



**BUREAU
VERITAS**

TEST REPORT

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DATE : Jun 25, 2019
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APPLICANT : **PARTICLE INDUSTRIES, INC**
126 POST ST, 4TH FLOOR, SAN FRANCISCO, CA 94108
USA

DATE OF SUBMISSION : NOV 12, 2018

TEST PERIOD : NOV 12, 2018 TO JUN 25, 2019

SAMPLE DESCRIPTION : BORON LTE

Style No. : BRN402

Sample Size: 1

BUREAU VERITAS SHENZHEN CO.,LTD
DONGGUAN BRANCH

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REMARK

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

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SUMMARY OF TEST RESULTS



TEST REQUESTED	CONCLUSION	REMARK
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 Amendment Directive 2015/863/EU	PASS	-
The BBP/DBP/DEHP/DIBP content requirements of the 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 Amendment Directive 2015/863/EU	PASS	-


Photo of the Submitted Sample



Test Item Description and Photo List

Test Item(s)	Sample Photo	Item / Component Description(s)	Location(s)	Style(s)
I001		Multi- color coated brown plastic	Sticker, big cover, big PCB	-
I002		Silvery metal	Big cover, big PCB	-
I003		Silvery metal	Small cover, big PCB	-
I004		Silvery metal	Cover, USB plug, big PCB	-
I005		Black plastic	Pin holder, USB plug, big PCB	-
I006		Silvery metal	Pin, USB plug, big PCB	-
I007		Black plastic	Small socket, big PCB	-
I008		Golden metal	Pin, small socket, big PCB	-
I009		Black plastic	Big socket, big PCB	-
I010		Silvery metal	Pin, big socket, big PCB	-
I011		Black body	SMD diode, side big socket, big PCB	-
I012		Black plastic	Button, switch, big PCB	-
I013		Silvery metal	Case, switch, big PCB	-
I014		Silvery metal	Contact plate, switch, big PCB	-
I015		Black plastic	Base, switch, big PCB	-
I016		Silvery metal	Pin, switch, big PCB	-
I017		Black/translucent body	EC, side switch, big PCB	-
I018		Golden metal	Case, smaller socket, big PCB	-
I019		Golden metal	Pin, smaller socket, big PCB	-

Test Item(s)	Sample Photo	Item / Component Description(s)	Location(s)	Style(s)
I020		White plastic	Pin holder, smaller socket, big PCB	-
I021		Black coated green body	EC, side smaller socket, big PCB	-
I022		Black body	Biggest IC, MXIC, small PCB	-
I023		Black body	Bigger IC, QUALCOMM, small PCB	-
I024		Black body	Big IC, 68001, small PCB	-
I025		Black body	Small IC, small PCB	-
I026		Black body	Smaller IC, small PCB	-
I027		Silvery body	EC, D733, small PCB	-
I028		Grey metal	Inductor, small PCB	-
I029		Coppery metal	Coil, inductor, small PCB	-
I030		White body	SMD capacitor, small PCB	-
I031		Brown body	SMD capacitor, small PCB	-
I032		Green coated translucent plastic with coppery metal	Small PCB	-
I033			Black plastic	Pin holder, bigger socket, big PCB
I034	Golden metal		Pin, bigger socket, big PCB	-
I035	Silvery metal		Case, socket, big PCB	-
I036	Black plastic		Base, socket, big PCB	-
I037	Silvery metal		Pin, socket, big PCB	-
I038	Black metal		Big inductor, 2R2, big PCB	-
I039	Coppery metal		Coil, big inductor, 2R2, big PCB	-
I040	Black metal		Small inductor, big PCB	-

Test Item(s)	Sample Photo	Item / Component Description(s)	Location(s)	Style(s)
I041		Coppery metal	Coil, small inductor, big PCB	-
I042		Black body	IC, Z146P, big PCB	-
I043		Silvery metal	Pin, IC, Z146P, big PCB	-
I044		Black body	IC, L3233F, big PCB	-
I045		Black body	IC, 8901410, big PCB	-
I046		Black body	IC, NS2840, big PCB	-
I047		Dull brown body	EC, side IC, NS2840, big PCB	-
I048		Beige body	SMD capacitor, 227G, big PCB	-
I049		Black body	IC, ZVK 46J, big PCB	-
I050		Black body	IC, CV5, big PCB	-
I051		White body	SMD capacitor, big PCB	-
I052		Blue body	SMD capacitor, big PCB	-
I053		Black body	SMD resistor, big PCB	-
I054		Silvery solder	Solder, big PCB	-
I055		Black coated translucent plastic with coppery metal	Big PCB	-



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TEST RESULT

Compliance Test – 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 Amendment Directive 2015/863/EU

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						-
Test Item(s)	-	-	-	-	-	-	-
I001	ND	ND	ND	ND	ND	ND	PASS
I002	ND	ND	ND	ND	NA	NA	PASS
I003	ND	ND	ND	ND	NA	NA	PASS
I004	ND	ND	ND	ND	NA	NA	PASS
I005	ND	ND	ND	ND	ND	ND	PASS
I006	ND	ND	ND	ND	NA	NA	PASS
I007	ND	ND	ND	ND	ND*	ND*	PASS
I008	ND	ND	ND	ND	NA	NA	PASS
I009	ND	ND	ND	ND	ND*	ND*	PASS
I010	ND	ND	ND	ND	NA	NA	PASS
I011	ND	ND	ND	ND	ND	ND	PASS
I012	ND	ND	ND	ND	ND	ND	PASS
I013	ND	ND	ND	ND	NA	NA	PASS
I014	ND	ND	ND	ND	NA	NA	PASS
I015	ND	ND	ND	ND	ND	ND	PASS
I016	ND	ND	ND	ND	NA	NA	PASS
I017	ND	ND	ND	ND	ND	ND	PASS
I018	ND	ND	ND	ND	NA	NA	PASS
I019	ND	ND	ND	ND	NA	NA	PASS
I020	ND	ND	ND	ND	ND	ND	PASS
I021	ND	ND	ND	ND	ND	ND	PASS
I022	ND	ND	ND	ND	ND	ND	PASS
I023	ND	ND	ND	ND	ND	ND	PASS
I024	ND	ND	ND	ND	ND	ND	PASS
I025	ND	ND	ND	ND	ND	ND	PASS
I026	ND	ND	ND	ND	ND	ND	PASS



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-	Result						
Parameter	Lead (Pb)	Cadmium (Cd)	Mercury (Hg)	Chromium VI (Cr VI)	PBBs	PBDEs	Conclusion
Unit	mg/kg						-
Test Item(s)	-	-	-	-	-	-	-
I027	ND	ND	ND	ND	ND	ND	PASS
I028	ND	ND	ND	ND	NA	NA	PASS
I029	ND	ND	ND	ND	NA	NA	PASS
I030	ND	ND	ND	ND	ND	ND	PASS
I031	ND	ND	ND	ND	ND	ND	PASS
I032	ND	ND	ND	ND	ND	ND	PASS
I033	ND	ND	ND	ND	ND*	ND*	PASS
I034	ND	ND	ND	ND	NA	NA	PASS
I035	ND	ND	ND	ND	NA	NA	PASS
I036	ND	ND	ND	ND	NA	NA	PASS
I037	ND	ND	ND	ND	NA	NA	PASS
I038	ND	ND	ND	ND	NA	NA	PASS
I039	ND	ND	ND	ND	NA	NA	PASS
I040	ND	ND	ND	ND	NA	NA	PASS
I041	ND	ND	ND	ND	NA	NA	PASS
I042	ND	ND	ND	ND	ND	ND	PASS
I043	ND	ND	ND	ND	NA	NA	PASS
I044	ND	ND	ND	ND	ND	ND	PASS
I045	ND	ND	ND	ND	ND	ND	PASS
I046	ND	ND	ND	ND	ND	ND	PASS
I047	ND	ND	ND	ND	ND	ND	PASS
I048	ND	ND	ND	ND	ND	ND	PASS
I049	ND	ND	ND	ND	ND	ND	PASS
I050	ND	ND	ND	ND	ND	ND	PASS
I051	ND	ND	ND	ND	ND	ND	PASS
I052	ND	ND	ND	ND	ND	ND	PASS
I053	ND	ND	ND	ND	ND	ND	PASS
I054	ND	ND	ND	ND	NA	NA	PASS
I055	ND	ND	ND	ND	ND*	ND*	PASS



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Note / Key:

ND = Not detected	“>” = Greater than	“<” = Less than
NR = Not requested	mg/kg = milligram(s) per kilogram = ppm = part(s) per million	
NA = Not applicable	% = percent	10000 mg/kg = 1 %
Detection Limit : See Appendix.		

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.
 - According to European 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.
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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 Analytes	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]	1000	
2	Cadmium (Cd)	50	50	50	10 ^[b]	100	
3	Mercury (Hg)	100	200	200	10 ^[c]	1000	
4	Chromium (Cr)	100	200	200	NA	NA	
5	Chromium VI (Cr VI)	NA	NA	NA	3 ^[g, h] / 10 ^[d] / Sec ^[e, i]	1000 / Negative ^[j]	
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 1000	
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 1000	



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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] :

NA = Not applicable

- [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: 2017.
- [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 17075-1:2017.
- [h] Other Than Metal, Leather, Polymers and Electronics - Test method with reference to International Standard ISO 17075-1:2017.
- [i] The principle of this method was evaluated and supported by two studies organized by IEC TC 111 WG3. These studies were focused on detecting the presence of Cr VI in the corrosion protection coatings on metallic samples. 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).
- [j]

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)



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TEST RESULT

BBP/DBP/DEHP/DIBP 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 Amendment Directive 2015/863/EU

Test Method : With reference to International Standard IEC 62321-8

Test Parameter:	BBP	DBP	DEHP	DiBP	-
Limit (%):	0.1	0.1	0.1	0.1	-
Test Item(s)	Result (%)				Conclusion
I001+I005+I007 +I009+I012	ND	ND	ND	ND	PASS
I015+I020+I032	ND	ND	ND	ND	PASS
I033+I036+I055	ND	ND	ND	ND	PASS

Note / key:

BBP = Butyl benzyl phthalate (CAS No: 85-68-7)

DBP = Dibutyl phthalate (CAS No: 84-74-2)

DEHP = Di(2-ethylhexyl) phthalate (CAS No: 117-81-7)

DiBP = Diisobutyl phthalate (CAS No: 84-69-5)

ND = Not detected % = percent

10000 mg/kg = 1 %

mg/kg = milligram(s) per kilogram

Detection Limit (%) : Each 0.005

Remark:

- The amendment will be effective on 22 July 2019. For medical devices and control instruments, effective date will be 22 July 2021.
- The composite test sample(s) of the submitted samples was prepared in the manner requested by the client, when subject to the test performed.
- The item(s) 001,005,007,009,012,015,020,032,033,036,055 were provided by client dated on Jun 19, 2019.

*** End of Report ***