

承 認 書

APPROVAL SHEET

客戶/廠商名稱

Customer/Vendor Name : 啟碁科技股份有限公司

適用機種

Model No : BYOC

送件日期

Date : 2020/3/3

凱銳料號

JET P/N : R415500901P

物料說明

Description : ANT,WNC,AUDI專用天線4,81XCBD15.G02 Black

版本

Ver. : 1.0

承 認 編 號	3W-RD-03-1003		
	核 准	審 核	擔 當
	陳 威 志	胡 聖 羣	陳 世 家

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APPROVAL SHEET

Customer Name: JET OPTOELECTRONICS CO., LTD.

Date: 02/13/2020

Doc. Version: 01

Customer P/N	R415500901P
Vendor P/N	81XCBD15.G02
Description	BYOC,WIFI ANTENNA,XCBD-JE1
Version	X02

Provided By Wistron NeWeb Corp	Reviewed By Wistron NeWeb Corp	Approved By Customer
Vincent Tseng	Vincent Tseng	

Wistron NeWeb Corporation
No. 20, Park Avenue II,
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Hsinchu 308, Taiwan, R.O.C.
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FAX: +886-3-666-7711
<http://www.wneweb.com>

啟碁科技股份有限公司

新竹市 308 科學園區園區二路 20 號

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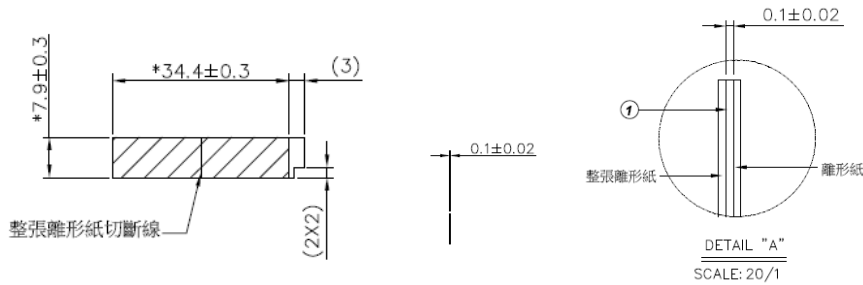


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1. Antenna Introduction

1.1 Antenna Features



Antenna Type: Dipole Antenna

Operation Frequency: WIFI 2.4GHz

Cable Length: 30±2 m

1.2 Antenna Outline

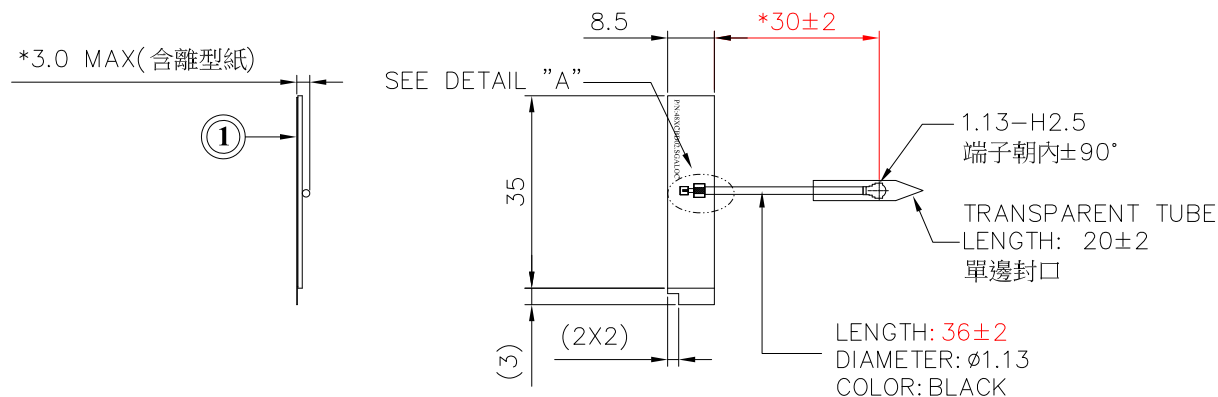
1

2

WNC CONFIDENTIAL

PART NUMBER BLOCK		CUSTOMER P/N BLOCK		CONFIRM ANTENNA SPEC.	
PART NUMBER	REV	PART NUMBER	REV	APPROVED	DATE
57XCBD15.002	B	R415500901P	X02	KEVIN KY KU	12/26/19

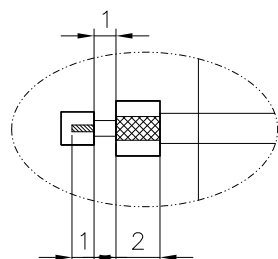
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	B	MODIFY PCB P/N	10/30/19	VINCENT CC LIN



NOTES: PCB ANTENNA SHOULD BE USED HEREUNDER.

⊗ 48XCBD02.SGBLOC
XCBD-JE1, PCB, 1L, 0.8MM, FR4(HF), ENIG, WIFI 2.4G, SAMPLE

" * " ARE THE CRITICAL DIMENSIONS.

DETAIL A
SCALE: 4/1

		UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN mm AND TOLERANCES ARE:				WNC 啟碁科技股份有限公司 Wistron NeWeb Corp. 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C. Tel: 886-3-6667799 Fax: 886-3-5788726		
		INTEGER DIMENSIONS ±0.2 1 PLACE DECIMAL ±0.1 2 PLACE DECIMALS ±0.05		ANGULAR DIMENSIONS ±1° HOLES UNDER Ø5.00 ±0.05				
		MATERIAL: NA						
		FINISH: NA				DWG TITLE BYOC(AUDI), ANTENNA 2, XCBD-JE1		
81XCBD15.G02	XCBD-JE1	THIRD ANGLE PROJECTION						
NEXT ASSY	USED ON		DRAWN	TERESA SF LIU	12/26/19	SIZE	DWG NO.	REV
APPLICATION			ENGR	KEVIN KY KU	12/26/19	A3	57XCBD15.002	B
			APVD	VINCENT CC LIN	12/26/19	SCALE	1/1	SHEET 1 OF 1

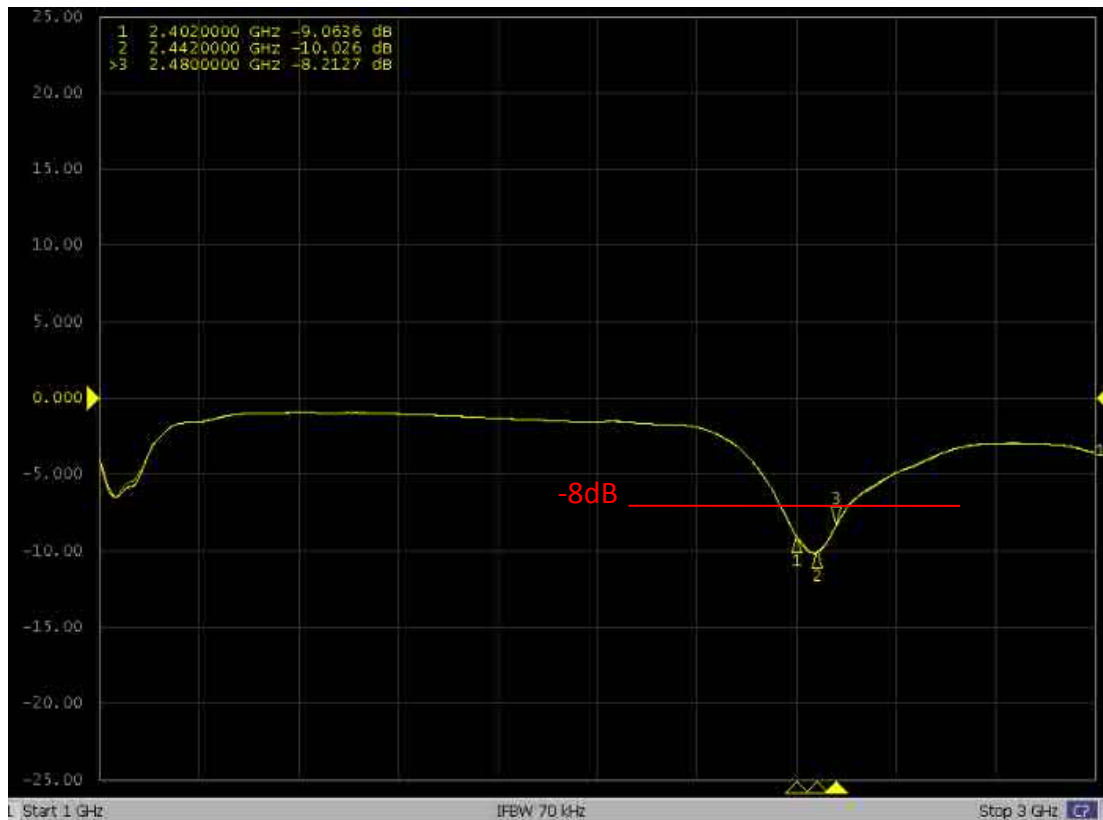
2. Antenna Specification

Item	Description
Frequency Range	2402MHz ~ 2480MHz
Peak Gain	1dBi
Return Loss	-8dB
Characteristics impedance	50 ohm

Note: Antenna gain includes the connector and cable loss

3. Antenna Performance

3.1 Return Loss



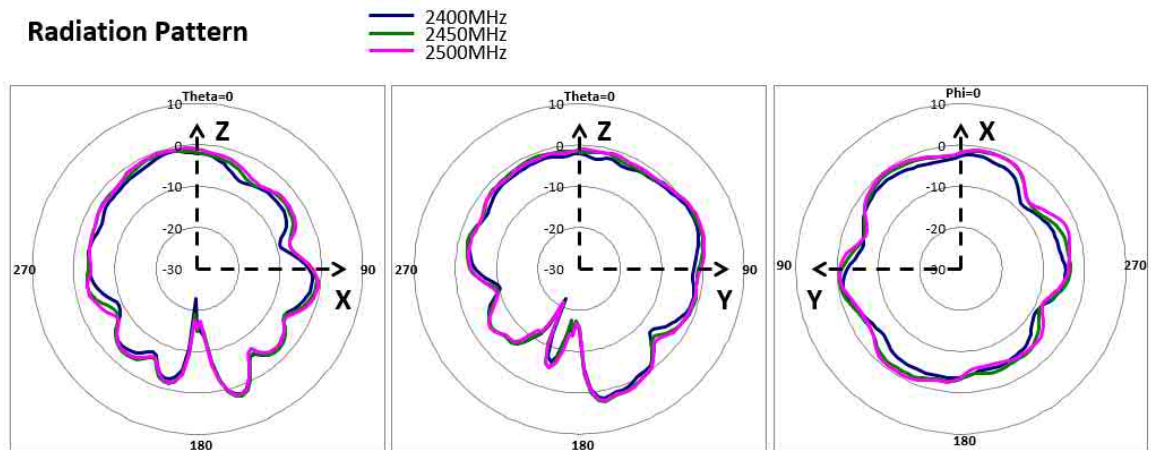
3.2 Antenna Gain and Efficiency

Test in BYOC case

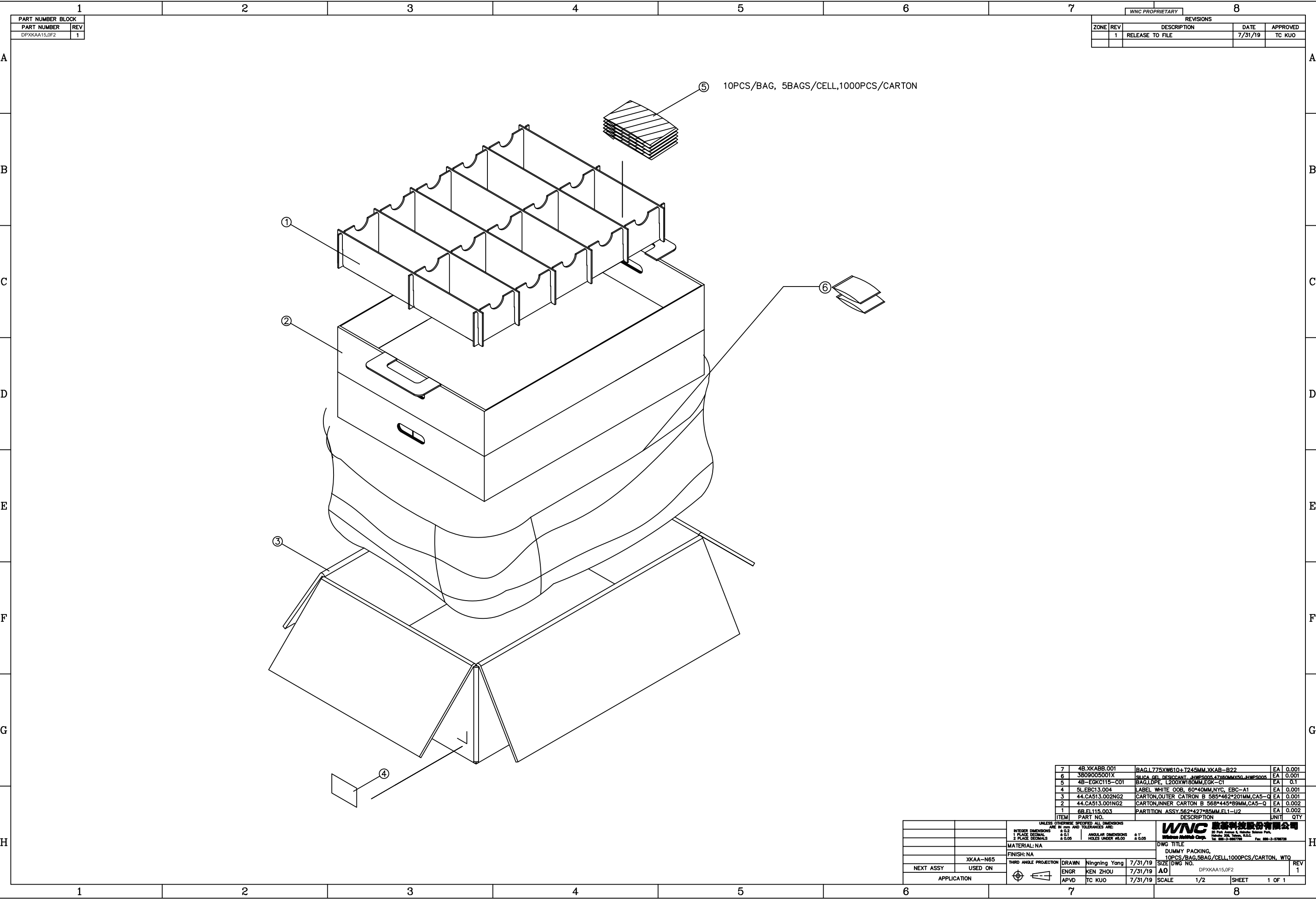
WIFI 2.4					
Frequency(MHz)	2400	2425	2450	2475	2500
Efficiency(%)	36%	37%	41%	37%	36%
Gain(dBi)	0.81	0.96	1.05	0.97	0.83

3.3 Antenna radiation pattern

Test in BYOC case



4. Package



1		2		3		4		5		6		7		8	
PART NUMBER BLOCK														WNC PROPRIETARY	
PART NUMBER		REV												REVISIONS	
DPXKAA15,0F2		1												ZONE REV DESCRIPTION DATE APPROVED	
														1 RELEASE TO FILE 7/31/19 TC KUO	

7	4B.XKAB8.001	BAG,L 775XW610+T245MM.XKAB-B22	EA	0.001
6	3809005001X	SILICA GEL DESICCANT .HWPS005.47X60MMX5G.HWPS005	EA	0.001
5	4B-EGKC115-C01	BAG,LDPE, L200XW180MM,EGK-C1	EA	0.1
4	5L.EBC13.004	LABEL WHITE OOB, 60*40MM,NYC, EBC-A1	EA	0.001
3	44.CA513.002NG2	CARTON,OUTER CATRON B 585*462*201MM,CA5-Q	EA	0.001
2	44.CA513.001NG2	CARTON,INNER CARTON B 585*445*89MM,CA5-Q	EA	0.002
1	6B.EL115.003	PARTITION ASSY,582*427*85MM,EL1-U2	EA	0.002
ITEM	PART NO.	DESCRIPTION	UNIT	QTY

		UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN mm AND TOLERANCES ARE:				WNC Wingene Hardware Corp.		20 Park Avenue & Mainland Science Park, Hsinchu, Hsinchu, Taiwan, R.O.C. Tel: 035-3-057739 Fax: 035-3-057729	
		INTEGER DIMENSIONS 1 PLACE DECIMAL 2 PLACE DECIMALS		± 0.2 ± 0.1 ± 0.05		ANGULAR DIMENSIONS HOLES UNDER #5.00		± 1° ± 0.5° ± 0.05	
		MATERIAL: NA							
		FINISH: NA							
		THIRD ANGLE PROJECTION							
		DRAWN		Ningning Yang		7/31/19			
		ENGR		KEN ZHOU		7/31/19			
		APVD		TC KUO		7/31/19			
		APPLICATION							

Material Data Sheet

English Form is better

Supplier company: **Wistron NeWeb Corporation**
 Contact phone No: **03-666-7799**
 Supplier part No: **81XCBD15.G02**
 part No: **R415500901P**

Total package weight: **0.544012**

No.	Name of the part	Material name	Component weight(gram)100% in total product	Materials analysis(element)	CAS number	Element Mass(gram)	Element Mass (% Weight)
1	SOLDER WIRE	SOLDER WIRE	5.26%	Tin	7440-31-5	0.0283998	99.30%
				Copper	7440-50-8	0.0002002	0.70%
2	DOUBLE SIDE TAPE	Acrylic glue	2.06%	2-Propenoic acid, polymer with butyl 2-propenoate and ethenyl acetate	25085-41-0	0.01122	100.00%
		Tissue paper	3.67%	Paper	-	0.019965	100.00%
		Release paper	0.33%	Polyethylene	9002-88-4	0.001815	100.00%
3	TUBE, TRANSPARENT CB-1	EVA	14.13%	Ethylene-vinyl acetate copolymer	24937-78-8	0.076868	100.00%
4	INTERNAL CONNECTOR	Housing	1.12%	Poly(oxy-1,4-butanediyl oxycarbonyl-1,4-phenylenecarbonyl)	24968-12-5	0.0036295	59.50%
				Glassfiber	-	0.00061	10.00%
				Carbon black	1333-86-4	0.0000305	0.50%
				Phosphorus Flame retardant and others	confidential	0.00183	30.00%
		CONTACT/C5210R	2.40%	Lead	7439-92-1	0.0000003	0.00%
				Copper	7440-50-8	0.0120307	92.13%
				Tin	7440-31-5	0.0010107	7.74%
				Phosphorus	7723-14-0	0.0000144	0.11%
				Iron	7439-89-6	0.0000003	0.00%
				Zinc	7440-66-6	0.0000013	0.01%
		CONTACT-Plating Au	0.02%	Gold	7440-57-5	0.0000882	100.00%
		CONTACT-Plating Ni	0.12%	Nickel	7440-02-0	0.0006541	100.00%
		GROUND CONTACT/C5191R	7.02%	Lead	7439-92-1	0.0000004	0.00%
				Copper	7440-50-8	0.0359754	94.14%
				Tin	7440-31-5	0.0021973	5.75%
				Zinc	7440-66-6	0.0000015	0.00%
				Phosphorus	7723-14-0	0.0000382	0.10%
				Iron	7439-89-6	0.0000008	0.00%
		CONTACT-Plating Au	0.01%	Gold	7440-57-5	0.0000809	100.00%
		CONTACT-Plating Ni	0.15%	Nickel	7440-02-0	0.0008055	100.00%
5	CABLE	SILVER-COATED COPPER WIRE	1.88%	Copper	7440-50-8	0.0091872	90.00%
				Silver	7440-22-4	0.0010208	10.00%
		FEP/NP-3180	4.45%	1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with tetrafluoroethene	25067-11-2	0.024224	100.00%
		TINNED COPPER WIRE	7.05%	Copper	7440-50-8	0.037950723	99.00%
				Tin	7440-31-5	0.00038336	1.00%
				Antimony	7440-36-0	1.9168E-07	0.00%
				Arsenic	7440-38-2	1.9168E-07	0.00%
				Iron	7439-89-6	1.9168E-07	0.00%
				Nickel	7440-02-0	1.9168E-07	0.00%
				Sulphur	7704-34-9	3.8336E-07	0.00%
				Silver	7440-22-4	7.6672E-07	0.00%
		FEP/NP-101	4.04%	1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with tetrafluoroethene	25067-11-2	0.021984	100.00%
		FEP Colormasterbatch	0.33%	1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with tetrafluoroethene	25067-11-2	0.001568	87.50%
				various heavy metal free organic and inorganic pigments, undangeroussubs	confidential	0.000224	12.50%
6	PCB	Copper	11.49%	Copper	7440-50-8	0.0625	100.00%
		plank	32.17%	Glass, oxide, chemicals	65997-17-3	0.0525	30.00%
				Copper	7440-50-8	0.02625	15.00%
				Epoxy Resin	-	0.09625	55.00%
		Surface treatment	0.46%	Citric acid	77-92-9	0.0025	100.00%
		Solder resist ink	1.38%	Novolac epoxy	61788-97-4	0.0004	9.60%
				O-cresol novolac epoxy	29690-82-2	0.003	35.20%
				Acrylic ester	29570-58-9	0.0015	16.40%
				Barium sulfate	7727-43-7	0.0016	18.40%
				Defoaming	63148-62-9	0.0002	4.20%
				Fumed silica	60676-86-0	0.0002	4.20%
				Pigment	1308-38-9	0.0001	1.00%
				High boiling point solvent	95481-62-2	0.0005	11.00%
		Text ink	0.46%	EPOXY RESIN	29690-82-2	0.00145	58.00%
				FILLING	7727-43-7	0.00075	30.00%
				THINNER	111-76-2	0.0003	12.00%

Note: Component derived from MSDS and material C of C from vendors;
 Composition weight based on assembly of generic parts.

Test Report

No. SHAEC1910973101

Date: 31 May 2019

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MAX JOY INTERNATIONAL INDUSTRIAL LIMITED

UNIT B ,23/F.,PHASE 1,KINGSFORD INDUSTRIAL BUILDING, 26-32 KWAI HEI STREET,KWAI

The following sample(s) was/were submitted and identified on behalf of the clients as : HALOGEN FREE SOLDER WIRE

SGS Job No. : SP19-017009 - SH

Model No. : FY-SnCu0.7

Material No. : SnCu0.7

Date of Sample Received : 27 May 2019

Testing Period : 27 May 2019 - 31 May 2019

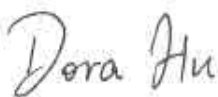
Test Requested : Selected test(s) as requested by client.

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.



Dora Hu
Approved Signatory



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Test Report

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Date: 31 May 2019

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-109731.001	Silvery metal wire

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	77
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm ²	0.10	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND



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Test Item(s)	Limit	Unit	MDL	001
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) ▽ = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm².
The sample coating is considered to contain CrVI
b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI 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
Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

Halogen

Test Method : With reference to EN 14582: 2016 , analysis was performed by IC.

Test Item(s)	Unit	MDL	001
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	122
Iodine (I)	mg/kg	50	ND



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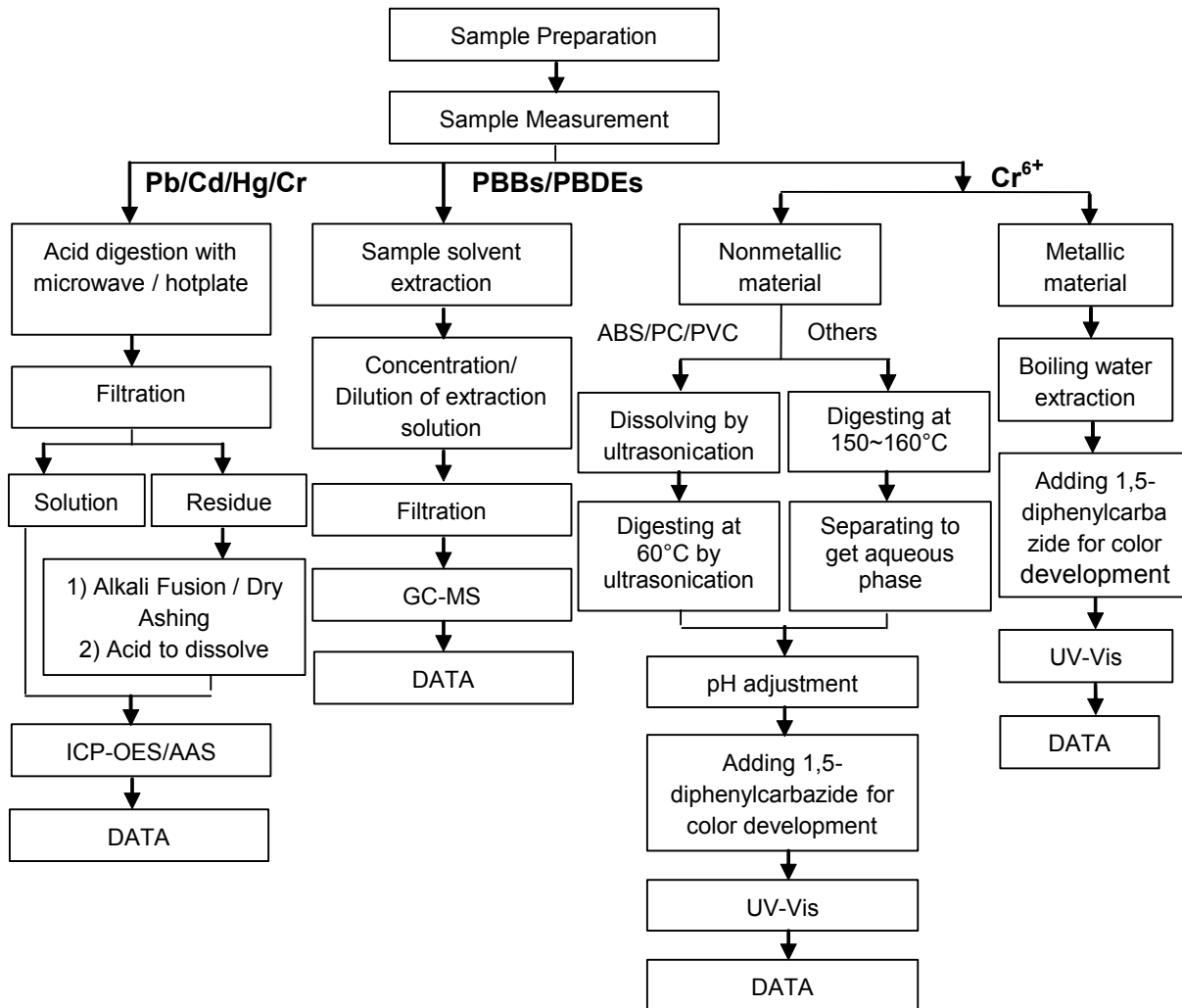
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ATTACHMENTS

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



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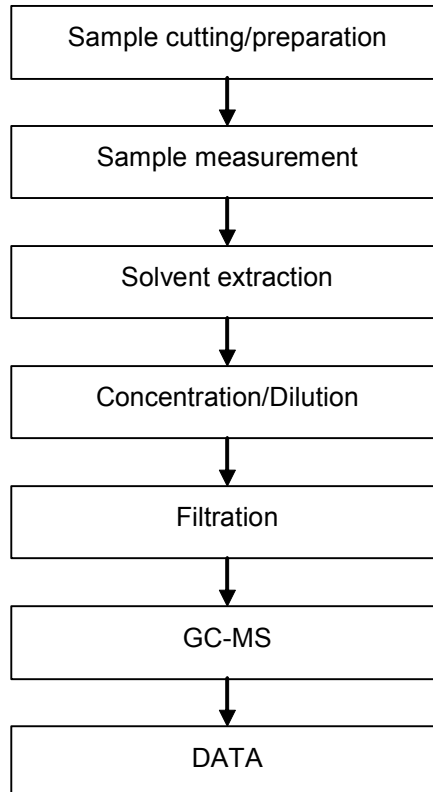
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Phthalates Testing Flow Chart



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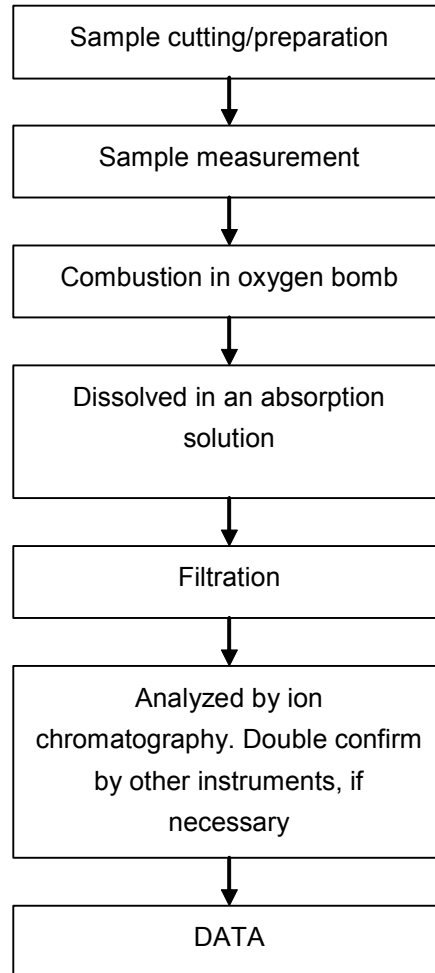
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Halogen Testing (oxygen bomb) Flow Chart



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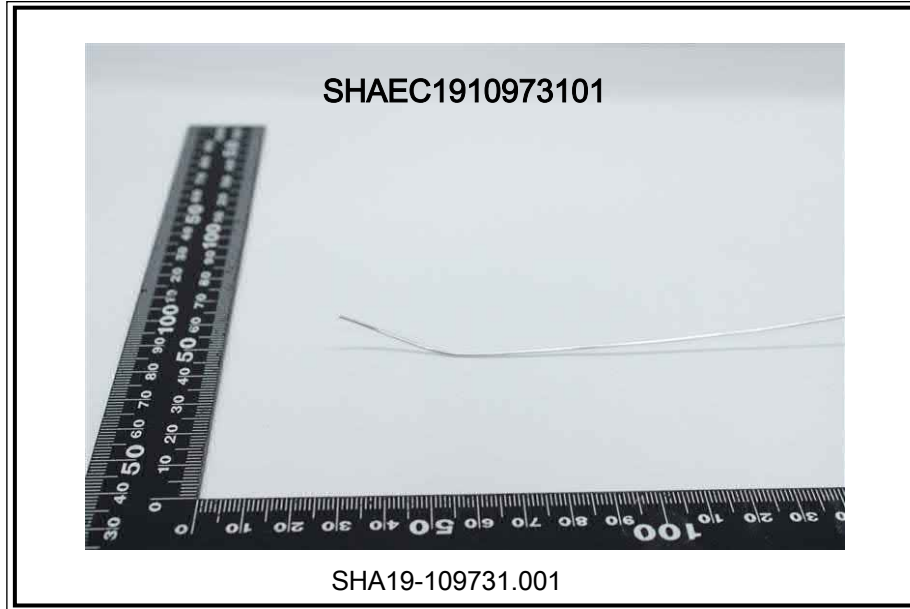
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No. SHAEC1910973101

Date: 31 May 2019

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Sample photo:



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測試報告

Test Report

號碼(No.) : CE/2019/C2858 日期(Date) : 2019/12/24

頁數(Page) : 1 of 9

王佳實業股份有限公司

SEAL KING IND. CO., LTD.

桃園市楊梅區豐野里富聯路221巷3號

NO. 3, LN. 221, FULIAN RD., YANGMEI DISTRICT, TAOYUAN CITY 326, TAIWAN (R. O. C.)

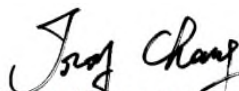
以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as):

送樣廠商(Sample Submitted By) : 王佳實業股份有限公司 (SEAL KING IND. CO., LTD.)
 樣品名稱(Sample Description) : DOUBLE SIDE TAPE (雙面膠帶)
 樣品型號(Style/Item No.) : DT-1XX (B、W、-P)、DT-2XX、DT-3XX、DT-4XX、DT-5XX、DT-6XX、DT-8XX、DT-9XX、DT-XXX系列
 收件日期(Sample Receiving Date) : 2019/12/17
 測試期間(Testing Period) : 2019/12/17 to 2019/12/24

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) 依據客戶指定, 進行鹵素-氟、氯、溴、碘測試. (As specified by client, to test Halogen-Fluorine, Chlorine, Bromine, Iodine contents in the submitted sample(s).)

測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages).


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



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號碼(No.) : CE/2019/C2858 日期(Date) : 2019/12/24

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測試結果(Test Results)

測試部位(PART NAME)No. 1 : 半透明雙面膠 (不含離型紙) (TRANSLUCENT DOUBLE SIDE ADHESIVE TAPE (EXCLUDING THE RELEASE PAPER))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)
				No. 1
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.
鉛 / Lead (Pb)	mg/kg		2	n. d.
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.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考 IEC 62321-7-2 (2017), 以UV-VIS 檢測. / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.	8	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.
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.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)
				No. 1
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.
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.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No. : 84-74-2)	mg/kg		50	n. d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No. : 84-69-5)	mg/kg		50	n. d.
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.
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 儀分析. / 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.

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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)

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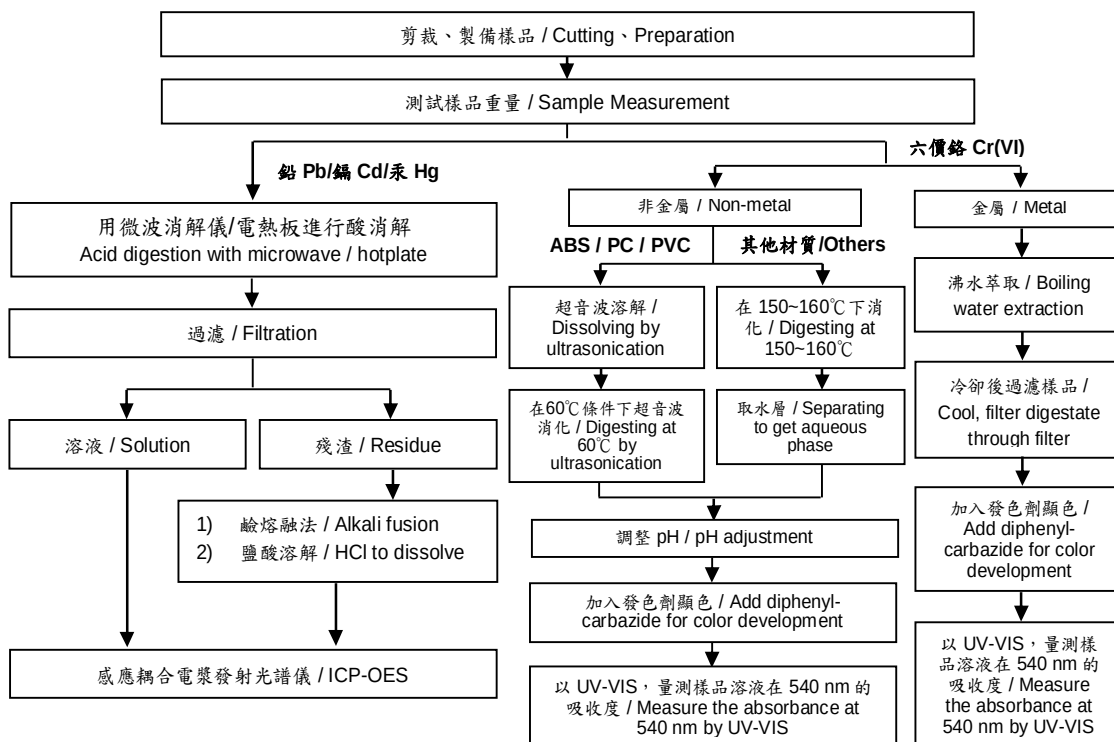
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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. (Cr⁶⁺ test method excluded)

- 測試人員：陳思臻 / Technician : Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang



測試報告

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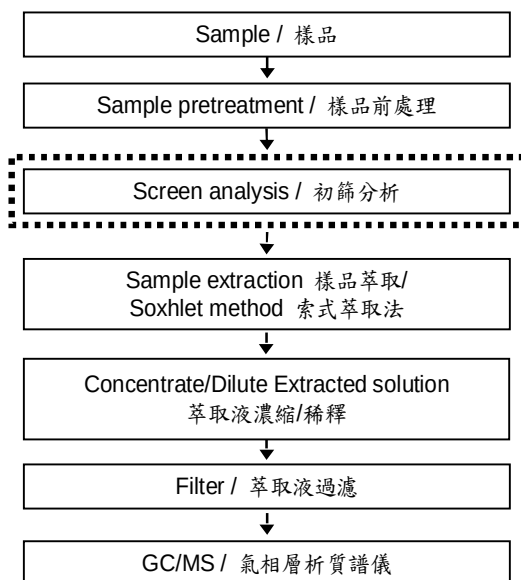
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process —————→
 選擇性篩檢程序 / Optional screen process
 確認程序 / Confirmation process - - - ->



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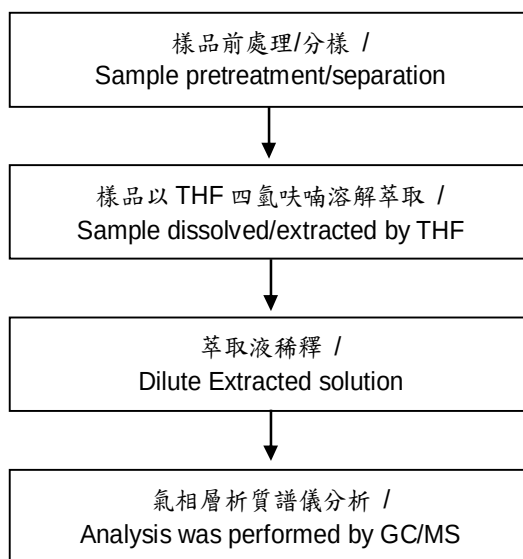
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

【測試方法/Test method: IEC 62321-8】



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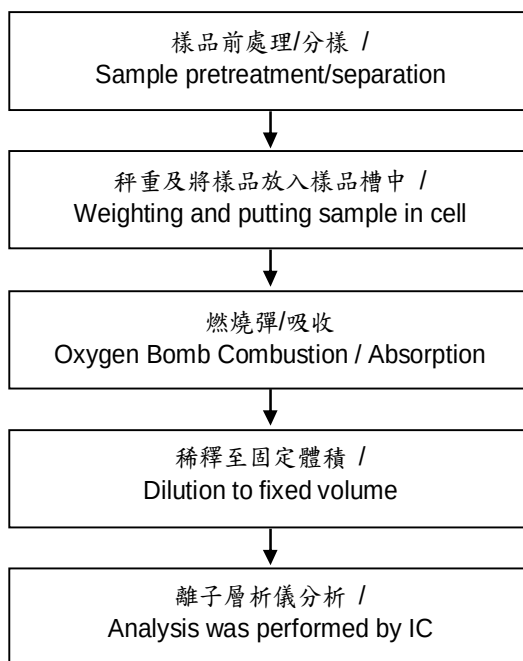
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鹵素分析流程圖 / Analytical flow chart - Halogen

- 測試人員：陳恩臻 / Technician: Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang



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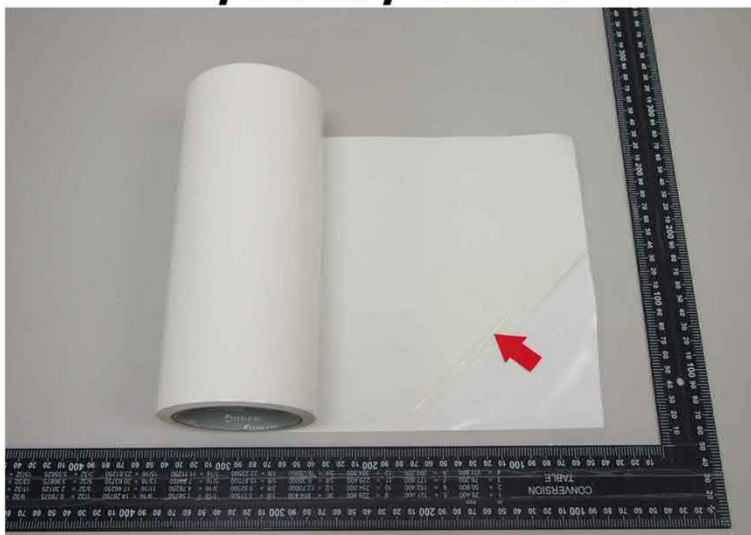
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* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2019/C2858



** 報告結尾 (End of Report) **

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Test Report

No. SHAEC1924737210

Date: 14 Nov 2019

Page 1 of 8

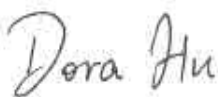
SHANGHAI CHANGYUAN ELECTRONIC MATERIAL CO., LTD.

NO.1690# , JIAHAO ROAD , JIADING , SHANGHAI

The following sample(s) was/were submitted and identified on behalf of the clients as : Heat-shrinkable Tubing

SGS Job No. : SP19-037002 - SH
 Part No. (P/N) : CB-101(Transparent)
 Main Substance : EVA
 Date of Sample Received : 08 Nov 2019
 Testing Period : 08 Nov 2019 - 14 Nov 2019
 Test Requested : Selected test(s) as requested by client.
 Test Method : Please refer to next page(s).
 Test Results : Please refer to next page(s).
 Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
 SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.



Dora Hu
 Approved Signatory



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Test Report

No. SHAEC1924737210

Date: 14 Nov 2019

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-247372.008	Transparent soft solid

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	008
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND



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Test Item(s)	Limit	Unit	MDL	008
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863. IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (3) The restriction of DEHP, BBP, DBP and DIBP shall not apply to toys which are already subject to the restriction of DEHP, BBP, DBP and DIBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Phthalates Content

Test Method : With reference to EN 14372:2004, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	008
Diisononyl Phthalate (DINP)	28553-12-0 /68515-48-0	%	0.01	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 /68515-49-1	%	0.01	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%	0.003	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%	0.003	ND



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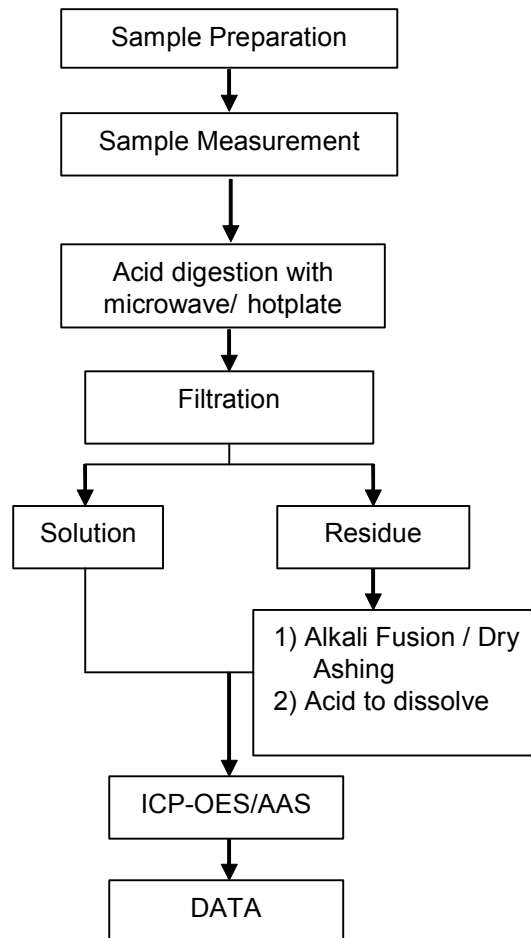
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Elements (IEC62321) Testing Flow Chart

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



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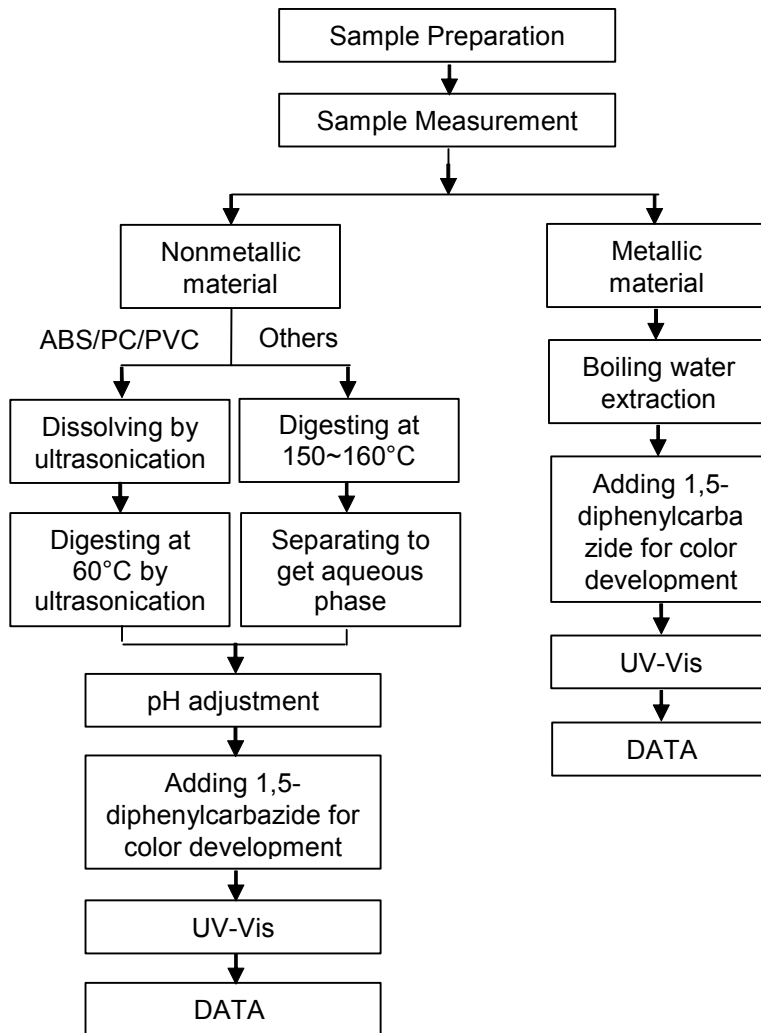
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart



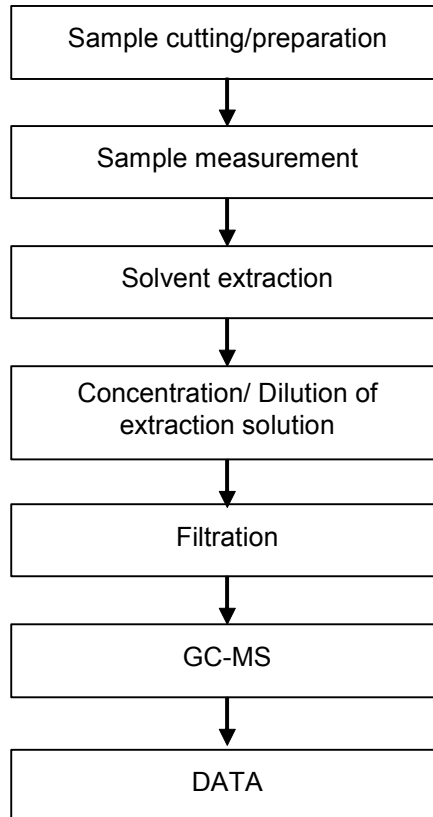
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PBBs/PBDEs Testing Flow Chart



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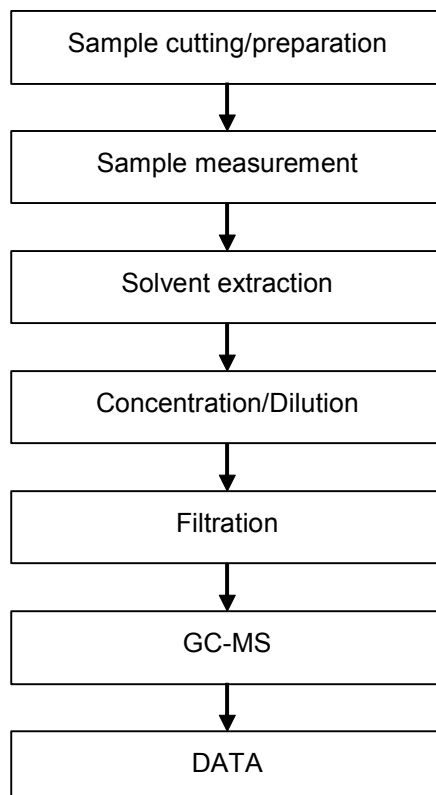
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Phthalates Testing Flow Chart



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Sample photo:



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Test Report

No. SHAEC1926829610

Date: 06 Dec 2019

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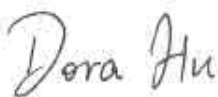
SHANGHAI CHANGYUAN ELECTRONIC MATERIAL CO., LTD.

NO.1690# , JIAHAO ROAD , JIADING , SHANGHAI

The following sample(s) was/were submitted and identified on behalf of the clients as : Heat-shrinkable Tubing

SGS Job No. : SP19-038761 - SH
 Part No. (P/N) : CB-101(Transparent)
 Main Substance : EVA
 Date of Sample Received : 03 Dec 2019
 Testing Period : 03 Dec 2019 - 06 Dec 2019
 Test Requested : Selected test(s) as requested by client.
 Test Method : Please refer to next page(s).
 Test Results : Please refer to next page(s).

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Test Report

No. SHAEC1926829610

Date: 06 Dec 2019

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-268296.010	Transparent soft solid

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

Halogen

Test Method : With reference to EN 14582: 2016 , analysis was performed by IC.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>010</u>
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND



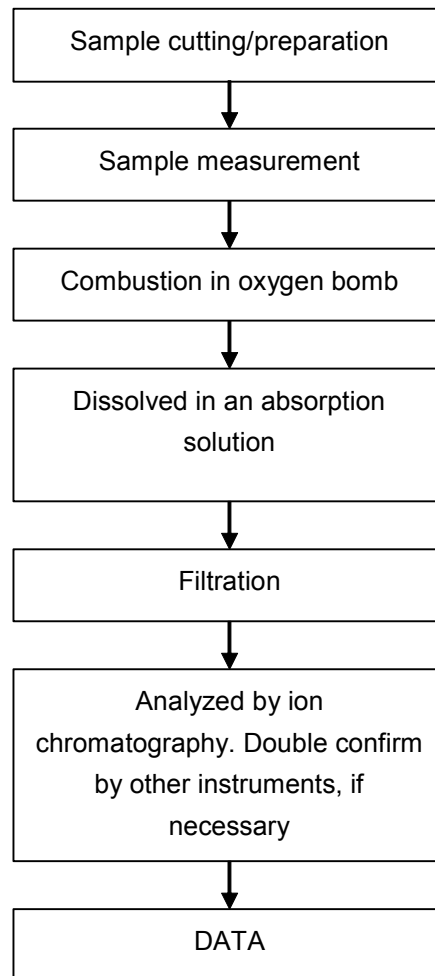
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Halogen Testing (oxygen bomb) Flow Chart



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No. SHAEC1926829610

Date: 06 Dec 2019

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Sample photo:



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中国·上海·徐汇区宜山路889号3号楼 邮编: 200233

TEL (86-21) 61402594 TEL (86-21) 61156899

e.sgs.china@sgs.com

Test Report

No. : KA/2019/50554

Date : 2019/05/17

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POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

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

Sample Submitted By : POLYPLASTICS TAIWAN CO., LTD.
 Sample Description : PBT
 Style/Item No. : 310NF ED3002 / Lot No.8375870
 Color : ED3002
 Sample Receiving Date : 2019/05/10
 Testing Period : 2019/05/10 to 2019/05/17

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.
- (2) Please refer to next page(s).

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

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



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No. : KA/2019/50554

Date : 2019/05/17

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POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Test Result(s)

PART NAME No.1 : ED3002 PBT

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)	mg/kg	With reference to IEC 62321-7-2:2017 and performed by UV-VIS.	8	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.
Monobromobiphenyl			5	n.d.
Dibromobiphenyl			5	n.d.
Tribromobiphenyl			5	n.d.
Tetrabromobiphenyl			5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl			5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl			5	n.d.
Sum of PBDEs	mg/kg	With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			5	n.d.
Pentabromodiphenyl ether			5	n.d.
Hexabromodiphenyl ether			5	n.d.
Heptabromodiphenyl ether			5	n.d.
Octabromodiphenyl ether			5	n.d.
Nonabromodiphenyl ether			5	n.d.
Decabromodiphenyl ether			5	n.d.

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POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Test Item(s)	Unit	Method	MDL	Result
				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.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)			50	n.d.
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)			50	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)			50	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	730
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)			50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)			50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.

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POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Note :

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

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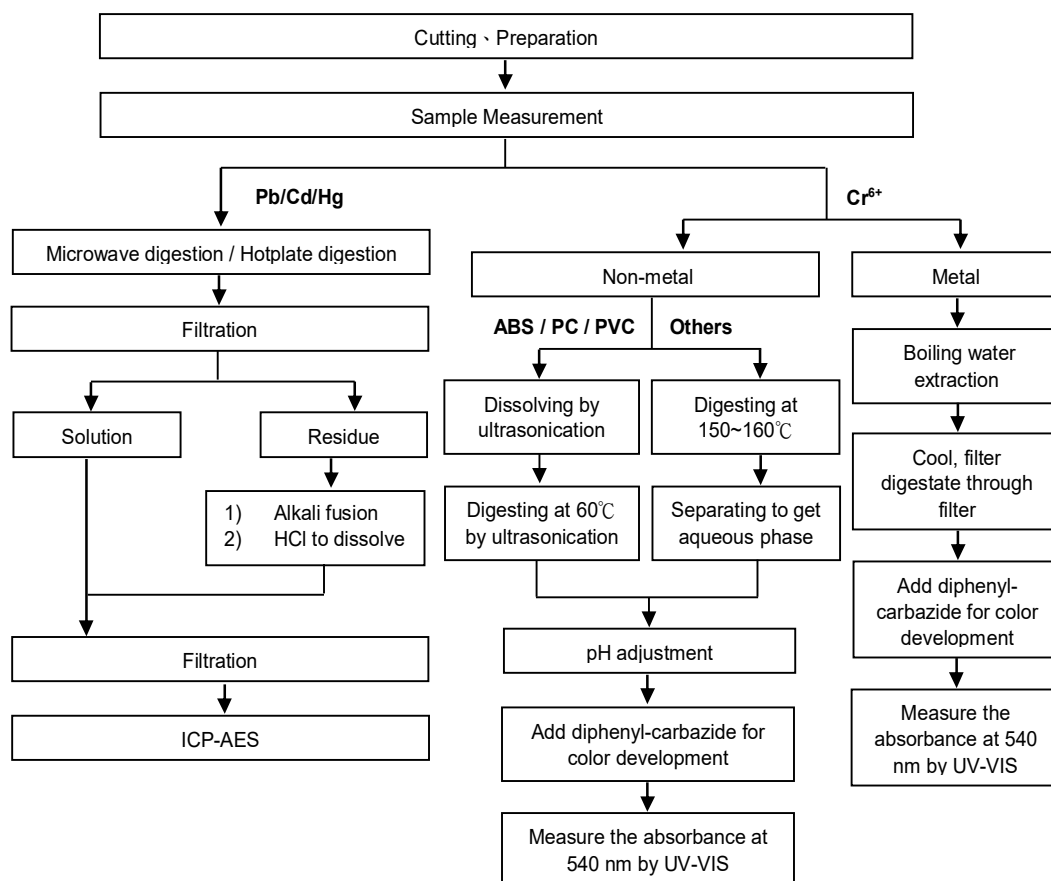
POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)

- Technician : Jony Liu
- Supervisor: Ray Chang



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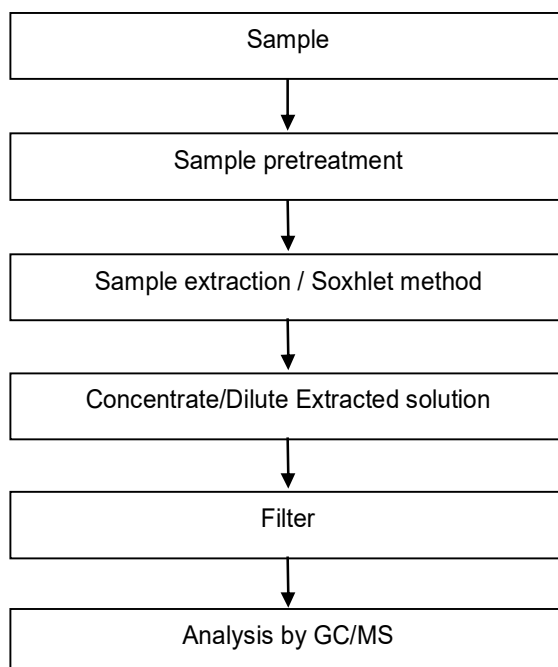
Page : 6 of 9

POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

PBB/PBDE analytical FLOW CHART

- Technician : Dorothy Chen
- Supervisor: Ray Chang



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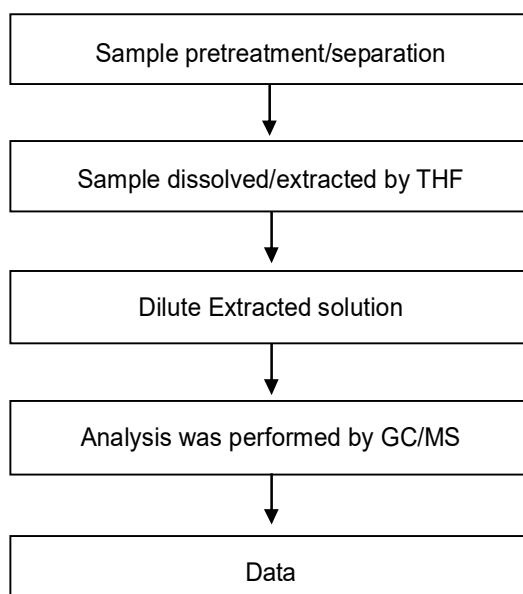
POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Analytical flow chart of phthalate content

- Technician: Dorothy Chen
- Supervisor: Ray Chang

【Test method: IEC 62321-8】



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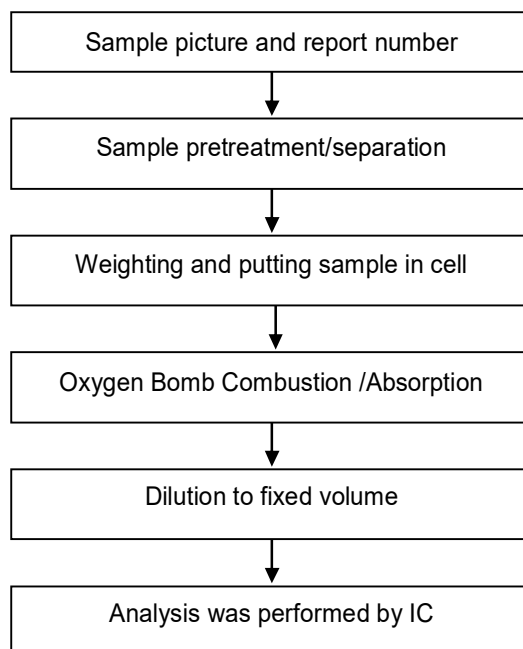
Page : 8 of 9

POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Analytical flow chart of halogen content

- Technician : Jean Hung
- Supervisor: Ray Chang



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POLYPLASTICS TAIWAN CO., LTD.

NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

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

KA/2019/50554



** End of Report **

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Test Report

No: 10479959(1)

Date: 17-Sep-19

Page 1 of 5

Singapore Dai-ichi Pte Ltd
55 Yishun Industrial Park A Singapore 768728

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

Sample Name : C line Au 1-1

Sample Receiving Date : 05-Sep-19
Testing Period : 05-Sep-19 to 17-Sep-19

Test Requested : In accordance with the RoHS Directive 2011/65/EU Annex II.

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

Conclusion : Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2011/65/EU Annex II ; recasting 2002/95/EC.

Signed for and on behalf of
SGS Testing & Control Services Singapore Pte Ltd



Y.C. Tham
Laboratory Manager



Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Test Report

No: 10479959(1)

Date: 17-Sep-19

Page 2 of 5

Test Result(s):

Sample Description : Gold colored flakes

Test Item(s):	Unit	Method	Results	MDL	RoHS Limit
Cadmium(Cd)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	n.d.	2	100
Lead (Pb)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	5.3	2	1000
Mercury (Hg)	mg/kg	With reference to IEC62321-4 :2013 +A1:2017. Analysis was performed by ICP/AES	n.d.	2	1000
Hexavalent Chromium (Cr(VI)) #	µg/cm2	With reference to IEC62321-7-1 :2015. Analysis was performed by UV-Vis Spectrometry.	n.d.	0.1	-

Note:

- (1) mg/kg = ppm ; 0.1wt% = 1000ppm
- (2) n.d.= Not Detected
- (3) MDL = Method Detection Limit
- (4) "-" = Not regulated
- (5) * : Exceeds limit
- (6) # = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13µg/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 0.10µg/cm2. The coating is considered a non-Cr(VI) based coating
c. The result between 0.10µg/cm2 and 0.13µg/cm2 is considered to be inconclusive - unavoidable coating variations may influence the determination

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing represent status of the sample at the time of testing.

Remarks: Sample received was totally dissolved by preconditioning methods.

Lab Analyst(s): AQ and Pheng

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Sample photo:

Sample Description : Gold colored flakes

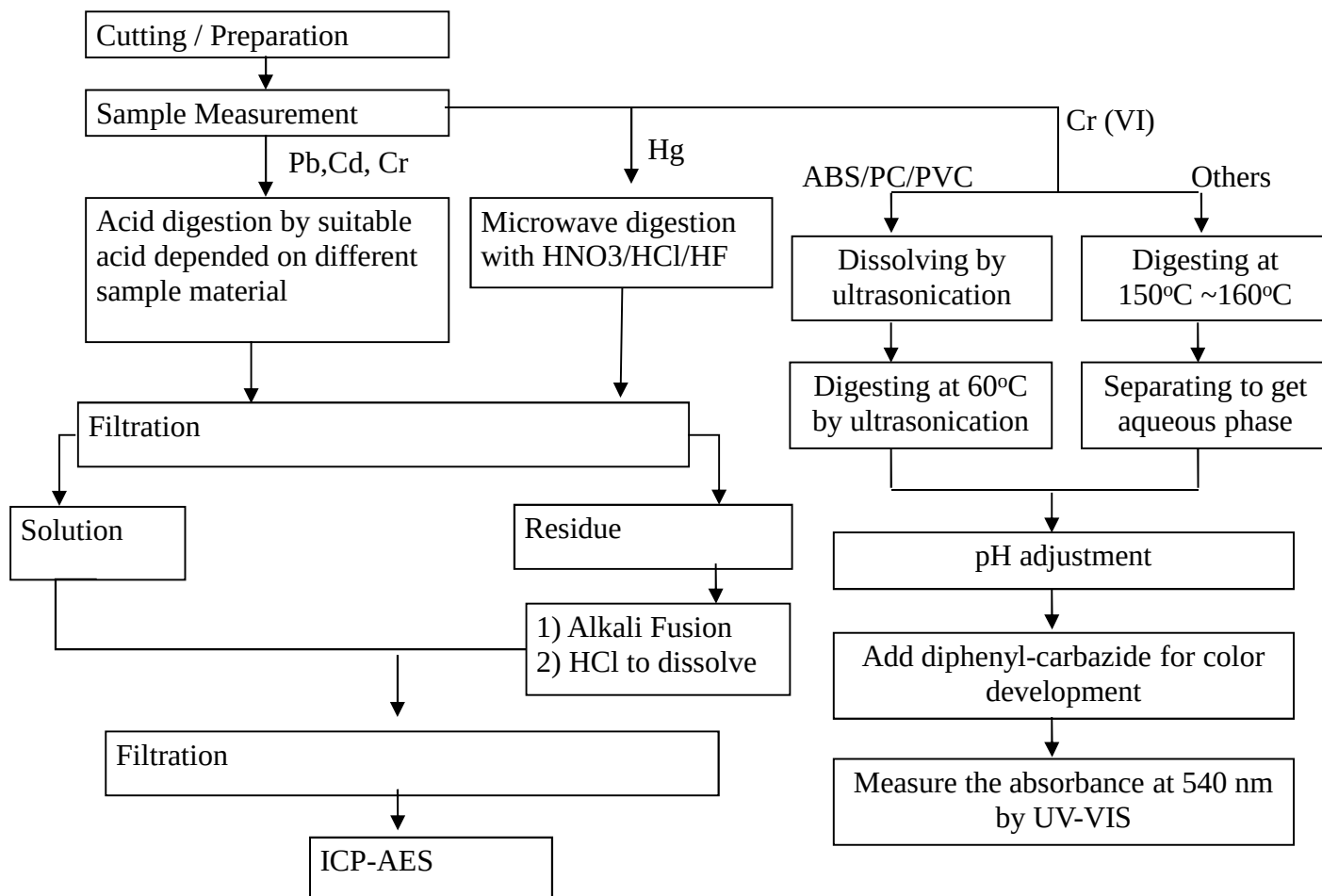
SGS authenticate the photo on original report only



Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Process Flow of IEC 62321 (Pb, Cd, Hg, Cr & Cr(VI))

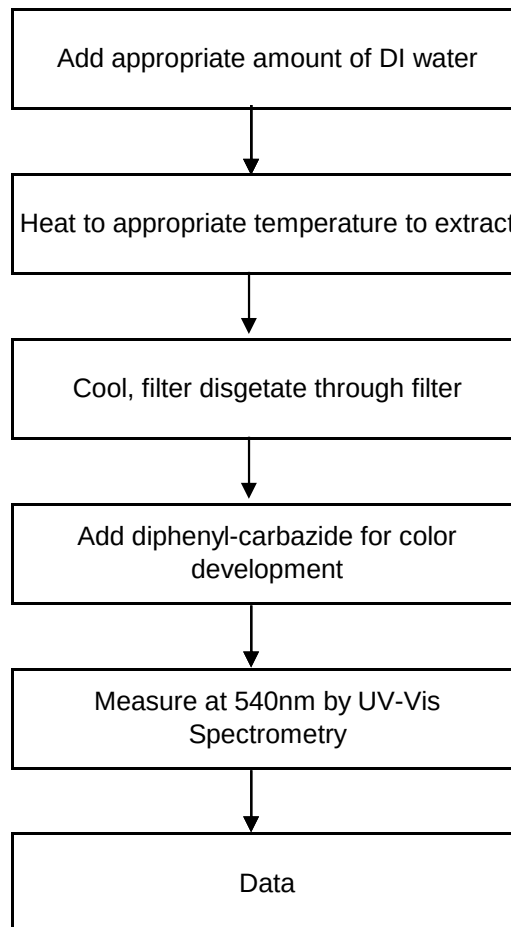


Remarks: Sample received was totally dissolved by preconditioning method. (CrVI method excluded)

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Process Flow of Cr(VI) by Boiling Water Extraction (IEC62321)



End of Report

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Test Report

No: 10479959(8)

Date: 17-Sep-19

Page 1 of 5

Singapore Dai-ichi Pte Ltd
55 Yishun Industrial Park A Singapore 768728

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

Sample Name : C line Ni

Sample Receiving Date : 05-Sep-19
Testing Period : 05-Sep-19 to 17-Sep-19

Test Requested : In accordance with the RoHS Directive 2011/65/EU Annex II.

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

Conclusion : Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2011/65/EU Annex II ; recasting 2002/95/EC.

Signed for and on behalf of
SGS Testing & Control Services Singapore Pte Ltd



Y.C. Tham
Laboratory Manager



Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Test Report

No: 10479959(8)

Date: 17-Sep-19

Page 2 of 5

Test Result(s):

Sample Description : Silver colored flakes

Test Item(s):	Unit	Method	Results	MDL	RoHS Limit
Cadmium(Cd)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	n.d.	2	100
Lead (Pb)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	n.d.	2	1000
Mercury (Hg)	mg/kg	With reference to IEC62321-4 :2013 +A1:2017. Analysis was performed by ICP/AES	n.d.	2	1000
Hexavalent Chromium (Cr(VI)) #	µg/cm2	With reference to IEC62321-7-1 :2015. Analysis was performed by UV-Vis Spectrometry.	n.d.	0.1	-

Note:

- (1) mg/kg = ppm ; 0.1wt% = 1000ppm
- (2) n.d.= Not Detected
- (3) MDL = Method Detection Limit
- (4) “-“ = Not regulated
- (5) * : Exceeds limit
- (6) # = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13µg/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 0.10µg/cm2. The coating is considered a non-Cr(VI) based coating
c. The result between 0.10µg/cm2 and 0.13µg/cm2 is considered to be inconclusive - unavoidable coating variations may influence the determination

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing represent status of the sample at the time of testing.

Remarks: Sample received was totally dissolved by preconditioning methods.

Lab Analyst(s): AQ and Pheng

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Sample photo:

Sample Description : Silver colored flakes

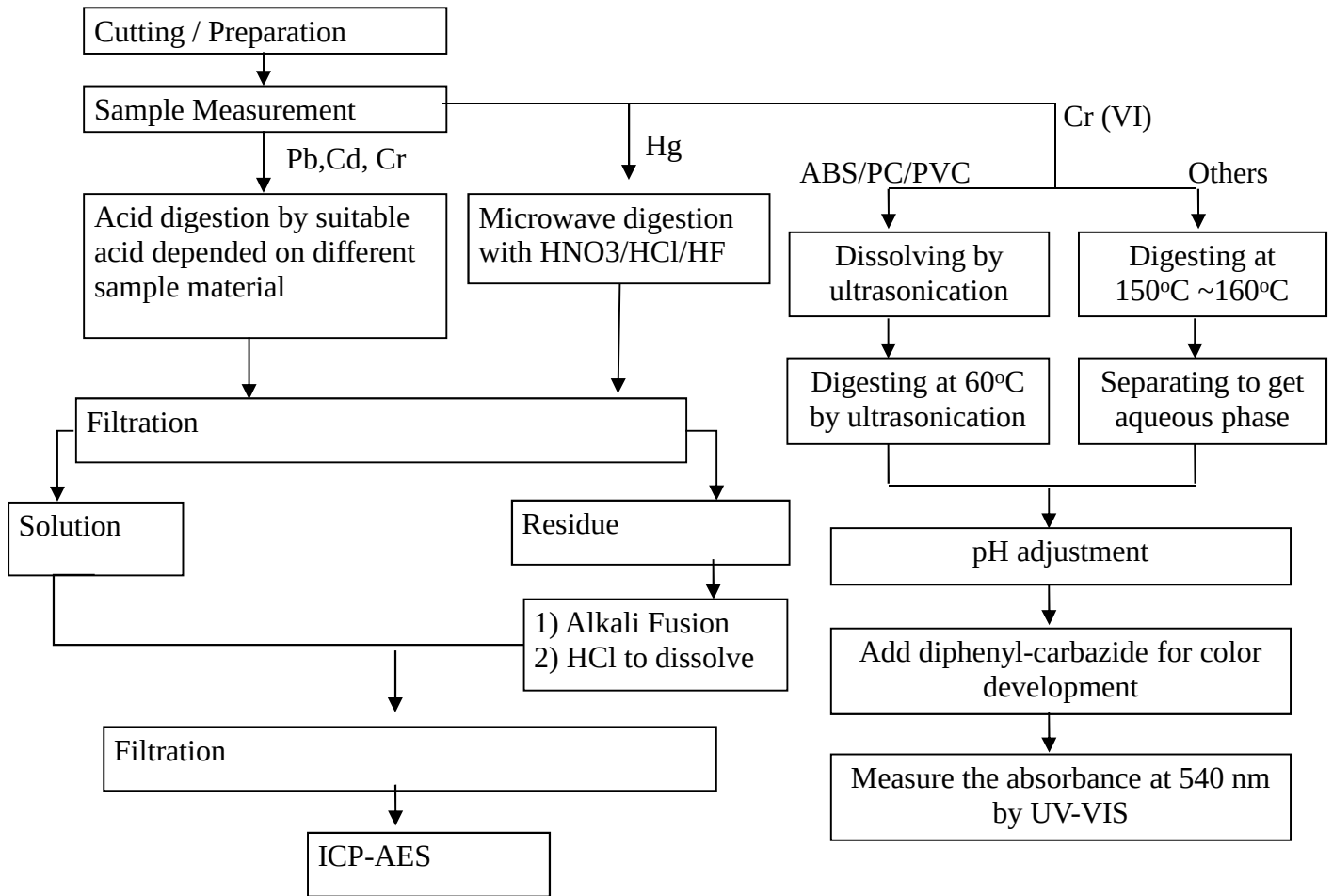
SGS authenticate the photo on original report only



Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Process Flow of IEC 62321 (Pb, Cd, Hg, Cr & Cr(VI))

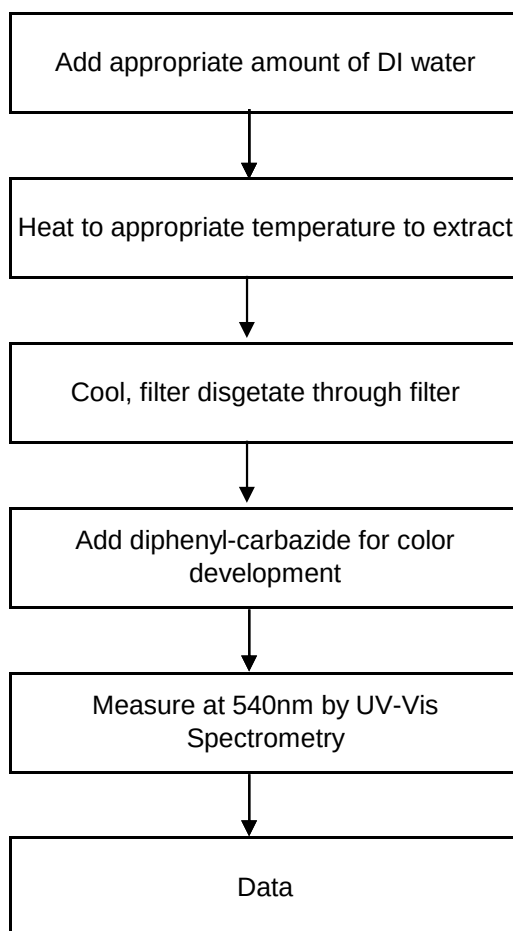


Remarks: Sample received was totally dissolved by preconditioning method. (CrVI method excluded)

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Process Flow of Cr(VI) by Boiling Water Extraction (IEC62321)



End of Report

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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TEST REPORT

REPORT NO. JP/2019/060606

DATE: June 24, 2019

PAGE: 1 OF 4

JX NIPPON MINING & METALS CORPORATION KURAMI WORKS

3 KURAMI SAMUKAWA-CHO KOZA-GUN KANAGAWA JAPAN

THE FOLLOWING SAMPLE(S) WAS/WERE SUBMITTED AND IDENTIFIED BY/ON BEHALF OF THE CLIENT AS:

以下のサンプルは顧客により提供され、顧客に代わって確認を行いました:

SAMPLE DESCRIPTION : C5210 (JX NIPPON MINING & METALS CORPORATION)

CLIENT REF.NO :

SAMPLE RECEIVED : 2019/06/11

TESTING DATE : 2019/06/11 TO 2019/06/24

TEST REQUESTED : SELECTED TEST(S) AS REQUESTED BY CLIENT.
分析項目 分析項目は顧客の要求によります。

TEST METHOD(S) : WITH REFERENCE TO LATEST EDITION OF IEC62321 FOR RoHS 6 SUBSTANCES.
分析方法 OTHER CHEMICALS WERE TESTED BY EACH APPROPRIATE METHOD.
RoHS6物質の分析は最新版のIEC62321を参照しました。
それ以外の化学物質についてはそれぞれに最適な方法で分析を行いました。

TEST RESULT(S) : PLEASE REFER TO THE NEXT PAGE(S).
分析結果 以下のページをご参照願います。

大内 幸弘



Yukihiro Ouchi / Quality Manager
SGS Japan Inc., Chemical Laboratory

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SGS Japan Inc.

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TEST REPORT

REPORT NO. JP/2019/060606

DATE: June 24, 2019

PAGE: 2 OF 4

JX NIPPON MINING & METALS CORPORATION KURAMI WORKS

3 KURAMI SAMUKAWA-CHO KOZA-GUN KANAGAWA JAPAN

TEST RESULT(S)

ITEM(S)	UNIT	RESULT	METHOD	INST./PLACE	MDL
CADMIUM(Cd)	mg/kg	N.D.	IEC62321-5: 2013	ICP-OES*	2
LEAD(Pb)	mg/kg	18	IEC62321-5: 2013	ICP-OES*	2
MERCURY(Hg)	mg/kg	N.D.	IEC62321-4: 2013+AMD1: 2017	ICP-OES*	2
CHROMIUM VI(Cr(VI))	μg/cm ²	N.D.	IEC62321-7-1: 2015	UV/VIS	0.01

NOTES: mg/kg = ppm, N.D. = Not Detected, INST. = INSTRUMENT, MDL = Method Detection Limit

REMARK: Cr(VI) has been tested with regard to the surface area of 12cm².

* = The test has been conducted in association with SGS Taiwan Ltd.

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TEST REPORT

REPORT NO. JP/2019/060606

DATE: June 24, 2019

PAGE: 3 OF 4

JX NIPPON MINING & METALS CORPORATION KURAMI WORKS

3 KURAMI SAMUKAWA-CHO KOZA-GUN KANAGAWA JAPAN

分析フローチャート MEASUREMENT FLOW CHART

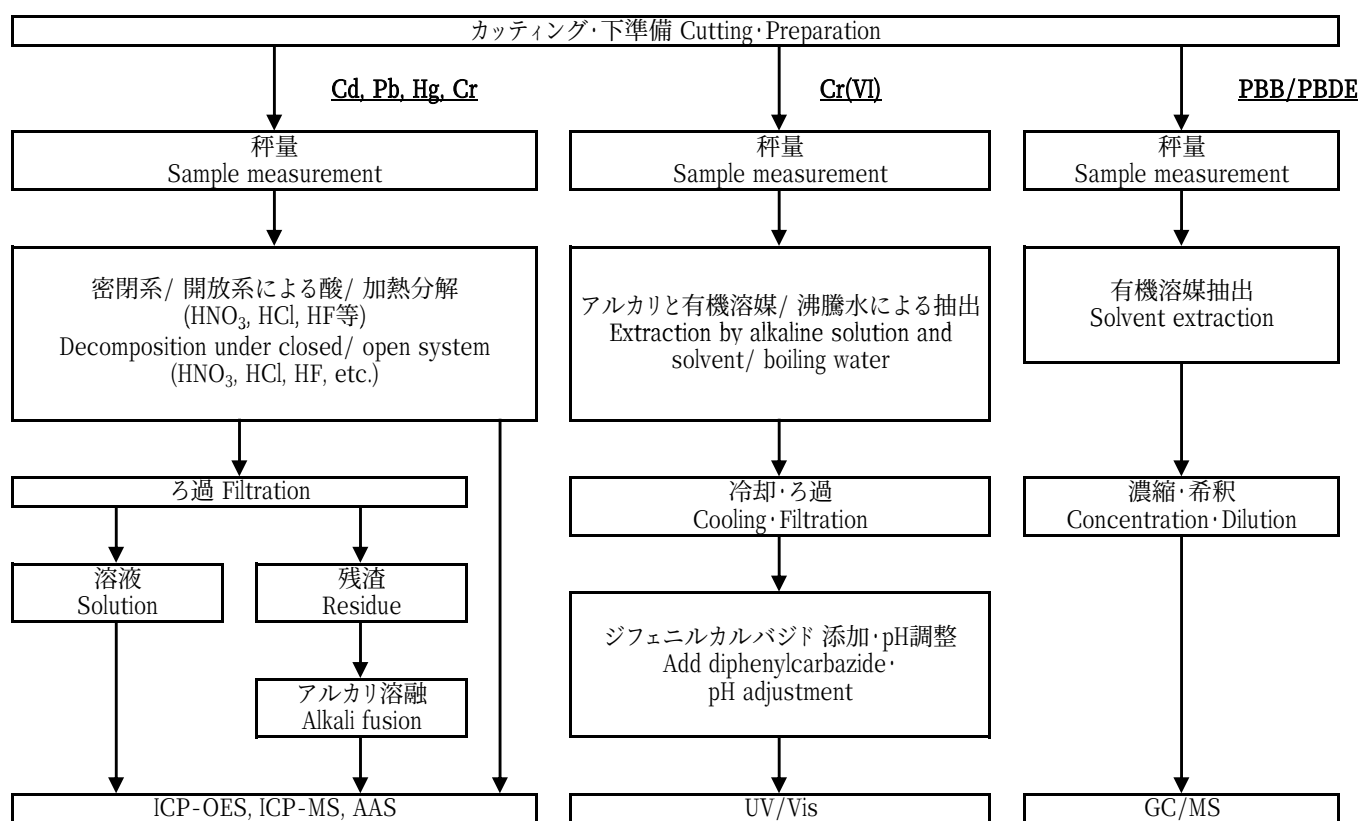
1) 酸分解前処理において試料を完全分解しています。

The sample was dissolved/ decomposed totally by acid pre-conditioning method according to below flow chart.

2) Cd, Pb, Hg, Cr, Cr(VI), PBB/PBDE

分析担当者 Name of the person in charge of measurement: 府川 亮平 Ryohei Fukawa

3) 分析責任者 Name of the person responsible for measurement: 大谷 真由美 Mayumi Otani



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TEST REPORT

REPORT NO. JP/2019/060606

DATE: June 24, 2019

PAGE: 4 OF 4

JX NIPPON MINING & METALS CORPORATION KURAMI WORKS

3 KURAMI SAMUKAWA-CHO KOZA-GUN KANAGAWA JAPAN

SAMPLE IMAGE



<END>

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TEST REPORT

REPORT NO. JP/2019/101878 DATE: November 14, 2019 PAGE: 1 OF 5

SANNO CO.,LTD.

5-8-8 TSUNASHIMAHIGASHI KOHOKU-KU YOKOHAMA-SHI KANAGAWA JAPAN

THE FOLLOWING SAMPLE(S) WAS/WERE SUBMITTED AND IDENTIFIED BY/ON BEHALF OF THE CLIENT AS:
以下のサンプルは顧客により提供され、顧客に代わって確認を行いました:

SAMPLE DESCRIPTION : Gold plated membrane(Hard Gold) SANNO CO.,LTD.

CLIENT REF.NO :

SAMPLE RECEIVED : 2019/10/31

TESTING DATE : 2019/10/31 TO 2019/11/13

TEST REQUESTED : SELECTED TEST(S) AS REQUESTED BY CLIENT.
分析項目 分析項目は顧客の要求によります。

TEST METHOD(S) : WITH REFERENCE TO LATEST EDITION OF IEC62321 FOR RoHS 10 SUBSTANCES.
分析方法 OTHER CHEMICALS WERE TESTED BY EACH APPROPRIATE METHOD.
RoHS10物質の分析は最新版のIEC62321を参照しました。
それ以外の化学物質についてはそれぞれに最適な方法で分析を行いました。

TEST RESULT(S) : PLEASE REFER TO THE NEXT PAGE(S).
分析結果 以下のページをご参照願います。

大内 幸弘



Yukihiro Ouchi / Quality Manager
SGS Japan Inc., Chemical Laboratory

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TEST REPORT

REPORT NO. JP/2019/101878 DATE: November 14, 2019 PAGE: 2 OF 5

SANNO CO., LTD.

5-8-8 TSUNASHIMAHIGASHI KOHOKU-KU YOKOHAMA-SHI KANAGAWA JAPAN

TEST RESULT(S)

ITEM(S)	UNIT	RESULT	METHOD	INST./PLACE	MDL
CADMIUM(Cd)	mg/kg	N.D.	IEC62321-5: 2013	ICP-OES	2
LEAD(Pb)	mg/kg	33	IEC62321-5: 2013	ICP-OES	2
MERCURY(Hg)	mg/kg	N.D.	IEC62321-4: 2013+AMD1: 2017	ICP-OES	2
CHROMIUM VI(Cr(VI))	μg/cm ²	N.D.	IEC62321-7-1: 2015	UV/VIS	0.01
PHTHALATES					
DIBUTYL PHTHALATE(DBP)	mg/kg	N.D.	IEC62321-8: 2017	GC/MS	50
DI(2-ETHYLHEXYL) PHTHALATE(DEHP)	mg/kg	N.D.	IEC62321-8: 2017	GC/MS	50
BUTYLBENZYL PHTHALATE(BBP)	mg/kg	N.D.	IEC62321-8: 2017	GC/MS	50
DIISOBUTYL PHTHALATE(DIBP)	mg/kg	N.D.	IEC62321-8: 2017	GC/MS	50

NOTES: mg/kg = ppm, N.D. = Not Detected, INST. = INSTRUMENT, MDL = Method Detection Limit

REMARK: Cr(VI) has been tested with regard to the surface area of 12cm².

Reference: The MDL of Cr(VI) can be converted into 2 (ppm) with regard to the sample weight.

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TEST REPORT

REPORT NO. JP/2019/101878

DATE: November 14, 2019

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SANNO CO.,LTD.

5-8-8 TSUNASHIMAHIGASHI KOHOKU-KU YOKOHAMA-SHI KANAGAWA JAPAN

分析フローチャート MEASUREMENT FLOW CHART

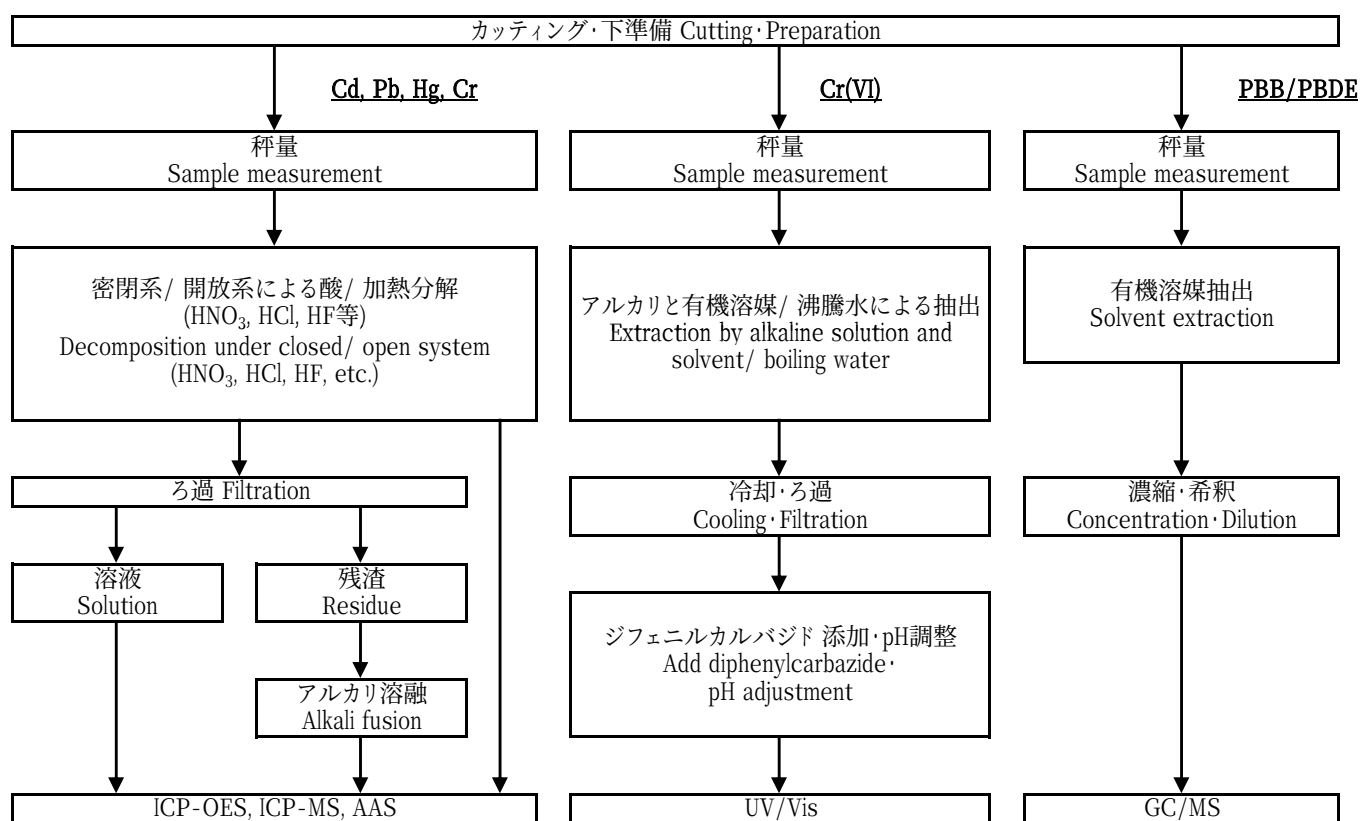
1) 酸分解前処理において試料を完全分解しています。

The sample was dissolved/ decomposed totally by acid pre-conditioning method according to below flow chart.

2) Cd, Pb, Hg, Cr, Cr(VI), PBB/PBDE

分析担当者 Name of the person in charge of measurement: 府川 亮平 Ryohei Fukawa

3) 分析責任者 Name of the person responsible for measurement: 大谷 真由美 Mayumi Otani



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TEST REPORT

REPORT NO. JP/2019/101878

DATE: November 14, 2019

PAGE: 4 OF 5

SANNO CO.,LTD.

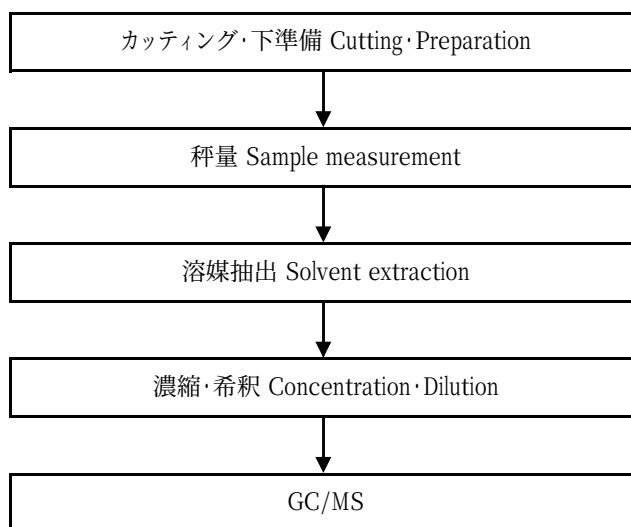
5-8-8 TSUNASHIMAHIGASHI KOHOKU-KU YOKOHAMA-SHI KANAGAWA JAPAN

分析フローチャート MEASUREMENT FLOW CHART

1) 分析担当者 Name of the person in charge of measurement: 府川 亮平 Ryohei Fukawa

2) 分析責任者 Name of the person responsible for measurement: 大谷 真由美 Mayumi Otani

フタル酸エステル
PHthalATES



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TEST REPORT

REPORT NO. JP/2019/101878

DATE: November 14, 2019

PAGE: 5 OF 5

SANNO CO.,LTD.

5-8-8 TSUNASHIMAHIGASHI KOHOKU-KU YOKOHAMA-SHI KANAGAWA JAPAN

SAMPLE IMAGE



<END>

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JP

Test Report

No: 10479959(8)

Date: 17-Sep-19

Page 1 of 5

Singapore Dai-ichi Pte Ltd
55 Yishun Industrial Park A Singapore 768728

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

Sample Name : C line Ni

Sample Receiving Date : 05-Sep-19
Testing Period : 05-Sep-19 to 17-Sep-19

Test Requested : In accordance with the RoHS Directive 2011/65/EU Annex II.

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

Conclusion : Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2011/65/EU Annex II ; recasting 2002/95/EC.

Signed for and on behalf of
SGS Testing & Control Services Singapore Pte Ltd



Y.C. Tham
Laboratory Manager



Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Test Report

No: 10479959(8)

Date: 17-Sep-19

Page 2 of 5

Test Result(s):

Sample Description : Silver colored flakes

Test Item(s):	Unit	Method	Results	MDL	RoHS Limit
Cadmium(Cd)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	n.d.	2	100
Lead (Pb)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	n.d.	2	1000
Mercury (Hg)	mg/kg	With reference to IEC62321-4 :2013 +A1:2017. Analysis was performed by ICP/AES	n.d.	2	1000
Hexavalent Chromium (Cr(VI)) #	µg/cm2	With reference to IEC62321-7-1 :2015. Analysis was performed by UV-Vis Spectrometry.	n.d.	0.1	-

Note:

- (1) mg/kg = ppm ; 0.1wt% = 1000ppm
- (2) n.d.= Not Detected
- (3) MDL = Method Detection Limit
- (4) "-" = Not regulated
- (5) * : Exceeds limit
- (6) # = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13µg/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 0.10µg/cm2. The coating is considered a non-Cr(VI) based coating
c. The result between 0.10µg/cm2 and 0.13µg/cm2 is considered to be inconclusive - unavoidable coating variations may influence the determination

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing represent status of the sample at the time of testing.

Remarks: Sample received was totally dissolved by preconditioning methods.

Lab Analyst(s): AQ and Pheng

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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Sample photo:

Sample Description : Silver colored flakes

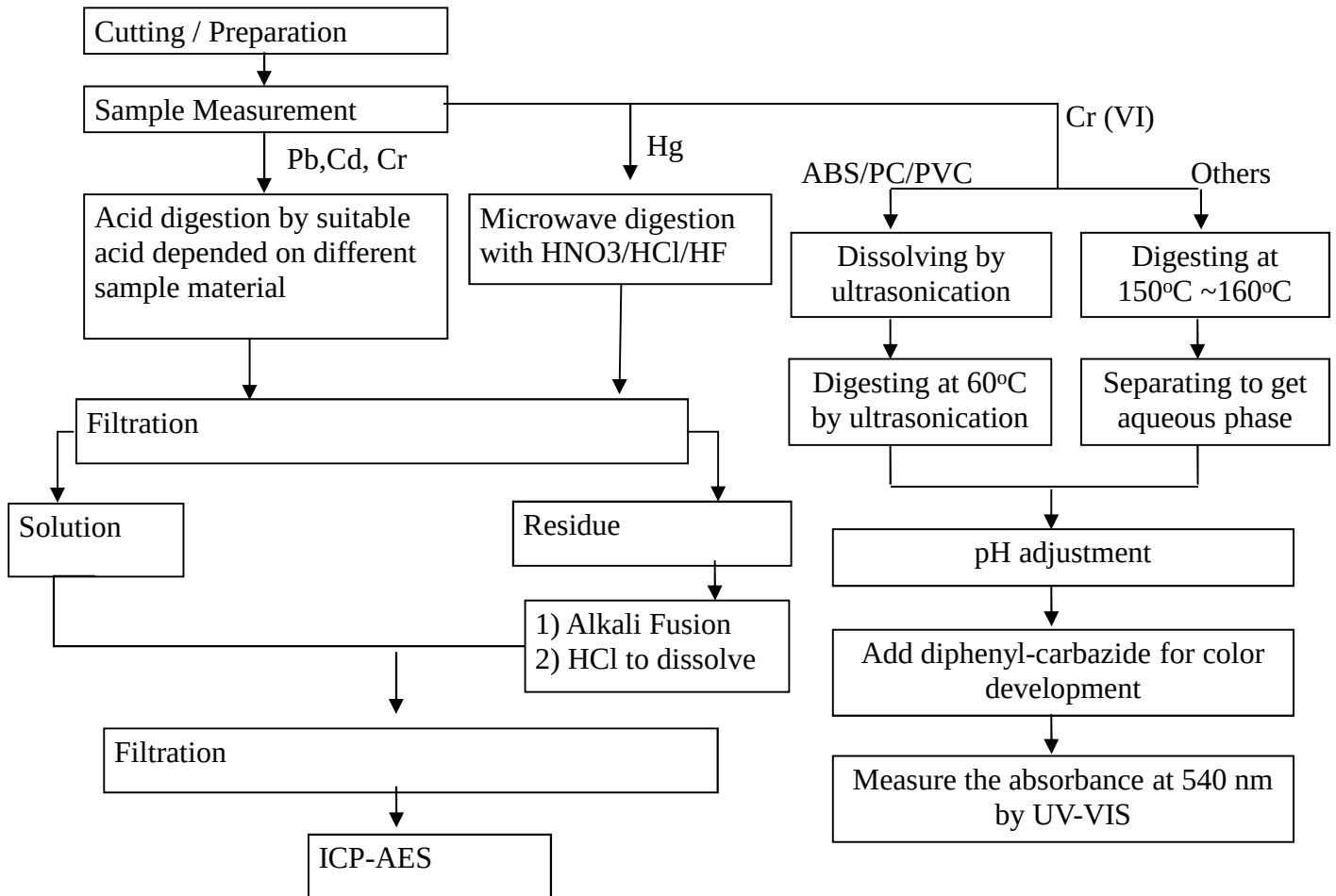
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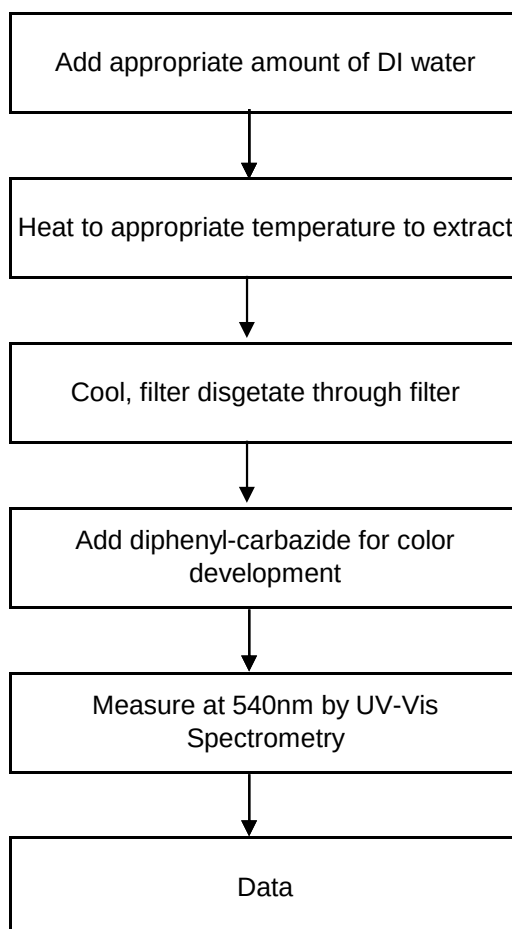
Process Flow of IEC 62321 (Pb, Cd, Hg, Cr & Cr(VI))



Remarks: Sample received was totally dissolved by preconditioning method. (CrVI method excluded)

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Process Flow of Cr(VI) by Boiling Water Extraction (IEC62321)

End of Report

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Test Report

No. SHAEC1912211507

Date: 19 Jun 2019

Page 1 of 5

HARADA METAL INDUSTRY CO.,LTD.

5-9-25 HONCHO, TODA-SHI SAITAMA 335-0023, JAPAN

The following sample(s) was/were submitted and identified on behalf of the clients as : C5191,Cu,Sn,P

SGS Job No. : SP19-019153 - SH

Date of Sample Received : 10 Jun 2019

Testing Period : 10 Jun 2019 - 13 Jun 2019

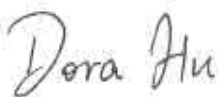
Test Requested : Selected test(s) as requested by client.

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.



Dora Hu
Approved Signatory



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Test Report

No. SHAEC1912211507

Date: 19 Jun 2019

Page 2 of 5

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-122115.002	Copper metal sheet

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-1:2015 and IEC 62321-6:2015, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	002
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	24
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm ²	0.10	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND



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Test Report

No. SHAEC1912211507

Date: 19 Jun 2019

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Test Item(s)	Limit	Unit	MDL	002
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) ▼ = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm².
The sample coating is considered to contain CrVI
b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI 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
Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.



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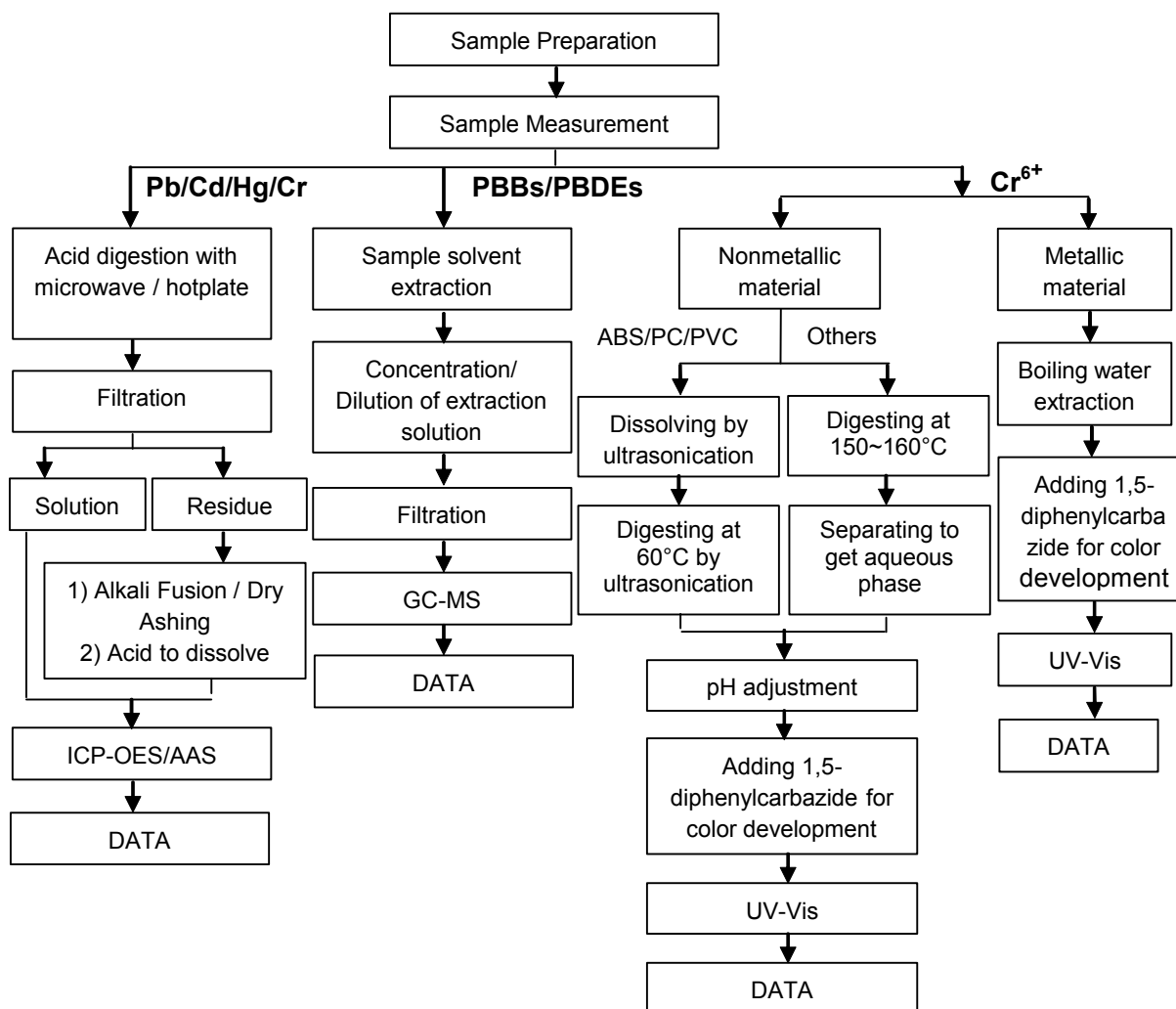
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ATTACHMENTS

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



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Test Report

No. SHAEC1912211507

Date: 19 Jun 2019

Page 5 of 5

Sample photo:



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Test Report

No. SHAEC1928362919

Date: 08 Jan 2020

Page 1 of 14

Changzhou Hengfeng Special Conductor Co., Ltd
26 FengHuang Road, Changzhou City

The following sample(s) was/were submitted and identified on behalf of the clients as : SILVER-COATED COPPER WIRE

SGS Job No. : SP19-041923 - SH
Date of Sample Received : 20 Dec 2019
Testing Period : 20 Dec 2019 - 06 Jan 2020
Test Requested : Selected test(s) as requested by client.
Test Method : Please refer to next page(s).
Test Results : Please refer to next page(s).
Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Helen Liu

Helen Liu
Approved Signatory



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Test Report

No. SHAEC1928362919

Date: 08 Jan 2020

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-283629.025	Silvery metal
SN2	SHA19-283629.026	Copper metal(base)
SN3	SHA19-283629.027	Silvery metal(plating)

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	026
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm ²	0.10	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND



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Test Report

No. SHAEC1928362919

Date: 08 Jan 2020

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Test Item(s)	Limit	Unit	MDL	026
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

- (1)The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2)▼ = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm².
The sample coating is considered to contain CrVI
b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI 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
Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013 and IEC62321-7-1:2015, analyzed by ICP-OES and UV-Vis .

Test Item(s)	Limit	Unit	MDL	027
Cadmium (Cd)	100	mg/kg	10	ND
Lead (Pb)	1000	mg/kg	10	ND
Mercury (Hg)	1000	mg/kg	10	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm ²	0.10	ND

Notes :

- (1)The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.



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(2) ▽ = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm².

The sample coating is considered to contain CrVI

b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI 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

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

Element(s)

Test Method : With reference to US EPA Method 3050B:1996, analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	025
Beryllium (Be)	mg/kg	5	ND
Antimony (Sb)	mg/kg	10	ND

PFOS (Perfluorooctane Sulfonates)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

Test Item(s)	Unit	MDL	025
Perfluorooctanesulfonate (PFOS)^	mg/kg	10	ND

Notes :

(1) ^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.

Benzenamine,N-phenyl-,Reaction Products with Styrene and 2,4,4-Trimethylpentene (BNST)

Test Method : With reference to EPA method 3550C:2007 & EPA method 8270D: 2014, analysis was performed by GC-MS.



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<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>025</u>
Benzenamine,N-phenyl-,Reaction Products with Styrene and 2,4,4-Trimethylpentene (BNST)	68921-45-9	mg/kg	10	ND



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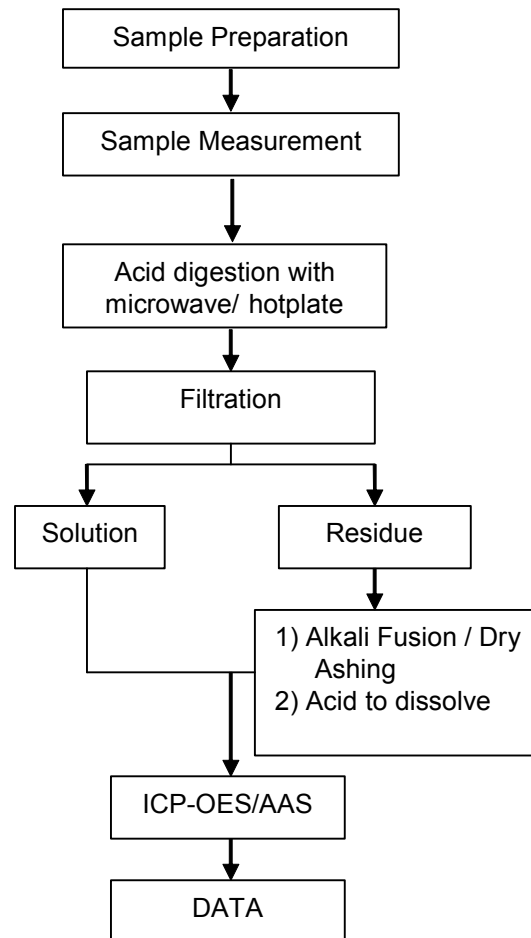
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Elements (IEC62321) Testing Flow Chart

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



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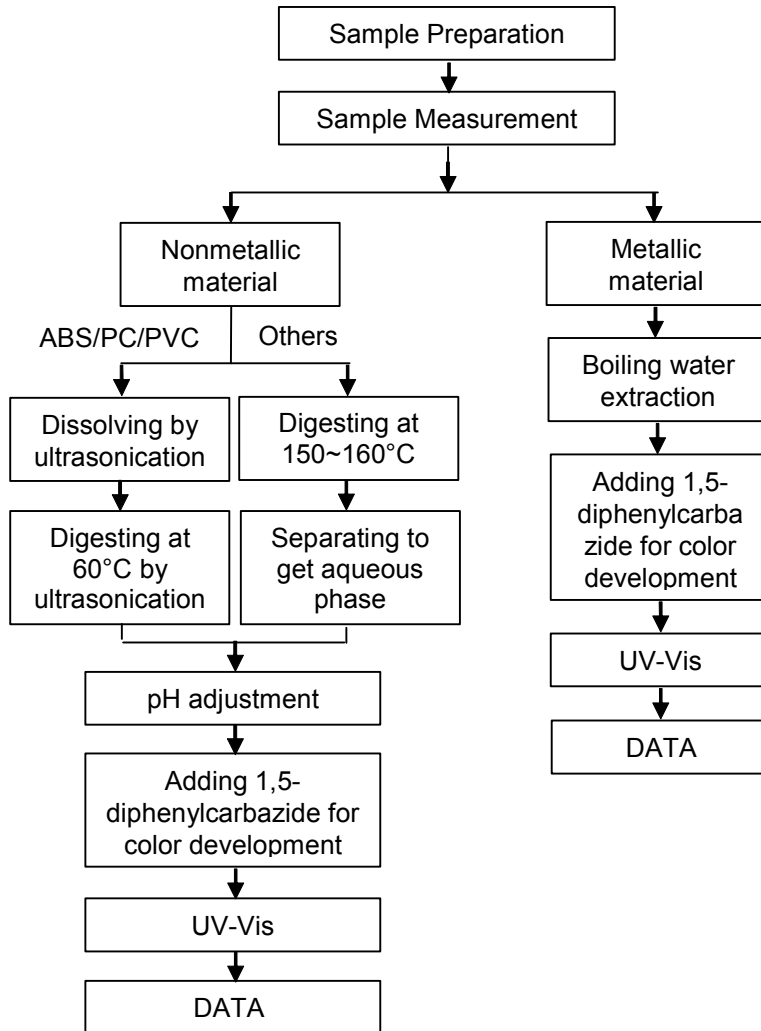
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart



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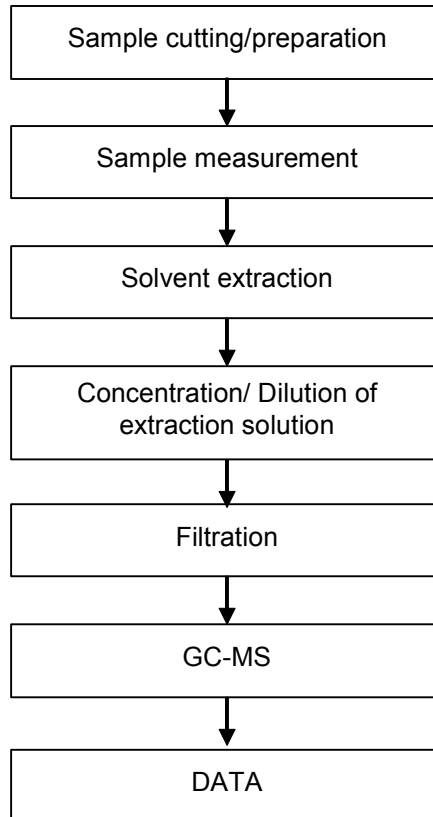
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PBBs/PBDEs Testing Flow Chart



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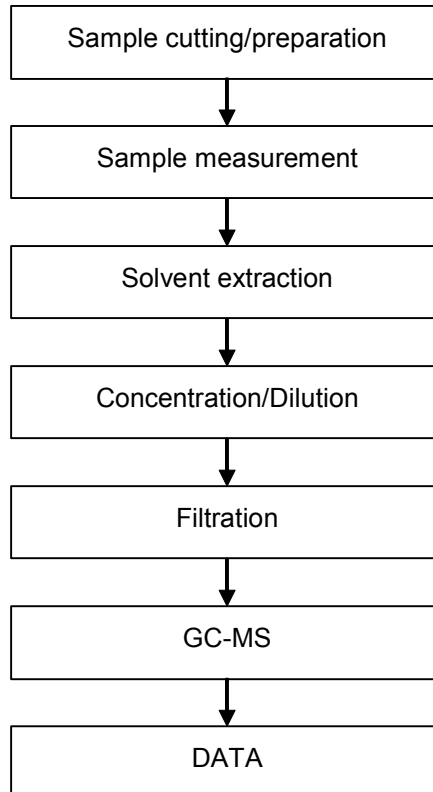
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Phthalates Testing Flow Chart



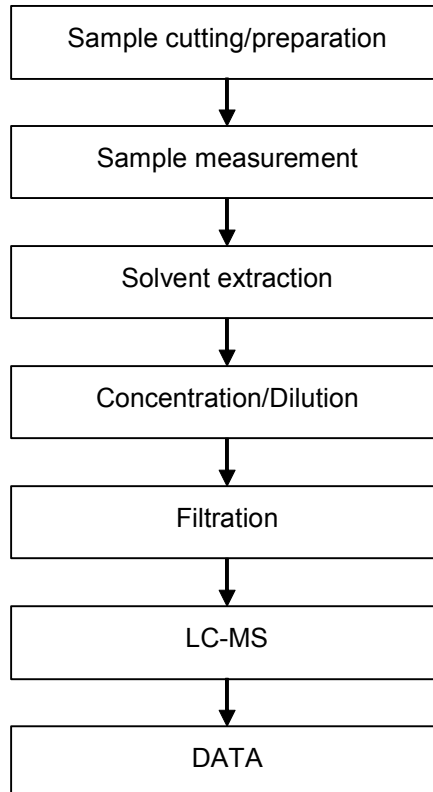
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PFOS/PFOA Testing Flow Chart



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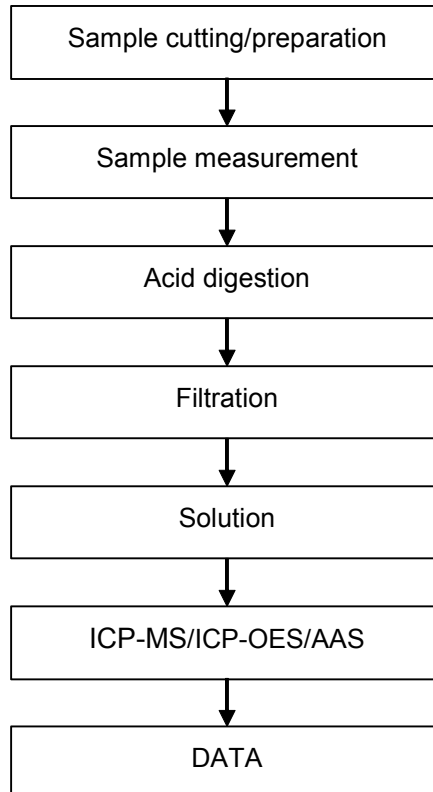
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Elements Testing Flow Chart



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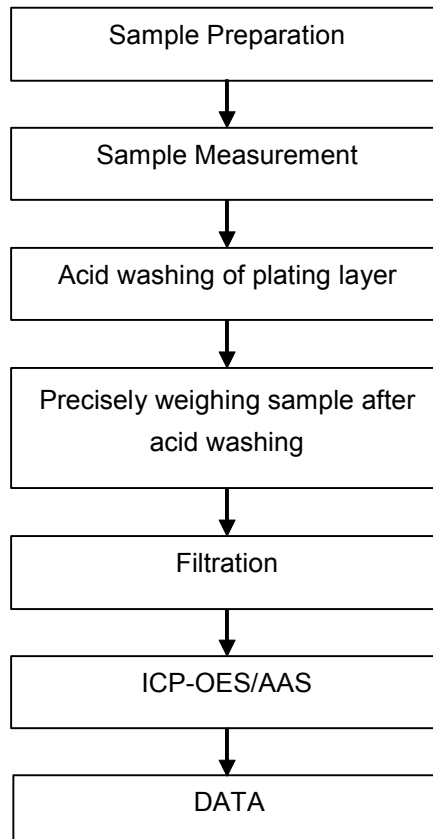
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Plating Pb/Cd/Hg Testing Flow Chart



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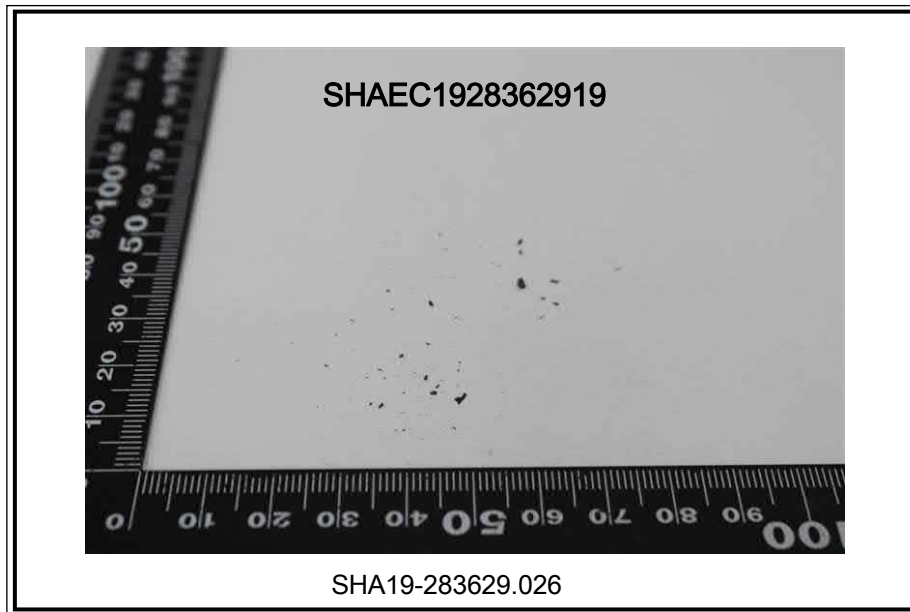
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Test Report

No. SHAEC1928831729

Date: 06 Jan 2020

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DAIKIN FLUORO CHEMICALS(CHINA) CO., LTD.

NO.8 JINYU ROAD(WEST) ADVANCED MATERIALS INDUSTRIAL PARK,CHANGSHU,JIANGSU
215522, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : NEOFロン FEP

SGS Job No. : SP19-042728 - SH

Model No. : NP-3180

Date of Sample Received : 27 Dec 2019

Testing Period : 27 Dec 2019 - 06 Jan 2020

Test Requested : Selected test(s) as requested by client.

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.



Helen Liu
Approved Signatory



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Test Report

No. SHAEC1928831729

Date: 06 Jan 2020

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-288317.015	White solid pellet

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	015
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND



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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>015</u>
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863. IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (3) The restriction of DEHP, BBP, DBP and DIBP shall not apply to toys which are already subject to the restriction of DEHP, BBP, DBP and DIBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

Test Method : With reference to EN 14582: 2016 , analysis was performed by IC.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>015</u>
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Element(s)

Test Method : With reference to US EPA 3052:1996, analysis was performed by ICP-OES.



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<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>015</u>
Beryllium (Be)	mg/kg	5	ND
Cobalt (Co)	mg/kg	5	ND
Phosphorus (P)	mg/kg	20	ND

Tetrabromobisphenol A (TBBP-A)

Test Method : With reference to US EPA 3540C: 1996, analysis was performed by GC-MS.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>015</u>
Tetrabromobisphenol A (TBBP-A)	mg/kg	10	ND

Bisphenol-A

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by LC -MS.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>015</u>
Bisphenol-A	mg/kg	0.1	ND

Phthalates Content

Test Method : With reference to EN 14372:2004, analysis was performed by GC-MS.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>015</u>
Diisononyl Phthalate (DINP)	28553-12-0	%	0.01	ND
	/68515-48-0			
Diisodecyl Phthalate (DIDP)	26761-40-0	%	0.01	ND
	/68515-49-1			
Di-n-octyl Phthalate (DNOP)	117-84-0	%	0.003	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%	0.003	ND
Dimethyl Phthalate (DMP)	131-11-3	%	0.003	ND
Diethyl Phthalate (DEP)	84-66-2	%	0.003	ND
Di-n-pentyl Phthalates (DnPP)	131-18-0	%	0.003	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%	0.003	ND
Diisopentylphthalate (DIPP)	605-50-5	%	0.003	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%	0.01	ND
Diisoheptyl phthalate (DIHP)	71888-89-6	%	0.01	ND



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Test Item(s)	CAS NO.	Unit	MDL	015
Diisooctyl Phthalate (DiOP)	27554-26-3	%	0.01	ND
Dicyclohexyl Phthalate (DCHP)	84-61-7	%	0.003	ND
Dipropyl Phthalate (DPrP)	131-16-8	%	0.003	ND
Dinonyl Phthalate (DNP)	84-76-4	%	0.003	ND
Dibenzyl Phthalate (DBzP)	523-31-9	%	0.003	ND
Diphenyl Phthalate (DPhP)	84-62-8	%	0.003	ND
Di(2-ethylhexy)adipate(DEHA)	103-23-1	%	0.003	ND

Polycyclic aromatic hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2014:01 PAK, analysis was performed by GC-MS.

Test Item(s)	Unit	MDL	015
Benzo(a)pyrene(BaP)	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	mg/kg	0.1	ND
Chrysene(CHR)	mg/kg	0.1	ND
Dibenzo(a,h)anthracene(DBA)	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	mg/kg	0.1	ND
Acenaphthylene(ANY)	mg/kg	0.1	ND
Acenaphthene(ANA)	mg/kg	0.1	ND
Fluorene(FLU)	mg/kg	0.1	ND
Phenanthrene(PHE)	mg/kg	0.1	ND
Pyrene(PYR)	mg/kg	0.1	ND
Anthracene(ANT)	mg/kg	0.1	ND
Fluoranthene(FLT)	mg/kg	0.1	ND
Sum of Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Pyrene, Anthracene, Fluoranthene	mg/kg	-	ND
Naphthalene(NAP)	mg/kg	0.1	ND
Sum of 18 PAHs	mg/kg	-	ND



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AFPS (German commission for Product Safety) : GS PAHs requirements

Parameter	Category 1 Material intended to be put in the mouth or toys with intended skin contact (longer than 30 s).	Category 2 Materials not falling under category 1 with foreseeable contact to skin for longer than 30 s (long-term skin) or frequent contact.		Category 3 Materials not falling under category 1 or 2 with foreseeable contact to skin for less than 30 s (short-term skin contact).	
		Toy under 2009/48/EC	Other products under ProdSG	Toy under 2009/48/EC	Other products under ProdSG
Benzo(a)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(e)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(1,2,3-cd)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Acenaphthylene, Acenaphthene, fluorene, phenanthrene, pyrene, anthracene, fluoranthene, mg/kg	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene, mg/kg	< 1	< 2		< 10	
Sum of 18 PAHs	< 1	< 5	< 10	< 20	< 50



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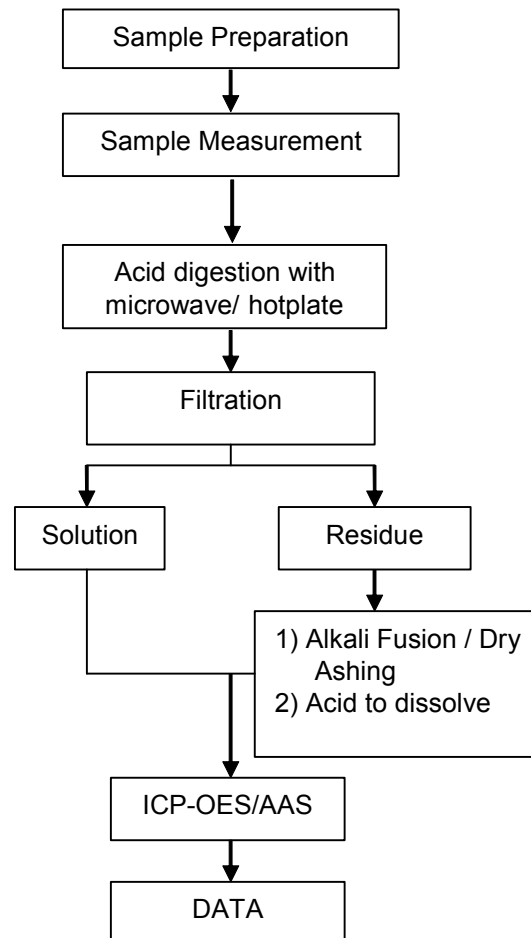
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Elements (IEC62321) Testing Flow Chart

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



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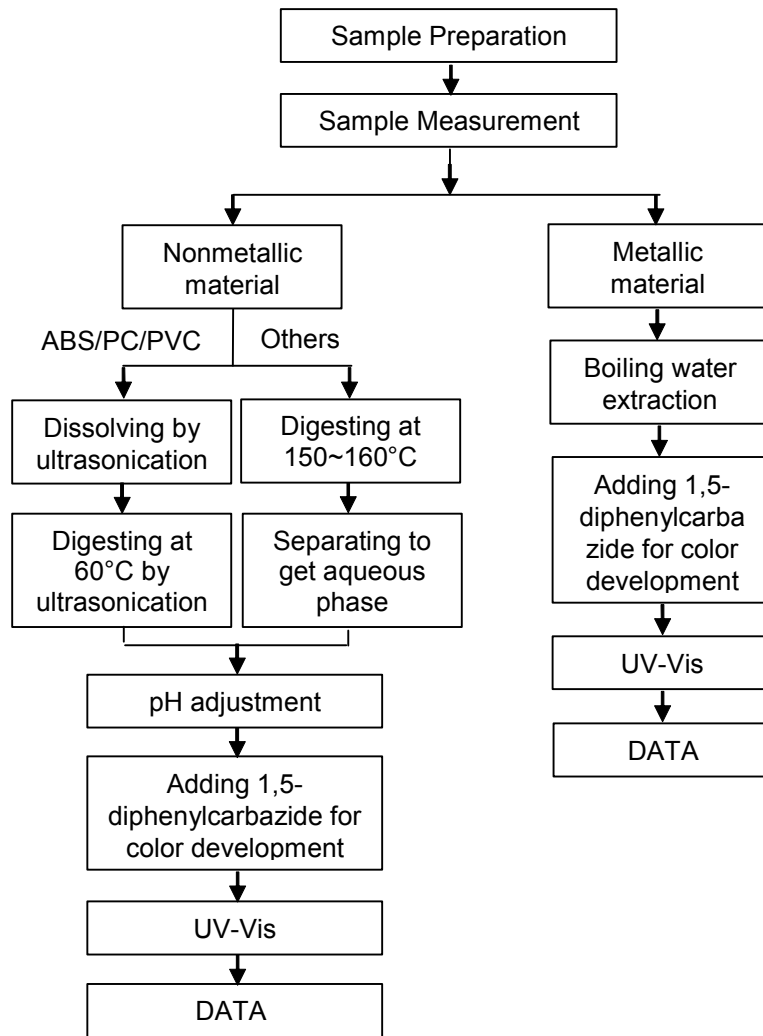
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart



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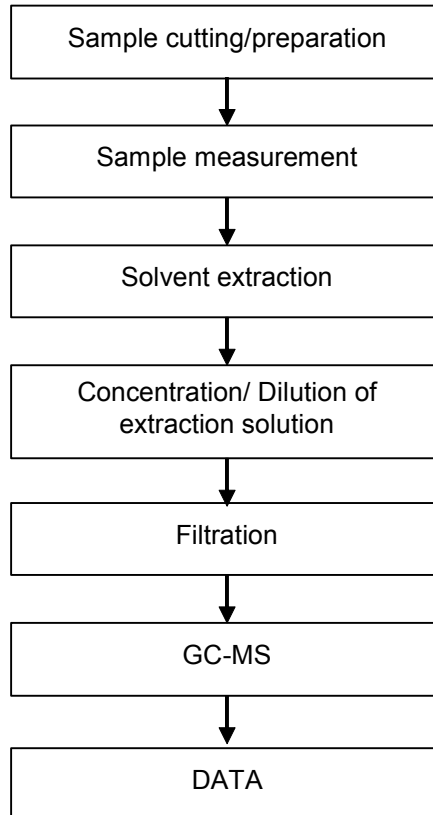
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PBBs/PBDEs Testing Flow Chart



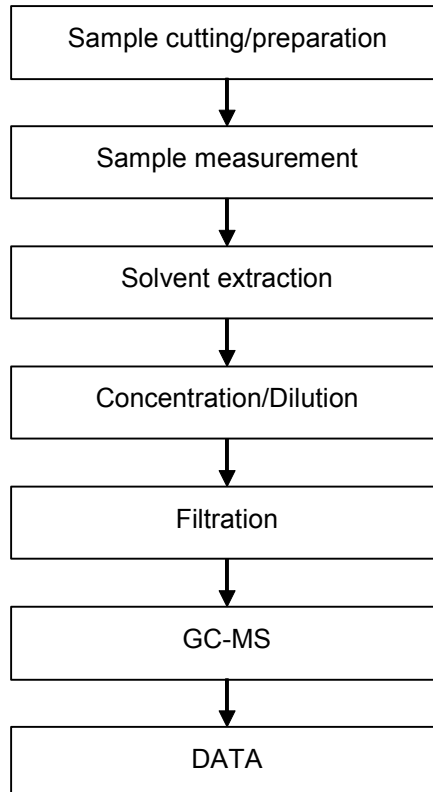
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Phthalates Testing Flow Chart



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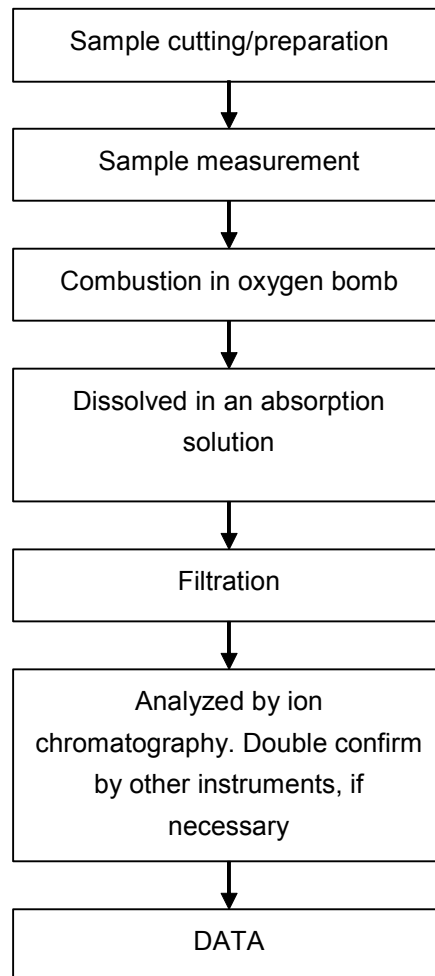
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Halogen Testing (oxygen bomb) Flow Chart



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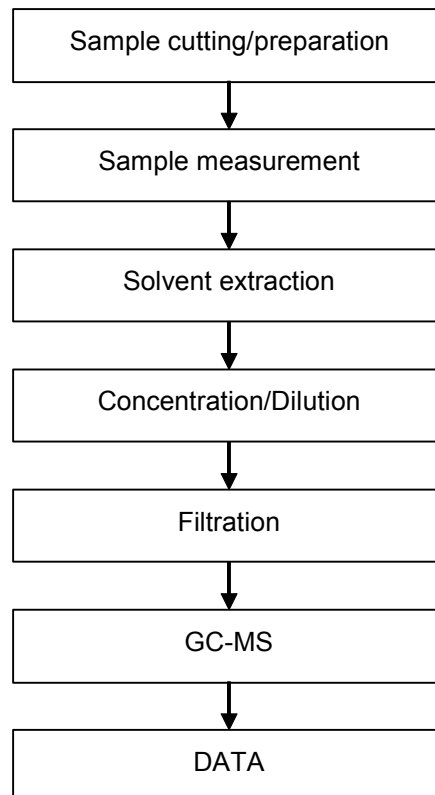
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PAHs Testing Flow Chart



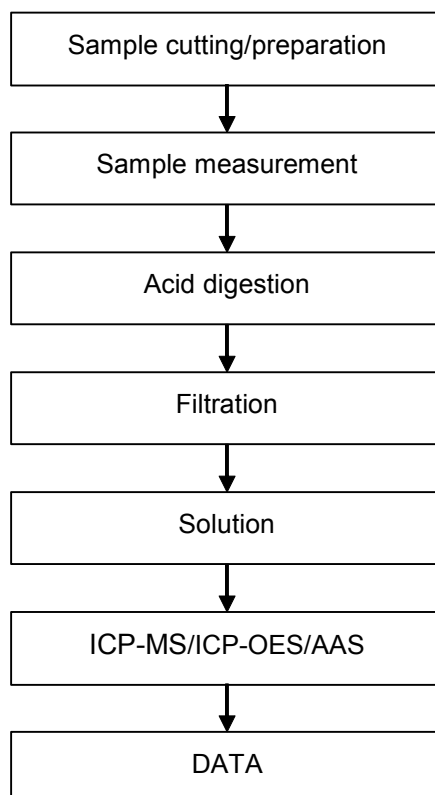
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Elements Testing Flow Chart



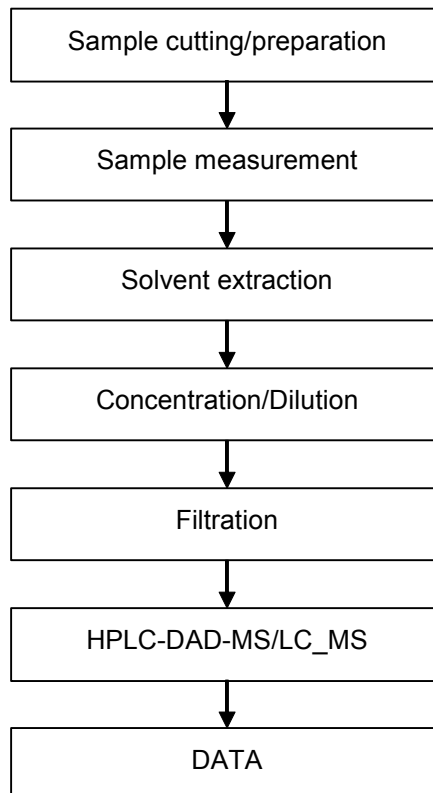
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BPA Testing Flow Chart



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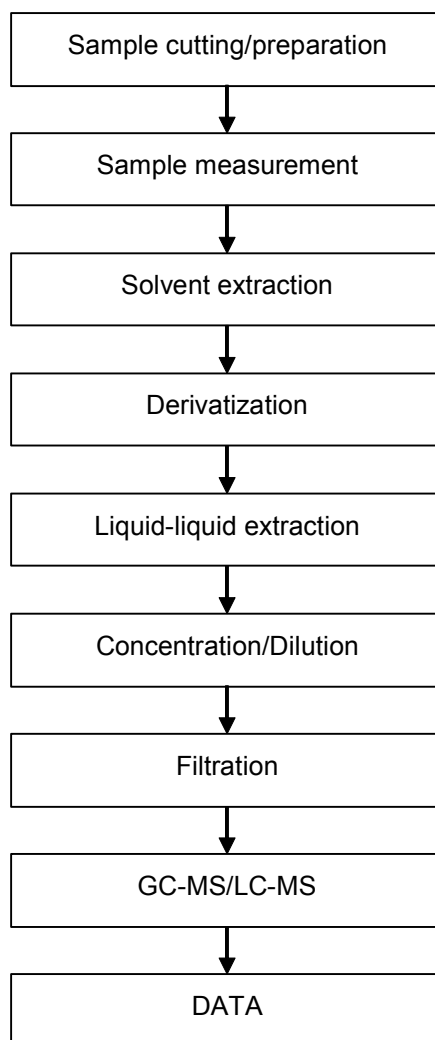
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TBBP-A Testing Flow Chart



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Sample photo:



SGS authenticate the photo on original report only

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DAIKIN FLUORO CHEMICALS(CHINA) CO., LTD.

NO.8 JINYU ROAD(WEST) ADVANCED MATERIALS INDUSTRIAL PARK,CHANGSHU,JIANGSU
215522, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : NEOFロン FEP

SGS Job No. : SP20-001318 - SH

Model No. : NP-101

Date of Sample Received : 13 Jan 2020

Testing Period : 13 Jan 2020 - 19 Jan 2020

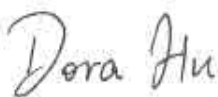
Test Requested : Selected test(s) as requested by client.

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.



Dora Hu
Approved Signatory



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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA20-008647.002	White solid pellet

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	002
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND



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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863. IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (3) The restriction of DEHP, BBP, DBP and DIBP shall not apply to toys which are already subject to the restriction of DEHP, BBP, DBP and DIBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

Test Method : With reference to EN 14582: 2016 , analysis was performed by IC.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Element(s)

Test Method : With reference to US EPA 3052:1996, analysis was performed by ICP-OES.



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<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Phosphorus (P)	mg/kg	20	ND

Element(s)

Test Method : With reference to ASTM D 4004-06(2017), analysis was performed by ICP-OES.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Antimony (Sb)	mg/kg	50	ND

Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCP)

Test Method : With reference to ISO 18219: 2015, analysis was performed by GC-NCI-MS

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCP)	mg/kg	50	ND

Hexabromocyclododecane (HBCDD/HBCD)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by GC-MS.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Hexabromocyclododecane (HBCDD/HBCD)	mg/kg	10	ND

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.



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Test Item(s)	Unit	MDL	002
Perfluorooctanesulfonate (PFOS)^	mg/kg	10	ND
Perfluorooctanoic Acid (PFOA)	mg/kg	10	ND

Notes :

(1) ^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.

PFOA (Perfluorooctanoic Acid)

Test Method : In house method, analysis is performed by LC-MS or LC-MS-MS.

Test Item(s)	Unit	MDL	002
Perfluorooctanoic Acid (PFOA)	mg/kg	0.01	ND

Phthalates Content

Test Method : With reference to EN 14372:2004, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	002
Di-n-octyl Phthalate (DNOP)	117-84-0	%	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0	%	0.01	ND
	/68515-48-0			
Diisodecyl Phthalate (DIDP)	26761-40-0	%	0.01	ND
	/68515-49-1			
Dimethyl Phthalate (DMP)	131-11-3	%	0.003	ND
Diethyl Phthalate (DEP)	84-66-2	%	0.003	ND
Di-n-pentyl Phthalates (DnPP)	131-18-0	%	0.003	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%	0.003	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%	0.003	ND
Diisopentylphthalate (DIPP)	605-50-5	%	0.003	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%	0.01	ND
Diisoheptyl phthalate (DIHP)	71888-89-6	%	0.01	ND

Polycyclic aromatic hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2014:01 PAK, analysis was performed by GC-MS.



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Test Item(s)	Unit	MDL	002
Benzo(a)pyrene(BaP)	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	mg/kg	0.1	ND
Chrysene(CHR)	mg/kg	0.1	ND
Dibenzo(a,h)anthracene(DBA)	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	mg/kg	0.1	ND
Acenaphthylene(ANY)	mg/kg	0.1	ND
Acenaphthene(ANA)	mg/kg	0.1	ND
Fluorene(FLU)	mg/kg	0.1	ND
Phenanthrene(PHE)	mg/kg	0.1	ND
Pyrene(PYR)	mg/kg	0.1	ND
Anthracene(ANT)	mg/kg	0.1	ND
Fluoranthene(FLT)	mg/kg	0.1	ND
Sum of Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Pyrene, Anthracene, Fluoranthene	mg/kg	-	ND
Naphthalene(NAP)	mg/kg	0.1	ND
Sum of 18 PAHs	mg/kg	-	ND



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Test Report

No. SHAEC2000864703

Date: 19 Jan 2020

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AtPS (German commission for Product Safety) : GS PAHs requirements

Parameter	Category 1 Material intended to be put in the mouth or toys with intended skin contact (longer than 30 s).	Category 2 Materials not falling under category 1 with foreseeable contact to skin for longer than 30 s (long-term skin) or frequent contact.		Category 3 Materials not falling under category 1 or 2 with foreseeable contact to skin for less than 30 s (short-term skin contact).	
		Toy under 2009/48/EC	Other products under ProdSG	Toy under 2009/48/EC	Other products under ProdSG
Benzo(a)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(e)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(1,2,3-cd)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Acenaphthylene, Acenaphthene, fluorene, phenanthrene, pyrene, anthracene, fluoranthene, mg/kg	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene, mg/kg	< 1	< 2		< 10	
Sum of 18 PAHs	< 1	< 5	< 10	< 20	< 50



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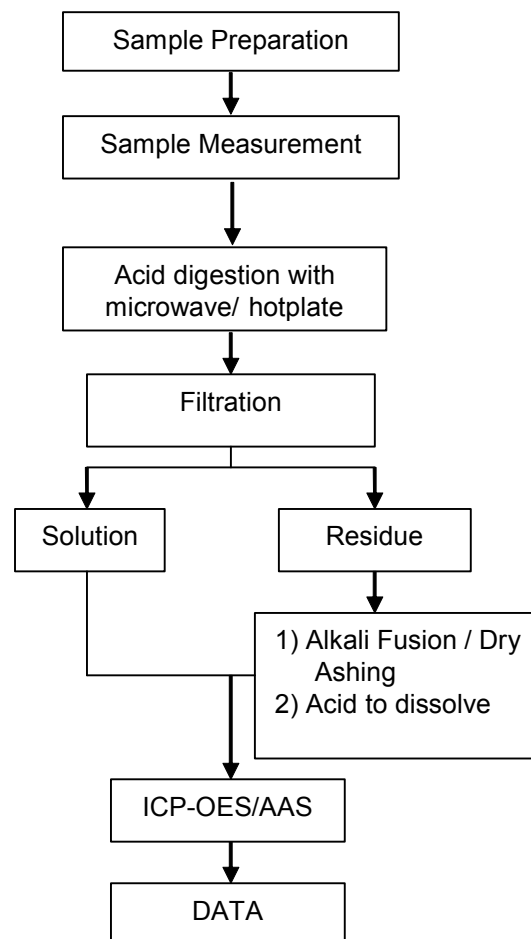
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Elements (IEC62321) Testing Flow Chart

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



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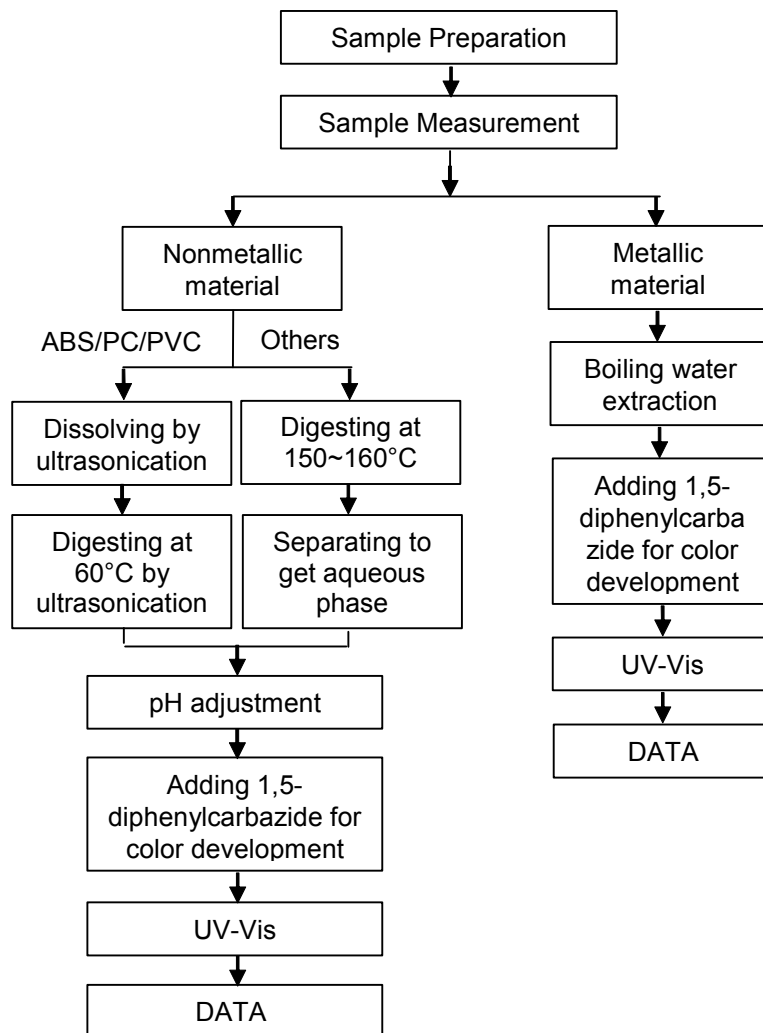
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart



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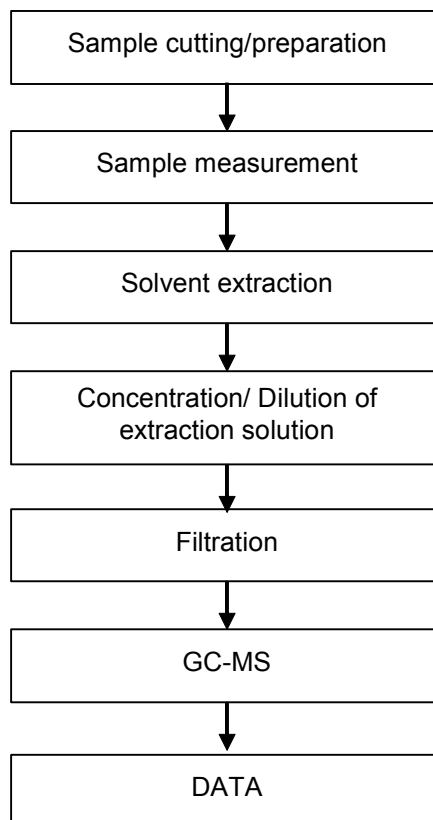
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PBBs/PBDEs Testing Flow Chart



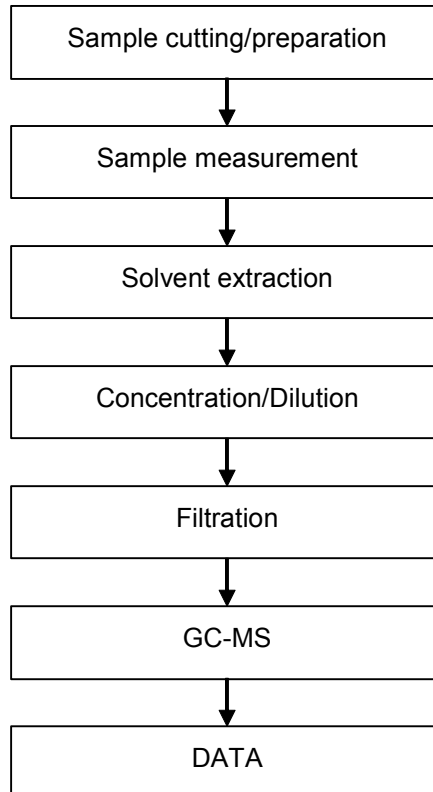
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Phthalates Testing Flow Chart



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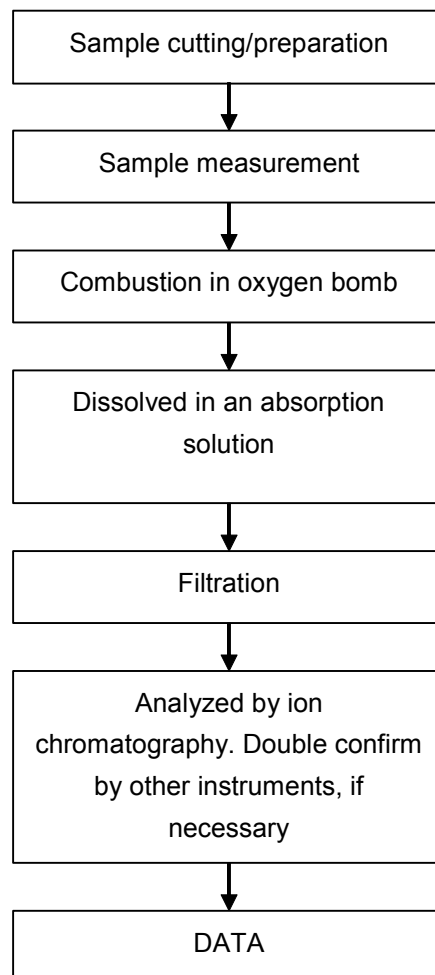
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Halogen Testing (oxygen bomb) Flow Chart



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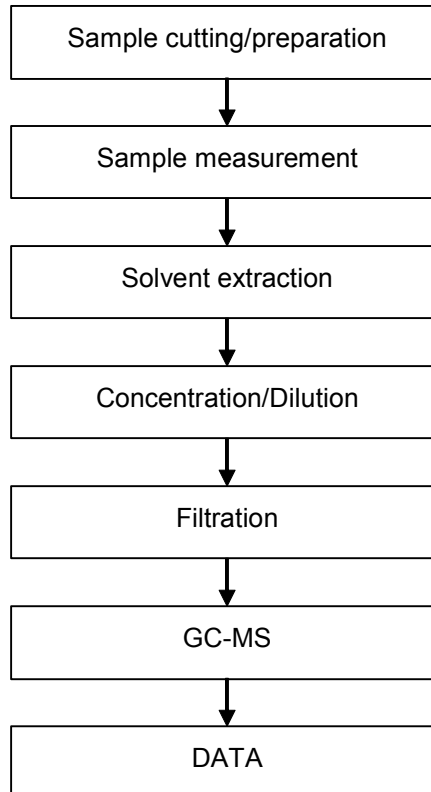
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HBCDD Testing Flow Chart



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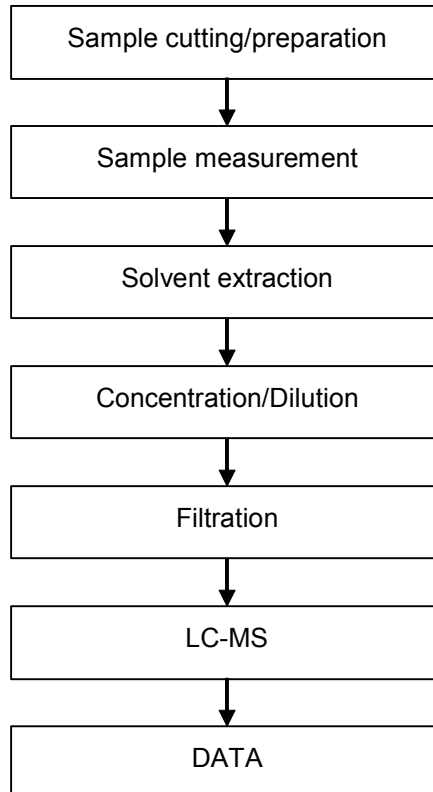
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PFOS/PFOA Testing Flow Chart



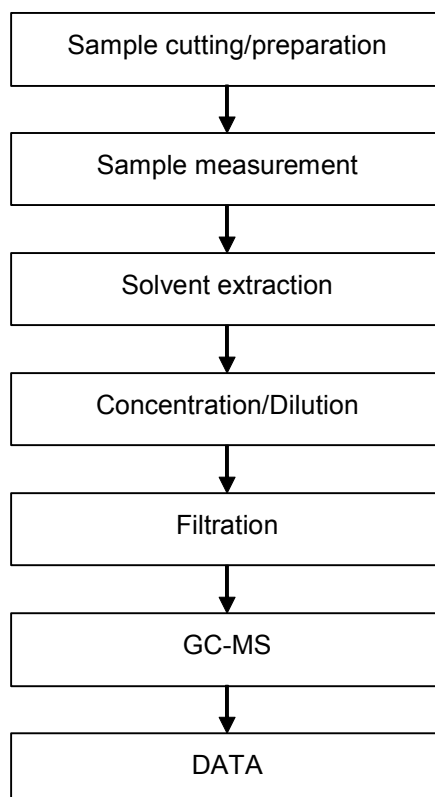
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PAHs Testing Flow Chart



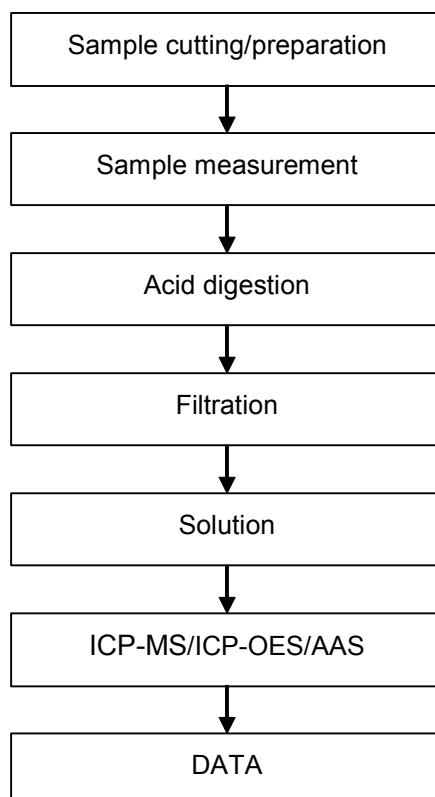
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Elements Testing Flow Chart



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Date: 19 Jan 2020

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Sample photo:



SGS authenticate the photo on original report only

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Test Report

No. SHAEC1904071101

Date: 13 Mar 2019

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COLORANT CHROMATICS TRADING(SHANGHAI)CO.,LTD
2F,BLOCK C,VI-HUB@JINQIAO,200 JINSU ROAD,PUDONG,SHANGHAI

The following sample(s) was/were submitted and identified on behalf of the clients as : FEP Colormasterbatch

SGS Job No. : SP19-007029 - SH

Lot No. : 6243509

Date of Sample Received : 08 Mar 2019

Testing Period : 08 Mar 2019 - 13 Mar 2019

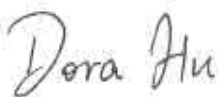
Test Requested : Selected test(s) as requested by client.

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.



Dora Hu
Approved Signatory



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Test Report

No. SHAEC1904071101

Date: 13 Mar 2019

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-040711.001	Black solid pellet

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND



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Test Report

No. SHAEC1904071101

Date: 13 Mar 2019

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Test Item(s)	Limit	Unit	MDL	001
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

- (1)The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2)On 4 June 2015, Commission Directive (EU) 2015/863 was published in the Official Journal of the European Union (OJEU) to include the phthalates BBP, DBP, DEHP and DIBP into ANNEX II of the Rohs Recast Directive. The new law restricts each phthalate to no more than 0.1% in each homogeneous material of an electrical product.
- (3)The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (4)The restriction of DEHP, BBP, DBP and DIBP shall not apply to cables or spare parts for the repair, the reuse, the updating of functionalities or upgrading of capacity of EEE placed on the market before 22 July 2019, and of medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, placed on the market before 22 July 2021.
- (5)The restriction of DEHP, BBP and DBP shall not apply to toys which are already subject to the restriction of DEHP, BBP and DBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

Test Method : With reference to EN 14582: 2016 , analysis was performed by IC.

Test Item(s)	Unit	MDL	001
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND



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Element(s)

Test Method : With reference to ASTM D 4004-06(2012), analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	001
Antimony (Sb)	mg/kg	50	ND

Hexabromocyclododecane (HBCDD/HBCD)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Hexabromocyclododecane (HBCDD/HBCD)	25637-99-4, 3194- 55-6	mg/kg	10	ND

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

Test Item(s)	Limit	Unit	MDL	001
Perfluorooctanesulfonate (PFOS)^	1000	mg/kg	10	ND
Perfluorooctanoic Acid (PFOA)	-	mg/kg	10	ND

Notes :

- (1) Max. limit specified by commission regulation (EU) No. 757/2010 amending regulation (EC) No 850/2004
- (2)^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.

Phthalates Content

Test Method : With reference to EN 14372:2004, analysis was performed by GC-MS.



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<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Diisononyl Phthalate (DINP)	28553-12-0 /68515-48-0	%	0.01	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 /68515-49-1	%	0.01	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%	0.003	ND

Notes :

- (1) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC).
 - i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles which can be placed in the mouth by children.
 - ii) Such toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.
- Please refer to Regulation (EC) No 552/2009 to get more detail information



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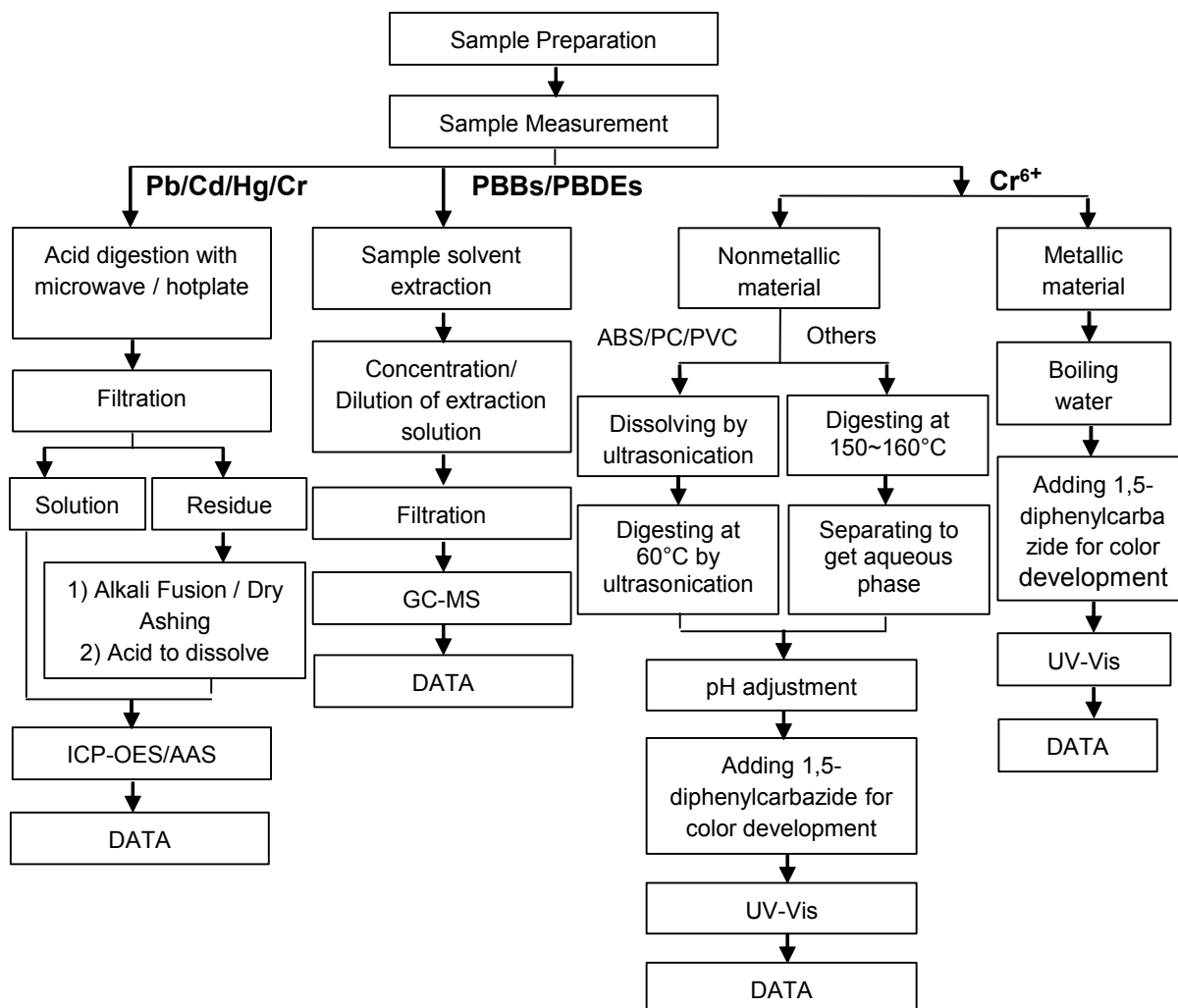
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Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr⁶⁺ and PBBs/PBDEs test method excluded)



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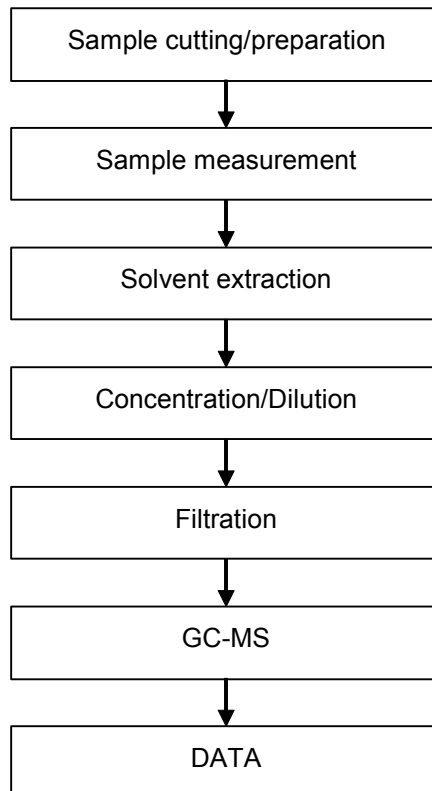
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Phthalates Testing Flow Chart



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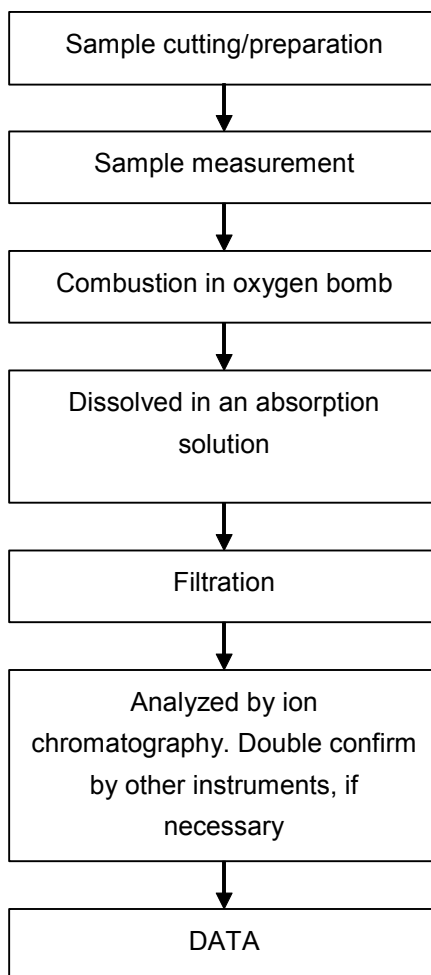
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Halogen Testing (oxygen bomb) Flow Chart



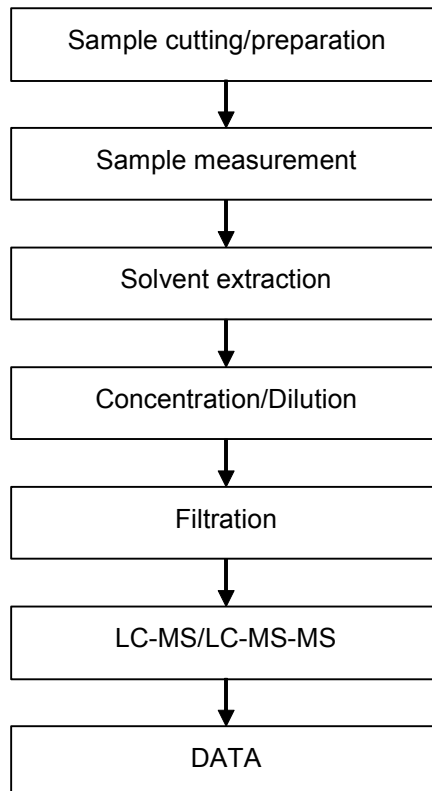
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PFOS/PFOA Testing Flow Chart



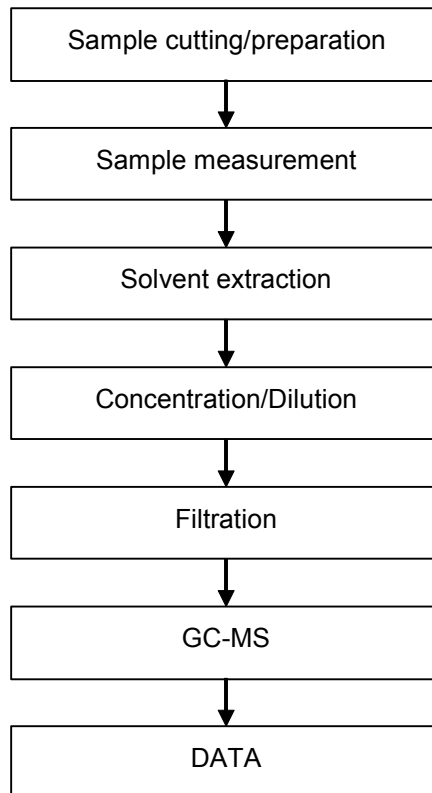
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HBCDD Testing Flow Chart



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Sample photo:



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Test Report

No. CANEC1907571202

Date: 06 May 2019

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SHENZHEN YICHENG ELECTRONIC TECHNOLOGY CO.,LTD.

4J/4H XIANJI MANSION,XIXIANG BAOMIN ROAD(II),BAOAN DISTRICT,SHENZHEN

The following sample(s) was/were submitted and identified on behalf of the clients as : Used for chemical kim
YC-60/YC-60-1/YC-61/YC-62/YC-65

SGS Job No. : CP19-021554 - SZ

Date of Sample Received : 29 Apr 2019

Testing Period : 29 Apr 2019 - 06 May 2019

Test Requested : Selected test(s) as requested by client.

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Dongyu Xie

Dongyu Xie
Approved Signatory



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center Chemical Laboratory

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Test Report

No. CANEC1907571202

Date: 06 May 2019

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN19-075712.002	Colorless transparent liquid

Remarks :

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017 , IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES , UV-Vis and GC-MS .

Test Item(s)	Limit	Unit	MDL	002
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND



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Test Report

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1,000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1,000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1,000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1,000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25



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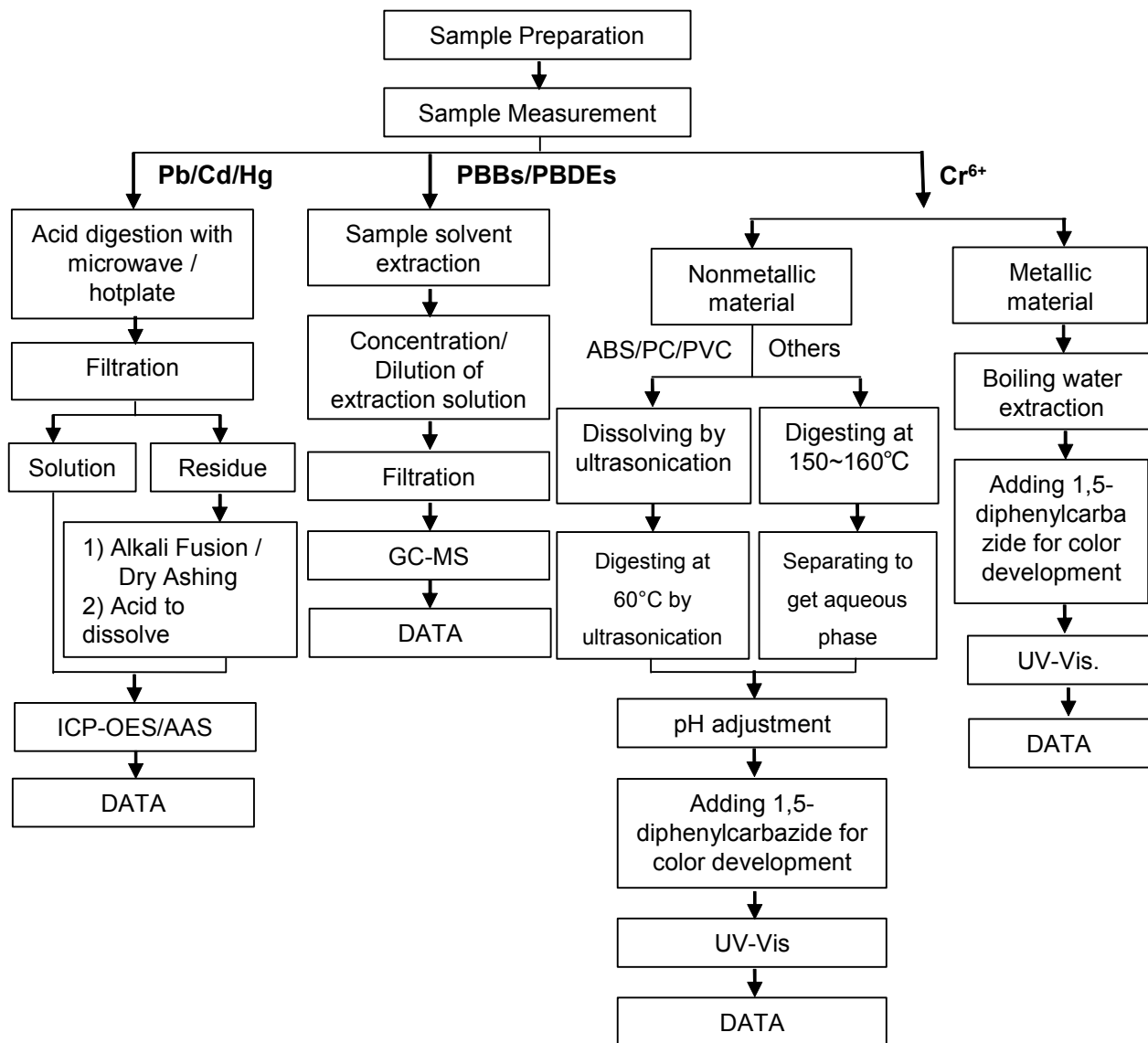
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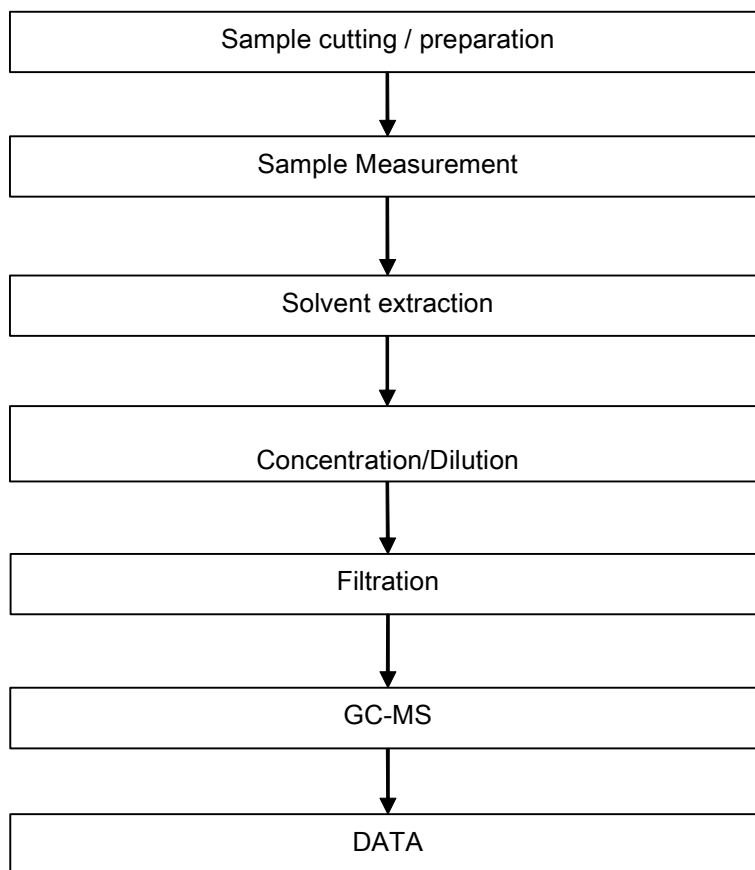
Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr⁶⁺ and PBBs/PBDEs test method excluded).



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Phthalates Testing Flow Chart



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Sample photo:



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Test Report

No. SZXEC1902125302

Date: 12 Oct 2019

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SHENZHEN YICHENG ELECTRONIC TECHNOLOGY CO.,LTD.

1212-1215,CUBE CENTER,XIXIANG BAOMIN ROAD(II),BAOAN DISTRICT,SHENZHEN

The following sample(s) was/were submitted and identified on behalf of the clients as : Used for chemical kim
YC-60/YC-60-1/YC-61/YC-62/YC-65

SGS Job No. : RP19-020475 - SZ
Date of Sample Received : 09 Oct 2019
Testing Period : 09 Oct 2019 - 12 Oct 2019
Test Requested : Selected test(s) as requested by client.
Test Method : Please refer to next page(s).
Test Results : Please refer to next page(s).

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch



Tina Fan
Approved Signatory



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Test Report

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SZX19-021253.002	Colorless transparent liquid

Remarks :

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

Halogen

Test Method : With reference to EN 14582:2016, analysis was performed by IC.

Test Item(s)	Unit	MDL	002
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND



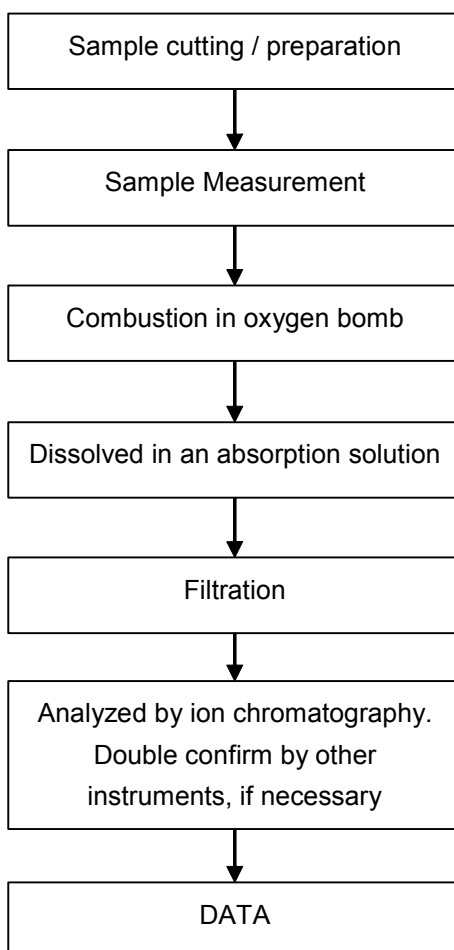
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Halogen Testing Flow Chart



Test Report

No. SZXEC1902125302

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Sample photo:



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*** End of Report ***

Test Report

No. SHAEC1927288105

Date: 13 Dec 2019

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SHANGHAI GLOBAL ELECTRONIC MATERIAL LTD.

33#, BAOSHENG ROAD. SONGJIANG AREA, SHANGHAI P.R CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : Halogen free Laminate (FR-4.1)

SGS Job No. : SP19-040494 - SH

Date of Sample Received : 09 Dec 2019

Testing Period : 09 Dec 2019 - 13 Dec 2019

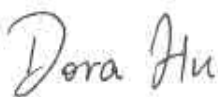
Test Requested : Selected test(s) as requested by client.

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.



Dora Hu
Approved Signatory



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Test Report

No. SHAEC1927288105

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA19-272881.003	Yellow/copper solid

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	003
Lead (Pb)	1000	mg/kg	2	6
Cadmium (Cd)	100	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND



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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>003</u>
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863. IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (3) The restriction of DEHP, BBP, DBP and DIBP shall not apply to toys which are already subject to the restriction of DEHP, BBP, DBP and DIBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

Test Method : With reference to EN 14582: 2016 , analysis was performed by IC.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>003</u>
Chlorine (Cl)	mg/kg	50	282
Bromine (Br)	mg/kg	50	ND

Hexabromocyclododecane (HBCDD/HBCD)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by GC-MS.



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<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>003</u>
Hexabromocyclododecane (HBCDD/HBCD)	mg/kg	10	ND

Asbestos

Test Method : With reference to NIOSH 9002:1994, Analysis was performed by Polarized light microscope (PLM).

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>003</u>
Actinolite	77536-66-4	%	0.1	Negative
Amosite	12172-73-5	%	0.1	Negative
Anthophyllite	77536-67-5	%	0.1	Negative
Chrysotile	12001-29-5/ 132207-32-0	%	0.1	Negative
Crocidolite	12001-28-4	%	0.1	Negative
Tremolite	77536-68-6	%	0.1	Negative

Notes :

(1) Negative = the absence of asbestos, Positive = the presence of asbestos.

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>003</u>
Perfluorooctanesulfonate (PFOS)^	mg/kg	10	ND
Perfluorooctanoic Acid (PFOA)	mg/kg	10	ND

Notes :

(1) ^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.



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Test Report

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Phthalates Content

Test Method : With reference to EN 14372:2004, analysis was performed by GC-MS.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>003</u>
Diisononyl Phthalate (DINP)	28553-12-0 /68515-48-0	%	0.01	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 /68515-49-1	%	0.01	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	%	0.003	ND
Dibutyl Phthalate (DBP)	84-74-2	%	0.003	ND
Benzylbutyl Phthalate (BBP)	85-68-7	%	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	117-81-7	%	0.003	ND



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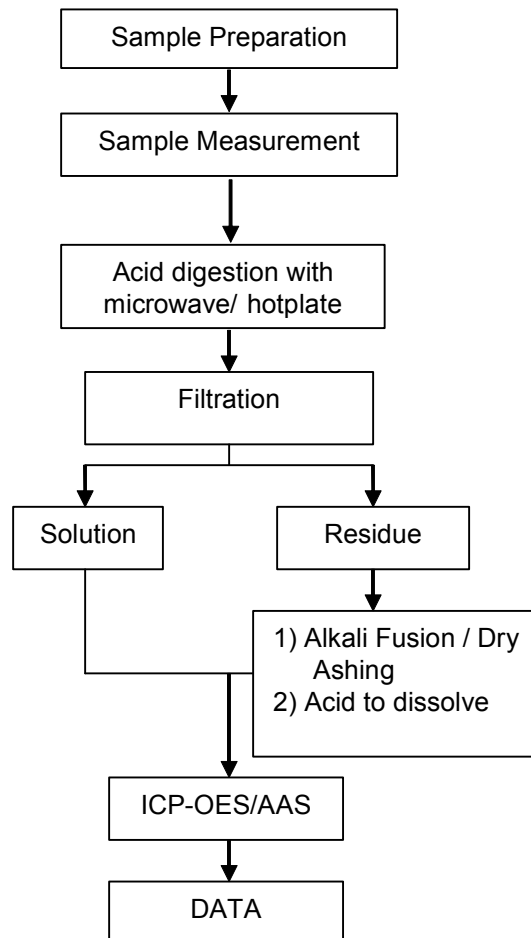
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Elements (IEC62321) Testing Flow Chart

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



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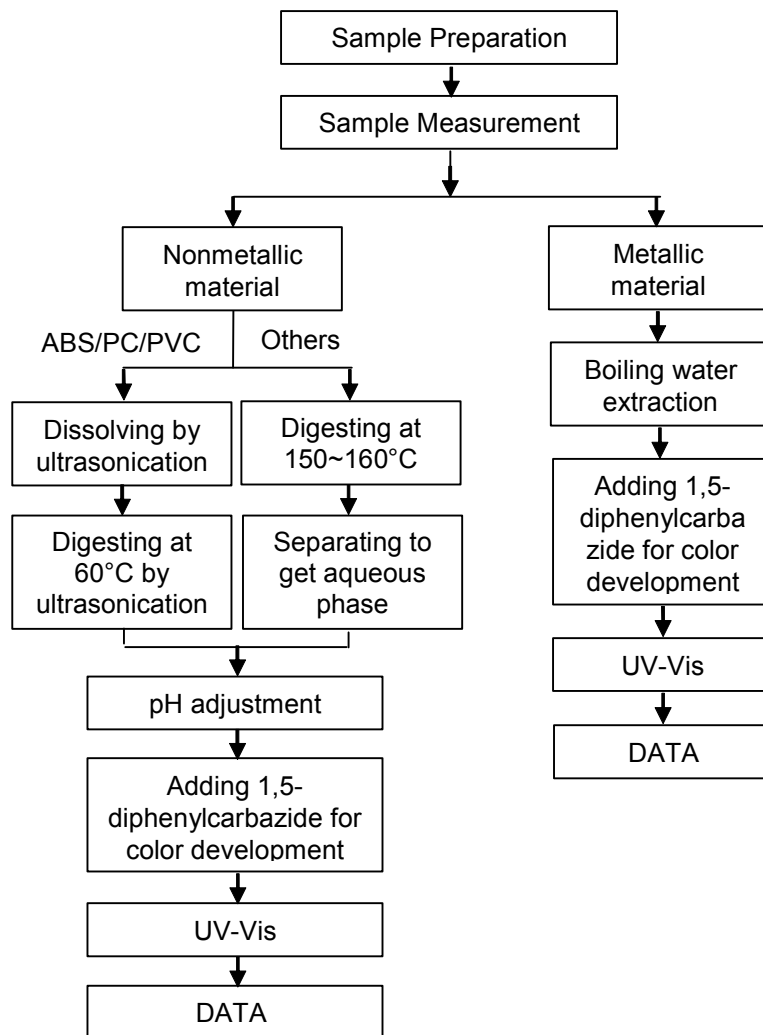
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart



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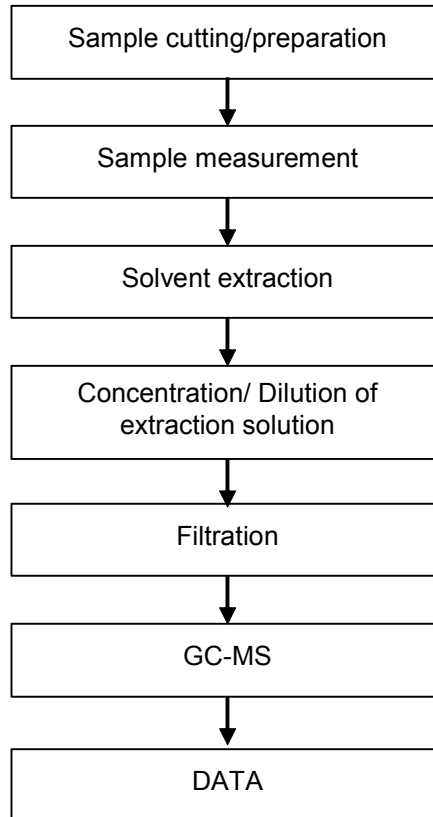
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PBBs/PBDEs Testing Flow Chart



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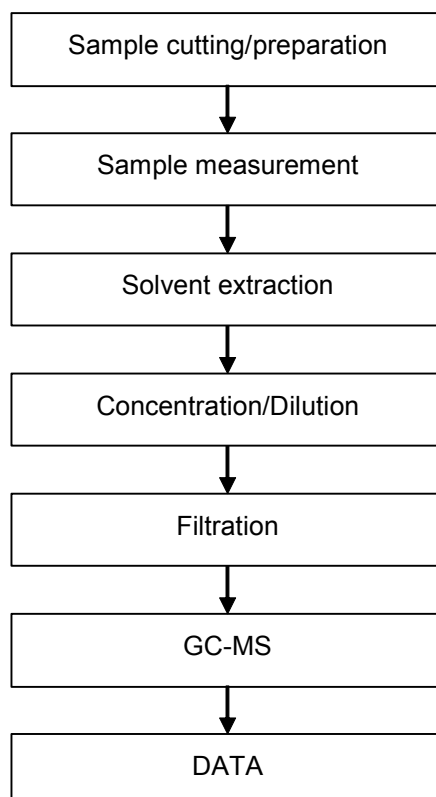
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Phthalates Testing Flow Chart



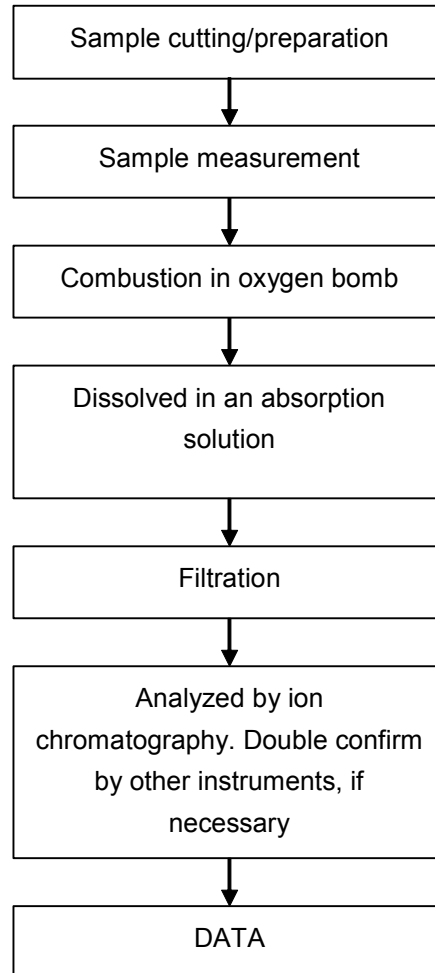
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Halogen Testing (oxygen bomb) Flow Chart



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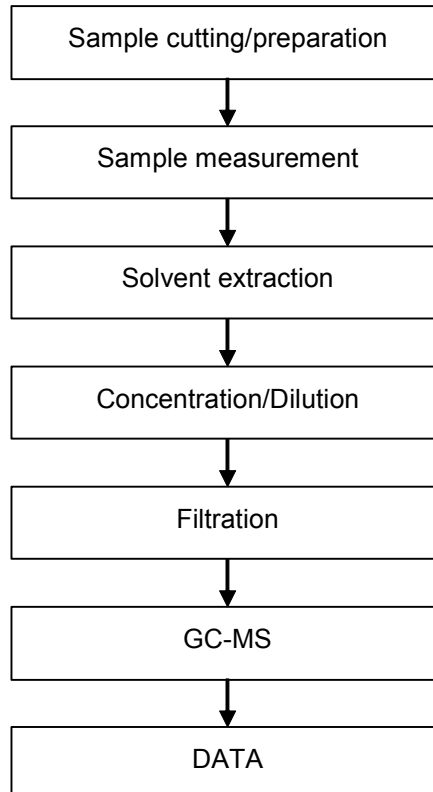
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HBCDD Testing Flow Chart



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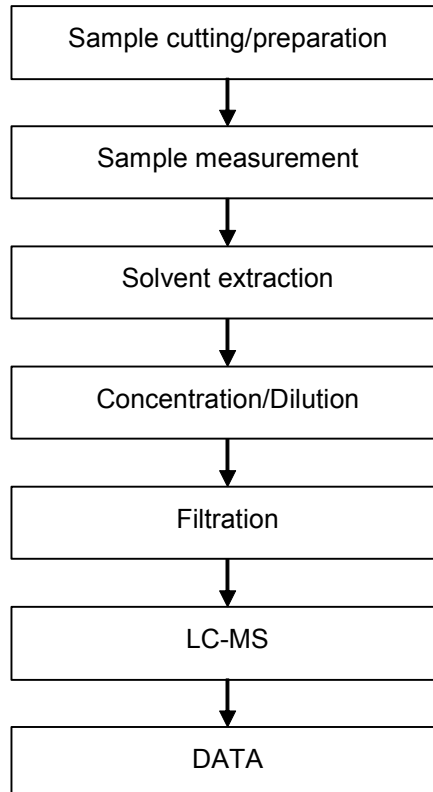
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PFOS/PFOA Testing Flow Chart



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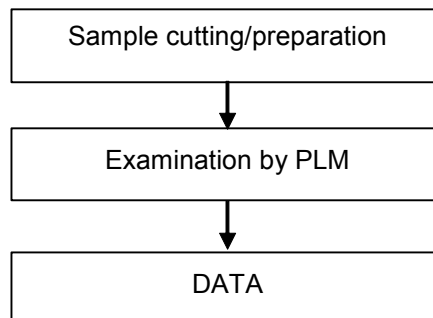
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Asbestos Testing Flow Chart



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No. SHAEC1927288105

Date: 13 Dec 2019

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Sample photo:



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Test Report

No. CANEC1920974001

Date: 31 Oct 2019

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UTEK CHEMICAL INC.

NO.10 YONGFENG ROAD,YONGSHAN VILLAGE,SHIJI TOWN,PANYU DISTRICT,GUANGZHOU
CITY, GUANGDONG PROVINCE
CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : UM-1000 /UH-100(HALOGEN-FREE)

SGS Job No. : CP19-057404 - GZ
Model No. : UM-1000 /UH-100(HALOGEN-FREE)
Client Ref. Info. : WHITE/including(E-W/E-W-1/EW-B01)
Date of Sample Received : 25 Oct 2019
Testing Period : 25 Oct 2019 - 31 Oct 2019
Test Requested : Selected test(s) as requested by client.
Test Method : Please refer to next page(s).
Test Results : Please refer to next page(s).
Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Dongyu Xie

Dongyu Xie
Approved Signatory



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center Chemical Laboratory

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Test Report

No. CANEC1920974001

Date: 31 Oct 2019

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN19-209740.001	White paste

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017 , IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES , UV-Vis and GC-MS .

Test Item(s)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND



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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1,000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1,000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1,000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1,000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863. IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (3) The restriction of DEHP, BBP, DBP and DIBP shall not apply to toys which are already subject to the restriction of DEHP, BBP, DBP and DIBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

Test Method : With reference to EN 14582:2016, analysis was performed by IC.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Fluorine (F)	mg/kg	50	134
Chlorine (Cl)	mg/kg	50	434
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Hexabromocyclododecane (HBCDD)

Test Method : With reference to IEC 62321:2008, analysis was performed by GC-MS.



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<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND

Phthalates

Test Method : With reference to IEC 62321-8:2017, analyzed by GC-MS.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.005	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.005	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%(w/w)	0.005	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%(w/w)	0.005	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%(w/w)	0.005	ND
Dipentyl Phthalates (DPENP/DnPP)	131-18-0	%(w/w)	0.005	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%(w/w)	0.005	ND
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	%(w/w)	0.005	ND
Dimethyl Phthalate (DMP)	131-11-3	%(w/w)	0.005	ND
Diethyl Phthalate (DEP)	84-66-2	%(w/w)	0.005	ND
Diisooctyl Phthalate (DIOP)	27554-26-3	%(w/w)	0.005	ND
Dinonyl Phthalate (DNP)	84-76-4	%(w/w)	0.005	ND

Remark : The result(s) shown is/are of the total weight of dried sample.



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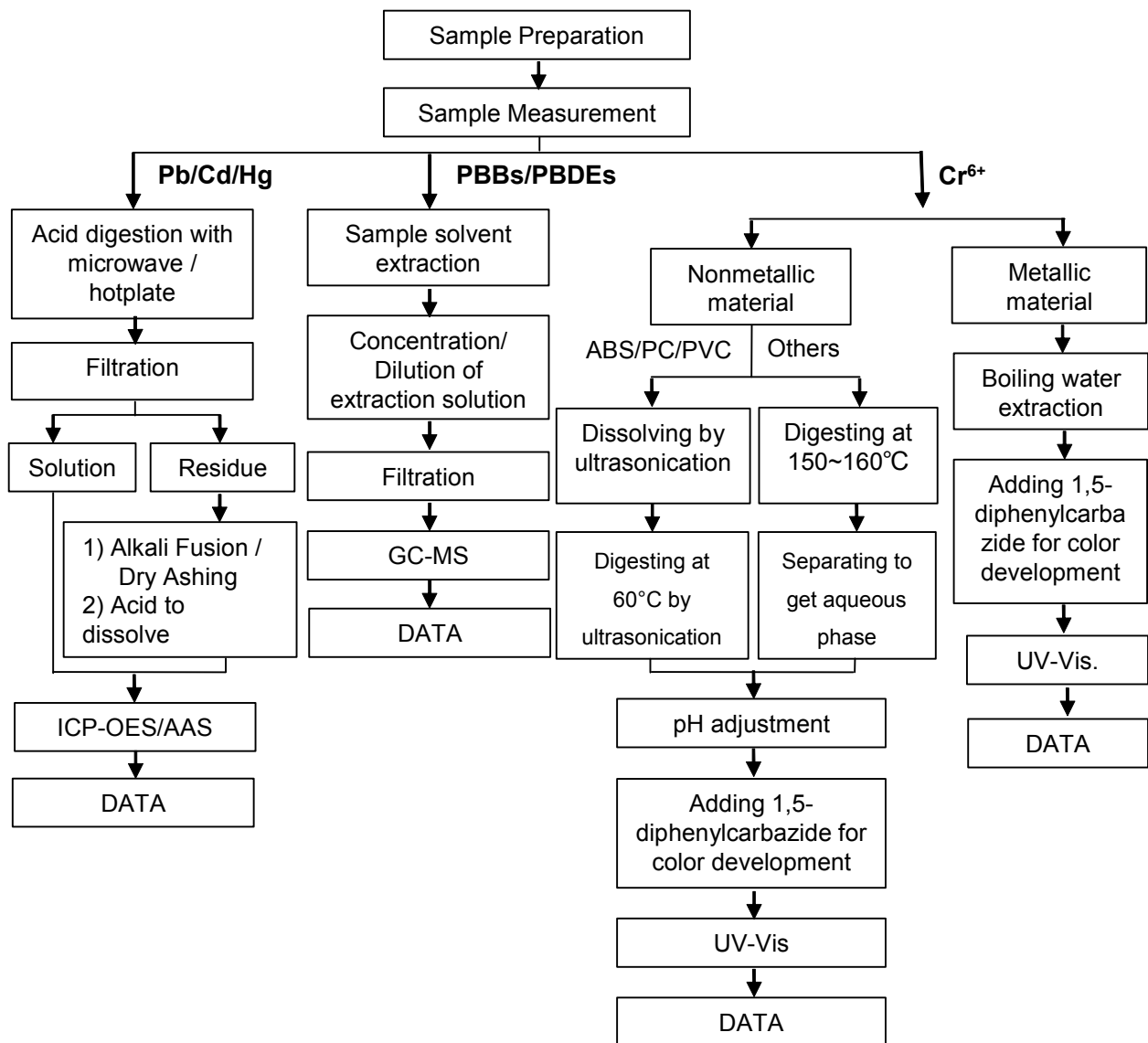
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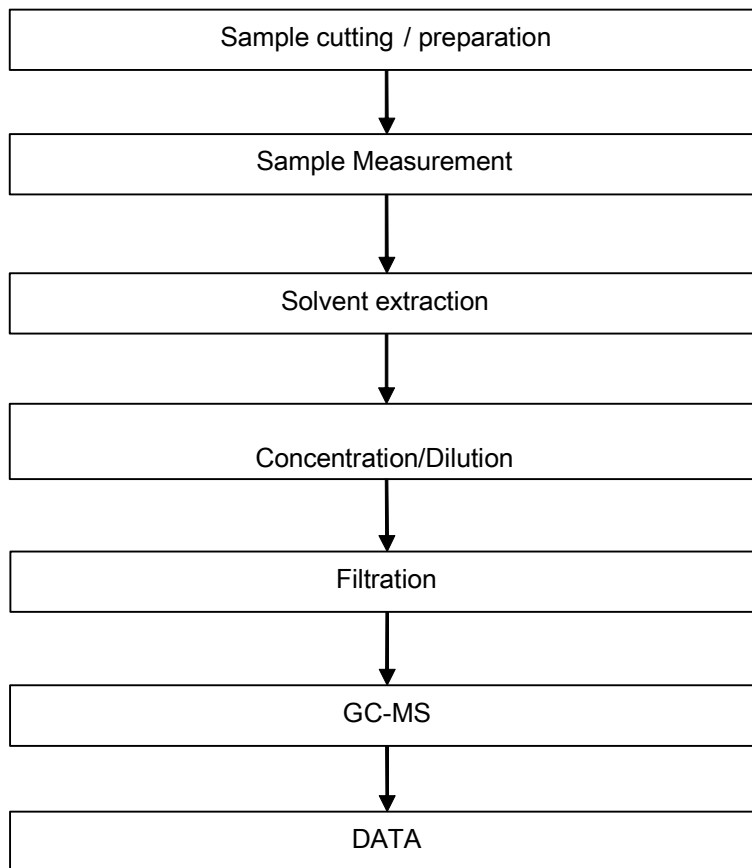
Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

- 1) These samples were dissolved totally by pre -conditioning method according to below flow chart.
(Cr⁶⁺ and PBBs/PBDEs test method excluded).



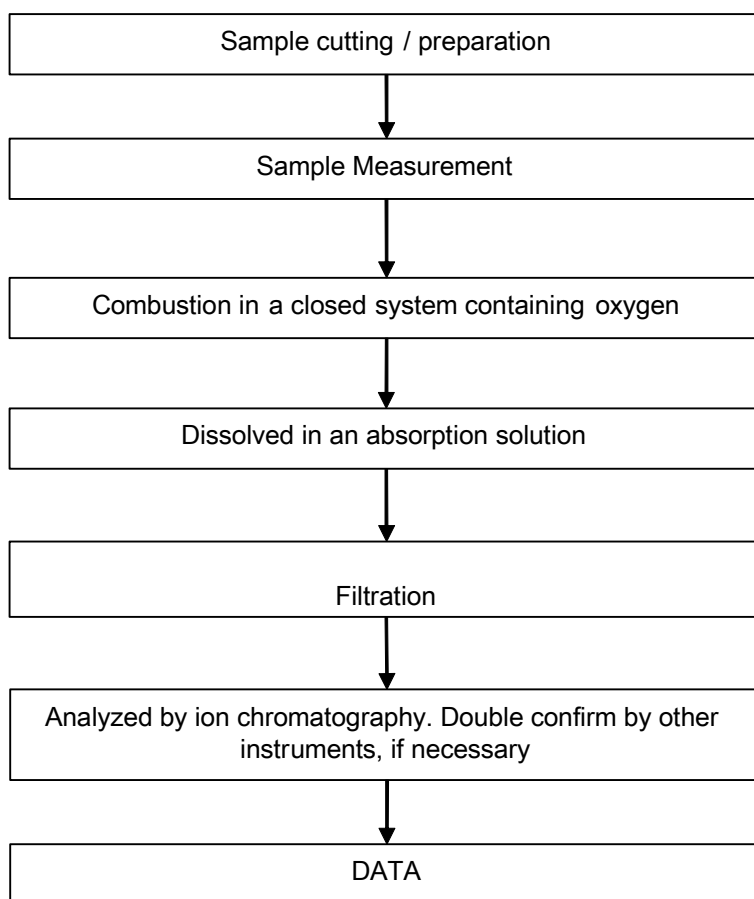
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Phthalates Testing Flow Chart



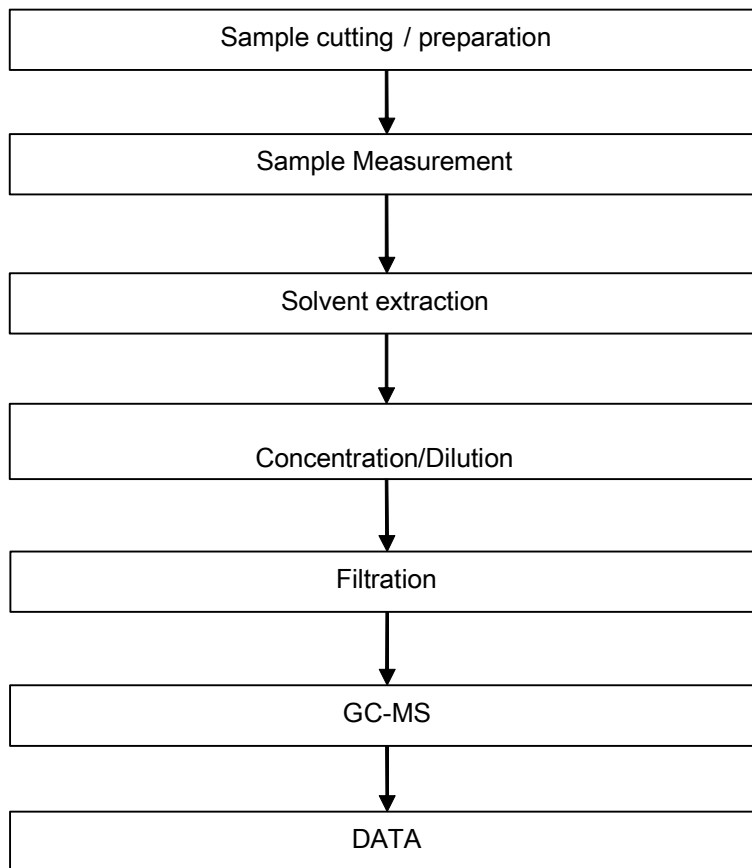
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Halogen Testing Flow Chart



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HBCDD Testing Flow Chart



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Sample photo:



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