中国认可
国际互认
检测
TESTING
CNAS L6478

# TEST REPORT

| | | |
|---|---|---|
| **Report No.** | : | WTF20F08051680C |
| **Applicant** | : | Mid Ocean Brands B.V. |
| **Address** | : | 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong |
| **Manufacturer** | : | 111906 |
| **Sample Name** | : | Earphone in case |
| **Model No.** | : | MO8149 |
| **Sample Receiving Date** | : | 2020-08-03 |
| **Testing Period** | : | 2020-08-03 to 2020-08-07 |
| **Date of Issue** | : | 2020-08-07 |
| **Test Result** | : | Please refer to next page (s) |

Remarks:
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Approved by: Swing.Liang / Technical Manager

| | | |
|---|---|---|
| **Test Requested**..... | : | In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863. |
| **Test Method** ..... | : | 1) With Reference to IEC 62321-2:2013, disassembly, disjunction and mechanical sample preparation<br>2) With Reference to IEC 62321-3-1:2013, screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry<br>3) With reference to IEC 62321-4:2013+AMD1:2017 CSV, determination of Mercury by ICP-OES<br>4) With reference to IEC 62321-5:2013, determination of Lead and Cadmium by ICP-OES<br>5) With reference to IEC 62321-7-2: 2017 and IEC 62321-7-1: 2015, determination of Hexavalent Chromium by UV-Vis<br>6) With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS<br>7) With reference to IEC 62321-8:2017, determination of Phthalates content by GC-MS. |
| **Test Conclusion**..... | : | **Pass** (Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863) |

**Test Results:**

**1. Lead, Mercury, Cadmium, Hexavalent Chromium, PBBs and PBDEs**

| Part No. | Part Description | Result of XRF | | | | | Result of Wet Chemical Testing (mg/kg) |
|---|---|---|---|---|---|---|---|
| | | Cd | Pb | Hg | Cr | Br | |
| 1 | White plastic shell | BL | BL | BL | BL | BL | NA |
| 2 | Transparent plastic cover | BL | BL | BL | BL | BL | NA |
| 3 | White plastic holder of earphone | BL | BL | BL | BL | BL | NA |
| 4 | White plastic shell of earphone | BL | BL | BL | BL | BL | NA |
| 5 | Blue plastic shell with silvery printing of earphone | BL | BL | BL | BL | BL | NA |
| 6 | White soft plastic stopper of earphone | BL | BL | BL | BL | BL | NA |
| 7 | Green plastic shell with silvery printing of earphone | BL | BL | BL | BL | BL | NA |
| 8 | White plastic wire covering | BL | BL | BL | BL | BL | NA |
| 9 | White fibrous wire | BL | BL | BL | BL | BL | NA |
| 10 | Coppery metal wire | BL | BL | BL | BL | BL | NA |
| 11 | Blue metal wire | BL | BL | BL | BL | BL | NA |
| 12 | Silvery metal shell of loudspeaker | BL | BL | BL | IN | BL | $Cr^{6+}$ : Negative |
| 13 | Pink glue | BL | BL | BL | BL | BL | NA |
| 14 | Dark grey magnetic ring | BL | BL | BL | IN | BL | $Cr^{6+}$ : ND |
| 15 | Solder | BL | BL | BL | BL | BL | NA |
| 16 | Green PCB | BL | BL | BL | BL | BL | NA |
| 17 | Semi-transparent plastic film of loudspeaker | BL | BL | BL | BL | BL | NA |
| 18 | Coppery metal winding of loudspeaker | BL | BL | BL | BL | BL | NA |
| 19 | White plastic shell of plug | BL | BL | BL | BL | BL | NA |

| Part No. | Part Description | Result of XRF | | | | | Result of Wet Chemical Testing (mg/kg) |
|---|---|---|---|---|---|---|---|
| | | Cd | Pb | Hg | Cr | Br | |
| 20 | Solder of plug | BL | BL | BL | BL | BL | NA |
| 21 | Silvery metal sleeve of plug | BL | BL | BL | BL | BL | NA |
| 22 | Black plastic core of plug | BL | BL | BL | BL | BL | NA |
| 23 | Silvery metal pin of plug | BL | BL | BL | BL | BL | NA |
| 24 | White soft plastic cord anchorage | BL | BL | BL | BL | BL | NA |

**Remark:**

(1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for $Cr^{6+}$) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1: 2013 (unit: mg/kg)

| Element | Polymer | Metal | Composite Materials |
|---|---|---|---|
| Cd | BL ≤ (70-3σ) < IN < (130+3σ) ≤ OL | BL ≤ (70-3σ) < IN < (130+3σ) ≤ OL | LOD < IN < (150+3σ) ≤ OL |
| Pb | BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL | BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL | BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL |
| Hg | BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL | BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL | BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL |
| Cr | BL ≤ (700-3σ) < IN | BL ≤ (700-3σ) <IN | BL ≤ (500-3σ) < IN |
| Br | BL ≤ (300-3σ) < IN | -- | BL ≤ (250-3σ) < IN |

BL= Below Limit OL= Over Limit LOD = Limit of Detection -- = Not Regulated

(2) "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.

(3) The XRF screening test for RoHS elements – the reading may be different to the actual content in the sample be of non-uniformity composition.

(4) mg / kg =milligram per kilogram=ppm, $\mu g/cm^2$= Micrograms per square centimetre.

(5) ND = Not Detected or lower than limit of quantitation.

(6) NA = Not Applicable, as the XRF screening test result was below the limit or as the XRF screening directly determine that test result was over the limit, it was not need to conduct the wet chemical testing.

(7) LOQ = Limit of quantitation.

| Test Items | Pb | Cd | Hg | $Cr^{6+}$ | | PBB | PBDE |
|---|---|---|---|---|---|---|---|
| Units | mg/kg | mg/kg | mg/kg | mg/kg | $\mu g/cm^2$ | mg/kg | mg/kg |
| LOQ | 2 | 2 | 2 | 8 | 0.1 | 5 | 5 |

The LOQ for single compound of PBBs and PBDEs is 5mg/kg, LOQ of $Cr^{6+}$ for polymer and composite sample is 8mg/kg and LOQ of $Cr^{6+}$ for metal sample is 0.1μg/$cm^2$.

(8) RoHS Requirement

| Restricted Substances | Limits |
|---|---|
| Cadmium (Cd) | 0.01% (100 mg/kg) |
| Lead (Pb) | 0.1% (1000 mg/kg) |
| Mercury (Hg) | 0.1% (1000 mg/kg) |
| Chromium (VI) ($Cr^{6+}$) | 0.1% (1000 mg/kg) |
| Polybrominated Biphenyls (PBBs) | 0.1% (1000 mg/kg) |
| Polybrominated Diphenyl Ethers (PBDEs) | 0.1% (1000 mg/kg) |

(9) According to IEC 62321-7-1:2015, determined of $Cr^{6+}$ on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.
Boiling water extraction:
Negative = Absence of $Cr^{6+}$ coating, the detected concentration in boiling water extraction solution is less than 0.10ug/$cm^2$.
Positive = Presence of $Cr^{6+}$ coating, the detected concentration in boiling water extraction solution is greater than 0.13ug/$cm^2$.
Information on storage conditions and production date of the tested sample is unavailable and thus $Cr^{6+}$ results represent status of the sample at the time of testing.

(10) Abbreviation:
"Pb" denotes Lead, "Cd" denotes Cadmium, "Hg" denotes Mercury, "Cr" denotes Chromium, "Cr (VI)" denotes Hexavalent Chromium, "Br" denotes Bromine, "PBBs" denotes Total Polybrominated Biphenyls, "PBDEs" denotes Total Polybrominated Diphenyl Ethers.

**2. Phthalates:**

| Serial No. | Part No. | Result (mg/kg) | | | |
|---|---|---|---|---|---|
| | | DBP | BBP | DEHP | DIBP |
| T01 | 1+2+3+4+5△ | <50 | <50 | <50 | <50 |
| T02 | 6 | <50 | <50 | <50 | <50 |
| T03 | 7 | <50 | <50 | <50 | <50 |
| T04 | 8 | <50 | <50 | <50 | <50 |
| T05 | 9 | <50 | <50 | 66 | <50 |
| T06 | 13 | <50 | <50 | <50 | <50 |
| T07 | 14+16△ | <50 | <50 | <50 | <50 |
| T08 | 17 | 145 | <50 | 77 | 78 |
| T09 | 19 | <50 | <50 | <50 | <50 |
| T10 | 22 | <50 | <50 | <50 | <50 |
| T11 | 24 | <50 | <50 | <50 | <50 |

**Note:**

(1) "<" = less than

(2) mg/kg = milligram per kilogram= ppm

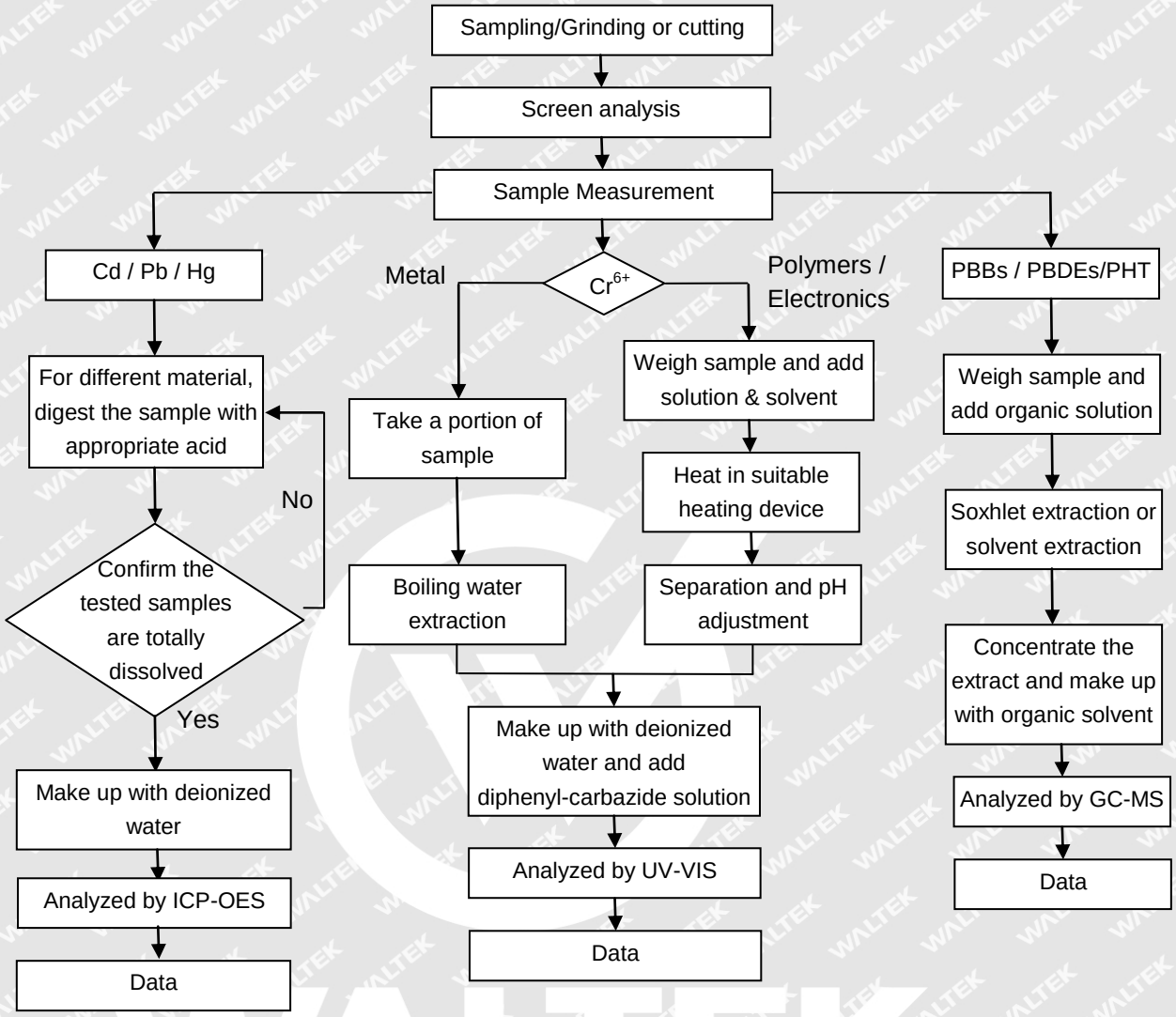
(3) Abbreviation:
"DBP" denotes Dibutyl phthalate, "BBP" denotes Benzyl butyl phthalate (BBP), "DEHP" denotes Bis(2-ethylhexyl)-phthalate, "DIBP" denotes Diisobutyl phthalate, "PHT" denotes Phthalates.

(4) RoHS requirement

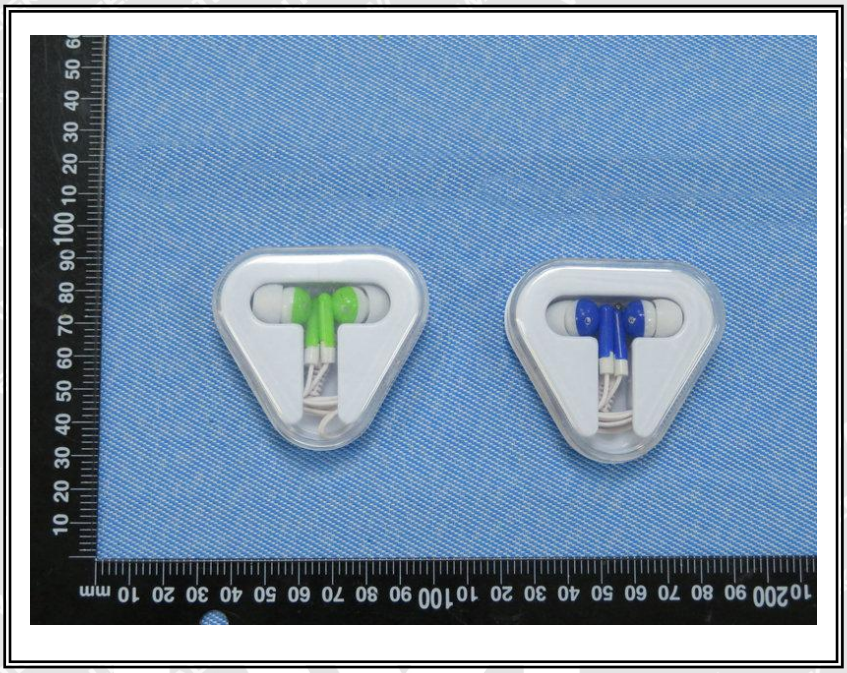
| Restricted Substances | Limits |
|---|---|
| Dibutyl phthalate (DBP) | 0.1% (1000 mg/kg) |
| Benzyl butyl phthalate (BBP) | 0.1% (1000 mg/kg) |
| Di(2-ethylhexyl) phthalate (DEHP) | 0.1% (1000 mg/kg) |
| Di-iso-butyl phthalate (DIBP) | 0.1% (1000 mg/kg) |

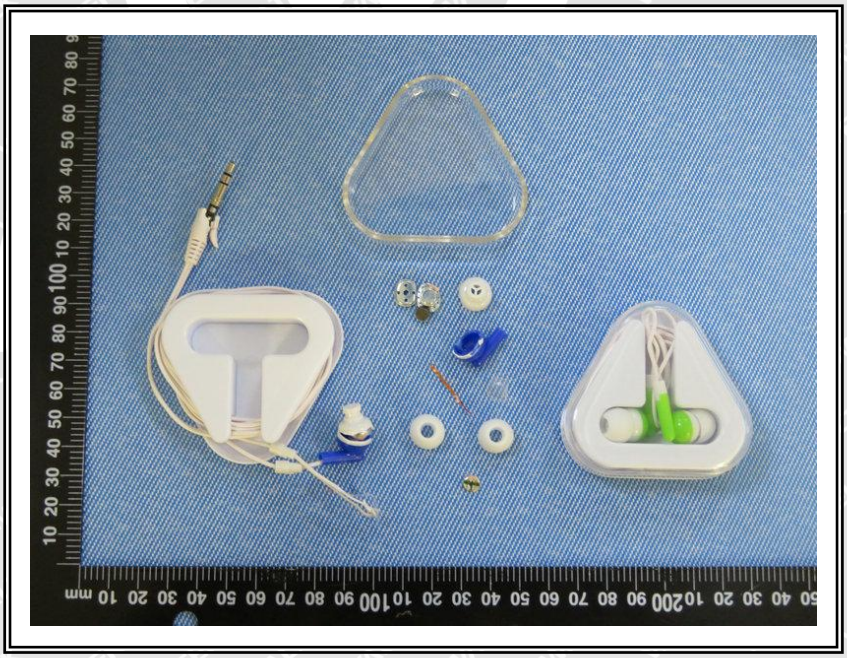
(5) "△"= As client's requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

**Measurement Flowchart:**

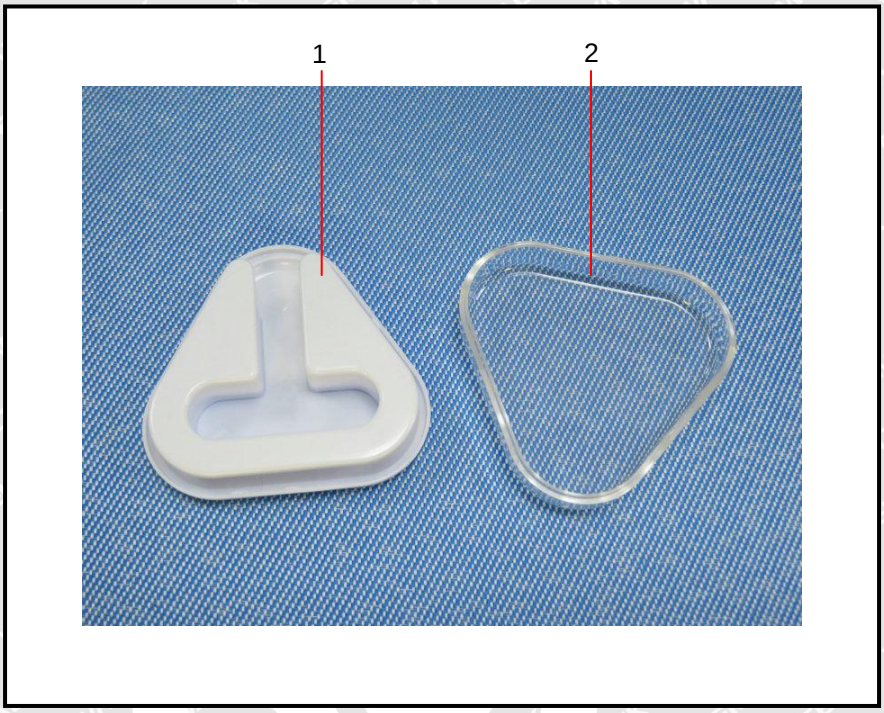


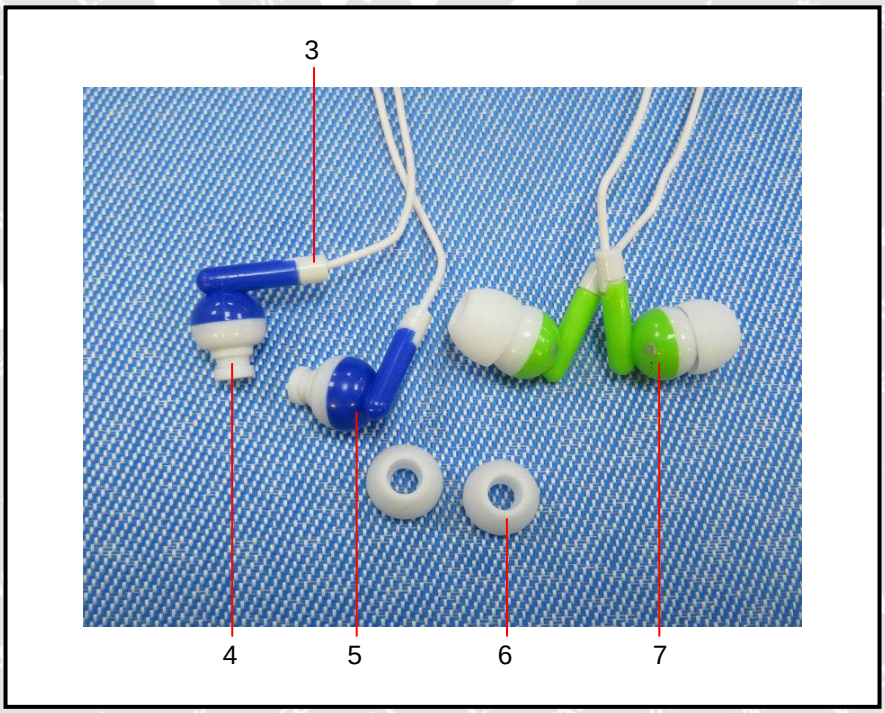
**Sample Photo(s):**

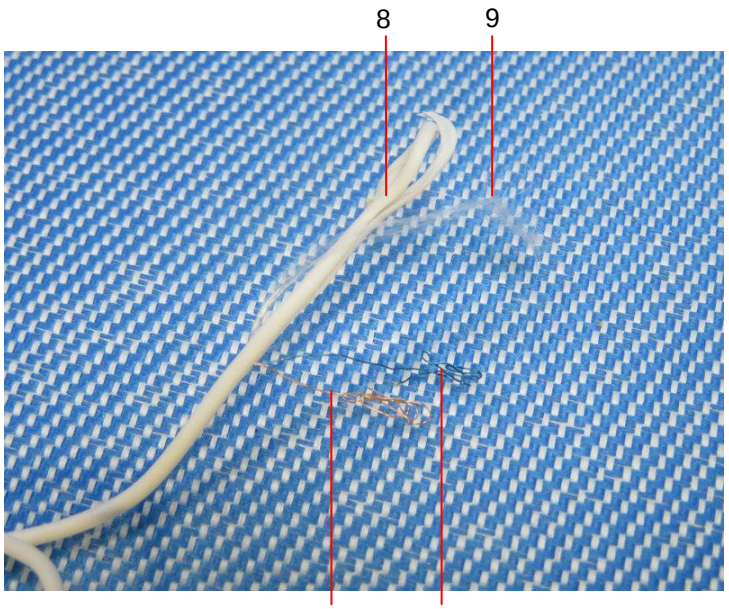




**Photograph of parts tested:**

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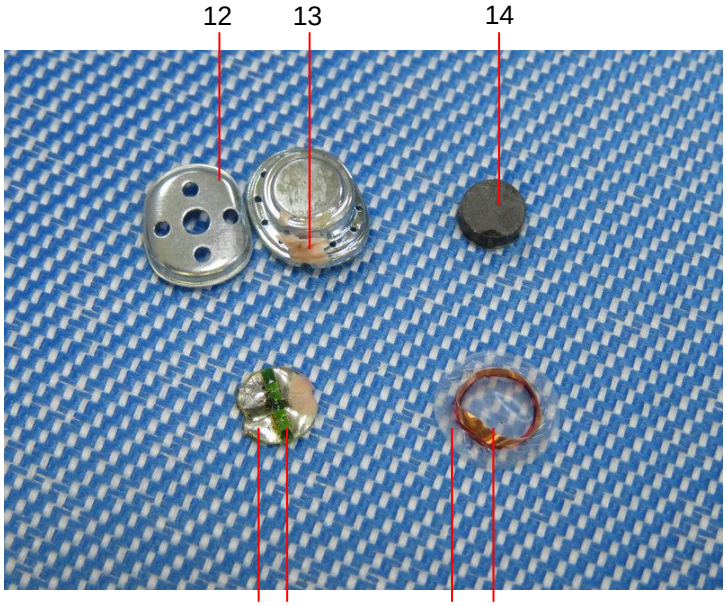
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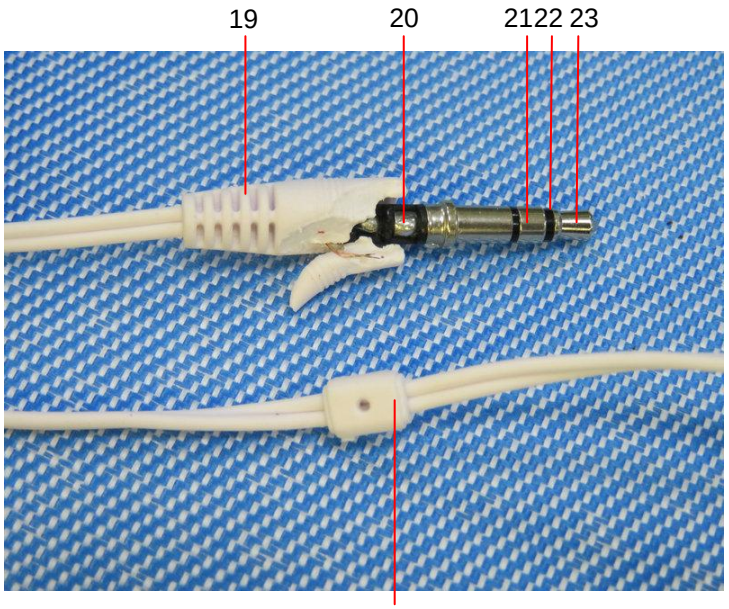


====== End of Report ======