# Test Report

**Report No.: A001R20171227049-2** Date: Jan.08, 2018 Page 1 of 11

Applicant:
Address:

**Report on the submitted sample(s) said to be:**

| | |
|---|---|
| Sample Name: | wireless charger |
| DNS model: | AC51, AC52 |
| Sample Received Date: | Dec.27, 2017 |
| Testing Period: | Dec.27, 2017 to Jan.05, 2018 |

| | |
|---|---|
| **Test Requested:** | Please refer to following page(s). |
| **Test Method:** | Please refer to following page(s). |
| **Test Result:** | Please refer to following page(s). |

| Tested by: | Reviewed by: | Approved by: |
|---|---|---|
| Luoxiao | Suhongliang, Leon | Liulinwen, Lewis |
| Test Engineer | Test Team Leader | Technical Director |





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# Test Report



**Test Requested:** **Conclusion**

As specified by client, to determine the Pb, Cd, Hg, $Cr^{6+}$, PBBs, PBDEs content in the submitted sample in accordance with EU RoHS Directive 2011/65/EU(RoHS) and its amendment directives on XRF and Chemical Method. **Pass**

**Test Methods:**

A: Screening by X-ray Fluorescence Spectrometry (XRF) :With reference to IEC 62321-3-1:2013 Ed 1.0 Screening – Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry

B: Chemical test:

| Test Item | Test Method | Measuring Instrument | MDL |
|---|---|---|---|
| Cadmium (Cd) | IEC 62321-5:2013 Ed 1.0 Section 7 | ICP-OES | 2 mg/kg |
| Lead (Pb) | IEC 62321-5:2013 Ed 1.0 Section 7 | ICP-OES | 2 mg/kg |
| Mercury (Hg) | IEC 62321-4:2013 Ed 1.0 Section 7 | ICP-OES | 2 mg/kg |
| Non-metal Hexavalent Chromium ($Cr^{6+}$) | IEC 62321-7-2:2017 Ed 1.0 | UV-Vis | 1 mg/kg |
| Metal Hexavalent Chromium ($Cr^{6+}$) | IEC 62321-7-1:2015 Ed 1.0 | UV-Vis | / |
| PBBs/PBDEs | IEC 62321-6:2015 Ed 1.0 | GC-MS | 5 mg/kg |





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# Test Report



**Test Results:**

**A、EU RoHS Directive 2011/65/EU and its amendment directives on XRF**

| Seq. No. | Tested Part(s) | Results(mg/kg) | | | | |
|---|---|---|---|---|---|---|
| | | Cd | Pb | Hg | Cr | Br |
| 1 | Black plastic shell(Shell) | BL | BL | BL | BL | BL |
| 2 | Black rubber mats(Shell) | BL | BL | BL | BL | BL |
| 3 | Silver screw(Shell) | BL | BL | BL | BL | - |
| 4 | Aluminum sheet metal | BL | BL | BL | BL | - |
| 5 | Double faced adhesive tape | BL | BL | BL | BL | BL |
| 6 | Tea tapes | BL | BL | BL | BL | BL |
| 7 | Tin solder | BL | BL | BL | BL | - |
| 8 | PCB board | BL | BL | BL | BL | X* |
| 9 | Chip capacitance | BL | BL | BL | BL | BL |
| 10 | Chip diode | BL | BL | BL | BL | BL |
| 11 | IC Ontology(IC) | BL | BL | BL | BL | BL |
| 12 | Pin(IC) | BL | BL | BL | BL | - |
| 13 | Chip resistor | BL | BL | BL | BL | BL |
| 14 | Chip yellow capacitor | BL | BL | BL | BL | BL |
| 15 | Chip magnetic frame inductor | BL | BL | BL | X* | BL |
| 16 | White label | BL | BL | BL | BL | BL |
| 17 | Metal shell(Micro joint) | BL | BL | BL | X* | - |
| 18 | Black plastic joint(Micro joint) | BL | BL | BL | BL | BL |
| 19 | Pin(Micro joint) | BL | BL | BL | BL | - |
| 20 | Black foam cotton | BL | BL | BL | BL | BL |
| 21 | Thermistor | OL* | BL | BL | BL | X* |
| 22 | Red enameled wire | BL | BL | BL | BL | - |
| 23 | White glue(coil) | BL | BL | BL | X* | BL |
| 24 | Cotton(coil) | BL | BL | BL | BL | BL |





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# Test Report



| Seq. No. | Tested Part(s) | Results(mg/kg) | | | | |
|---|---|---|---|---|---|---|
| | | Cd | Pb | Hg | Cr | Br |
| 25 | Enameled wire(coil) | BL | BL | BL | BL | - |
| 26 | Black ceramics(coil) | BL | BL | BL | BL | BL |
| Difference | | | | | | |
| 27 | Bright black rubber frame(Bright black charging seat) | BL | BL | BL | BL | BL |
| 28 | Bright black plastic shell(Bright black charging seat) | BL | BL | BL | BL | BL |
| 29 | Black rubber mats(Bright black charging seat) | BL | BL | BL | BL | BL |
| 30 | White rubber frame(White charging seat) | BL | BL | BL | BL | BL |
| 31 | White plastic shell(White charging seat) | BL | BL | BL | BL | BL |
| 32 | White rubber mats(White charging seat) | BL | BL | BL | BL | BL |
| 33 | Silver coating(White charging seat) | BL | BL | BL | BL | BL |
| 34 | Black plastic frame(White charging seat) | BL | BL | BL | X* | BL |

| Element | Unit | Non-metal | Metal | Composite Material |
|---|---|---|---|---|
| Cd | mg/kg | BL≤70-3σ<X <130+3σ≤OL | BL≤70-3σ<X <130+3σ≤OL | BL≤50-3σ<X <150+3σ≤OL |
| Pb | mg/kg | BL≤700-3σ<X <1300+3σ≤OL | BL≤700-3σ<X <1300+3σ≤OL | BL≤500-3σ<X <1500+3σ≤OL |
| Hg | mg/kg | BL≤700-3σ<X <1300+3σ≤OL | BL≤700-3σ<X <1300+3σ≤OL | BL≤500-3σ<X <1500+3σ≤OL |
| Cr | mg/kg | BL≤700-3σ<X | BL≤700-3σ<X | BL≤500-3σ<X |
| Br | mg/kg | BL≤300-3σ<X | - | BL≤250-3σ<X |

Note: BL= Below Limit
OL= Over limited
X= Inconclusive
"-"= Not regulated
*= Scanning by XRF and detected by chemical method. The test results of chemical method please refer to next pages.





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Remark:

i Results were obtained by XRF for primary scanning, 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 above warning value according to IEC 62321-3-1:2013 Ed 1.0.

ii The XRF scanning test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

iii The maximum permissible limit is quoted from RoHS directive 2011/65/EU:

| 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 |

Disclaimers:

This XRF Scanning 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 scanning 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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# Test Report



**B、<u>The Test Results of Chemical Method:</u>**

1) The Test Results of Cd

| Test Item(s) | Unit | Result(s) |
|---|---|---|
| | | 21 |
| Cadmium(Cd) | mg/kg | N.D. |

Note: N.D. = Not Detected or less than MDL
MDL = Method Detection Limit

2) The Test Results of non-metal $Cr^{6+}$

| Test Item(s) | Unit | Result(s) | | | Limit |
|---|---|---|---|---|---|
| | | 15 | 23 | 34 | |
| Hexavalent Chromium($Cr^{6+}$) | mg/kg | N.D. | N.D. | N.D. | 1000 |

Note: N.D. = Not Detected or less than MDL
MDL = Method Detection Limit





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3)The Test Results of metal $Cr^{6+}$

| Test Item(s) | MDL | Result(s) | Limit |
|---|---|---|---|
| | | 17 | |
| Hexavalent Chromium ($Cr^{6+}$) | See note | Negative | # |

Note:

- Negative = Absence of Cr(Ⅵ) on the tested areas
- MDL = Method Detection Limit
- Boiling-water-extraction:

| Number | Colorimetric result (Cr(VI) concentration) | Qualitative result |
|---|---|---|
| 1 | The sample solution is<the 0,10 μg/cm$^2$ equivalent comparison standard solution | The sample is negative for Cr(VI) − The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating. |
| 2 | The sample solution is ≥ the 0,10 μg/cm$^2$ and ≤ the0,13 μg/cm$^2$ equivalent comparison standard solutions | The result is considered to be inconclusive – Unavoidable coating variations may influence the determination. |
| 3 | The sample solution is > the 0,13 μg/cm$^2$ equivalent comparison standard solution | The sample is positive for Cr(VI) − The Cr(VI) concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI). |

- # =Negative indicates the absence of Cr(Ⅵ) on the tested areas concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.

Uncertainty indicates the absence of Cr(Ⅵ) on the tested areas unavoidable coating variations may influence the determination.

Positive indicates the presence of Cr(Ⅵ) on the tested areas concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

Storage conditions and production date of the tested sample are unavailable and thus result of Cr(VI) represent status of the sample at the time of testing.





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# Test Report



4) The Test Results of PBBs & PBDEs

Unit: mg/kg

| Item(s) | MDL | Result(s) | | Limit |
|---|---|---|---|---|
| | | 8 | 21 | |
| **Polybrominated Biphenyls (PBBs)** | | | | |
| Monobromobiphenyl | 5 | N.D. | N.D. | Total PBBs Content <1000 |
| Dibromobiphenyl | 5 | N.D. | N.D. | |
| Tribromobiphenyl | 5 | N.D. | N.D. | |
| Tetrabromobiphenyl | 5 | N.D. | N.D. | |
| Pentabromobiphenyl | 5 | N.D. | N.D. | |
| Hexabromobiphenyl | 5 | N.D. | N.D. | |
| Heptabromobiphenyl | 5 | N.D. | N.D. | |
| Octabromobiphenyl | 5 | N.D. | N.D. | |
| Nonabromodiphenyl | 5 | N.D. | N.D. | |
| Decabromodiphenyl | 5 | N.D. | N.D. | |
| Total content | / | N.D. | N.D. | |
| **Polybrominated Diphenylethers (PBDEs)** | | | | |
| Monobromodiphenyl ether | 5 | N.D. | N.D. | Total PBDEs Content <1000 |
| Dibromodiphenyl ether | 5 | N.D. | N.D. | |
| Tribromodiphenyl ether | 5 | N.D. | N.D. | |
| Tetrabromodiphenyl ether | 5 | N.D. | N.D. | |
| Pentabromodiphenyl ether | 5 | N.D. | N.D. | |
| Hexabromodiphenyl ether | 5 | N.D. | N.D. | |
| Heptabromodiphenyl ether | 5 | N.D. | N.D. | |
| Octabromodiphenyl ether | 5 | N.D. | N.D. | |
| Nonabromodiphenyl ether | 5 | N.D. | N.D. | |
| Decabromodiphenyl ether | 5 | N.D. | N.D. | |
| Total content | / | N.D. | N.D. | |
| **Conclusion** | / | **Pass** | **Pass** | / |

Note: N.D. = Not Detected or less than MDL
MDL = Method Detection Limit





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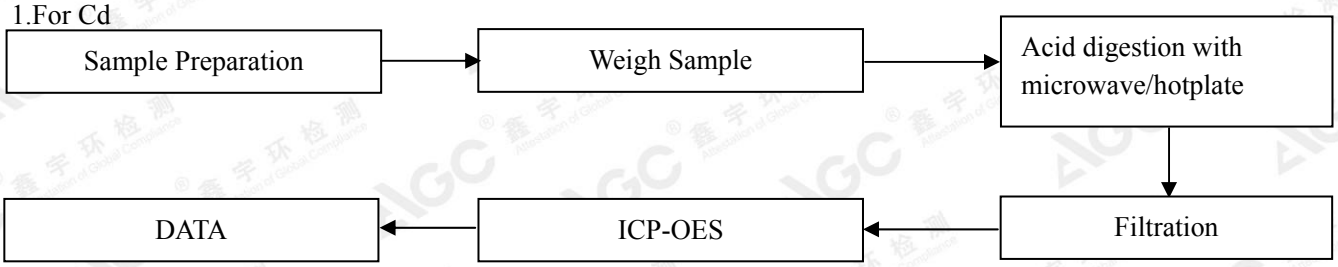
# Test Report

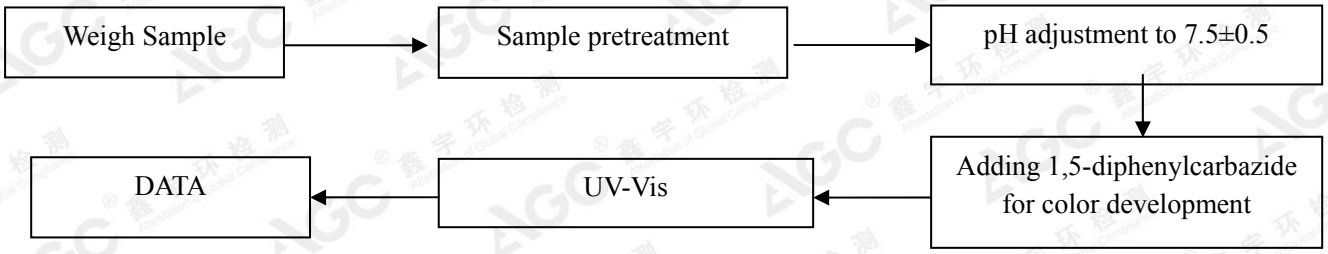


## Test Flow Chart

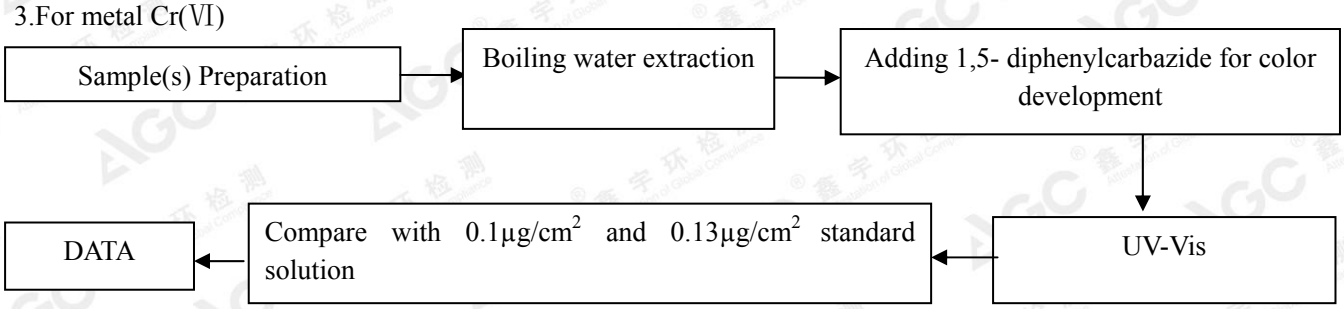
1.For Cd



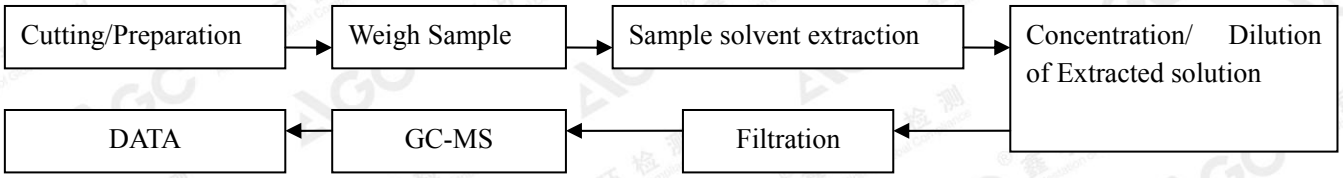

2.For non-metal Cr(Ⅵ)




3.For metal Cr(Ⅵ)




4.For PBBs & PBDEs




**The test results of No.1 to No.26 copied from test results of No.1 to No.26 of report No.: A001R20171227049-1.**





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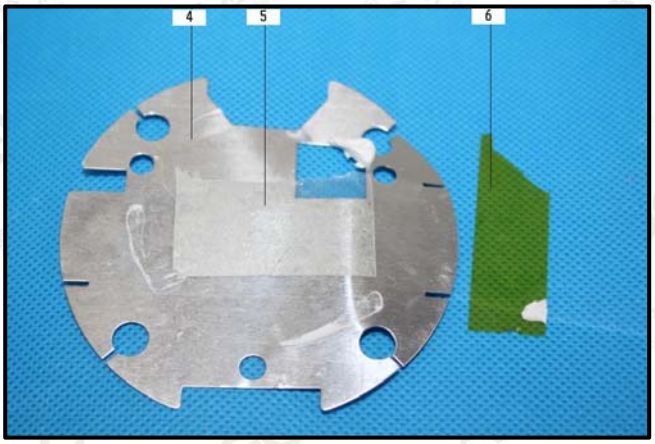
## The photo of the sample


1


2

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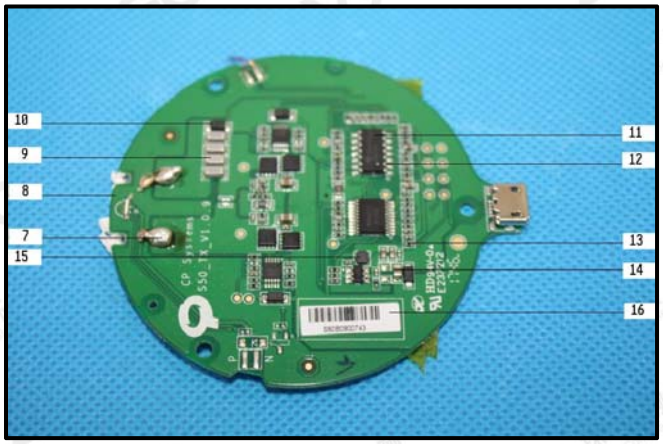


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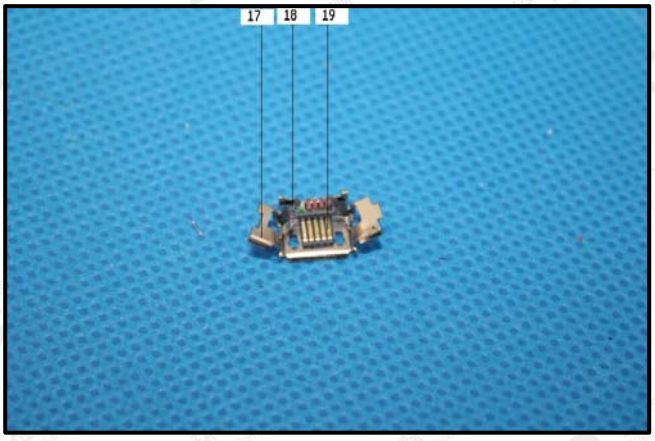


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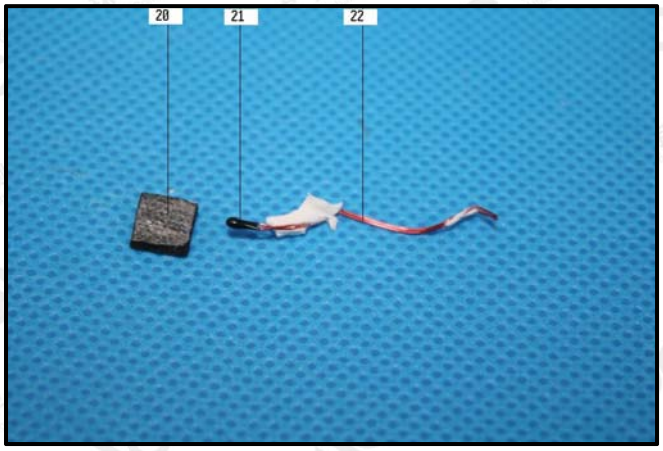


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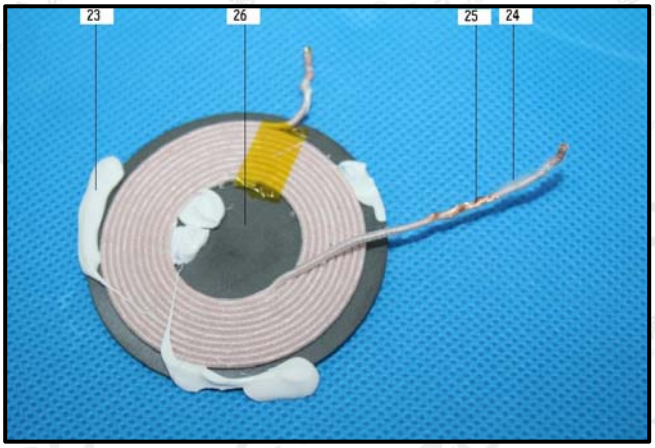


7


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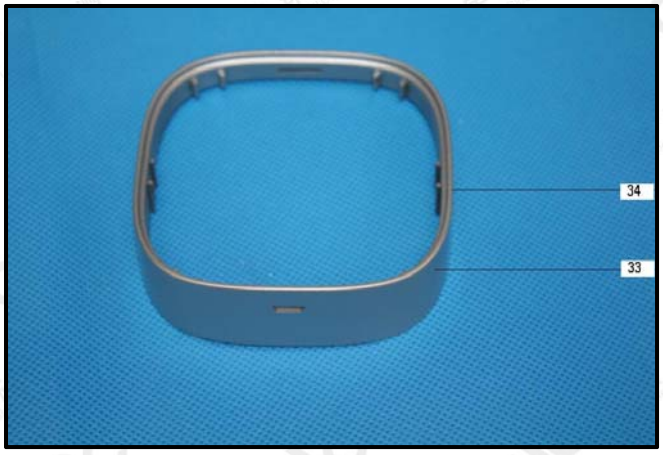
9




10



AGC authenticate the photo only on original report

*** End of Report ***