

TEST REPORT

Report No.:TBR-C-202311-0041-1

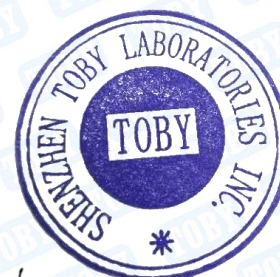
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Applicant Company : Shenzhen Juyi science and trade Co., LTD
Address : Xinyuan Business 308, No.23, Shuidun Street, Nanzhuang, Gongming Town, Guangming District, Shenzhen, China
Manufacturer : Shenzhen Juyi science and trade Co., LTD
Address : Xinyuan Business 308, No.23, Shuidun Street, Nanzhuang, Gongming Town, Guangming District, Shenzhen, China

Sample Information

Sample Name : Lithium active balance board
Trade Mark : enerkey
Basic Model No. : EK-C4S5A
Series Model No. : EK-C3S5A,EK-C4S5A,EK-C5S5A,EK-C6S5A,EK-C7S5A,EK-C8S5A, EK-C10S5A,EK-C12S5A,EK-C14S5A, EK-C16S5A,EK-C21S5A
Testing Period : December 04, 2023~December 08, 2023
Date of issue : December 08, 2023
Results : Please refer to next page(s).

TEST REQUEST	CONCLUSION
As specified by client, based on the performed tests on submitted sample, the result of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, Dibutyl Phthalate(DBP), Butylbenzyl Phthalate(BBP), Di-2-ethylhexyl Phthalate(DEHP) and Diisobutyl phthalate(DIBP) content comply with the limits set by RoHS Directive 2011/65/EU with amendment (EU) 2015/863.	Pass



Edited by:

Wick Wu

Approved by:

Kim Chan.



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Results:

1. EU RoHS Directive 2011/65/EU and its amendment directives

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Sample No.	Sample Description	Results					
		Cd	Pb	Hg	Cr ^{VI}	Br ^{VI}	
						PBBs	PBDEs
1	Silver solder	BL	BL	BL	BL	N/A	N/A
2	Black wet paper	BL	BL	BL	BL	BL	BL
3	Black powder	BL	BL	BL	BL	BL	BL
4	Black rubber sheet	BL	BL	BL	BL	BL	BL
5	Silver metal shell	BL	BL	BL	BL	N/A	N/A
6	Silver metal pin	BL	BL	BL	BL	N/A	N/A
7	Black PCB board	BL	BL	BL	BL	X	X
8	White plastic shell	BL	BL	BL	BL	BL	BL
9	Silver metal pin	BL	BL	BL	BL	N/A	N/A
10	Green resistance	BL	BL	BL	BL	BL	BL
11	Black resistance	BL	BL	BL	BL	BL	BL
12	Orange capacitor	BL	BL	BL	BL	N/A	N/A
13	Black resistance	BL	BL	BL	BL	BL	BL

Remark :

- Results were obtained by XRF for primary screening, and further chemical testing by ICP(for Cd, Pb, Hg), UV-Vis(for Cr(VI)) and GC-MS(for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013(Unit: mg/kg).

Element	Polymers	Metals	Composite material
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$
Br	$BL \leq (300-3\sigma) < X$	N/A	$BL \leq (250-3\sigma) < X$

- BL= Below Limit



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- OL= Over Limit
 - X= The range of needing to do further testing
 - 3σ = The reproducibility of analytical instruments
 - N/A= Not applicable
 - LOD= Detection limit
2. The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
 3. The maximum permissible limit is quoted from the document RoHS Directive 2011/65/EU with amendment (EU) 2015/863.
 4. ▼=For restricted substances PBBs and PBDEs, the results show the total Br content, the restricted substance was Cr(VI), and the results showed the total Cr content.

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium(Cd)	100
Lead(Pb)	1000
Mercury(Hg)	1000
Hexavalent Chromium(Cr(VI))	1000
Polybrominated biphenyls(PBBs)	1000
Polybrominated diphenylethers(PBDEs)	1000
Dibutyl Phthalate(DBP)	1000
Butylbenzyl Phthalate(BBP)	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	1000
Diisobutyl phthalate(DIBP)	1000

Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes. The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.



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2. EU RoHS Directive 2011/65/EU and its amendment Directives 2015/863/EU on Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content.

Test method:

Lead(Pb) & Cadmium(Cd) Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Mercury(Hg) Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Hexavalent Chromium(Cr(VI)) Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

BBP DBP DEHP & DIBP Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

1) The test results of Phthalates(DBP, BBP, DEHP &DIBP)

Tested Items	Unit	MDL	Results			Limit
			(7)	(4,8,10)	(11,13)	
Diisobutyl phthalate(DIBP) Content	mg/kg	100	N.D.	N.D.	N.D.	1000
Dibutyl Phthalate(DBP) Content	mg/kg	100	N.D.	N.D.	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	mg/kg	100	N.D.	N.D.	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	mg/kg	100	N.D.	N.D.	N.D.	1000



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Tested Items	Unit	MDL	Results		Limit
			(2)	(3)	
Diisobutyl phthalate(DIBP) Content	mg/kg	100	N.D.	N.D.	1000
Dibutyl Phthalate(DBP) Content	mg/kg	100	N.D.	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	mg/kg	100	N.D.	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	mg/kg	100	N.D.	N.D.	1000



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2) The test results of PBBs & PBDEs

Tested Items	Unit	MDL	Results	Limit
			(7)	
Polybrominated Biphenyls(PBBs) Content				
Monobromobiphenyl	mg/kg	50	N.D.	/
Dibromobiphenyl	mg/kg	50	N.D.	/
Tribromobiphenyl	mg/kg	50	N.D.	/
Tetrabromobiphenyl	mg/kg	50	N.D.	/
Pentabromobiphenyl	mg/kg	50	N.D.	/
Hexabromobiphenyl	mg/kg	50	N.D.	/
Heptabromobiphenyl	mg/kg	50	N.D.	/
Octabromobiphenyl	mg/kg	50	N.D.	/
Nonabromodiphenyl	mg/kg	50	N.D.	/
Decabromodiphenyl	mg/kg	50	N.D.	/
Total content	mg/kg	/	N.D.	1000
Polybrominated Diphenylethers(PBDEs) Content				
Monobromodiphenyl ether	mg/kg	50	N.D.	/
Dibromodiphenyl ether	mg/kg	50	N.D.	/
Tribromodiphenyl ether	mg/kg	50	N.D.	/
Tetrabromodiphenyl ether	mg/kg	50	N.D.	/
Pentabromodiphenyl ether	mg/kg	50	N.D.	/
Hexabromodiphenyl ether	mg/kg	50	N.D.	/
Heptabromodiphenyl ether	mg/kg	50	N.D.	/
Octabromodiphenyl ether	mg/kg	50	N.D.	/
Nonabromodiphenyl ether	mg/kg	50	N.D.	/
Decabromodiphenyl ether	mg/kg	50	N.D.	/
Total content	mg/kg	/	N.D.	1000



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Remark :

- MDL = Method Detection Limit
 - /= Not apply
 - N.D.=Not Detected(<MDL or LOQ)
 - mg/kg = ppm=parts per million
 - LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 $\mu\text{g}/\text{cm}^2$
 - ★ = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 $\mu\text{g}/\text{cm}^2$. The sample coating is considered to contain Cr(VI).
b. The sample is negative for Cr(VI) if Cr(VI) is N.D.(concentration less than 0.10 $\mu\text{g}/\text{cm}^2$). The sample coating is considered a non- Cr(VI) based coating.
c. The result between 0.10 $\mu\text{g}/\text{cm}^2$ and 0.13 $\mu\text{g}/\text{cm}^2$ is considered to be inconclusive, unavoidable coating variations may influence the determination.
 - Information on storage conditions and production date of the tested samples is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
- #1 According to RoHS Directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #2 According to RoHS Directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.
- #3 According to RoHS Directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).
- #4 According to RoHS Directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
- #5 According to RoHS Directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.
- #6 According to RoHS Directive 2011/65/EU and its amendments, Cadmium and its compounds in electrical contact are exempted.
- #7 According to RoHS Directive 2011/65/EU and its amendments, Lead is exempted in steel for machining purposes and in galvanised steel containing up to 0.35% (3500ppm) by weight.

Remark:

- Tested part(s) were specified by client.
- Composite testing(s) were specified by client.



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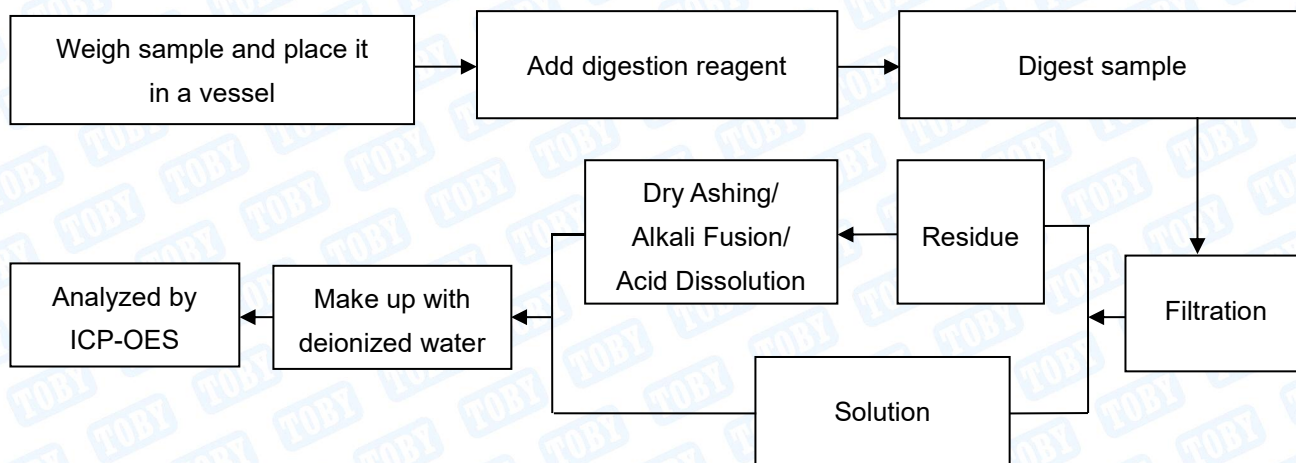
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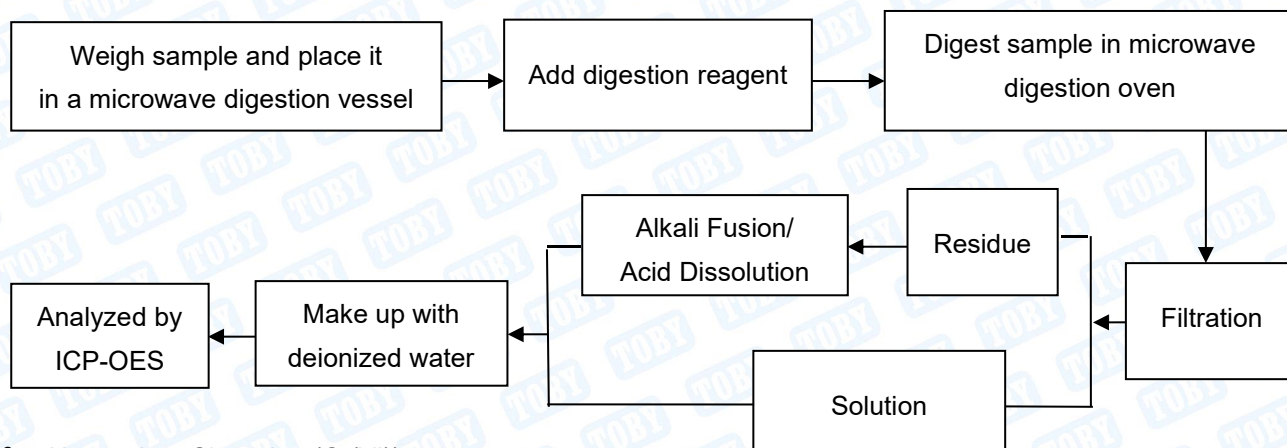
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Test Process

1. Lead(Pb) & Cadmium(Cd): IEC 62321-5:2014

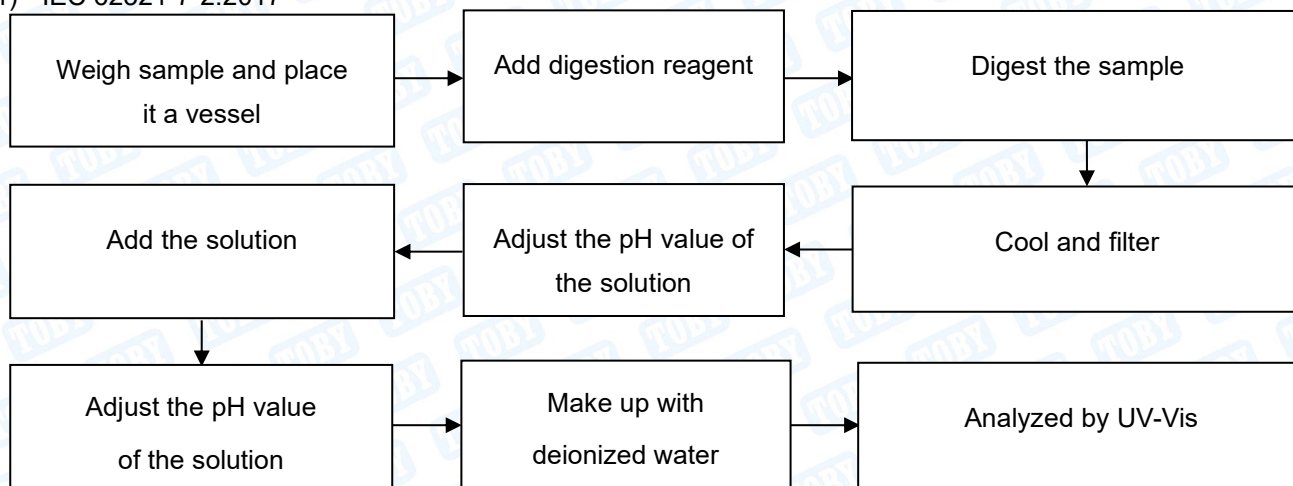


2. Mercury(Hg): IEC 62321-4:2014+A1:2017



3. Hexavalent Chromium(Cr(VI))

1) IEC 62321-7-2:2017



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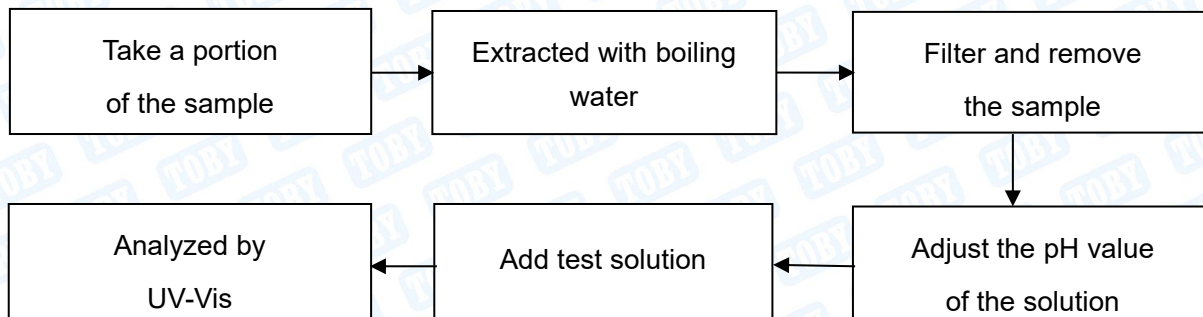
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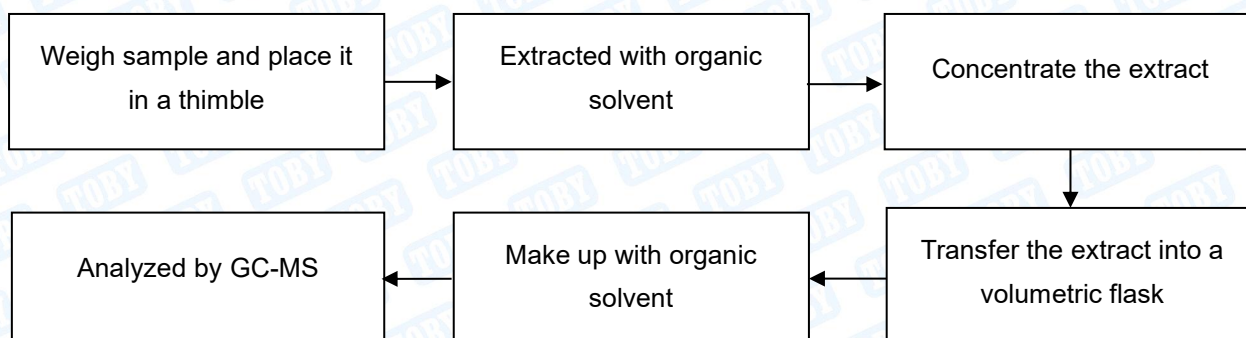
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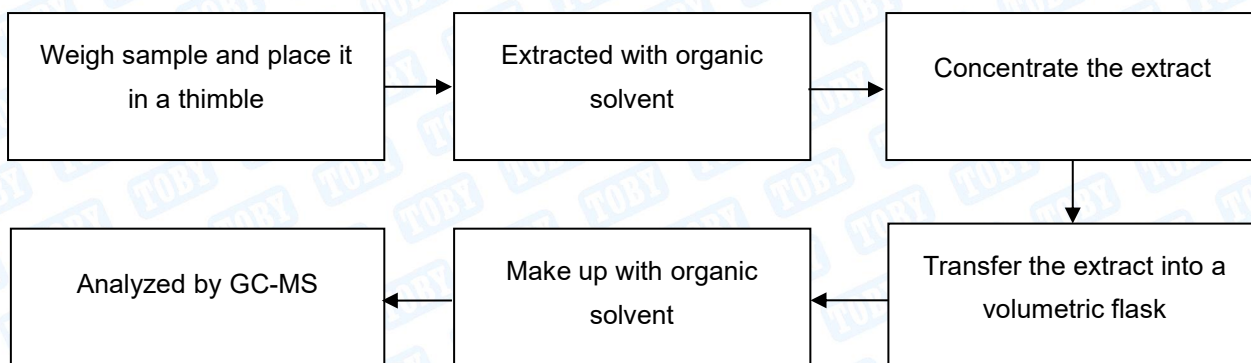
2) IEC 62321-7-1:2015



4. Polybrominated Biphenyls(PBBs) & Polybrominated Diphenyl Ethers(PBDEs) : IEC 62321-6:2015



5. Phthalates(DBP, BBP, DEHP & DIBP) : IEC 62321-8:2017



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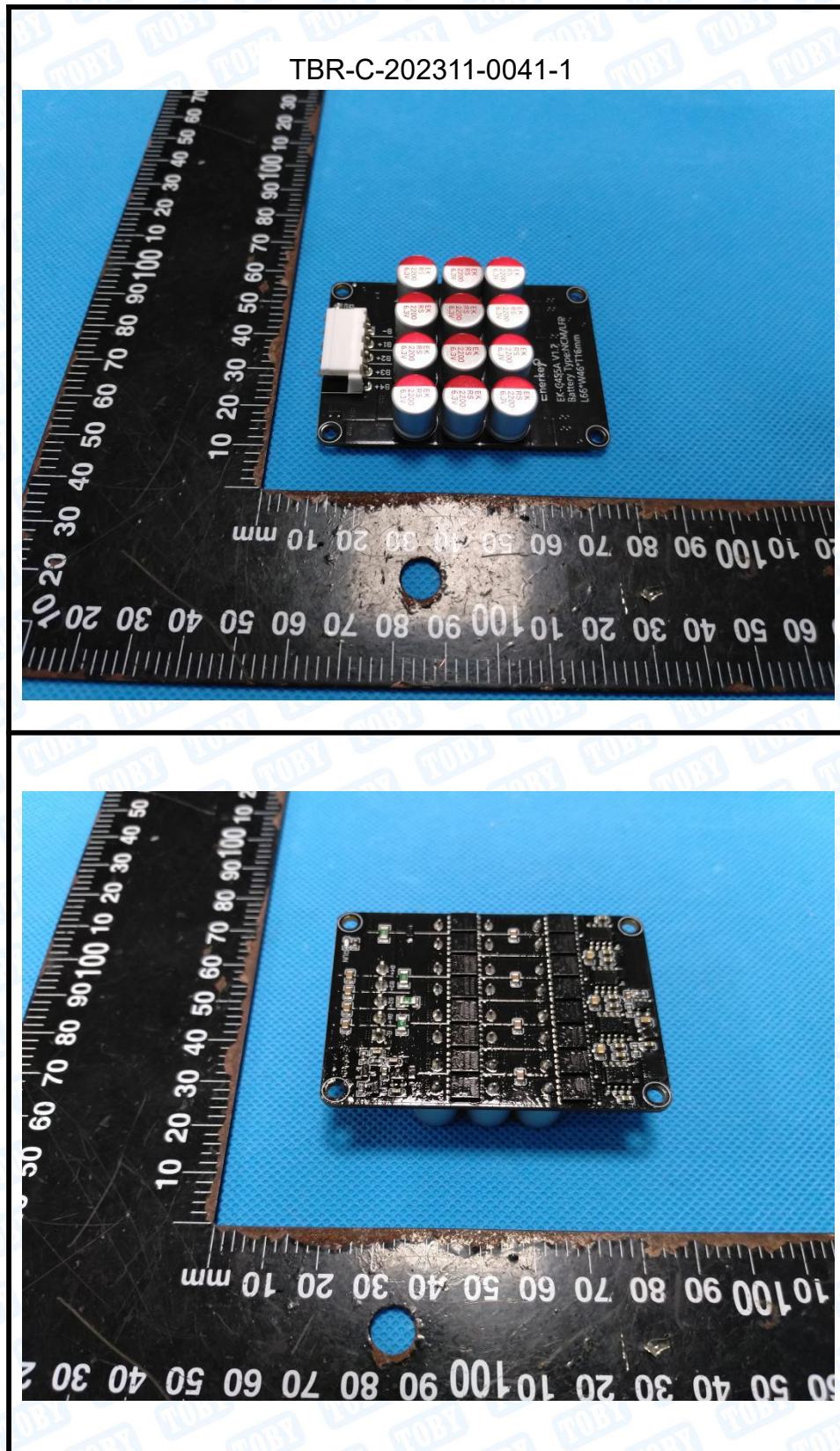
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Sample Photo



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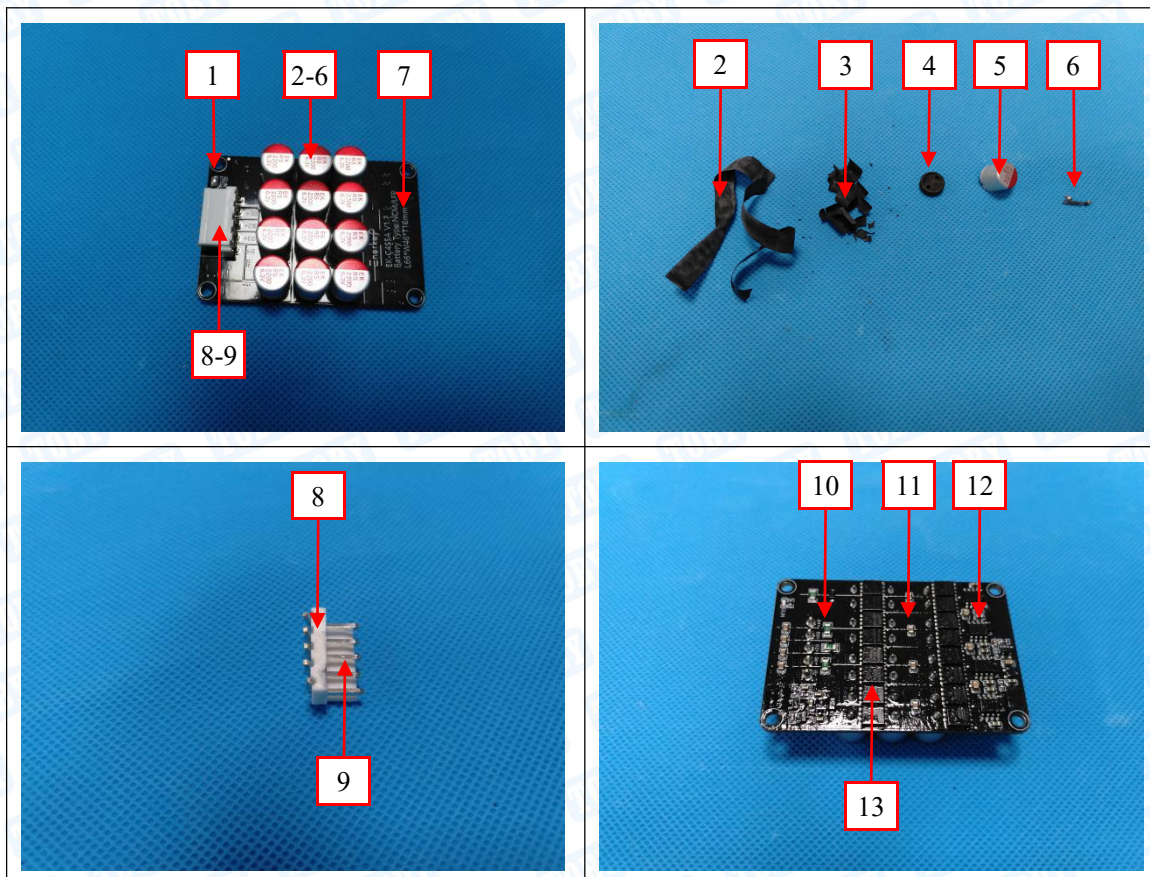
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Statement:

1. The information as listed on the first page of this test report was all provided by the client except the sample from, date received, test period, test results and conclusion. The client shall be responsible for the representativeness of sample and authenticity of materials, for which TOBY shall bear no responsibilities.
2. This test data is only responsible for the tested sample. The judgment method of determining the conformity in this test report is according to the measured value without considering the risk caused by uncertainty, unless otherwise clearly stipulated in special agreement, standard or specification. The client shall assume the risk caused by the judgment method, and TOBY shall not bear related responsibilities.
3. The test report is effective only with both signature and specialized stamp. Without written approval of TOBY, this report can't be reproduced in full or in part.
4. The result(s) in no CMA logo report shall only be used for client's scientific research, teaching, internal quality control, product research and development, etc..and just for internal reference.
5. The marked with special symbols in CNAS logo report means that the test item(s) was(were) currently not applying for CNAS accreditation.

***** END OF REPORT *****



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