MTEx Laboratories

Ontploffingvoorkomingstegnologie
Explosion Prevention Technologies

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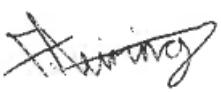
IP TEST REPORT

Report reference number.	MTEx 2498/24.0071
Revision tracking.	Rev 0: Original report (Issue Date: 2024/03/07).
Date Tested.	2024/03/05
Sampling Date:	2024/02/21
Test Location:	MTEx Laboratories - Centurion.
Standards.	SANS 60529:2013 “Degree of protection provided by enclosure (IP Code).”
IP rating obtained after testing.	IP 65
Applicant’s Company Name.	Robert Bosch (Pty) Ltd.
Applicant’s reference.	Order Number: B61/4569192
Device.	Tracker enclosure (with mended rubber sealing element)
Test Sample(s) Serial Number(s).	N/A
Address.	P.O. Box 348 Brits 0250

General remarks:

- The test results presented in this Test Report relate only to the item(s) tested (additional items must be tested additionally and may be tested as part of a sample scheme to SANS 96).
- Where the words: "(see Attachment #)" were used (if any) it refers to additional information appended to this document.
- Where the words: "(see appended table)" were used (if any) it refers to a table appended to this document.
- Throughout this document, a point “.” is used as the decimal separator.
- This report/certificate shall not be reproduced except in full.
- The information in this report may be shared with auditors.
- If the information is requested by third parties such requests will be diverted to the Applicant (i.e. your contact information will in such event be shared with the requestee).

Reviewed by + Signature (ExTL):	F. Meiring	
Approved by + Signature (ExCB): (MTEx Laboratories Technical Signatory)	J. Venter	

1. DESCRIPTION OF SAMPLE

The Asset Tracker consisted of a white non-metallic enclosure that housed the electronic components and battery pack. A lid that was secured with resin was used to close and seal off the enclosure after it was assembled. The enclosure had mounting holes on the outside on each corner along (did not penetrate the enclosure) with an entry opening on the side of the enclosure to access the mini-USB socket. This opening was sealed by means of a rubber plug and the dubber plug was made with a section to secure it to the enclosure to prevent loss.

Photos:

Rubber USB access cover.	USB access hole.	Overview (opened)	Overview (closed)
			

2. SAMPLE SETUP AND CONDITIONING IF APPLICABLE.

The sample was mounted and exposed to IP X5, X6 and X8 water tests. Afterwards an 8mm hole was drilled into the enclosure to apply a vacuum to the enclosure before exposing it to a IP6X dust test.

During testing the sample was exposed to water and dust to assess its protection against the ingress.

3. TEST RESULTS:

SANS 60529: 2013 Ed.1.2	
CLAUSE	**DUST TEST**
13.4	Dust test for first characteristic numeral 6.
	Environmental conditions were within the limits of the Standard.
	Dimensional evaluation (Overall approximate dimensions): L700 mm × W650 mm × D300 mm
	After testing inspection results: After the IP 5/6X test against the ingress of dust, a visual inspection was conducted. **No ingress of dust was observed - Pass.**
13.5 or 13.6	Special conditions for first characteristic numeral 6: - None

SANS 60529: 2013 Ed.1.2	
CLAUSE	**WATER TEST**
14.2.5	TEST FOR SECOND CHARACTERISTIC NUMERAL 5 WITH 6.3MM NOZZLE
	Internal diameter of nozzle: 6.3mm
	Environmental conditions were within the limits of the Standard.
	Water flow rate: 12.5 ℓ/min ± 5.
	Stream: circle of approximately 40mm diameter at 2.5m distance from nozzle.
	Test duration: 1min per square meter of enclosure
	Minimum test duration: 3min
	Distance between nozzle and enclosure: 2.5m - 3m
	After testing inspection results: After the IP X5 test against the ingress of water with the water hose, a visual inspection was conducted. **No ingress of water was observed - Pass**.

CLAUSE	**WATER TESTS**
SANS 60529: 2013 Ed.1.2	
CLAUSE	**IP X6 TEST**
14.2.6	TEST FOR SECOND CHARACTERISTIC NUMERAL 6 WITH 12.5MM WATER JET NOZZLE.
	Internal diameter of nozzle: 12.5mm .
	Environmental conditions were within the limits of the Standard.
	Water flow rate: 100 ℓ/min ± 5%.
	Stream: circle of approximately 120mm diameter at 2.5m distance from nozzle.
	Test duration: 1min per square meter of enclosure.
	Minimum test duration: 3min.
	Distance between nozzle and enclosure: 2.5m - 3m.
	After testing inspection results: During the **IP X6** test against the ingress of water with a water jet, the rubber plug separated from the enclosure, exposing the USB access hole. **Water ingress and the IP integrity being compromised, was observed – Failed**.
SANS 60529: 2013 Ed.1.2	
CLAUSE	**IP X8 TEST**
14.2.8	TEST FOR SECOND CHARACTERISTIC NUMERAL 8 CONTINUOUS IMMERSION.
	Environmental conditions were within the limits of the Standard.
	Unless there is a relevant product standard, the test conditions are subject to agreement between manufacturer and user, but they shall be more severe than those prescribed in 14.2.7. Duration: >60 mins Depth of submergion: >3m
	After testing inspection results: After the **IP X8** test against the ingress of water by continuous immersion, a visual inspection was conducted. **Water ingress was observed - Failed**.

4. CONCLUSION

Sample complied to IP65.

5. ADDITIONAL NOTES AND RECOMMENDED "BATCH" VERIFICATION TESTING

- Visually inspect for:
  - A continuous permanent seal on the lid of the enclosure.
  - Any cracks on the non-metallic materials.
  - The mini-USB rubber cover must be installed securely.
- Inspect joints for conformity.
- Inspect for modifications to the original tested device.
- IP65 test (2 hours dust & 3 minutes water).
  - Dust tank test for 2 hours or suitable vacuum hold test.
  - IPX5/6 test.
- Note that care must be taken to limit the destructive effects of handling enclosures as there are no official IK-rating allocated to the enclosure in accordance with SANS 62262.

End of Report.