMark Technical Specification on an ongoing basis. However, where the manufacturer can demonstrate adequate process control to the WaterMark Conformity Assessment Body, the frequency of the sampling and testing nominated by the manufacturer's quality plan and/or documented procedures shall take precedence for the purposes of WaterMark product certification.

A.5.3 Retesting

In the event of a batch release test failure, the products within the batch may be retested at a frequency agreed to with the WaterMark Conformity Assessment Body and only those batches found to comply may be claimed and/or marked as complying with this WaterMark Technical Specification.

Table A1—TYPE TESTS

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Composition	AS/NZS 1260	At any change in materials
		Colour	AS/NZS 1260	
Marking	6	Permanent markings	Visual	At any change in the design or method of marking
Packaging	7	Suitable protective packaging	Visual	At any change in design or method of packaging
Design	8.1	General	Clause 8	At any change in design
	8.2	Dimensions-Thickness \geq 3mm at any point		
Performance	9.1	Infiltration test	Appendix B	At any change in design or manufacturing process
	9.2	Overflow-relief test	Appendix C	
	9.3	Load test	AS 2888.6	
	9.4	High temperature stress-relief test	AS/NZS 1462.11	
	9.5	Foot ventilation of overflow relief and disconnector gullies	Appendix D	
Product documentation	11	Product data/Installation and maintenance instructions	Review product documentation	At any change to installation requirements

Table A2— BATCH RELEASE TESTS

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Composition	Review materials parts lists and compliance certification	Verification of incoming materials
		Colour	Visual	Once per production batch
Marking	6	Permanent markings	Visual	100%
Design	8.2	Dimensions – Thickness \geq 3 mm at any point	Clause 8	Once per cavity per production shift
Performance	9.1	Infiltration test	Appendix B	Once per production batch
	9.2	Overflow-relief test	Appendix C	
	9.3	Load test	AS 2888.6	
	9.4	High temperature stress-relief test	AS/NZS 1462.11	Once per cavity per production shift
Product documentation	11	Production data/Installation and maintenance instructions	Review production documentation	100%

Appendix B INFILTRATION TEST

(Normative)

B.1 SCOPE

This Appendix sets out the method for conducting an infiltration test to verify the leakage rate through an anti-infiltration overflow-relief device under simulated flood conditions.

B.2 PRINCIPLE

Volume of water infiltration is measured over a given time when the device is subject to simulated flood conditions when installed in accordance with the manufacturer's instructions.

B.3 APPARATUS

The following apparatus is required:

- (f) Water supply system.
- (g) A test rig to maintain a defined head of water above the assembled device.
- (h) Suitable measuring equipment to measure volume of water infiltration over a given time.

B.4 PROCEDURE

The procedure shall be as follows:

- (a) Install the device into the drainage socket in accordance with the manufacturer's instructions.
- (b) Fit the socket assembly into the test rig ensuring that the entire assembly will be submerged in water (see Figure B1).
- (c) Fill the test rig with water and maintain a 150, +25, -0 mm head of water above the top of the device.
- (d) Maintain the head of water for 60, +5, -0 min and record the volume of water that leaks through the device.

B.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer and model identification.

- (b) Test parameters, i.e. head of water, test period.
- (c) The volume/rate of water that the device allowed to leak through.
- (d) Reference to this test method, i.e. WMTS-501, Appendix B.

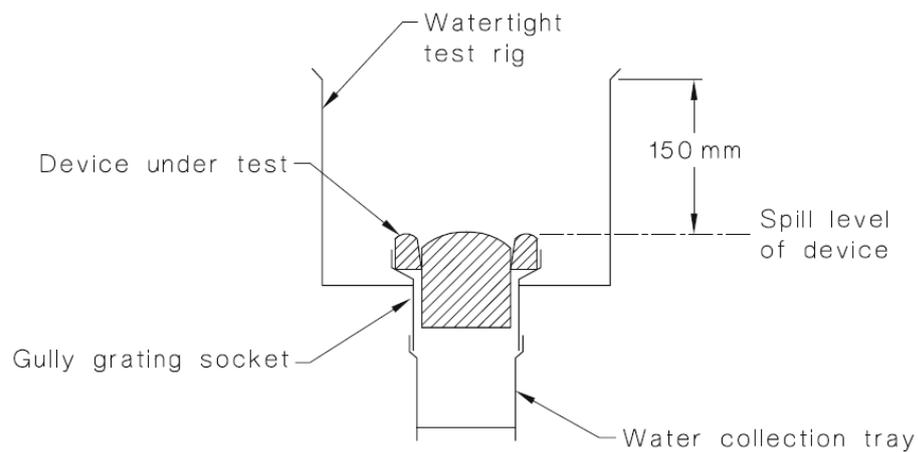


FIGURE B1 TYPICAL INFILTRATION TEST SET-UP

Appendix C OVERFLOW-RELIEF TEST

(Normative)

C.1 SCOPE

This Appendix sets out the method for conducting an overflow-relief test for an anti-infiltration overflow-relief device, to establish the ability of the device to operate satisfactorily under surcharge conditions.

C.2 PRINCIPLE

The device is subjected to a condition of simulated drainage surcharge, to determine that it operates satisfactorily under surcharge conditions.

C.3 APPARATUS

The following apparatus is required:

- (a) DN 100 PVC-U pipe and U-bend.
- (b) DN 100 PVC-U ORG grating socket.

C.4 PROCEDURE

The procedure shall be as follows:

- (a) Install the device into the ORG socket in accordance with the manufacturer's instructions.
- (b) Connect the outlet of the gully grating socket to one side of the U-bend and a riser pipe to the other side of the U-bend and extend it 150 mm above the spill level of the device (see Figure C1).
- (c) Slowly fill the pipe with water and observe that the device allows the release of water when the water in the adjacent pipe reaches the spill level of the device.

C.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer and model identification.
- (b) Test parameters.

- (c) The ability of the device to allow the free flow of water from the device under surcharge conditions.
- (d) Reference to this test method, i.e. WMTS-501, Appendix C.

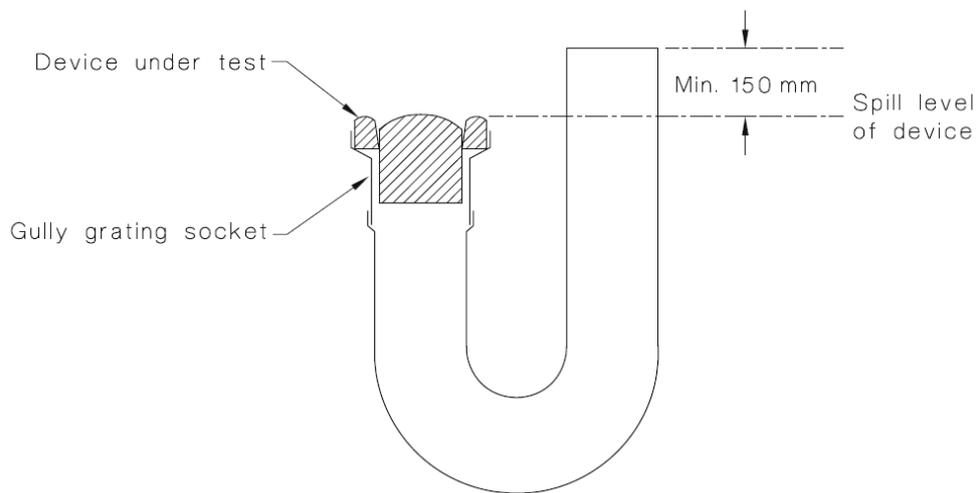


FIGURE C1 TYPICAL OVERFLOW-RELIEF TEST SET-UP

Appendix D FOOT VENTILATION TEST

(Normative)

D.1 SCOPE

This Appendix sets out the method for verifying that the foot ventilation for an overflow relief gully (ORG) fitted with an anti-infiltration overflow-relief device will be equal to or superior to—

- (a) an ORG located external to a building and fitted with a standard overflow relief gully grate; and
- (b) a disconnector gully located internal to a building and fitted with a DN 50 breather vent.

D.2 PRINCIPLE

Adequate foot ventilation is provided to an ORG so that the discharge time of fixture or fixtures connected to the gully, in accordance with the manufacturer's instructions, meets the performance requirements of AS/NZS 3500.2.

D.3 APPARATUS

The following is required:

- (a) Water supply system.
- (b) Three equal containers each with a minimum capacity of 10.65 L to simulate fixtures connected to an ORG.
- (c) A test rig to allow each container to discharge through a 50 cm fixture trap to an ORG, as shown in Figure D1.
- (d) A stopwatch to measure the fixture discharge time of each test.

D.4 PROCEDURE

D.4.1 General

Three tests shall be conducted as follows:

- (a) Test A—ventilation through an open gate.
- (b) Test B—ventilation through a connector gully located internal to a building and fitted with a DN 50 breather vent.

- (c) Test C—ventilation through an anti-infiltration overflow-relief device.

Each test shall be performed for discharges from a single container, then two containers simultaneously, and finally three containers simultaneously. Each discharge test shall be repeated seven times.

NOTE: Put simply, perform Test A seven times discharging a single container, then perform Test A seven times discharging two containers, then perform Test A seven times discharging three containers. Repeat the same process for Test B and C. A testing schedule, and example of a results form, is given in Table D1.

D.4.2 Test A—Open grate

The procedure shall be as follows:

- (a) Fit the ORG riser pipe with a standard grate.
- (b) Discharge the container(s) through the fixture trap (see Figure D1).
- (c) Record the time between the start of the discharge of the container(s) to when the last container(s) has/have drained.

D.4.3 Test B—Riser pipe

The procedure shall be as follows:

- (a) Fit the ORG riser pipe with a screwed sealed cap fitted with a DN 50 breather vent that extends vertically 3 m to the atmosphere.
- (b) Discharge the container(s) through the fixture trap (see Figure D1).
- (c) Record the time between the start of the discharge of the container(s) to when the container(s) has/have drained.

D.4.4 Test C—Overflow relief device

The procedure shall be as follows:

- (a) Fit the ORG riser pipe with an anti-infiltration overflow-relief device.
- (b) Discharge the container(s) through the fixture trap (see Figure D1).
- (c) Record the time between the start of the discharge of the container(s) to when the container(s) has/have drained.

The slowest individual recorded test time for this test shall be within 4 s of the slowest recorded test times of Tests A and B.

The average tests time for all this test shall be within 4 s of the average recorded test times of Tests A and B.

D.5 TEST REPORT

The following shall be reported for each test listed in Paragraph D4:

- (a) The time taken in each test for the fixture(s) to drain.
- (b) The average time taken in all tests for the fixtures to drain.
- (c) The slowest individual recorded test time for Test C.
- (d) The average test time for all Type C tests.
- (e) Reference to this test method, i.e. WMTS-501, Appendix D.

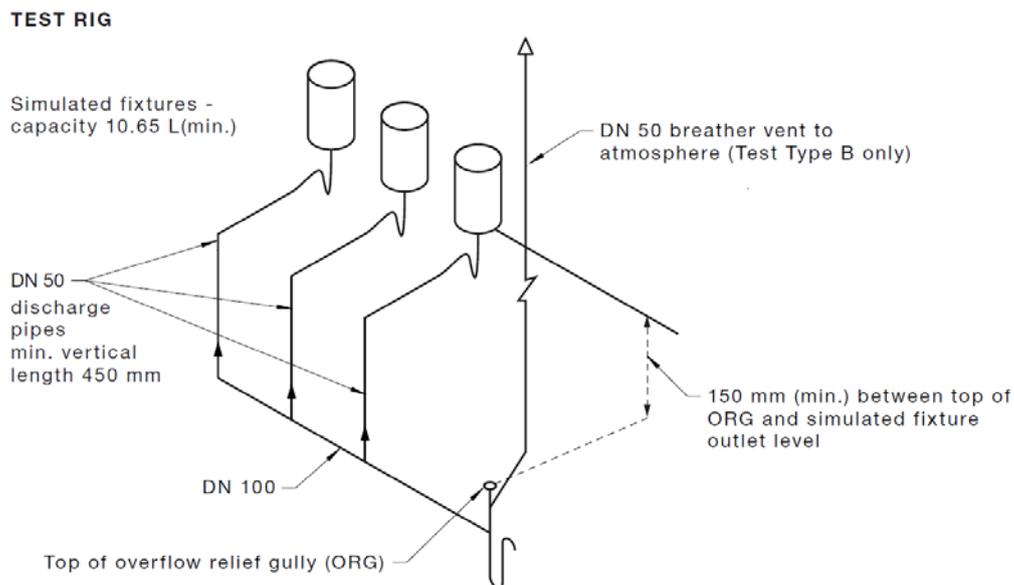


FIGURE D1 TEST RIG TO SIMULATE FIXTURES DISCHARGING INTO AN ORG

TABLE D1
TESTING SCHEDULE AND SAMPLE RESULTS FORM

Test A Open grate		
Test No.	No. of containers discharged	Discharge time(s)
A1	1	
A2	1	
A3	1	
A4	1	
A5	1	
A6	1	
A7	1	
Average of 7 tests		
A8	2	
A9	2	
A10	2	
A11	2	
A12	2	
A13	2	
A14	2	
Average of 7 tests		
A15	3	
A16	3	
A17	3	
A18	3	
A19	3	
A20	3	
A21	3	
Average of 7 tests		

TABLE D1 (continued)

Test B Riser pipe		
Test No.	No. of containers discharged	Discharge time(s)
B1	1	
B2	1	
B3	1	
B4	1	
B5	1	
B6	1	
B7	1	
Average of 7 tests		
B8	2	
B9	2	
B10	2	
B11	2	
B12	2	
B13	2	
B14	2	
Average of 7 tests		
B15	3	
B16	3	
B17	3	
B18	3	
B19	3	
B20	3	
B21	3	
Average of 7 tests		

TABLE D1 (continued)

Test C Anti-infiltration device fitted to ORG		
Test No	No. of containers discharged	Discharge time(s)
C1	1	
C2	1	
C3	1	
C4	1	
C5	1	
C6	1	
C7	1	
Average of 7 tests		
C8	2	
C9	2	
C10	2	
C11	2	
C12	2	
C13	2	
C14	2	
Average of 7 tests		
C15	3	
C16	3	
C17	3	
C18	3	
C19	3	
C20	3	
C21	3	
Average of 7 tests		

TABLE D1 *(continued)*

Comparison of averages					
Tests type	Average discharge time (A)	Tests type	Average discharge time (B)	Tests type	Average discharge time (C)
A(1-7)		B(1-7)		C(1-7)	
A(8-14)		B(8-14)		C(8-14)	
A(15-21)		B(15-21)		C(15-21)	

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