



**Test Report**

No. 644742-CH02

Date: April 11, 2014

Page 1 of 7

**Sound Design Technologies**  
970 Fraser Drive  
Burlington, Ontario  
Canada

The following sample(s) was/were submitted and identified by/on behalf of the client as:

**Hearing aid Amplifier**  
**Model/Part No.: SA3291A-E1**

Sample Received Date:

**4/10/2014**

Testing Period:

**4/10/2014 – 4/11/2014**

Test Requested : Please refer to the result summary.

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

Result Summary :

Test Requested	Comment
European Directive 2011/65/EU Annex II (RoHS); recasting 2002/95/EC	PASS

Signed for and on behalf of SGS North America, Inc.

Prepared By:

Christina Crimi  
Laboratory Manager, Chemistry Laboratory

Veronica Marrero  
Laboratory Operations Lead, Chemistry Laboratory

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## Test Report

No. 644742-CH02

Date: April 11, 2014

Page 2 of 7

### European Directive 2011/65/EU Annex II (RoHS); recasting 2002/95/EC

1. Lead, Cadmium, Mercury, Chromium and Bromine content by XRF Screening

Method : With reference to IEC 62321-5:2013. Analysis was performed by XRF Spectroscopy.

Test item	Sample Description	Result					Comment
		Cd	Pb	Hg	Cr	Br	
1	Hearing aid Amplifier – Front Side	X	BL	BL	BL	BL	PASS
2	Hearing Aid Amplifier – Back Side	X	BL	BL	BL	BL	Refer to chemical result

- Note :
1. BL = Below Limit by XRF analysis
  2. OL = Over Limit by XRF analysis
  3. X = Inconclusive (means questionable, need further chemical analysis)
  4. # = Insufficient sample for screening test
  5. NA = Not Applicable

Remark : 1. Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr(VI)) and GCMS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-5:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	mg/kg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	mg/kg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cr	mg/kg	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$
Br	mg/kg	$BL \leq (300-3\sigma) < X$	--	$BL \leq (250-3\sigma) < X$

BL = Below Limit  
 OL = Over Limit  
 X = Inconclusive  
 LOD = Limit of Detection

2. The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample due to non-uniformity composition.

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3. Maximum permissible limit:

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr VI)	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenylethers (PBDEs)	1000

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## Test Report

No. 644742-CH02

Date: April 11, 2014

Page 4 of 7

2. Cadmium content and Polybromobiphenyl (PBB) and Polybromodiphenyl ether (PBDE) by chemical method

Method : With reference to IEC 62321-5:2013. Cadmium was analyzed by Inductively Coupled Argon Plasma Spectrometry and PBB, PBDE were analyzed by Gas Chromatography – Mass Spectrometry (GC-MS).

Test Item	Result (mg/kg)	Detection Limit (mg/kg)	Permissible Limit (mg/kg)
	1		
Cadmium (Cd)	ND	2	100
<b>Comment</b>	PASS	--	--

### Sample Description:

1. Hearing aid Amplifier

Note : 1. mg/kg = milligram per kilogram  
2. ND = Not Detected

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## Test Report

No. 644742-CH02

Date: April 11, 2014

Page 5 of 7

Method : With reference to IEC 62321-5:2013. Lead, Cadmium and Mercury were analyzed by Inductively Coupled Argon Plasma Spectrometry, Chromium (VI) was analyzed by UV-Visible Spectroscopy and PBB, PBDE were analyzed by Gas Chromatography – Mass Spectrometry (GC-MS).

Test Item	Result (mg/kg)	Detection Limit (mg/kg)	Permissible Limit (mg/kg)
	1		
<b>Sum of PBBs</b>	ND	--	1000
Monobromobiphenyl	ND	5	--
Dibromobiphenyl	ND	5	--
Tribromobiphenyl	ND	5	--
Tetrabromobiphenyl	ND	5	--
Pentabromobiphenyl	ND	5	--
Hexabromobiphenyl	ND	5	--
Heptabromobiphenyl	ND	5	--
Octabromobiphenyl	ND	5	--
Nonabromobiphenyl	ND	5	--
Decabromobiphenyl	ND	5	--
<b>Sum of PBDEs</b>	ND	--	1000
Monobromodiphenyl ether	ND	5	--
Dibromodiphenyl ether	ND	5	--
Tribromodiphenyl ether	ND	5	--
Tetrabromodiphenyl ether	ND	5	--
Pentabromodiphenyl ether	ND	5	--
Hexabromodiphenyl ether	ND	5	--
Heptabromodiphenyl ether	ND	5	--
Octabromodiphenyl ether	ND	5	--
Nonabromodiphenyl ether	ND	5	--
Decabromodiphenyl ether	ND	5	--
<b>Comment</b>	PASS	--	--

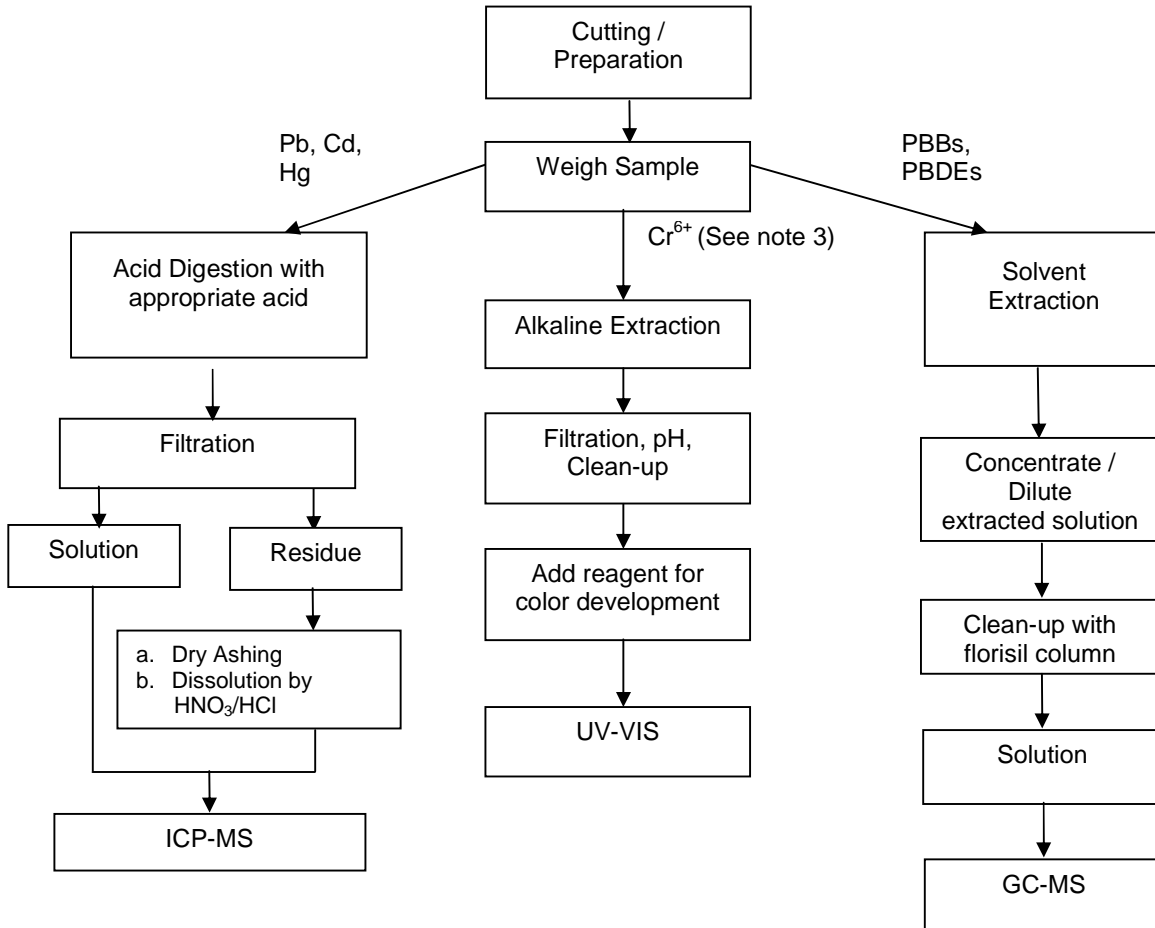
### Sample Description:

1. Hearing Aid Amplifier

Note : 1. mg/kg = milligram per kilogram  
2. ND = Not Detected

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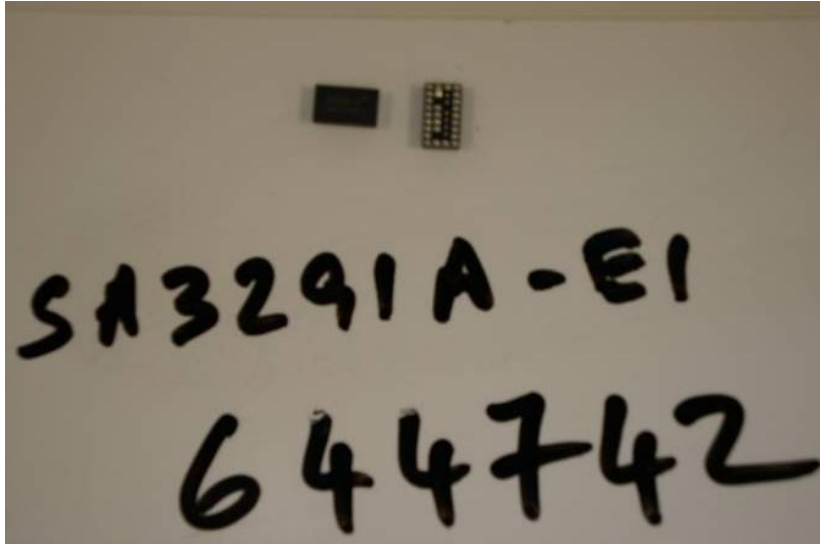
Flowchart for RoHS:



- Note :
1. For Cr(VI), spot test is adopted for metal sample.
  2. The Cd, Pb and Hg contents test on polymeric samples were dissolved totally by pre-conditioning method according to above flow chart.
  3. Cr<sup>6+</sup> is performed only when total Cr is detected

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## Sample Photo:



SGS authenticates the photo on the original report only

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

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