ROTAID™
AED CABINETS

QUALITY REPORT

REGARDING MODELS:
SOLID PLUS, SOLID PLUS HEAT LED
AND ROTAID 24/7

IP56

IK10

Salt-mist protection

Signal Interference

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AED CABINETS

Quality Report

WHY IS TESTING IMPORTANT

Automated external defibrillators are installed globally in a variety of venues, both indoor and outdoor. Every installation comes with its unique characteristics, weather and environmental footprint.

To ensure the quality of storage of defibrillators in Rotaid AED Cabinets, we have conducted an extensive and demanding testing program. This program covers critical weather simulations, demands for storage of defibrillators, public safety and usage in the public domain. It also recognizes recent new requirements set by AED manufacturers in regard to connectivity and signal interference.

Furthermore, Rotaid AED Cabinets can build on its vast experience in AED storage and wants to make sure defibrillators are always in good working condition. With the successful completion of the test program, Rotaid AED Cabinets has set a new global standard for storage of defibrillators, based on our customers' feedback and experiences collected from over 35,000 installations.

This Quality Report provides a summary of the tests and their results and a detailed insight in how these tests were conducted and why they are important. With Eurofins, we have found a professional and objective global testing partner to confirm the quality of our cabinet solutions.

OUR TESTING PARTNER

EAG Laboratories | A Eurofins company has over 40 years' experience in materials testing services. Our parent company, Eurofins Scientific, is a multi-billion-dollar global leader in scientific services with a portfolio of over 200,000 validated analytical methods. We offer a consultative multi-disciplinary approach to solving your materials and engineering related product problems. As thought leaders in investigative science, we set the global standard for materials testing services.

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Quality Report

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IP56 Testing

WHAT IS AN IP RATING

IP rating is also known as Ingress Protection or International Protection ratings which are defined by the international standard of EN 60529 (British BS EN 60529:1992). This standard is used to define the levels of sealing effectiveness of electrical enclosures against intrusion from foreign bodies such as tools, dirt and moisture.

IP65 = First Digit - Solids
The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (electrical conductors, moving parts etc) and the ingress of solid foreign objects.

IP65 = Second Digit - Liquids
The second digit defines the protection of the equipment inside the enclosure against various forms of moisture (drips, sprays, submersion etc).

Summary
IP Rating First Digit - SOLIDS
IP56 Protected against dust limited dust ingress, no harmful deposits.

IP Rating Second Digit - LIQUIDS
IP56 Protected against strong jets of water from any direction, e.g. on ships deck, limited ingress permitted.

IP56 REPORT: DUST PROTECTION TEST

Tests performed under ISO17025 accreditation unless specified otherwise.

Test Levels:
- Dust Chamber
- DUT non-operational
- Airflow during the test : 160 l/min
- Test duration : 8 hours
- Dust particle size: ≤75µm

Conclusion
Test performed according standard.
Result: No dust inside the housing of the AED.

IP56 REPORT: LIQUIDS PROTECTION TEST

The request concerns an IPX6 water ingress protection test according to IEC 60529.

Test Levels:
- Nozzle diameter : 12.5 mm
- Spray distance : 2.5 to 3 m
- Water flow : ±100 l/min
- Spray time : 3 to 3.5 min per sample

IPX6: Protected against powerful water jets. Water projected in powerful jets against the enclosure from any direction shall have no harmful effects.

Conclusion
The tested enclosure without connectivity module is IPX6 compliant. There are water droplets visible in the AED recess, and some of the attached dew labels show traces of water contact.
But this is acceptable according the acceptance conditions. These water droplets are not expected to be harmful to the AED, especially since the AED is also packed in a factory bag.

The tested enclosure with connectivity module is IPX6 compliant. No water droplets are visible inside the module, nor in the AED recess it was mounted.
Also, the attached dew labels in this location did not show any traces of water contact.

IP56 Testing

IP56 REPORT IMAGES: DUST PROTECTION

Pictures after the test:

IP56 REPORT IMAGES: LIQUIDS PROTECTION

Pictures during the IPx test:

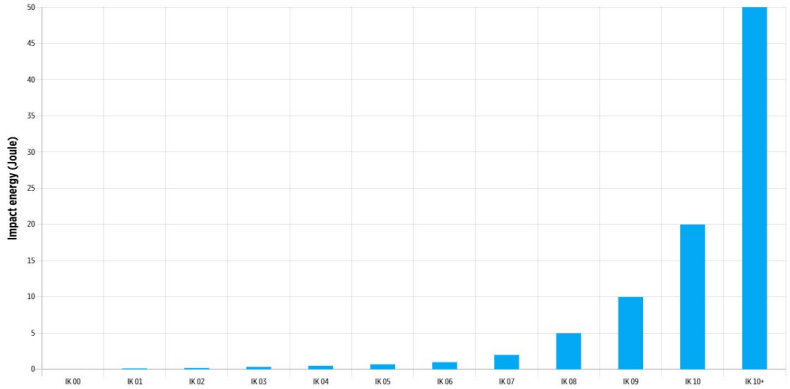
Pictures after IPx test:

IK10 Testing

WHAT IS IK10 IMPACT RESISTANCE

The European standard EN 62262, the equivalent of international standard IEC 62262 (2002), relates to IK ratings. This is an international numeric classification for the degrees of protection provided by enclosures for electrical equipment against external mechanical impacts. It provides a means of specifying the capacity of an enclosure to protect its contents from external impacts. IK10 classification is the highest vandal resistance rating with an impact energy of 20 joules applied repeatedly to the GRP enclosure.

IK IMPACT ENERGY INCREASE



EN 60068-2-75 DROP HEIGHTS

Energy J	0,14	0,2	0,35	0,5	0,7	1	2	5	10	20	50
Total mass kg	0,25	0,25	0,25	0,25	0,25	0,25	0,5	1,7	5	5	10
Drop height mm ± 1%	56	80	140	200	280	400	400	300	200	400	500

IK10 REPORT: IMPACT TEST

Tests performed under IEC 62262 accreditation unless specified otherwise.

Test Levels:
- Auto-JBC2 High Pendulum Impact Test device
- Steel pendulum hammer
- Mass KG : 5
- Impact energy (joules) : 20
- R mm (radius of striking element : 40

Conclusion
The tested AED cabinet is fully IK 10 compliant according to the acceptance conditions.

Remarks
An IK 10+ test has been executed as well on the same sample.
The results of that test have been described in a separate report.

IK10 Testing

IK10 REPORT: IMPACT TEST

Pictures test setup:

Impact side view

Impact front view

Salt-Mist protection

WHAT IS SALT-MIST SPRAY TEST?

The salt mist spray test is a standardized test method used to check corrosion resistance of coated samples. The test produces a corrosive attack to the coated samples in order to predict the coating's suitability in use as a protective finishenclosure.

Salt spray testing is very important for assessing the suitability of products intended for outdoor use or for use in cold or wet environments. Unacceptable products corrode within a short time under the influence of the saline air.

Standardized salt spray chamber
Equipment for salt mist testing are standardized under national and international regulations. These standards describe the necessary information needed to carry out the tests; determining testing parameters such as the size of the chamber, temperature, air pressure of the sprayed solution, preparation of the spraying solution, concentration, pH, etc.

Example: Electro-galvanized carbon steel and AISI 441 type stainless steel after short and long salt spray test exposure.

SALT-MIST REPORT: IMPACT TEST

Tests performed under IEC 60068-2-52 accreditation unless specified otherwise.

Test Levels:
The total test consists of 1 cycle (i.e. 1 week) with 3 parts each (test method 3), followed by 1 part to conclude - according to IEC 60068-2-52:2017 (Ed. 3.0)

- Salt spray : 35 °C for 2 hours
- Humid condition : 40 °C / 93 %RH for 22 hours
- Standard atmosphere : 23 °C / 50 %RH for 3 days
- Recovery : clean (rinse and brush) with DM water for 5 minutes, and then dried @ 55 °C for 30 minutes

Test period & location
The entire test was conducted in the period from 09-02-2020 to 02-03-2020 in the EAG Laboratories | A Eurofins company in Eindhoven

Conclusion
No visible corrosion occurred at metal parts as a result of the test, neither externally nor internally – where it should be mentioned that the internal parts were protected from the saline environment by the cover.
Also, and although not being the main scope of the test standard, no visible changes (e.g. glossiness) could be noticed on any the cabinet surfaces either.

Remarks
Due to the water repellency of the cabinet material, only few salt deposits are visible, except on most exterior metal parts. layer
The seal lever for instance did not show salt deposits which can be due to a water repellent.

Salt-Mist protection

SALT-MIST REPORT:

Pictures Salt spray test chamber:

Pictures temp. & humid. chamber:

Pictures salt deposits condition

Signal Interference

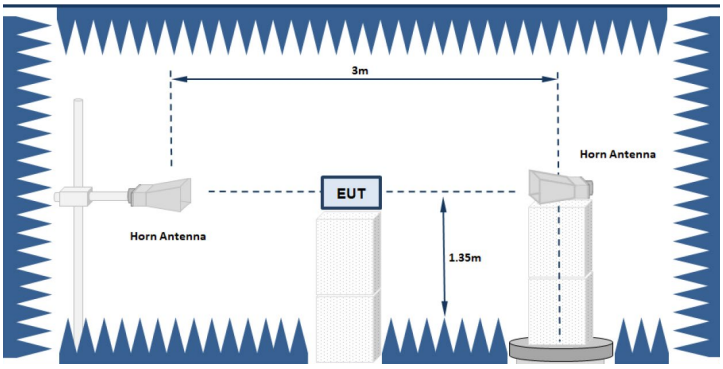
WHAT IS AN ANECHOIC CHAMBER

A fully anechoic chamber is used to measure the RF antenna performance of wireless devices. The anechoic chamber is lined with dense foam cones that eliminate all outside interference and reflections, making it an ideal test environment to get clean, consistent and repeatable results.

What Does the Anechoic Chamber Measure?
Over-the-air (OTA) performance test systems analyze radiated device performance. Businesses that rely on this piece of equipment typically want to validate conformance to industry, network operator and internal company requirements.

Specifically, an OTA test system verifies antenna patterns and transmitter/receiver chain wireless system performance—for example, total radiated power (TRP) and total isotropic sensitivity (TIS), respectively.

Attenuation in fully anechoic chamber (3 meter)



SIGNAL INTERFERENCE REPORT:

Results:

Frequency [MHz]	Backplate +Cover [dB]	Backplate [dB]	Cover [dB]	Technology
824	-0.792	-0.460	-0.332	UMTS V, EGPRS 850
880	-0.757	-0.508	-0.249	UMTS VIII, EGPRS 900
894	-0.785	-0.577	-0.208	UMTS V, EGPRS 850
960	-0.804	-0.577	-0.228	UMTS VIII, EGPRS 900
1710	-1.596	-0.777	-0.819	UMTS IV, EGPRS 1800
1850	-1.277	-0.587	-0.689	UMTS II, EGPRS 1900
1880	-1.478	-0.865	-0.613	EGPRS 1800
1920	-2.063	-1.124	-0.939	UMTS I
1990	-2.381	-1.364	-1.017	UMTS II, EGPRS 1900
2155	-1.107	-0.603	-0.504	UMTS IV
2170	-1.044	-0.500	-0.545	UMTS I
2412	-1.756	-0.821	-0.935	802.11 b, g, n
2472	-2.112	-1.023	-1.090	802.11 b, g, n

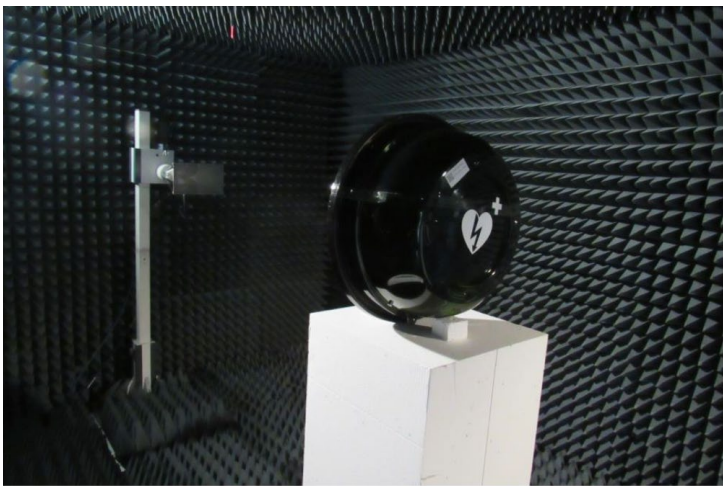
The measured attenuation of the housing will decrease the transmitter power and the receiver sensitivity by the same amount at a given frequency (reciprocity).

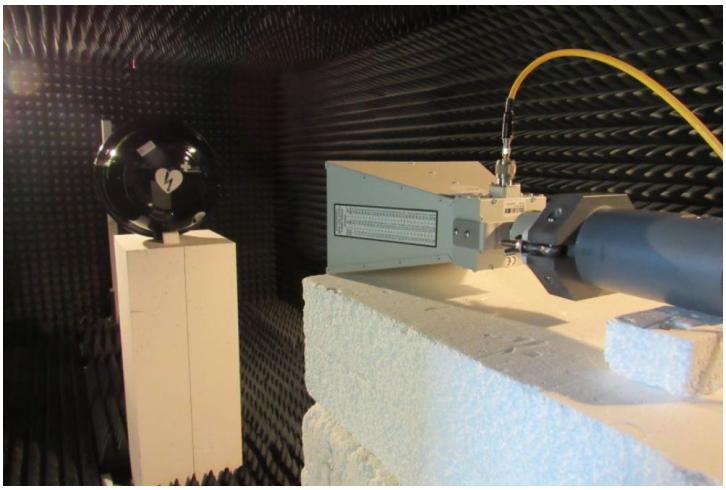
db	Ratio	Signal Degradation in %
0.1	1.023	2.276
0.5	1.122	10.875
1	1.259	20.567
1.5	1.413	29.205
2	1.585	36.904

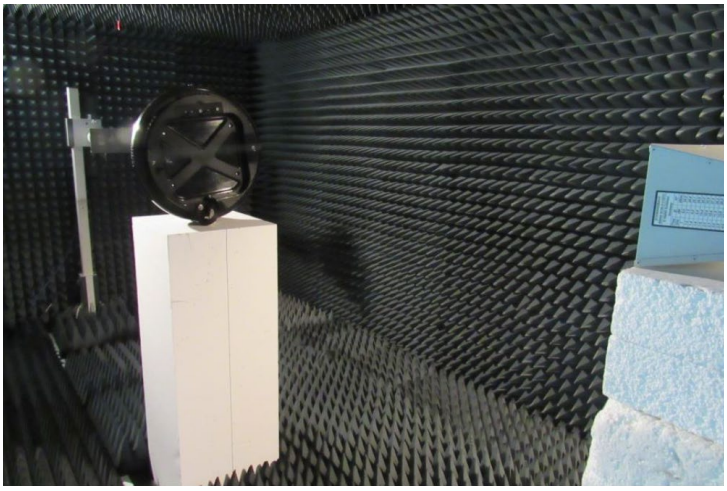
Signal Interference

SIGNAL INTERFERENCE REPORT:

Pictures Radio test chamber:







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