



## Test Report

**Report No.** THJS17103012316EN

**Date:** Nov.15, 2017

Applicant : barpa  
Address : Zona Industrial da Portelinha Rua Noé Pereira, 473, 4510-706 Fânzeres  
– GONDOMAR  
Sample Name : Fiber Patch Cord  
Tested Model : 812T2AACCM (T refer to category, AA refer to first connector and MM refer to meters)  
Sample Receiving date: : 2017-11-09  
Test period : 2017-11-09 – 2017-11-15  
Test Requirement : The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU.  
Test Method : Please refer to next page(s).  
Test result : Please refer to next page(s).  
Conclusion : **PASS**

Based on the verification results of the submitted sample(s), the results of Lead, Cadmium, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs) and Polybrominated diphenyl ethers (PBDEs) comply with the limits as set by RoHS Directive 2011/65/EU—The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

*For and on behalf of*  
Shanghai Global Testing Services Co., Ltd.

Authorized Signature



Shi Lei/Kevin

General Manger -GTS/SHO

Page 1 of 8

This document is issued subject to GTS CENERAL CONDITIONS OF SERVICE, and shall not be reproduced except in full or with written approval by GTS Testing.

Shanghai Global Testing Services Co., Ltd.

No.968 Meilong West Road, Minhang District, Shanghai, 201104 China

Tel: (86-21) 3363 7866 Fax: (86-21) 3363 7858 E-mail: info@gts-lab.com Web Site: <http://www.gts-lab.com>



## Test Report

**Report No.** THJS17103012316EN

**Date:** Nov.15, 2017

### **Test Method:**

1. Disassembly, disjointment and mechanical sample preparation
  - Ref. to IEC 62321-2: 2013, Disassembly, disjointment and mechanical sample preparation.
2. With reference to IEC 62321-1: 2013, tests were performed for the samples indicated by the photos in this report.
  - (1) Screening – Lead, mercury, cadmium, total chromium and total bromine
    - Ref. to IEC 62321-3-1: 2013, Screening for Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry.
  - (2) Wet chemical test method
    - a. Total Lead, Cadmium, Chromium and Mercury content
      - Ref. to IEC 62321-4: 2013, determination of Mercury in polymers, metals and electronics by ICP-OES.
      - Ref. to IEC 62321-5: 2013, determination of Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by ICP-OES.
    - b. Chromium (VI) content
      - For Colourless and coloured corrosion-protected coatings on metals, Ref. to IEC 62321-7-1: 2015, determination of presence of hexavalent chromium (Cr(VI)) in colourless and coloured corrosion-protected coatings on metals by the colorimetric method.
      - For polymers and electronics, Ref. to IEC 62321-7-2: 2017, determination of hexavalent chromium (Cr(VI)) in polymers and electronics by the colorimetric method.
    - c. PBBs, PBDEs
      - Ref. to IEC 62321-6: 2015, determination of polybrominated biphenyls and polybrominated diphenyl ethers in polymers by gas chromatography -mass spectrometry (GC-MS).



## Test Report

Report No. THJS17103012316EN

Date: Nov.15, 2017

**Test result(s):**

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	White plastic	BL	BL	BL	BL	BL	---	Pass
2	Green plastic	BL	BL	BL	BL	BL	---	Pass
3	Black plastic bushing	BL	BL	BL	BL	BL	---	Pass
4	Red plastic bushing	BL	BL	BL	BL	BL	---	Pass
5	White heat-shrinkable tubing	BL	BL	BL	BL	BL	---	Pass
6	Yellow heat-shrinkable tubing	BL	BL	BL	BL	BL	---	Pass
7	Green plastic sheath	BL	BL	BL	BL	BL	---	Pass
8-1	White plastic sheath	BL	BL	BL	BL	BL	---	Pass
8-2	Optical fiber	BL	BL	BL	BL	BL	---	Pass
9	Yellow fiber	BL	BL	BL	BL	BL	---	Pass
10	Yellow plastic sheath	BL	BL	BL	BL	BL	---	Pass
11	Green plastic	BL	BL	BL	BL	BL	---	Pass
12	Metal (spring)	BL	BL	BL	BL	---	Cr(VI): Negative	Pass
13	Optical fiber head	BL	BL	BL	BL	---	---	Pass
14	Silvery metal	OL	BL	BL	BL	---	Pb: 18140 <sup>(^4)</sup>	Pass
15	Transparent plastic tubing	BL	BL	BL	BL	BL	---	Pass
16	Green plastic	BL	BL	BL	BL	BL	---	Pass
17	Silvery metal	BL	BL	BL	BL	---	---	Pass
18	Green plastic	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
19	Green plastic	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
20	Black plastic bushing	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
21	Red plastic bushing	BL	BL	BL	BL	BL	---	Pass
22	White heat-shrinkable tubing	BL	BL	BL	BL	BL	---	Pass
23	Transparent plastic	BL	BL	BL	BL	BL	---	Pass
24	White plastic	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass



## Test Report

Report No. THJS17103012316EN

Date: Nov.15, 2017

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
25	Metal (spring)	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
26	Optical fiber head	BL	BL	BL	BL	---	---	Pass
27	Silvery metal	OL	BL	BL	BL	---	Pb: 17852 <sup>(^4)</sup>	Pass
28	Silvery metal	BL	BL	BL	BL	---	---	Pass
29	Silvery metal	BL	BL	BL	BL	---	---	Pass
30	Silvery metal	BL	BL	BL	BL	---	---	Pass

Remark:

(^1) "----" = Not Applicable;

(^2) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

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

(c) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Pb, Cd, Hg), UV-VIS for Cr(VI) and GC/MSD (for PBBs/PBDEs) is recommended to be performed if the concentration exceeds the below warning value according to IEC 62321-3-1: 2013.

Attached table 1, XRF screening limits in mg/kg for regulated elements in various matrices:

Element	Polymer Materials	Metallic Materials	Electronics
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (250+3\sigma) \leq OL$
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	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	N.A.	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

Note: ① BL "below limit" = the result less than the limit.

② OL "over limit" = the result greater than the limit.

③ IN = inconclusive, the region where need further chemical testing by ICP-OES (for Pb、Cd、Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs).

④  $3\sigma$  = Repeability of the analyser at the action level.

⑤ LOD = Limit of detection.



## Test Report

Report No. THJS17103012316EN

Date: Nov.15, 2017

- (^3) (a) mg/kg=ppm=0.0001%; (b) N.D. = Not detected (lower than RL);  
 (c) Reporting Limit (RL) and Limit of Directive 2011/65/EU.

Parameter	Unit	Limit	Reporting Limit (RL)
Lead (Pb)	mg/kg	1000	10
Cadmium (Cd)	mg/kg	100	10
Mercury (Hg)	mg/kg	1000	10
Chromium VI (Cr VI)	mg/kg	1000	R1
Group PBBs	mg/kg	1000	R2
Group PBDEs	mg/kg	1000	R2

R1: Cr(VI) for metal sample, the reporting limit (RL)= Method Detection Limit (MDL)=0.10 ug/cm<sup>2</sup>.

The reporting limit (RL) of Cr(VI) for polymers and electronics is 10mg/kg.

R2: The reporting limit (RL) for single compound of PBBs & PBDEs is 50mg/kg.

- (d) According to IEC 62321-7-1: 2015, result on Cr(VI) for metal sample is shown as Negative, Inconclusive or Positive: Negative = Absence of Cr(VI), Inconclusive = Maybe exist Cr(VI), Positive = Presence of Cr(VI).

Colorimetric result (Cr(VI) concentration)	Qualitative result
The sample solution is < the 0.10 ug/cm <sup>2</sup> 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.
The sample solution is ≥ the 0.10 ug/cm <sup>2</sup> and ≤ the 0.13 ug/cm <sup>2</sup> equivalent comparison standard solutions	The result is considered to be inconclusive – Unavoidable coating variations may influence the determination. Recommendation: if addition samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trials for the final determination.
The sample solution is > the 0.13 ug/cm <sup>2</sup> 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)

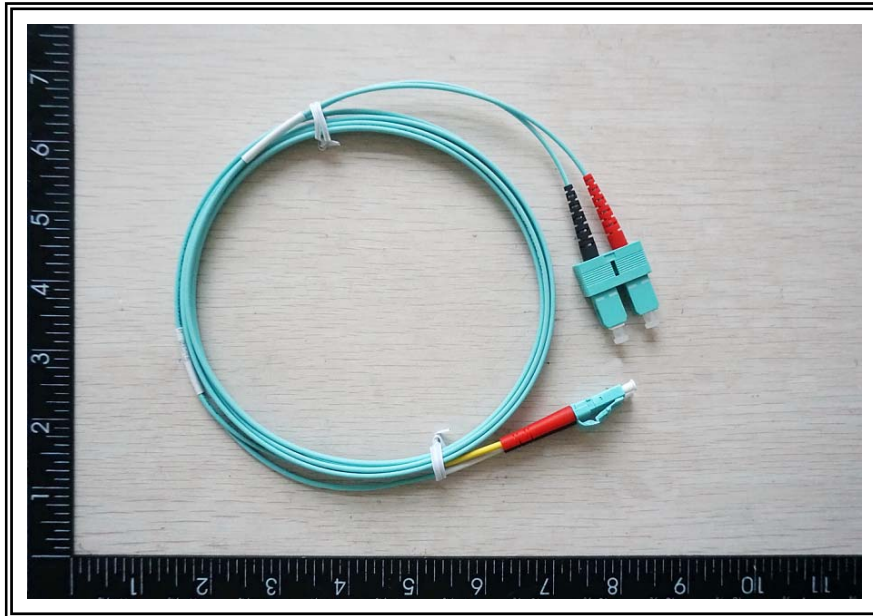
- (^4) According to the declaration from the client, Lead (Pb) was exempted by EU RoHS Directive 2011/65/EU based on Annex III 6(c): Copper alloy containing up to 4% lead by weight.

## Test Report

Report No. THJS17103012316EN

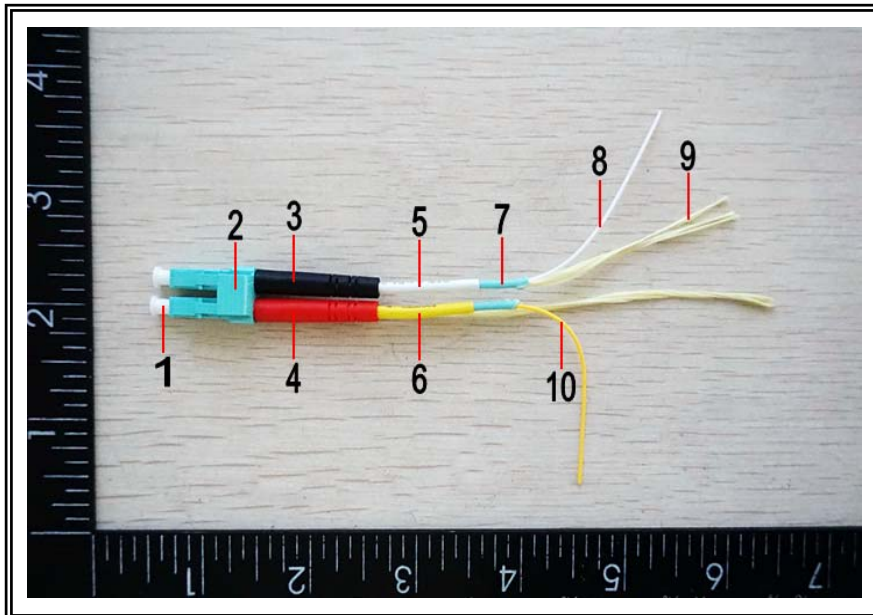
Date: Nov.15, 2017

Sample photo(s):



Test item: Fiber Patch Cord

Tested Model: 812T2AACMM (T refer to category,  
AA refer to first connector and MM refer to meters)

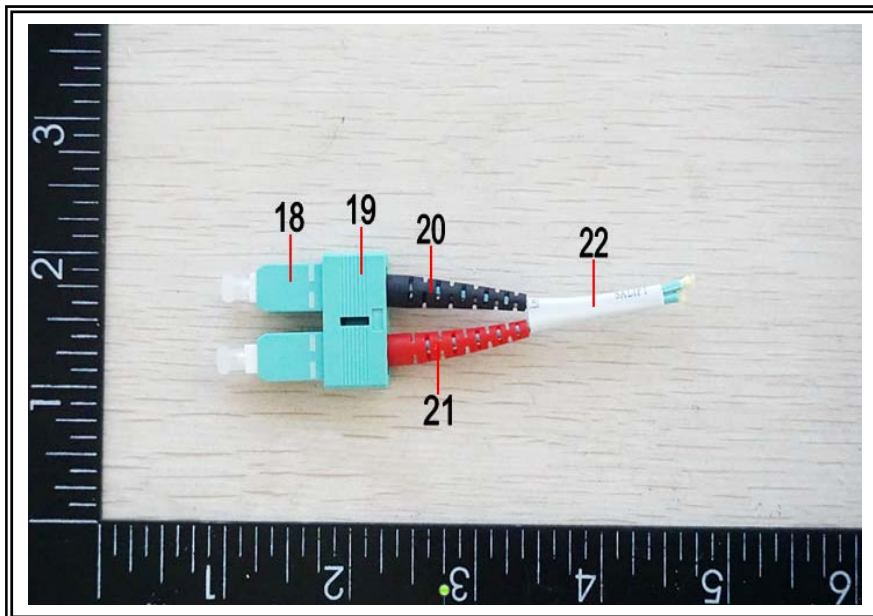
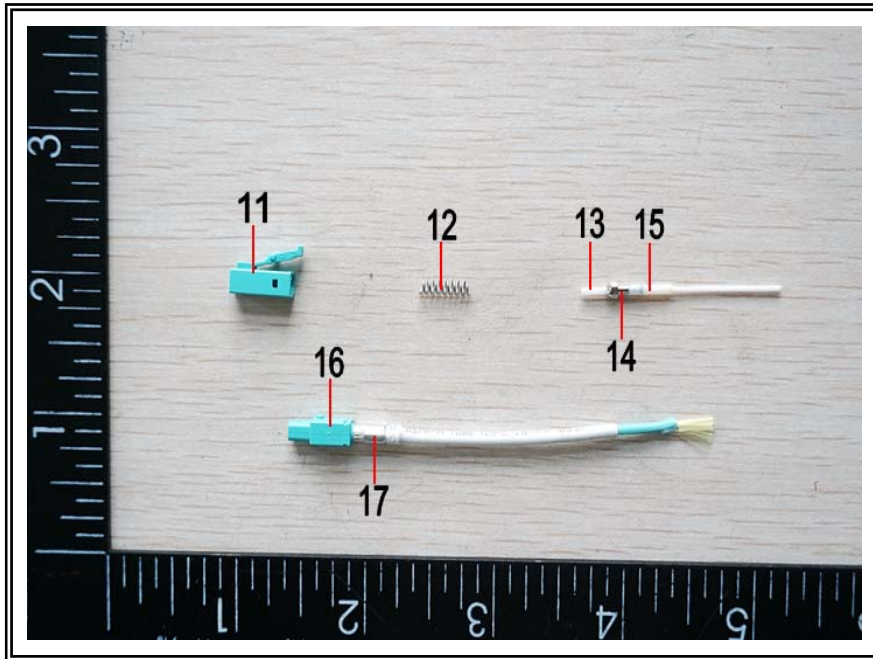




## Test Report

Report No. THJS17103012316EN

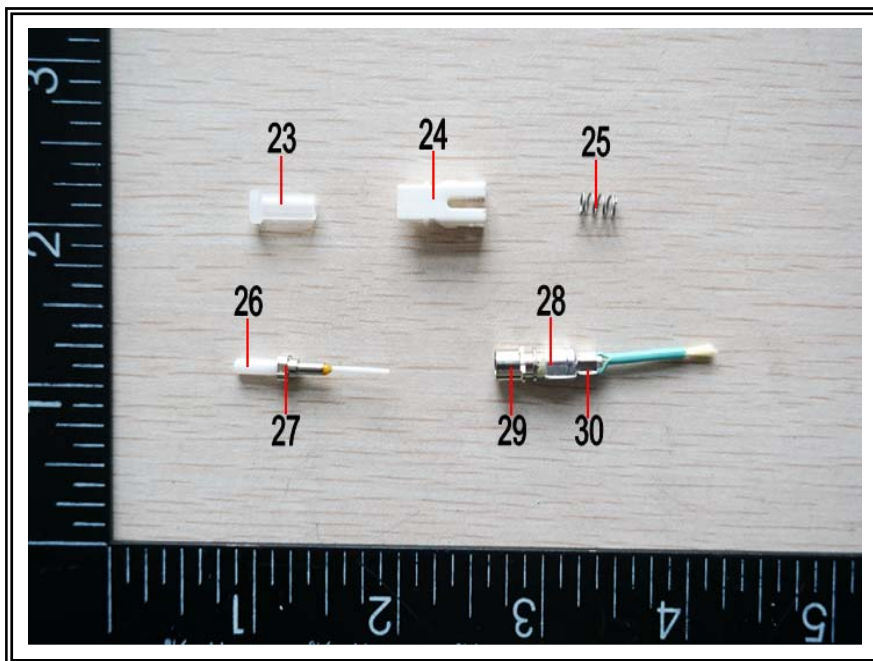
Date: Nov.15, 2017



## Test Report

Report No. THJS17103012316EN

Date: Nov.15, 2017



\*\*\*End of Report\*\*\*