



Testing laboratory for climatic, mechanical
and corrosive environmental stress

QUALITY TEST CERTIFICATE

Test report No. 19-14583.01

Client	Solidplex GmbH Laurentiusstr. 39 63897 Miltenberg	
Equipment under test	Sinora Case Quantity Status	SIN-05542-20BK 1 sample August 2019
Purpose	Tests for the certification of the degrees of protection IP67.	
Test program	Protection against access to hazardous parts IP6X acc. to the IEC 60529 pt.12.2 Protection against solid foreign objects IP6X acc. to the IEC 60529 pt.13.4 Protection against immersion (temporary submersion)IPX7 acc. to the IEC 60529 pt.14.2.7	
Test period	26 August to 09 September 2019	
Execution / results	see pages 2 to 4	
Total number of page	6 (inclusive 1 appendix)	
Test results	The tests were carried out according to the specifications of the standards. After each single test IP6X and IPX7 no dust or water were detected inside the opened housing. The test of the degree of protection IP67 has been verified on the Sinora Case SIN-05542-20BK.	

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Head of the testing laboratory
Berlin, 08. November 2019



M.Eng. M. Sommerfeld
Test engineer

1 Purpose

The certification of the degrees of protection IP67 for the **Sinora Case SIN-05542-20BK** was carried out according to the specifications of the current standards and to the demands of the client.

2 Device under test

Sinora Case	SIN-05542-20BK
Quantity	1 sample
Status	August 2019

3 Basics

3.1 Demands of the client

3.2 Used standards

IEC 60068-1:2013 **DIN EN 60068-1; VDE 0468-1:2015-09**
„Environmental testing - Part 1: General and guidance“

IEC 60529:1989 + A1:1999 + A2:2013 **DIN EN 60529; VDE 0470-1:2014-09**
„Degrees of protection provided by enclosures (IP Code)“

4 Test program

4.1 Protection against access to hazardous parts IP6X

according to the IEC 60529 pt.12.2

DUT not operating, without connections

Before the dust test, the **protection against access to hazardous parts IP6X** shall be verified using a standardized wire. The access probe \varnothing 1.0 mm (force 1 N) must not penetrate the housing at any point.

4.2 Protection against solid foreign objects IP6X (dust tight)

according to the IEC 60529 pt.13.4

DUT not operating
DUT position horizontal lying

The certification of the **degree of protection IP6X** is to be carried out in compliance with the specifications of the standards.

The specimen will be placed inside the dust chamber within a whirling air flow with finely distributed dust. For the test IP6X with vacuum, a suction hose must be led to the inside of the samples.

Using vacuum a volume of 80X the volume of the specimen will be removed without exceeding a flow-rate of 60 Volumes per hour. Under no circumstance may the vacuum exceed 2kPa. Once a flow-rate of 40-60 Volumes/h has been achieved, the test will last at least 2h.

Talcum powder will be used as test dust (composition and grain size distribution in compliance with the regulation).

Visual inspection

After the protection against solid foreign objects IP6X (dust test), the specimen will be examined for external defects and any other changes.

Subsequently the housing will be opened and checked for penetrated dust.

4.3 **Protection against submersion IPX7 (temporary submersion)**

according to the IEC 60529 pt.14.2.7 and to the demands of the client

DUT not operating
 DUT position horizontal lying

For the test to prove the degree of protection IPX7, the standard requirements apply:

test equipment dip tank
 dip depth 1 m underneath the water surface
 (bottom edge of the sample)
 water temperature the temperature may not diverge more than 5 K
 from the temperature of the specimen
 test duration 30 min

Visual inspection

After the protection against temporary submersion IPX7, the specimen will be examined for external defects and any other changes.

Subsequently the housing will be opened and checked for penetrated water.

5 **Execution**

The tests for the degrees of protection IP67 for the **Sinora Case SIN-05542-20BK** were carried out according to the test program (section 4.1 to 4.3), in compliance with the specifications of the current standards and with the demands of the client.

Visual inspection

After the individual tests the DUT were examined for penetrated dust or water, the presence of external damage and any other alterations.

The housing was opened by the testing laboratory for visual inspection.

Acceptance criteria

The **protection against access to hazardous parts IP6X** is proven when a test wire (Ø 1 mm, force 1 N) cannot penetrate the housing of the specimen.

The **protection against solid foreign objects IP6X (dust tight)** is satisfactory, if at the end of the test no visible dust deposits are detected inside the housing of the specimen.

The **protection against immersion IPX7** is considered proven if after the completion of the test no water has penetrated into the sample, or if it has it is in a quantity such that the proper operation of the equipment or its safety are compromised.

Measurement and test devices

Name	Type	Serial-No.	Maker	Remarks
IEC steel wire Ø1mm	P 10.27	5130337	PTL	IP6X
Dust chamber 89	DI-1500	3089	Xi'an LIB Env. Sim. Industry	
Talcum dust	Talkum	130319	KSL	
Vacuum system dust	UE-5	P 17-0314-01	TZ Baden	
Dip tank	TB1500L	1158	GEOPlast	IPX7
IR Thermometer	Fluke 561	14950036	Fluke	
Timer / stop watch	Profil 25	12998288	eurochron	

6 Results

The certification of the degrees of protection IP67 for the **Sinora Case SIN-05542-20BK** with

- **Protection against access to hazardous parts** **IP6X**
- **Protection against solid foreign objects** **IP6X**
- **Protection against immersion (temporary submersion)** **IPX7**

was carried out according to the test program.

6.1 Protection against access to hazardous parts IP6X

according to the IEC 60529 pt.12.4

The standardized test wire (Ø 1 mm, force 1 N) could not penetrate the EUT.

6.2 Protection against solid foreign objects IP6X (dust tight)

according to the IEC 60529 pt.13.4

- After the dust test IP6X no external damage or any other alterations were detected on the DUT.
- No traces of dust were detected inside the opened housing.
- The test of the degree of protection IP6X has been verified on the Sinora Case SIN-05542-20BK.

6.3 Protection against submersion IPX7 (temporary submersion)

according to the IEC 60529 pt.14.2.7 and to the demands of the client

- After the dipping test IPX7 no external damage or any other alterations were detected on the DUT.
- No traces of water were detected inside the opened housing.
- The test of the degree of protection IP6X has been verified on the Sinora Case SIN-05542-20BK.

The tests were carried out according to the specifications of the standards.

After each single test IP6X and IPX7 no dust or water were detected inside the opened housing.

The test of the degree of protection IP67 has been verified on the Sinora Case SIN-05542-20BK.

The results of the tests refer only to the above mentioned equipment under test. This report, or individual pages of this test report, may only be copied following the written consent of the testing laboratory. This test report No. 19-14583.01 includes 4 pages and 1 appendix (2 pages).

Pictures



Picture 1
Sinora Case SIN-05542-20BK
delivery status
before the tests of the IP-protection IP67



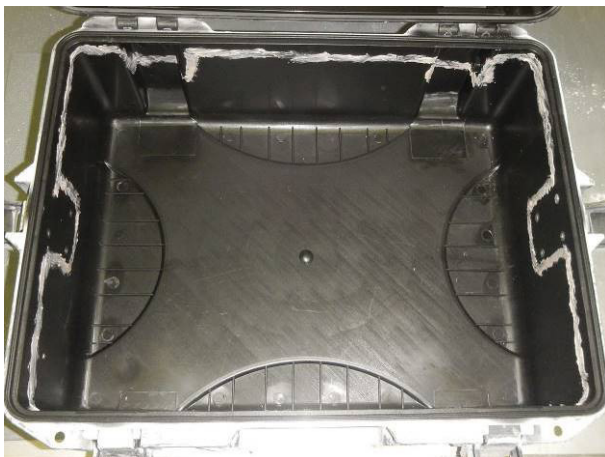
Picture 2
Sinora Case SIN-05542-20BK with
IEC-steel wire on the housing (Ø 1 mm, Kraft 1 N)
during the access to hazardous parts test IP6X



Picture 3
Sinora Case SIN-05542-20BK
in the dust chamber 89 with under pressure hose
before the solid foreign objects test IP6X



Picture 4
Sinora Case SIN-05542-20BK
with settled talcum dust
after the solid foreign objects test IP6X



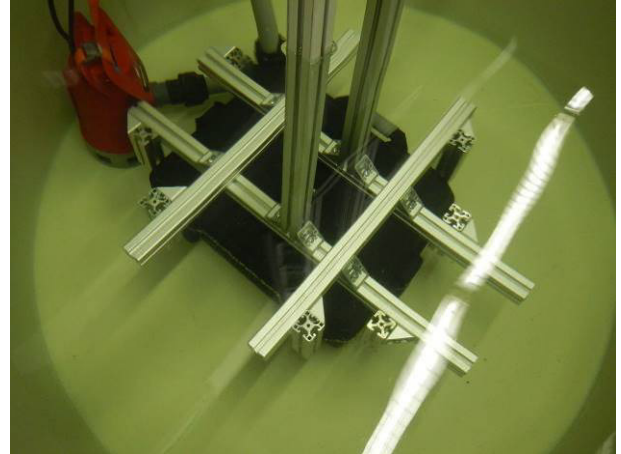
Picture 5
Sinora Case SIN-05542-20BK
without visible dust inside
after the solid foreign objects test IP6X



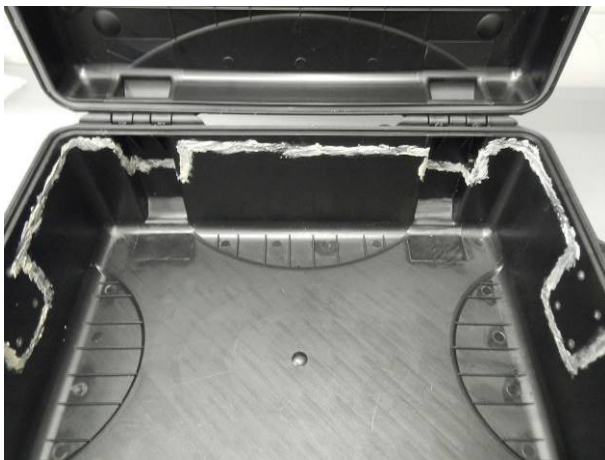
Picture 6
Sinora Case SIN-05542-20BK
without visible dust inside
after the solid foreign objects test IP6X



Picture 7
Sinora Case SIN-05542-20BK
mounted in immersion frame
during the immersion test IPX7



Picture 8
Sinora Case SIN-05542-20BK
in the dip tank at 1 m water depth
during the immersion test IPX7



Picture 9
Sinora Case SIN-05542-20BK
without visible water inside
after the immersion test IPX7



Picture 10
Sinora Case SIN-05542-20BK
without visible water inside
during the immersion test IPX7