



TEST REPORT

DEKRA Testing and Certification (Shanghai) Ltd
5F, 217# Jiangchangsan Road, Shibe Hi-Tech
Park, Shanghai, P.R.C. (200436)
Tel.: +86 21 6056 7512
Fax: +86 21 6056 7555

Contact
Mr. Halo Sheng
Tel: 021-60507666*7732
Report Issue Date: 2019.06.24
Page 1 of 7

Test Report No. : 6053858.50QS
Project no. : 6053858

Client : WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO.,LTD.
No.311,LATITUDE FIFTEEN ROAD,YUEQING ECONOMIC DEVELOPMENT
ZONE,ZHEJIANG,CHINA

Date sample received : 2019.05.06 / 2019.05.30

Product : CIRCUIT BREAKERS FOR OVERCURRENT PROTECTION (MCB)

Model : SGP SERIES

Test Requested : Test of RoHS conformity (2011/65/EU) and its subsequent amendments directive (EU) 2015/863

Test Method : Please refer to next page(s).

Result : Please refer to next page(s).

Conclusion : Requirement passed

Testing Period : 2019.05.06—2019.06.05

Signed for and on behalf of

DEKRA Testing and Certification (Shanghai) Ltd

Lu Saijian (陆赛健)
Project Manager



Sheng Jinghuan(盛景焕)
Test Engineer

Picture of the product



TEST RESULTS

sample-no.	sample designation	Pb (%)	Cd (%)	Hg (%)	Cr VI (%)	PBB (%)	PBDE (%)	DEHP* (%)	BBP* (%)	DBP* (%)	DIBP* (%)
001	grey plastic(sheel)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
002	yellow plastic(hook)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1 ¹⁾	< 0.1 ¹⁾	< 0.1	< 0.1	< 0.1	< 0.1
003	golden metal(connection)	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
004	blue plastic(cover)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
005	grey plastic(buckle)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
006	black plastic(connection)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
007	brown plastic(switch)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1 ¹⁾	< 0.1 ¹⁾	< 0.1	< 0.1	< 0.1	< 0.1
008	grey plastic(switch)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1 ¹⁾	< 0.1 ¹⁾	< 0.1	< 0.1	< 0.1	< 0.1
009	silvery metal(switch)	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
010	coppery metal	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
011	coppery metal	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
012	silvery metal	< 0.1	< 0.01	< 0.1	< 0.1 ²⁾	N/A	N/A	N/A	N/A	N/A	N/A
013	brown plastic(switch)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1 ¹⁾	< 0.1 ¹⁾	< 0.1	< 0.1	< 0.1	< 0.1
014	black plastic(switch)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
015	red paper	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	N/A	N/A	N/A	N/A
016	silvery metal	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
017	white plastic	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
018	silvery metal(switch)	< 0.1	< 0.01	< 0.1	< 0.1 ²⁾	N/A	N/A	N/A	N/A	N/A	N/A
019	grey plastic(cover)	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
020	black metal	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
021	golden metal	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
022	silvery metal(screw)	< 0.1	< 0.01	< 0.1	< 0.1 ²⁾	N/A	N/A	N/A	N/A	N/A	N/A
023	silvery metal(bracket)	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
024	silvery metal(bracket)	< 0.1	< 0.01	< 0.1	< 0.1 ²⁾	N/A	N/A	N/A	N/A	N/A	N/A
025	coppery metal	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
026	silvery metal	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
027	silvery metal(bracket)	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
028	silvery metal(spring)	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
029	coppery metal(spring)	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A
030	silvery metal(spring)	< 0.1	< 0.01	< 0.1	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A

1)The analysis by X-ray fluorescence spectrometry showed a detection for Br. The verification and quantification of PBB/PBDE was performed by GC-MS.

2)The analysis by X-ray fluorescence spectrometry showed a detection for Cr. The verification and quantification of Cr (VI) was performed by photometric analysis..

N/A: Not applicable

*=With reference to IEC62321-8:2017, Analysis was performed by GC-MS.

Description of the analysis procedure (brief version):

Test of RoHS conformity

The measurements are performed according to IEC 62321-3-1 : 2013, "Electrotechnical products - Determination of levels of six regulated substances".

The product is divided in single material samples. The materials are analysed on different parameters of the RoHS-directive to assure that the complete product is RoHS-conform or not. At first a XRF (X-ray fluorescence spectrometry) screening is performed. For every sample following statements can be made.

Table: Screening limits in mg/kg for regulated elements in various matrices

Element	Polymers	Metals	Composite Material
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
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	$BL \leq (300-3\sigma) < X$		$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

Below limit (**BL**): the tested material complies to the RoHS directive.

Inconclusive (**X**): If the level of the measurement is around the maximum allowed, or if the level for Chrome or Bromine is too high, other more accurate methods are needed to determine the exact level or the composition of Chrome and Bromine.

Over limit (**OL**): If the level of lead, mercury or cadmium is well above the maximum allowed levels (the XRF uncertainty is taken into account), the tested material does not comply with the RoHS directive.

In case of **inconclusive** XRF results, following analysis procedures are applied:

In order to examine the material samples for the heavy metals cadmium, lead and mercury they are digested in acid and the solutions are used to carry out the analysis for the heavy metals by ICP-OES or atomic-absorption spectroscopy.

Hexavalent chromium is checked by extracting the sample with water at 100 °C (determination of Cr VI in colorless and colored chromate coating on metals) respectively with alkaline extraction at 90-95 °C (determination of Cr VI in polymers and electronic components) followed by photometric analysis.

In the case of metallic components with a surface coating containing hexavalent Chromium (passivation) the concentration is expressed in mg of Chromium VI per component. In order to obtain further information about the concentration on the surface coating it is necessary to know the weight per unit area of the coating and the surface area of the component. Information about surface coatings is to be provided by the client.

The examination for bromine-based flame retardant products is carried out by gas chromatography-mass spectrometry after extraction by solvents; this involves the individual analysis and quantification of the substances specified in the RoHS. The current valid regulations relating to exceptions in respect of the analysed substances are to be taken into account by the client.

The following Polybrominated Biphenyls (PBBs) and Polybrominated Diphenyl Ethers (PBDEs) are analyzed:

2-Bromobiphenyl PBB2, Dibromobiphenyl PBB15, Tribromobiphenyl PBB30, Tetrabromobiphenyl PBB52, Pentabromobiphenyl PBB103, Hexabromobiphenyl PBB153, Heptabromobiphenyl PBB250, Octabromobiphenyl PBB250, Nonabromobiphenyl PBB250, Decabromobiphenyl PBB209, Bromodiphenylether BDE2, Dibromodiphenylether BDE15, Tribromodiphenylether BDE30, Tetrabromodiphenylether BDE62, Pentabromodiphenylether BDE99, Hexabromodiphenylether BDE153, Heptabromodiphenylether BDE183, Octabromodiphenylether BDE203, Nonabromodiphenylether BDE206, Decabromodiphenylether BDE209.

Limits according to RoHS (2011/65/EU) and its subsequent amendments directive (EU) 2015/863 / Test methods (additional chemical analysis):

Parameter	Limits according to RoHS	Test method
Cadmium	0,01 % (100 mg/kg or 0,1 g/kg)	IEC62321-5:2013
Lead	0,1 % (1000 mg/kg or 1 g/kg)	IEC62321-5:2013
Hexavalent Chromium	0,1 % (1000 mg/kg or 1 g/kg)	Metal: IEC62321-7-1:2015 Non-metal: IEC62321-7-2:2017
Mercury	0,1 % (1000 mg/kg or 1 g/kg)	IEC62321-4:2013/AMD1:2017
PBB and PBDE	0,1 % (1000 mg/kg or 1 g/kg)	IEC62321-6:2015
DEHP	0,1 % (1000 mg/kg or 1 g/kg)	IEC62321-8:2017
BBP	0,1 % (1000 mg/kg or 1 g/kg)	IEC62321-8:2017
DBP	0,1 % (1000 mg/kg or 1 g/kg)	IEC62321-8:2017
DIBP	0,1 % (1000 mg/kg or 1 g/kg)	IEC62321-8:2017

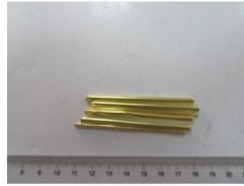
Sample Photos



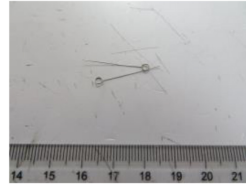
Test item001



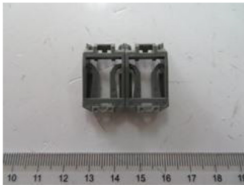
Test item002



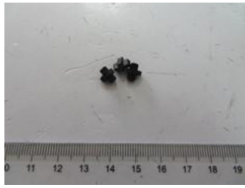
Test item003



Test item004



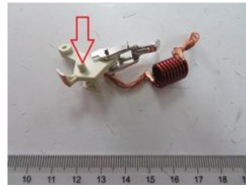
Test item005



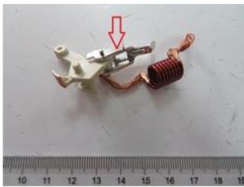
Test item006



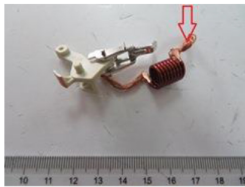
Test item007



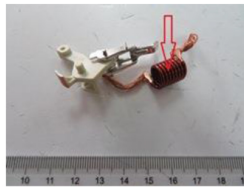
Test item008



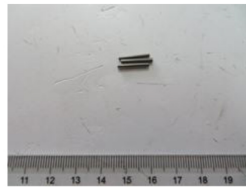
Test item009



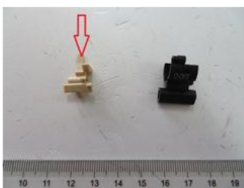
Test item010



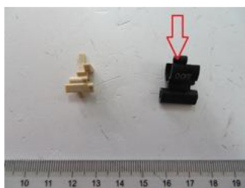
Test item011



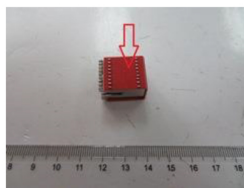
Test item012



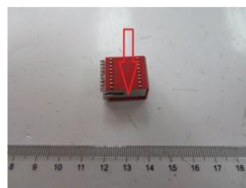
Test item013



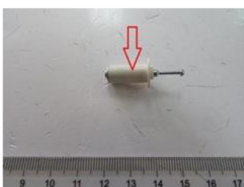
Test item014



Test item015



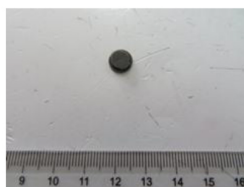
Test item016



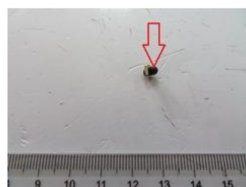
Test item017



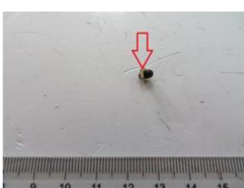
Test item018



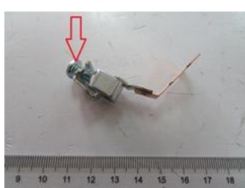
Test item019



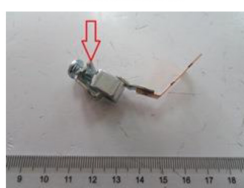
Test item020



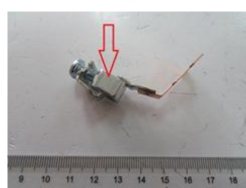
Test item021



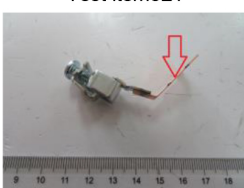
Test item022



Test item023



Test item024



Test item025



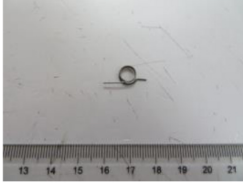
Test item026



Test item027



Test item028



Test item029

---End of Report---

Please note that every statement made in this report is only valid for the samples tested and reported herein. Samples were provided by applicant. Without consent of the testing organization, this report shall not be reproduced except in full and the clients shall not be unauthorized use of test results for improper propaganda. DEKRA declines any responsibility with deviations required by the customer that may affect the validity of result. The information is provided by the customer in this report may affect the validity of the results; the test lab is not responsible for it. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to calculate the uncertainty associated with the measurement result, unless the specification, standard or customer have special requirements. This report is not used for social proof function in China market