CERMET
Certificazione e ricerca per la qualità

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TEST TYPE:	IP67 DEGREE CHECK
MATERIAL/SAMPLE:	Outdoor Cases Type 4000/B
COMMESSA N°:	MBO12E01038
JOB N:	N° Ddt n°51 del 28/05/2012
ORDER N:	N° mail 23/05/2012del 2012/05/24
SAMPLE ARRIVAL DATE:	2012/05/24
CLIENT:	**B&W International GmbH** Junkendiek 5 Ibbenbüren

STATEMENT

Any data included in this test report exclusively refer to the sample given by the Client.

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The Client engages it self to reproduce this test report integrally; any partial reproduction shall be authorized by CERMET.

Cadriano di Granarolo, 2012-06-14

The Engineer
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1.0 Test purpose

These tests aim at verifying the compliance of tested sample with the IP67 protection degree according to the following reference standards:

- *CEI EN 60529 (1997) + A1 (2000) Enclosure protection degrees (code IP)*

The characteristic of the case submitted to test are:

Manufacturer	B&W International GmbH S.p.a.
Model	**Outdoor Cases Type 4000/B**

The sample tested it's identified in the photos here below.

Photo 1: Sample submitted to test

2.0 Results in brief

Test type	Standard	Result
Verification of the protection degree against access to dangerous parts **IP6X**	**CEI EN 60529** Point § 12	NOT APPLICABLE
Verification of the protection degree against the inlet of solid foreign matters **IP6X**	**CEI EN 60529** Poit § 13.4 – 13.6	COMPLIANT
Verification of the protection degree against inlet of water **IPX7**	**CEI EN 60529** Point § 14.2.7	COMPLIANT

3.0 Test period and environmental conditions

The verification of IPX7 degree was carried out on June 4th, 2012 at the CERMET Laboratory.

The verifications of IP6X degree were carried out from June 06th to 07th, 2012 at INTEK Laboratory in Rezzato (BS).

During the tests the environmental conditions did not change significantly; in detail, the values recorded are:

- temperature of 23°C ± 3 °C
- percentage relative humidity 50% ± 5%
- atmospheric pressure 1010 mbar ± 20 mbar

4.0 Verification of the protection degree IP 6X (CEI EN 60529)

4.1 Test for protection against access to dangerous parts (point § 12)

The test was carried out using the accessibility gauge for the first characteristic digit IP6X specified in Table 6 of the reference standard.
The accessibility gauge is pressed against any possible opening of the enclosure with a force equal to 1 N.

The protection is satisfactory if the gauge does not pass through the enclosure openings.

The test was not carried out since there are no dangerous parts inside the enclosure.

4.2 Test for protection against access of solid foreign matters (point § 13.4 and point § 13.6)

The test was carried out using the powder chamber which creates the base principles shown in Fig.2 of the reference standard.
The talcum powder used is such as to be able to pass through a square mesh sieve where the nominal diameter of wires is 50 µm and the nominal wire distance is 75 µm.
The quantity of talcum powder to be used is 2 kg per m^3 of the test chamber.

The enclosures shall belong to one of the two following categories:

- Category 1: enclosures where the normal operation cycle of the equipment causes reductions in the internal pressure with respect to the atmospheric environmental pressure such as, for example, due to the thermal cycle effect.
- Category 2: enclosures where there is no pressure difference with respect to the atmospheric pressure.

For the first characteristic digit 6, the enclosure is always considered of Category 1.

With regard to the Category 1, the sample tested is placed inside the test chamber and the pressure in the enclosure is kept below the atmospheric pressure by means of a vacuum pump.
The suction union is connected to a hole specially provided for this test.
This test has the purpose to let an air quantity equal to 80 times the enclosure volume flow inside the enclosure without exceeding 60 volumes per hour, by means of an adequate suction pressure.

In no case the vacuum shall exceed 2 kPa (20 mbar).

If a suction flow from 40 to 60 volumes per hour is reached, the test length is 2 hours while if with a maximum vacuum of 2 kPa (20 mbar) the flow is less than 40 volumes per hour, the test shall go on as long as the volume of sucked air is 80 times the enclosure one, or for 8 hours.

With regard to the test in question, the test time is 8 hours; the photo 3 shows the test set up described.

The protection is satisfactory if at the test end there is no powder deposit inside the enclosure.

At the end of the test no talcum traces are found inside the enclosure; the test result is shown in the photo 4 here below.

Photo 2: Set-up for the test to verify the protection degree IP 6X

Photo 3: Result of the test to verify the protection degree IP 6X

5.0 Verification of the protection degree IP X7 (EN 60529 point § 14.2.7)

The test is carried out by dipping the enclosure completely in water, in its use position as specified by the manufacturer, so as to meet the following requirements:

a) the lowest point of enclosures high less then 850 mm shall be placed 1000 mm below the water surface;
b) the lowest point of enclosures higher than or equal to 850 mm shall be 150 mm below the water surface;
c) the minimum test length shall be 30 min
d) the water temperature shall not differ from the enclosure one by more than 5°K

The protection is compliant if at the end of the test there is no water trace inside the enclosure.

If some water has seeped inside, it shall be in a quantity such not to damage the good operation of the equipment or jeopardize its security.

In detail, the test conditions were:

Water temperature	Enclosure temperature	Procedure	Test lenght
26,4°C	25,1 °C	Total case dipping	30 min

At the test end, no water traces are visible inside the sample (Photo 4).

Foto 4: Result of the test to verify the protection degree IP X7

Table of test fixture and methods

Test type	*Instrument*	*Manufacturer/Model*	*Calibration*	*Identification*
Test of IP6X degree	Chronometer	Manufacturer: Oregon Scientific Model: /	Certificate n° RTI 2012-0003 del 2012-01	0853 P UL
Test of IP6X degree	Powder chamber	Manufacturer: Galbusera Model: 03.01	/	0049
Test of IP6X degree	Powder sieve	Manufacturer: Endecotts Model: /	Certificate n° RTI 09-0050 del 2009-11	0835 P
Test of IP6X degree	Thermohygrometer - Barometer	Manufacturer: Fischer Model: /	Certificate n° 1243-SP-10 del 2012/04	IE007
Test of IPX7 degree	*GPS Master Clock*	Manufacturer: / Mod. Trt'L 300	Certificate N.0902145HRI of 2009/03/11	IX13
Test of IPX7 degree	Thermohygrometer	Manufacturer: Delta Ohm Model. /	Certificate n°124-11001463 of 07/2011	IT016 Visualizer: 08031075 Probe: 09000707
Test of IPX7 degree	Lifting device 20 m	Manufacturer: Richter Model. steel	Certificate n°1008226DRI del 2010-09	ID187
Test of IPX7 degree	Contact thermometer	Manufacturer: Tersid Moof. PTS-40901P2E	Certificate n° 1100211TRI del 2011-13	IT06