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BSI Standards Publication

Fixed fire protection systems – Industrial and commercial watermist systems

Part 5: Fire performance tests and requirements for watermist systems for the protection of combustion turbines and machinery spaces with volumes up to and including 80 m^3

bsi.

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 14, an inside back cover and a back cover.

Foreword

Publishing information

This part of BS 8489 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 May 2016. It was prepared by Subcommittee FSH/18/5, *Watermist systems*, under the authority of Technical Committee FSH/18, *Fixed fire fighting systems*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This part of BS 8489 supersedes DD 8489-5:2011, which is withdrawn.

Relationship with other publications

BS 8489 is published in a series of parts:

- Part 1: *Code of practice for design and installation*;
- Part 4: *Tests and requirements for watermist systems for local applications involving flammable liquid fires*;
- Part 5: *Tests and requirements for watermist systems for the protection of combustion turbines and machinery spaces with volumes up to and including 80 m^3*;
- Part 6: *Tests and requirements for watermist systems for the protection of industrial oil cookers*;
- Part 7: *Tests and requirements for watermist systems for the protection of low hazard occupancies*.

BS 8489-5 is intended to be read in conjunction with BS 8489-1.

Information about this document

This document converts DD 8489-5 into a full British Standard.

Third-party testing/certification. Users of this British Standard are advised to consider the desirability of third-party testing/certification of conformity with this British Standard.

Use of this document

This British Standard is intended for use by manufacturers, designers and installers of watermist systems, and for authorities having jurisdiction.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its methods are expressed as a set of instructions, a description, or in sentences in which the principal auxiliary verb is “shall”. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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1 Scope

This part of BS 8489 describes tests and specifies requirements for industrial and commercial watermist systems for the protection of combustion turbines and machinery spaces with volumes up to and including 80 m^3.

This part of BS 8489 is applicable to rooms with machinery such as oil pumps, oil tanks, fuel filters, generators, transformer vaults, gear boxes, drive shafts, and lubrication skids, diesel engine driven generators, and other similar machinery using fuel and/or lubrication fluids with volatilities less than or equal to diesel (e.g. Kerosine).

It is not applicable to enclosures with equipment using fuel and/or lubrication fluids with volatilities greater than those of diesel.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ASTM A36, *Standard specification for carbon structural steel* [1)]

BS 8489-1, *Fixed fire protection systems – Industrial and commercial watermist systems – Part 1: Code of practice for design and installation*

BS EN ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

For the purposes of this part of BS 8489, the terms and definitions given in BS 8489-1 apply.

4 Apparatus

NOTE Unless otherwise stated, the following tolerances apply:

- *length: ±2%;*
- *volume: ±5%;*
- *pressure: ±3%;*
- *temperature: ±5%.*

4.1 *Test hall*, constructed of wood or metal frame with an inner lining of minimum 13 mm gypsum or 0.7 mm galvanized steel, and with main dimensions of 5.6 m × 3.6 m × 3.9 m high. To minimize leakages, all joints and gaps shall be sealed. In one of the shorter walls, at the junction of a longer wall, a 0.81 m × 2.03 m high personnel door shall be installed with a locking mechanism. At least two hinged ceiling hatches measuring nominally 0.91 m × 1.83 m shall be installed in opposite diagonal corners for heat and smoke release after the conclusion of the test.

NOTE A small louvered vent may be provided to allow intake of air to prevent excessive suctioning of the walls and ceiling and to maintain structural integrity of the fire enclosure.

[1)] Published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428–2959 USA.

4.2 *Watermist system* comprising nozzles, piping, control valves and water supplies, configured in accordance with the manufacturer's design manual and with the test conditions specified in Clause **5**.

4.3 *Two test pools*, one each of sizes 1 m × 1 m and 0.1 m × 0.1 m, each comprising a square pan or tray, of steel construction, 1.73 mm thick and 100 mm high with no lip, with smooth surfaces and edges that are free from imperfections, containing a water base of 50 mm in height, with a fuel load of at least 20 mm above the water. The fuel used in the test pools shall be diesel. After each pool fire test, the fuel left in the pool or tray shall be reignited to ensure that sufficient fuel remains in the pan.

4.4 *Conventional oil burner*, with the characteristics for nominal heat release rates of 1 MW and 2 MW, as specified in Table 1. The fuel used shall be diesel.

Table 1 **Characteristics of oil burners for tests involving spray fires**

Fire type	Spray nozzle [A)]	Fuel type	Nominal oil pressure	Fuel flow	Fuel temp.	Nominal heat release rate
			bar [B)]	L/h	°C	MW
Low pressure, low flow	Monarch model F80-24	Light diesel	8.6	106	20 ±10	1.0
Low pressure	Monarch model F80-50	Light diesel	8.6	212	20 ±10	2.0

[A)] Monarch F80-24 and Monarch F80-50 are trade marks owned by Monarch Nozzles, 500 Pedricktown Road, Swedesboro, NJ 08085, USA. These are trade names of products available in the UK. This information is given for the convenience of users of this part of BS 8489 and does not constitute an endorsement by BSI of the products named. Equivalent products may be used if they can be shown to lead to the same results.

[B)] 1 bar = 10^5 N/m^2 = 100 kPa.

4.5 *Insulation mat*, composed of mineral wool, 0.1 m^2 in size, saturated with diesel fuel and placed in a 0.1 m^2 pan (**4.3**). The mat shall be located below the steel plate, between the baffles located at the far end of the steel plate away from the access door. The tray shall be placed so that it is centred between baffles, with the edge of the table.

NOTE *When slightly depressing the mat, a liquid fuel pool should occur.*

4.6 *Insulation mat*, composed of mineral wool, 1 m^2 in size, saturated with diesel fuel and placed in a 1 m^2 pan (**4.3**). The mat shall be centred below the steel plate, located between the baffles, with the baffles located 500 mm from the far end of the steel plate away from the access door.

NOTE *When slightly depressing the mat, a liquid fuel pool should occur.*

4.7 *Combustion turbine test rig*, as specified in Annex A.

4.8 *Fixture stand*, which shall be a free-standing secure arrangement, constructed of metal, with the oil burner nozzle mounted within and centred at the closed end of a metal cylindrical flame stabilizer measuring 150 mm diameter × 75 mm with a thickness of 0.25 mm.

4.9 *Thermocouples*, which shall be located (25 ±2) mm above the initial pool surface and (250 ±10) mm within the pool rim, and in front of the spray fires, capable of registering extinguishment.

NOTE *In addition to thermocouples, thermal imaging equipment is recommended.*

4.10 *Instrumentation* to measure and record the following parameters, as appropriate to the type of test:

- fuel pressure and flow at the outlet of the fuel pump;
- fuel temperature within the fuel storage container;
- temperature of fuel in pools;
- test enclosure temperatures;
- temperature of air in spray fires;
- pool fire flame temperatures;
- spray fire flame temperatures;
- extinguishing agent flow and pressure in the extinguishing system;
- water supply pressure (including tank pressure if applicable) and nozzle discharge pressures;
- extinguishing agent pressure at the most remote nozzle branch line;
- gas pressure at its storage outlet and distribution sources;
- oxygen, carbon monoxide, and carbon dioxide concentrations;
- consumption of foam concentrate or other additive, recorded by means of a load cell on which the concentrate/additive tank is placed during the tests;
- gas consumption (gas used to drive water from cylinders supplying the watermist system), measured by means of pressure or load cell on which the gas tank is placed during the tests, or mass flow measurement.

4.11 *Additional baffles or obstructions*, if needed, to prevent the direct impact of mist on the spray fire.

4.12 *Stopwatch*.

5 Test conditions

5.1 The minimum operating nozzle pressure (as specified by the manufacturer) shall be used for all tests. System operating pressures shall be maintained to within ±5%. For decaying pressure systems, the starting pressure shall be within ±5% of the manufacturer's designated starting pressure. For systems designed to cycle between two pressure limits, both the higher and lower pressures shall be within ±5% of the manufacturer's designated pressures, and the periods pertaining to the higher and lower pressure in each cycle shall be within ±3 s of the manufacturer's designated duration.

5.2 The maximum ceiling height, maximum nozzle height and maximum nozzle spacing (as specified by the manufacturer) shall be used for all tests. This includes utilizing the maximum ceiling spacing of nozzles from walls.

5.3 The nozzle arrangement shall have uniform spacing. The nozzle spacing from the wall shall be uniform.

NOTE The nozzle spacing from the wall should preferably be one half the main spacing.

5.4 For all fire tests, the ceiling, floor and walls shall be dry. The relative humidity in the test enclosure prior to the start of the test shall not differ from that of the ambient relative humidity by more than 20%.

5.5 All fuels shall be at an ambient temperature of (20 ±10) °C, measured with the thermocouple located in the approximate centre of the initial fuel layer.

5.6 The test hall shall have an ambient temperature of (20 ±10) °C prior to the start of the test, measured in the central area of the test hall at one-third, two-thirds and ceiling heights. The test hall shall be at as uniform an ambient temperature as reasonably practicable, with no localized hot or cold spots. All non-fire-induced draughts shall be eliminated.

5.7 Test rig temperatures shall be measured away from the direct flame impingement, except where otherwise stated in Annex A, with bare bead thermocouples welded from 28 gauge Chromel-alumel wire (Type K).

5.8 The extinguishing agent flow and pressure in the extinguishing system shall be measured continuously on the high pressure side of the pump, cylinder or equivalent equipment.

5.9 The water supply and nozzle discharge pressures shall be monitored at the source (pump and/or cylinder) and at the distribution piping manifold.

5.10 The oxygen, carbon monoxide, and carbon dioxide concentrations shall be measured at mid-room height, (500 ±25) mm horizontally behind the fuel spray nozzle or away from the pool, and away from any open door or ventilation source. Oxygen levels shall be not less than 15% during the entire period of each test.

5.11 For the shielded 1 m^2 diesel pool fire test (**7.2**), the fire shall be centred below the steel plate and located between the baffles, with the baffles located 500 mm from the far end of the steel plate away from the access door.

5.12 For the unshielded 1 MW diesel spray fire test (**7.3**), the fire shall be located above the plate, positioned in the location with the lowest flux density. The fuel nozzle shall be located 0.305 m to 1.676 m above the table at the baffle end, away from the access door, with the fire directed towards the centre of the shorter wall with the access door.

5.13 For the shielded diesel spray fire tests (**7.4** and **7.5**), the fire shall be located 500 mm above the floor, centred between the baffles, away from the access door, underneath the test plate with the fuel spray nozzle aimed horizontally. The fire shall be directed towards the centre of the shorter wall with the access door.

5.14 For the saturated insulation mat and spray fire test (**7.6**), the fire shall be centred below the steel table and located between the baffles, with the baffles located at a position determined to be the most challenging based on the watermist discharge. The insulation mat shall be positioned under the spray fire. The spray fire shall be located 500 mm above the floor, centred between the baffles underneath the test table, with the fuel spray nozzle aimed horizontally. The spray fire should be directed towards the centre of the shorter wall with the access door.

5.15 For the large saturated insulation mat fire test (**7.7**), the fire shall be centred below the steel plate and located between the baffles, with the baffles located 500 mm from the far end of the steel plate away from the access door.

5.16 Where nozzle protection caps are used to prevent or reduce the amount of nozzle contamination, the use of such caps shall be included in the test.

6 Principle

The combustion turbine and machinery space test comprises six individual tests for a variety of spray, pool and mat fires. The watermist system needs to pass all six tests.

7 Procedure

7.1 General

7.1.1 The following individual tests shall be conducted:

a) shielded 1 m^2 diesel pool fire (**7.2**);

b) unshielded 1 MW diesel spray fire (**7.3**);

c) shielded 1 MW diesel spray fire (**7.4**);

d) shielded 2 MW diesel spray fire under limited natural ventilation (**7.5**);

e) saturated insulation mat and spray fire (**7.6**);

f) large saturated insulation mat fire (**7.7**).

7.1.2 The personnel access door shall be kept closed throughout each test unless otherwise specified.

7.1.3 For each test, the watermist system shall be manually activated after the designated pre-burn time, which shall be determined as follows unless otherwise specified. For pool fires, the pre-burn time shall commence when the flames have spread across the entire pool. For spray fires, the pre-burn time shall commence upon ignition. Fire pre-burn times shall be as follows unless otherwise specified:

a) diesel spray fires: 15 s;

b) diesel pool fires: 30 s.

7.1.4 The results of the tests shall be documented in a test report prepared in accordance with BS EN ISO/IEC 17025:2005, **5.10**. The test report shall contain at least the following information:

a) a title;

b) the name and address of the laboratory, and the location where the tests were carried out, if different from the address of the laboratory;

c) unique identification of the test report (such as the serial number), an identification on each page in order to ensure that the page is recognized as a part of the test report, and a clear identification of the end of the test report;

d) the name and address of the client;

e) a description of the method used, including details of the test apparatus and a reference to the standard against which the system was tested, i.e. BS 8489-5;

f) a description of, the condition of, and unambiguous identification of the item(s) tested;

g) the date of receipt of the test item(s) where this is critical to the validity and application of the results, and the date(s) of performance of the test;

h) reference to the sampling plan and procedures used by the laboratory or other bodies where these are relevant to the validity or application of the results;

i) the test results, with units of measurement where appropriate, including the percentage of any damage to the system components, test rig, or test enclosure, together with the times and parameters recorded during each test;

j) a statement of compliance/non-compliance with the pass/fail criteria specified in Clause **8**;

k) confirmation of system design parameters relevant to the specific application, including, but not limited to, the following:

   1) the extinguishing time, system duration and discharge duration;

   2) nozzle designation;

   3) permitted location in the protected volume;

   4) minimum and maximum installation height limitation;

   5) maximum dimensional and area coverage, including spacing between the nozzles;

   6) operating flow rates of the nozzle;

   7) distance between the ceiling and nozzle orifice;

   8) maximum and minimum design pressure over the duration of the test;

   9) type of detection/actuation method;

   10) additives, propellants and atomizing media used;

   11) details of the test hall geometry;

   12) ventilation conditions during the test;

   13) environmental conditions during the test;

l) the name(s), function(s) and signature(s) or equivalent identification of person(s) authorizing the test report;

m) where relevant, a statement to the effect that the results relate only to the items tested.

7.2 Shielded 1 m^2 diesel pool fire

7.2.1 The test shall be conducted in accordance with **7.2.2** to **7.2.7**, using the 1 m^2 test pool (**4.3**), with the configuration described in **5.11**.

7.2.2 The test shall be conducted for 30 min (unless otherwise specified) or until the fire is extinguished or the length of time to discharge 50% of the water agent, whichever is shorter.

NOTE There is no minimum extinguishing agent discharge time.

7.2.3 System components, component locations, operating conditions and test enclosure details shall remain unaltered throughout all of the fire tests for a given application. During each test, all systems shall operate without manual intervention. All tests shall be conducted using the specifications from the manufacturer's design and installation manual with regard to nozzle placement, spray flux, and spray duration. For intermittent sprays, the time between the consecutive spray shots shall be not less than 50% of the total time, as related to a specific watermist system.

NOTE Sprays may be continuous or intermittent in time, at the manufacturer's discretion.

7.2.4 The watermist system shall be manually activated after the pre-burn time for pool fires as specified in **7.1.3**.

7.2.5 The fire shall be deemed to be extinguished when the temperature registration drops below 100 °C and does not increase. Following extinguishment, the fuel left in the pool or tray shall be reignited. If reignition is not achieved, the test shall be deemed to be inconclusive and shall be repeated with new fuel.

7.2.6 The following times shall be recorded during testing:

a) start of ignition procedure;

b) start of test fuel ignition;

c) time when the extinguishing system is activated with watermist discharging from the nozzles;

d) time when the fire(s) is extinguished;

NOTE Use of a thermal imaging camera is recommended.

e) time when the extinguishing system is shut off;

f) time of reignition (if any);

g) time when the test is finished.

7.2.7 The following parameters shall be recorded during testing:

a) temperature of fuel in the pool;

b) temperature of flame;

c) temperature of test enclosure;

d) extinguishing agent flow and pressure in the extinguishing system;

e) water supply pressure (including tank pressure if applicable) and nozzle discharge pressure;

f) extinguishing agent pressure at the most remote nozzle branch line;

g) gas pressure at its storage outlet and distribution sources;

h) oxygen, carbon monoxide, and carbon dioxide concentrations;

i) consumption of foam concentrate or other additive;

j) gas consumption (gas used to drive water from cylinders supplying the watermist system).

7.3 Unshielded 1 MW diesel spray fire

7.3.1 The test shall be conducted in accordance with **7.3.2** to **7.3.8**, using the oil burner for a 1 MW fire (**4.4**), with the configuration described in **5.12**.

7.3.2 Before commencing the test, the fuel pressure and flow at the outlet of the fuel pump shall be measured.

7.3.3 The tests shall be conducted for 30 min (unless otherwise specified) or until the fire is extinguished or the length of time to discharge 50% of the water agent, whichever is shorter. The fuel spray shall be shut off 15 s after the fire extinguishment. The watermist discharge shall be shut off 45 s after the fuel spray is shut off.

NOTE There is no minimum extinguishing agent discharge time.

7.3.4 The system operation during the test shall be in accordance with **7.2.3**.

7.3.5 The watermist system shall be manually activated after the pre-burn time for spray fires as specified in **7.1.3**.

7.3.6 The fire shall be deemed to be extinguished when the temperature registration drops below 100 °C and does not increase.

7.3.7 The following times shall be recorded during testing:

a) the times specified in **7.2.6**;

b) time when the fuel is shut off.

7.3.8 The following parameters shall be recorded during testing:

a) the parameters specified in **7.2.7**b) to **7.2.7**j);

b) temperature of air;

c) fuel pressure and flow at the outlet of the fuel pump;

d) fuel temperature within the fuel storage container.

7.4 Shielded 1 MW diesel spray fire

The test shall be conducted in accordance with **7.3.2** to **7.3.8**, using the oil burner for a 1 MW fire (**4.4**), with the configuration described in **5.13**.

7.5 Shielded 2 MW diesel spray fire under limited natural ventilation

The test shall be conducted in accordance with **7.3.2** to **7.3.8**, using the oil burner for a 2 MW fire (**4.4**), with the configuration described in **5.13**. The fire shall be ignited and the test conducted with the access door open.

7.6 Saturated insulation mat and spray fire

7.6.1 The test shall be conducted in accordance with **7.6.2** to **7.6.9**. The test shall be conducted using the 0.1 m^2 test pool (**4.3**), the oil burner for a 1 MW fire (**4.4**), and the 0.1 m^2 insulation mat (**4.5**), with the configuration described in **5.14**.

7.6.2 Before commencing the test, the fuel pressure and flow at the outlet of the fuel pump shall be measured.

7.6.3 The test shall be conducted for the length of time and with the shut-off times specified in **7.3.3**.

NOTE There is no minimum extinguishing agent discharge time.

7.6.4 The system operation during the test shall be in accordance with **7.2.3**.

7.6.5 The dry insulation mat shall be placed in the dry pan, and the diesel fuel shall then be added to the pan.

7.6.6 The insulation mat shall be ignited first. The spray fire shall then be ignited 15 s after the mat fire is fully developed. Following ignition of the spray fire, a pre-burn time of a further 15 s shall be allowed before activation of the watermist system.

7.6.7 The fire shall be deemed to be extinguished when the temperature registration drops below 100 °C and does not increase.

7.6.8 The following times shall be recorded during testing:

a) the times specified in **7.2.6**;

b) time when the fuel is shut off.

7.6.9 The parameters specified in **7.3.8** shall be recorded during testing.

7.7 Large saturated insulation mat fire

7.7.1 The test shall be conducted in accordance with **7.7.2** to **7.7.7**. The test shall be conducted using the 1 m^2 test pool (**4.3**) and the 1 m^2 insulation mat (**4.6**), with the configuration described in **5.15**.

7.7.2 The test shall be conducted for a full 30 min.

7.7.3 The system operation during the test shall be in accordance with **7.2.3**.

7.7.4 The dry insulation mat shall be placed in the dry pan, and the diesel fuel shall then be added to the pan.

7.7.5 Following ignition of the insulation mat, a pre-burn time of 30 s shall be allowed before activation of the watermist system.

7.7.6 The times specified in **7.2.6**a), b), c), e) and g) shall be recorded during testing.

7.7.7 The parameters specified in **7.2.7**b) to **7.2.7**j) shall be recorded during testing.

8 Pass/fail criteria

When tested in accordance with Clause **7**, the watermist system shall be deemed to have passed the test if all the following criteria are met:

- for tests **7.2** to **7.5**, the fire is extinguished;
- for test **7.6**, both the mat fire and the spray fire are extinguished;
- for test **7.7**, there is no full surface flaming during the test.

Annex A (normative)

Combustion turbine test rig

NOTE 1 The combustion turbine casing mock-up is simulated with a horizontal flat steel plate and steel baffles (see Figure A.1). The specific details and thermal mass of the obstructions are not simulated.

The combustion turbine mock-up unit shall be centred along the longer wall dimension in the test hall.

NOTE 2 The positioning of the test rig with respect to the aspect ratio of the test hall may be altered.

A horizontal hot rolled steel plate 1.0 m wide × 2.0 m long × 50 mm thick, conforming to ASTM A36 or an equivalent standard, shall be placed at 1 m elevation, with legs at the four corners of the steel plate. This shall be located in the centre of the test hall or at a location within the test rig in accordance with the manufacturer's design criteria.

NOTE 3 This allows the fire to be placed in an area deemed to be the most challenging to the specific watermist system being tested.

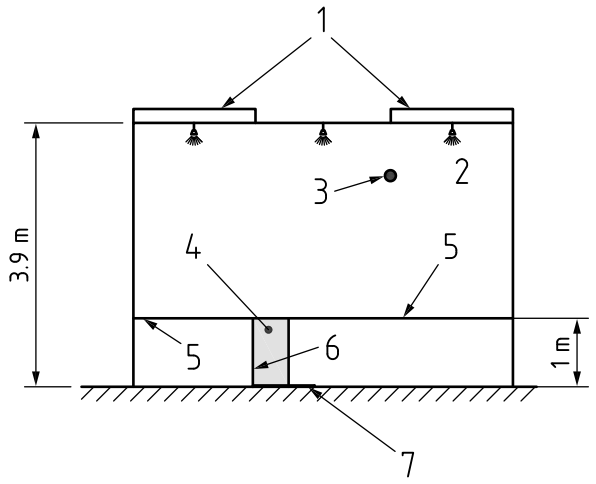
The underside curvature of the turbine shall be simulated with 22 gauge (0.85 mm thick) galvanized sheet metal, directed upward at an angle of 45° on either side of the steel plate and horizontal sheet metal extension surface. These side pieces shall also extend longitudinally the entire length of the enclosure, rising to a height of 1.5 m above the horizontal sheet metal and steel plate surfaces. There shall be a nominal gap of 3 mm between the various steel table and sheet metal surfaces to permit water run-off.

The space below the plate shall be partially shielded from watermist using 1 m × 0.5 m sheet metal baffles located at the end of the plate, away from the enclosure personnel door. The side baffles shall be of 22 gauge (0.85 mm) thick galvanized sheet metal construction, and shall be removable.

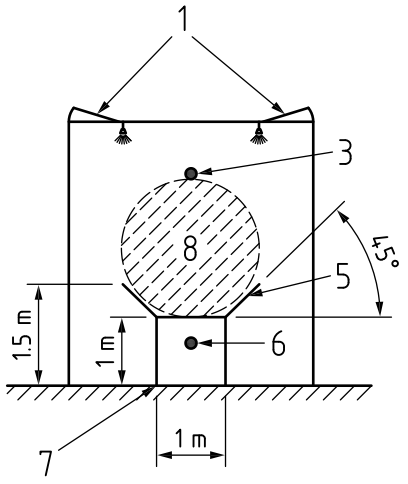
NOTE 4 The side baffles may be installed on support legs and kept in place by being pinched between the underside of the steel plate table and the 45° angle extensions and the floor for ease of removal.

The configuration and instrumentation for shielded spray fire tests shall be in accordance with Figure A.2. The configuration and instrumentation for shielded pool fire tests shall be in accordance with Figure A.3.

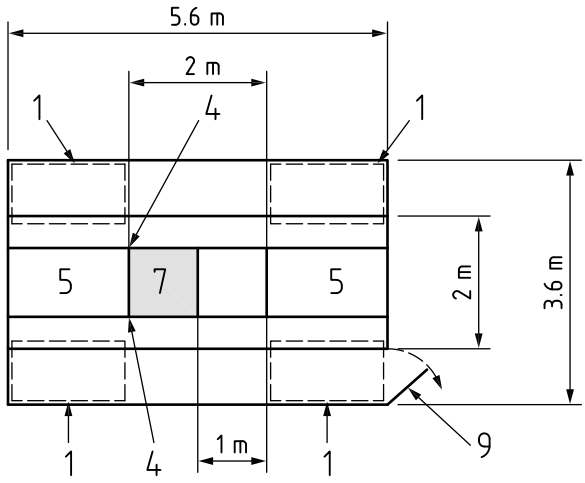
Figure A.1 **Test enclosure and combustion turbine simulator steel plate**



a) Elevation



b) Side view

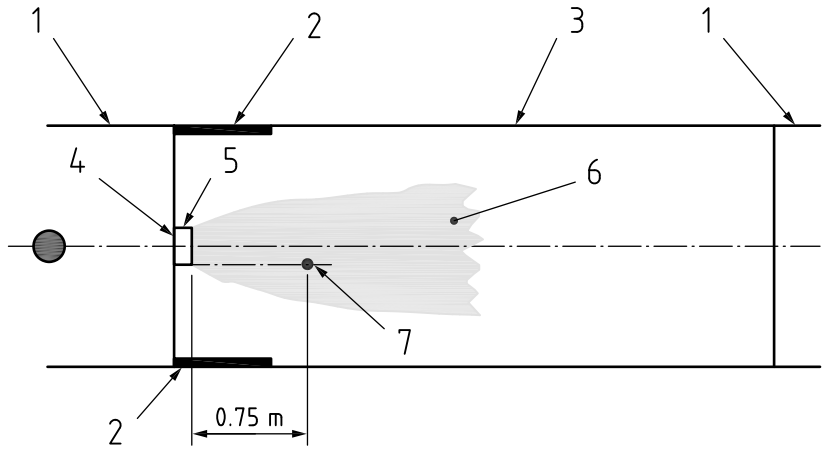


c) Plan

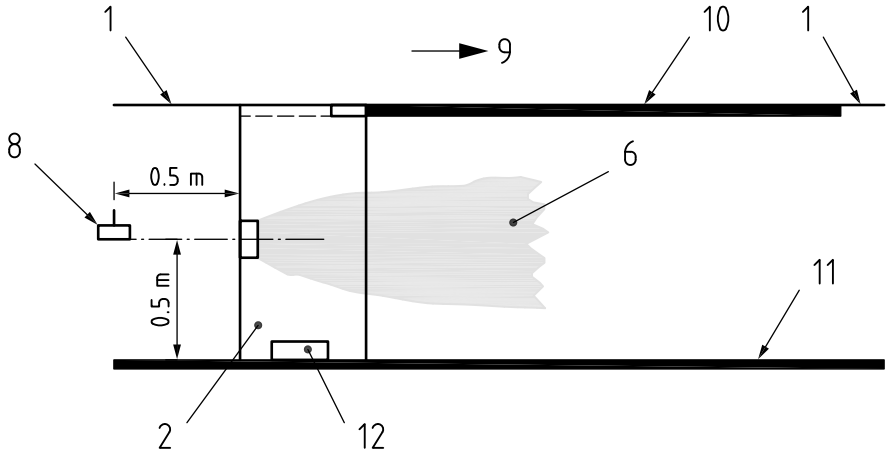
Key

1 Ceiling hatch, 0.9 m × 1.8 m
2 Nozzle
3 Exposed spray fire
4 Baffle, 1 m × 0.5 m
5 Sheet metal
6 Shielded spray fire
7 Pan, 1 m × 1 m
8 Imaginary turbine body
9 Door, 0.8 m × 2 m

Figure A.2 **Fire source configuration and instrumentation for shielded spray fire testing**



a) Plan

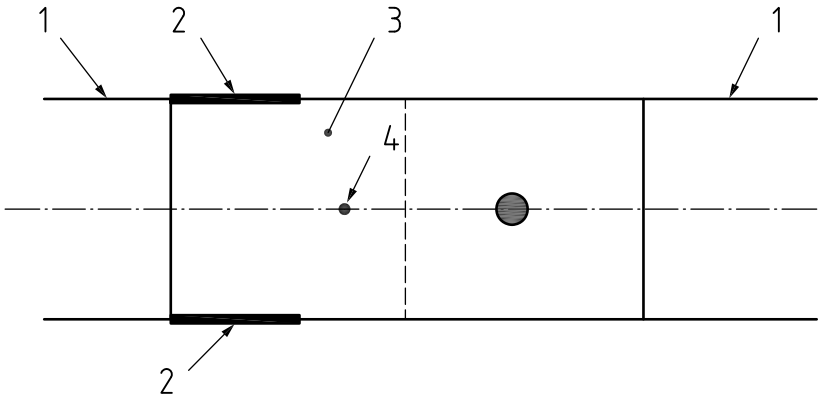


b) Elevation

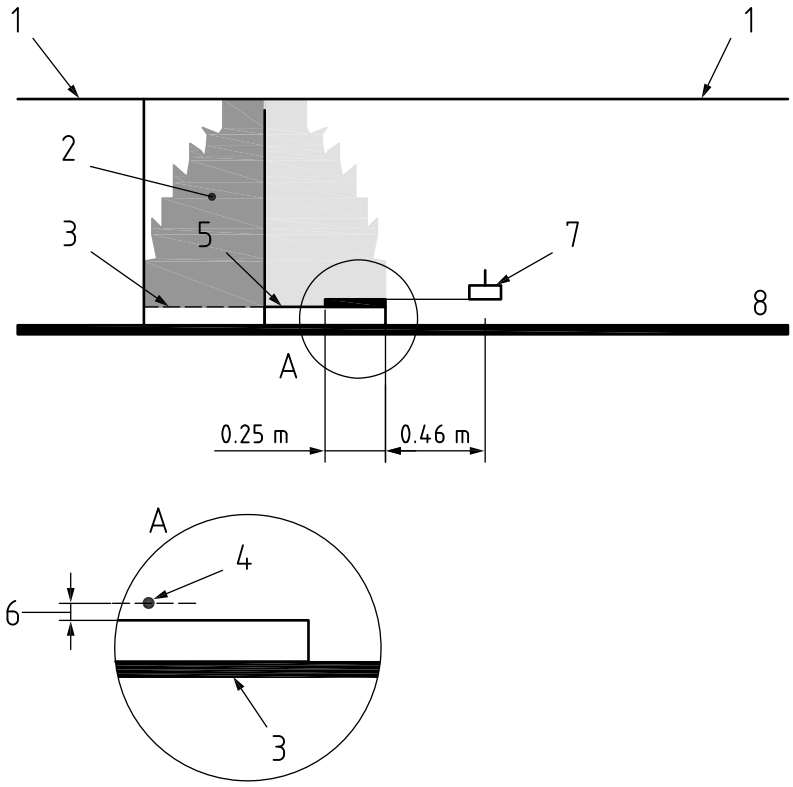
Key

1 Sheet metal
2 Baffle, 0.5 m wide × 1 m high
3 Steel plate wall
4 Spray fuel nozzle
5 Can stabilizer
6 Spray fire
7 Flame thermocouple
8 Air temperature sensor
9 Fuel discharge direction
10 Steel plate ceiling
11 Floor
12 For test with insulation, 0.1 m^2 and 1 m^2 pans

Figure A.3 **Fire source configuration and instrumentation for shielded pool fire testing**



a) Plan



b) Elevation

Key

1	Sheet metal	5	Pool fire
2	Baffle, 0.5 m wide × 1 m high	6	Height of thermocouple above pan, 26 mm
3	Pan, 1 m × 1 m	7	Gas sampling port
4	Flame thermocouple	8	Floor

Bibliography

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 8489-4, *Fixed fire protection systems – Industrial and commercial watermist systems – Part 4: Tests and requirements for watermist systems for local applications involving flammable liquid fires*

BS 8489-6, *Fixed fire protection systems – Industrial and commercial watermist systems – Part 6: Tests and requirements for watermist systems for the protection of industrial oil cookers*

BS 8489-7, *Fixed fire protection systems – Industrial and commercial watermist systems – Part 7: Tests and requirements for watermist systems for the protection of low hazard occupancies*

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