TL23065B

European Safety Systems Ltd.

Ingress Protection

EN 60529: 1992 + A2: 2013 (IP66 and IPX7)

D2xC Sounder and Beacon

30th May 2023

Contents

1 SCOPE OF WORK

Test requirements

This file contains the results of tests carried out to meet the requirements of EN 60529: 1992 + A2: 2013 (IP66 and IPX7).

2 EQUIPMENT UNDER TEST

The tests were performed only on the sample shown below

Description	The EUT is a sounder combined with a Xenon strobe beacon.

Item	Model	Unique Identifier
Sounder and Beacon (IP6X)	D2xC	001
Sounder and Beacon (IPX6)	D2xC	002
Sounder and Beacon (IPX7)	D2xC	003

All model numbers and unique identifiers were supplied by the client or taken from the supplied EUT. The sample tested was selected and provided by the client. The laboratory did not sample the selected EUT.

The client stated that the unit tested forms part of a range of products that share the same IP housing. It was decided that testing only one product from the range was necessary as the unit enclosures are identical and the only difference is the internal electronics. This report is only for the sample tested.

The following models are units within this range. Only the D2xC combined Sounder/Beacon was tested. - D1xL Loudspeaker, D1xS Sounder, D1xC combined Sounder/Beacon, D2xL Loudspeaker and D2xS2 Sounder form the range of identical units.

Date of Receipt	4th May 2023

Date of Testing	16th May 2023 – 19th May 2023

Client: European Safety Systems Ltd
Unit B Impress House
Mansell Road Acton
London
W3 7QH

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Telephone Number: +44 (0)20 3470 0135

Test Results

The equipment under test complied with the requirements of the specification. This test report may not be reproduced in whole or part without the prior written approval of the laboratory. The test results in this report are facts and any opinions or interpretations derived from these facts shall be marked *

Signed

Mr. Stephen Lee
Laboratory Manager

3 TEST LABORATORY

The tests were carried out at MS Testing, located in Newton Aycliffe, Co. Durham, UK.

Laboratory accreditation:

MS Testing is UKAS Accredited Test Laboratory No. 4413.

Ambient conditions in the laboratory:

PARAMETER	Required (Lloyd's Specification 1)
Temperature °C	15 – 35
Humidity % RH	42 – 78
Barometric pressure mbar	860 - 1060

4 TEST SPECIFICATION, METHODS AND PROCEDURES

4.1 Test Details

The tests detailed in this file are –

	Test	Basic Standard
6.4	Ingress Protection 6X (IP6X)	EN 60529: 1992 + A2: 2013
6.5	Ingress Protection X6 (IPX6)	EN 60529: 1992 + A2: 2013
6.6	Ingress Protection X7 (IPX7)	EN 60529: 1992 + A2: 2013

4.2 Test Procedures

IP6X

The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump. The suction connection shall be made to a hole specially provided for this test. If not otherwise specified in the relevant product standard, this hole shall be in the vicinity of the vulnerable parts. If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole. If there are other holes (e.g., more cable inlet holes or drain-holes) these shall be treated as intended for normal use on site. The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour. In no event shall the depression exceed 2 kPa (20 mbar) on the manometer. If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h. If, with a maximum depression of 2kPa (20 mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 h has elapsed.

IPX6

The enclosure under test is sprayed from all practical directions at a distance of 2500mm to 3000mm with water through a 12.5mm nozzle at a water pressure of 100 litres/min. The equipment under test is sprayed for a period of no less than 3 minutes at each direction.

IPX7

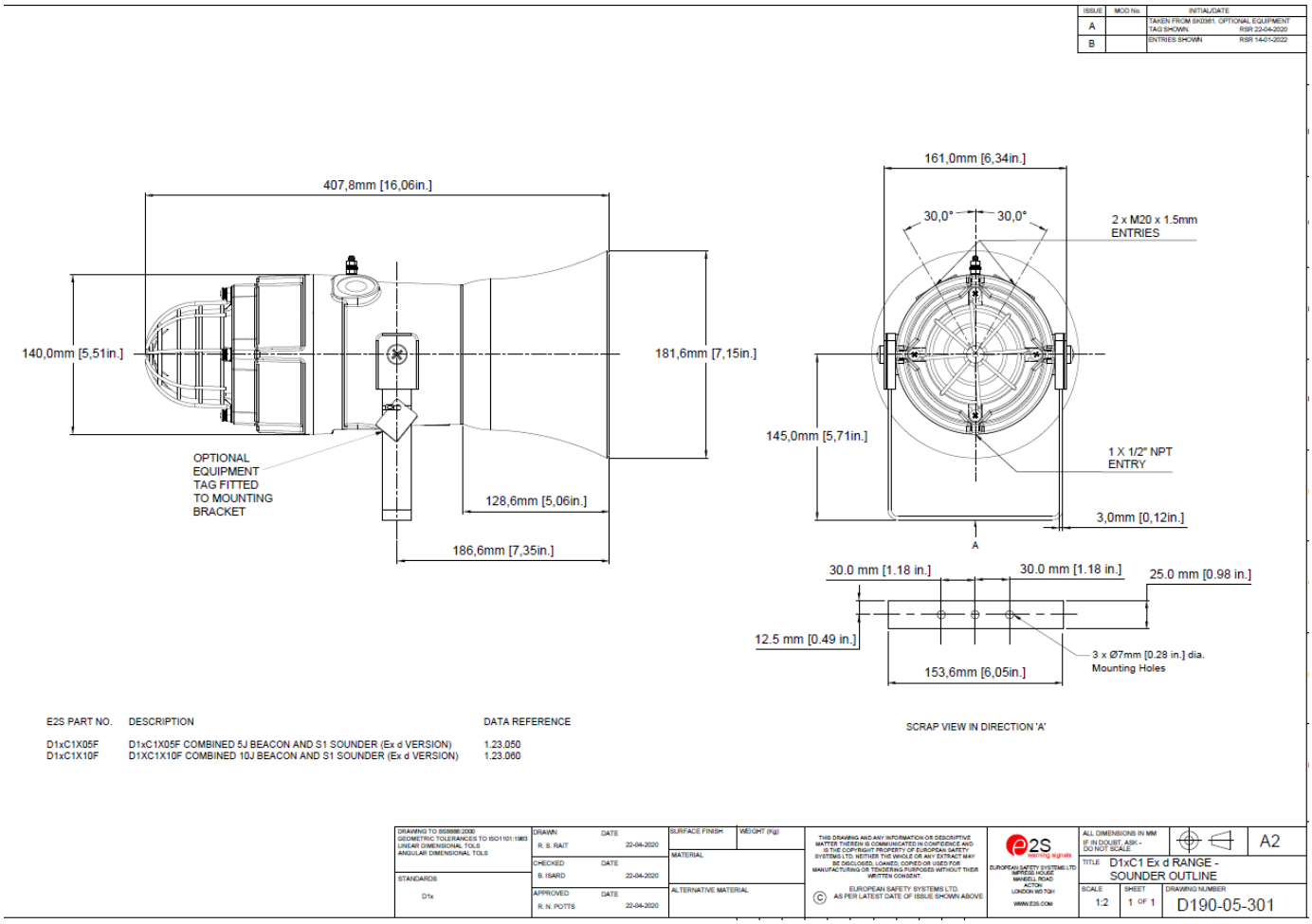
The enclosure under test is placed in its normal operating orientation into a tank filled with water to a depth of 1 metre for 30 minutes.

5 OPERATION OF THE EUT DURING TESTING

5.1 System Configuration

The equipment was not powered during any of the testing, the enclosure was checked after the test for ingress as applicable.

Page 1



5.2 Acceptance Criteria

IP6X

No dust shall enter the enclosure.

IPX6, and IPX7

No water shall enter the enclosure that will either impair safety or correct operation given in the acceptance criterion of the standard.

6 TEST RESULTS

6.1 Samples

Sample 1 – Original Sample.

6.2 Summary of test results

Basic Standard	Test	Result	Sample
EN 60529	Ingress Protection IP6X	Complied	Sample 1
EN 60529	Ingress Protection IPX6	Complied	Sample 1
EN 60529	Ingress Protection IPX7	Complied	Sample 1

6.3 Equipment Performance

Specification

The conformance to drawings is checked and a functional performance test is demonstrated to ensure that the system operates in accordance with the customer's instructions where applicable.

Test Procedure

The equipment was checked to ensure it was sealed as the customer required it and to the correct torque.

6.4 IP6X

Basic Standard:	EN 60529: 1992 + A2: 2013
Applicability:	Enclosure

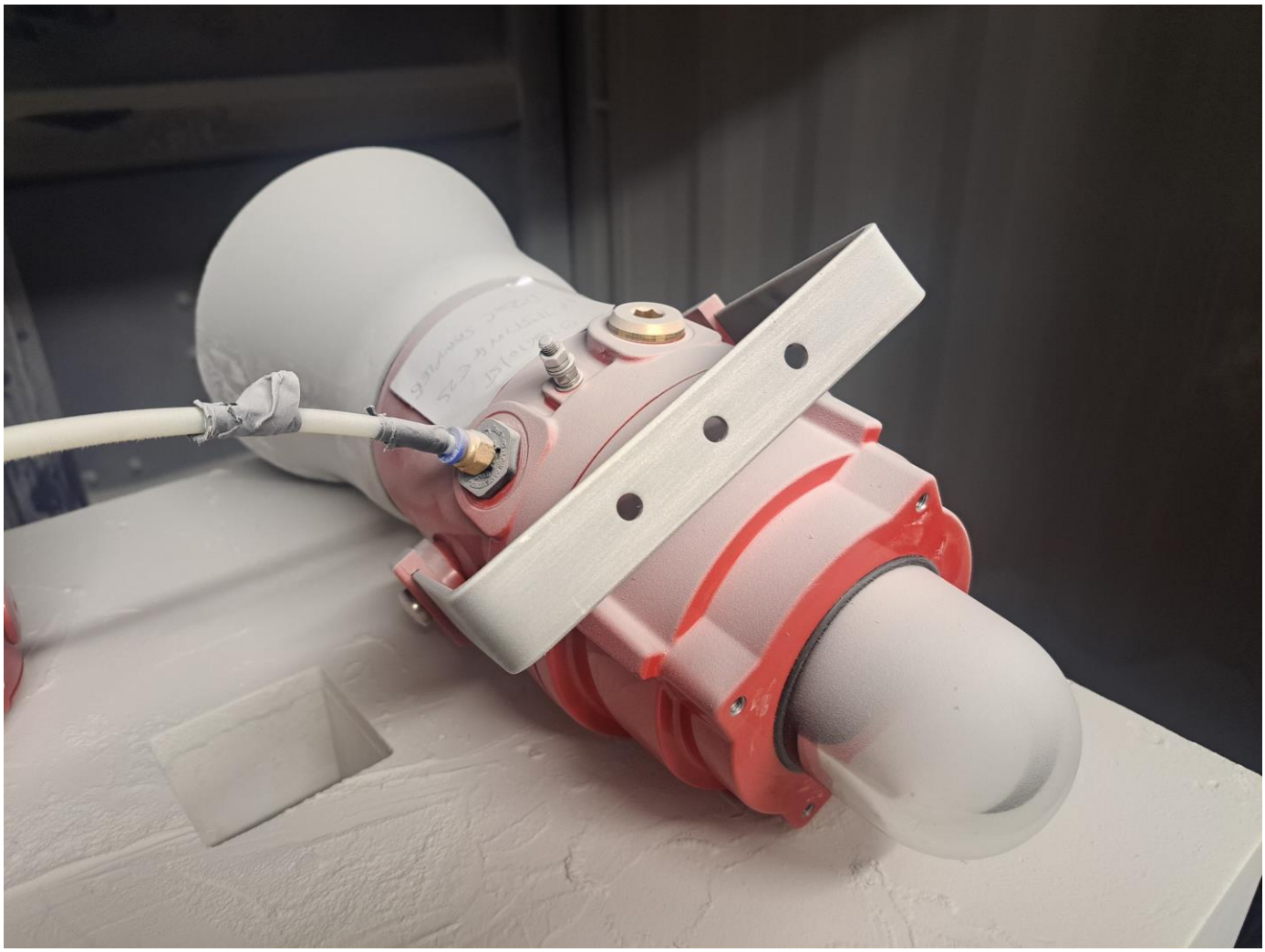
Test Result

IP6X

The enclosure under test was supported inside the test chamber and the pressure inside the enclosure was maintained below the surrounding atmospheric pressure by a vacuum pump.

The extraction rate was less than 40 volumes per hour so the test was continued for a period of 8h.

No dust was found to have entered the enclosure.



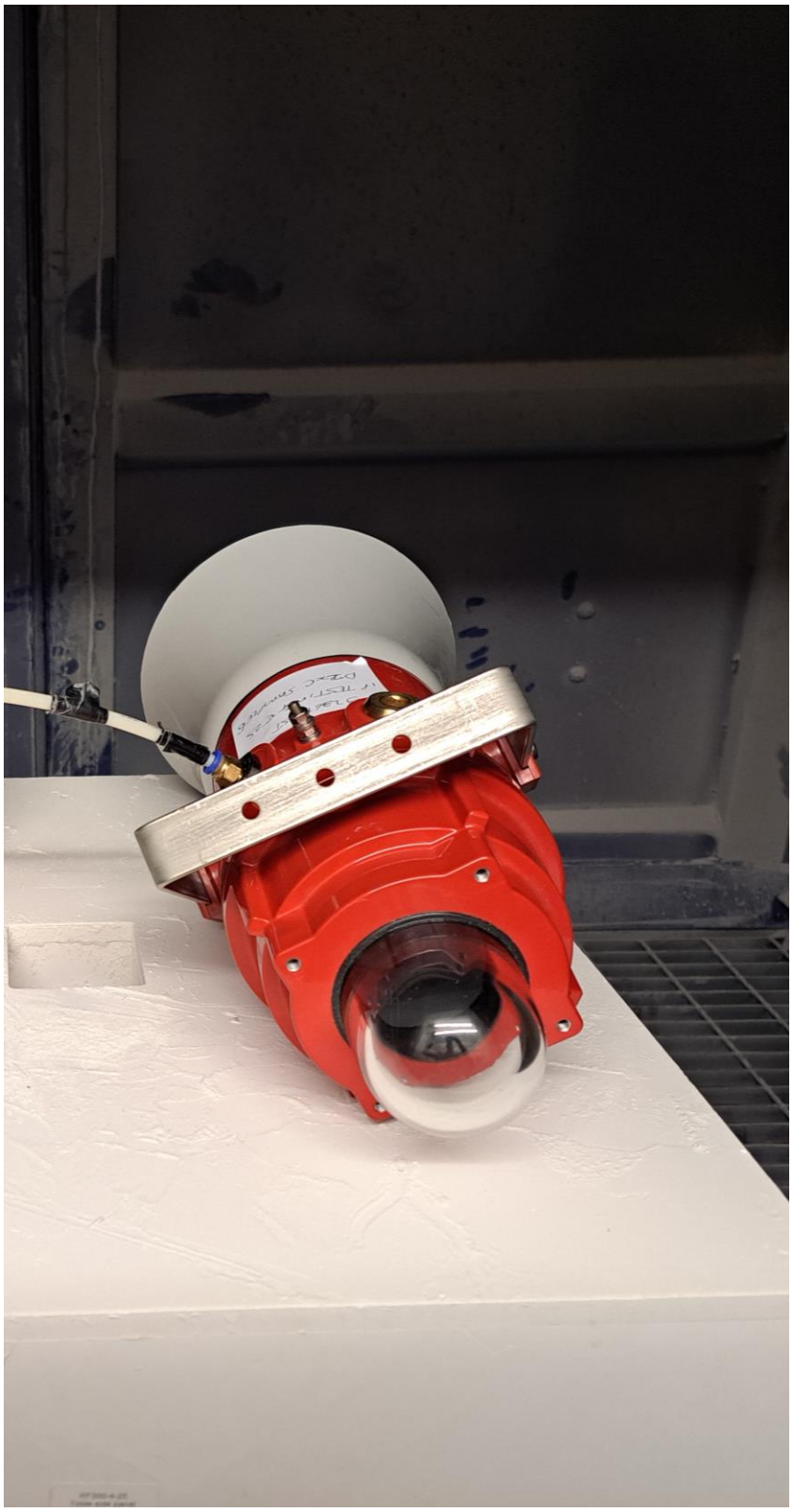
Test Result

Test Result

Test Result

Test Result

Test Setup



Test Equipment

Equipment	Model	Serial
Dust Chamber	Not Applicable	Not Applicable
Dust	Not Applicable	Not Applicable
Three-phase Compressor	Clarke	Not Applicable
Manson Power Supply	EP-603	460424750
Digital manometer	RS	
Flow metre		
Flow metre		

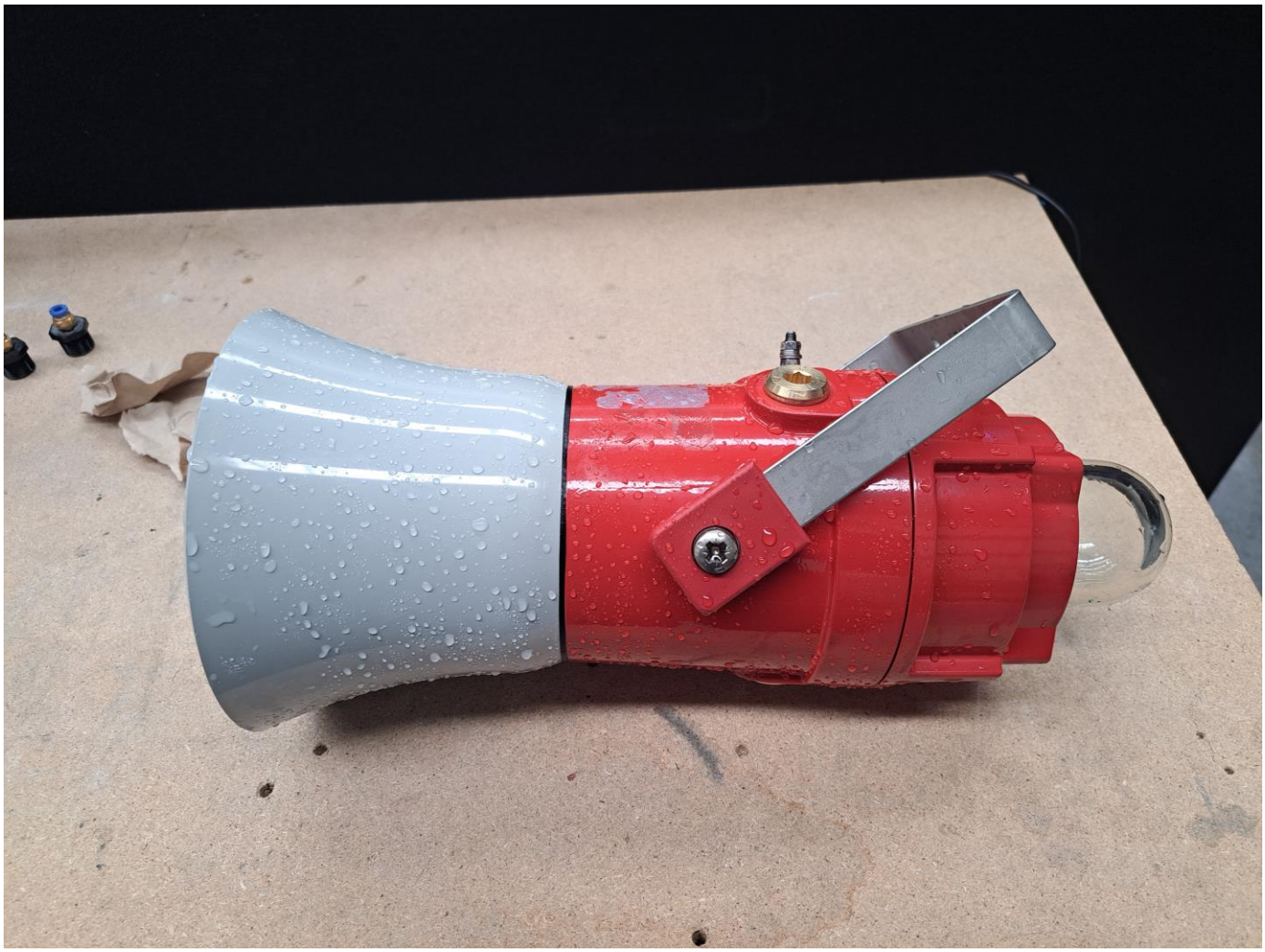
6.5 IPX6

Basic Standard:	EN 60529: 1992 + A2: 2013
Applicability:	Enclosure

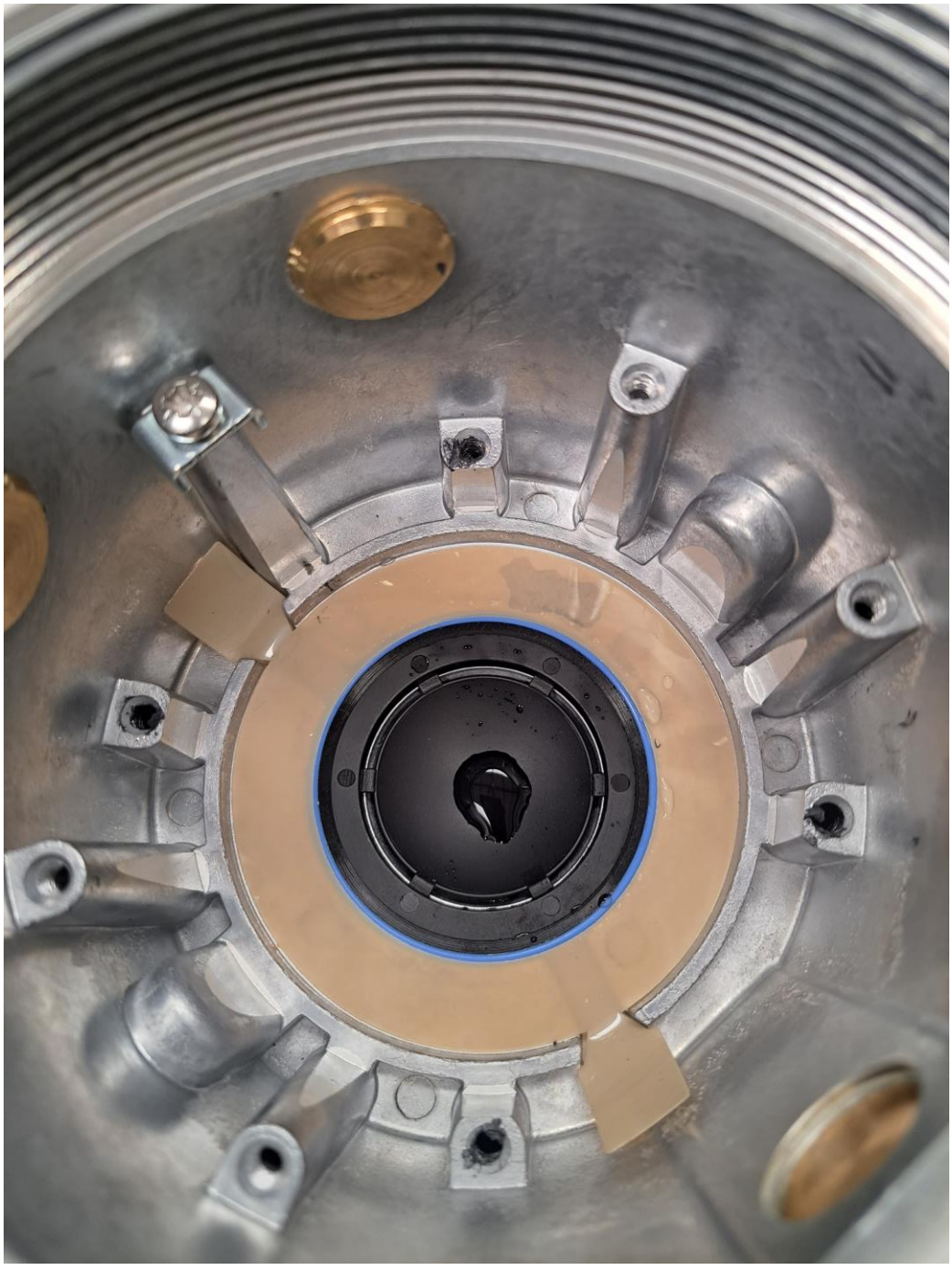
Test Results

The enclosure under test was sprayed from all practical directions at a distance of 2500mm to 3000mm with water through a 12.5mm nozzle at a water pressure of 100 litres/min. The equipment under test was sprayed for a period of no less than 3 minutes at each direction.

The client stated the last barrier within the unit that provided protection against ingress was the diaphragm and hard plastic casing, this was mounted to the base on the beacon side the enclosure below the speaker. Provided no water surpassed this point then it would not be present where electronics would be mounted. The enclosure was opened after the test and there was no ingress of water passed the diaphragm and hard plastic case, the water shown in the picture below was on the underside of these.



Test Results



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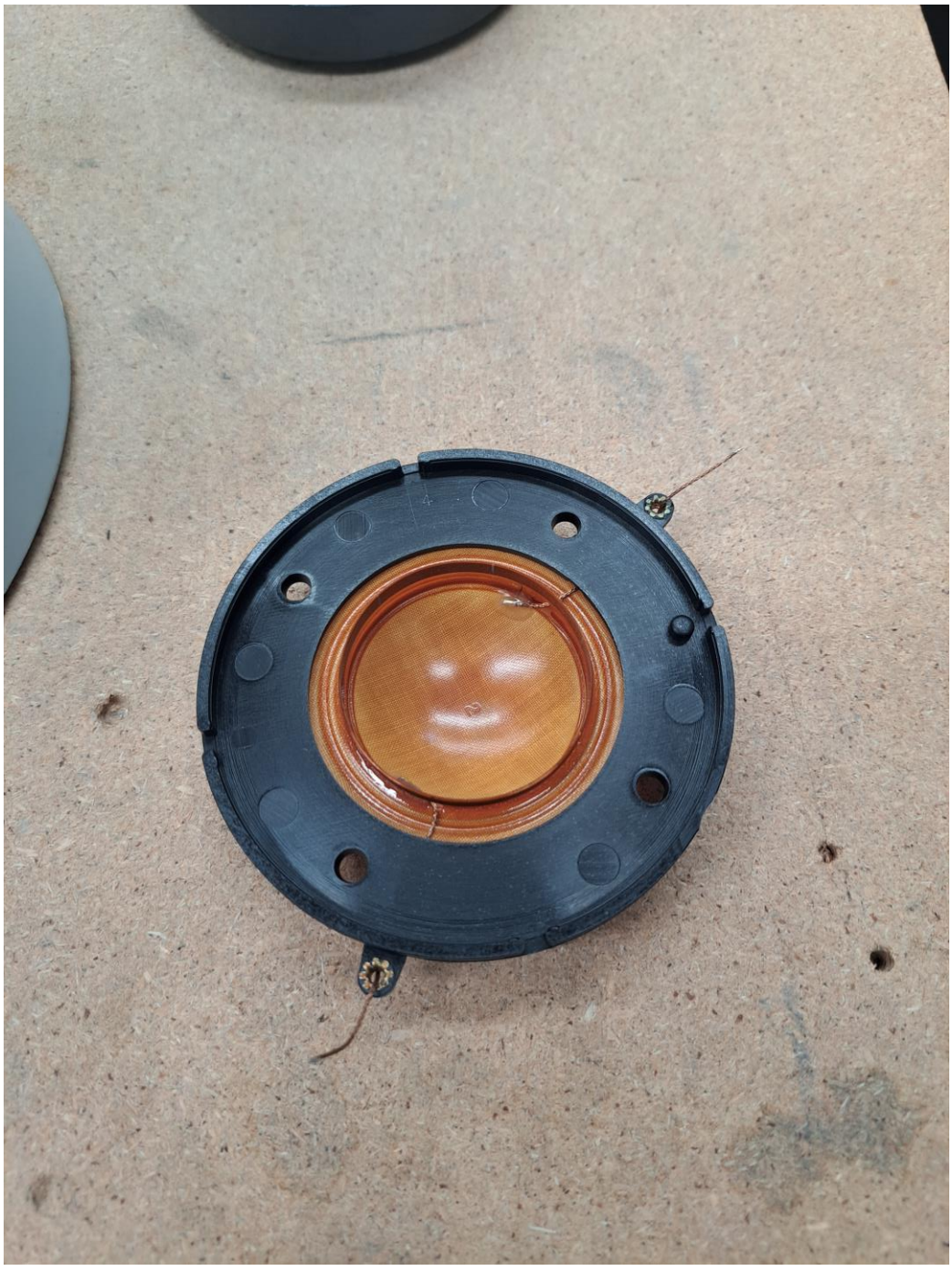


Test Setup

Test Equipment

Equipment	Model	Serial
Water Tank	Not Applicable	Not Applicable
Clarke Water Pump	PW50A	7140640
Tape Measure	RS Pro	Not Applicable
Thermocouple	Not Applicable	Not Applicable
Test Lance	Jet – 6K	Not Applicable
12.5mm Nozzle	Jet – 6K	Not Applicable
Pressure Gauge	SSI	120328012

6.6 IPX7

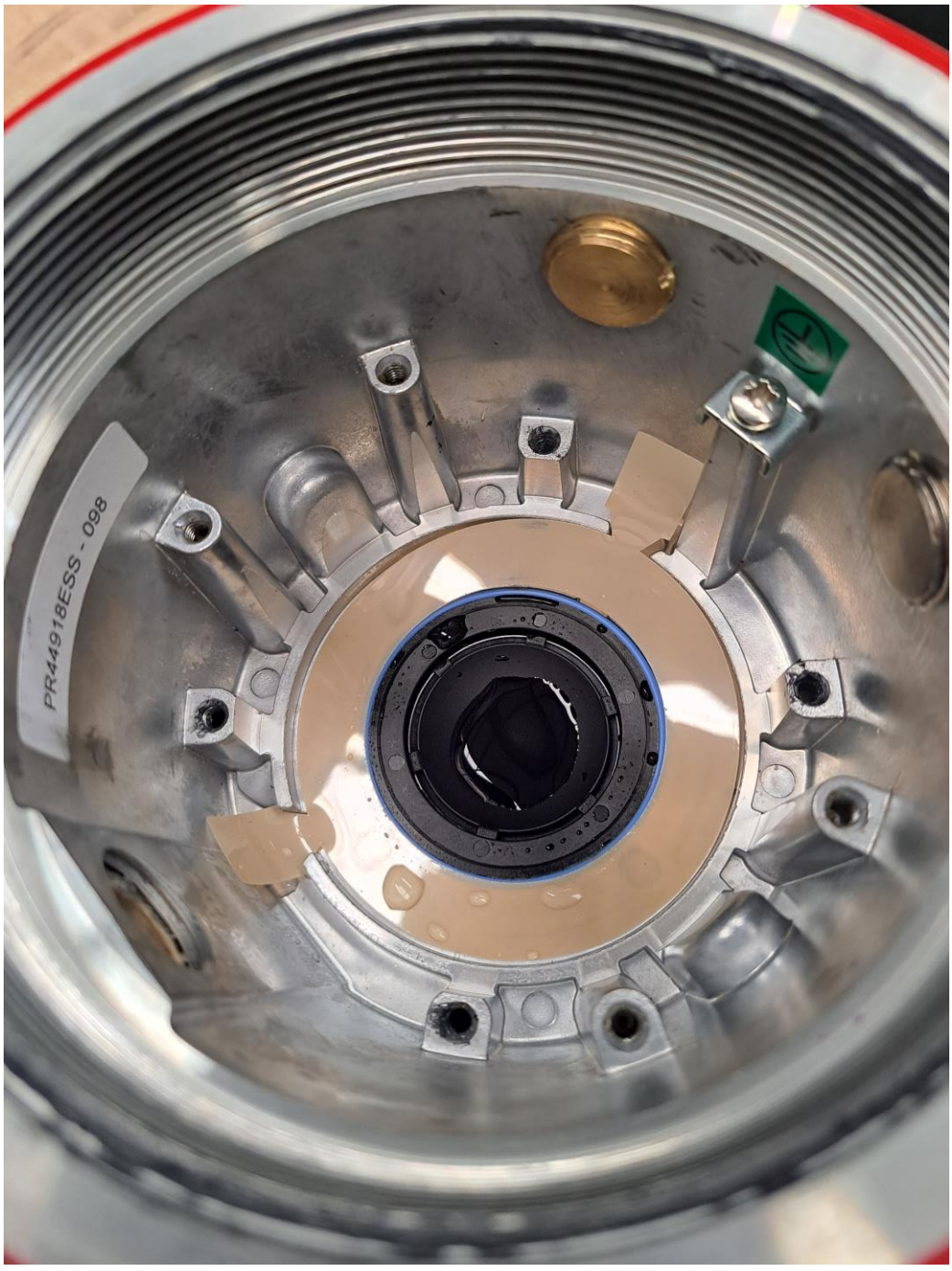
Basic Standard:	EN 60529: 1992 + A2: 2013
Applicable:	Enclosure

Test Result

The enclosure under test was placed in its normal operating orientation into a tank filled with water to a depth of 1 metre for 30 minutes.

The client stated the last barrier within the unit that provided protection against ingress was the diaphragm and hard plastic casing, this was mounted to the base on the beacon side the enclosure below the speaker. Provided no water surpassed this point then it would not be present where electronics would be mounted. The enclosure was opened after the test and there was no ingress of water passed the diaphragm and hard plastic case, the water shown in the picture below was on the underside of these.

Test Result



Test Result

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Test Setup

Test Equipment

Equipment	Model	Serial
Water Tank	Not Applicable	Not Applicable
Tape Measure	RS Pro	Not Applicable
Thermocouple	Not Applicable	Not Applicable

END OF REPORT

1	Original Issue	S Thompson	30th May 2023
ISSUE	**MODIFICATION**	**ISSUED BY**	**DATE**

This test report relates only to the actual item(s) tested, details of which can be found in Section 2 of this report

The test results in this report are facts and any opinions or interpretations derived from the results of these tests shall be marked *

Any testing not presently covered by the scope of our UKAS Schedule of Accreditation shall be marked †