



**BUREAU  
VERITAS**

# TEST REPORT

LAB NO. 报告号 : (5509)335-1344-R1

DATE 日期 : December 15, 2009

PAGE 页码 : 1 OF 8

The report is amendment of and supersedes the previous report (5509)335-1344 dated December 10, 2009

**APPLICANT** : **Poly-tech Precision Industry Ltd.**  
 申请人公司名称 : Flat 8, 8/F, Shing Yip Industrial Building,  
 19-21 Shing Yip Street, Kwun Tong, Kowloon, Hong Kong

**CONTACT PERSON** : Philip Wong  
 联系人名称

**DATE OF SUBMISSION** : December 1, 2009  
 样品收取日期

**TEST PERIOD** : December 1, 2009 to December 10, 2009  
 所需工作周期

**NO. OF WORKING DAY(S)** : 8  
 所需工作日

**SAMPLE DESCRIPTION** : Ceramic trimmer Capacitor  
 样品描述  
 Color: Blue, white, red, green, yellow, brown  
 Style No.: CVN6050, CVN6070, CVN6100, CVN6200,  
 CVN6300, CVN6400, CVN6500, CVN6600,  
 CVN6700, CVN6900, CVN6120  
 Manufacturer: POLY-TECH  
 Country of Origin: Korea

## SUMMARY OF TEST RESULTS 测试结果摘要

| TEST REQUESTED 测试项目   | PASS 通过 | FAIL 不通过 | REMARK 备注 |
|---|---------|----------|-----------|
| Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC<br>有关欧洲针对电子产品的指令(电子电器禁用某些有害物质指令), 2002/95/EC | X       |          |           |

### REMARK

If there are questions or concerns on this report, please contact:

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RW

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**Photo of the Submitted Sample**

**递交样品照片**



Sample Number  
(5509)335-1344



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**TEST RESULT 测试结果**

**Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC**

有关欧洲针对电子产品的指令（电子电器禁用某些有害物质指令），2002/95/EC

| Compounds 化合物   | Tested item 测试项目 (ppm) |                        | RoHS' Limits<br>RoHS' 建议最高界限<br>(ppm) |
|---|------------------------|------------------------|---------------------------------------|
|   | 1                      | 2                      |                                       |
| Lead 铅 (Pb)   | ND                     | 10.2                   | 1000                                  |
| Mercury 汞 (Hg)  | ND                     | ND                     | 1000                                  |
| Cadmium 镉 (Cd)  | ND                     | ND                     | 100                                   |
| Chromium VI 六价铬 (Cr VI)                               | Negative <sup>2)</sup> | Negative <sup>2)</sup> | Negative                              |
| <b>Polybrominated Biphenyls 多溴联苯 (PBBs) :</b>         |                        |                        |                                       |
| Bromobiphenyls 一溴联苯                                   | NA                     | NA                     | /                                     |
| Dibromobiphenyls 二溴联苯                                 | NA                     | NA                     |                                       |
| Tribromobiphenyls 三溴联苯                                | NA                     | NA                     |                                       |
| Tetrabromobiphenyls 四溴联苯                              | NA                     | NA                     |                                       |
| Pentabromobiphenyls 五溴联苯                              | NA                     | NA                     |                                       |
| Hexabromobiphenyls 六溴联苯                               | NA                     | NA                     |                                       |
| Heptabromobiphenyls 七溴联苯                              | NA                     | NA                     |                                       |
| Octabromobiphenyls 八溴联苯                               | NA                     | NA                     |                                       |
| Nonabromobiphenyls 九溴联苯                               | NA                     | NA                     |                                       |
| Decabromobiphenyl 十溴联苯                                | NA                     | NA                     |                                       |
| Sum of PBBs 多溴联苯总和                                    | NA                     | NA                     | 1000                                  |
| <b>Polybrominated Diphenyl Ethers 多溴联苯醚 (PBDEs) :</b> |                        |                        |                                       |
| Bromodiphenyl ethers 一溴联苯醚                            | NA                     | NA                     | /                                     |
| Dibromodiphenyl ethers 二溴联苯醚                          | NA                     | NA                     |                                       |
| Tribromodiphenyl ethers 三溴联苯醚                         | NA                     | NA                     |                                       |
| Tetrabromodiphenyl ethers 四溴联苯醚                       | NA                     | NA                     |                                       |
| Pentabromodiphenyl ethers 五溴联苯醚                       | NA                     | NA                     |                                       |
| Hexabromodiphenyl ethers 六溴联苯醚                        | NA                     | NA                     |                                       |
| Heptabromodiphenyl ethers 七溴联苯醚                       | NA                     | NA                     |                                       |
| Octabromodiphenyl ethers 八溴联苯醚                        | NA                     | NA                     |                                       |
| Nonabromodiphenyl ethers 九溴联苯醚                        | NA                     | NA                     |                                       |
| Decabromodiphenyl ether 十溴联苯醚                         | NA                     | NA                     |                                       |
| Sum of PBDEs 多溴联苯醚总和                                  | NA                     | NA                     | 1000                                  |

| Tested Item 测试项目                            | Conclusion 结论 |
|---|---------------|
| 1) Silvery metal (capacitor)                | PASS 通过       |
| 2) Silvery plated coppery metal (capacitor) | PASS 通过       |



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| Compounds 化合物   | Tested item 测试项目 (ppm) |       | RoHS' Limits<br>RoHS' 建议最高界限<br>(ppm) |
|---|------------------------|-------|---------------------------------------|
|   | 3+4+5                  | 6+7+8 |                                       |
| Lead 铅 (Pb)   | ND                     | ND    | 1000                                  |
| Mercury 汞 (Hg)  | ND                     | ND    | 1000                                  |
| Cadmium 镉 (Cd)  | ND                     | ND    | 100                                   |
| Chromium VI 六价铬 (Cr VI)                               | ND                     | ND    | 1000                                  |
| <b>Polybrominated Biphenyls 多溴联苯 (PBBs) :</b>         |                        |       |                                       |
| Bromobiphenyls 一溴联苯                                   | ND                     | ND    | /                                     |
| Dibromobiphenyls 二溴联苯                                 | ND                     | ND    |                                       |
| Tribromobiphenyls 三溴联苯                                | ND                     | ND    |                                       |
| Tetrabromobiphenyls 四溴联苯                              | ND                     | ND    |                                       |
| Pentabromobiphenyls 五溴联苯                              | ND                     | ND    |                                       |
| Hexabromobiphenyls 六溴联苯                               | ND                     | ND    |                                       |
| Heptabromobiphenyls 七溴联苯                              | ND                     | ND    |                                       |
| Octabromobiphenyls 八溴联苯                               | ND                     | ND    |                                       |
| Nonabromobiphenyls 九溴联苯                               | ND                     | ND    |                                       |
| Decabromobiphenyl 十溴联苯                                | ND                     | ND    |                                       |
| Sum of PBBs 多溴联苯总和                                    | ND                     | ND    |                                       |
| <b>Polybrominated Diphenyl Ethers 多溴联苯醚 (PBDEs) :</b> |                        |       |                                       |
| Bromodiphenyl ethers 一溴联苯醚                            | ND                     | ND    | /                                     |
| Dibromodiphenyl ethers 二溴联苯醚                          | ND                     | ND    |                                       |
| Tribromodiphenyl ethers 三溴联苯醚                         | ND                     | ND    |                                       |
| Tetrabromodiphenyl ethers 四溴联苯醚                       | ND                     | ND    |                                       |
| Pentabromodiphenyl ethers 五溴联苯醚                       | ND                     | ND    |                                       |
| Hexabromodiphenyl ethers 六溴联苯醚                        | ND                     | ND    |                                       |
| Heptabromodiphenyl ethers 七溴联苯醚                       | ND                     | ND    |                                       |
| Octabromodiphenyl ethers 八溴联苯醚                        | ND                     | ND    |                                       |
| Nonabromodiphenyl ethers 九溴联苯醚                        | ND                     | ND    |                                       |
| Decabromodiphenyl ether 十溴联苯醚                         | ND                     | ND    |                                       |
| Sum of PBDEs 多溴联苯醚总和                                  | ND                     | ND    |                                       |

| Tested Item 测试项目  | Conclusion 结论 |
|---|---------------|
| 3) Red plastic (capacitor) +<br>4) White plastic (capacitor) +<br>5) Blue plastic (capacitor)     | PASS 通过       |
| 6) Green plastic (capacitor) +<br>7) Brown plastic (capacitor) +<br>8) Yellow plastic (capacitor) | PASS 通过       |



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有关欧洲针对电子产品的指令（电子电器禁用某些有害物质指令），2002/95/EC

| Compounds 化合物                                  | Tested item 测试项目 (ppm) |      | RoHS' Limits<br>RoHS' 建议最高界限<br>(ppm) |
|--|------------------------|------|---------------------------------------|
|  | 9                      | 10   |                                       |
| Lead 铅 (Pb)                                    | 28200 <sup>#</sup>     | 75.3 | 1000                                  |
| Mercury 汞 (Hg)                                 | ND                     | ND   | 1000                                  |
| Cadmium 镉 (Cd)                                 | ND                     | ND   | 100                                   |
| Chromium VI 六价铬 (Cr VI)                        | ND                     | ND   | 1000                                  |
| Polybrominated Biphenyls 多溴联苯 (PBBs) :         |                        |      |                                       |
| Bromobiphenyls 一溴联苯                            | NA                     | ND   |                                       |
| Dibromobiphenyls 二溴联苯                          | NA                     | ND   |                                       |
| Tribromobiphenyls 三溴联苯                         | NA                     | ND   |                                       |
| Tetrabromobiphenyls 四溴联苯                       | NA                     | ND   |                                       |
| Pentabromobiphenyls 五溴联苯                       | NA                     | ND   |                                       |
| Hexabromobiphenyls 六溴联苯                        | NA                     | ND   |                                       |
| Heptabromobiphenyls 七溴联苯                       | NA                     | ND   |                                       |
| Octabromobiphenyls 八溴联苯                        | NA                     | ND   |                                       |
| Nonabromobiphenyls 九溴联苯                        | NA                     | ND   |                                       |
| Decabromobiphenyl 十溴联苯                         | NA                     | ND   |                                       |
| Sum of PBBs 多溴联苯总和                             | NA                     | ND   | 1000                                  |
| Polybrominated Diphenyl Ethers 多溴联苯醚 (PBDEs) : |                        |      |                                       |
| Bromodiphenyl ethers 一溴联苯醚                     | NA                     | ND   |                                       |
| Dibromodiphenyl ethers 二溴联苯醚                   | NA                     | ND   |                                       |
| Tribromodiphenyl ethers 三溴联苯醚                  | NA                     | ND   |                                       |
| Tetrabromodiphenyl ethers 四溴联苯醚                | NA                     | ND   |                                       |
| Pentabromodiphenyl ethers 五溴联苯醚                | NA                     | ND   |                                       |
| Hexabromodiphenyl ethers 六溴联苯醚                 | NA                     | ND   |                                       |
| Heptabromodiphenyl ethers 七溴联苯醚                | NA                     | ND   |                                       |
| Octabromodiphenyl ethers 八溴联苯醚                 | NA                     | ND   |                                       |
| Nonabromodiphenyl ethers 九溴联苯醚                 | NA                     | ND   |                                       |
| Decabromodiphenyl ether 十溴联苯醚                  | NA                     | ND   |                                       |
| Sum of PBDEs 多溴联苯醚总和                           | NA                     | ND   | 1000                                  |

| Tested Item 测试项目                    | Conclusion 结论                         |
|-------------------------------------|---------------------------------------|
| 9) Light brown ceramic (capacitor)  | EXEMPTED <sup>#</sup> 豁免 <sup>#</sup> |
| 10) White/brown ceramic (capacitor) | PASS 通过                               |

For item 9:

<sup>#</sup>According to the directive 2005/717/EC, 2005/747/EC and 2006/310/EC, the annex of 2002/95/EC was amended and Clause 7 is reiterated here "Lead in electronic ceramic parts (e.g. piezoelectronic devices)." The sample as received was provided by the client to be electronic ceramic parts, therefore, this material containing the found heavy metals level should be exempted.

<sup>#</sup>根据指令 2005/717/EC, 2005/747/EC 和 2006/310/EC, 2002/95/EC 的附件被修订, 并重申第 7 条“电子陶瓷零件（即压电电子设备）中的铅”。根据客户提供, 测试样品为电子陶瓷零件, 因此, 含有被测得的重金属水平的该材料可以被豁免。



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| Compounds 化合物                                  | Tested item 测试项目 (ppm) | RoHS' Limits<br>RoHS' 建议最高界限<br>(ppm) |
|--|------------------------|---------------------------------------|
|  | 11                     |                                       |
| Lead 铅 (Pb)                                    | 20.5                   | 1000                                  |
| Mercury 汞 (Hg)                                 | ND                     | 1000                                  |
| Cadmium 镉 (Cd)                                 | ND                     | 100                                   |
| Chromium VI 六价铬 (Cr VI)                        | Negative <sup>2)</sup> | Negative                              |
| Polybrominated Biphenyls 多溴联苯 (PBBs) :         |                        |                                       |
| Bromobiphenyls 一溴联苯                            | NA                     | /                                     |
| Dibromobiphenyls 二溴联苯                          | NA                     |                                       |
| Tribromobiphenyls 三溴联苯                         | NA                     |                                       |
| Tetrabromobiphenyls 四溴联苯                       | NA                     |                                       |
| Pentabromobiphenyls 五溴联苯                       | NA                     |                                       |
| Hexabromobiphenyls 六溴联苯                        | NA                     |                                       |
| Heptabromobiphenyls 七溴联苯                       | NA                     |                                       |
| Octabromobiphenyls 八溴联苯                        | NA                     |                                       |
| Nonabromobiphenyls 九溴联苯                        | NA                     |                                       |
| Decabromobiphenyl 十溴联苯                         | NA                     |                                       |
| Sum of PBBs 多溴联苯总和                             | NA                     | 1000                                  |
| Polybrominated Diphenyl Ethers 多溴联苯醚 (PBDEs) : |                        |                                       |
| Bromodiphenyl ethers 一溴联苯醚                     | NA                     | /                                     |
| Dibromodiphenyl ethers 二溴联苯醚                   | NA                     |                                       |
| Tribromodiphenyl ethers 三溴联苯醚                  | NA                     |                                       |
| Tetrabromodiphenyl ethers 四溴联苯醚                | NA                     |                                       |
| Pentabromodiphenyl ethers 五溴联苯醚                | NA                     |                                       |
| Hexabromodiphenyl ethers 六溴联苯醚                 | NA                     |                                       |
| Heptabromodiphenyl ethers 七溴联苯醚                | NA                     |                                       |
| Octabromodiphenyl ethers 八溴联苯醚                 | NA                     |                                       |
| Nonabromodiphenyl ethers 九溴联苯醚                 | NA                     |                                       |
| Decabromodiphenyl ether 十溴联苯醚                  | NA                     |                                       |
| Sum of PBDEs 多溴联苯醚总和                           | NA                     | 1000                                  |

| Tested Item 测试项目           | Conclusion 结论 |
|----------------------------|---------------|
| 11) Grey metal (capacitor) | PASS 通过       |



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Note / 注释:

Detection limits for regulated substances and limit of RoHS (in ppm) reference to 2002/95/EC

| Regulated Substances 受限物质  | Detection limit 检测限 | RoHS' Limit (ppm) RoHS' 建议最高界限 |
|--|---------------------|--------------------------------|
| Pb 铅   | 10                  | 1000                           |
| Hg 汞   | 10                  | 1000                           |
| Cd 镉   | 10                  | 100                            |
| Cr VI 六价铬  | 10                  | 1000                           |
| PBBs 多溴联苯<br>Bromobiphenyls<br>Dibromobiphenyls<br>Tribromobiphenyls<br>Tetrabromobiphenyls<br>Pentabromobiphenyls<br>Hexabromobiphenyls<br>Heptabromobiphenyls<br>Octabromobiphenyls<br>Nonabromobiphenyls<br>Decabromobiphenyl   | 50 (each)           | 1000 (sum)                     |
| PBDEs 多溴联苯醚<br>Bromodiphenyl ethers<br>Dibromodiphenyl ethers<br>Tribromodiphenyl ethers<br>Tetrabromodiphenyl ethers<br>Pentabromodiphenyl ethers<br>Hexabromodiphenyl ethers<br>Heptabromodiphenyl ethers<br>Octabromodiphenyl ethers<br>Nonabromodiphenyl ethers<br>Decabromodiphenyl ether | 50 (each)           | 1000 (sum)                     |

ppm = mg/kg 百万分之一

Negative = 阴性

Pb = Lead 铅

Br = Bromine 溴

< = less than 少于

Positive = 阳性

Hg = Mercury 汞

PBBs = Polybrominated Biphenyls 多溴联苯

ND = not detected 不被检出

NR = not requested 没有要求

NA = not applicable 不适用

Cd = Cadmium 镉 Cr = Chromium 铬

PBDEs = Polybrominated Diphenyl Ethers 多溴联苯醚

Test Method / 测试方法:

Wet Chemistry Tests - Reference to IEC 62321:2008, "Electrotechnical Products- Determination of Levels of Six Regulated Substances": 湿化学方法 - 参照 IEC 62321:2008, 电子电器产品中六种限用物质浓度测定

i. Lead (Pb) and Cadmium (Cd): The sample is comminuted and digested with acid mixtures. Pb/ Cd contents are determined with ICP-AES technique. (Chapter 8, 9 & 10)

铅和镉: 先将样品粉碎, 然后用混酸消解。铅/镉的含量由等离子发射光谱仪测定 (第 8, 9 和 10 章)。

ii. Mercury (Hg): The sample is comminuted and digested with acid mixtures. Hg content is determined with ICP-AES, ICP-MS or AAS-VGA technique. (Chapter 7)

汞: 先将样品粉碎, 然后用混酸消解。汞含量由离子发射光谱仪, 或者原子吸收分光光度计-氢化物发生装置测定。(第 7 章)

iii. Chromium (VI) (Cr VI) 六价铬:

A. Metal: Qualitative method for the presence of hexavalent chromium on metal surface on "Test for the presence of Hexavalent Chromium (Cr (VI)) in colourless and coloured corrosion-protection coatings on metals". The presence of hexavalent chromium is indicated by the formation of a red to violet color. The method is applied in turn to 1) untreated surface; 2) surface got by gently rubbing to scratch possibly reduced chromate surface but without completely removing the whole coating layer; 3) surface got by forcibly scratching into the deeper layers, even reaching the substrate. The sample is further verified by boiling water extraction method if the result of spot test shows ahead is negative or uncertain. (Annex B)

金属: 金属表面六价铬存在的定性方法“金属表面无色和有色腐蚀防护涂层中六价铬 (Cr VI) 的测试”。测试颜色呈红-紫色, 则表明六价铬的存在。该方法适用于 1) 未磨损过的表面; 2) 轻微磨损过的表面, 以去除可能被还原的铬酸盐表层, 但不去除整个镀层; 3) 用力磨损的镀层表面, 甚至于基材表面。如果以上点测试结果呈阴性或无法确定, 则用沸水萃取方法作进一步确认。(附录 B)

B. Plastics & Electronics : The sample is comminuted and digested with alkaline mixtures. Chromium VI content is determined with UV-VIS spectroscopic technique. (Annex C)

塑料和电子器件: 先将样品粉碎, 然后用混碱消解。六价铬含量由紫外可见分光光度计测定。(附录 C)

iv. PBBs and PBDEs: The sample extracted by appropriate solvent is used for extraction and quantified GC-MS. (Annex A)

多溴联苯和多溴联苯醚: 将样品用合适溶液进行提取, 再由气相色谱-质谱联用仪测定。(附录 A)

Remark / 备注:

1. The result relates only to the tested item. The report shall not be reproduced except full without the written approval of the testing laboratory. Parameters which are not covered by the lab's testing scope are subcontracted to laboratories with government approval. The accreditation relates to competences given in the accreditation certificate.

测试结果仅代表被测样品。未经实验室书面许可, 此报告不可被复制。对于本实验室未能涵盖的测试项目, 实验室可以分包给其它政府承认的实验室。分包实验室的能力验证会在验证证书中注明。

2. Positive means the presence of hexavalent chromium on the tested areas. It is regarded as conflict with RoHS requirement.

According to the IEC 62321, the principle of this method was evaluated and supported by two studies organized by IEC TC111 WG3. The studies were focused on detecting the presence of Cr(VI) in metallic samples.

阳性表示测试表面存在六价铬, 则被认为与 RoHS 要求有冲突。根据 IEC62321, 该测试方法的原理被 IEC TC111 WG3 所组织的两次研究所评估和支持。该研究主要致力于金属样品六价铬 Cr(VI)存在性的检测。

END 结束



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**APPENDIX 附录 – TEST PROCESS 测试程序**

