Cypress Semiconductor Corporation – An Infineon Technologies Company
198 Champion Court, San Jose, CA 95134. Tel: (408) 943-2600

PRODUCT CHANGE NOTIFICATION

PCN: PCN203103 **Date:** July 28, 2020

Subject: Transfer of Assembly Operations to Greatek Electronics Inc. for Select SOIC, SSOP and SOJ Packages

To: FUTURE ELECTRONICS
FUTURE ELE
pcn.system@futureelectronics.com

Change Type: Major

Description of Change:
Cypress announces the qualification of Greatek Electronics Inc., Taiwan located at No. 136, Gong-Yi Rd., Zhunan Township, Miaoli County 350, Taiwan, as an alternate assembly site for select Memory and USB products offered in 32-Lead SOIC (450mil), 56-Lead SSOP (300mil) and 44-Lead SOJ (400mil), 36-Lead SOJ (400mil), 32-Lead SOJ (400mil), 32-Lead SOJ (300mil), 28-Lead SOJ (300mil) packages.

These products are currently processed at Jiangsu Changjiang Electronics Technology Co., Ltd (JCET), Cypress' subcontractor in China. The transfer of assembly operations to Greatek is motivated by JCET's phasing out (i.e., End-Of-Life) of SOIC, SSOP and SOJ manufacturing operations, as previously announced in advance PCN (APCN 201001 and APCN 201002).

Given the imminent phase out of operations at JCET, and the dynamically changing market conditions, Cypress is pleased to offer supply of changed material (i.e., Greatek assembled product) ahead of the implementation date. Customers are strongly encouraged to avail of this option, where production volumes of Greatek assembled product can be secured and shipped against current orders. Please contact your Cypress Sales Representative for more information on availing this option.

Greatek is certified by international quality and safety standards, namely, ISO 9001, IATF 16949, ISO 14001, and ISO 26262. These certificates, along with their Sony Green Partnership certificate, can be viewed on their corporate web site: http://www.greatek.com.tw/

BOM Comparison:
The SOIC, SSOP and SOJ packages will be assembled at Greatek using an industry standard set of Bill of Materials (BOM). Please see table below for a comparison of BOM between Greatek and JCET.

a) The 32-Lead SOIC package is assembled at Greatek using the following Bill of Materials (BOM):

For Automotive product:

Material	Greatek BOM	JCET BOM
Leadframe Type	Cu Leadframe	PPF Leadframe
Leadfinish	Pure Sn	NiPdAu
Die Attach Material	Hitachi EN-4900GC	Henkel QMI-509
Wire type	1.0 mil Au wire	1.0 mil Au wire
Mold Compound	Sumitomo EME-G700SLA	Kyocera KE-G6000DA-CY

For Non-Automotive product:

Material	Greatek BOM	JCET BOM
Leadframe Type	Cu Leadframe	PPF/ Cu Leadframe
Leadfinish	Pure Sn	NiPdAu/Pure Sn
Die Attach Material	Hitachi EN-4900GC	Henkel QMI-509
Wire type	0.8 mil CuPdAu wire	1.0mil Au wire/ 0.8mil CuPd wire
Mold Compound	Sumitomo EME-G700SLA	Kyocera KE-G6000DA-CY

b) The 56-Lead SSOP package is assembled at Greatek using the following Bill of Materials (BOM):

Material	Greatek Taiwan BOM	JCET China BOM
Leadframe Type	Cu Leadframe	Cu Leadframe
Leadfinish	Pure Sn	Pure Sn
Die Attach Material	Hitachi EN-4900GC	Henkel QMI-509
Wire type	0.8 mil CuPdAu wire	0.9mil Au wire/ 0.8mil CuPd wire
Mold Compound	Sumitomo EME-G700H	Kyocera KE-G3000DA-CY/ Sumitomo EME G620B

c) The SOJ packages are assembled at Greatek using the following Bill of Materials (BOM):

Material	Greatek BOM	JCET BOM
Leadframe Type	Cu Leadframe	Cu Leadframe
Leadfinish	Pure Sn	Pure Sn
Die Attach Material	Hitachi EN-4900GC	Henkel QMI-509
Wire type	0.8 mil CuPdAu wire	0.9mil Au wire/ 0.8mil CuPd wire
Mold Compound	Sumitomo EME-G700SLA	Sumitomo EME-G620B/ Sumitomo EME-G631SH-Q/ Kyocera KE-G6000DA-CY

Benefit of Change:
Qualification of alternative manufacturing sites provides the means for Cypress to ensure business continuity on the stated products, and thereby meet long-term market demand and delivery commitments to customers after the phase out of operations at JCET.

Part Numbers Affected: 69
See the attached 'Affected Parts List' file for a list of all part numbers affected by this change. Note that any new parts introduced after the publication of this PCN will be assembled at Greatek.

Qualification Status:
Greatek has been qualified through a series of tests documented in the Qualification Test Plans summarized in the table below. These qualification reports can be found as attachments to this PCN or by visiting www.cypress.com and typing the QTP number in the keyword search window.

QTP Number	Qualification Purpose
201304	SOIC 32L Package Qual at Greatek Taiwan
201104	SOIC 32L Package Qual at Greatek Taiwan
200404	SSOP 56L Package Qual at Greatek Taiwan
201301	SOJ Package Qual at Greatek Taiwan

Sample Status:
Samples are available now, unless there is an indication that the sample ordering part numbers are subject to lead times. Qualification samples may not be built ahead of time for all part numbers affected by this change.

Please review the attached 'Affected Parts List' file for a list of affected part numbers with their associated Greatek sample ordering part numbers.

If you require qualification samples, please contact your local Cypress sales representative as soon as possible, preferably within 30 days of the date of this notification.

Approximate Implementation Date:
Effective immediately upon customer approval, or 90 days from the date of this notification, whichever comes first, shipments on part numbers in the attached file will be primarily sourced from Greatek. Customers should expect to receive JCET assembled product for a transitionary period, until inventory is depleted. For Automotive PPAP part numbers this change will be effective upon customer approval.

Anticipated Impact:
Products assembled at Greatek are completely compatible with existing products from form, fit, functional, parametric and quality performance perspectives.

Cypress also recommends that customers take this opportunity to review this change against current application notes, system design considerations and customer environment conditions to assess impact (if any) to their application.

Method of Identification:
Cypress also maintains traceability of product to wafer level, including wafer fabrication location, through the lot number marked on the package.

Response Required:
No response is required.

For additional information regarding this change, contact your local sales representative or contact the PCN Administrator at pcn_adm@cypress.com.

Sincerely,

Cypress PCN Administration

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard **http://www.ipc.org/IPC-175x**	**Form Type *** **Distribute**	**Declaration Class *** **Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat**

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-05-13**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Staff EH&S Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SOJ 36_VZ364_23.49x10	SOJ 36_VZ364_23.49x10.16x2	SOJ 36_VZ364_23.49x10.16x2	2020-05-13		Greatek	1,485	mg	Each
Alternate Recommendation				Alternate Item Comments	Package QTP# 201301			

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: MC (002-27679); DA (001-79591); PLATING (002-26469) ; BW (002-26275); LF (001-80024)

*** Required Field**

Form enabled by Adobe

Save the fields in this form to a file	Export Data	Import fields from a file into this form	Import Data	Clear all of the fields on this form	Reset Form	Lock the fields on this form to prevent changes	Lock Supplier Fields

RoHS Material Composition Declaration

Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	475.2	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		446.21	mg			300,417
						+C -C	Supplier	Iron	+S -S	Fe	7439-89-6		10.93	mg			7,360
						+C -C	Supplier	Phosphorus	+S -S	P	7723-14-0		0.47	mg			316
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		0.95	mg			639
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		16.64	mg			11,205
+I -I	Adhesive	+M -M	Die Attach (DAF)	1.18	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.094	mg			63
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.071	mg			47
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.012	mg			8
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.071	mg			47
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.035	mg			23
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.006	mg			4
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.012	mg			8
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		0.879	mg			59
+I -I	Encapsulation	+M -M	Mold Compound	945.91	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		47.29	mg			31,845
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		9.46	mg			6,370
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		690.51	mg			464,988
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		189.18	mg			127,390
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		9.47	mg			6,377
+I -I	External Plating	+M -M	Lead Finish	44.55	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		44.5455	mg			29,996
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.0045	mg			4
+I -I	Circuit	+M -M	Silicon Die	16.67	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		16.67	mg			11,225
+I -I	Interconnect	+M -M	Bond Wire	1.49	mg	+C -C	Supplier	Copper	+S -S	Cu	744-57-5		1.46	mg			983
						+C -C	Supplier	Palladium	+S -S	Pd	7440-05-3		0.026	mg			16

*** Required Field**

+C	-C	Supplier	Gold	+S	-S	Au	7440-57-5		0.004	mg			1

*** Required Field**

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

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Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-05-14**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Staff EH&S Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SOJ 44_VZ44A_28.57x10	SOJ 44_VZ44A_28.57x10.16x2	SOJ 44_VZ44A_28.57x10.16x2	2020-05-13		Greatek	1,803.886	mg	Each
Alternate Recommendation				Alternate Item Comments	QTP# 201301			

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: Test Reports: MC (002-27679); DA (001-79591); PLATING (002-26469) ; BW (002-26275); LF (001-80024)

*** Required Field**

Form enabled by Adobe

Save the fields in this form to a file	Export Data	Import fields from a file into this form	Import Data	Clear all of the fields on this form	Reset Form	Lock the fields on this form to prevent changes	Lock Supplier Fields

RoHS Material Composition Declaration

Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	577.25	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		542.03	mg			300,46
						+C -C	Supplier	Iron	+S -S	Fe	7439-89-6		13.36	mg			7,411
						+C -C	Supplier	Phosphorus	+S -S	P	7723-14-0		0.55	mg			309
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		1.11	mg			618
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		20.2	mg			11,200
+I -I	Adhesive	+M -M	Die Attach (DAF)	1.407	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.11	mg			64
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.08	mg			48
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.01	mg			8
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.08	mg			48
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.04	mg			24
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.007	mg			4
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.01	mg			8
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		1.07	mg			596
+I -I	Encapsulation	+M -M	Mold Compound	1,153.82	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		69.23	mg			38,377
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		34.61	mg			19,188
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		957.7	mg			53,870
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		86.53	mg			47,971
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		5.76	mg			3,198
+I -I	External Plating	+M -M	Lead Finish	54.115	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		54.11	mg			299,96
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.005	mg			3
+I -I	Circuit	+M -M	Silicon Die	15.49	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		15.49	mg			11,225
+I -I	Interconnect	+M -M	Bond Wire	1.794	mg	+C -C	Supplier	Copper	+S -S	Cu	744-57-5		1.75	mg			973
						+C -C	Supplier	Palladium	+S -S	Pd	7440-05-3		0.04	mg			27

*** Required Field**

+C	-C	Supplier	Gold	+S	-S	Au	7440-57-5		0.004	mg			1

*** Required Field**

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard **http://www.ipc.org/IPC-175x**	**Form Type *** **Distribute**	**Declaration Class *** **Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat**

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-07-02**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Staff EH&S Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SOJ 32_VZ324_20.95X10	SOJ 32_VZ324_20.95X10.16X	SOJ 32_VZ324_20.95X10.16X	2020-07-02		Greatek	648.514	mg	Each
Alternate Recommendation				Alternate Item Comments		Package QTP# 201301		

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: MC (002-27679); DA (001-79591); PLATING (002-26469) ; BW (002-26275); LF (001-80024)

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Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	215.025	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		201.91	mg			300,46
						+C -C	Supplier	Iron	+S -S	Fe	7439-89-6		4.98	mg			7,411
						+C -C	Supplier	Phosphorus	+S -S	P	7723-14-0		0.2	mg			309
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		0.415	mg			618
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		7.52	mg			11,200
+I -I	Adhesive	+M -M	Die Attach (DAF)	0.535	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.043	mg			64
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.032	mg			48
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.005	mg			8
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.032	mg			48
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.016	mg			24
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.002	mg			4
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.005	mg			8
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		0.4	mg			596
+I -I	Encapsulation	+M -M	Mold Compound	405.65	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		40.56	mg			60,360
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		20.28	mg			30,185
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		283.97	mg			422,58
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		56.79	mg			84,517
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		4.05	mg			6,037
+I -I	External Plating	+M -M	Lead Finish	20.152	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		20.15	mg			29,997
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.002	mg			3
+I -I	Circuit	+M -M	Silicon Die	6.5	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		6.5	mg			44,500
+I -I	Interconnect	+M -M	Bond Wire	0.652	mg	+C -C	Supplier	Copper	+S -S	Cu	744-57-5		0.65	mg			980
						+C -C	Supplier	Palladium	+S -S	Pd	7440-05-3		0.001	mg			18

*** Required Field**

+C	-C	Supplier	Gold	+S	-S	Au	7440-57-5		0.001	mg			2

*** Required Field**

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard **http://www.ipc.org/IPC-175x**	**Form Type *** **Distribute**	**Declaration Class *** **Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat**

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-07-02**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Staff EH&S Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SOJ 28_VZ283_18.03x7.6	SOJ 28_VZ283_18.03x7.62x2	SOJ 28_VZ283_18.03x7.62x2.2	2020-07-02		Greatek	888.9361	mg	Each
Alternate Recommendation				Alternate Item Comments	Package QTP# 201301			

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: MC (002-27679); DA (001-79591); PLATING (002-26469) ; BW (002-26275); LF (001-80024)

*** Required Field**

Form enabled by Adobe

Save the fields in this form to a file	Export Data	Import fields from a file into this form	Import Data	Clear all of the fields on this form	Reset Form	Lock the fields on this form to prevent changes	Lock Supplier Fields

RoHS Material Composition Declaration

Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	284.8	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		269.99	mg			303,25
						+C -C	Supplier	Iron(Fe)	+S -S	Fe	7439-89-6		7.4	mg			8,314
						+C -C	Supplier	Phosphorus	+S -S	P	12019-57-7		0.28	mg			314
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		0.56	mg			629
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.028	mg			31
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		6.542	mg			7,350
+I -I	Adhesive	+M -M	Die Attach (DAF)	0.6481	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.057	mg			64
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.042	mg			47
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.0071	mg			8
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.042	mg			47
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.0213	mg			24
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.0035	mg			4
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.0071	mg			8
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		0.4681	mg			525
+I -I	Encapsulation	+M -M	Mold Compound	567.878	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		56.88	mg			63,910
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		28.39	mg			31,898
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		397.51	mg			446,64
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		79.5	mg			89,325
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		5.598	mg			6,289
+I -I	External Plating	+M -M	Lead Finish	26.7	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		26.697	mg			29,996
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.003	mg			4
+I -I	Circuit	+M -M	Silicon Die	8.02	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		8.02	mg			9,011
+I -I	Interconnect	+M -M	Bond Wire	0.89	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		0.87	mg			977

*** Required Field**

+C	-C	Supplier	Palladium	+S	-S	Pd	7440-05-3		0.016	mg			17
+C	-C	Supplier	Gold	+S	-S	Au	7440-57-5		0.004	mg			6

*** Required Field**

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard **http://www.ipc.org/IPC-175x**	**Form Type *** **Distribute**	**Declaration Class *** **Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat**

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-05-13**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Staff EH&S Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SOJ 32_VZ323_20.95x7.6	SOJ 32_VZ323_20.95x7.62x2	SOJ 32_VZ323_20.95x7.62x2.2	2020-05-13		Greatek	1,011	mg	Each
Alternate Recommendation				Alternate Item Comments	Package QTP# 201301			

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: MC (002-27679); DA (001-79591); PLATING (002-26469) ; BW (002-26275); LF (001-80024)

*** Required Field**

Form enabled by Adobe

Save the fields in this form to a file	Export Data	Import fields from a file into this form	Import Data	Clear all of the fields on this form	Reset Form	Lock the fields on this form to prevent changes	Lock Supplier Fields

RoHS Material Composition Declaration

Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	323.52	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		303.78	mg			300,47
						+C -C	Supplier	Iron	+S -S	Fe	7439-89-6		7.44	mg			7,359
						+C -C	Supplier	Phosphorus	+S -S	P	7723-14-0		0.32	mg			316
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		0.65	mg			643
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		11.33	mg			11,207
+I -I	Adhesive	+M -M	Die Attach (DAF)	0.808	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.064	mg			63
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.048	mg			47
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.008	mg			8
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.048	mg			47
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.024	mg			23
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.004	mg			4
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.008	mg			8
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		0.604	mg			59
+I -I	Encapsulation	+M -M	Mold Compound	648.831	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		64.88	mg			64,174
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		32.44	mg			32,087
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		454.18	mg			449,22
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		90.84	mg			89,851
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		6.491	mg			6,420
+I -I	External Plating	+M -M	Lead Finish	30.33	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		30.326	mg			29,996
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.004	mg			4
+I -I	Circuit	+M -M	Silicon Die	6.5	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		6.5	mg			6,429
+I -I	Interconnect	+M -M	Bond Wire	1.011	mg	+C -C	Supplier	Copper	+S -S	Cu	744-57-5		0.99	mg			979
						+C -C	Supplier	Palladium	+S -S	Pd	7440-05-3		0.018	mg			17

*** Required Field**

+C	-C	Supplier	Gold	+S	-S	Au	7440-57-5		0.003	mg			4

*** Required Field**

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard **http://www.ipc.org/IPC-175x**	**Form Type *** **Distribute**	**Declaration Class *** **Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat**

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-05-19**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Staff EH&S Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SSOP 56_SP56_ 18.4x7.5	SSOP 56_SP56_ 18.4x7.5x2.4	SSOP 56_SP56_ 18.4x7.5x2.4	2020-05-19		Greatek	781	mg	Each
Alternate Recommendation				Alternate Item Comments	Package QTP# 200404			

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: MC (002-28936); DA (001-79591); PLATING (002-26469) ; BW (002-26275); LF (001-80024)

*** Required Field**

Form enabled by Adobe

Save the fields in this form to a file	Export Data	Import fields from a file into this form	Import Data	Clear all of the fields on this form	Reset Form	Lock the fields on this form to prevent changes	Lock Supplier Fields

RoHS Material Composition Declaration

Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	249.9	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		241.9	mg			309,72
						+C -C	Supplier	Iron	+S -S	Fe	7439-89-6		5.7	mg			7,298
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.02	mg			25
						+C -C	Supplier	Phosphorus	+S -S	P	7723-14-0		0.037	mg			47
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		0.2499	mg			319
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		1.9931	mg			2,552
+I -I	Adhesive	+M -M	Die Attach (DAF)	0.6	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.048	mg			61
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.036	mg			46
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.006	mg			7
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.036	mg			46
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.018	mg			23
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.003	mg			3
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.006	mg			6
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		0.447	mg			572
+I -I	Encapsulation	+M -M	Mold Compound	489.06	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		29.34	mg			37,567
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		14.67	mg			18,784
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		391.25	mg			500,96
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		48.91	mg			62,625
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		4.89	mg			6,261
+I -I	External Plating	+M -M	Lead Finish	23.43	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		23.427	mg			29,996
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.003	mg			4
+I -I	Circuit	+M -M	Silicon Die	17.23	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		17.23	mg			22,061
+I -I	Interconnect	+M -M	Bond Wire	0.78	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		0.76	mg			973

*** Required Field**

+C	-C	Supplier	Palladium	+S	-S	Pd	7440-05-3		0.014	mg			18
+C	-C	Supplier	Gold	+S	-S	Au	7440-57-5		0.006	mg			9

*** Required Field**

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard **http://www.ipc.org/IPC-175x**	**Form Type *** **Distribute**	**Declaration Class *** **Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat**

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-05-11**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Sr EHS Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SOP 32L_SZ324_20.32x1	SOP 32L_SZ324_20.32x11.43	SOP 32L_SZ324_20.32x11.43	2020-05-11		Greatek	1.457	mg	Each
Alternate Recommendation				Alternate Item Comments	Package QTP No.201104 /201802			

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: MC (002-27679), DA (001-79591), PLATING (002-26469), BW (002-26275), LF (001-80024)

*** Required Field**

Form enabled by Adobe

Save the fields in this form to a file	Export Data	Import fields from a file into this form	Import Data	Clear all of the fields on this form	Reset Form	Lock the fields on this form to prevent changes	Lock Supplier Fields

RoHS Material Composition Declaration

Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	466.24	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		437.8	mg			300,48
						+C -C	Supplier	Iron	+S -S	Fe	7439-89-6		10.7	mg			7,344
						+C -C	Supplier	Phosphorus	+S -S	P	7723-14-0		0.47	mg			323
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		0.93	mg			638
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		16.34	mg			11,215
+I -I	Adhesive	+M -M	Die Attach (DAF)	1.16	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.093	mg			64
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.069	mg			47
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.012	mg			8
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.069	mg			47
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.034	mg			23
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.0058	mg			4
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.0116	mg			8
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		0.8656	mg			594
+I -I	Encapsulation	+M -M	Mold Compound	923.52	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		46.18	mg			31,695
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		9.24	mg			6,342
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		674.17	mg			462,71
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		184.7	mg			126,76
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		9.23	mg			6,335
+I -I	External Plating	+M -M	Lead Finish	43.71	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		43.7056	mg			29,996
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.0044	mg			4
+I -I	Circuit	+M -M	Silicon Die	20.91	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		20.91	mg			14,351
+I -I	Interconnect	+M -M	Bond Wire	1.46	mg	+C -C	Supplier	Copper	+S -S	Cu	744-57-5		1.43	mg			981
						+C -C	Supplier	Palladium	+S -S	Pd	7440-05-3		0.026	mg			17

*** Required Field**

+C	-C	Supplier	Gold	+S	-S	Au	7440-57-5		0.004	mg			2

*** Required Field**

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard **http://www.ipc.org/IPC-175x**	**Form Type *** **Distribute**	**Declaration Class *** **Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat**

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	**Response Date ***	Response Document ID	
Cypress Semiconductor Corp	CYPRESS		**2020-05-11**		
Contact Name *	Title - Contact	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
QA Customer Support	QA Customer Support	**6328497500**	**qacs_team@cypress.com**		
Authorized Representative *	Title - Representative	**Phone - Representative ***	**Email - Representative** *	Supplier Comments or URL for Additional Information	
Jeff Gary Ballesca	Sr EHS Engr	**6328497500**	**jgtb@cypress.com**		

Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	**Weight ***	UOM	Unit Type
SOP 32L_SZ324_20.32x1	SOP 32L_SZ324_20.32x11.43	SOP 32L_SZ324_20.32x11.43	2020-05-11		Greatek	1,457	mg	Each
Alternate Recommendation				Alternate Item Comments		Package QTP No.201304		

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Matte Tin (Sn)	**CU Alloy**	**3**	**260** C	**30** seconds	**3**

Comments

Test reports: MC (002-27679), DA (001-79591), PLATING (002-26469), BW (001-79681), LF (001-80024)

*** Required Field**

Form enabled by Adobe

Save the fields in this form to a file	Export Data	Import fields from a file into this form	Import Data	Clear all of the fields on this form	Reset Form	Lock the fields on this form to prevent changes	Lock Supplier Fields

RoHS Material Composition Declaration

Declaration Type * **Detailed**

RoHS Directive 2002/95/EC	**RoHS Definition:** Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part,the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	**Supplier Acceptance ***	**Accepted**

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Ballesca	Digitally signed by Jeff Gary Ballesca DN: cn=Jeff Gary Ballesca, o, ou, email=jgtb@cypress.com, c=US Date: 2018.09.06 09:50:19 +08'00'	

*** Required Field**

Homogeneous Material Composition Declaration for Electronic Products

SubItem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /SubItem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/SubItem Name		Homogeneous Material	Weight	Unit of Measure		Level	Substance Category		Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance -	Tolerance +	PPM
+I -I	Base Material	+M -M	Leadframe	466.24	mg	+C -C	Supplier	Copper	+S -S	Cu	7440-50-8		437.8	mg			300,48
						+C -C	Supplier	Iron	+S -S	Fe	7439-89-6		10.7	mg			7,344
						+C -C	Supplier	Phosphorus	+S -S	P	7723-14-0		0.47	mg			323
						+C -C	Supplier	Zinc	+S -S	Zn	7440-66-6		0.93	mg			638
						+C -C	Supplier	Silver	+S -S	Ag	7440-22-4		16.34	mg			11,215
+I -I	Adhesive	+M -M	Die Attach (DAF)	1.16	mg	+C -C	Supplier	Acrylic resin	+S -S	Acrylic resin	Trade secret		0.093	mg			64
						+C -C	Supplier	Polybutadiene derivative	+S -S	Polybutadiene derivative	Trade Secret		0.069	mg			47
						+C -C	Supplier	Butadiene copolymer	+S -S	Butadiene copolymer	Trade Secret		0.012	mg			8
						+C -C	Supplier	Acrylate	+S -S	Acrylate	Trade Secret		0.069	mg			47
						+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade Secret		0.034	mg			23
						+C -C	Supplier	Peroxide	+S -S	Peroxide	Trade Secret		0.0058	mg			4
						+C -C	Supplier	Additive	+S -S	Additive	Trade Secret		0.0116	mg			8
						+C -C	Supplier	Silver	+S -S	Silver	7440-22-4		0.8656	mg			594
+I -I	Encapsulation	+M -M	Mold Compound	937.66	mg	+C -C	Supplier	Epoxy resin	+S -S	Epoxy resin	Trade secret		46.88	mg			32,176
						+C -C	Supplier	Phenol resin	+S -S	Phenol resin	Trade secret		9.38	mg			6,438
						+C -C	Supplier	Silica(Amorphous)A	+S -S	Silica(Amorphous)A	60676-86-0		684.49	mg			469,70
						+C -C	Supplier	Silica(Amorphous)B	+S -S	Silica(Amorphous)B	7631-86-9		187.53	mg			128,70
						+C -C	Supplier	Carbon black	+S -S	Carbon black	1333-86-4		9.38	mg			6,438
+I -I	External Plating	+M -M	Lead Finish	43.71	mg	+C -C	Supplier	Tin(Sn)	+S -S	Tin(Sn)	7440-31-5		43.7056	mg			29,996
						+C -C	A	Lead/Lead Compound	+S -S	Lead	7439-92-1		0.0044	mg			4
+I -I	Circuit	+M -M	Silicon Die	6.77	mg	+C -C	Supplier	NonMetal	+S -S	Silicon	7440-21-3		6.77	mg			4,647
+I -I	Interconnect	+M -M	Bond Wire	1.46	mg	+C -C	Supplier	Gold	+S -S	Au	7440-57-5		1.46	mg			1,000

*** Required Field**

Test Report

No. : KA/2019/90875 Date : 2019/09/20

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

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

Sample Submitted By	:	SUMITOMO BAKELITE (TAIWAN) CO., LTD.
Sample Description	:	EPOXY MOLDING COMPOUND
Style/Item No.	:	EME-G700H TYPE A SERIES (Lot:9063138)
Sample Receiving Date	:	2019/09/16
Testing Period	:	2019/09/16 to 2019/09/20

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Test Requested : (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

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

Conclusion : (1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Ray Chang Ph.D. / Manager
Signed for and on behalf of
SGS Taiwan Limited
Chemical Laboratory-Kaohsiung

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Test Result(s)

PART NAME NO.1 : BLACK EPOXY MOLDING COMPOUND

Test Item (s)	Unit	Method	MDL	Result No.1	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n.d.	1000
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321-7-2:2017 and performed by UV-VIS.	8	n.d.	1000
Sum of PBBs	mg/kg	With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
Monobromobiphenyl	mg/kg		5	n.d.	-
Dibromobiphenyl	mg/kg		5	n.d.	-
Tribromobiphenyl	mg/kg		5	n.d.	-
Tetrabromobiphenyl	mg/kg		5	n.d.	-
Pentabromobiphenyl	mg/kg		5	n.d.	-
Hexabromobiphenyl	mg/kg		5	n.d.	-
Heptabromobiphenyl	mg/kg		5	n.d.	-
Octabromobiphenyl	mg/kg		5	n.d.	-
Nonabromobiphenyl	mg/kg		5	n.d.	-
Decabromobiphenyl	mg/kg		5	n.d.	-
Sum of PBDEs	mg/kg	With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
Monobromodiphenyl ether	mg/kg		5	n.d.	-
Dibromodiphenyl ether	mg/kg		5	n.d.	-
Tribromodiphenyl ether	mg/kg		5	n.d.	-
Tetrabromodiphenyl ether	mg/kg		5	n.d.	-
Pentabromodiphenyl ether	mg/kg		5	n.d.	-
Hexabromodiphenyl ether	mg/kg		5	n.d.	-
Heptabromodiphenyl ether	mg/kg		5	n.d.	-
Octabromodiphenyl ether	mg/kg		5	n.d.	-
Nonabromodiphenyl ether	mg/kg		5	n.d.	-
Decabromodiphenyl ether	mg/kg		5	n.d.	-

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Test Item (s)	Unit	Method	MDL	Result No.1	Limit
Antimony (Sb)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
Beryllium (Be)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	With reference to IEC 62321: 2008. Analysis was performed by GC/MS.	5	n.d.	-
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
Halogen					-
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Phthalates					-
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000

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Test Item (s)	Unit	Method	MDL	Result No.1	Limit
DIPP (Diisopentyl Phthalat) (CAS No.: 605-50-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0, 68515-48-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DPP (Di-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DIHP (1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich) (CAS No.: 71888-89-6)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DHNUP (1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters) (CAS No.: 68515-42-4)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated

PFOS Reference Information : POPs - (EU) 2019/1021

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m². PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
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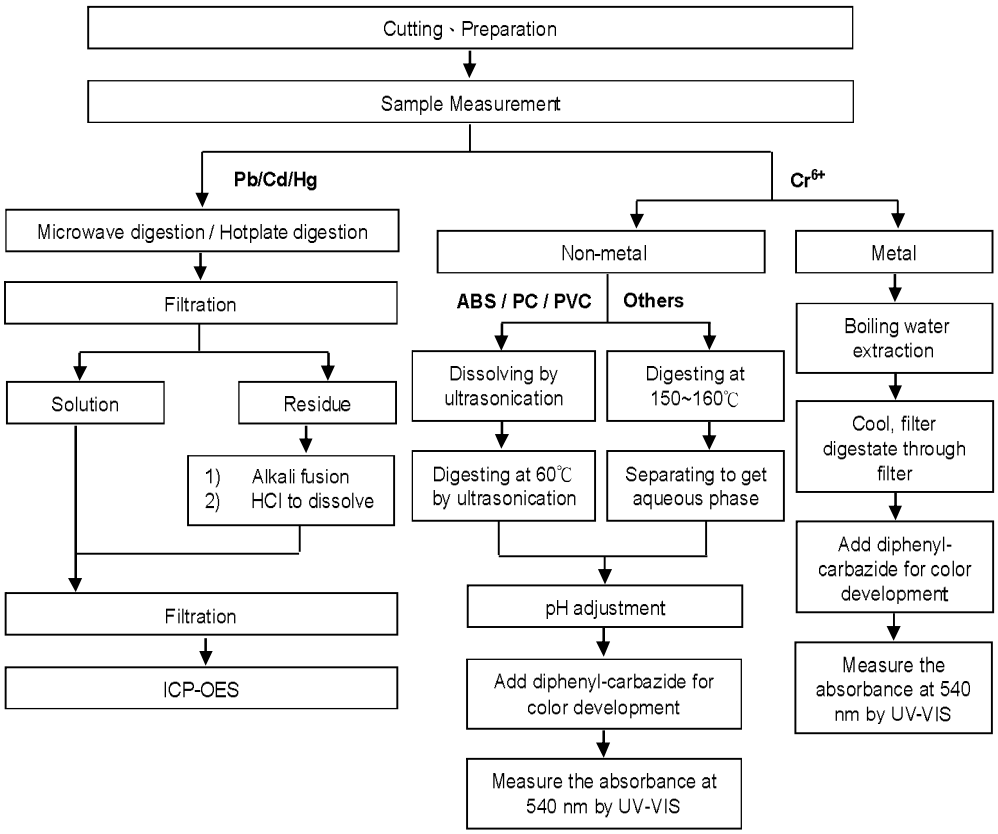
Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)

- Technician: Jony Liu
- Supervisor: Ray Chang



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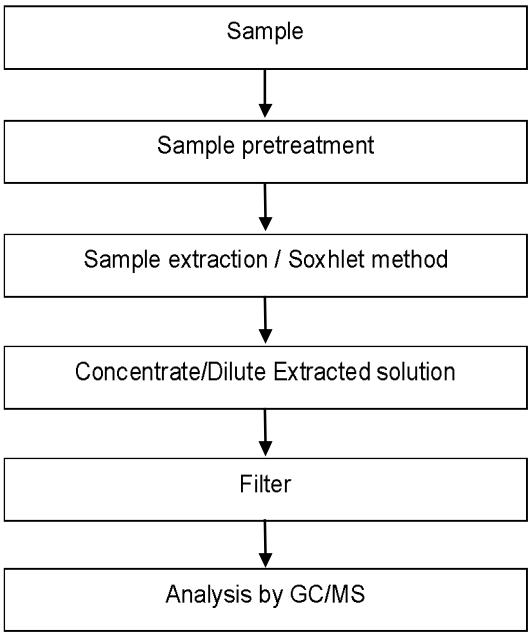
PBB/PBDE analytical FLOW CHART

- Technician : Dorothy Chen
- Supervisor: Ray Chang



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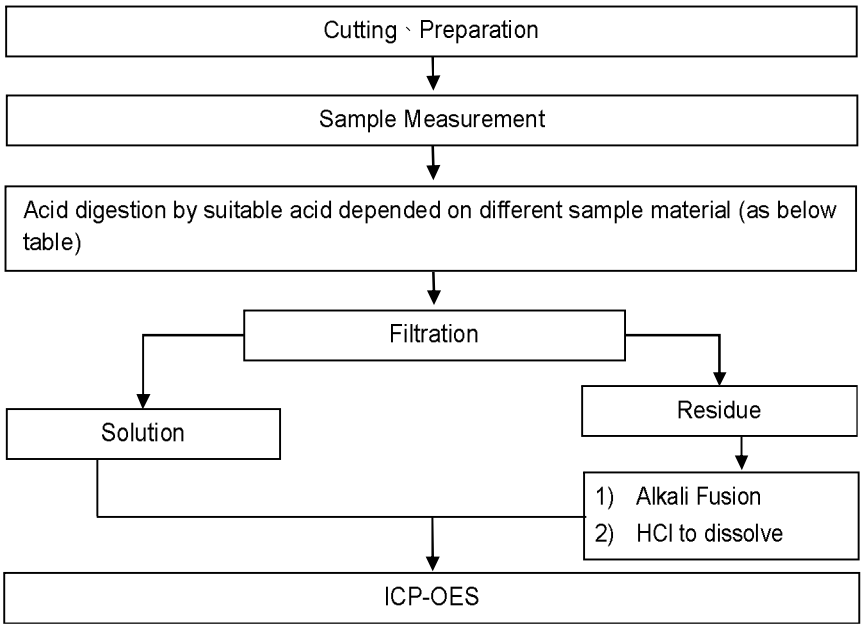
Flow Chart of digestion for the elements analysis performed by ICP-OES

These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Jony Liu
- Supervisor: Ray Chang



Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Any acid to total digestion

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
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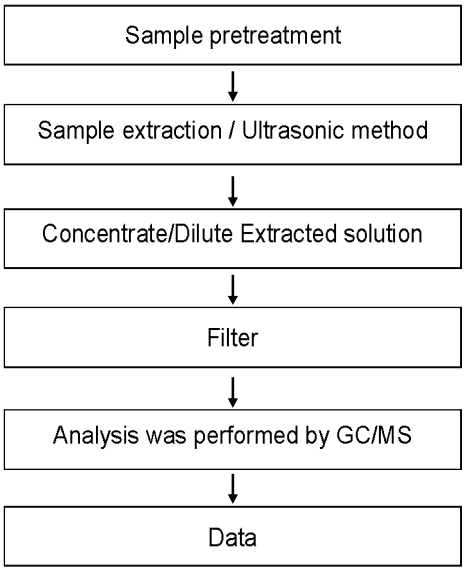
HBCDD analytical flow chart

- Technician : Dorothy Chen
- Supervisor: Ray Chang



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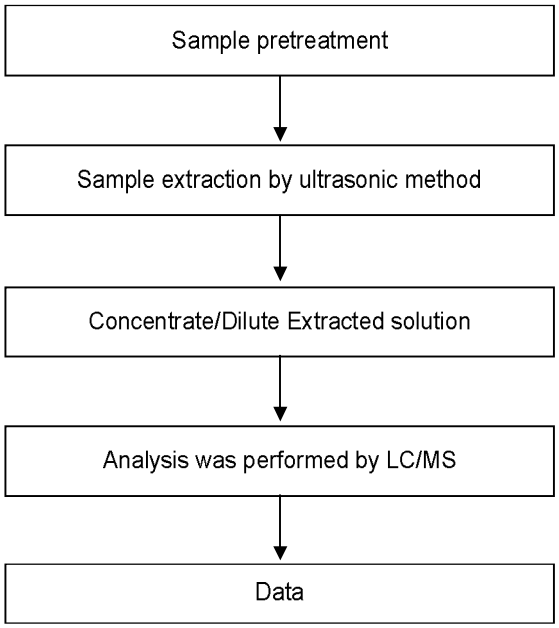
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Analytical flow chart of PFOA/PFOS content

- Technician : Ginny Huang
- Supervisor: Ray Chang



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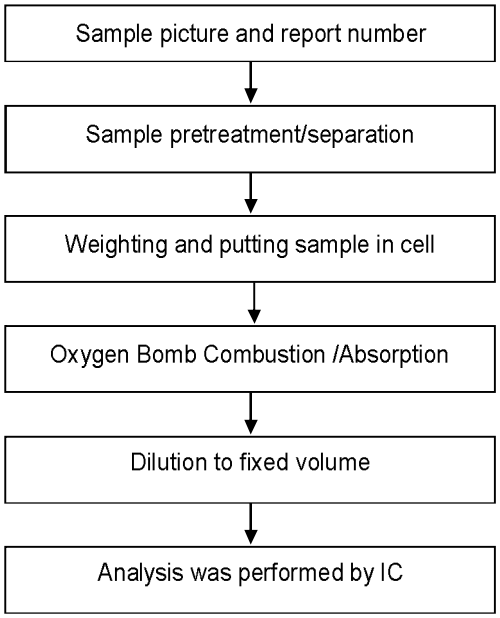
Analytical flow chart of halogen content

- Technician : Jean Hung
- Supervisor: Ray Chang



SUMITOMO BAKELITE (TAIWAN) CO., LTD.
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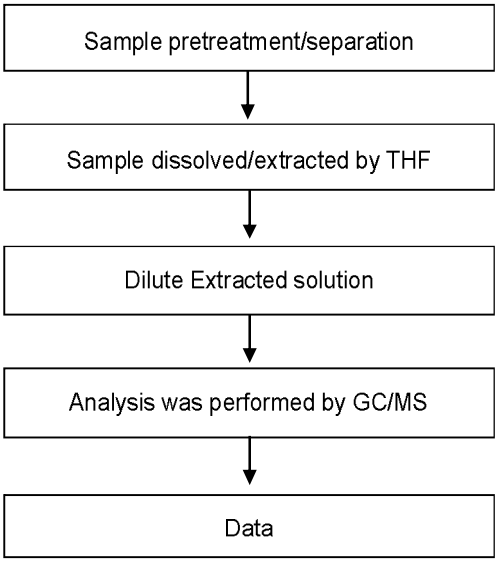
Analytical flow chart of phthalate content

- Technician: Dorothy Chen
- Supervisor: Ray Chang

【Test method: IEC 62321-8】



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*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

** End of Report **

試驗報告
Test Report

號碼(No.) : KA/2019/A1081 日期(Date) : 2019/10/23

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

以下測試樣品係由客戶送樣, 且由客戶聲稱並經客戶確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

送樣廠商(Sample Submitted By)	:	ASM MATERIALS CHINA LTD
樣品名稱(Sample Description)	:	A194/C194 Cu ALLOY
收件日期(Sample Receiving Date)	:	2019/10/15
測試期間(Testing Period)	:	2019/10/15 to 2019/10/23

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測試需求(Test Requested) :

(1) 依據客戶指定，參考RoHS 2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP. (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).)

(2) 其他測試項目請見下一頁 . (Please refer to next pages for the other item(s).)

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).

結論(Conclusion) :

(1) 根據客戶所提供的樣品，其鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP的測試結果符合RoHS 2011/65/EU Annex II暨其修訂指令(EU) 2015/863之限值要求. (Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.)

報告簽署人/張伯睿/博士/技術經理
Ray Chang, Ph.D./Manager -Tech
Signed for and on behalf of
SGS Taiwan Limited
化學實驗室-高雄/Chemical Laboratory-Kaohsiung

試驗報告
Test Report

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

測試結果(Test Results)

測試部位(PART NAME) NO.1 : 紅銅色金屬片 (RED COPPER COLORED METAL SHEET)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.	100
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	16.9	1000
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4:2013+AMD1:2017，以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-4:2013+AMD1:2017 and performed by ICP-OES.	2	n.d.	1000
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	$\mu g/cm^2$	參考IEC 62321-7-1:2015，以UV-VIS檢測. / With reference to IEC 62321-7-1:2015 and performed by by UV-VIS.	0.10	n.d.	-
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6:2015，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n.d.	-
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n.d.	-
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n.d.	-
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n.d.	-
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n.d.	-
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n.d.	-
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n.d.	-
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n.d.	-
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n.d.	-
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n.d.	-

試驗報告
Test Report

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	參考IEC 62321-6:2015，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n.d.	-
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5	n.d.	-
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg		5	n.d.	-
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5	n.d.	-
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5	n.d.	-
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n.d.	-
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5	n.d.	-
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n.d.	-
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n.d.	-
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n.d.	-
銻 / Antimony (Sb)	mg/kg	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀檢測. / With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
三氧化二銻 / Antimony trioxide (Sb_2O_3) (CAS No.: 1309-64-4)	mg/kg	由銻結果計算得之. / Calculated from the result of Antimony.	2 (▲)	n.d.	-
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀檢測. / With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
多氯聯苯 / Polychlorinated Biphenyls (PCBs)	mg/kg	參考US EPA 3550C: 2007，以氣相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by GC/MS.	0.5	n.d.	-
多氯奈 / Polychlorinated Naphthalene (PCNs)	mg/kg	參考US EPA 3550C: 2007，以氣相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by GC/MS.	5	n.d.	-
多氯三聯苯 / Polychlorinated Terphenyls (PCTs)	mg/kg	參考US EPA 3550C: 2007，以氣相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by GC/MS.	0.5	n.d.	-

試驗報告
Test Report

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
短鏈氯化石蠟 / Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.:85535-84-8))	mg/kg	參考US EPA 3550C: 2007，以氣相層析儀/電子補捉偵測器檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by GC/ECD.	100	n.d.	-
鹵素 / Halogen					
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	參考BS EN 14582:2016，以離子層析儀檢測. / With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg	參考BS EN 14582:2016，以離子層析儀檢測. / With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	參考BS EN 14582:2016，以離子層析儀檢測. / With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	參考BS EN 14582:2016，以離子層析儀檢測. / With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
有機錫 / Organic-tin compounds					
三丁基錫 / Tributyl Tin (TBT)	mg/kg	參考ISO 17353: 2004，以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n.d.	-
氧化雙三丁基錫 / Bis(tributyltin)oxide (TBTO) (CAS No.: 56-35-9)	mg/kg	參考ISO 17353: 2004，以氣相層析儀/火焰光度偵測器檢測；由三丁基錫測試結果計算得之. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD. Calculated from the result of Tributyl Tin (TBT).	0.03 (▲)	n.d.	-

試驗報告
Test Report

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
三苯基錫 / Triphenyl Tin (TphT)	mg/kg	參考ISO 17353: 2004，以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n.d.	-
二丁基錫 / Dibutyl Tin (DBT)	mg/kg	參考ISO 17353: 2004，以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n.d.	-
二辛基錫 / Dioctyl Tin (DOT)	mg/kg	參考ISO 17353: 2004，以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n.d.	-
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考US EPA 3550C: 2007，以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
全氟辛酸(銨) / PFOA (CAS No.: 335-67-1)	mg/kg	參考US EPA 3550C: 2007，以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
可塑劑定量分析 / Phthalates					
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di-(2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000

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Test Report

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
鄰苯二甲酸二異戊酯 / DIPP (Diisopentyl Phthalat) (CAS No.: 605-50-5)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
鄰苯二甲酸二(2-甲氧基乙基)酯 / DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
鄰苯二甲酸二己酯 / DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
鄰苯二甲酸二正戊酯/ DNPP(Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-

試驗報告
Test Report

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
鄰苯二甲酸正戊基異戊基酯 / nPiPP (N-pentyl-isopentylphtalate) (CAS No.: 776297-69-9)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	參考IEC 62321: 2008，以氣相層析/質譜儀檢測. / With reference to IEC 62321: 2008. Analysis was performed by GC/MS.	5	n.d.	-
聚氯乙烯 / PVC	**	以紅外光譜分析及焰色法檢測. / Analysis was performed by FTIR and FLAME Test.	-	Negative	-
砷 / Arsenic (As)	mg/kg	參考US EPA 3052 (1996)，以感應耦合電漿發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-OES.	2	n.d.	-

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出)
4. "-" = Not Regulated (無規格值)
5. (#2) =
   a. 當六價鉻結果大於0.13 μg/cm²，表示樣品表層含有六價鉻. / The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
   b. 當六價鉻結果為n.d. (濃度小於0.10 μg/cm²)，表示表層不含六價鉻. / The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. 當六價鉻結果介於 0.10 及 0.13 μg/cm² 時，無法確定塗層是否含有六價鉻. / The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
6. **= Qualitative analysis (No Unit) 定性分析(無單位)
7. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

8. (▲):MDL是針對元素/測試化合物之評估. / The MDL was evaluated for element / tested substance.
換算公式 (Conversion Formula):AX = A × F

AX	A	F
三氧化二銻 / Antimony trioxide (Sb_2O_3)	銻 / Antimony	1.1971
氧化雙三丁基錫 / Bis(tributyltin)oxide	三丁基錫 / Tributyl Tin (TBT)	1.024

PFOS參考資訊(Reference Information) : 持久性有機污染物 POPs - (EU) 2019/1021

PFOS濃度在物質或製備中不得超過0.001%(10ppm),在半成品、成品或零部件中不得超過0.1%(1000ppm),在紡織品或塗層材料中不得超過1μg/m²。

(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².)

全氟辛烷磺酸指全氟辛烷磺酸和它的衍生物包括全氟辛烷磺酸, 全氟辛基磺醯胺, N-甲基全氟辛烷磺酰胺, N-乙基全氟辛烷磺酰胺, N-甲基全氟辛基磺酰基氨基乙醇, N-乙基全氟辛基磺酰基氨基乙醇。(PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.)

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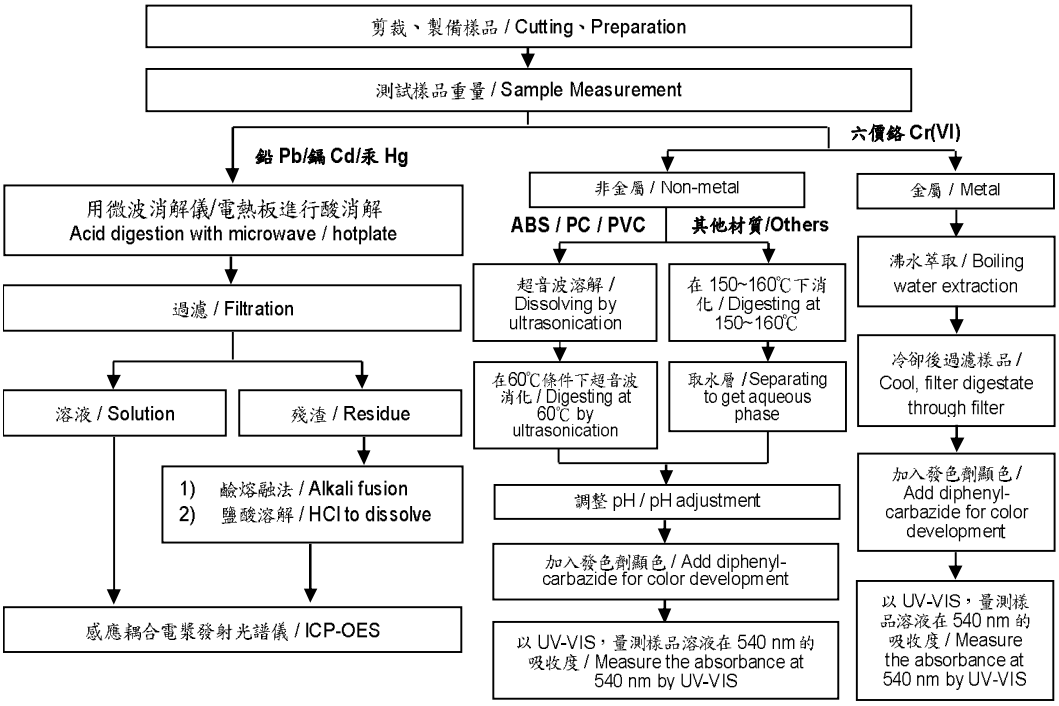
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件，樣品已完全溶解。（六價鉻測試方法除外）
These samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

- 測試人員：劉俊宏/ Technician : Jony Liu
- 測試負責人：張伯睿/ Supervisor: Ray Chang



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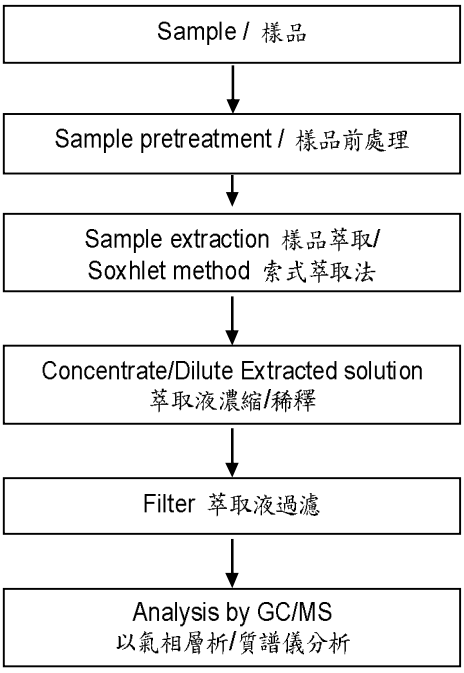
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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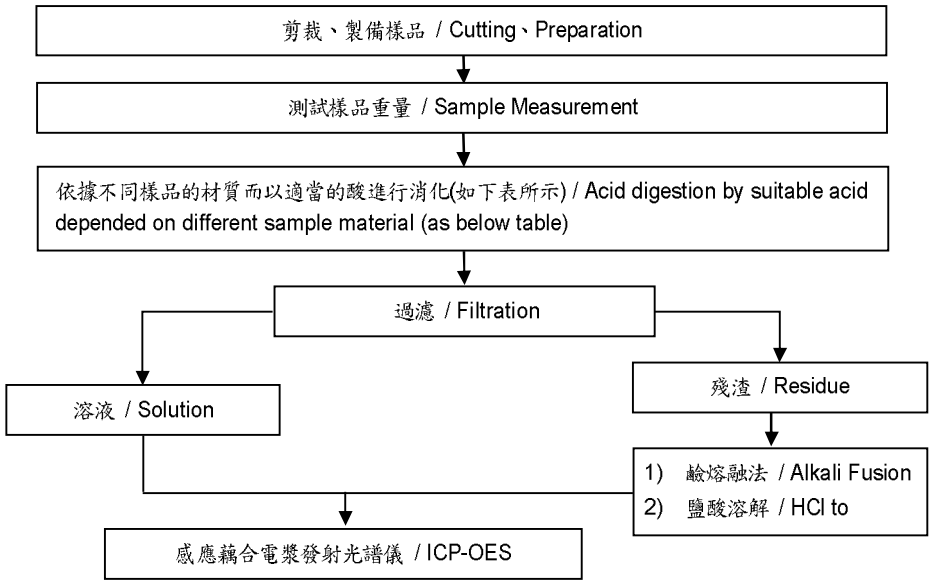
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

元素以 ICP-OES 分析的消化流程圖
(Flow Chart of digestion for the elements analysis performed by ICPOES)

根據以下的流程圖之條件，樣品已完全溶解。 / These samples were dissolved totally by pre conditioning method according to below flow chart.

- 測試人員：劉俊宏 / Technician: Jony Liu
- 測試負責人：張伯睿 / Supervisor: Ray Chang



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNO_3, HCl, HF, H_2O_2
玻璃 / Glass	硝酸,氫氟酸 / HNO_3/HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO_3
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H_2SO_4, H_2O_2, HNO_3, HCl
其他 / Others	加入任何酸至完全溶解 / Any acid to total digestion

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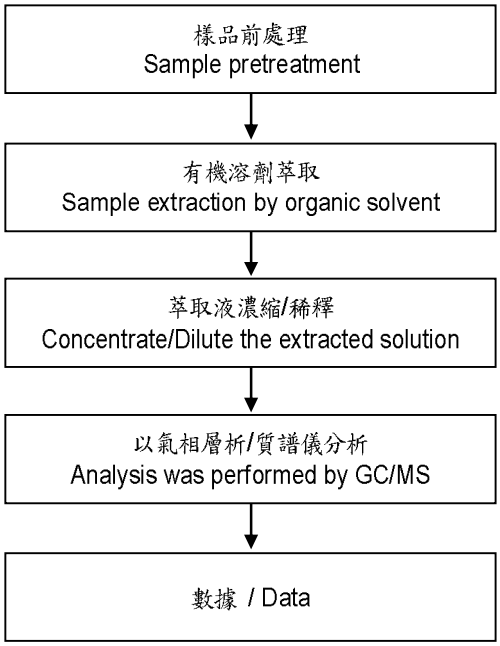
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

含氯阻燃劑分析流程 / Chlorinated Flame retardant analytical flow chart

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang

【參考方法(Reference method): US EPA 3550C】
【測試項目:多氯聯苯、多氯奈、多氯三聯苯 / Test Items: PCBs, PCNs, PCTs】



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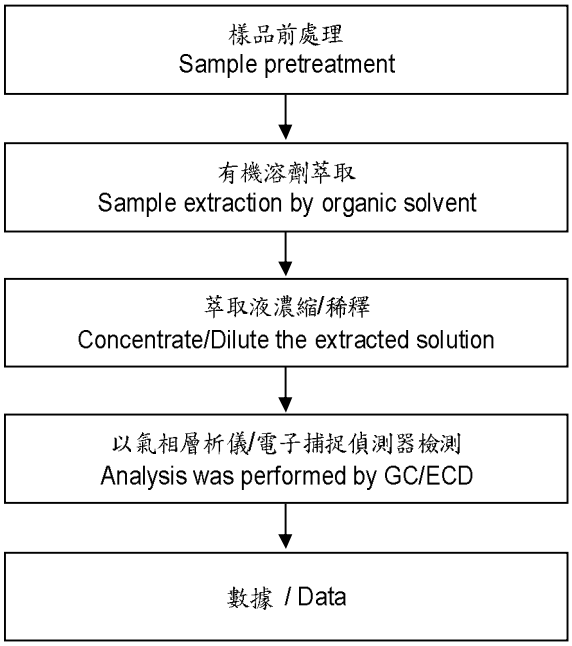
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

氯化石蠟分析流程圖 / Analytical flow chart - Chlorinated Paraffins

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang

【參考方法(Reference method): US EPA 3550C】



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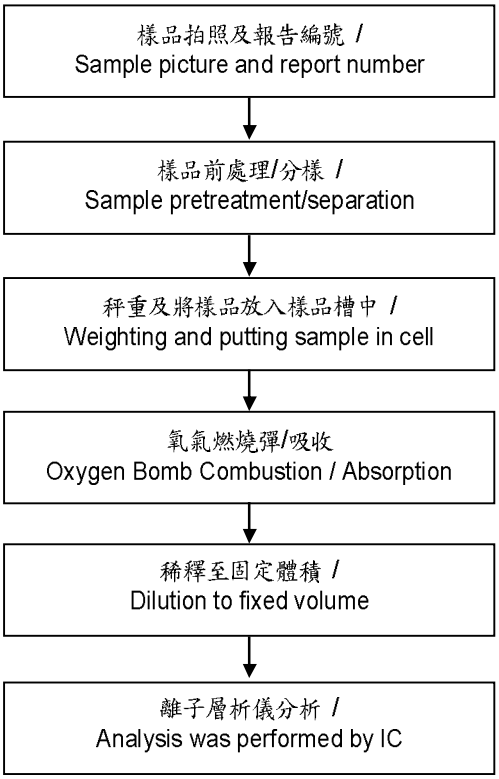
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

鹵素分析流程圖 / Analytical flow chart of halogen content

- 測試人員：洪秀真 / Technician : Jean Hung
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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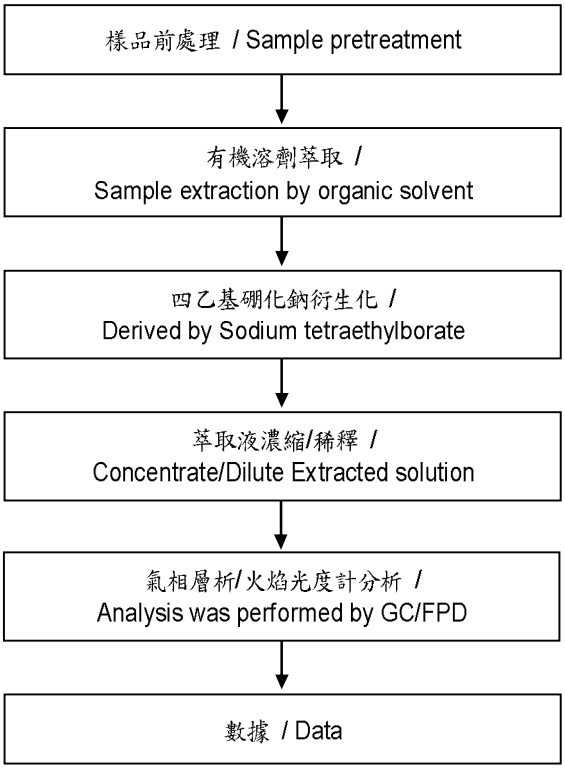
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

有機錫分析流程圖 / Analytical flow chart of Organic-Tin content

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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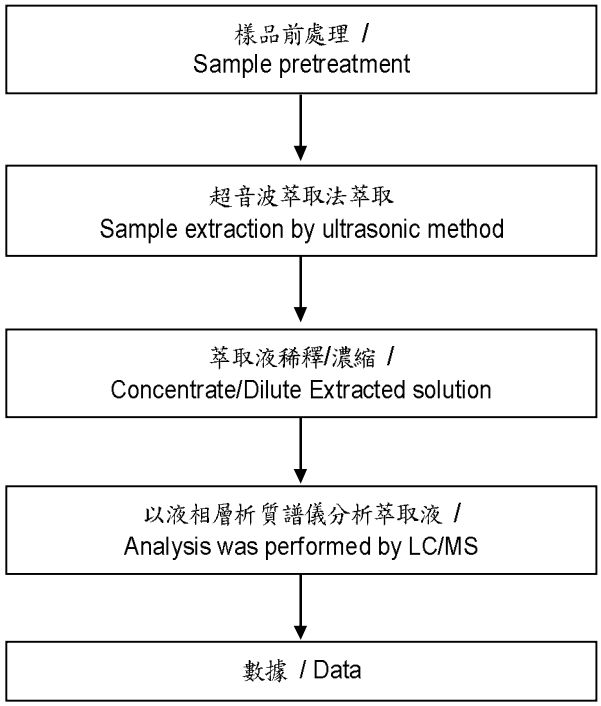
全氟辛酸(鹽)/ 全氟辛烷磺酸分析流程圖 / Analytical flow chart of PFOA/PFOS content

- 測試人員：黃璟瓔 / Technician : Ginny Huang
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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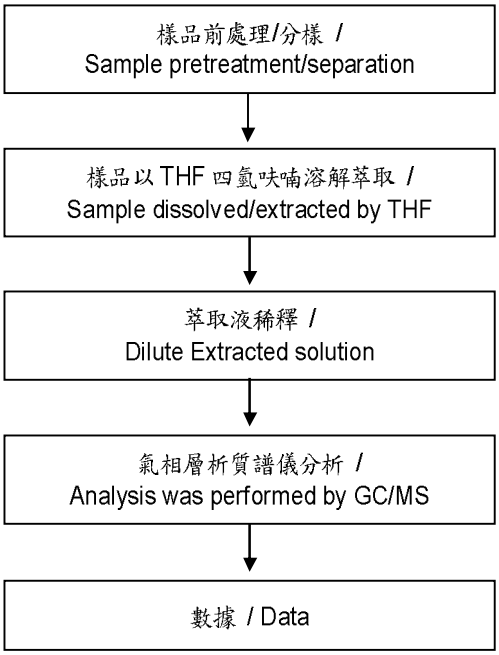
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

可塑劑分析流程圖 / Analytical flow chart of phthalate content

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang

【測試方法/Test method: IEC 62321-8】



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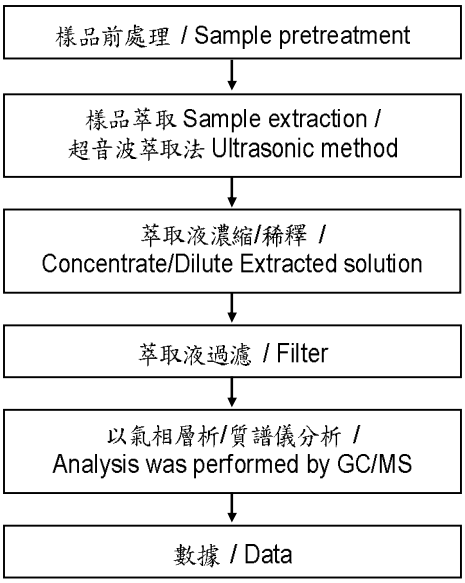
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

六溴環十二烷分析流程圖 / HBCDD analytical flow chart

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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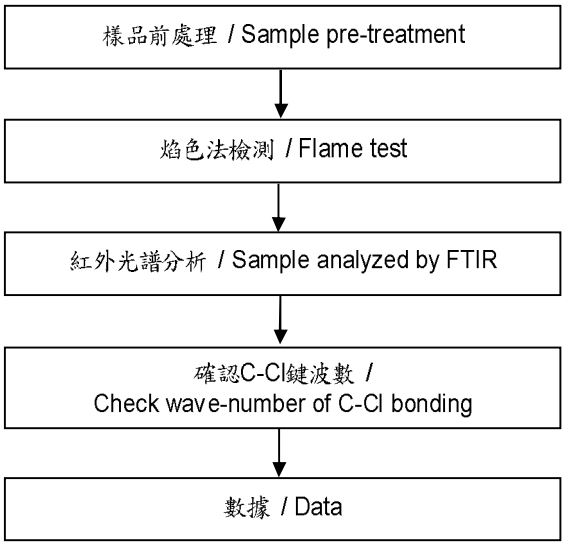
BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

聚氯乙烯物質判定分析流程圖 /
Analysis flow chart for determination of PVC in material

- 測試人員：戴秀純 / Technician : Hannah Tai
- 測試負責人：林立翔 / Supervisor: Roger Lin



試驗報告
Test Report

ASM MATERIALS CHINA LTD

BLOCK 10-17, FUQIAO INDUSTRIAL ESTATE, FUYONG, BAOAN, SHENZHEN, CHINA

＊ 照片中如有箭頭標示，則表示為實際檢測之樣品/部位. ＊
(The tested sample / part is marked by an arrow if it's shown on the photo.)

** 報告結尾(End of Report) **

Test Report

No. : CE/2019/74259P Date : 2019/07/30

HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

The following samples was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By	:	HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
Sample Description	:	DIE BONDING PASTE
Style/Item No.	:	EN-4900GC
Sample Receiving Date	:	2019/07/23
Testing Period	:	2019/07/23 to 2019/07/30

==========

Test Requested :

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

Test Result(s) : Please refer to following pages.

Conclusion : (1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Troy Chang / Manager - Tec
Signed for and behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

Test Result(s)

PART NAME No.1 : SILVER COLORED PASTE

Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-AES.	2	n.d.	1000
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.	8	n.d.	1000
Sum of PBBs	mg/kg	With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.	1000
Monobromobiphenyl	mg/kg		5	n.d.	-
Dibromobiphenyl	mg/kg		5	n.d.	-
Tribromobiphenyl	mg/kg		5	n.d.	-
Tetrabromobiphenyl	mg/kg		5	n.d.	-
Pentabromobiphenyl	mg/kg		5	n.d.	-
Hexabromobiphenyl	mg/kg		5	n.d.	-
Heptabromobiphenyl	mg/kg		5	n.d.	-
Octabromobiphenyl	mg/kg		5	n.d.	-
Nonabromobiphenyl	mg/kg		5	n.d.	-
Decabromobiphenyl	mg/kg		5	n.d.	-
Sum of PBDEs	mg/kg		-	n.d.	1000
Monobromodiphenyl ether	mg/kg		5	n.d.	-
Dibromodiphenyl ether	mg/kg		5	n.d.	-
Tribromodiphenyl ether	mg/kg		5	n.d.	-
Tetrabromodiphenyl ether	mg/kg		5	n.d.	-
Pentabromodiphenyl ether	mg/kg		5	n.d.	-
Hexabromodiphenyl ether	mg/kg		5	n.d.	-
Heptabromodiphenyl ether	mg/kg		5	n.d.	-
Octabromodiphenyl ether	mg/kg		5	n.d.	-
Nonabromodiphenyl ether	mg/kg		5	n.d.	-
Decabromodiphenyl ether	mg/kg		5	n.d.	-

Test Report

No. : CE/2019/74259P Date : 2019/07/30

HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

Test Item(s)	Unit	Method	MDL	Result	Limit
				No.1	
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.	1000
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.	1000
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.	1000
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.	1000
Halogen					
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582 (2016). Analysis was performed by IC.	50	n.d.	-
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.	-
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.	-
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.	-
Antimony (Sb)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n.d.	-

Note：

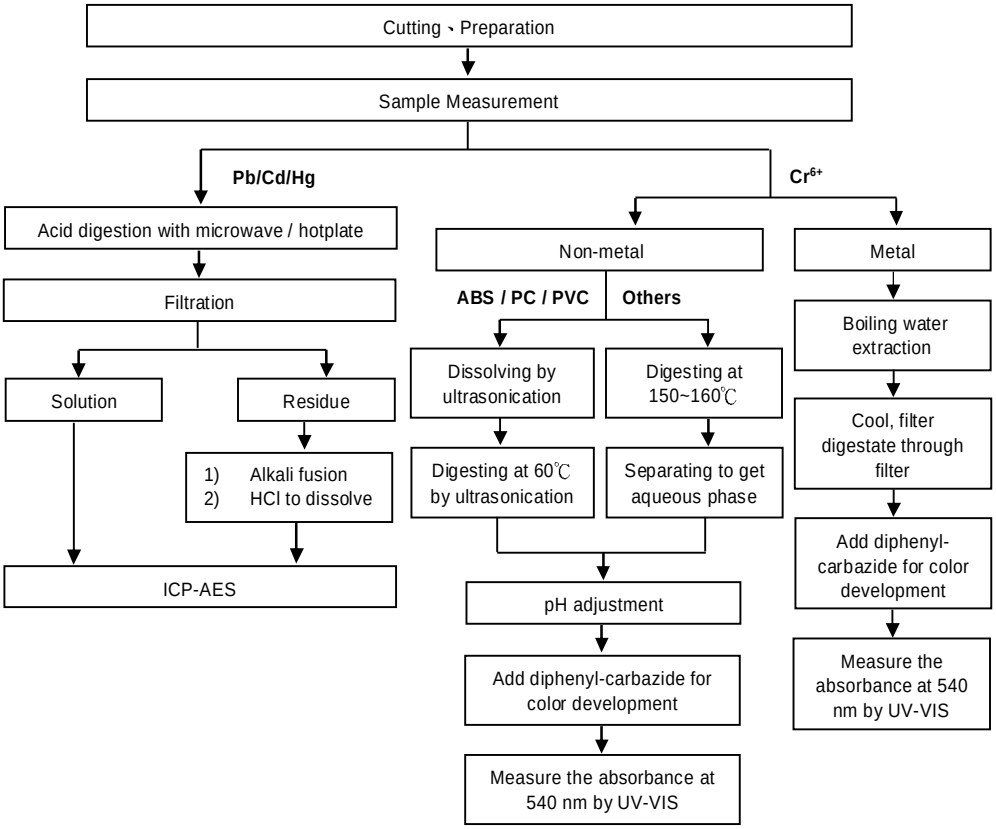
1. mg/kg = ppm；0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected = less than MDL
4. " - " = Not Regulated

HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)

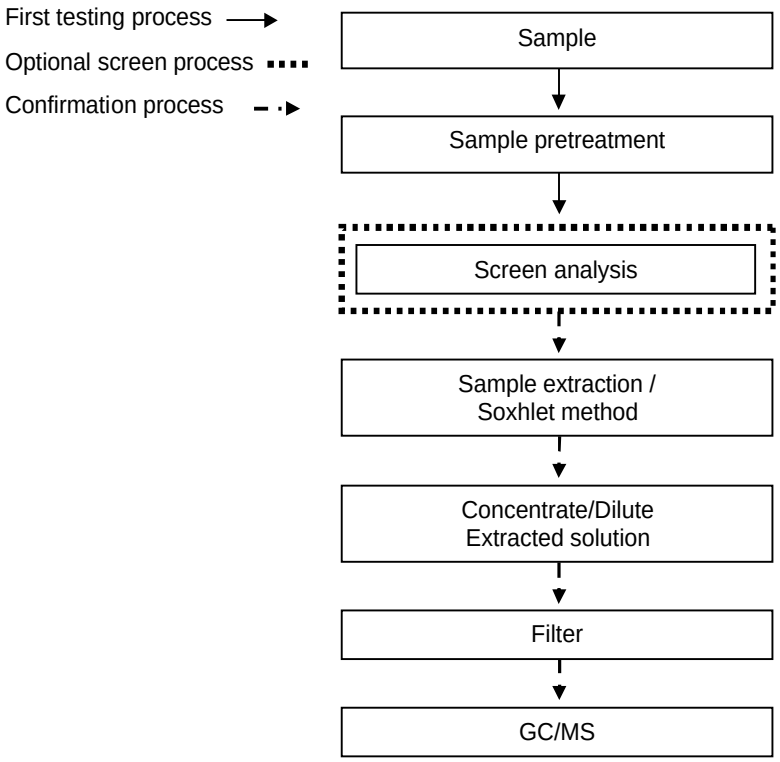
- Technician : Rita Chen
- Supervisor: Troy Chang



HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

Analytical flow chart – PBB / PBDE

- Technician : Yaling Tu
- Supervisor: Troy Chang

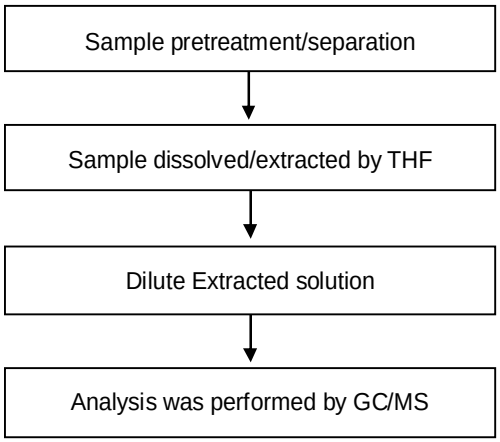


HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

Analytical flow chart - Phthalate

- Technician: Yaling Tu
- Supervisor: Troy Chang

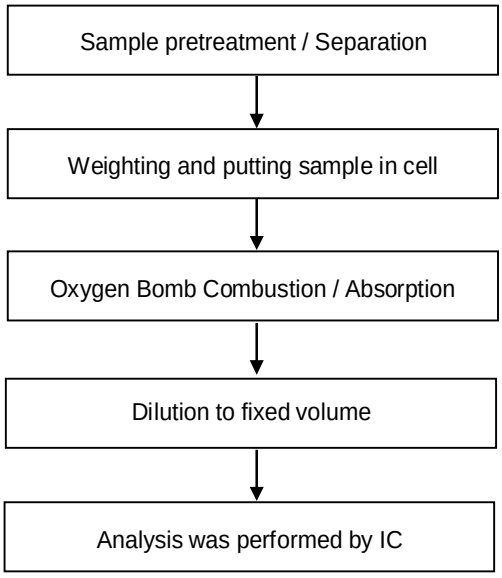
【Test method: IEC 62321-8】



HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

Analytical flow chart - Halogen

- Technician: Rita Chen
- Supervisor: Troy Chang

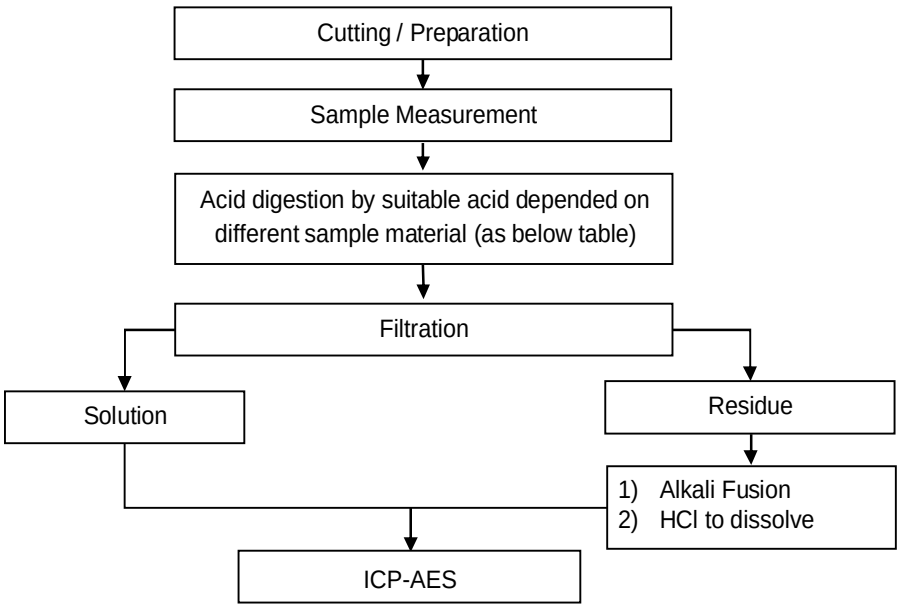


HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Rita Chen
- Supervisor: Troy Chang

Flow Chart of digestion for the elements analysis performed by ICP-AES



Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Added appropriate reagent to total digestion

HITACHI CHEMICAL CO., LTD. YAMAZAKI WORKS
4-13-1, HIGASHI-CHO, HITACHI-SHI, IBARAKI, 317-8555, JAPAN

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

CE/2019/74259

** End of Report **

Test Report

No. : KA/2019/B0852 Date : 2019/11/15

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

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

Sample Submitted By	:	SUMITOMO BAKELITE (TAIWAN) CO., LTD.
Sample Description	:	EPOXY MOLDING COMPOUND
Style/Item No.	:	EME-G700SLA SERIES
Sample Receiving Date	:	2019/11/11
Testing Period	:	2019/11/11 to 2019/11/15

==========

Test Requested : (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

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

Conclusion : (1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Ray Chang Ph.D. / Manager
Signed for and on behalf of
SGS Taiwan Limited
Chemical Laboratory-Kaohsiung

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Test Result(s)

PART NAME NO.1 : BLACK EPOXY MOLDING COMPOUND

Test Item (s)	Unit	Method	MDL	Result No.1	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n.d.	1000
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321-7-2:2017 and performed by UV-VIS.	8	n.d.	1000
Sum of PBBs	mg/kg	With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
Monobromobiphenyl	mg/kg		5	n.d.	-
Dibromobiphenyl	mg/kg		5	n.d.	-
Tribromobiphenyl	mg/kg		5	n.d.	-
Tetrabromobiphenyl	mg/kg		5	n.d.	-
Pentabromobiphenyl	mg/kg		5	n.d.	-
Hexabromobiphenyl	mg/kg		5	n.d.	-
Heptabromobiphenyl	mg/kg		5	n.d.	-
Octabromobiphenyl	mg/kg		5	n.d.	-
Nonabromobiphenyl	mg/kg		5	n.d.	-
Decabromobiphenyl	mg/kg		5	n.d.	-
Sum of PBDEs	mg/kg	With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
Monobromodiphenyl ether	mg/kg		5	n.d.	-
Dibromodiphenyl ether	mg/kg		5	n.d.	-
Tribromodiphenyl ether	mg/kg		5	n.d.	-
Tetrabromodiphenyl ether	mg/kg		5	n.d.	-
Pentabromodiphenyl ether	mg/kg		5	n.d.	-
Hexabromodiphenyl ether	mg/kg		5	n.d.	-
Heptabromodiphenyl ether	mg/kg		5	n.d.	-
Octabromodiphenyl ether	mg/kg		5	n.d.	-
Nonabromodiphenyl ether	mg/kg		5	n.d.	-
Decabromodiphenyl ether	mg/kg		5	n.d.	-

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Test Item (s)	Unit	Method	MDL	Result	Limit
				No.1	
Antimony (Sb)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
Beryllium (Be)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	With reference to IEC 62321: 2008. Analysis was performed by GC/MS.	5	n.d.	-
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
Halogen					
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Phthalates					
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
DIPP (Diisopentyl Phthalat) (CAS No.: 605-50-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0, 68515-48-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Test Item (s)	Unit	Method	MDL	Result	Limit
				No.1	
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DPP (Di-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DIHP (1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich) (CAS No.: 71888-89-6)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DHNUP (1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters) (CAS No.: 68515-42-4)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000

Note：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated

PFOS Reference Information : POPs - (EU) 2019/1021

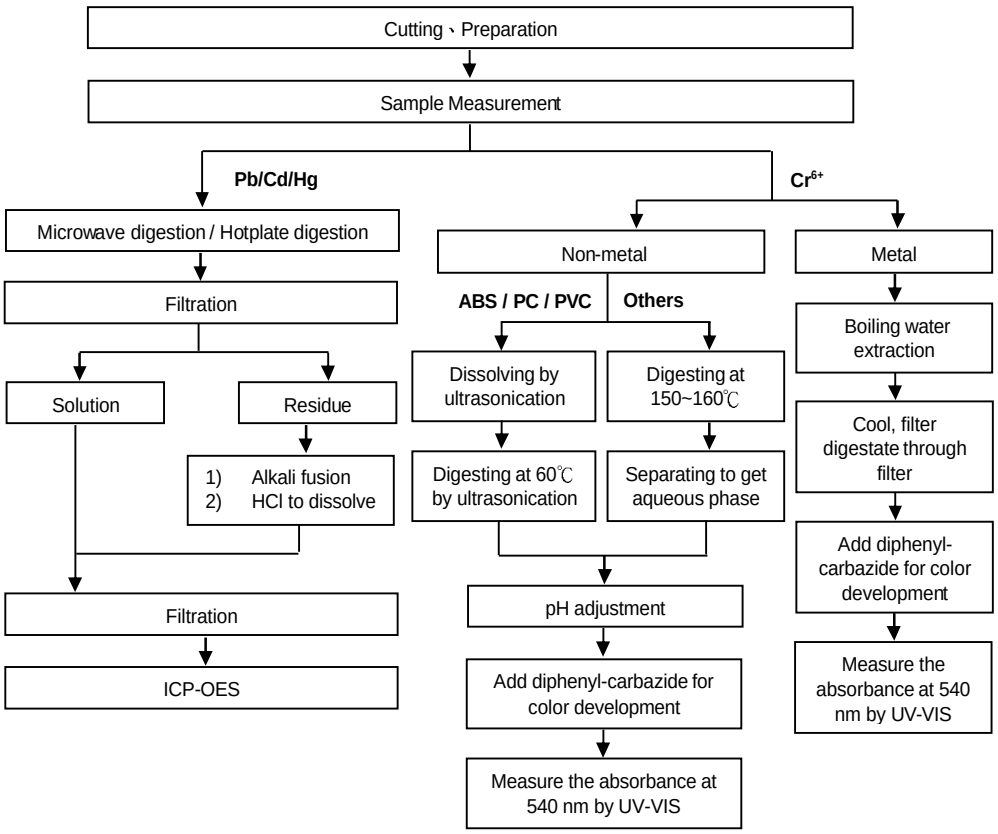
Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m². PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

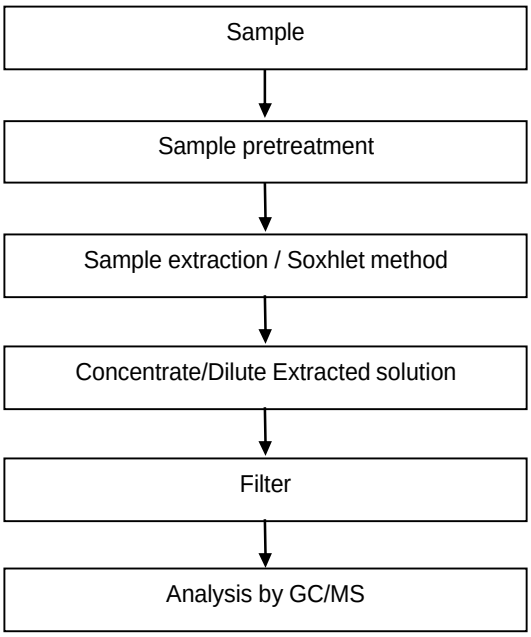
- Technician: Jony Liu
- Supervisor: Ray Chang



SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

PBB/PBDE analytical FLOW CHART

- Technician : Dorothy Chen
- Supervisor: Ray Chang

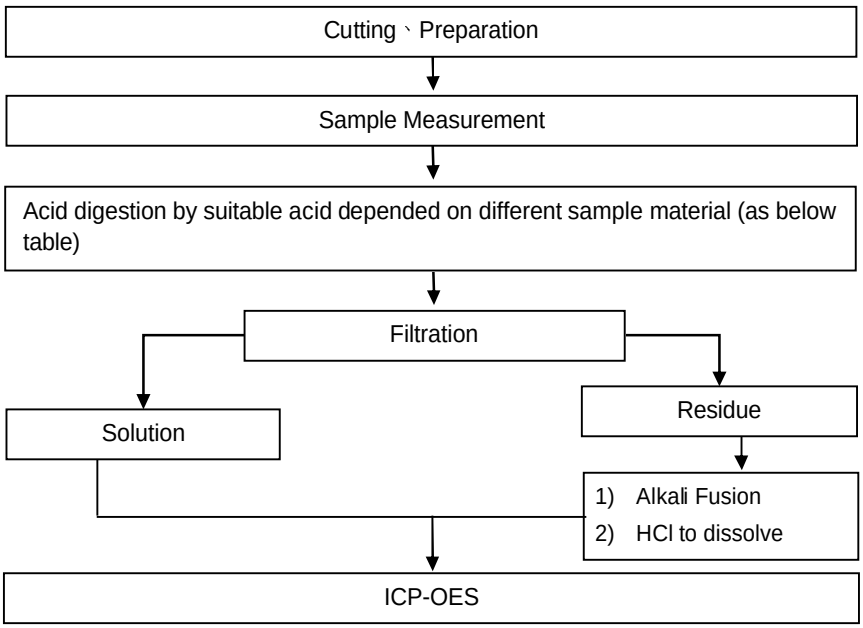


SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Flow Chart of digestion for the elements analysis performed by ICP-OES

These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Jony Liu
- Supervisor: Ray Chang

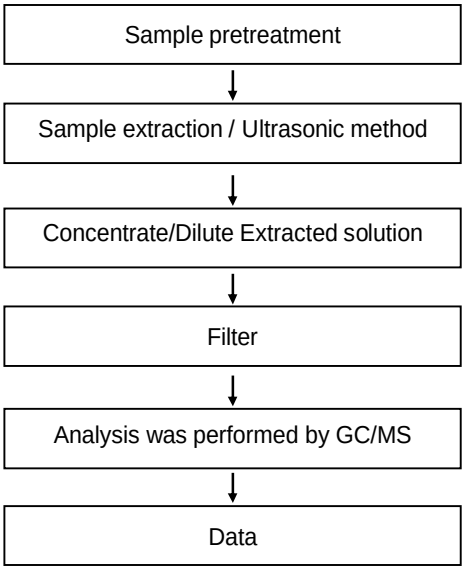


Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Any acid to total digestion

SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

HBCDD analytical flow chart

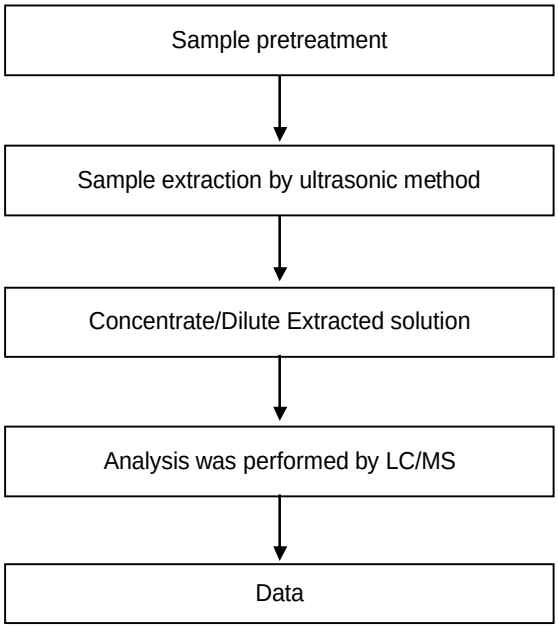
- Technician : Dorothy Chen
- Supervisor: Ray Chang



SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Analytical flow chart of PFOA/PFOS content

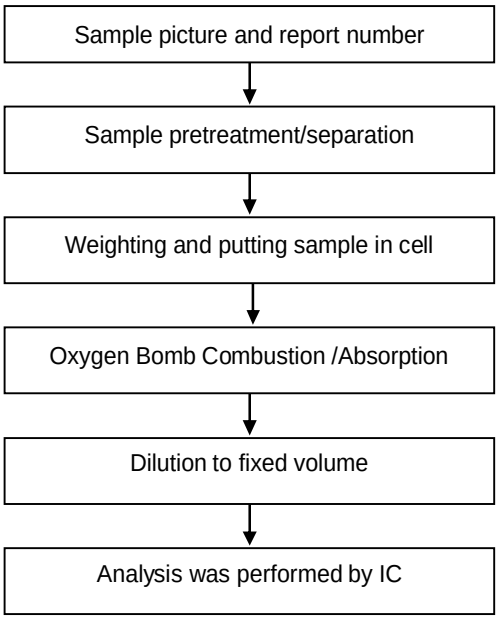
- Technician : Ginny Huang
- Supervisor: Ray Chang



SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Analytical flow chart of halogen content

- Technician : Jean Hung
- Supervisor: Ray Chang

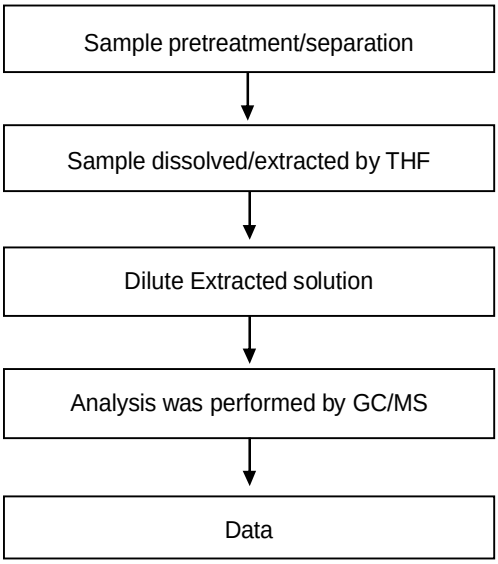


SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

Analytical flow chart of phthalate content

- Technician: Dorothy Chen
- Supervisor: Ray Chang

【Test method: IEC 62321-8】



SUMITOMO BAKELITE (TAIWAN) CO., LTD.
NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

** End of Report **

Test Report

No. : CE/2019/75437 Date : 2019/08/02

MK ELECTRON CO., LTD.
405, GEUMEO-RO, POGOK-EUP, CHEOIN-GU, YONGIN-SI, GYEONGGI-DO, KOREA

The following samples was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By	:	MK ELECTRON CO., LTD.
Sample Description	:	GOLD WIRE
Style/Item No.	:	4N
Sample Receiving Date	:	2019/07/26
Testing Period	:	2019/07/26 to 2019/08/02

==========

Test Requested :

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

Test Result(s) : Please refer to following pages.

Troy Chang / Manager - Tec
Signed for and behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

MK ELECTRON CO., LTD.
405, GEUMEO-RO, POGOK-EUP, CHEOIN-GU, YONGIN-SI, GYEONGGI-DO, KOREA

Test Result(s)

PART NAME No.1 : GOLDEN COLORED METAL WIRE

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)(#2)	µg/cm²	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
Monobromobiphenyl	mg/kg		5	n.d.
Dibromobiphenyl	mg/kg		5	n.d.
Tribromobiphenyl	mg/kg		5	n.d.
Tetrabromobiphenyl	mg/kg		5	n.d.
Pentabromobiphenyl	mg/kg		5	n.d.
Hexabromobiphenyl	mg/kg		5	n.d.
Heptabromobiphenyl	mg/kg		5	n.d.
Octabromobiphenyl	mg/kg		5	n.d.
Nonabromobiphenyl	mg/kg		5	n.d.
Decabromobiphenyl	mg/kg		5	n.d.
Sum of PBDEs	mg/kg		-	n.d.
Monobromodiphenyl ether	mg/kg		5	n.d.
Dibromodiphenyl ether	mg/kg		5	n.d.
Tribromodiphenyl ether	mg/kg		5	n.d.
Tetrabromodiphenyl ether	mg/kg		5	n.d.
Pentabromodiphenyl ether	mg/kg		5	n.d.
Hexabromodiphenyl ether	mg/kg		5	n.d.
Heptabromodiphenyl ether	mg/kg		5	n.d.
Octabromodiphenyl ether	mg/kg		5	n.d.
Nonabromodiphenyl ether	mg/kg		5	n.d.
Decabromodiphenyl ether	mg/kg		5	n.d.

MK ELECTRON CO., LTD.
405, GEUMEO-RO, POGOK-EUP, CHEOIN-GU, YONGIN-SI, GYEONGGI-DO, KOREA

Test Item(s)	Unit	Method	MDL	Result
				No.1
Polychlorinated Biphenyls (PCBs) (CAS No.: 1336-36-3)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	0.5	n.d.
Polychlorinated Terphenyls (PCTs)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	0.5	n.d.
Polychlorinated Naphthalene (PCNs)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	5	n.d.
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	100	n.d.
Tributyl Tin (TBT)	mg/kg	With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.	0.03	n.d.
Triphenyl Tin (TphT)	mg/kg		0.03	n.d.
Dibutyl Tin (DBT)	mg/kg		0.03	n.d.
Dioctyl Tin (DOT)	mg/kg		0.03	n.d.
Bis(tributyltin)oxide (TBTO) (CAS No.: 56-35-9)	mg/kg	With reference to ISO 17353 (2004). Analysis was performed by GC/FPD. Calculated from the result of Tributyl Tin (TBT).	0.03 (▲)	n.d.
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582 (2016). Analysis was performed by IC.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.
Antimony (Sb)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n.d.
Beryllium (Be)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	6.02
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MS.	0.01	n.d.
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MS.	0.01	n.d.
PVC	**	Analysis was performed by FTIR and FLAME Test.	-	Negative

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Test Item(s)	Unit	Method	MDL	Result
				No.1
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DIHP (1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich) (CAS No.: 71888-89-6)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DHNUP (1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters) (CAS No.: 68515-42-4)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DNPP (Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
Medium-Chained Chlorinated Paraffins (C14-C17) (MCCP) (CAS No.: 85535-85-9)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	100	n.d.
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n.d.

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Test Item(s)	Unit	Method	MDL	Result
				No.1
Sulfur Hexafluoride (SF6) (CAS No.: 2551-62-4)	mg/kg	With reference to US EPA 5021A (2014). Analysis was performed by GC/MS.	1	n.d.
Arsenic (As)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n.d.
Phosphorus (P)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n.d.
Cobalt (Co)	mg/kg	With reference to US EPA 3050B (1996). Analysis was performed by ICP-AES.	2	n.d.
Red phosphorus	**	Analysis was performed by Pyrolyzer-GC/MS.	-	Negative

Note：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected = less than MDL
4. " - " = Not Regulated
5. ** = Qualitative analysis (No Unit)
6. Negative = Undetectable / Positive = Detectable
7. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm². The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 µg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
8. (▲)：The MDL was evaluated for element / tested substance.
   Conversion Formula：AX ＝ A × F

AX	A	F
Bis(tributyltin)oxide (TBTO)	Tributyl Tin (TBT)	1.024

PFOS Reference Information : POPs - (EU) 2019/1021

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m².

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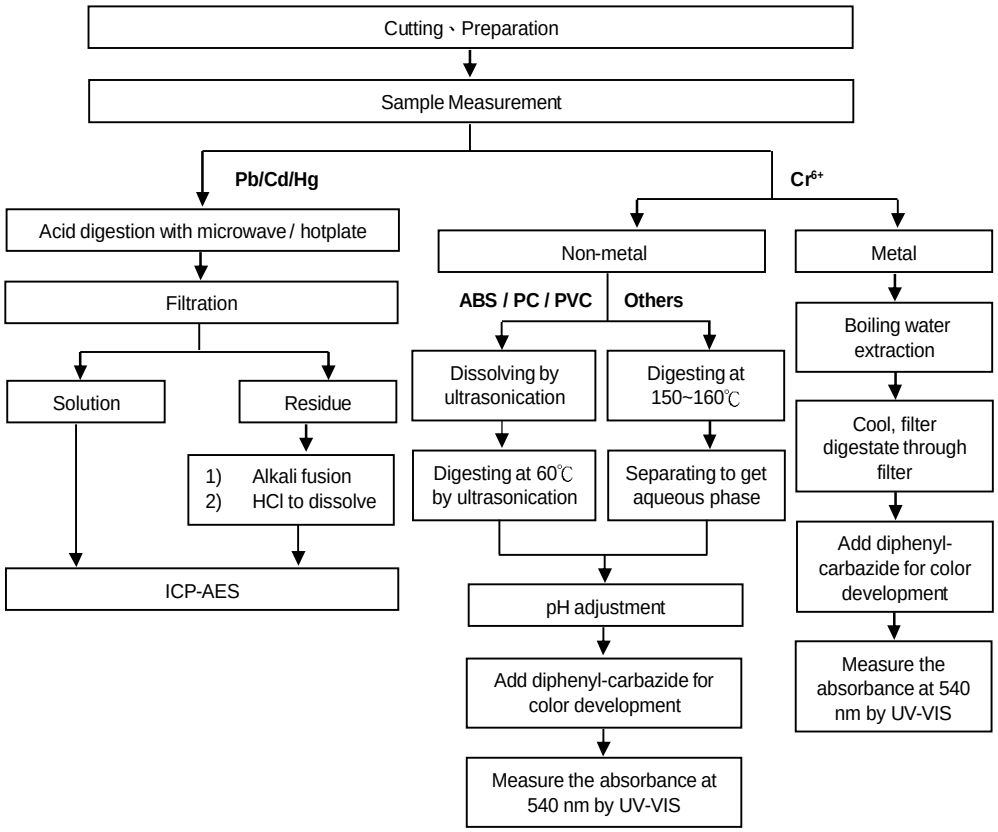
Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

- Technician : Rita Chen
- Supervisor: Troy Chang



MK ELECTRON CO., LTD.
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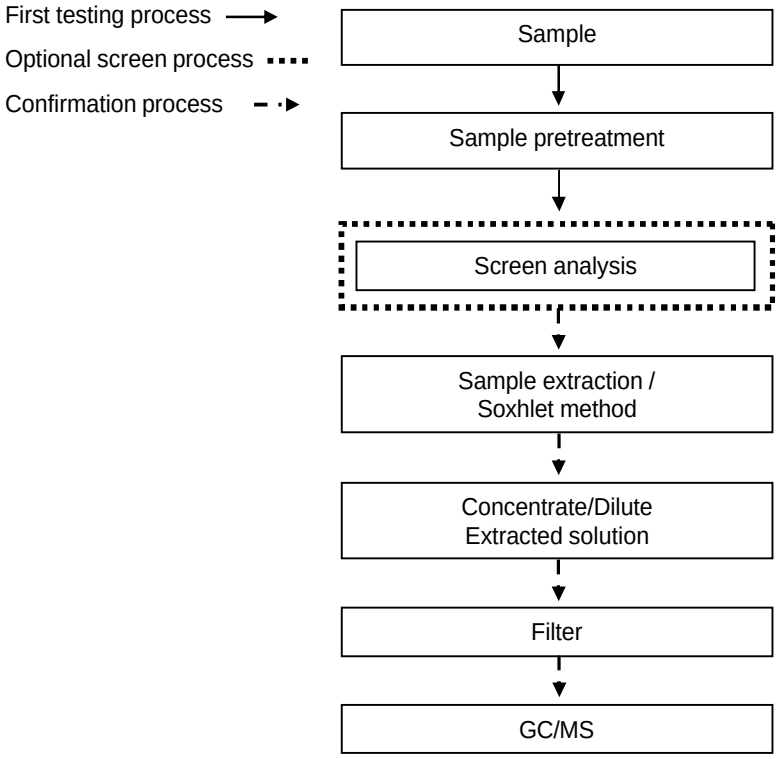
Analytical flow chart – PBB / PBDE

- Technician : Yaling Tu
- Supervisor: Troy Chang



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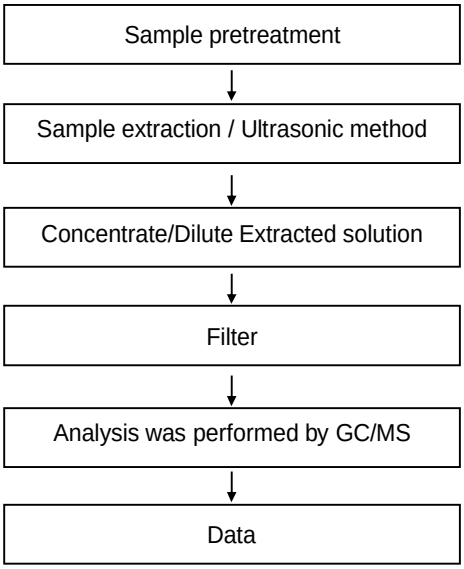
405, GEUMEO-RO, POGOK-EUP, CHEOIN-GU, YONGIN-SI, GYEONGGI-DO, KOREA

Analytical flow chart - PCBs

- Technician: Yaling Tu
- Supervisor: Troy Chang



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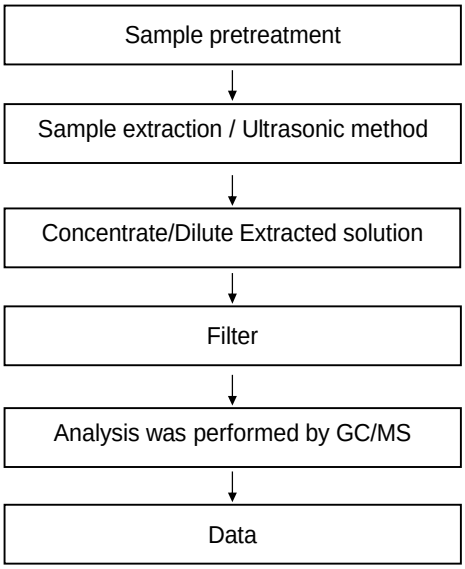
405, GEUMEO-RO, POGOK-EUP, CHEOIN-GU, YONGIN-SI, GYEONGGI-DO, KOREA

Analytical flow chart - PCTs

- Technician: Yaling Tu
- Supervisor: Troy Chang



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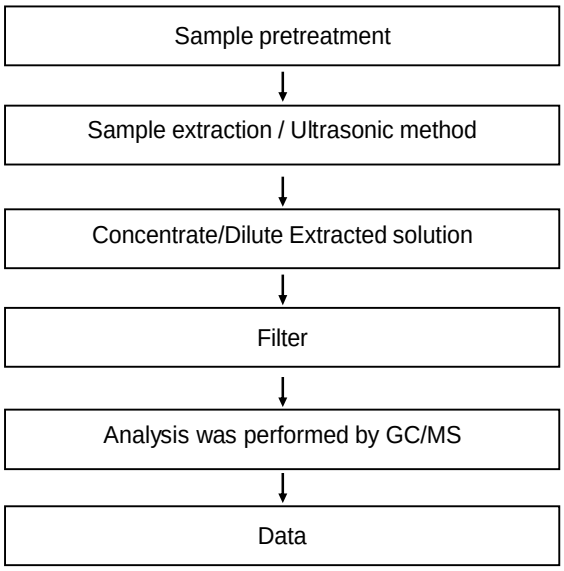
Analytical flow chart - PCNs

- Technician: Yaling Tu
- Supervisor: Troy Chang



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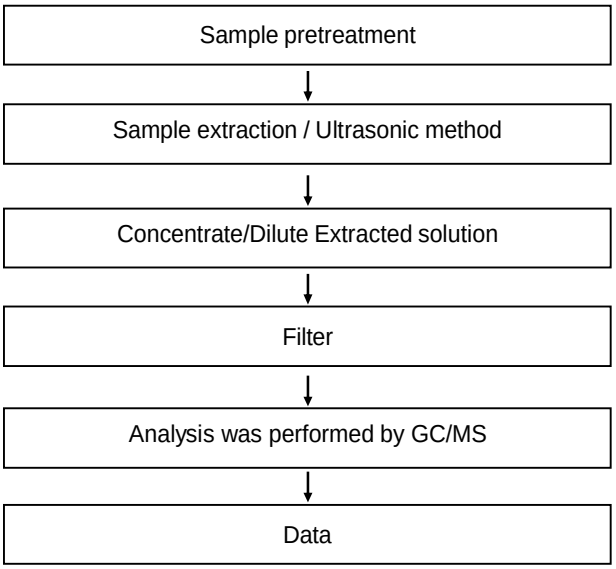
Analytical flow chart - Chlorinated Paraffins

- Technician: Yaling Tu
- Supervisor: Troy Chang



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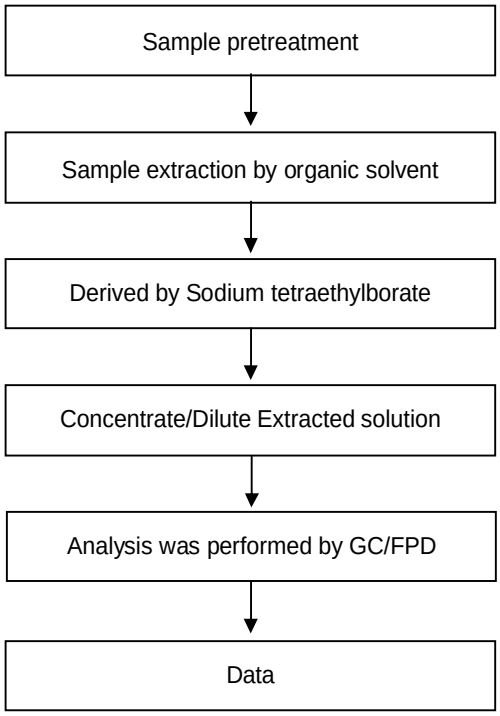
Analytical flow chart - Organic-Tin

- Technician: Yaling Tu
- Supervisor: Troy Chang



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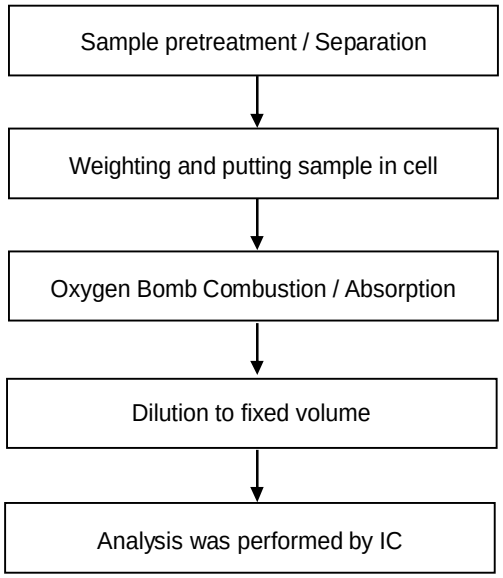
Analytical flow chart - Halogen

- Technician: Rita Chen
- Supervisor: Troy Chang



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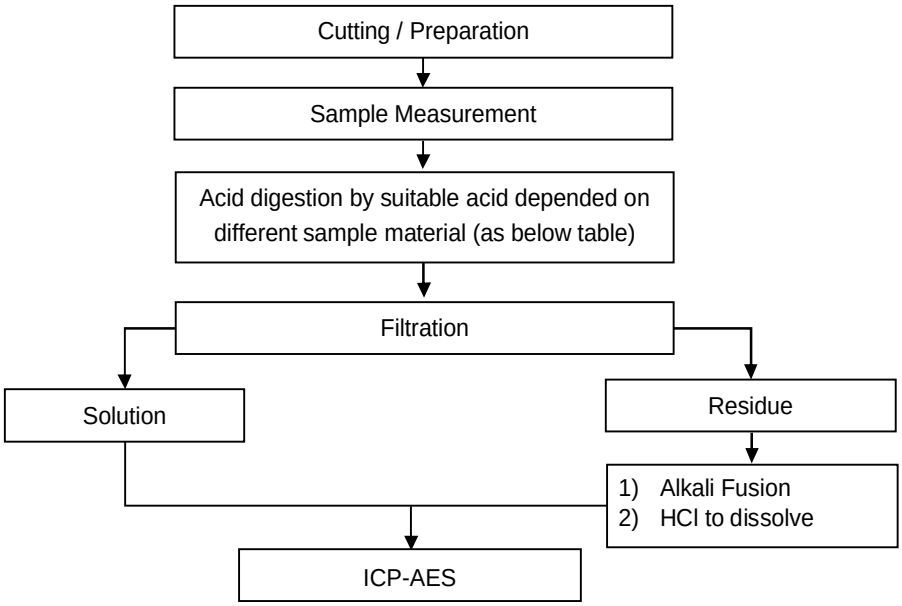
These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Rita Chen
- Supervisor: Troy Chang

Flow Chart of digestion for the elements analysis performed by ICP-AES



Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Added appropriate reagent to total digestion

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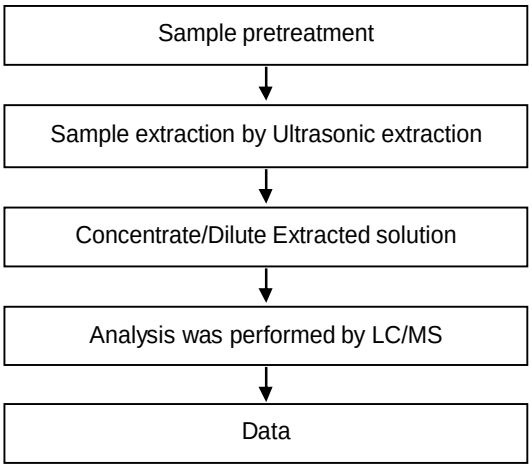
Analytical flow chart - PFOA/PFOS

- Technician: Yaling Tu
- Supervisor: Troy Chang



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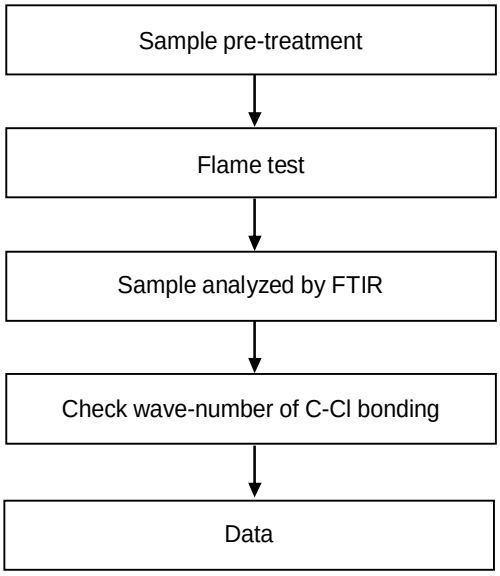
Analysis flow chart - PVC

- Technician: Yaling Tu
- Supervisor: Troy Chang



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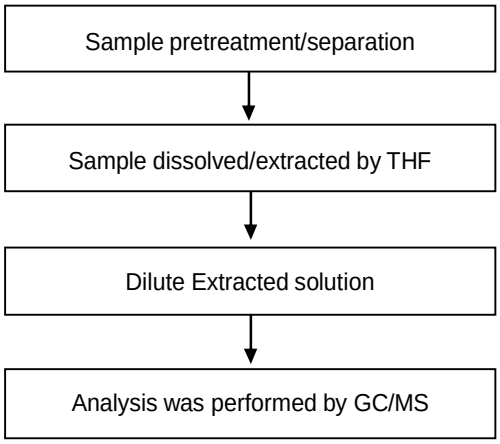
Analytical flow chart - Phthalate

- Technician: Yaling Tu
- Supervisor: Troy Chang

【Test method: IEC 62321-8】



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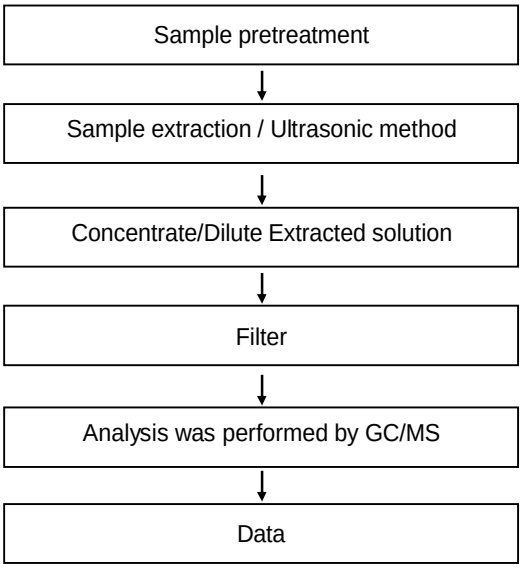
Analytical flow chart - HBCDD

- Technician: Yaling Tu
- Supervisor: Troy Chang



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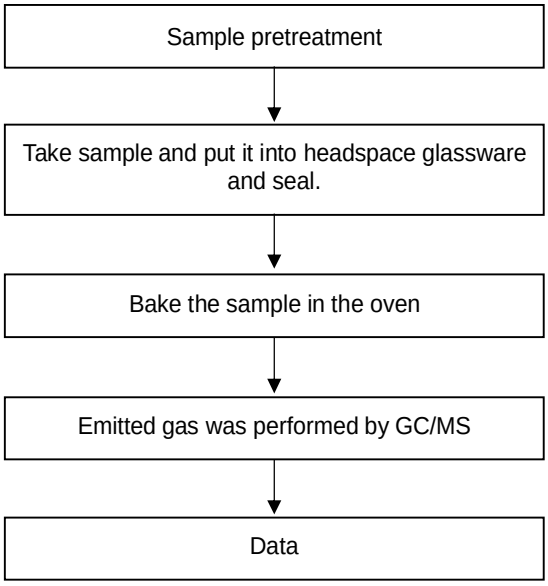
Analytical flow chart - volatile organic compounds (VOCs)

- Technician：Chun Wu
- Supervisor：Shinjyh Chen

【Reference method：US EPA 5021, 5021A】



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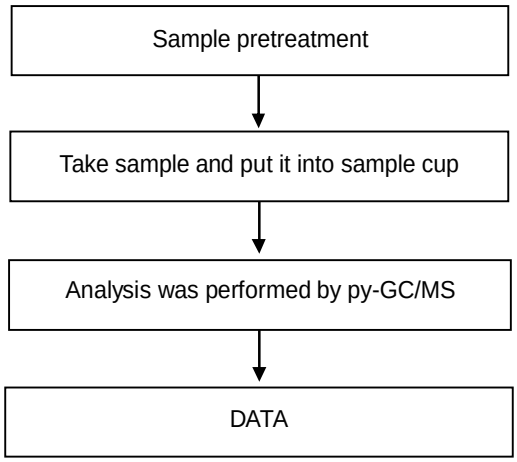
Analytical flow chart - Red phosphorus

- Technician: Yaling Tu
- Supervisor: Troy Chang



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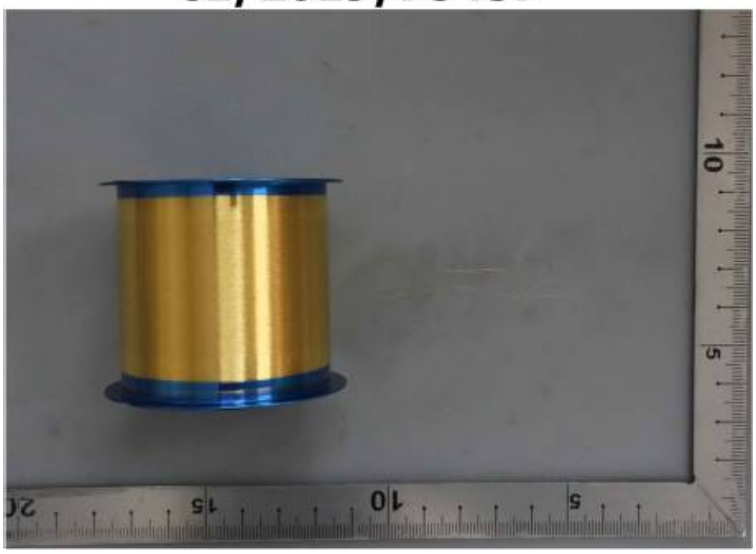
*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

CE/2019/75437



** End of Report **

試驗報告
Test Report

號碼(No.) : KA/2019/C0947 日期(Date) : 2019/12/16

耀漳企業有限公司
JAU JANQ ENTERPRISE CO., LTD.
高雄市苓雅區廈門街111號
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

以下測試樣品係由客戶送樣, 且由客戶聲稱並經客戶確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

送樣廠商(Sample Submitted By) : 耀漳企業有限公司 (JAU JANQ ENTERPRISE CO., LTD.)
樣品名稱(Sample Description) : 純錫99.99 (PURE Tin 99.99)
收件日期(Sample Receiving Date) : 2019/12/10
測試期間(Testing Period) : 2019/12/10 to 2019/12/16

==========

測試需求(Test Requested) :

(1) 依據客戶指定，參考RoHS 2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP. (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).)

(2) 其他測試項目請見下一頁 . (Please refer to next pages for the other item(s).)

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).

結論(Conclusion) :

(1) 根據客戶所提供的樣品，其鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP的測試結果符合RoHS 2011/65/EU Annex II暨其修訂指令(EU) 2015/863之限值要求. (Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.)

報告簽署人/張伯睿/博士/技術經理
Ray Chang, Ph.D./Manager -Tech
Signed for and on behalf of
SGS Taiwan Limited
化學實驗室-高雄/Chemical Laboratory-Kaohsiung

試驗報告
Test Report

耀漳企業有限公司
JAU JANQ ENTERPRISE CO., LTD.
高雄市苓雅區廈門街111號
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

測試結果(Test Results)

測試部位(PART NAME) NO.1 : 銀色金屬 (SILVER COLORED METAL)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.	100
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	6.17	1000
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4:2013+AMD1:2017，以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-4:2013+AMD1:2017 and performed by ICP-OES.	2	n.d.	1000
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	$\mu g/cm^2$	參考IEC 62321-7-1:2015，以UV-VIS檢測. / With reference to IEC 62321-7-1:2015 and performed by by UV-VIS.	0.10	n.d.	-
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6:2015，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n.d.	-
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n.d.	-
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n.d.	-
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n.d.	-
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n.d.	-
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n.d.	-
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n.d.	-
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n.d.	-
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n.d.	-
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n.d.	-

試驗報告
Test Report

耀漳企業有限公司
JAU JANQ ENTERPRISE CO., LTD.
高雄市苓雅區廈門街111號
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	參考IEC 62321-6:2015，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.	1000
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n.d.	-
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5	n.d.	-
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg		5	n.d.	-
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5	n.d.	-
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5	n.d.	-
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n.d.	-
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5	n.d.	-
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n.d.	-
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n.d.	-
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n.d.	-
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.	1000
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n.d.	1000
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.	1000
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n.d.	-
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0, 68515-48-0)	mg/kg		50	n.d.	-
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0, 68515-49-1)	mg/kg		50	n.d.	-

試驗報告
Test Report

耀漳企業有限公司
JAU JANQ ENTERPRISE CO., LTD.
高雄市苓雅區廈門街111號
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
鄰苯二甲酸二正戊酯/ DNPP(Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg	參考IEC 62321-8:2017，以氣相層析/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-
銻 / Antimony (Sb)	mg/kg	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀檢測. / With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀檢測. / With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ-HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	參考IEC 62321: 2008，以氣相層析/質譜儀檢測. / With reference to IEC 62321: 2008. Analysis was performed by GC/MS.	5	n.d.	-
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg	參考CEN/TS 15968 (2010)，以液相層析/串聯質譜儀檢測. / With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MSMS.	0.01	n.d.	-
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考CEN/TS 15968 (2010)，以液相層析/串聯質譜儀檢測. / With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MSMS.	0.01	n.d.	-

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) NO.1	法規限值 (Limit)
鹵素 / Halogen					
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	參考BS EN 14582:2016，以離子層析儀檢測. / With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.	-
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.	-
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.	-

備註(Note):

1. mg/kg = ppm；0.1wt% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出)
4. "-" = Not Regulated (無規格值)
5. (#2) =

a. 當六價鉻結果大於0.13 μg/cm²，表示樣品表層含有六價鉻. / The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
b. 當六價鉻結果為n.d. (濃度小於0.10 μg/cm²)，表示表層不含六價鉻. / The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
c. 當六價鉻結果介於 0.10 及 0.13 μg/cm² 時，無法確定塗層是否含有六價鉻. / The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

耀漳企業有限公司
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高雄市苓雅區廈門街111號
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PFOS參考資訊(Reference Information) : 持久性有機污染物 POPs - (EU) 2019/1021

PFOS濃度在物質或製備中不得超過0.001%(10ppm)，在半成品、成品或零部件中不得超過0.1%(1000ppm)，在紡織品或塗層材料中不得超過1μg/m²。

(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².)

全氟辛烷磺酸指全氟辛烷磺酸和它的衍生物包括全氟辛烷磺酸, 全氟辛基磺醯胺, N-甲基全氟辛烷磺酰胺, N-乙基全氟辛烷磺酰胺, N-甲基全氟辛基磺酰基氨基乙醇, N-乙基全氟辛基磺酰基氨基乙醇。(PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.)

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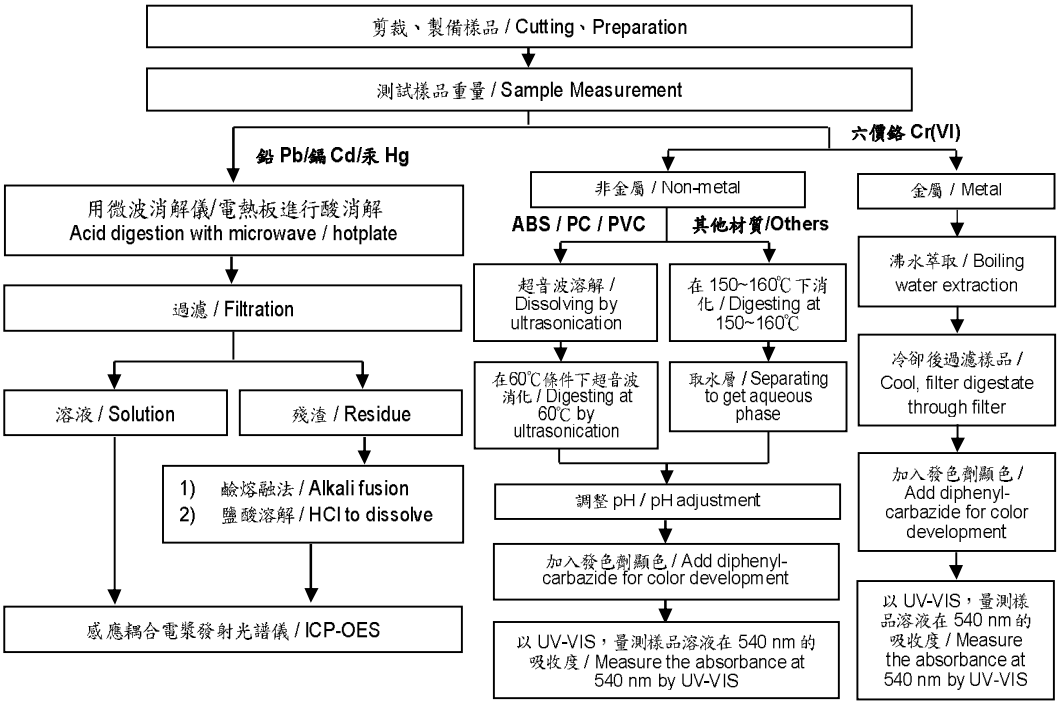
重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件，樣品已完全溶解。（六價鉻測試方法除外）
These samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

- 測試人員：劉俊宏/ Technician : Jony Liu
- 測試負責人：張伯睿/ Supervisor: Ray Chang



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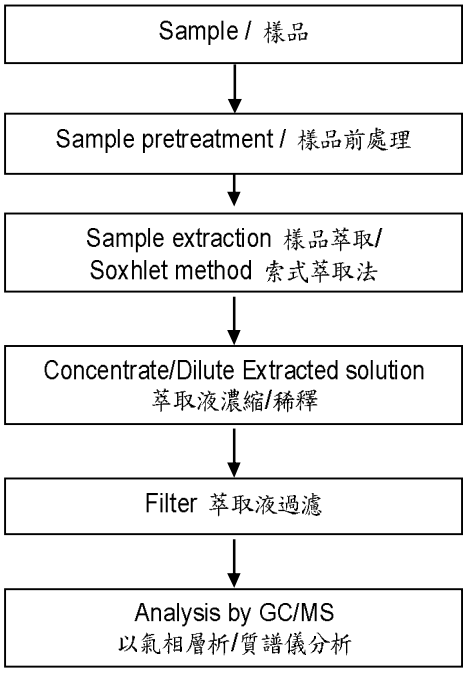
多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang



試驗報告
Test Report

耀漳企業有限公司
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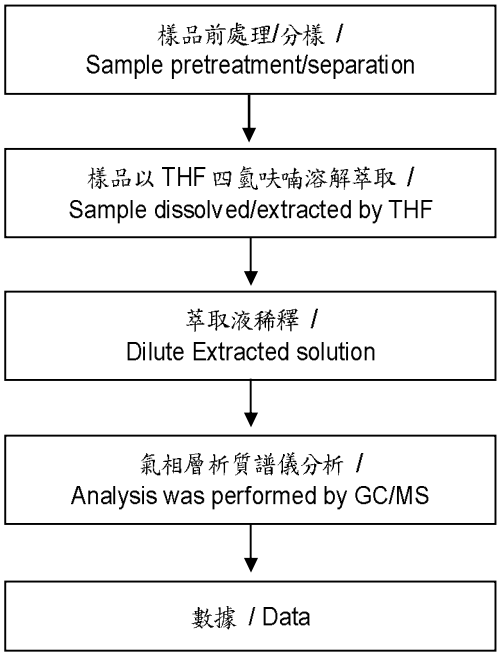
可塑劑分析流程圖 / Analytical flow chart of phthalate content

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang

【測試方法/Test method: IEC 62321-8】



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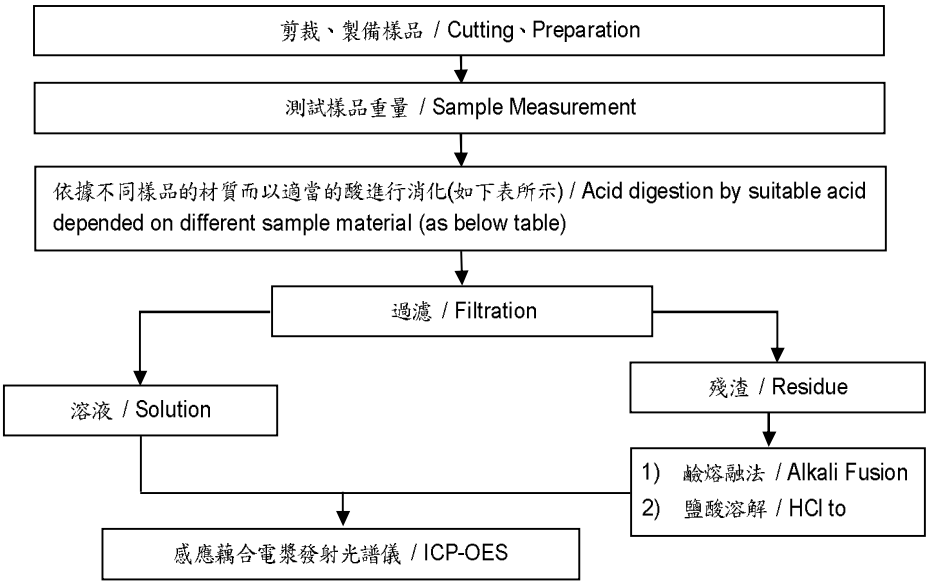
高雄市苓雅區廈門街111號
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

元素以 ICP-OES 分析的消化流程圖
(Flow Chart of digestion for the elements analysis performed by ICPOES)

根據以下的流程圖之條件，樣品已完全溶解。 / These samples were dissolved totally by pre conditioning method according to below flow chart.

- 測試人員：劉俊宏 / Technician: Jony Liu
- 測試負責人：張伯睿 / Supervisor: Ray Chang



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNO_3, HCl, HF, H_2O_2
玻璃 / Glass	硝酸,氫氟酸 / HNO_3/HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO_3
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H_2SO_4, H_2O_2, HNO_3, HCl
其他 / Others	加入任何酸至完全溶解 / Any acid to total digestion

試驗報告
Test Report

耀漳企業有限公司
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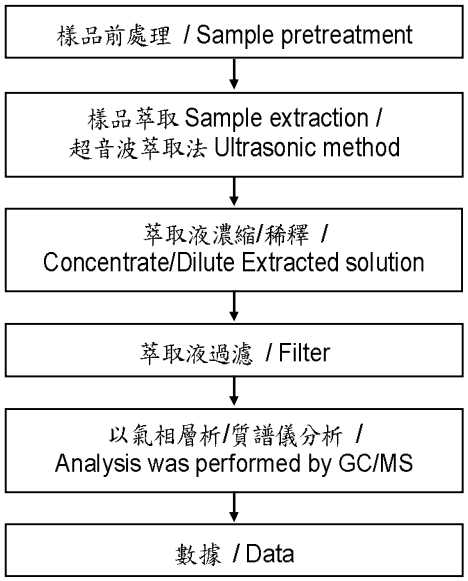
六溴環十二烷分析流程圖 / HBCDD analytical flow chart

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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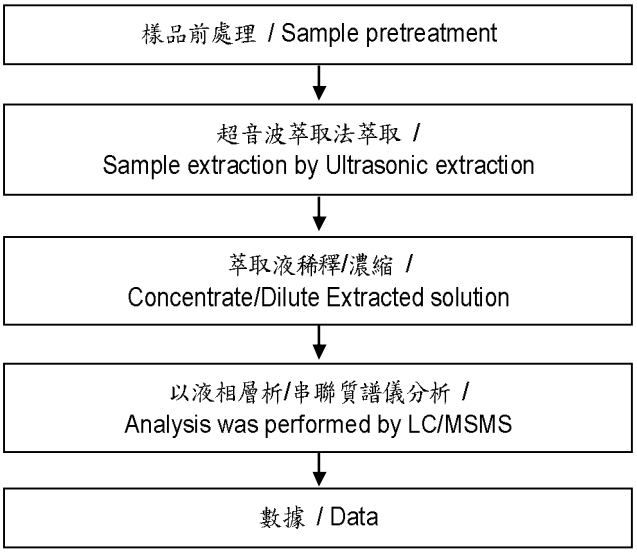
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

- 測試人員：黃璟瑾 / Technician: Ginny Huang
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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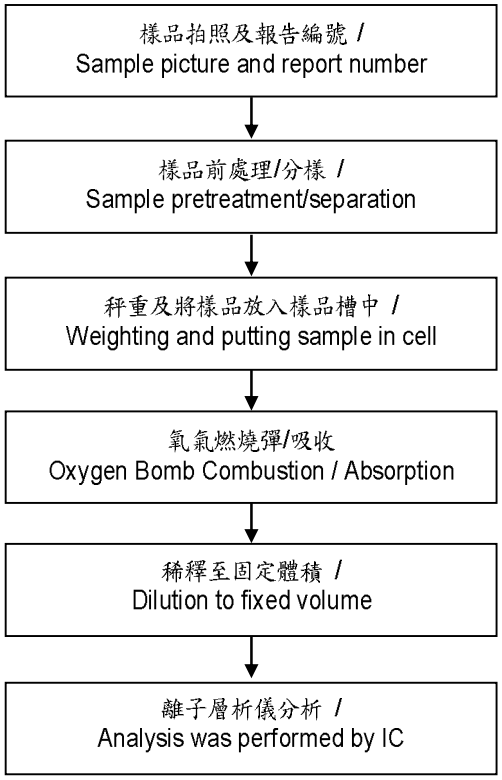
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

鹵素分析流程圖 / Analytical flow chart of halogen content

- 測試人員：洪秀真 / Technician : Jean Hung
- 測試負責人：張伯睿 / Supervisor: Ray Chang



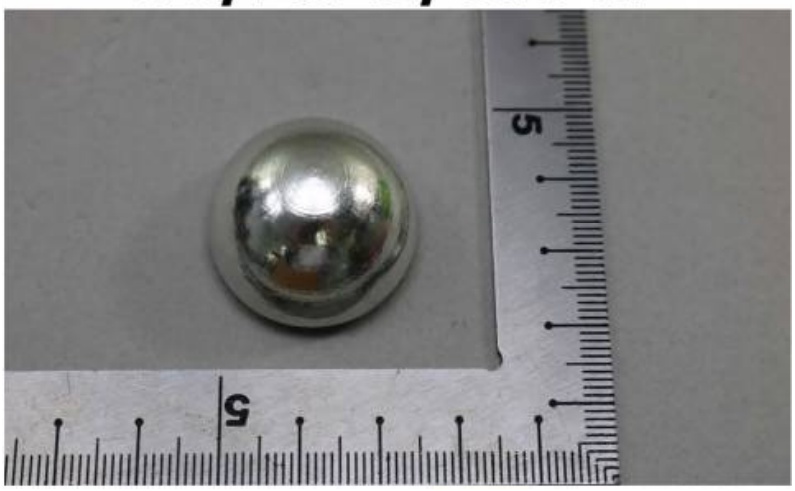
試驗報告
Test Report

號碼(No.) : KA/2019/C0947 日期(Date) : 2019/12/16

耀漳企業有限公司
JAU JANQ ENTERPRISE CO., LTD.
高雄市苓雅區廈門街111號
NO. 111, SIAMEN ST., LINGYA DISTRICT, KAOHSIUNG CITY 802, TAIWAN (R. O. C.)

＊ 照片中如有箭頭標示，則表示為實際檢測之樣品/部位. ＊
(The tested sample / part is marked by an arrow if it's shown on the photo.)

KA/2019/C0947



** 報告結尾(End of Report) **

Test Report

No. : CE/2020/20341 Date : 2020/02/10

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

The following samples was/were submitted and identified by/on behalf of the applicant as :

Sample Description	:	NIPPON COPPER WIRE
Style/Item No.	:	COPPER WIRE(EX1p)
Sample Receiving Date	:	2020/02/03
Testing Period	:	2020/02/03 to 2020/02/10

==========

Test Requested :

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

Test Result(s) : Please refer to following pages.

Troy Chang / Manager - Tech
Signed for and behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Test Result(s)

PART NAME No.1 : SILVER COLORED METAL WIRE (INCLUDING THE PLATING LAYER)

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-OES.	2	n.d.
Lead (Pb)	mg/kg		2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n.d.
Hexavalent Chromium Cr(VI)(#2)	µg/cm²	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
Monobromobiphenyl	mg/kg		5	n.d.
Dibromobiphenyl	mg/kg		5	n.d.
Tribromobiphenyl	mg/kg		5	n.d.
Tetrabromobiphenyl	mg/kg		5	n.d.
Pentabromobiphenyl	mg/kg		5	n.d.
Hexabromobiphenyl	mg/kg		5	n.d.
Heptabromobiphenyl	mg/kg		5	n.d.
Octabromobiphenyl	mg/kg		5	n.d.
Nonabromobiphenyl	mg/kg		5	n.d.
Decabromobiphenyl	mg/kg		5	n.d.
Sum of PBDEs	mg/kg		-	n.d.
Monobromodiphenyl ether	mg/kg		5	n.d.
Dibromodiphenyl ether	mg/kg		5	n.d.
Tribromodiphenyl ether	mg/kg		5	n.d.
Tetrabromodiphenyl ether	mg/kg		5	n.d.
Pentabromodiphenyl ether	mg/kg		5	n.d.
Hexabromodiphenyl ether	mg/kg		5	n.d.
Heptabromodiphenyl ether	mg/kg		5	n.d.
Octabromodiphenyl ether	mg/kg		5	n.d.
Nonabromodiphenyl ether	mg/kg		5	n.d.
Decabromodiphenyl ether	mg/kg		5	n.d.

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Test Item(s)	Unit	Method	MDL	Result No.1
Polychlorinated Biphenyls (PCBs) (CAS No.: 1336-36-3)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	0.5	n.d.
Polychlorinated Naphthalene (PCNs)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	5	n.d.
Polychlorinated Terphenyls (PCTs)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	0.5	n.d.
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	100	n.d.
Tributyl Tin (TBT)	mg/kg	With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.	0.03	n.d.
Triphenyl Tin (TphT)	mg/kg		0.03	n.d.
Dibutyl Tin (DBT)	mg/kg		0.03	n.d.
Dioctyl Tin (DOT)	mg/kg		0.03	n.d.
Bis(tributyltin)oxide (TBTO) (CAS No.: 56-35-9)	mg/kg	With reference to ISO 17353 (2004). Analysis was performed by GC/FPD. Calculated from the result of Tributyl Tin (TBT).	0.03 (▲)	n.d.
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582 (2016). Analysis was performed by IC.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.
Antimony (Sb)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-OES.	2	n.d.
Beryllium (Be)	mg/kg	With reference to US EPA 3050B (1996). Analysis was performed by ICP-OES.	2	n.d.
Arsenic (As)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-OES.	2	n.d.

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Test Item(s)	Unit	Method	MDL	Result
				No.1
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MS.	0.01	n.d.
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MS.	0.01	n.d.
Polyvinyl chloride (PVC)	**	Analysis was performed by FTIR and FLAME Test.	-	Negative
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DNPP (Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
DIHP (1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich) (CAS No.: 71888-89-6)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n.d.
Red phosphorus	**	Analysis was performed by Pyrolyzer-GC/MS.	-	Negative

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Note：

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected = less than MDL
4. " - " = Not Regulated
5. ** = Qualitative analysis (No Unit)
6. Negative = Undetectable / Positive = Detectable
7. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm². The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 µg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
8. (▲) : The MDL was evaluated for element / tested substance.
   Conversion Formula : AX = A × F

AX	A	F
Bis(tributyltin)oxide (TBTO)	Tributyl Tin (TBT)	1.024

9. Parameter Conversion Table : http://twap.sgs.com/sgsrsts/chn/download-REACH_tw.asp

PFOS Reference Information : POPs - (EU) 2019/1021

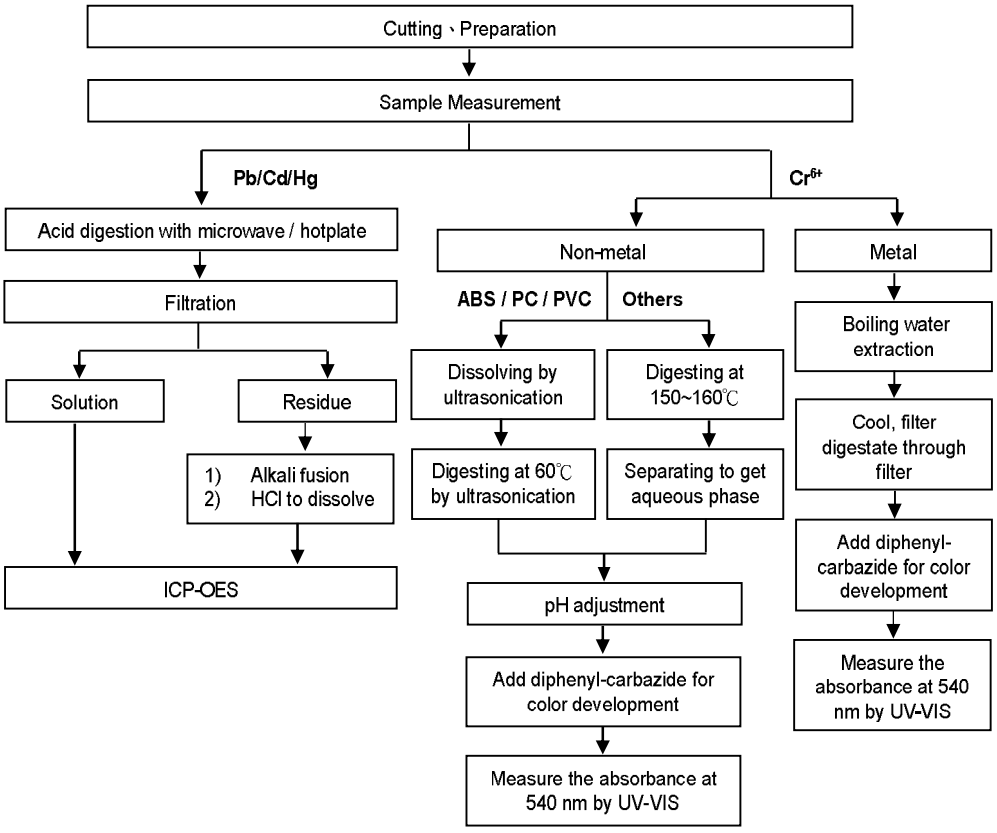
Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m².

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

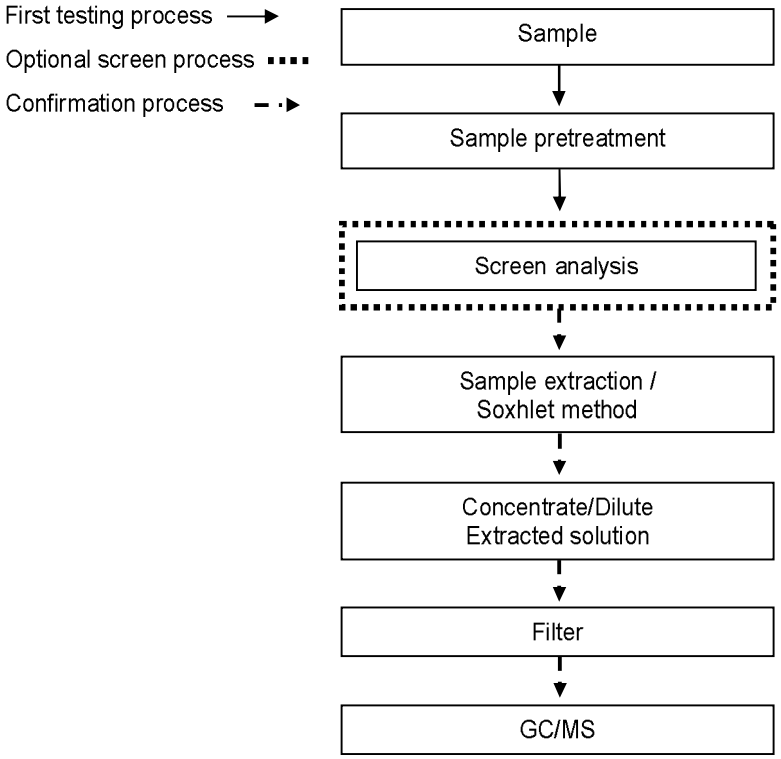
- Technician : Rita Chen
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart – PBB / PBDE

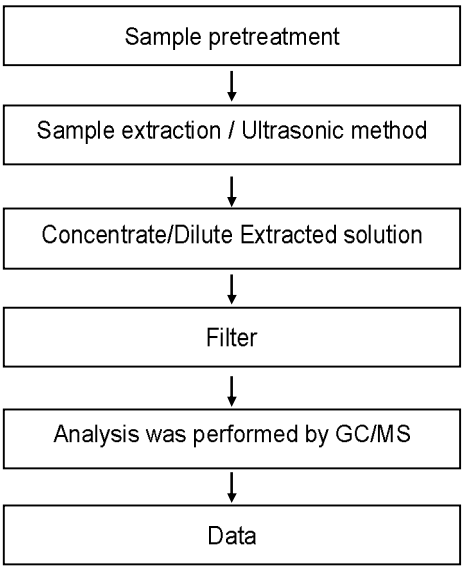
- Technician : Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - PCBs

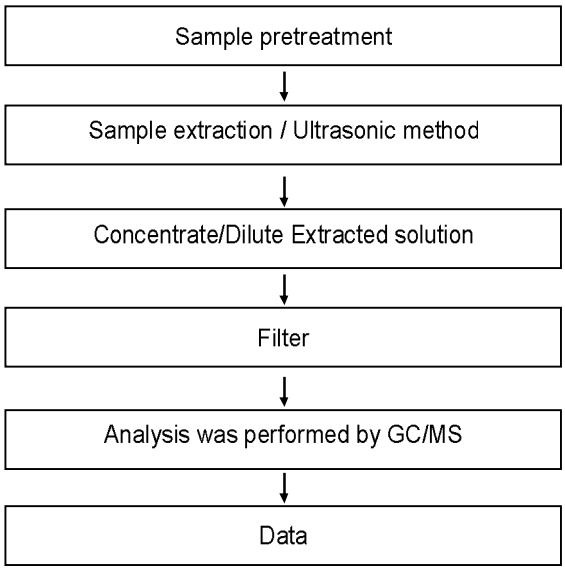
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - PCNs

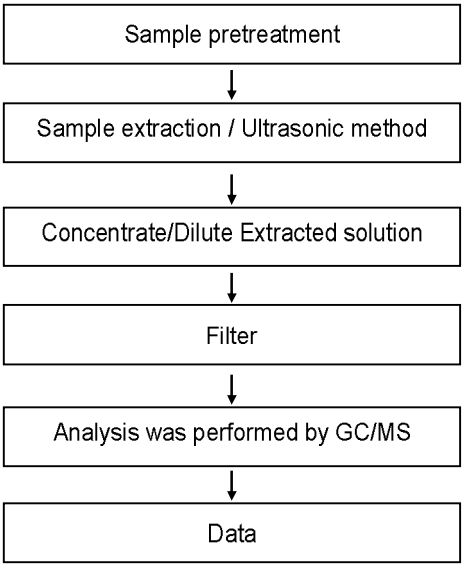
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - PCTs

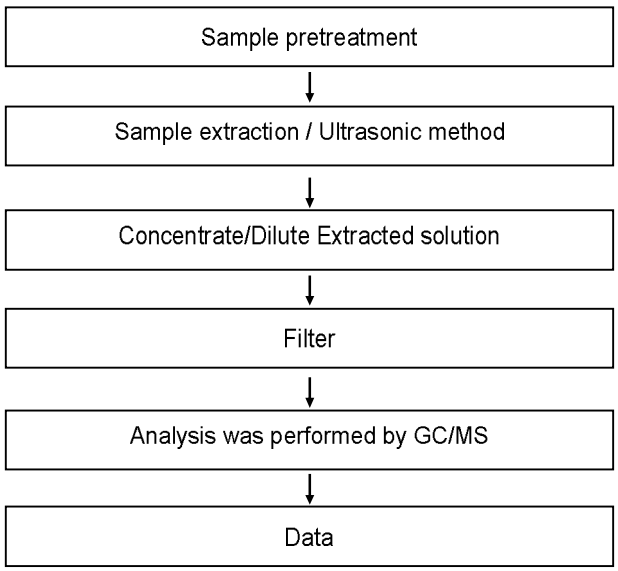
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - Chlorinated Paraffins

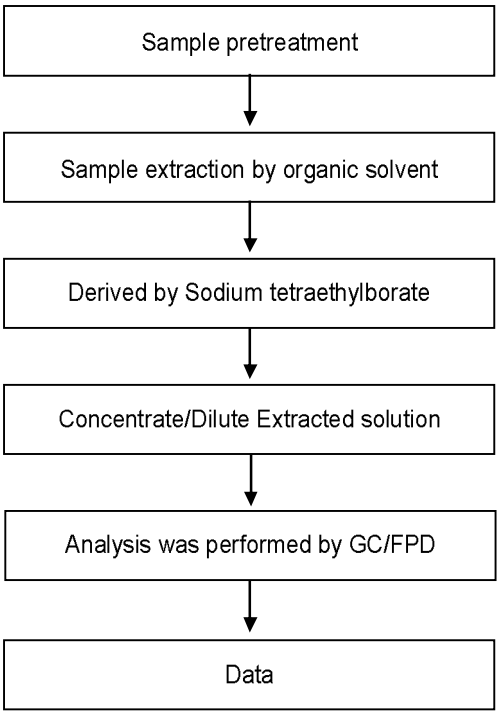
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - Organic-Tin

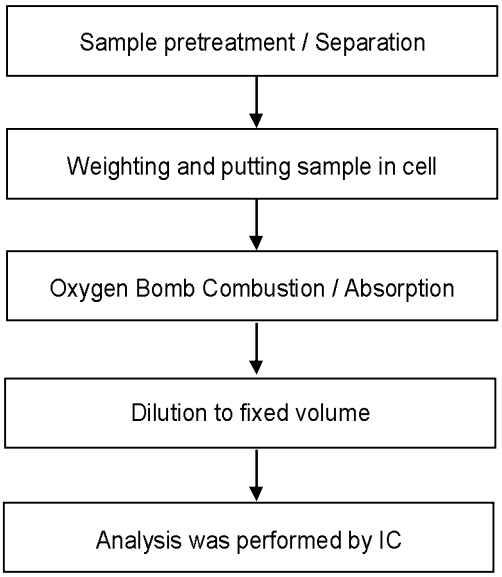
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - Halogen

- Technician: Rita Chen
- Supervisor: Troy Chang

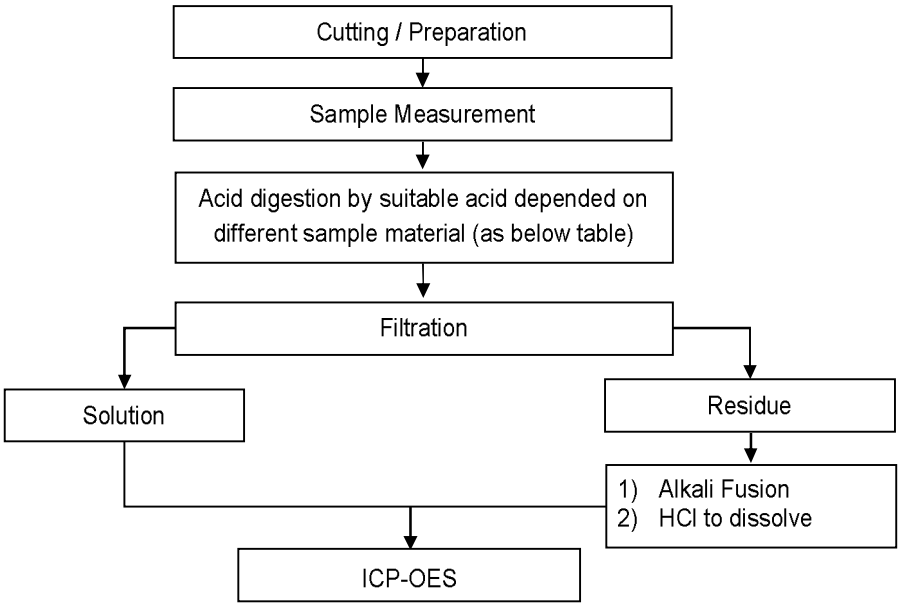


NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Rita Chen
- Supervisor: Troy Chang

Flow Chart of digestion for the elements analysis performed by ICP-OES

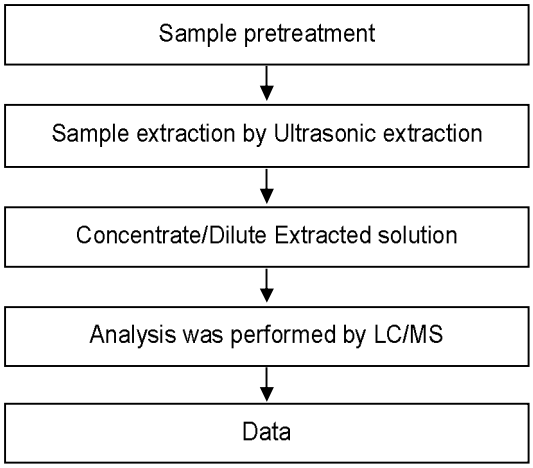


Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Added appropriate reagent to total digestion

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - PFOA/PFOS

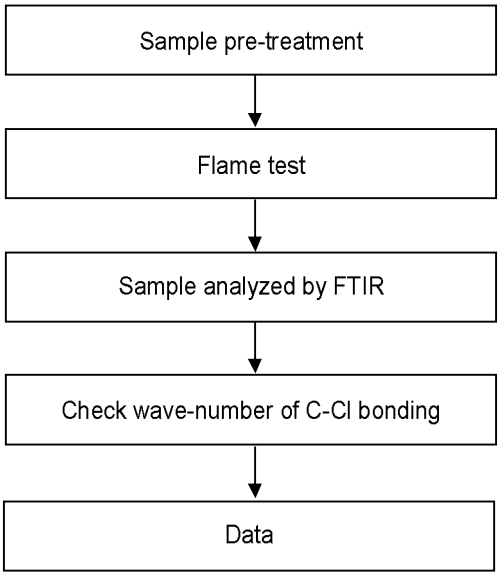
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analysis flow chart - PVC

- Technician: Yaling Tu
- Supervisor: Troy Chang

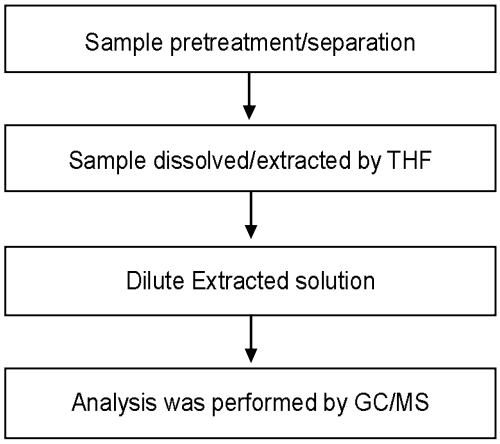


NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - Phthalate

- Technician: Yaling Tu
- Supervisor: Troy Chang

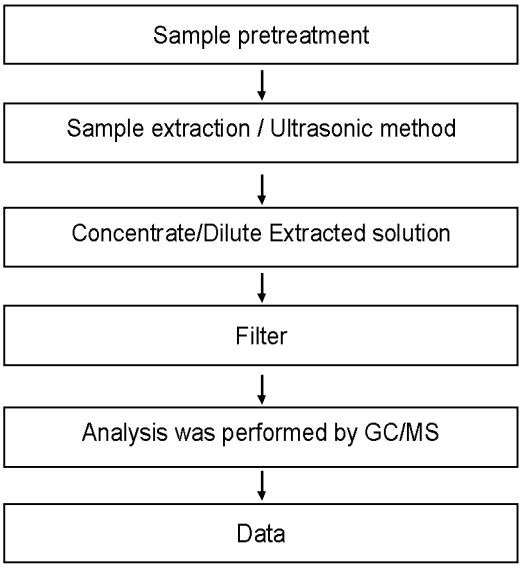
【Test method: IEC 62321-8】



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - HBCDD

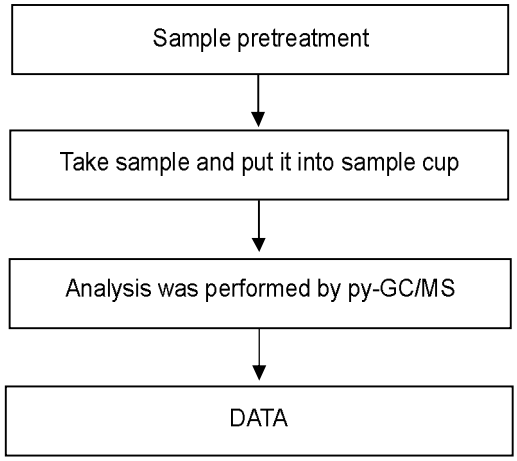
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - Red phosphorus

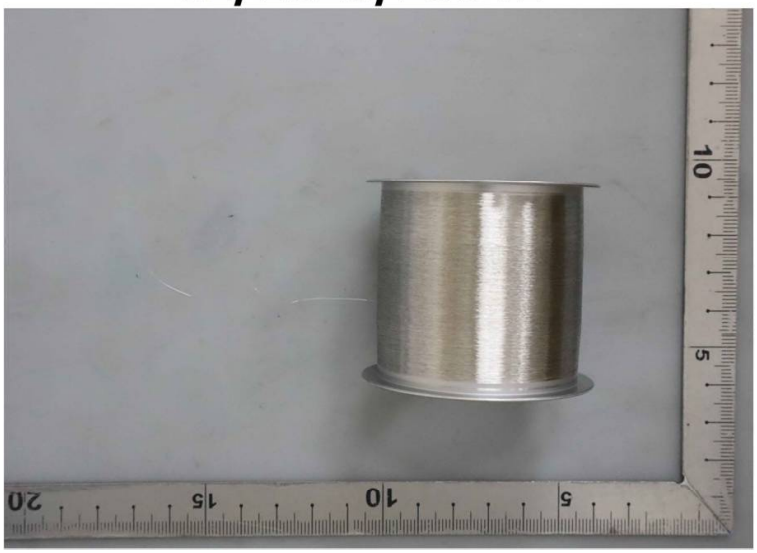
- Technician: Yaling Tu
- Supervisor: Troy Chang



NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

CE/2020/20341



** End of Report **

AN INFINEON TECHNOLOGIES COMPANY

Cypress Semiconductor
Package Qualification Report

QTP# 201104 VERSION*A
July 2020

32L SOIC (450 mils)

Pure Sn Leadfinish

MSL3, 260°C Reflow

Greatek-Taiwan (IG)

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
reliability@cypress.com

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Reliability Manager

Approved By:
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Reliability Director

AN INFINEON TECHNOLOGIES COMPANY

PACKAGE QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
201104	32L SOIC (SZ324) Package Qualification Transfer at Greatek-Taiwan (IG)	June 2020

AN INFINEON TECHNOLOGIES COMPANY

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	SZ32
Package Outline, Type, or Name:	32L SOIC (450 mils)
Mold Compound Name/Manufacturer:	G700/Sumitomo
Mold Compound Flammability Rating:	V0 UL94
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Paddle
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw Process
Die Attach Supplier:	Hitachi
Die Attach Material:	EN-4900
Bond Diagram Designation	002-28858
Wire Bond Method:	Thermosonic
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	002-26450
Name/Location of Assembly (prime) facility:	Greatek-Taiwan (G)
MSL Level	3
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R

AN INFINEON TECHNOLOGIES COMPANY

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Ball Shear	JESD22-B116 Cpk : 1.33, Ppk : 1.66	P
Bond Pull	MIL-STD-883 – Method 2011, Cpk : 1.33, Ppk : 1.66	P
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Die Shear	MIL-STD-883, Method 2019	P
Dye Penetrant Test	Test to determine the existence and extent of cracks, Criteria: No Package Crack	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V, 1000V, 1250V JESD22-C101	P
Final Visual Inspection	JESD22-B101	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 5.25V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
High Temp Storage	JESD22-A103: 175°C, no bias	P
Internal Visual Inspection	MIL-STD-883-2014	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Pressure Cooker Test	JESD22-A102, 121°C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Solderability, Steam Aged	J-STD-002, JESD22-B102 95% solder coverage minimum	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
X-Ray	MIL-STD-883 – 2012	P

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 201104

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	22	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	22	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	22	0	
STRESS: ACOUSTIC								
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	22	0	
STRESS: BALL SHEAR								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	30	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	30	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	30	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	30	0	
STRESS: BOND PULL								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	30	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	30	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	30	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYSIS								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	5	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	5	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	5	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	5	0	
STRESS: DIE SHEAR								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	5	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	5	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	5	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	5	0	

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 201104

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: DYE PENETRANT TEST								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	15	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	500	9	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	1000	3	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	1250	3	0	
STRESS: FINAL VISUAL								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	600	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	599	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	464	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	500	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.25V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	96	30	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	96	30	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	96	30	0	
STRESS: HIGH TEMP STORAGE								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	500	80	0	
STRESS: INTERNAL VISUAL								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	5	0	
STRESS: PHYSICAL DIMENSION								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	10	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	10	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	10	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	10	0	

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 201104

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	168	80	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	168	79	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	168	80	0	
STRESS: SOLDERABILITY TEST								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	5	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	5	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	5	0	
STRESS: TC COND. C –65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	500	80	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	500	80	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	500	80	0	
STRESS: X-RAY								
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008323	IG-Taiwan	COMP	15	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612008324	IG-Taiwan	COMP	15	0	
CY7C53120E4 (77CP531200D)	SZ32	4928279	612009797	IG-Taiwan	COMP	15	0	
CY62128EV30LL (7CP62128K)	SZ32	4812350	612011682	IG-Taiwan	COMP	15	0	

AN INFINEON TECHNOLOGIES COMPANY

Document History Page

Document Title: QTP# 201104: 32L SOIC (450 MILS) PURE SN LEADFINISH, CUPDAU WIRE, MSL3, 260C REFLOW, GREATEK-TAIWAN (IG)
Document Number: 002-30808

Rev.	ECN No.	Orig. of Change	Description of Change
**	6909013	JYF	Initial release.
*A	6916747	JYF	Added Qualification data for CY62128EV30LL MPN.

AN INFINEON TECHNOLOGIES COMPANY

Cypress Semiconductor
Package Qualification Report

QTP# 200404 VERSION**
July 2020

56L SSOP (300 mils)

Pure Sn Leadfinish

MSL3, 260°C Reflow

Greatek-Taiwan (IG)

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
reliability@cypress.com

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Reviewed By:
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Reliability Manager

Approved By:
David Hoffman (DHH)
Reliability Director

AN INFINEON TECHNOLOGIES COMPANY

PACKAGE QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
200404	56L SSOP (300 mils) Package Qualification at Greatek-Taiwan (IG)	July 2020

AN INFINEON TECHNOLOGIES COMPANY

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	SP56
Package Outline, Type, or Name:	56L SSOP (300mils)
Mold Compound Name/Manufacturer:	EME-G700/Sumitomo
Mold Compound Flammability Rating:	V0 UL94
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Paddle
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw Process
Die Attach Supplier:	Hitachi
Die Attach Material:	EN-4900
Bond Diagram Designation	002-29373
Wire Bond Method:	Thermosonic
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	002-26450
Name/Location of Assembly (prime) facility:	Greatek-Taiwan (G)
MSL Level	3
Reflow Profile	260

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R

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RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Ball Shear	JESD22-B116 Cpk : 1.33, Ppk : 1.66	P
Bond Pull	MIL-STD-883 – Method 2011, Cpk : 1.33, Ppk : 1.66	P
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Die Shear	MIL-STD-883, Method 2019	P
Dye Penetrant Test	Test to determine the existence and extent of cracks, Criteria: No Package Crack	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V, 1000V, 1250V JESD22-C101	P
Final Visual Inspection	JESD22-B101	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 3.63V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
High Accelerated Saturation Test (HAST) - Unbiased	JEDEC STD 22-A110: 130°C, 85%RH Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
High Temp Storage	JESD22-A103: 175°C, no bias	P
Internal Visual Inspection	MIL-STD-883-2014	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Pressure Cooker Test	JESD22-A102, 121°C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Solderability, Steam Aged	J-STD-002, JESD22-B102 95% solder coverage minimum	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
X-Ray	MIL-STD-883 - 2012	P

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 200404

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	22	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	22	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	22	0	
STRESS: BALL SHEAR								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	30	0	
STRESS: BOND PULL								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYSIS								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	5	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	5	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	5	0	
STRESS: DIE SHEAR								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	5	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	5	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	5	0	
STRESS: DYE PENETRANT TEST								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	15	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	15	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	500	9	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	1000	3	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	1250	3	0	

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 200404

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: FINAL VISUAL								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	1350	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	800	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	800	0	
STRESS: HI-ACCEL SATURATION TEST- UNBIASED (130C, 85%RH), PRE COND 192 HR 30C/60%RH (MSL3)								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	96	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	96	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	96	30	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 3.63V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	96	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	96	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	96	30	0	
STRESS: HIGH TEMP STORAGE								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	500	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	500	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	500	30	0	
STRESS: INTERNAL VISUAL								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	5	0	
STRESS: PHYSICAL DIMENSION								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	10	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	10	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	10	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	96	29	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	96	29	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	96	30	0	

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 200404

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: SOLDERABILITY TEST								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	3	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	3	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	3	0	
STRESS: TC COND. C –65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	500	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	500	30	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	500	30	0	
STRESS: X-RAY								
CY7C68013A (7CP686000B)	SP56	4920453	612012673	IG-Taiwan	COMP	15	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012674	IG-Taiwan	COMP	15	0	
CY7C68013A (7CP686000B)	SP56	4920453	612012675	IG-Taiwan	COMP	15	0	

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Document History Page

Document Title: QTP# 200404: 56L SSOP (300 MILS) PURE SN LEADFINISH, MSL3, 260C REFLOW, GREATEK-TAIWAN (IG)
Document Number: 002-30937

Rev.	ECN No.	Orig. of Change	Description of Change
**	6925746	JYF	Initial release.

AN INFINEON TECHNOLOGIES COMPANY

Cypress Semiconductor Automotive Package Qualification Report

**QTP# 201304 VERSION **
July 2020**

32-lead SOIC (450mils)
Pure Sn leadfinish
MSL3, 260C Reflow
Greatek-Taiwan (IG)

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
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AN INFINEON TECHNOLOGIES COMPANY

PACKAGE QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
201304	Qualification of Automotive 32-lead SOIC (450mils) package assembled at Greatek-Taiwan (IG) using Sumitomo G700SLA mold compound, Hitachi EN-4900GC die attach material, Copper leadframe and Pure Sn leadfinish at MSL3 260C Reflow Temperature	Jul 2020

AN INFINEON TECHNOLOGIES COMPANY

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	SZ324
Package Outline, Type, or Name:	32-lead SOIC (450mils)
Mold Compound Name/Manufacturer:	G700SLA / Sumitomo
Mold Compound Flammability Rating:	V0 UL94
Mold Compound Alpha Emission Rate:	0.001 CPH/cm2
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Paddle
Lead Frame Material:	Copper
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw Process
Die Attach Supplier:	Hitachi
Die Attach Material:	EN-4900GC
Bond Diagram Designation	002-28857
Wire Bond Method:	Thermosonic
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	002−30811
Name/Location of Assembly (prime) facility:	Greatek-Taiwan (IG)
MSL LEVEL	3
REFLOW PROFILE	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	Greatek-Taiwan (IG)

Note: Please contact a Cypress Representative for other package availability.

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RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Early Failure Rate	AEC-Q100-008 and JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 5.25V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 5.25V	P
High Accelerated Saturation Test (HAST)	JESD22-A110, 130C, 5.0V, 85%RH Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3xReflow, 260°C+0, -5°C	P
Temperature Cycle	JESD22-A104, -65°C to 150°C Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3xReflow, 260°C+0, -5°C	P
Pressure Cooker	JESD22-A102, 121C, 100%RH, 15 Psig Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3xReflow 260°C+0, -5°C	P
Acoustic	J-STD-020 Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3xReflow, 260C+0, -5C	P
High Temperature Storage	JESD22-A103: 175 C, no bias	P
Wire Bond Pull	Mil-Std 883, Method 2011	P
Post Temperature Cycle Wire Bond Pull	Mil-Std 883, Method 2011	P
Dye Penetrant Test	Criteria: No Package Crack	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	AEC-Q100-011 250V/500V/ 750V (corner pins)	P
Electrostatic Discharge Human Body Model (ESD-HBM)	AEC-Q100-002 500V/1000V/2000V	P
Electrical Distribution	AEC-Q100-009	P
Wire Ball Shear	AEC-Q100-001	P
Final Visual	JESD22-B101B	P
Physical Dimensions	JESD22B100 and B108	P
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Solderability	JESD22-B102	P

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 201304

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	22	0	
STRESS: ACOUSTIC, (TIME ZERO)								
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	22	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	22	0	
STRESS: BALL SHEAR								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	30	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	30	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	30	0	
STRESS: BOND PULL								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	30	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	30	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYSIS								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	5	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	5	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	5	0	
STRESS: DIE SHEAR								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	5	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	5	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	5	0	
STRESS: DYE PENETRANT								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	15	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	15	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	15	0	
STRESS: ELECTRICAL DISTRIBUTION								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	30	0	

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 201304

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 5.25V, Vcc Max								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	48	800	0	
STRESS: ESD-CHARGE DEVICE MODEL								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	250	3	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	500	3	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	750	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	500	3	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	1000	3	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	2000	3	0	
STRESS: FINAL VISUAL INSPECTION								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	1596	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	1494	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	1586	0	
STRESS: GLUE ADHESION								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	15	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.0V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	96	80	0	
STRESS: HIGH TEMPERATURE STORAGE (175C)								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	500	80	0	
STRESS: LEAD INTEGRITY								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	5	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 5.25V, Vcc Max								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	500	80	0	
STRESS: PRESSURE COOKER TEST								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	96	80	0	

AN INFINEON TECHNOLOGIES COMPANY

Reliability Test Data

QTP #: 201304

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: PHYSICAL DIMENSION								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	10	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	10	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	10	0	
STRESS: POST TCT BOND PULL								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	500	5	0	
STRESS: SOLDERABILITY								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	5	0	
STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	500	85	0	
STRESS: TIN WHISKER								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	66	0	
STRESS: X-RAY								
CY62128ELL (7A62128KC)	SZ324	4845804	612008784	TAIWAN-IG	COMP	15	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008785	TAIWAN-IG	COMP	15	0	
CY62128ELL (7A62128KC)	SZ324	4845804	612008786	TAIWAN-IG	COMP	15	0	

AN INFINEON TECHNOLOGIES COMPANY

Document History Page

Document Title: QTP#201304: 32-lead SOIC (450mils) PURE SN LEADFINISH MSL3, 260C REFLOW GREATEK-TAIWAIN (IG)
Document Number: 002-30966

Rev.	ECN No.	Orig. of Change	Description of Change
**	6930916	HSTO	Initial spec release

Automotive Electronics Council
Component Technical Committee

AN INFINEON TECHNOLOGIES COMPANY

Cypress Semiconductor
Automotive Reliability Qualification Report

AEC-Q100 Automotive Qualification Test Plan Report for

CY62128ELL-55SXE/T, R95LD, Grade 1 -40 to 125℃

Contents:

Q100 Qualification Test Plan

Automotive Grade Level = 3 **MSL = 3**

Supplier Name:	CYPRESS		**General Specification:**	AEC-Q100 Rev. H	
Supplier Code:			**Supplier Wafer Fabrication:**	Skywater	
Supplier Part Number:	CY62128ELL-55SXE/T		**Supplier Wafer Test:**	Skywater	
Supplier Contact:			**Supplier Assembly Site:**	Greatek-Taiwan (IG)	
Supplier Family Type:	SZ324 (32-lead SOIC 450mild)		**Supplier Final Test Site:**	CML-Philippines (R)	
Device Description:	1-MBIT (128K x8) Static RAM		**Supplier Reliability Signature:**		
PPAP Submission Date:			**Customer Test ID:**		
Reason for Qualification:	Transfer Assembly Site (QTP#201304)		**Customer Part Number:**		
Prepared by Signature:	HSTO	Date: 21-Jul-20	**Customer Approval Signature:**		Date:

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Lot/Pass/Fail	Comments: (N/A =Not Applicable)

TEST GROUP A – ACCELERATED ENVIRONMENT STRESS TESTS

PC	A1	JESD22 A113 J-STD-020	Preconditioning: (Test @ Rm) SMD only; Moisture Preconditioning for THB/HAST, AC/UHST, TC; Peak Reflow Temp = 260℃ -0/+5℃	Min. MSL = 3			MSL = 3	a) SZ324: 245 Units / 0 Fails (3X Reflow)
THB or HAST	A2	JESD22 A101 JESD22 A110	Highly Accelerated Stress Test: (Test @ Rm/Hot/) 130℃/85%RH, 96hrs	1	80	80	0 of 80 (96 Hrs)	a. SZ324: 1 Lot / 80 Units / 0 Fails (96 Hrs)
AC or UHST or TH	A3	JESD22 A102 JESD22 A118 or JESD22-A101	Autoclave Stress Test: (Test @ Rm) 121℃/100%RH, 96hrs	1	80	80	0 of 80 (96 Hrs)	a. SZ324: 1 Lot / 80 Units / 0 Fails (96 Hrs)
TC	A4	JESD22 A104	Temperature Cycle: (Test @ Hot) -65℃ to150℃, 500 Cycles	1	85	85	0 of 85 (500 Cycles)	a. SZ324: 1 Lot / 85 Units / 0 Fails (500 Cycles) Wire Pull: 1 Lot / 5 Units / Passed (500 Cycles)
PTC	A5	JESD22 A105	Power Temperature Cycle: (Test @ Rm/Hot)	-	-	-	-	N/A
HTSL	A6	JESD22 A103	High Temperature Storage Life: (Test @ Rm/Hot) 175℃ @ 500hrs	3	80	80	0 of 80 (500 Hrs)	a. SZ324: 1 Lot / 80Units / 0 Fails (500 Hrs)

TEST GROUP B – ACCELERATED LIFETIME SIMULATION TESTS

HTOL	B1	JESD22 A108	High Temp Operating Life: (Test @ Rm/Cold/Hot) 150℃, 500 Hrs	1	80	80	0 of 80	a) SZ324 : 1 Lot / 80 Units / 0 Fails
ELFR	B2	AEC-Q100-008	Early Life Failure Rate: (Test @ Rm/Hot) 150℃, 48 Hrs	1	800	800	0 of 800	a) SZ324 : 1 Lot / 800 Units / 0 Fails
EDR	B3	AEC-Q100-005	NVM Endurance & Data Retention Test: (Test @ Rm/Hot)	-	-	-	-	N/A

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Lot/Pass/Fail	Comments: (N/A =Not Applicable)

TEST GROUP C – PACKAGE ASSEMBLY INTEGRITY TESTS

WBS	C1	AEC-Q100-001 AEC-Q003	Wire Bond Shear Test: (Cpk > 1.67)	30 bonds	5 parts Min.	bonds	Cpk > 1.67	a) SZ324 : 3 Lots / 15 units / 0 Fails
WBP	C2	Mil-STD-883, Method 2011 AEC-Q003	Wire Bond Pull: (Cpk > 1.67); Each bonder used	30 bonds	5 parts Min.	bonds	Cpk > 1.67	a) SZ324 : 3 Lots / 15 units / 0 Fails
SD	C3	JESD22 B102 JSTD-002D	Solderability: (>95% coverage) 8hr steam aging prior to testing	1	15	15	0 of 15	a) SZ324: 1 Lot / 15 units / 0 Fails
PD	C4	JESD22 B100, JESD22 B108 AEC-Q003	Physical Dimensions: (Cpk > 1.67)	3	10	30	0 of 30	a) SZ324: 3 Lots / 30 units / 0 Fails
SBS	C5	AEC-Q100-010 AEC-Q003	Solder Ball Shear: (Cpk > 1.67); 5 balls from min. of 10 devices	-	-	-	-	N/A
LI	C6	JESD22 B105	Lead Integrity: (No lead cracking or breaking); Through-hole only; 10 leads from each of 5 devices	1	5	5	0 of 5	a) SZ324: 1 Lot / 5 units / 0 Fails

TEST GROUP D – DIE FABRICATION RELIABILITY TESTS

EM	D1	JESD61	Electromigration: 90℃	-	-	-	-	N/A
TDDB	D2	JESD35	Time Dependant Dielectric Breakdown: 125℃	-	-	-	-	N/A
HCI	D3	JESD60 & 28	Hot Carrier Injection: 125℃, -40℃	-	-	-	-	N/A
NBTI	D4	JESD90	Negative Bias Temperature Instability: 125℃	-	-	-	-	N/A
SM	D5	JESD61, 87, & 202	Stress Migration: Ta = 160℃,190℃,225℃	-	-	-	-	N/A

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Lot/Pass/Fail	Comments: (N/A =Not Applicable)

TEST GROUP E- ELECTRICAL VERIFICATION

TEST	E1	User/Supplier Specification	Pre and Post Stress Electrical Test:	All	All	All	All	Performed for all qualification units
HBM	E2	AEC-Q100-002	Electrostatic Discharge, Human Body Model: (Test @ Rm/Hot); (2KV HBM / Class 2 or better)	1	9	9	0 of 9	a) SZ324 : 1 Lot / 9 units / 0 Fails 500V / 1000V / 2000V
CDM	E3	AEC-Q100-011	Electrostatic Discharge, Charged Device Model: (Test @ Rm/Hot); (750V corner leads, 500V all other leads / Class C4B or better)	1	6	6	0 of 6	a) SZ324 : 1 Lot / 6 Units / 0 Fails 250V/ 500V/ 750V
LU	E4	AEC-Q100-004	Latch-Up: (Test @ Rm/Hot)	-	-	-	-	N/A
ED	E5	AEC-Q100-009 AEC-Q003	Electrical Distributions: (Test @ Rm/Hot/Cold) (where applicable, Cpk >1.67)	1	30	30	Cpk > 1.67	a) SZ324 : 1 Lot / 30 Units / Cpk >1.67
FG	E6	AEC-Q100-007	Fault Grading:	-	-	-	Fault Grade	100%
CHAR	E7	AEC-Q003	Characterization: (Test @ Rm/Hot/Cold)	-	-	-	Passed	Performed at Room, Hot and Cold
EMC	E9	SAE J1752/3	Electromagnetic Compatibility (Radiated Emissions)	-	-	-	-	N/A
SC	E10	AEC Q100-012	Short Circuit Characterization	-	-	-	-	N/A
SER	E11	JESD89-1 JESD89-2 JESD89-3	Soft Error Rate	1	3	3	Passed	Passed
LF	E12	AEC-Q005	Lead (Pb) Free: (see AEC-Q005)	1	66	66	0 of 66	Passed

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Lot/Pass/Fail	Comments: (N/A =Not Applicable)

TEST GROUP F – DEFECT SCREENING TESTS

PAT	F1	AEC-Q001	Process Average Testing: (see AEC-Q001)	All	All	All	Reject units outside Avg.	CYPRESS incorporates the principle of PAT methodology
SBA	F2	AEC-Q002	Statistical Bin/Yield Analysis: (see AEC-Q002)	All	All	All	Reject units outside criteria	CYPRESS incorporates the principle of SBA methodology

TEST GROUP G – CAVITY PACKAGE INTEGRITY TESTS (for Ceramic Package testing only)

MS	G1	JESD22 B104	Mechanical Shock: (Test @ Rm)	-	-	-	-	N/A
VFV	G2	JESD22 B103	Variable Frequency Vibration: (Test @ Rm)	-	-	-	-	N/A
CA	G3	MIL-STD-883 Method 2001	Constant Acceleration: (Test @ Rm)	-	-	-	-	N/A
GFL	G4	MIL-STD-883 Method 1014	Gross and Fine Leak:	-	-	-	-	N/A
DROP	G5	----------	Drop Test: (Test @ Rm) MEMS cavity parts only. Drop part on each of 6 axes once from a height of 1.2m onto a concrete surface.	-	-	-	-	N/A
LT	G6	MIL-STD-883 Method 2004	Lid Torque:	-	-	-	-	N/A
DS	G7	MIL-STD-883 Method 2019	Die Shear:	-	-	-	-	N/A
IWV	G8	MIL-STD-883 Method 1018	Internal Water Vapor:	-	-	-	-	N/A

Document History Page

Document Title: QTP#201304: AEC-Q100 AUTOMOTIVE QUALIFICATION TEST PLAN REPORT FOR CY62128ELL-55SXE/T, R95LD, Grade 1 -40 to 125C
Document Number: 002-30967

Rev.	ECN No.	Orig. of Change	Description of Change
**	6930930	HSTO	Initial Spec Release for Automotive CY62128 device, assembly site transfer at Greatek-Taiwan (IG) (QTP#201304)

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Cypress Semiconductor
Package Qualification Report

QTP# 201301 VERSION**
July 2020

28/32L SOJ (300 mils)

32/36/44L SOJ (400 mils)

Pure Sn Leadfinish

MSL3, 260°C Reflow

Greatek-Taiwan (IG)

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
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PACKAGE QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
201301	Qualification of SOJ Package Family at Greatek-Taiwan (IG)	July 2020

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MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	VZ44A
Package Outline, Type, or Name:	44L SOJ (400 mils)
Mold Compound Name/Manufacturer:	G700/Sumitomo
Mold Compound Flammability Rating:	V0 UL94
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Paddle
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw Process
Die Attach Supplier:	Hitachi
Die Attach Material:	EN-4900
Bond Diagram Designation	002-29827
Wire Bond Method:	Thermosonic
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	002-26450
Name/Location of Assembly (prime) facility:	Greatek-Taiwan (G)
MSL Level	3
Reflow Profile	260

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	JCET-JT, CML-R

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RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Ball Shear	JESD22-B116 Cpk : 1.33, Ppk : 1.66	P
Bond Pull	MIL-STD-883 – Method 2011, Cpk : 1.33, Ppk : 1.66	P
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Die Shear	MIL-STD-883, Method 2019	P
Dye Penetrant Test	Test to determine the existence and extent of cracks, Criteria: No Package Crack	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V, 1000V, 1250V JESD22-C101	P
Final Visual Inspection	JESD22-B101	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 5.5V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
High Accelerated Saturation Test (HAST) - Unbiased	JEDEC STD 22-A110: 130°C, 85%RH Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
High Temp Storage	JESD22-A103: 150°C, no bias	P
Internal Visual Inspection	MIL-STD-883-2014	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Pressure Cooker Test	JESD22-A102, 121°C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Solderability, Steam Aged	J-STD-002, JESD22-B102 95% solder coverage minimum	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
X-Ray	MIL-STD-883 - 2012	P

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Reliability Test Data

QTP #: 201301

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	22	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	22	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	22	0	
STRESS: BALL SHEAR								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	30	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	30	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	30	0	
STRESS: BOND PULL								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	30	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	30	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYSIS								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	5	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	5	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	5	0	
STRESS: DIE SHEAR								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	5	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	5	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	5	0	
STRESS: DYE PENETRANT TEST								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	15	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	15	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	500	9	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	1000	3	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	1250	3	0	

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Reliability Test Data

QTP #: 201301

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: FINAL VISUAL								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	1493	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	597	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	598	0	
STRESS: HI-ACCEL SATURATION TEST- UNBIASED (130C, 85%RH), PRE COND 192 HR 30C/60%RH (MSL3)								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	96	79	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	96	80	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	96	80	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.5V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	96	30	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	96	30	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	96	30	0	
STRESS: HIGH TEMP STORAGE								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	1000	77	0	
STRESS: INTERNAL VISUAL								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	5	0	
STRESS: PHYSICAL DIMENSION								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	10	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	10	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	10	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	168	79	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	168	80	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	168	80	0	
STRESS: SOLDERABILITY TEST								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	3	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	3	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	3	0	

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Reliability Test Data

QTP #: 201301

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: TC COND. C –65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	500	78	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	500	80	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	500	80	0	
STRESS: X-RAY								
CY7C1041G (7CP171041A)	VZ44	9923020	612010612	IG-Taiwan	COMP	15	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010613	IG-Taiwan	COMP	15	0	
CY7C1041G (7CP171041A)	VZ44	9923020	612010614	IG-Taiwan	COMP	15	0	

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Document History Page

Document Title: QTP# 201301: 28/32L SOJ (300 MILS), 32/36/44L SOJ (400 MILS) PURE SN LEADFINISH, MSL3, 260C REFLOW, GREATEK-TAIWAN (IG)
Document Number: 002-30923

Rev.	ECN No.	Orig. of Change	Description of Change
**	6923565	JYF	Initial release.

Marketing Part Number	Sample Order Part Number	Sample Availability
CY62128ELL-45SXA	CY62128ELL-45SXAKT	Available
CY62128ELL-45SXAT	CY62128ELL-45SXAKT	Available
CY62128ELL-45SXI	CY62128ELL-45SXIKT	Available
CY62128ELL-45SXIT	CY62128ELL-45SXIKT	Available
CY62128ELL-55SXE	CY62128ELL-55SXEKT	Subject to lead time
CY62128ELL-55SXET	CY62128ELL-55SXEKT	Subject to lead time
CY62128EV30LL-45SXA	CY62128EV30LL-45SXAKT	Subject to lead time
CY62128EV30LL-45SXAT	CY62128EV30LL-45SXAKT	Subject to lead time
CY62128EV30LL-45SXI	CY62128EV30LL-45SXIKT	Available
CY62128EV30LL-45SXIT	CY62128EV30LL-45SXIKT	Available
CY7C1009D-10VXI	CY7C1009D-10VXIKT	Available
CY7C1009D-10VXIT	CY7C1009D-10VXIKT	Available
CY7C1010DV33-10VXI	CY7C1010DV33-10VXIKT	Subject to lead time
CY7C1010DV33-10VXIT	CY7C1010DV33-10VXIKT	Subject to lead time
CY7C1018DV33-10VXI	CY7C1018DV33-10VXIKT	Available
CY7C1018DV33-10VXIT	CY7C1018DV33-10VXIKT	Available
CY7C1019D-10VXI	CY7C1019D-10VXIKT	Subject to lead time
CY7C1019D-10VXIT	CY7C1019D-10VXIKT	Subject to lead time
CY7C1019DV33-10VXI	CY7C1019DV33-10VXIKT	Subject to lead time
CY7C1019DV33-10VXIT	CY7C1019DV33-10VXIKT	Subject to lead time
CY7C1020D-10VXI	CY7C1020D-10VXIKT	Subject to lead time
CY7C1020D-10VXIT	CY7C1020D-10VXIKT	Subject to lead time
CY7C1021D-10VXI	CY7C1021D-10VXIKT	Available
CY7C1021D-10VXIT	CY7C1021D-10VXIKT	Available
CY7C1021DV33-10VXI	CY7C1021DV33-10VXIKT	Available
CY7C1021DV33-10VXIT	CY7C1021DV33-10VXIKT	Available
CY7C1041G-10VXI	CY7C1041G-10VXIKT	Available
CY7C1041G-10VXIT	CY7C1041G-10VXIKT	Available
CY7C1041G18-15VXI	CY7C1041G18-15VXIKT	Subject to lead time
CY7C1041G18-15VXIT	CY7C1041G18-15VXIKT	Subject to lead time
CY7C1041G30-10VXI	CY7C1041G30-10VXIKT	Subject to lead time
CY7C1041G30-10VXIT	CY7C1041G30-10VXIKT	Subject to lead time
CY7C1041GE-10VXI	CY7C1041GE-10VXIKT	Subject to lead time
CY7C1041GE-10VXIT	CY7C1041GE-10VXIKT	Subject to lead time
CY7C1041GE30-10VXI	CY7C1041GE30-10VXIKT	Subject to lead time
CY7C1041GE30-10VXIT	CY7C1041GE30-10VXIKT	Subject to lead time
CY7C1041GN-10VXI	CY7C1041GN-10VXIKT	Subject to lead time
CY7C1041GN-10VXIT	CY7C1041GN-10VXIKT	Subject to lead time
CY7C1041GN30-10VXI	CY7C1041GN30-10VXIKT	Subject to lead time
CY7C1041GN30-10VXIT	CY7C1041GN30-10VXIKT	Subject to lead time
CY7C1049G-10VXI	CY7C1049G-10VXIKT	Subject to lead time
CY7C1049G-10VXIT	CY7C1049G-10VXIKT	Subject to lead time
CY7C1049G30-10VXI	CY7C1049G30-10VXIKT	Subject to lead time
CY7C1049G30-10VXIT	CY7C1049G30-10VXIKT	Subject to lead time
CY7C1049GN-10VXI	CY7C1049GN-10VXIKT	Available
CY7C1049GN-10VXIT	CY7C1049GN-10VXIKT	Available

CY7C1049GN30-10VXI	CY7C1049GN30-10VXIKT	Available
CY7C1049GN30-10VXIT	CY7C1049GN30-10VXIKT	Available
CY7C109D-10VXI	CY7C109D-10VXIKT	Subject to lead time
CY7C109D-10VXIT	CY7C109D-10VXIKT	Subject to lead time
CY7C1399BN-12VXI	CY7C1399BN-12VXIKT	Subject to lead time
CY7C1399BN-12VXIT	CY7C1399BN-12VXIKT	Subject to lead time
CY7C199D-10VXI	CY7C199D-10VXIKT	Subject to lead time
CY7C199D-10VXIT	CY7C199D-10VXIKT	Subject to lead time
CY7C64713-56PVXC	CY7C64713-56PVXCKT	Subject to lead time
CY7C64713-56PVXCT	CY7C64713-56PVXCKT	Subject to lead time
CY7C68013A-56PVXC	CY7C68013A-56PVXCKT	Subject to lead time
CY7C68013A-56PVXCT	CY7C68013A-56PVXCKT	Subject to lead time
CY7C68013A-56PVXI	CY7C68013A-56PVXIKT	Available
CY7C68014A-56PVXC	CY7C68014A-56PVXCKT	Subject to lead time
CY7C68300C-56PVXC	CY7C68300C-56PVXCKT	Subject to lead time
CY7C68300C-56PVXCT	CY7C68300C-56PVXCKT	Subject to lead time
CY7S1041G30-10VXI	CY7S1041G30-10VXIKT	Subject to lead time
CY7S1041G30-10VXIT	CY7S1041G30-10VXIKT	Subject to lead time
CY7S1049G30-10VXI	CY7S1049G30-10VXIKT	Subject to lead time
CY7S1049G30-10VXIT	CY7S1049G30-10VXIKT	Subject to lead time
CY7S1049GE30-10VXI	CY7S1049GE30-10VXIKT	Subject to lead time
CY7S1049GE30-10VXIT	CY7S1049GE30-10VXIKT	Subject to lead time
CG8265AA	CG8265WA	Subject to lead time