



TEST REPORT

**BUREAU
VERITAS**

LAB NO. : (2421)090-0076
DATE : July 07, 2021
PAGE : 1 OF 10

Applicant:

ZHEJIANG GEYA ELECTRICAL CO., LTD.

WENZHOU BRIDGE INDUSTRIAL ZONE, BEIBAIXIANG TWON, YUEQING CITY, ZHEJIANG PROVINCE,
CHINA 32560.

Date of Submission: 2021-03-31
Test Period: 2021-03-31 to 2021-07-07
BV EE Ref. No. GYB-ESH-Q21033001-A0

Sample Description:	AUTOMATIC TRANSFER SWITCH		
Sample Status :	Intact		
Manufacturer:	/	Buyer:	/
Style No.(s):	W2R	PO No.:	/
Country of Origin:	/	Country of Destination:	/

Test Item(s): Details see attached page(s).

SUMMARY OF TEST RESULTS

TEST REQUESTED	CONCLUSION
Compliance Test - Heavy Metals, Flame Retardants Content - European Parliament and Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) with its Amendments	PASS
Compliance Test - Phthalate Test - (EU) 2015/863 amending Annex II to Directive 2011/65/EU	PASS

Note: The tested part of the sample was specified by client.
The composite testing was performed as per client's request.
The test conclusion was given based on the results of tested part.

REMARK

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

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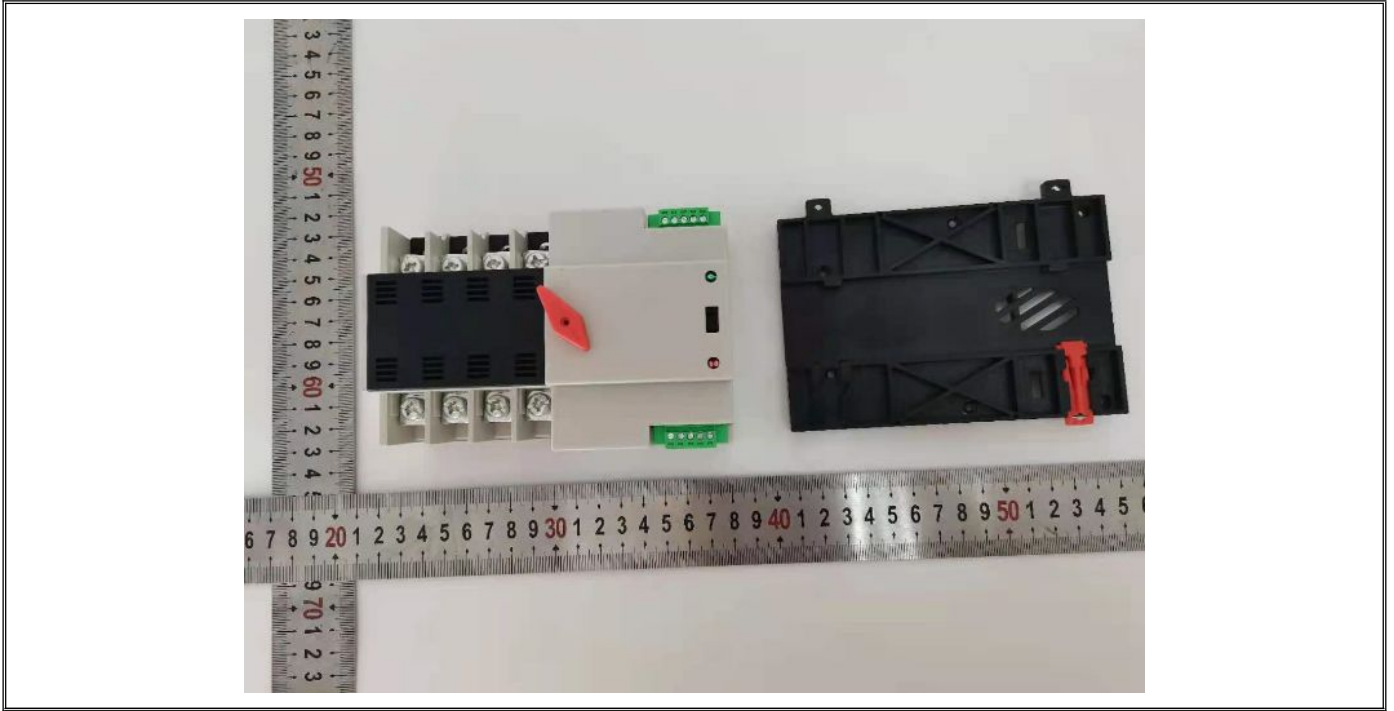
This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



**BUREAU
VERITAS**

LAB NO. : (2421)090-0076
DATE : July 07, 2021
PAGE : 2 OF 10

Photo of the Submitted Sample



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TEST RESULT

Compliance Test - Heavy Metals, Flame Retardants Content - European Parliament and Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) with its Amendments

Test Method : See Appendix.

See Analytes and their corresponding Maximum Allowable Limit in Appendix

			Result					
Parameter			Lead (Pb)	Cadmium (Cd)	Mercury (Hg)	Chromium VI (Cr VI)	PBBs & PBDEs	Conclusion
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-
Test Item	Description	Location	-	-	-	-	-	-
Tested components of W2R								
1	Gray plastic shell	Housing	ND	ND	ND	ND	ND	PASS
2	Gray plastic	Housing	ND	ND	ND	ND	PBDEs 244*	PASS
3	Black plastic base	Housing	ND	ND	ND	ND	PBDEs 223*	PASS
4	Red plastic	Base	ND	ND	ND	ND	ND	PASS
5	Black plastic cover	Housing	ND	ND	ND	ND	PBDEs 632*	PASS
6	Silvery metal shaft	Inside	ND	ND	ND	ND	NA	PASS
7	White plastic jump ring	Inside	ND	ND	ND	ND	ND	PASS
8	Dark brown plastic	Inside	ND	ND	ND	ND	ND	PASS
9	Black plastic jump ring	Inside	ND	ND	ND	ND	PBDEs 271*	PASS
10	Copper wire	Inside	ND	ND	ND	ND	NA	PASS
11	Red plastic button	Housing	ND	ND	ND	ND	ND	PASS
12	White plastic	Inside	ND	ND	ND	ND	ND	PASS
13	Black plastic gasket ^{R1}	Part	ND	ND	ND	ND	PBDEs 271*	PASS
14	Silvery metal gasket	Inside	ND	ND	ND	ND	NA	PASS
15	Silvery metal	Inside	ND	ND	ND	ND	NA	PASS
16	Black metal	Inside	ND	ND	ND	ND	NA	PASS
17	Silvery metal	Inside	ND	ND	ND	ND	NA	PASS
18	Silvery metal screw	Inside	ND	ND	ND	ND	NA	PASS
19	Silvery metal washer	Inside	ND	ND	ND	ND	NA	PASS
20	Silvery metal	Inside	ND	ND	ND	ND	NA	PASS
21	Silvery metal	Inside	ND	ND	ND	ND	NA	PASS
22	Silvery metal spring	Inside	ND	ND	ND	ND	NA	PASS
23	Black plastic cover	Switch	ND	ND	ND	ND	ND*	PASS
24	Silvery metal contact point	Switch	ND	EX [#]	ND	ND	NA	EX [#]
25	Black plastic button	Switch	ND	ND	ND	ND	ND*	PASS
26	Black plastic shell	Switch	ND	ND	ND	ND	ND*	PASS
27	Silvery metal solder	Solder	ND	ND	ND	ND	NA	PASS
28	White adhesive tape	Inductance	ND	ND	ND	ND	ND	PASS



LAB NO. : (2421)090-0076
 DATE : July 07, 2021
 PAGE : 4 OF 10

**BUREAU
 VERITAS**

-			Result					Conclusion
Parameter			Lead (Pb)	Cadmium (Cd)	Mercury (Hg)	Chromium VI (Cr VI)	PBBs & PBDEs	
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-
Test Item	Description	Location	-	-	-	-	-	-
29	White cotton varnished sleeve ^{R1}	Inductance	ND	ND	ND	ND	ND	PASS
30	Black soft plastic wire jacket ^{R2}	Wire jacket	ND	ND	ND	ND	ND	PASS
31	Black soft plastic wire jacket ^{R2}	Wire jacket	ND	ND	ND	ND	ND	PASS
32	Silvery metal solder	Solder	ND	ND	ND	ND	NA	PASS
33	Black plastic inner support	Inductance	ND	ND	ND	ND	ND	PASS
34	Transparent adhesive tape	Inductance	ND	ND	ND	ND	ND	PASS
35	Green plastic	PCB	ND	ND	ND	ND	ND*	PASS
36	Gold metal bolt	Inside	2.59x10 ⁴ *	16.4*	ND	ND	NA	EX [#]
37	Silvery metal bolt	Inside	2.48x10 ⁴ *	5.91*	ND	ND	NA	EX [#]
38	Black plastic button	Switch	ND	ND	ND	ND	ND	PASS
39	Brown plastic base	Switch	ND	ND	ND	ND	ND	PASS
40	Transparent plastic cover	Relay	ND	ND	ND	ND	ND	PASS
41	Black plastic	Relay	ND	ND	ND	ND	ND*	PASS
42	Silvery metal contact point	Relay	ND	ND	ND	ND	NA	PASS
43	Black plastic base	Relay	ND	ND	ND	ND	ND	PASS
44	Black plastic	Relay	ND	ND	ND	ND	ND*	PASS
45	White soft plastic wire jacket	Wire jacket	ND	ND	ND	ND	ND	PASS
46	Silvery metal spring	Relay	ND	ND	ND	ND	NA	PASS
47	Silvery metal solder	Relay	ND	ND	ND	ND	NA	PASS
48	Yellow adhesive tape	Relay	ND	ND	ND	ND	ND	PASS
49	Transparent plastic inner support	Relay	ND	ND	ND	ND	ND	PASS
50	SMD resistor	PCB	ND	ND	ND	ND	ND	PASS
51	Green LED	PCB	ND	ND	ND	ND	ND	PASS
52	SMD diode	PCB	ND	ND	ND	ND	ND	PASS
53	Red LED	PCB	ND	ND	ND	ND	ND	PASS
54	Rectifier bridge	PCB	ND	ND	ND	ND	ND	PASS
55	Blue voltage dependent resistor	PCB	ND	ND	ND	ND	ND	PASS
56	Silvery metal solder	PCB	ND	ND	ND	ND	NA	PASS
57	PCB	PCB	ND	ND	ND	ND	ND	PASS
58	White label	Part	ND	ND	ND	ND	ND	PASS



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VERITAS**

Note / Key :

ND = Not detected

NR = Not requested

Detection Limit: See Appendix.

“>” = Greater than

mg/kg = milligram(s) per kilogram = ppm = part(s) per million

NA = Not applicable

“<” = Less than

EX= Exempted

Remark :

- The testing approach is listed in table of Appendix.
- * denotes as reported result(s) was (were) performed by wet chemistry method. Others were screened by XRF. For XRF screening, the result(s) of Cr VI was (were) reported as total chromium and the result(s) of PBBs and PBDEs was (were) reported as total bromine. Also, the XRF result(s) may be different to the actual content based on various factors including, but not limit to, sample size, thickness, area, non-uniformity composition, surface flatness.
- Only selected example(s) is (are) indicated on the photograph(s) in Comment.
- According to European Parliament and Council Directive 2011/65/EU, Article 5 “Adaptation of the Annexes to scientific and technical progress”, exemption(s) should be granted to the materials and components of Test Item(s) in the lists in Annexes III and IV of this directive.
- For item 36,37:
#According to Annex III of European Council Directive 2011/65/EU with Amendment (EU)2018/741, exemptions were granted a few materials and Clause 6(c) is reiterated here “Copper alloy containing up to 4 % lead by weight.”. Test Item(s) was (were) claimed as is by client (received as is). Therefore, this (these) Test Item(s) containing the found lead level should be exempted.
- For item 24:
#According to Annex III of European Council Directive 2011/65/EU with Amendment (EU)2019/171, exemptions were granted a few materials and Clause 8(b) is reiterated here “Cadmium and its compounds in electrical contacts.”. Test Item(s) was (were) claimed as is by client (received as is). Therefore, this (these) Test Item(s) containing the found cadmium level should be exempted.
- R1=Second submission
- R2=Third submission

LAB NO. : (2421)090-0076
DATE : July 07, 2021
PAGE : 5 OF 10



TEST RESULT

Compliance Test - Phthalate Test – (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : Reference to IEC 62321-8: 2017.

Maximum Allowable Limit : 0.1% (Each)

Parameter	CAS No.	Unit	MDL	Result			
				1+2+3	4+5+7	8+9+11	(12+13+23) ^{R1}
Dibutyl phthalate (DBP)	84-74-2	%	0.005	ND	ND	ND	ND
Butyl benzyl phthalate (BBP)	85-68-7	%	0.005	ND	ND	ND	ND
Di-2-ethylhexyl phthalate (DEHP)	117-81-7	%	0.005	ND	ND	ND	ND
Diisobutyl phthalate (DIBP)	84-69-5	%	0.005	ND	ND	ND	ND
Conclusion	-	-	-	PASS	PASS	PASS	PASS

Parameter	CAS No.	Unit	MDL	Result			
				25+26+33	28	29 ^{R1}	(30+31) ^{R2}
Dibutyl phthalate (DBP)	84-74-2	%	0.005	ND	ND	0.017	ND
Butyl benzyl phthalate (BBP)	85-68-7	%	0.005	ND	ND	ND	ND
Di-2-ethylhexyl phthalate (DEHP)	117-81-7	%	0.005	ND	0.010	0.009	ND
Diisobutyl phthalate (DIBP)	84-69-5	%	0.005	ND	ND	ND	ND
Conclusion	-	-	-	PASS	PASS	PASS	PASS

Parameter	CAS No.	Unit	MDL	Result			
				34	35+38+39	40+41+43	44+49
Dibutyl phthalate (DBP)	84-74-2	%	0.005	ND	ND	ND	ND
Butyl benzyl phthalate (BBP)	85-68-7	%	0.005	ND	ND	ND	ND
Di-2-ethylhexyl phthalate (DEHP)	117-81-7	%	0.005	0.021	ND	ND	ND
Diisobutyl phthalate (DIBP)	84-69-5	%	0.005	ND	ND	ND	ND
Conclusion	-	-	-	PASS	PASS	PASS	PASS

Parameter	CAS No.	Unit	MDL	Result			
				45	48	50+52+54+55+57	51+53
Dibutyl phthalate (DBP)	84-74-2	%	0.005	ND	ND	ND	ND
Butyl benzyl phthalate (BBP)	85-68-7	%	0.005	ND	ND	ND	ND
Di-2-ethylhexyl phthalate (DEHP)	117-81-7	%	0.005	ND	ND	ND	ND
Diisobutyl phthalate (DIBP)	84-69-5	%	0.005	ND	ND	ND	ND
Conclusion	-	-	-	PASS	PASS	PASS	PASS



BUREAU
VERITAS

LAB NO. : (2421)090-0076
DATE : July 07, 2021
PAGE : 7 OF 10

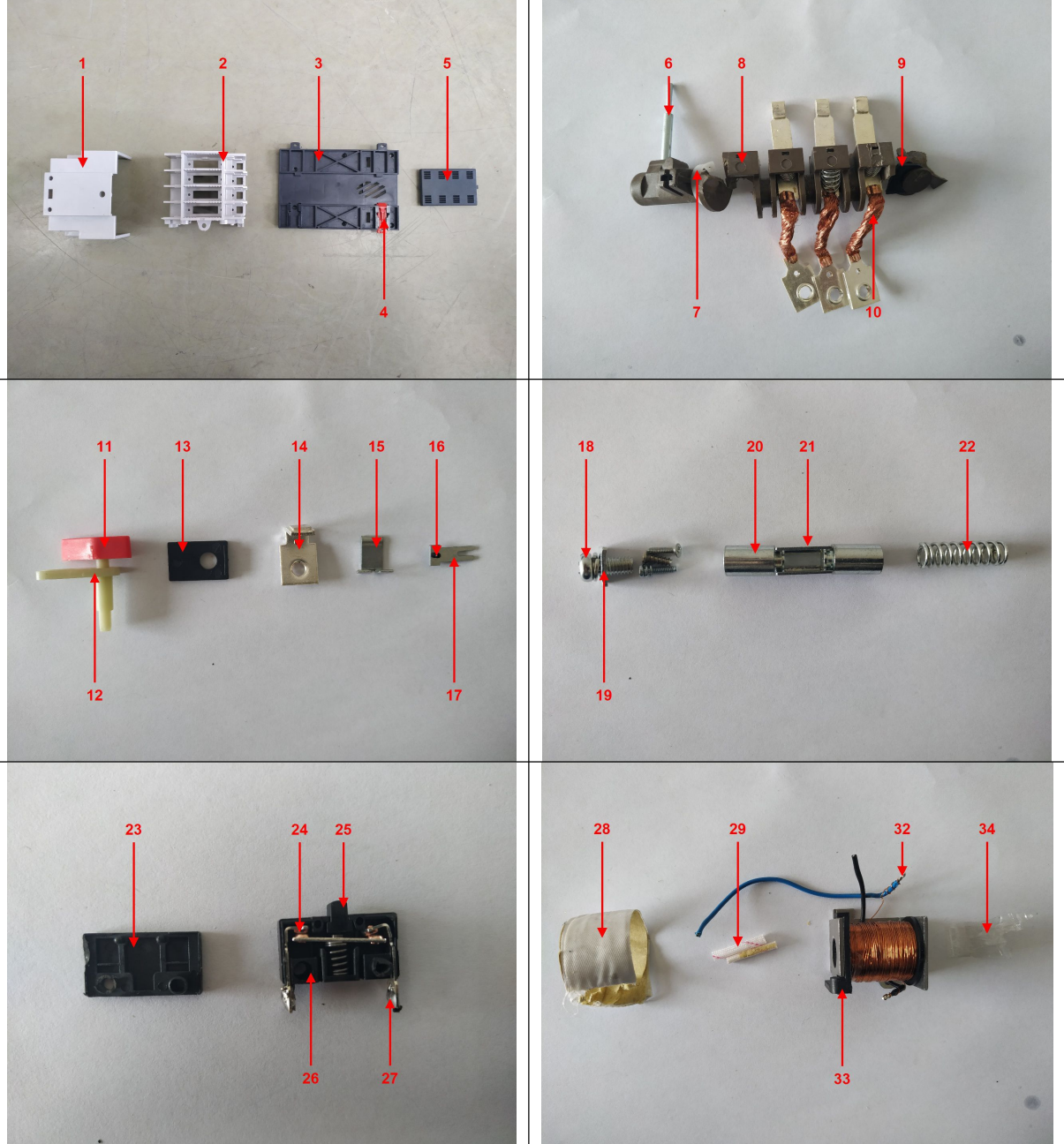
Parameter	CAS No.	Unit	MDL	Result
				58
Dibutyl phthalate (DBP)	84-74-2	%	0.005	ND
Butyl benzyl phthalate (BBP)	85-68-7	%	0.005	ND
Di-2-ethylhexyl phthalate (DEHP)	117-81-7	%	0.005	ND
Diisobutyl phthalate (DIBP)	84-69-5	%	0.005	ND
Conclusion	-	-	-	PASS

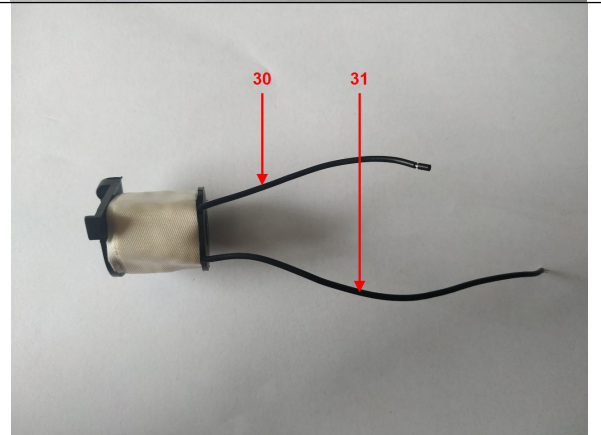
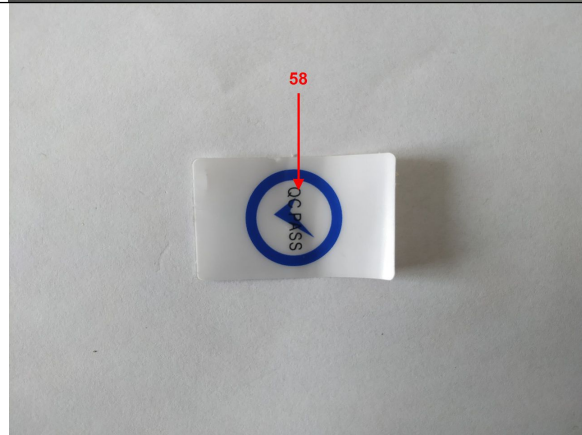
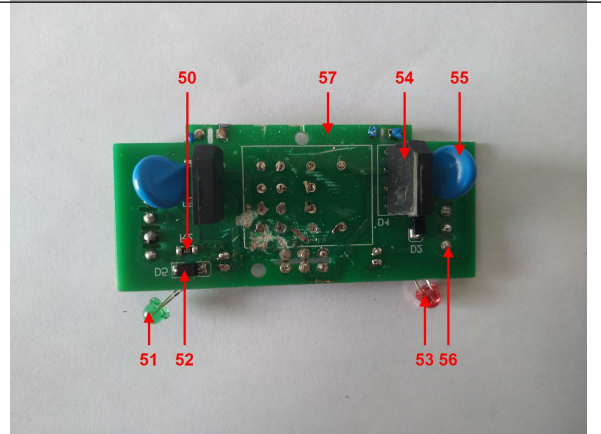
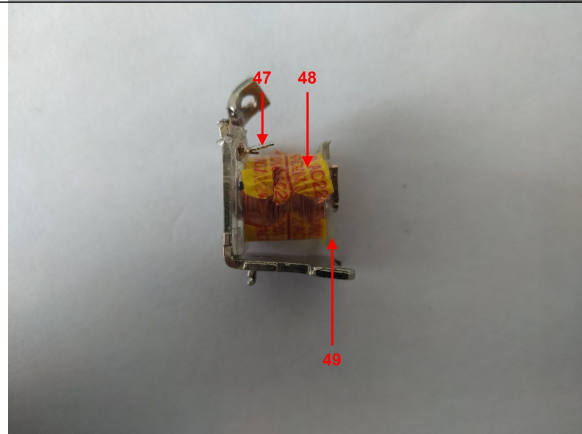
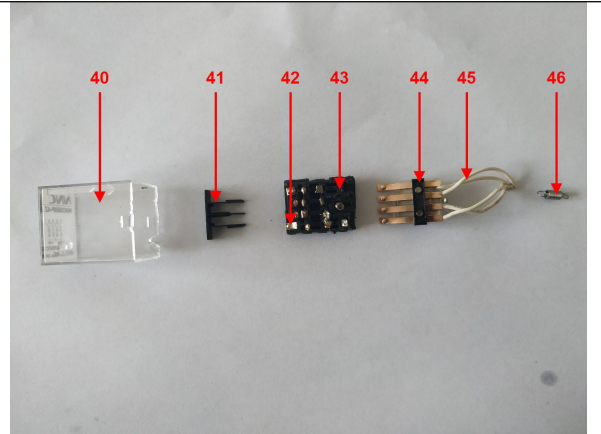
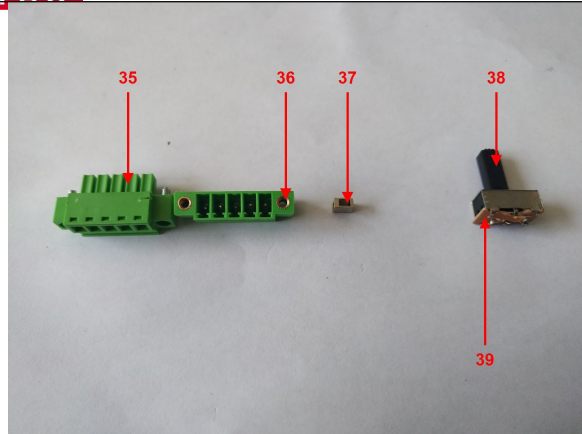
Note: mg/kg= milligram per kilogram % = percentage 1 mg/kg = 0.0001%
MDL = Method Detection Limit ND = Not Detected (< MDL) “-“ = Not Regulated

- R1=Second submission
- R2=Third submission

Comment :

Photograph(s) | Compliance Test for European Parliament and Council Directive 2011/65/EU | :
Photograph depicting Test Item(s)







APPENDIX

List of Analytes and their Corresponding Test Methods, Detection Limit and Maximum Allowable Limit [Compliance Test for European Parliament and Council Directive 2011/65/EU] :							
No.	Name of Analyte(s)	Detection Limit (mg/kg)				Wet Chemistry	Maximum Allowable Limit (mg/kg)
		X-ray fluorescence (XRF)^[a]					
		Plastic	Metallic / glass / ceramic	Others			
1	Lead (Pb)	100	200	200	10 ^[b]	1 000	
2	Cadmium (Cd)	50	50	50	10 ^[b]	100	
3	Mercury (Hg)	100	200	200	10 ^[c]	1 000	
4	Chromium (Cr)	100	200	200	NA	NA	
5	Chromium VI (Cr VI)	NA	NA	NA	3 ^[g, h] / 10 ^[d] / Sec ^[e, i]	1 000 / Negative ^[i]	
6	Bromine (Br)	200	NA	200	NA	NA	
7	Polybromobiphenyls (PBBs) - Bromobiphenyl (MonoBB) - Dibromobiphenyl (DiBB) - Tribromobiphenyl (TriBB) - Tetrabromobiphenyl (TetraBB) - Pentabromobiphenyl (PentaBB) - Hexabromobiphenyl (HexaBB) - Heptabromobiphenyl (HeptaBB) - Octabromobiphenyl (OctaBB) - Nonabromobiphenyl (NonaBB) - Decabromobiphenyl (DecaBB)	NA	NA	NA	Each 50 ^[f]	Sum 1 000	
8	Polybromodiphenyl ethers (PBDEs) - Bromodiphenyl ether (MonoBDE) - Dibromodiphenyl ether (DiBDE) - Tribromodiphenyl ether (TriBDE) - Tetrabromodiphenyl ether (TetraBDE) - Pentabromodiphenyl ether (PentaBDE) - Hexabromodiphenyl ether (HexaBDE) - Heptabromodiphenyl ether (HeptaBDE) - Octabromodiphenyl ether (OctaBDE) - Nonabromodiphenyl ether (NonaBDE) - Decabromodiphenyl ether (DecaBDE)	NA	NA	NA	Each 50 ^[f]	Sum 1 000	

NA = Not applicable IEC = International Electrotechnical Commission

[a] Test method with reference to International Standard IEC 62321-3-1: 2013.

[b] Test method with reference to International Standard IEC 62321-5: 2013.

[c] Test method with reference to International Standard IEC 62321-4: 2013+AMD1: 2017 CSV.

[d] Polymers and Electronics - Test method with reference to International Standard IEC 62321-7-2: 2017.

[e] Metal - Test method with reference to International Standard IEC 62321-7-1: 2015.

[f] Test method with reference to International Standard IEC 62321-6: 2015.

[g] Leather - Test method International Standard ISO 17075: 2017.

[h] Other Than Metal, Leather, Polymers and Electronics - Test method with reference to International Standard ISO 17075: 2017.

[i] Result(s) of Cr VI for metallic material(s) was (were) expressed in term of positive and negative. Negative means the absence of Cr VI on the tested areas and the result(s) was (were) regarded as in compliance with European Parliament and Council Directive 2011/65/EU, Article 4(1). While, positive means the presence of Cr VI on tested areas and the result(s) was (were) regarded as in conflict with European Parliament and Council Directive 2011/65/EU, Article 4(1).

Testing Approach [Compliance Test for European Parliament and Council Directive 2011/65/EU] :	
The testing approach was with reference to the following document(s).	
1	International Standards IEC 62321-1: 2013 and IEC 62321-2: 2013
2	"RoHS Enforcement Guidance Document Version 1" by EU RoHS Enforcement Authorities Informal Network. (May 2006)
3	"RoHS Regulations - Government Guidance Notes" by United Kingdom Department for Business Innovation & Skills. (February 2011)
4	"Final Report to RoHS substances (Hg, Pb, Cr(VI), Cd, PBB and PBDE) in electrical and electronic equipment in Belgium" by Belgium Federal Public Service Health, Food Chain Safety and Environment. (November 2005)

END