

Test Report 測試報告

Applicant 申請廠商: Sharkoon Technologies GmbH
Siemensstrasse 38,
35440 Linden, Germany.

Number : TWNC00624268
報告號碼

Date 日期 : Aug 17, 2017

Sample Description 樣品敘述:

One (1) group of submitted samples said to be :

以下測試樣品乃供應商所提供及確認 :

Sample Description : SHARKOON PUREWRITER TKL

樣品名稱

Date Sample Received : Jul 31, 2017

收件日期

Date Test Started : Jul 31, 2017

開始測試日期

Test Conducted 測試執行:

As requested by the applicant, for details please refer to attached pages.

依申請商之要求, 細節請參考附頁.

Conclusion 結論:

Please see page two.

請參考第二頁.

Authorized by:

On Behalf of Intertek Testing Services
Taiwan Limited



Matt Wang
Sr. Manager



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Test Report 測試報告

Number : TWNC00624268
報告號碼

Conclusion:

結論

Tested Samples

測試樣品

Screening components of submitted samples

測試部位

Standard

標準

With reference to test method of IEC 62321 edition 1.0:2013 part 3-1, screening by XRF spectroscopy and chemical confirmation test for RoHS Directive (2011/65/EU)

依據危害物質限制指令 RoHS Directive (2011/65/EU), 參考測試方法 IEC 62321 版本 1.0:2013 part 3-1, 以 X 射線螢光光譜法作篩檢測試及進行化學確認測試

Result

結果

Pass
合格

Remark:

備註

As requested by the applicant, only components shown in this report were screened by XRF spectroscopy for 2011/65/EU. Other components were not screened in this report.

依據客戶要求, 只有表列於報告中的部位有依照 2011/65/EU 以 X 射線螢光光譜法作篩檢測試, 此報告中其他部位未被篩檢。

Chemical confirmation tests were conducted to verify the inconclusive results of XRF tests.

為查證 XRF 測試中的不確定結果, 已進行化學確認測試。

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Test Conducted 測試內容 :

XRF Screening Test

X 射線螢光光譜法篩檢測試

Contents of cadmium (Cd), lead (Pb), mercury (Hg), chromium (Cr) and bromine (Br) were measured by XRF spectroscopy. The further wet chemical tests will be conducted if necessary.

以 X 射線螢光光譜法進行鎘(Cd), 鉛(Pb), 汞(Hg), 鉻(Cr)與溴(Br) 的含量篩檢測試，必要時會以化學測試進行確認。

Test Result Summary 測試結果:

| | Tested Component 測試部位 | XRF screening X 射線螢光光譜法篩檢測試 | | Chemical testing 化學測試 | | |
|---|-------------------------------------|--------------------------------|-------------------------|----------------------------------|----------------------------|---------------------------------------|
| | | Element 元素 | Result (ppm) 結果(ppm) | Cr ⁶⁺ 六價鉻 (ppm) | Pb/Cd/Hg 鉛/鎘/汞 (ppm) | PBBs/PBDEs 多溴聯苯/多 溴聯苯醚 (ppm) |
| 1 | Black metal top cover | Cd | ND | Negative | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | 3658 | | | |
| | | Br | NA | | -- | |
| 2 | Black/silvery/off-white plastic key | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | -- | |
| | | Br | ND | | -- | |
| 3 | Black plastic bottom | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | -- | |
| | | Br | ND | | -- | |
| 4 | Black plastic feet | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | -- | |
| | | Br | ND | | -- | |
| 5 | Black soft plastic pad | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | -- | |
| | | Br | ND | | -- | |



Test Conducted 測試內容 :

| | Tested Component 測試部位 | XRF screening X 射線螢光光譜法篩檢測試 | | Chemical testing 化學測試 | | |
|----|---------------------------|--------------------------------|-------------------------|----------------------------------|----------------------------|---------------------------------------|
| | | Element 元素 | Result (ppm) 結果(ppm) | Cr ⁶⁺ 六價鉻 (ppm) | Pb/Cd/Hg 鉛/鎘/汞 (ppm) | PBBs/PBDEs 多溴聯苯/多 溴聯苯醚 (ppm) |
| 6 | Black metal screw | Cd | ND | Negative | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | 2609 | | | |
| | | Br | NA | | -- | |
| 7 | Silvery metal support pin | Cd | ND | Negative | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | 155300 | | | |
| | | Br | NA | | -- | |
| 8 | Black plastic socket | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | | |
| | | Br | ND | | -- | |
| 9 | White plastic frame | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | | |
| | | Br | ND | | -- | |
| 10 | Transparent plastic frame | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | | |
| | | Br | ND | | -- | |
| 11 | Blue plastic key | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | | |
| | | Br | ND | | -- | |



Test Conducted 測試內容 :

| | Tested Component 測試部位 | XRF screening X 射線螢光光譜法篩檢測試 | | Chemical testing 化學測試 | | |
|----|--|--------------------------------|-------------------------|----------------------------------|----------------------------|---------------------------------------|
| | | Element 元素 | Result (ppm) 結果(ppm) | Cr ⁶⁺ 六價鉻 (ppm) | Pb/Cd/Hg 鉛/鎘/汞 (ppm) | PBBs/PBDEs 多溴聯苯/多 溴聯苯醚 (ppm) |
| 12 | Silvery metal spring | Cd | ND | Negative | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | 175300 | | | |
| | | Br | NA | | -- | |
| 13 | Silvery metal spring | Cd | ND | Negative | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | 175600 | | | |
| | | Br | NA | | -- | |
| 14 | Golden metal contact | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | | |
| | | Br | NA | | -- | |
| 15 | Coppery metal contact | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | | |
| | | Br | NA | | -- | |
| 16 | Black plastic frame | Cd | ND | -- | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | | | |
| | | Br | ND | | -- | |
| 17 | PCBA [The all tested components were excluded] | Cd | -- | NA | ND | |
| | | Pb | -- | | 4 | |
| | | Hg | -- | | ND | |
| | | Cr | -- | | | |
| | | Br | -- | | | |
| | | | | | | PBBs :ND |
| | | | | | | PBDEs: ND |



Test Conducted 測試內容 :

| | Tested Component 測試部位 | XRF screening X 射線螢光光譜法篩檢測試 | | Chemical testing 化學測試 | | |
|----|---|--------------------------------|-------------------------|----------------------------------|----------------------------|---------------------------------------|
| | | Element 元素 | Result (ppm) 結果(ppm) | Cr ⁶⁺ 六價鉻 (ppm) | Pb/Cd/Hg 鉛/鎘/汞 (ppm) | PBBs/PBDEs 多溴聯苯/多 溴聯苯醚 (ppm) |
| 18 | Glass diode - orange glass molding part | Cd | ND | | -- | |
| | | Pb | 118600(#) | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |
| 19 | Mini USB jack - silvery metal frame | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | NA | | -- | |
| 20 | Mini USB jack - blackish grey plastic socket | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | 386 | | PBBs :ND PBDEs: ND | |
| 21 | Mini USB jack - silvery/golden metal pin | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | NA | | -- | |
| 22 | SMD LED - white molding part | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |
| 23 | Chip - black molding part | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |



Test Conducted 測試內容 :

| | Tested Component 測試部位 | XRF screening X 射線螢光光譜法篩檢測試 | | Chemical testing 化學測試 | | |
|----|-------------------------------------|--------------------------------|-------------------------|----------------------------------|----------------------------|---------------------------------------|
| | | Element 元素 | Result (ppm) 結果(ppm) | Cr ⁶⁺ 六價鉻 (ppm) | Pb/Cd/Hg 鉛/鎘/汞 (ppm) | PBBs/PBDEs 多溴聯苯/多 溴聯苯醚 (ppm) |
| 24 | Chip - black molding part | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | -- |
| | | Br | ND | | | -- |
| 25 | USB plug - black strain relief hood | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | -- |
| | | Br | ND | | | -- |
| 26 | USB plug - golden metal frame | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | -- |
| | | Br | NA | | | -- |
| 27 | USB plug - white plastic socket | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | -- |
| | | Br | ND | | | -- |
| 28 | USB plug - golden metal pin | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | -- |
| | | Br | NA | | | -- |
| 29 | USB plug - golden metal frame | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | 131200 | Negative | | -- |
| | | Br | NA | | | -- |



Test Conducted 測試內容 :

| | Tested Component 測試部位 | XRF screening X 射線螢光光譜法篩檢測試 | | Chemical testing 化學測試 | | |
|----|---|--------------------------------|-------------------------|----------------------------------|----------------------------|---------------------------------------|
| | | Element 元素 | Result (ppm) 結果(ppm) | Cr ⁶⁺ 六價鉻 (ppm) | Pb/Cd/Hg 鉛/鎘/汞 (ppm) | PBBs/PBDEs 多溴聯苯/多 溴聯苯醚 (ppm) |
| 30 | USB plug - blackish grey plastic socket | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |
| 31 | USB plug - golden metal pin | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | NA | | -- | |
| 32 | White cable jacket | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |
| 33 | Green cable jacket | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |
| 34 | Red cable jacket | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |
| 35 | Black cable jacket | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |



Test Conducted 測試內容 :

| | Tested Component 測試部位 | XRF screening X 射線螢光光譜法篩檢測試 | | Chemical testing 化學測試 | | |
|----|--------------------------|--------------------------------|-------------------------|----------------------------------|----------------------------|---------------------------------------|
| | | Element 元素 | Result (ppm) 結果(ppm) | Cr ⁶⁺ 六價鉻 (ppm) | Pb/Cd/Hg 鉛/鎘/汞 (ppm) | PBBs/PBDEs 多溴聯苯/多 溴聯苯醚 (ppm) |
| 36 | Silvery metal wire | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | NA | | -- | |
| 37 | Coppery metal wire | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | NA | | -- | |
| 38 | Black cable insulator | Cd | ND | | -- | |
| | | Pb | ND | | -- | |
| | | Hg | ND | | -- | |
| | | Cr | ND | -- | | |
| | | Br | ND | | -- | |

Remarks: ppm = Parts per million = mg/kg
備註 百萬分之一 = 毫克/公斤

ND = Not detected and pass, the screened sample is found to be under detection limit of table II.
未檢測出且合格, 測試部位的結果低於表格 II 中的偵測極限

NA = Not applicable
不適用

-- = Not tested 未檢測

Negative = A negative test result indicated positive observation was not found at the time of test.
When the spot test showed a negative result, the boiling water extraction procedure shall be used to verify the result.
A negative test result indicated positive observation was not found at the time of test.
此陰性結果顯示樣品在分析過程中無發現任何陽性現象的存在。若點測試的結果為陰性, 應以沸水萃取法查證結果。

- As per applicant's request, the Chromium VI (Cr⁶⁺) content of metal material was conducted spot test only.
依據客戶要求, 金屬材質的部位僅以點測試測量六價鉻含量。

- PCB assembly was ground and randomly selected for test.
印刷電路板經粉碎及隨機均勻取樣後進行測試。

= As claimed by the declaration submitted by the client, the tested component was within the scope of RoHS (2011/65/EU-7(c)-I) exemption: Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.
依據客戶出具之材質確認書, 此測試部位符合 RoHS 指令(2011/65/EU-7(c)-I)之排除項目: 電氣電子設備的玻璃或陶瓷(電容中絕緣陶瓷除外)或玻璃或陶瓷混合物中的鉛(例如: 壓電陶瓷器件)。



Test Conducted 測試內容 :

Responsibility of Chemist 分析人員 : PelnY Hsiao/ Vita Fu

Date Sample Received 樣品收件日期 : Jul 31, 2017

Test Period 樣品測試期間 : Jul 31, 2017 to Aug 17, 2017

Table I: XRF screening limits in mg/kg for regulated elements in various materials.

表格 I: X 射線螢光光譜法在不同材質中對不同元素的篩檢極限(mg/kg)

| Element 元素 | Polymer Materials 聚合物材質 | Metallic Materials 金屬材質 | Composite Materials 複合性材質 |
|---------------|----------------------------|----------------------------|------------------------------|
| 鎘 (Cd) | BL ≤ 70 < X < 130 ≤ OL | BL ≤ 70 < X < 130 ≤ OL | BL ≤ 70 < X < 150 ≤ OL |
| 鉛 (Pb) | BL ≤ 700 < X < 1300 ≤ OL | BL ≤ 700 < X < 1300 ≤ OL | BL ≤ 500 < X < 1500 ≤ OL |
| 汞 (Hg) | BL ≤ 700 < X < 1300 ≤ OL | BL ≤ 700 < X < 1300 ≤ OL | BL ≤ 500 < X < 1500 ≤ OL |
| 鉻 (Cr) | BL ≤ 700 < X | BL ≤ 700 < X | BL ≤ 500 < X |
| 溴 (Br) | BL ≤ 300 < X | Not Applicable 不適用 | BL ≤ 250 < X |

Remarks: mg/kg = Milligram per kilogram = ppm

備註 百萬分之一 = 毫克/公斤

BL = Below Limit
低於極限

X = Inconclusive result
不確定的結果

OL = Over Limit
高於極限

Table II: Estimated detection limits in mg/kg for regulated elements in various matrices.

表格 II: 不同元素在不同材質中的偵測極限(/mg/kg)

| Element 元素 | Polymer Materials 聚合物材質 | Metallic Materials 金屬材質 | Composite Materials 複合性材質 |
|---------------|----------------------------|----------------------------|------------------------------|
| 鎘 (Cd) | 50 | 70 | 70 |
| 鉛 (Pb) | 100 | 200 | 200 |
| 汞 (Hg) | 100 | 200 | 200 |
| 鉻 (Cr) | 100 | 200 | 200 |
| 溴 (Br) | 200 | Not Applicable 不適用 | 200 |



Test Conducted 測試內容 :

Disclaimers:

聲明

The numerical test data of this XRF screening report is for reference purposes only due to the data variation incurred from various factors as described in next paragraph. 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.

此 XRF 篩檢報告僅作為參考之用，因測試結果會受到多種因素的影響，細節於下個段落中說明。
申請者應自行評估本報告中所提供的資訊是否符合其申請目的。

The results 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.

X 射線螢光光譜法篩檢的結果會受到很多因素影響，包含但不限於樣品的大小,厚度,面積,表面平整度,設備參數,與基質效應(舉例:塑膠,橡膠,金屬,陶瓷等)，需要進一步的化學前處理及相對應的化學分析設備以得到定量的數據。

Chemical Test Method 化學測試方法

| Test Item 測試項目 | Test Method 測試方法 | Reporting Limit 報告極限 |
|---|--|-------------------------|
| Cadmium (Cd) Content 鎘含量 | With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。 | 2 ppm |
| Lead (Pb) Content 鉛含量 | With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。 | 2 ppm |
| Mercury (Hg) Content 汞含量 | With reference to IEC 62321-4:2013+AMD1:2017, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4:2013+AMD1:2017，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。 | 2 ppm |
| Chromium VI (Cr ⁶⁺) Content 六價鉻含量 (for non-metal) | With reference to IEC 62321: 2008, by alkaline digestion and determined by UV-Vis Spectrophotometer. 參考 IEC 62321:2008，以鹼液消化並用紫外光-可見光分光光度計分析。 | 1 ppm |
| Chromium VI (Cr ⁶⁺) Content 六價鉻含量 (for metal) | With reference to IEC 62321: 2008, by spot test. 參考 IEC 62321:2008 第一版附錄 B，以點測試法分析。 | 1 ppm |
| Polybrominated Biphenyls (PBBs) 多溴聯苯 | With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。 | 5 ppm |
| Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚 | With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。 | 5 ppm |

Remark : Reporting Limit = Quantitation limit of analyte in sample 測試樣品之定量偵測極限備註



Test Conducted 測試內容 :

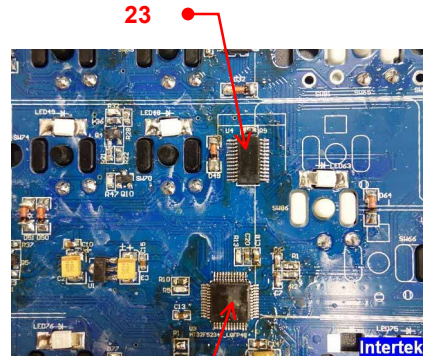
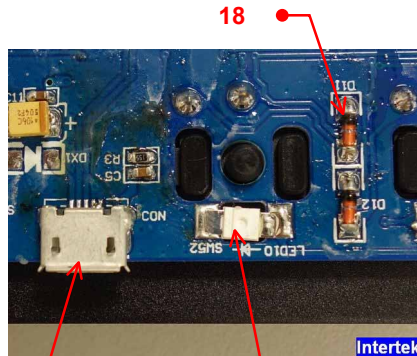
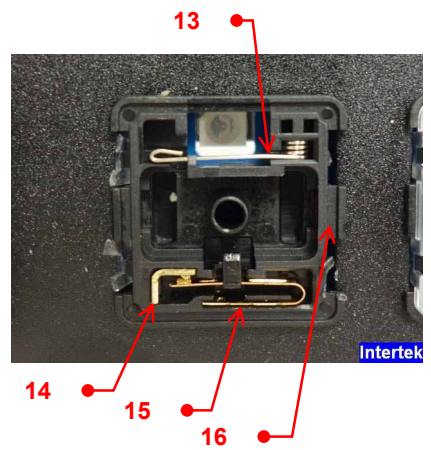
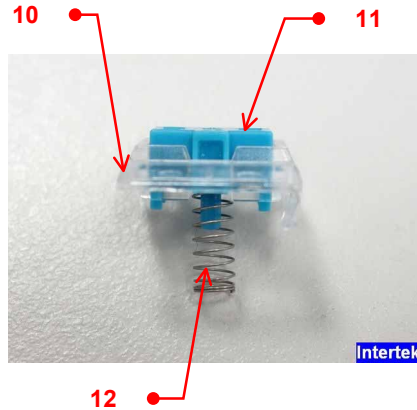
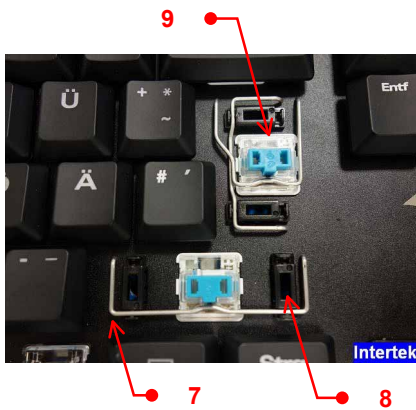
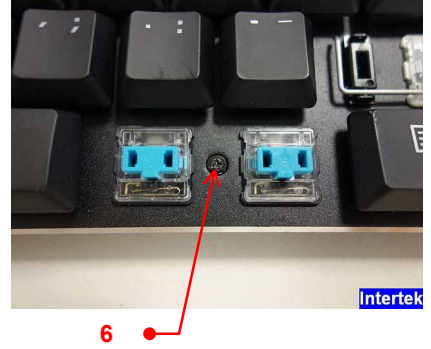
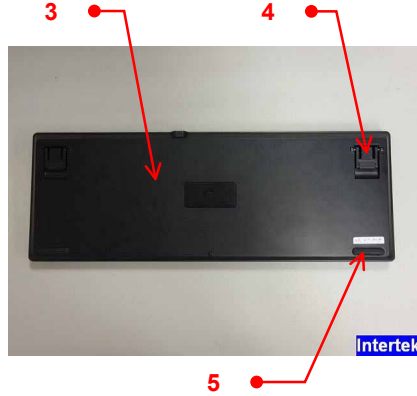
RoHS Limit RoHS 限值

| Restricted Substances 限用物質 | Limits 限值 |
|---|----------------|
| Cadmium (Cd) content 鎘含量 | 0.01% (100ppm) |
| Lead (Pb) content 鉛含量 | 0.1% (1000ppm) |
| Mercury (Hg) content 汞含量 | 0.1% (1000ppm) |
| Chromium VI (Cr ⁶⁺) content 六價鉻含量 | 0.1% (1000ppm) |
| Polybrominated Biphenyls (PBBs) 多溴聯苯 | 0.1% (1000ppm) |
| Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚 | 0.1% (1000ppm) |

The limits were quoted from Annex II of 2011/65/EU for homogeneous material.

本限值是依據歐盟指令 2011/65/EU 附錄二針對均質材質所訂定。



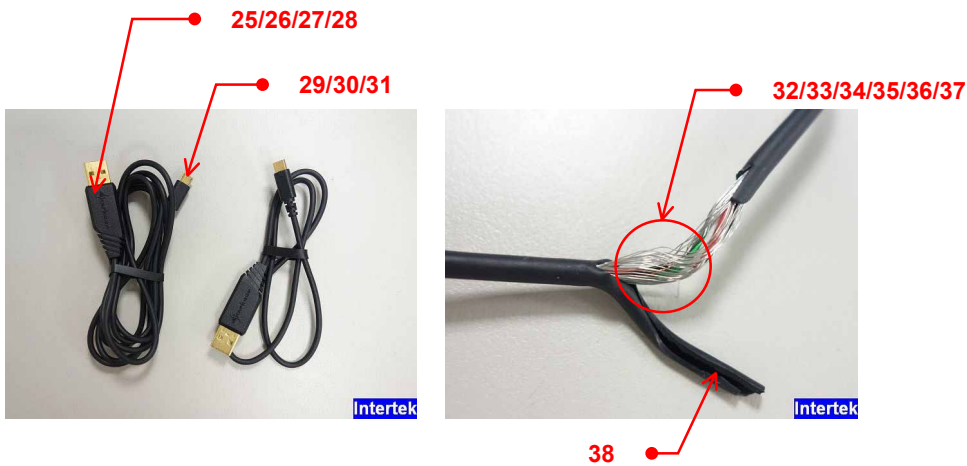


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End of Report

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