

**Unisto AG**

**Seestrasse 7**

**9326 Horn / Switzerland**

# Environmental Test Report

## SCOPE OF WORKS

The IP65 test according to DIN EN 60529 were performed.

## DEVICE:

Electronic seal for cargo containers

## MANUFACTURER:

Unisto AG

## TYPE:

Unisto e-Guard Data Trans

## REPORT NUMBER

2248078KAU001

## ISSUE DATE

2023-02-02

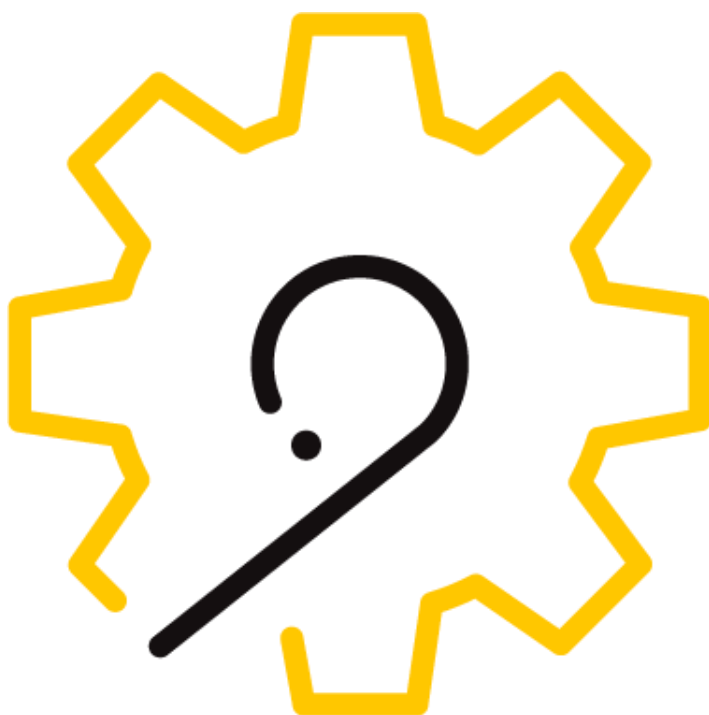
## PAGES

19

## DOCUMENT CONTROL NUMBER

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## TEST REPORT FOR UNISTO AG, CH-9326 HORN

Report No.: 2248078KAU001

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## SECTION 1 GENERAL

All measurement results exclusively refer to the equipment, which was tested. Reproduction of this report except in its entirety is not permitted without written approval of INTERTEK Deutschland GmbH.

### SECTION 1.1 REVISION SUMMARY

The following changes have been made to this report

DATE/PROJECT #	PROJECT HANDLER	PAGE NO.	DESCRIPTION OF STANDARD
NONE			

Table 1

### SECTION 1.2 GENERAL INFORMATION

Electronic seal for cargo containers

### SECTION 1.3 DELIVERY INFORMATION

#### SECTION 1.3.1 DELIVERY DATE

2023-01-16

#### SECTION 1.3.2 DELIVERY CONDITIONS OF TEST DEVICES

The test devices reached us intact. No optical damages were detected.

The results apply to the examinee as received.

They were not used for other tests at INTERTEK laboratory in Kaufbeuren before.

## SECTION 2 TEST DEVICES

### SECTION 2.1 OVERVIEW OF TEST DEVICES



Picture 1: front side view



Picture 2: back side view



Picture 3: top side view



Picture 4: bottom view



Picture 5: left side view



Picture 6: right side view

## SECTION 2.2 SERIAL NUMBERS

TEST	SERIAL No.
IP6x test	Prototype
IPx5 test	Prototype

Table 2

## SECTION 3 TEST RESULTS

### SECTION 3.1 IP TESTS

TEST DESCRIPTION	PARAMETER	PASS	FAIL	APPLIED
<b><u>Protection against access to hazardous parts and solid foreign objects – Dust tight</u></b>  DIN EN 60529:1991+A1:2000+A2:2013 clause: 5; 13.4; 13.6	IP rating: IP6x test wire: Ø 1,0 mm length: 100 mm Dust: Talcum category: 1 (with depression) Test time: 2 h 24 min  Operating mode: not operating Observed: none  <u>Note:</u> At the dust test the battery housing is not part of the evaluation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Protection against water jets</u></b>  DIN EN 60529:1991+A1:2000+A2:2013 clause: 14.1; 14.2; 14.2.5; 14.3	IP rating: IPx5 test equipment: water jet hose nozzle Diameter of nozzle: 6,3mm Distance to DUT: 2,5m Flow rate: 12,5l/min Test duration: 1min/m2 at least 3 min Temperature DUT: 24°C Temperature Water: 23°C  Operating mode: not operating Observed: none	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 3



## SECTION 4 ASSESSMENT

### IP6x

The protection is satisfactory if no deposit of dust is observed inside the enclosure at the end of the test.

The object probe is not allowed to penetrate.

### IPx5

After testing in accordance with the appropriate requirements of 14.2.5 the enclosure shall be inspected for ingress of water.

It is the responsibility of the relevant Technical Committee to specify the amount of water which may be allowed to enter the enclosure and the details of a dielectric strength test, if any.

In general, if any water has entered, it shall not:

- be sufficient to interfere with the correct operating of the equipment or impair safety.
- deposit on insulation parts where it could lead to tracking along the creepage distances.
- reach live parts or windings not designed to operate when wet.
- Accumulate near the cable end or enter the cable if any.

If the enclosure is provided with drain-holes, it should be proved by inspection that any water which enters does not accumulate and that it drains away without doing any harm to the equipment.

For enclosures without drain-holds, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts.

## SECTION 5 VARIATION TO THE REQUIREMENTS

None

## SECTION 6 FINAL

### IP6x

The access probe did not penetrate. No dust was detected inside the enclosures.

### IPx5

No water was detected inside the enclosures.

## SECTION 7 DURATION OF TEST

TEST DESCRIPTION	DATE OF START	DATE OF STOP
IPx5 test	2023-01-26	2023-01-26
IP6x test	2023-01-30	2023-01-30

Table 4

### SECTION 7.1 TEST EQUIPMENT

EQUIPMENT	TEST EQUIPMENT NO.
Dust chamber DIN EN 60529	PM KF 2304
Dust Talcum	PM KF 2425
Test probe 1mm diameter	PM KF 2653-4
Datalogger (TT laboratory)	PM KF 2342
Temp.- Humidity Sensor (TT laboratory)	PM KF 2348
Air Pressure Sensor (laboratory Kaufbeuren)	PM WI 0793
6,3 mm nozzle	PM KF 1279
Thermometer water	PM KF 2489
Flowmeter water	PM KF 2748
Datalogger (Safety laboratory)	PM KF 1250
Temp.- Humidity Sensor (Safety laboratory)	PM KF 1251
Stopwatch	PM KF 3363
Ruler 1m	PM KF 0984

Table 5

## SECTION 8 AMBIENT CONDITION

### SECTION 8.1 TT LABORATORY

Ambient temperature °C	Ambient humidity (relative) / % r.H.	Ambient air pressure / mbar
21	26	933

Table 6

### SECTION 8.2 SAFETY LABORATORY

Ambient temperature °C	Ambient humidity (relative) / % r.H.	Ambient air pressure / mbar
24	42	939

Table 7

## SECTION 9 APPENDIX

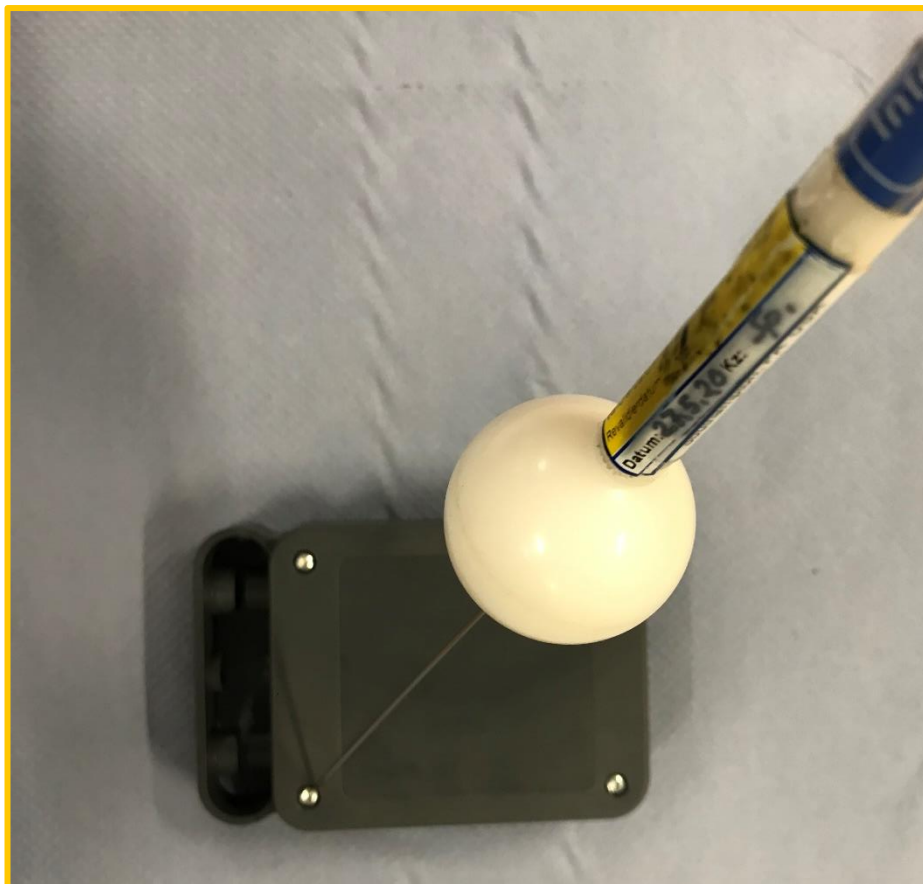
### SECTION 9.1 TEST SETUP



Picture 7: IP6x before



Picture 8: IP6x after



Picture 9 : IP6x test probe



Picture 10: setup IPx5



## SECTION 9.2 RESULTS

### SECTION 9.2.1 RESULT IP6X





Picture 12: result batterie compartment (NOT PART OF THE EVALUATION – Just Informative / This compartment was not under vacuum during the IP6x test)



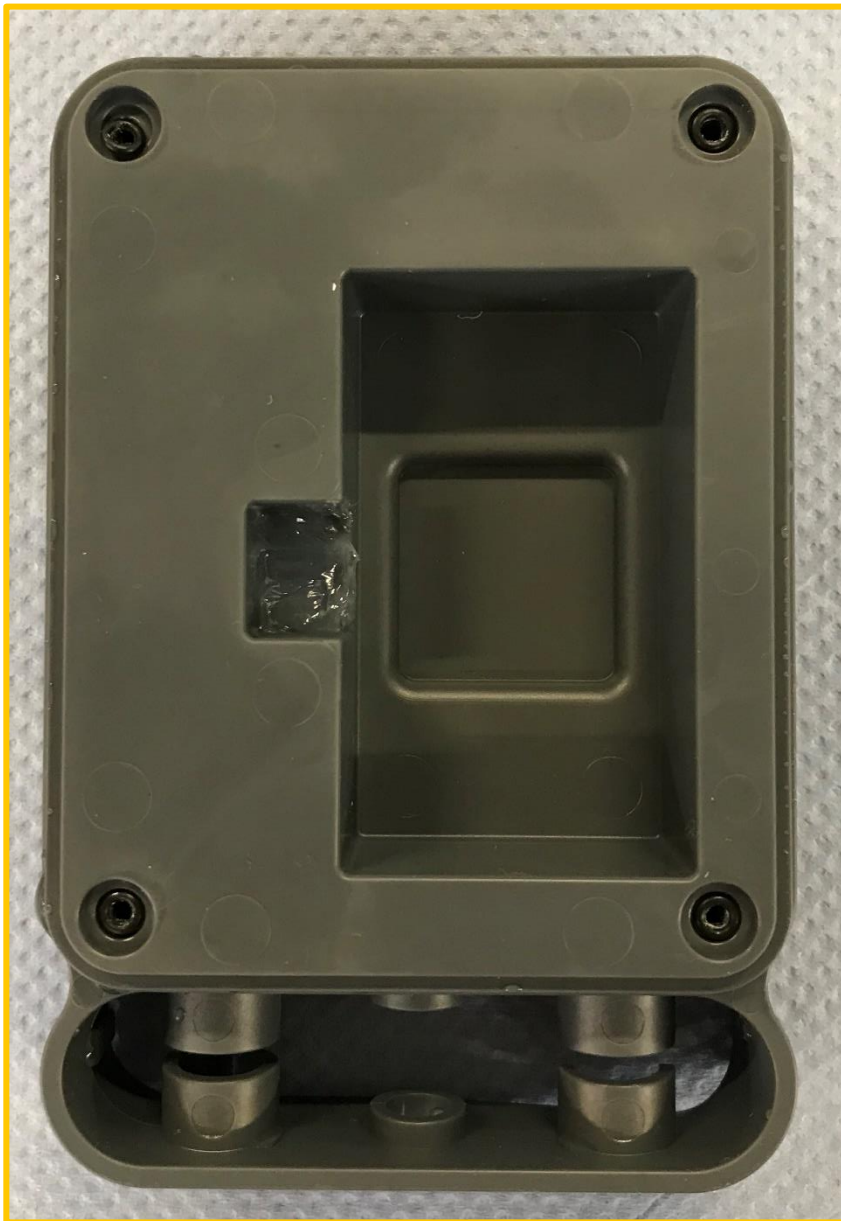
Picture 13: result lid batterie compartment (NOT PART OF THE EVALUATION – Just Informative)



**SECTION 9.2.2      RESULT IPX5**



Picture 14: IPx5 result inside housing



Picture 15: IPx5 result batterie compartment



Picture 16: IPx5 result lid batterie compartment