

SPECIFICATION APPROVAL

MESSRS. 環天世通科技股份有限公司

Customer P/N : L0ATRGW10BT000
Spec. No./Ver. No. : SP03AF2442E-0020 / V01
Cirocomm P/N : 03P40E03000020T
Description : Embedded BT Antenna
RoHS 2.0 & Halogen Free

RoHS Compliant Product

Compliant with ISO14001 : 2015

Halogen Free RoHS Compliant Product

Customer Approval Stamp

Date:

Contact:

陳蕙佩

Date:

2023/11/27



太盟光電科技股份有限公司

Cirocomm Technology Corp.

No. 5, Industrial 2nd Rd., Pingzhen Dist., Taoyuan City 324, Taiwan (R.O.C.)

TEL: 886-3-4699868

FAX : 886-3-4699928

SPEC NO.	SP03AF2442E-0020	ISSUED DATE	2023.11.27	PUBLISHED BY
PRODUCT NAME	ESAK0003	VERSION	01	
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SPECIFICATION

SPEC NO. : SP03AF2442E-0020

PART NO. : 03P40E03000020T

PRODUCT NAME : ESAK0003

DESCRIPTION : Embedded BT Antenna
RoHS 2.0 & Halogen Free

REVISION STATUS

VERSION	DATE	PAGE	REVISION DESCRIPTION	PREPARED	CHECKED	APPROVED
01	2023.11.27	Whole	New Issued.	翁秀惠	謝其樺	張敦信、吳佳宗

Prepared By	Checked By	Approved By
翁秀惠	謝其樺	張敦信 吳佳宗

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CIROCOMM TECHNOLOGY .

PART NUMBER: 03P40E03000020T

1 SCOPE

CIROCOMM's customized **Embedded BT Antenna** covers the 2442MHz.

2 Name of the product

This product is named "Embedded BT Antenna ".

3 Electrical characteristics

3-1 Electrical characteristics of antenna

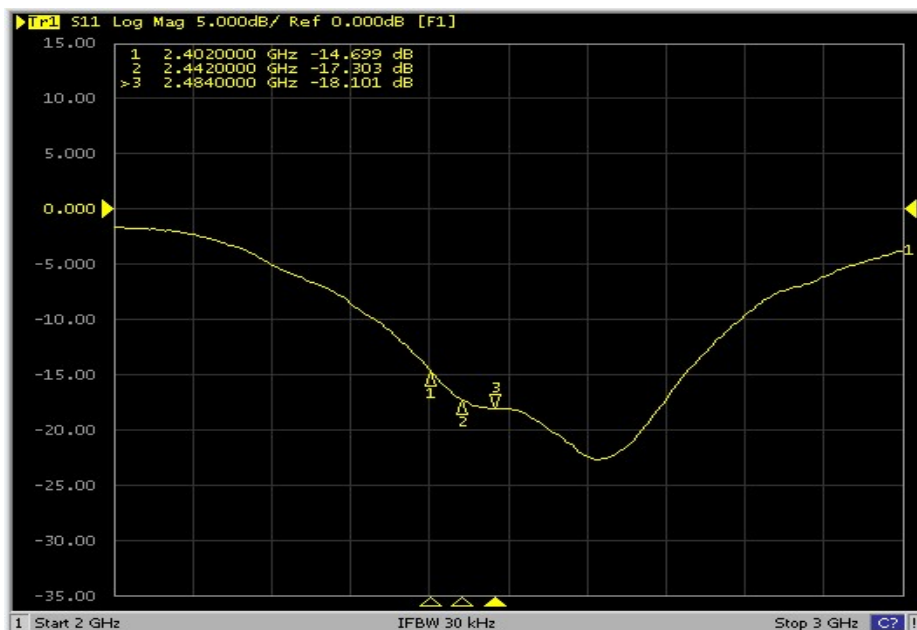
The antenna has the electrical characteristics given in Table 1 under the *cirocomm* standard installation conditions.

Table 1

No	Parameter	Specification
1	Working Frequency	2402~2484MHz
2	Dimension(FPC)	16.5*7.95*0.15mm
3	Polarization	Linear
4	Operating Temperature	- 30°C to +80°C

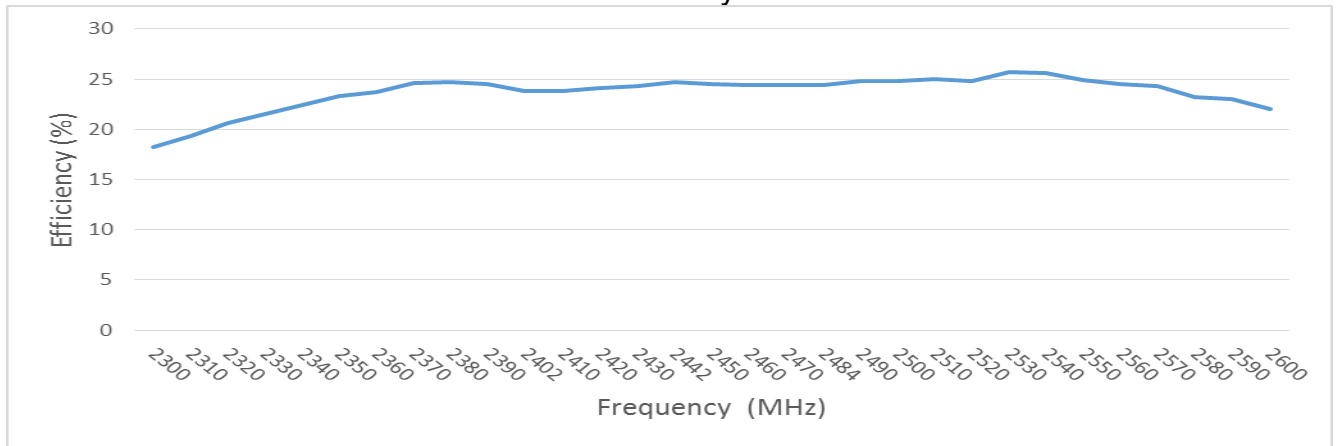
* Actual value will depend on customer ground plane size.

3-2 S11 Response curve

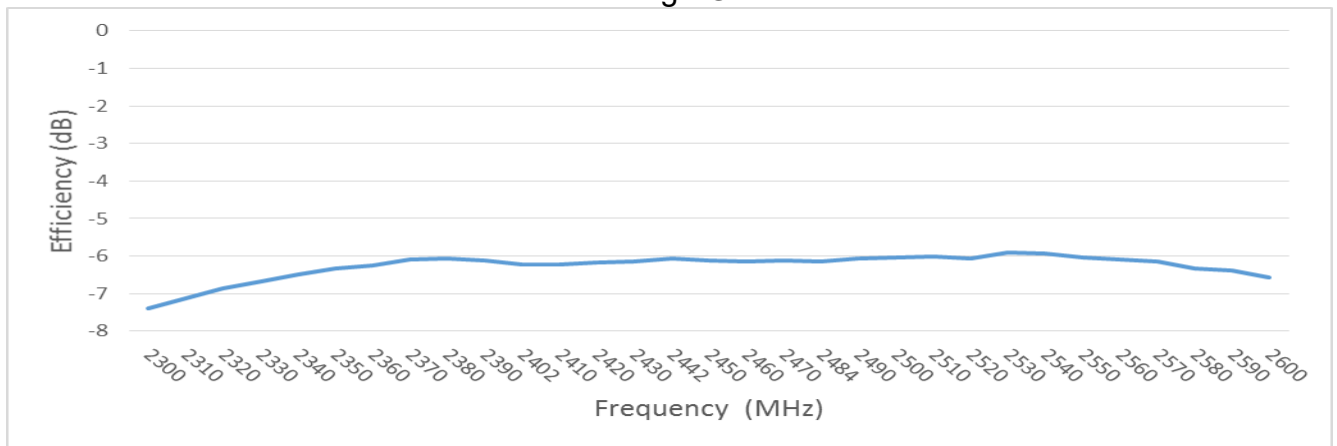


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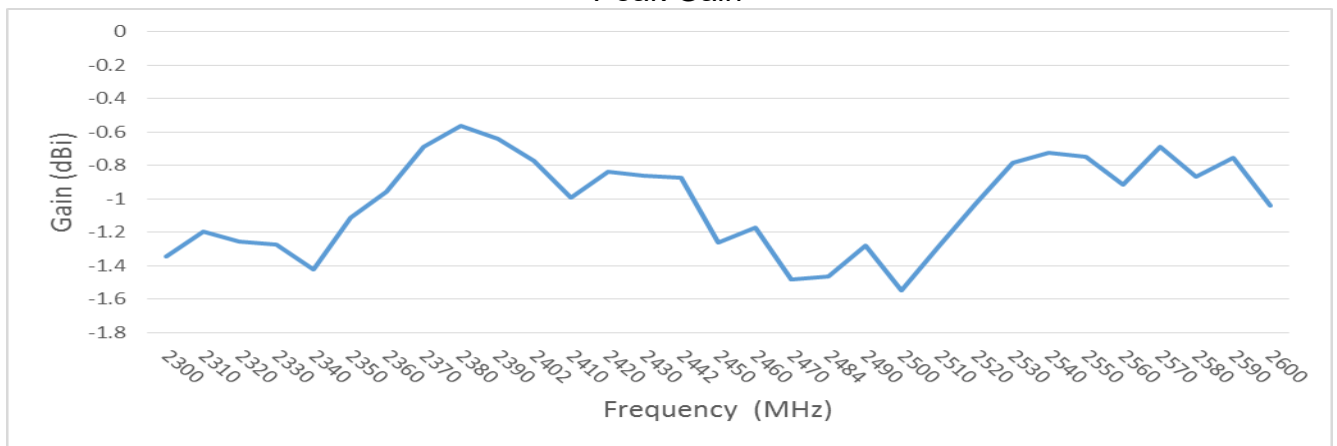
Efficiency



Average Gain



Peak Gain

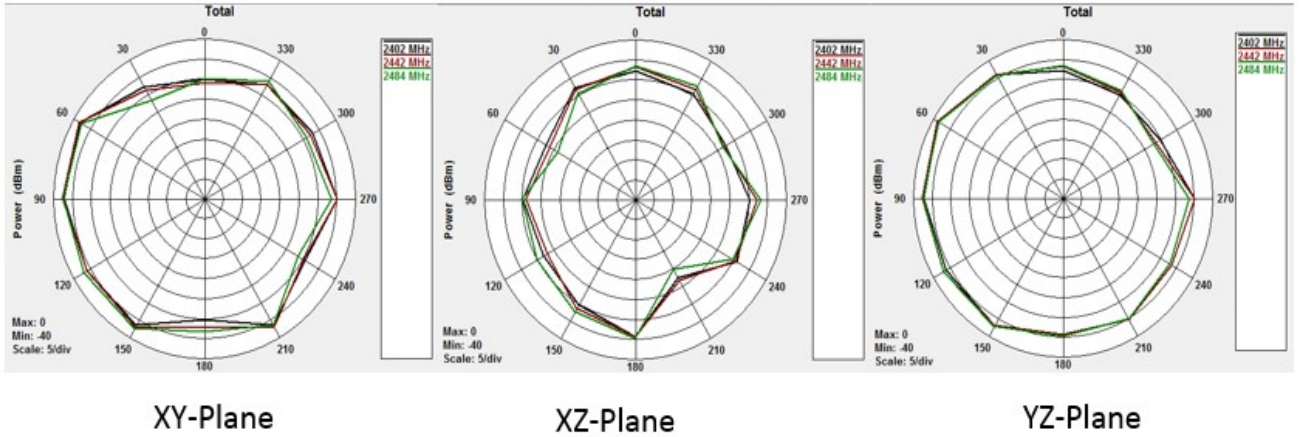


Frequency (MHz)	2402	2442	2484
Efficiency (%)	23.83	24.72	24.37
Average Gain (dB)	-6.22	-6.06	-6.13
Peak Gain (dBi)	-0.77	-0.87	-1.46

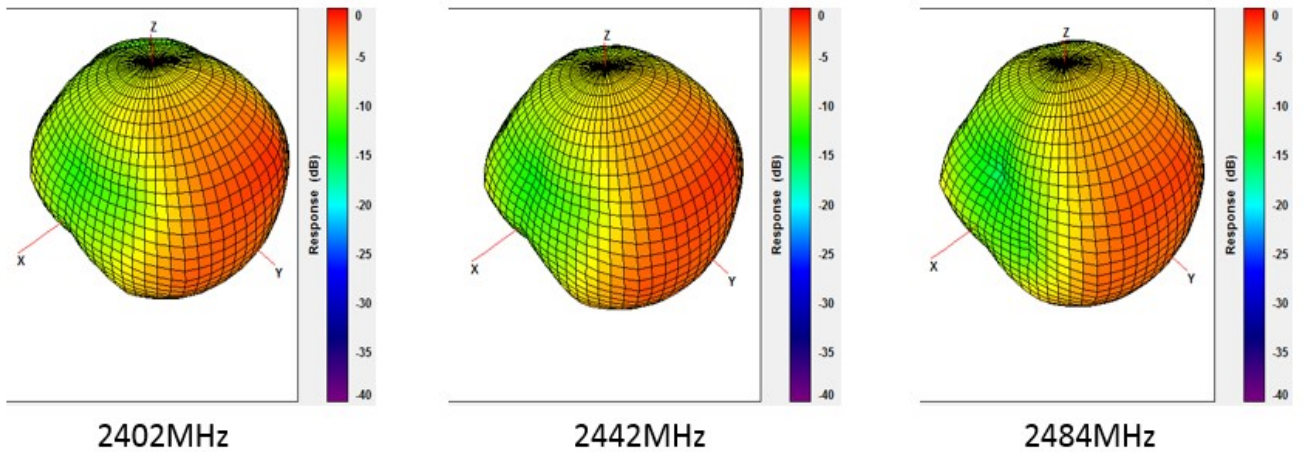


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2D Pattern



3D Pattern



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4 Environmental conditions

4-1 Operating conditions

The antenna has the electrical characteristics given in Tables 1 in the temperature range of -30°C to +80°C and under the environmental conditions of +40°C and 0-95% r.h..

4-2 Storage temperature range

The storage temperature range of product is -30°C to +80°C.

5 Reliability tests

The decision standard of the confirmation of the movement is doing the characteristic electric standard of the antenna module. And, the decision standard of the appearance isn't thought function problem become defect be.

5-1 Low-temperature test

Expose the specimen to -30°C for 16 hours and then to normal temperature/ humidity for 24 hours or more. After that examine the appearance and functions.

5-2 High-temperature test

Expose the specimen to +80°C for 16 hours and then to normal temperature/ humidity for 24 hours or more. After that examine the appearance and functions.

6 Inspection

As for the examination in the mass production, the receiving character of the ratio wave sent in a shield box from the standard antenna and S11 are confirmed in the picking out examination.

7 Warranty

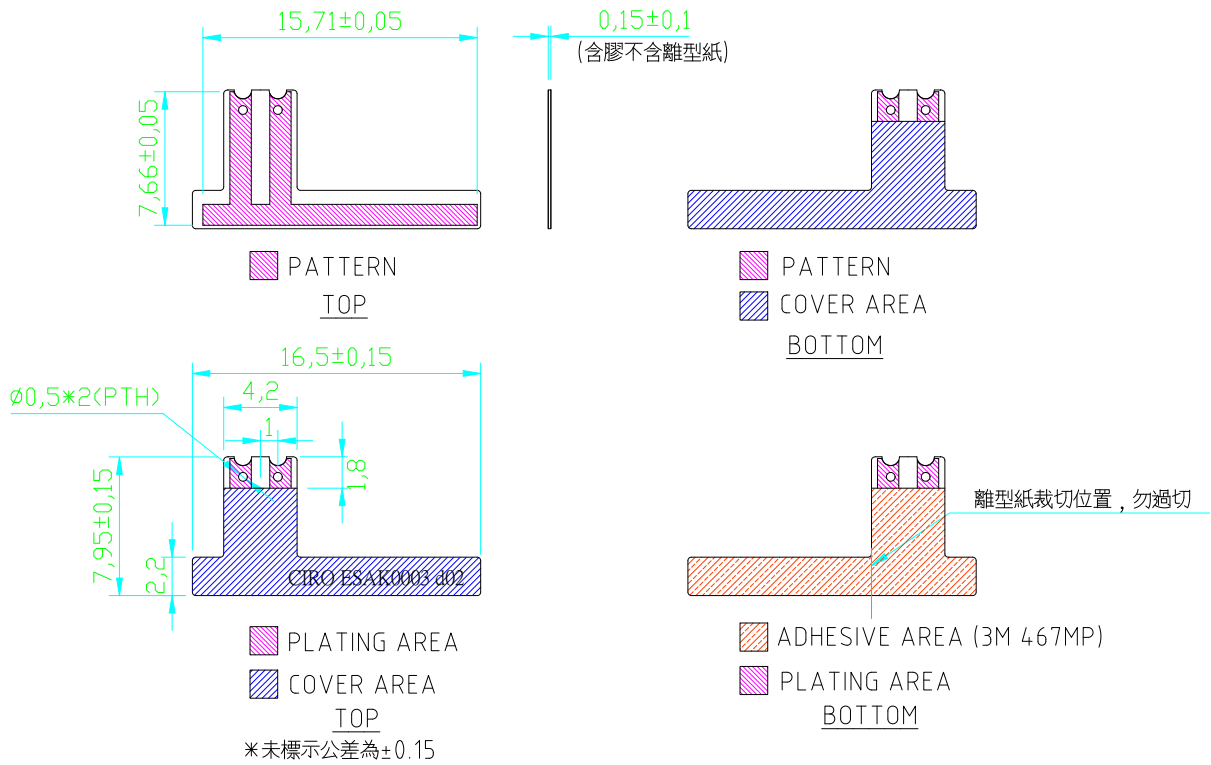
If any defect occurs form the product during proper use within a year after delivery, it will be repaired or replaced free of charge.

8 Other

Any question arising from this specification manual shall be solved by arrangement made by both parties.

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9 Drawings ANTENNA

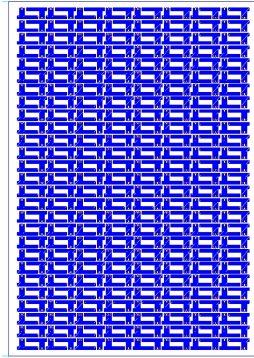


Unit : mm



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10 Packing



(圖一)



(圖二)



(外箱示意圖)

包裝方式說明:

- 1.單 pcs 裁切後排列整齊(如圖一)，再以靜電膜保護，每張排版方向儘量保持一致；432pcs/張。
- 2.產品整齊放入 PE 自封袋中，封好開口，100 張/袋 (43,200pcs)。(如圖二)
- 3.再將每袋產品放入外箱中。(註：依訂單數量彈性決定外箱大小)

Material Composition Declaration

2nd level 材料組件	2nd level 供應商	Total weight after assembly of components (g) 零組件組裝後 總重量(g)	Constitute the substance name 構成物質名稱	CAS No.	Weight Percentage(g) 重量百分比(%)	Weight after disassembly of parts and components (g) 零組件拆解後 重量(g)	3rd Party Test Lab 第三方公正實 驗室	Lab Report No. 檢測報告編號	Report Date: 檢測報告日期	RoHS/Halogen Free物質檢測結果(mg/kg, ppm)：請填入所有原始報告中結果之最大值 Test Results for RoHS/Halogen Free- Please enter the maximum from all 3rd party report Limit 限值 (mg/kg, ppm)													Remark 備註			
										Pb 鉛	Cd 鎘	Hg 汞	Cr6+ 六價鉻	Packaging 包裝材料 Pb+Cd+Hg+Cr6+Packag ing	PBBs 多溴聯苯	PBDEs 溴聯苯醚	DEHP	BBP	DBP	DIBP	氯 (Cl)	溴 (Br)		Total Halogens 氯 (Cl)+溴 (Br)	全氟辛烷 磺酸PFOS	全氟辛酸 (按)PFOA
										< 500	< 50	<500	ND/Negative	<100	<500	<500	<1000	<1000	<1000	<1000	< 900	< 900		<1500	<10	<10
1.肖膠 (3M_467MP)	3M		Acrylate Polymer	Trade Secrets (商業機密)	100.00%	0.003	SGS	CANEC2219166301	2022/9/14	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-
							SGS	CANEC2219166302	2022/9/14	-	-	-	-	-	-	-	-	-	-	-	-	150	ND	-	-	-
2.銅箔 (LPI-HF)	九江福萊克斯有限公司		聚酰亚胺	25038-81-7	2.98%	0.003	CTI	A2230172669101001	2023/4/20	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-
			环氧树脂	25036-25-3	2.42%																					
			阻燃剂	225789-38-8	0.49%																					
			橡胶	9003-18-3	1.45%																					
3.防焊油墨 (PSM-800)	UNIRES CHEMICAL INDUSTRIAL CO., LTD.	0.010	銅箔	7440-50-8	92.66%	0.002	SGS	ETR22705905	2022/8/5	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND	ND
			Epoxy acrylate oligomer	28064-14-4	50.00%																					
			Silicon dioxide Fused silica	7631-86-9	13.00%																					
			Oxygen acrylate oligmer Epoxy acrylate oligmer	64742-94-5	4.00%																					
			Methyl dipropylene glycol	34590-94-8	4.00%																					
			Carbon black	1333-86-4	3.50%																					
			BaSO4 sulfate	13462-86-7	24.00%																					
Photoinitiator and the others	5495-84-1	1.50%																								
4.文字印刷 (ZSR-150)	川裕工業股份有限公司		環氧樹脂	25085-99-8	50.00%	0.002	SGS	ETR22A01347M01	2022/10/17	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	591	ND	-	ND	ND
			硫酸鋇	7727-43-7	15.00%																					
			鈦白粉	13463-67-7	30.00%																					
			石油腦	8030-30-6	5.00%																					

Test Report

No. CANEC2219166301

Date: 14 Sep 2022

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Client Name : 3M MATERIAL TECHNOLOGY (GUANGZHOU) CO.,LTD.

Client Address : NO.9,NANXIANG 2 ROAD,SCIENCE CITY GUANGZHOU HIGH TECH INDUSTRY
DEVELOPMENT DISTRICT
CHINA

Sample Name : 467MP
Model No. : 467MP
Client Ref. Info. : 467MPF, 468MP, 467MPR, 468MPF, 468MPR, 7952MP, 7955MP, 7962MP,
7965MP, 9172MP, 9172PT, 9185MP, 9188, 9667MP, 9668MP, 9676, 7953MP,
7945MP, 7956MP, 7993MP, 7995MP, 7997MP, 7957MP, 7959MP, 7961MP,
9045MP, 9056MP, 9057MP, 9059MP, 9061MP, 9492MP, 9492MPF, 9495MP,
9495MPF, 9495FL, CDB610

The above sample(s) and information were provided by the client.

SGS Job No. : CP22-049846 - GZ
Date of Sample Received : 07 Sep 2022
Testing Period : 07 Sep 2022 - 14 Sep 2022
Test Requested : Selected test(s) as requested by the client.
Test Method(s) : Please refer to next page(s).
Test Result(s) : Please refer to next page(s).

Result Summary :

Test Requested	Conclusion
EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	PASS

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

Dongyu Xie

Dongyu Xie
Approved Signatory

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4A33B974



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

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198 Kazhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663

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Test Report

No. CANEC2219166301

Date: 14 Sep 2022

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Test Result(s) :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN22-191663.001	Colorless transparent double-side adhesive sheet

Remarks :

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

EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)

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 .

<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	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. CANEC2219166301

Date: 14 Sep 2022

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</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
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Bis (2-ethylhexyl) 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.
- (2) IEC 62321 series is equivalent to EN 62321 series
- (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.

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule ($w=0$) stated in ILAC-G8:09/2019.



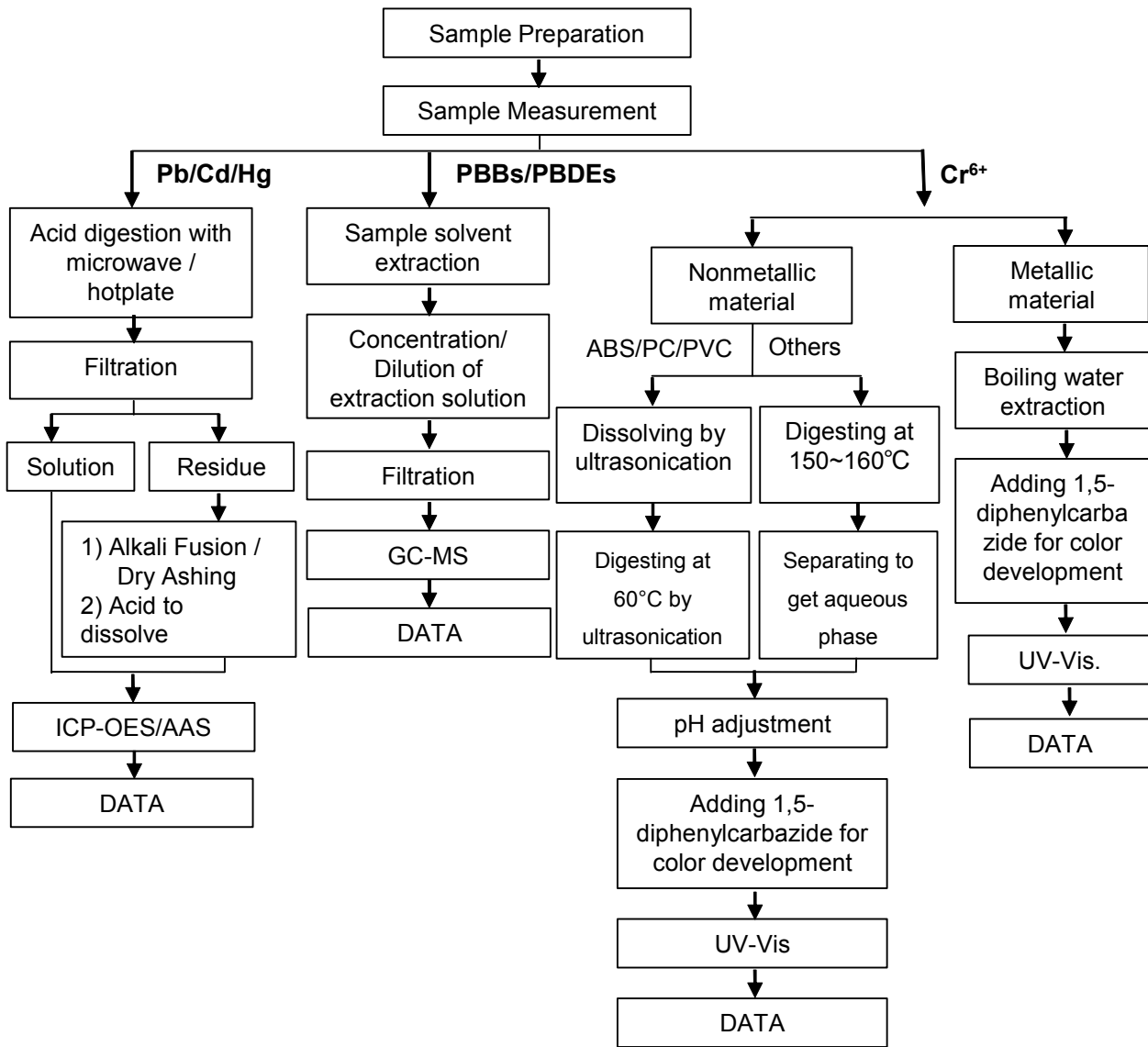
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ATTACHMENTS

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).

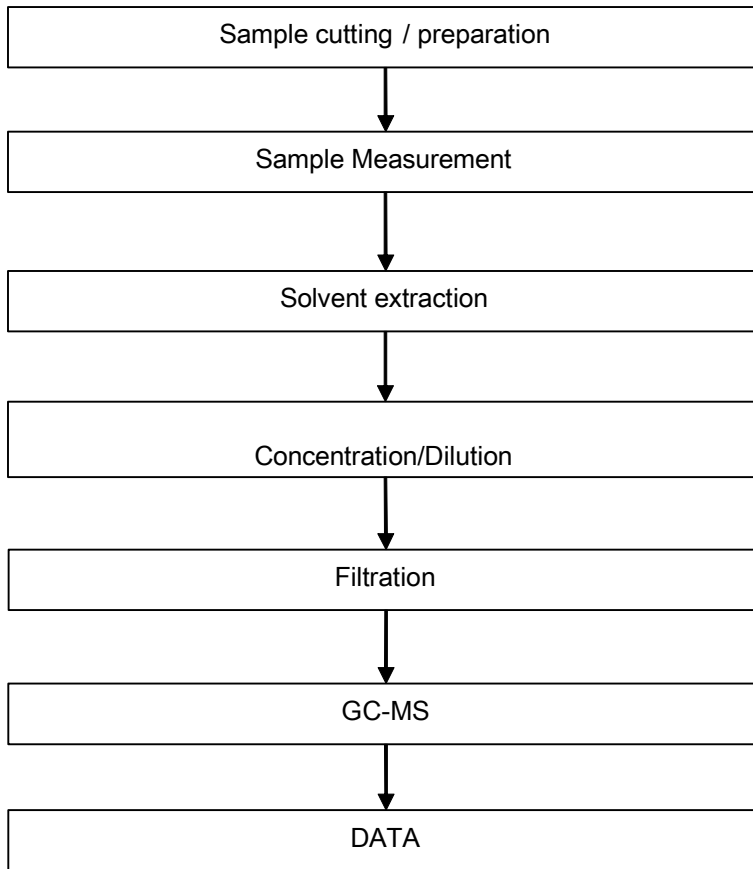


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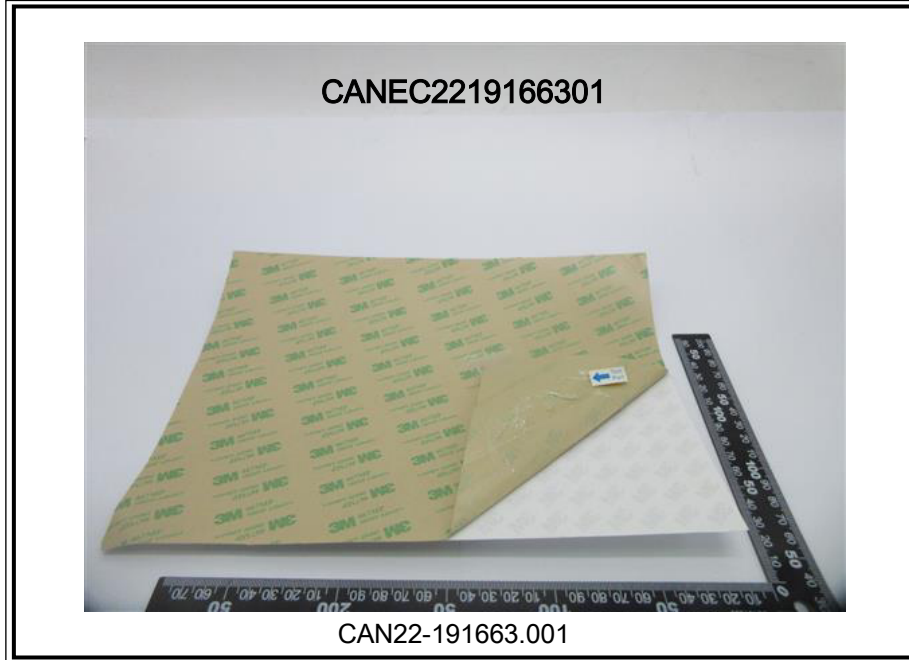
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Phthalates Testing Flow Chart



Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***



Test Report

No. CANEC2219166302

Date: 14 Sep 2022

Page 1 of 4

Client Name : 3M MATERIAL TECHNOLOGY (GUANGZHOU) CO.,LTD.

Client Address : NO.9,NANXIANG 2 ROAD,SCIENCE CITY GUANGZHOU HIGH TECH INDUSTRY
DEVELOPMENT DISTRICT
CHINA

Sample Name : 467MP

Model No. : 467MP

Client Ref. Info. : 467MPF, 468MP, 467MPR, 468MPF, 468MPR, 7952MP, 7955MP, 7962MP,
7965MP, 9172MP, 9172PT, 9185MP, 9188, 9667MP, 9668MP, 9676, 7953MP,
7945MP, 7956MP, 7993MP, 7995MP, 7997MP, 7957MP, 7959MP, 7961MP,
9045MP, 9056MP, 9057MP, 9059MP, 9061MP, 9492MP, 9492MPF, 9495MP,
9495MPF, 9495FL, CDB610

The above sample(s) and information were provided by the client.

SGS Job No. : CP22-049846 - GZ

Date of Sample Received : 07 Sep 2022

Testing Period : 07 Sep 2022 - 14 Sep 2022

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

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

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

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

Dongyu Xie

Dongyu Xie
Approved Signatory

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C0C74551



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

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Test Report

No. CANEC2219166302

Date: 14 Sep 2022

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Test Result(s) :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN22-191663.001	Colorless transparent double-side adhesive sheet

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>001</u>
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	150
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule ($w=0$) stated in ILAC-G8:09/2019.

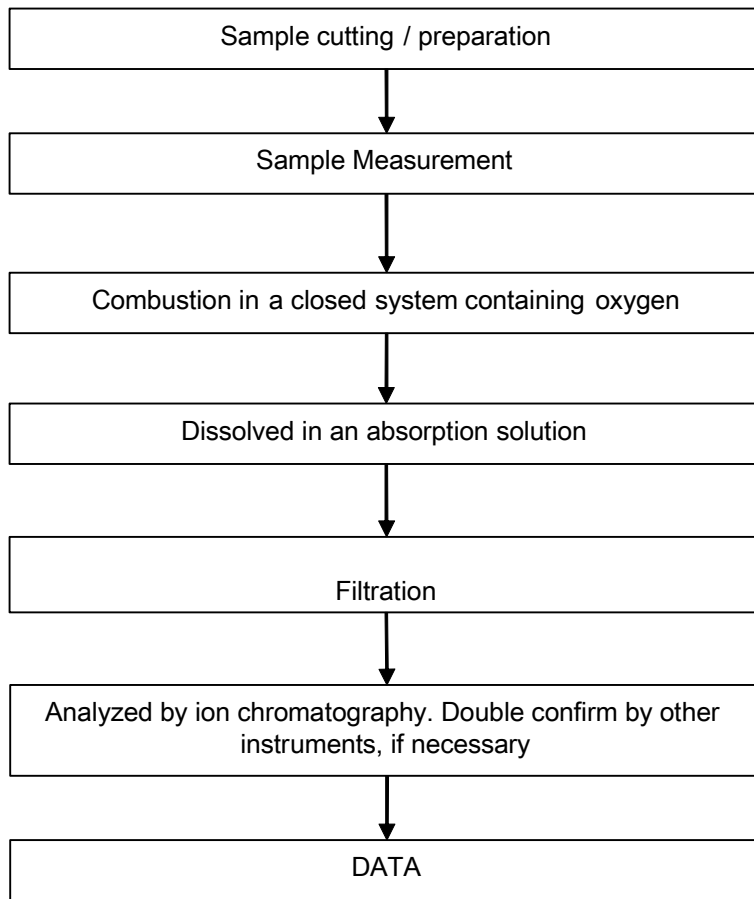


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Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN_Doccheck@sgs.com

ATTACHMENTS

Halogen Testing Flow Chart



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Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***





Test Report

Report No. A2230172669101001

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Company Name JIUJIANG FLEX CO.,LTD
shown on Report
Address 1210 QIAN JIN ROAD(E), JIUJIANG JIANGXI, CHINA

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

Sample Name Copper clad laminates of polyimide for FPC (印制线路用无卤阻燃型聚酰亚胺层压覆铜板)
Part No. LPI-HF
Material PI、Adhesive、Cu
Sample Received Date Apr. 17, 2023
Testing Period Apr. 17, 2023 to Apr. 20, 2023

Test Requested As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)), Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs), Phthalates (DBP, BBP, DEHP, DIBP), Beryllium(Be), Antimony(Sb), Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), Perfluorooctane Sulfonates(PFOS), Perfluorooctanoic Acid(PFOA), Phthalates,Red phosphorus in the submitted sample(s).

Test Method/Test Result(s) Please refer to the following page(s).



Approved by

Hill Zheng

Date

Apr. 20, 2023

Hill Zheng
Technical Manager

No. R158921634

Centre Testing International Group Co.,Ltd.

CTI Building, Xing Dong Community, Xin'an Sub-district, Bao'an District, Shenzhen City, Guangdong Province, P.R. China

Test Report

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Conclusion

<u>Tested Sample</u>	<u>According to standard/directive</u>	<u>Result</u>
Submitted Sample	RoHS Directive 2011/65/EU with amendment (EU) 2015/863	PASS

PASS means that the results shown on the report comply with the limits set by RoHS Directive 2011/65/EU with amendment (EU) 2015/863.

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Test Method

Tested Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	IEC 62321-5:2013	ICP-OES
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium (Cr(VI))	IEC 62321-7-2:2017 and/or determination of Total Chromium by IEC 62321-5:2013	UV-Vis/ICP-OES
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS
Beryllium(Be)	Refer to US EPA 3052:1996 & US EPA 6010D:2018	ICP-OES
Antimony(Sb)	Refer to US EPA 3052:1996 & US EPA 6010D:2018	ICP-OES
Fluorine (F)	Refer to EN 14582:2016	IC
Chlorine (Cl)	Refer to EN 14582:2016	IC
Bromine (Br)	Refer to EN 14582:2016	IC
Iodine (I)	Refer to EN 14582:2016	IC
Perfluorooctane Sulfonates(PFOS)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
Perfluorooctanoic Acid(PFOA)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
Phthalates	Refer to EN 14372:2004(E)	GC-MS
Red phosphorus	Refer to GB/T 9722-2006	PY-GC-MS

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Test Result(s)

Tested Item(s)	Result	MDL	Limit
	001		
Lead (Pb)	N.D.	2 mg/kg	1000 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury (Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium (Cr(VI))	N.D.	8 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL	Limit
	001		
Polybrominated Biphenyls (PBBs)			
Monobromobiphenyl	N.D.	5 mg/kg	1000 mg/kg
Dibromobiphenyl	N.D.	5 mg/kg	
Tribromobiphenyl	N.D.	5 mg/kg	
Tetrabromobiphenyl	N.D.	5 mg/kg	
Pentabromobiphenyl	N.D.	5 mg/kg	
Hexabromobiphenyl	N.D.	5 mg/kg	
Heptabromobiphenyl	N.D.	5 mg/kg	
Octabromobiphenyl	N.D.	5 mg/kg	
Nonabromobiphenyl	N.D.	5 mg/kg	
Decabromobiphenyl	N.D.	5 mg/kg	

Tested Item(s)	Result	MDL	Limit
	001		
Polybrominated Diphenyl Ethers (PBDEs)			
Monobromodiphenyl ether	N.D.	5 mg/kg	1000 mg/kg
Dibromodiphenyl ether	N.D.	5 mg/kg	
Tribromodiphenyl ether	N.D.	5 mg/kg	
Tetrabromodiphenyl ether	N.D.	5 mg/kg	
Pentabromodiphenyl ether	N.D.	5 mg/kg	
Hexabromodiphenyl ether	N.D.	5 mg/kg	
Heptabromodiphenyl ether	N.D.	5 mg/kg	
Octabromodiphenyl ether	N.D.	5 mg/kg	
Nonabromodiphenyl ether	N.D.	5 mg/kg	
Decabromodiphenyl ether	N.D.	5 mg/kg	

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Tested Item(s)	Result	MDL	Limit
	001		
Phthalates (DBP, BBP, DEHP, DIBP)			
Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg	1000 mg/kg
Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	50 mg/kg	1000 mg/kg
Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	50 mg/kg	1000 mg/kg
Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg	1000 mg/kg
Tested Item(s)	Result	MDL	
	001		
Beryllium (Be)	N.D.	2 mg/kg	
Tested Item(s)	Result	MDL	
	001		
Antimony (Sb)	N.D.	5 mg/kg	
Tested Item(s)	Result	MDL	
	001		
Fluorine (F)	N.D.	10 mg/kg	
Chlorine (Cl)	N.D.	10 mg/kg	
Bromine (Br)	N.D.	10 mg/kg	
Iodine (I)	N.D.	10 mg/kg	
Tested Item(s)	Result	MDL	
	001		
Perfluorooctane Sulfonates (PFOS)	N.D.	0.010 mg/kg	
Tested Item(s)	Result	MDL	
	001		
Perfluorooctanoic Acid (PFOA)	N.D.	0.010 mg/kg	

Test Report

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Tested Item(s)	Result	MDL
	001	
Phthalates		
Di-n-octyl phthalate (DNOP) CAS#:117-84-0	N.D.	30 mg/kg
Di-isononyl phthalate (DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
Di-iso-decyl phthalate (DIDP) CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg
Diethyl phthalate (DEP) CAS#:84-66-2	N.D.	30 mg/kg
Tested Item(s)	Result	MDL
	001	
Red phosphorus	Negative [#]	500 mg/kg

Sample/Part Description

No.	CTI Sample ID	Description
1	001	Brown-yellow film with cupreous metal foil

Remark: The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury, Beryllium, Antimony.

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

-1000 mg/kg = 0.1%

-Negative = Not Contained

-The red phosphorus is qualified by PY-GC-MS method which detect pyrolysis products P₄ of red phosphorus. But there is a false positive risk by performing this method, since P₄ could also generate while the phosphate and organic phosphate coexist with some strong oxidizing or reductant agent in pyrolysis process.

-[#]Result for reference only.

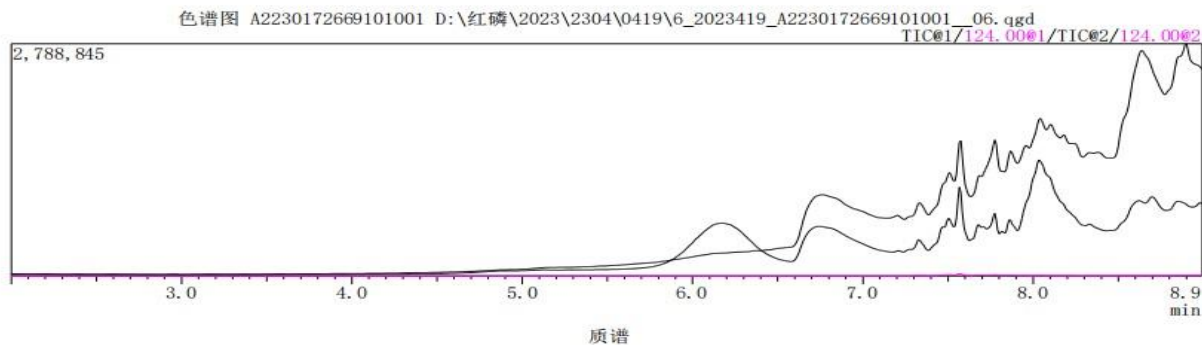
Note: The testing data and result(s) in this report is(are) just for scientific research, education, internal quality control and product development etc.

Test Report

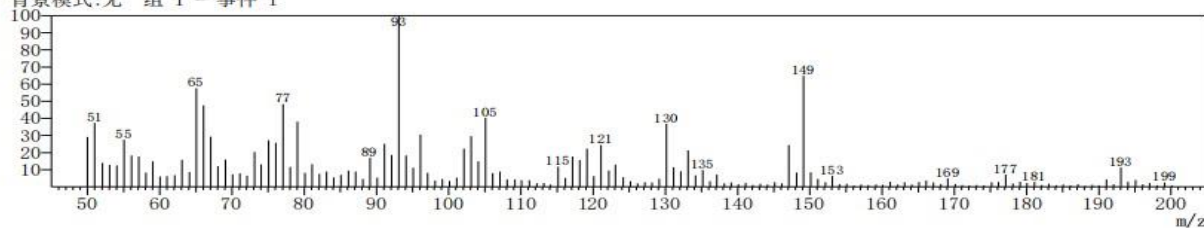
Report No. A2230172669101001

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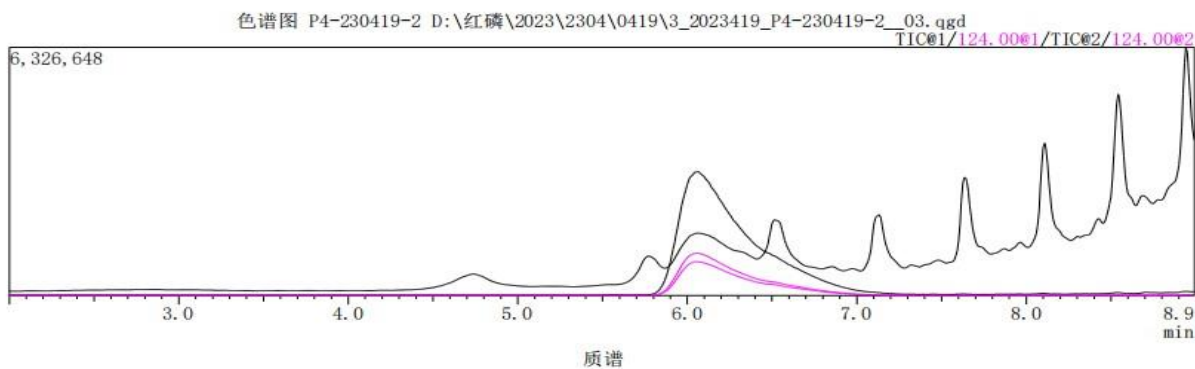
Sample Test Spectra



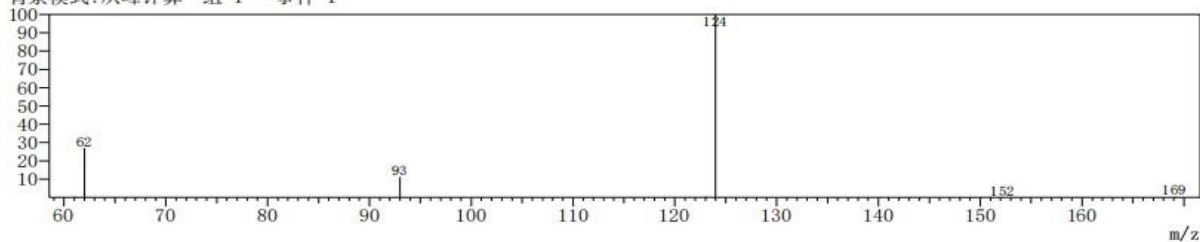
ID#: 1 保留时间: N. D. (W/B) (扫描数: 973)
质量峰: 151
原始模式: 单个 6.050 (973)
背景模式: 无 组 1 - 事件 1



Standard Material Test Spectra



ID#: 1 保留时间: 6.050 (扫描数: 973)
质量峰: 9
原始模式: 平均 6.042-6.058 (971-975)
背景模式: 从峰计算 组 1 - 事件 1



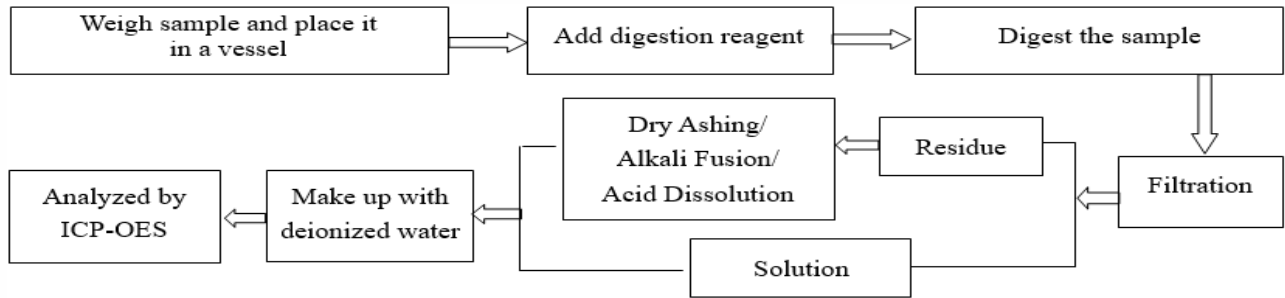
Test Report

Report No. A2230172669101001

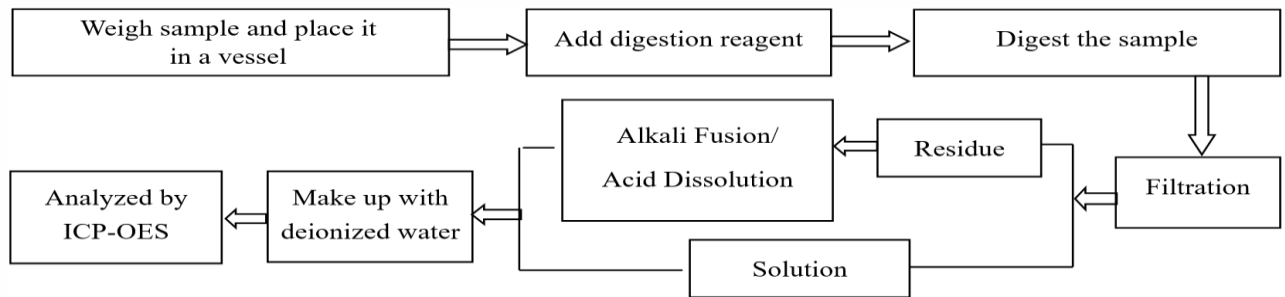
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Test Process

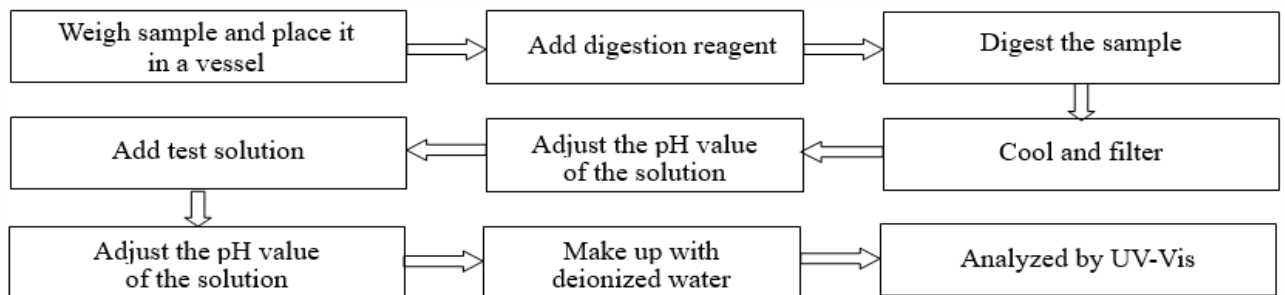
1. Cadmium (Cd), Lead (Pb), Chromium(Cr)



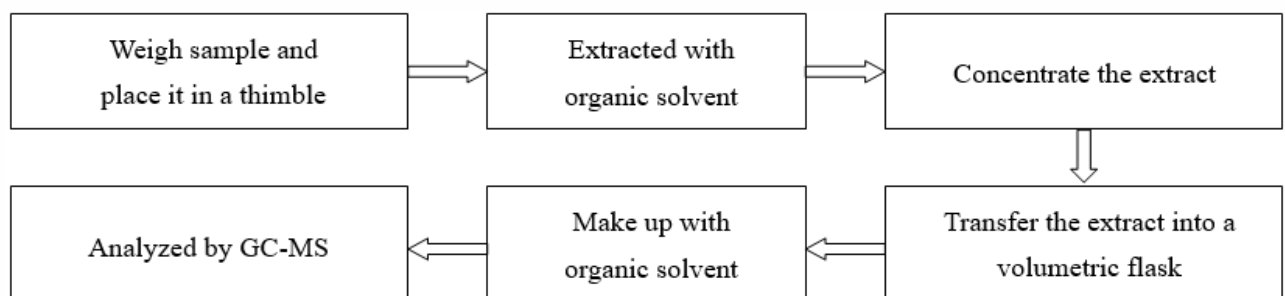
2. Mercury (Hg)



3. Hexavalent Chromium (Cr(VI))



4. Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)

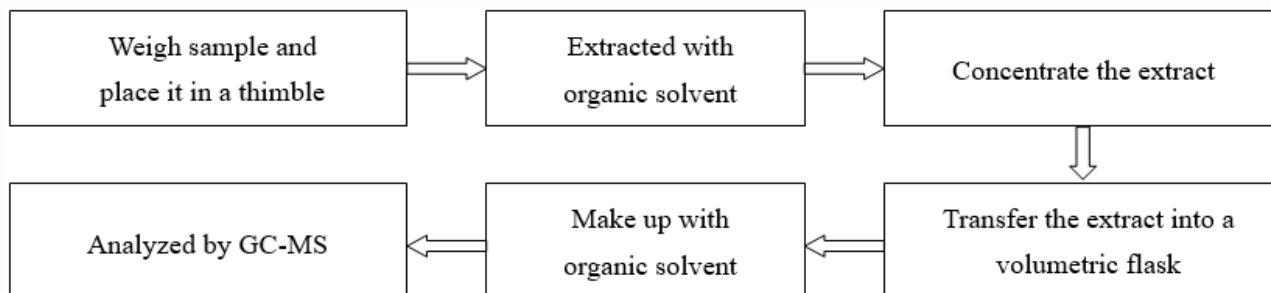


Test Report

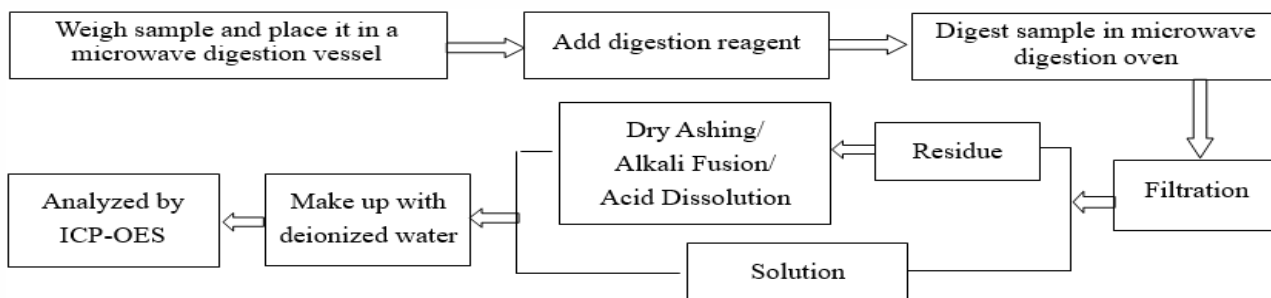
Report No. A2230172669101001

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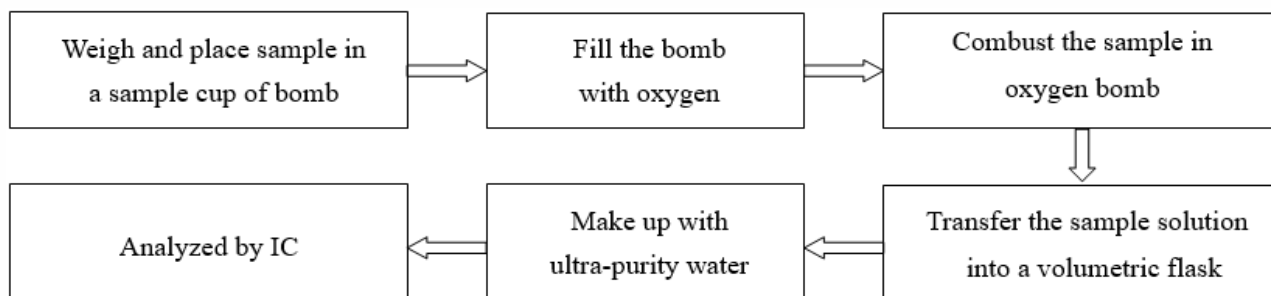
5. Phthalates (DBP, BBP, DEHP, DIBP)



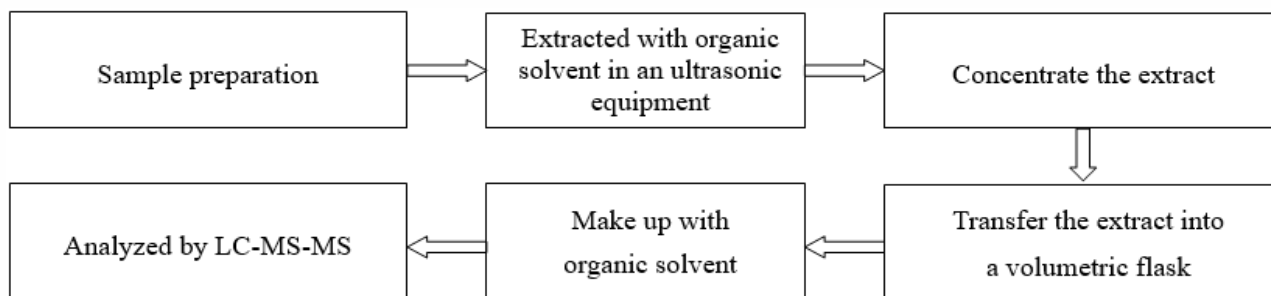
6. Antimony(Sb), Beryllium(Be)



7. Bromine (Br), Chlorine (Cl), Fluorine (F), Iodine (I)



8. Perfluorooctane Sulfonates(PFOS), Perfluorooctanoic Acid(PFOA)

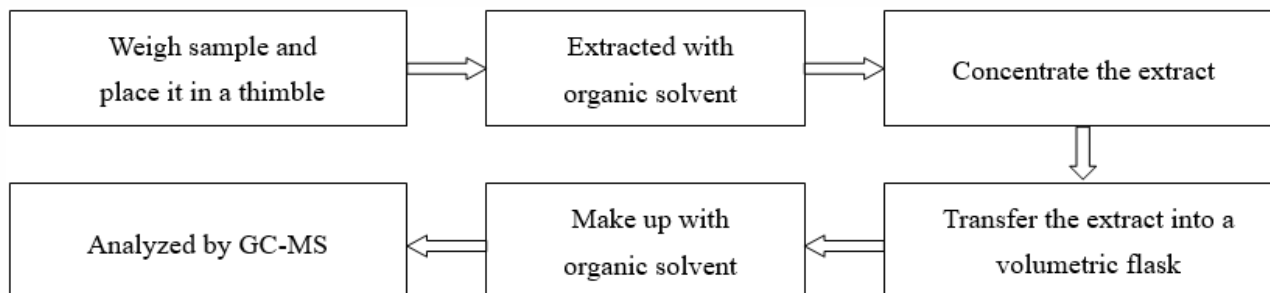


Test Report

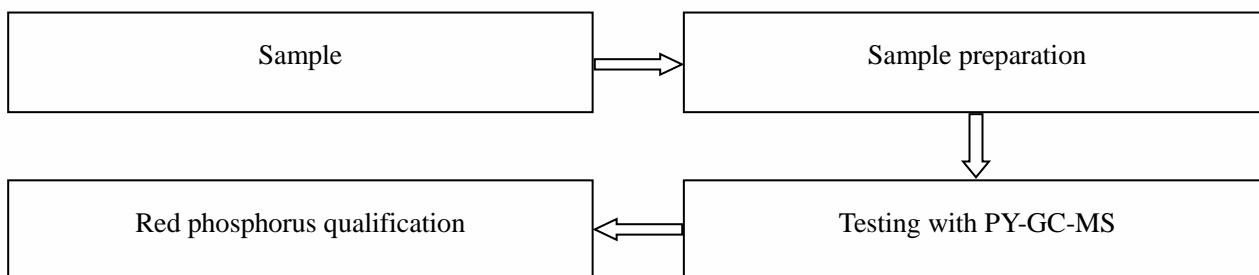
Report No. A2230172669101001

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9. Phthalates



10. Red phosphorus

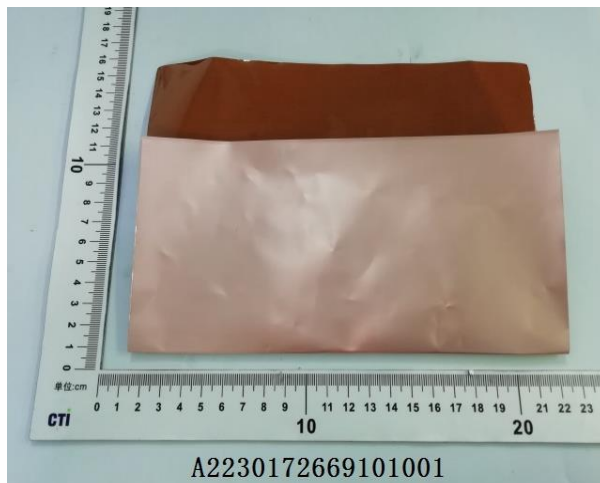


Test Report

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Photo(s) of the sample(s)



Statement:

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Without written approval of CTI, this report can't be reproduced except in full;
5. In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

*** End of Report ***

測試報告

Test Report

號碼(No.): ETR22705905

日期(Date): 05-Aug-2022

頁數(Page): 1 of 13

優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

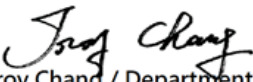
以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by the applicant as) :

送樣廠商(Sample Submitted By) : 優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)
樣品名稱(Sample Name) : 防焊油墨
樣品型號(Style/Item No.) : PSM-800/SMH-800/BK5/BK6/BK7/BK8/BK8A/DM6/DM7/FBK/
FBK5/FBK7/FDM/FMBL2/FMBL3/FMBL4/FMBL5/FMBL6/FMBL7/
FMBL8/FMBL9/FSBK/FSBK5/FSDM/FSDM-A/FSDM-B/FSDM-C/
FSDM-D/FSDM-F/FSMBL2/FSMBL4/FSMBL5/FSMBL6/FSMBL7/
FSMBL8/FSMBL9/FSDM9/FSUK
顏色(Color) : 黑色 (BLACK INK)

=====

收件日(Sample Receiving Date) : 29-Jul-2022
測試期間(Testing Period) : 29-Jul-2022 to 05-Aug-2022

測試需求(Test Requested) : (1) 依據客戶指定，參考RoHS 2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP。 (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).)
(2) 其他測試項目請見下一頁。(Please refer to next pages for the other item(s).)
測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages.)


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



PIN CODE: C751674B

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測試報告

Test Report

號碼(No.): ETR22705905

日期(Date): 05-Aug-2022

頁數(Page): 2 of 13

優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

測試部位敘述 (Test Part Description)

No.1 : 黑色片狀 (BLACK SHEET)

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) (CAS No.: 18540-29-9)	參考IEC 62321-7-2: 2017 · 以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.
一溴聯苯 (Monobromobiphenyl)	參考IEC 62321-6: 2015 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.

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測試報告

Test Report

號碼(No.): ETR22705905

日期(Date): 05-Aug-2022

頁數(Page): 3 of 13

優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
一溴聯苯醚 (Monobromodiphenyl ether)	參考IEC 62321-6: 2015 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP)) (CAS No.: 85-68-7)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP)) (CAS No.: 84-74-2)		mg/kg	50	n.d.
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) (CAS No.: 117-81-7)		mg/kg	50	n.d.
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) (CAS No.: 84-69-5)		mg/kg	50	n.d.
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)		mg/kg	50	n.d.
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)		mg/kg	50	n.d.
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)		mg/kg	50	n.d.
四溴雙酚-A (TBBP-A) (Tetrabromobisphenol A (TBBP-A)) (CAS No.: 79-94-7)	參考RSTS-E&E-121 · 以液相層析儀/質譜儀分析。(With reference to RSTS-E&E-121, analysis was performed by LC/MS.)	mg/kg	10	n.d.

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測試報告

Test Report

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優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
中鏈氯化石蠟(C14-C17) (MCCP) (Medium Chain Chlorinated Paraffins(C14-C17) (MCCP)) (CAS No.: 85535-85-9)	參考ISO 18219: 2015 · 以氣相層析儀/質譜儀分 析。(With reference to ISO 18219: 2015, analysis was performed by GC/MS.)	mg/kg	50	n.d.
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440- 36-0)	參考US EPA 3052: 1996 · 以感應耦合電漿發射光 譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
N-乙基全氟正辛磺醯胺 (EtFOSA) (N- ethylperfluoro-1-octanesulfonamide (EtFOSA)) (CAS No.: 4151-50-2)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
N-甲基全氟正辛磺醯胺 (N-Me-FOSA) (N-Methyl-Perfluorooctanesulfonamide (N-Me-FOSA)) (CAS No.: 31506-32-8)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
N-乙基全氟辛基磺醯胺乙醇 (N-Et-FOSE alcohol) (N-Ethyl- Perfluorooctanesulfonamidoethanol (N- Et-FOSE alcohol)) (CAS No.: 1691-99-2)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
N-甲基全氟辛基磺醯胺乙醇 (N-Me-FOSE alcohol) (N-Methyl- Perfluorooctanesulfonamidoethanol (N- Me-FOSE alcohol)) (CAS No.: 24448- 09-7)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
全氟辛基磺醯胺 (PFOSA) (Perfluorooctanesulfonamide (PFOSA)) (CAS No.: 754-91-6)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.

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優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
1H,1H,2H,2H-全氟癸磺酸 (8:2 FTS) (1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)) (CAS No.: 39108-34-4)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
全氟辛酸甲酯 (Me-PFOA) (Methyl perfluorooctanoate (Me-PFOA)) (CAS No.: 376-27-2)	參考CEN/TS 15968: 2010 · 以氣相層析儀/質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.)	mg/kg	0.1	n.d.
全氟辛酸乙酯 (Et-PFOA) (Ethyl perfluorooctanoate (Et-PFOA)) (CAS No.: 3108-24-5)	參考CEN/TS 15968: 2010 · 以氣相層析儀/質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.)	mg/kg	0.1	n.d.
1H,1H,2H,2H-全氟-1-癸醇 (8:2 FTOH) (1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH)) (CAS No.: 678-39-7)	參考CEN/TS 15968: 2010 · 以氣相層析儀/質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.)	mg/kg	0.1	n.d.
1H,1H,2H,2H-全氟癸基丙烯酸酯 (8:2 FTA) (1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA)) (CAS No.: 27905-45-9)	參考CEN/TS 15968: 2010 · 以氣相層析儀/質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.)	mg/kg	0.1	n.d.
1H,1H,2H,2H-全氟癸基甲基丙烯酸鹽 (8:2 FTMA) (1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA)) (CAS No.: 1996-88-9)	參考CEN/TS 15968: 2010 · 以氣相層析儀/質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.)	mg/kg	0.1	n.d.
全氟辛基碘烷 (PFOI) (Perfluoro-1-iodooctane (PFOI)) (CAS No.: 507-63-1)	參考CEN/TS 15968: 2010 · 以氣相層析儀/質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.)	mg/kg	0.1	n.d.

備註(Note) :

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出) ; 小於MDL / Less than MDL
4. "-" = Not Regulated (無規格值)
5. 全氟辛烷磺酸及其鹽類包含 (PFOS and its salts including) :
CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
6. 全氟辛酸及其鹽類包含 (PFOA and its salts including) :
CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.

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優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

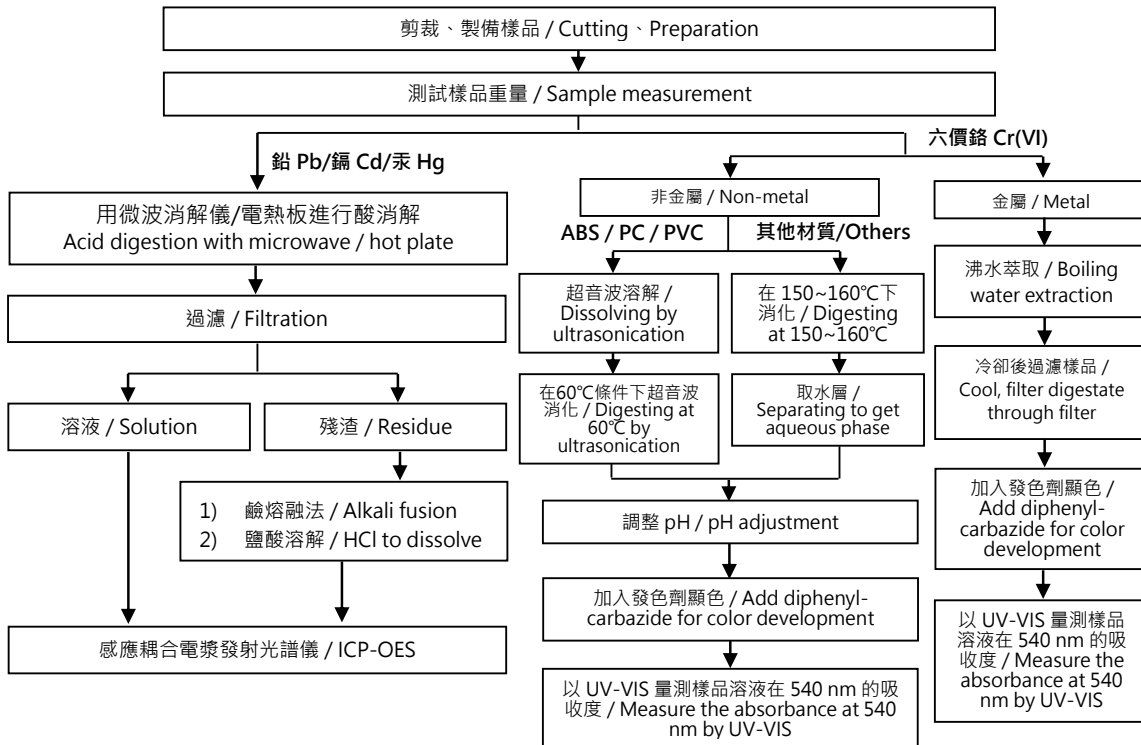
桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

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)



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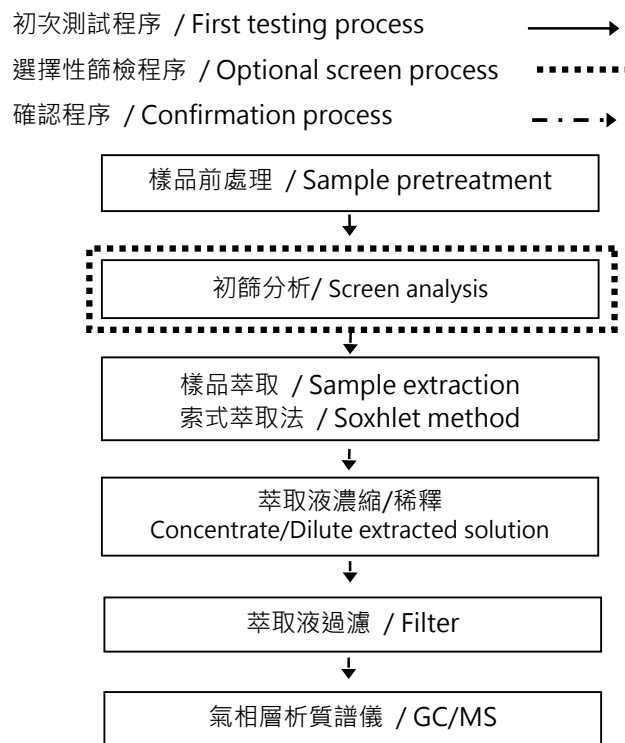
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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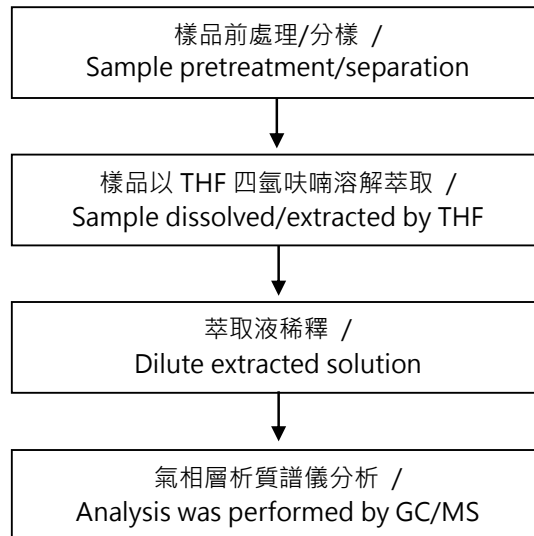
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桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

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

【測試方法/Test method: IEC 62321-8】



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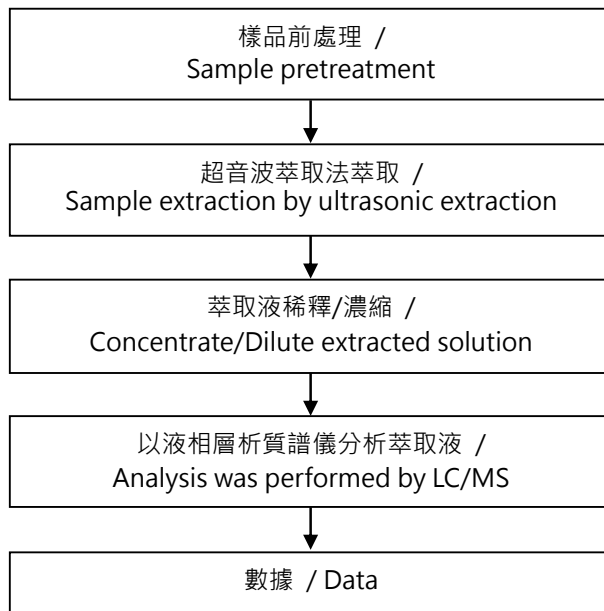
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四溴雙酚-A 分析流程圖 / Analytical flow chart - TBBP-A



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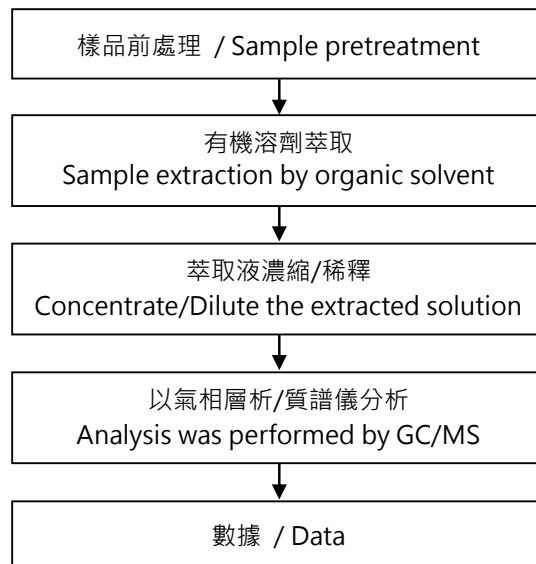
優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

分析流程圖 / Analytical flow chart

【適用於：多氯聯苯、多氯奈、多氯三聯苯、滅蟻靈、氯化石蠟、DBBT】

*Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



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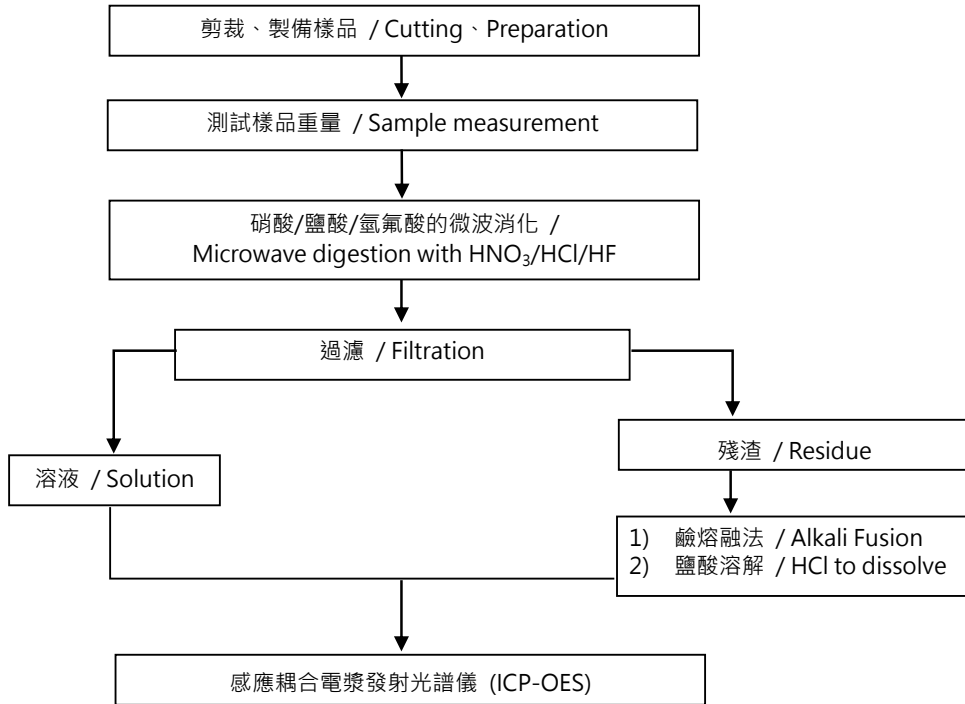
桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

元素(含重金屬)分析流程圖 / Analytical flow chart of Elements (Heavy metal included)

根據以下的流程圖之條件，樣品已完全溶解。

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

【參考方法/Reference method : US EPA 3051A、US EPA 3052】



* US EPA 3051A 方法未添加氫氟酸 / US EPA 3051A method does not add HF.

測試報告

Test Report

號碼(No.): ETR22705905

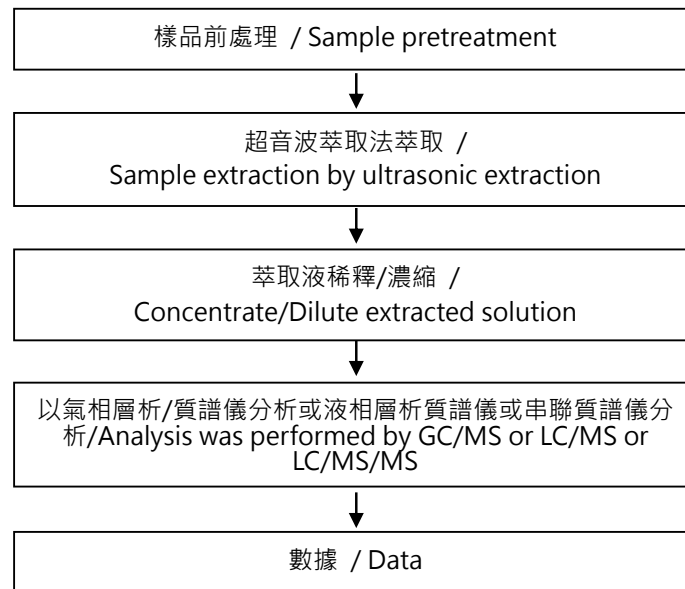
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優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

* 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.)

ETR22705905



** 報告結尾 (End of Report) **

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測試報告

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號碼(No.): ETR22705913

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優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

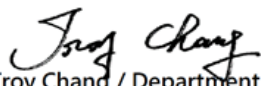
以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by the applicant as) :

送樣廠商(Sample Submitted By) : 優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)
樣品名稱(Sample Name) : 防焊油墨
樣品型號(Style/Item No.) : PSM-800/SMH-800/BK5/BK6/BK7/BK8/BK8A/DM6/DM7/FBK/FBK5/FBK7/FDM/
FMBL2/FMBL3/FMBL4 FMBL5/FMBL6/FMBL7/FMBL8/FMBL9/FSBK/FBK5/
FSDM/FSDM-A/FSDM-B/FSDM-C/FSDM-D/FSDM-F FSBML2/FSMML4/FSMML5/
FSMML6/FSMML7/FSMML8/FSMML9/FSDM9/FSUK
顏色(Color) : 黑色 (BLACK INK)

收件日(Sample Receiving Date) : 29-Jul-2022
測試期間(Testing Period) : 29-Jul-2022 to 05-Aug-2022

測試需求(Test Requested) : 依據客戶指定 · 測試鹵素-氟、氯、溴、碘。(As specified by client, to test Halogen-Fluorine, Chlorine, Bromine, Iodine in the submitted sample.)

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


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



PIN CODE: FB3D1049

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測試報告

Test Report

號碼(No.): ETR22705913

日期(Date): 05-Aug-2022

頁數(Page): 2 of 4

優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

測試部位敘述 (Test Part Description)

No.1 : 黑色片狀 (BLACK SHEET)

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	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.)	mg/kg	50	n.d.
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)	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.)	mg/kg	50	253
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)	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.)	mg/kg	50	n.d.
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)	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.)	mg/kg	50	n.d.

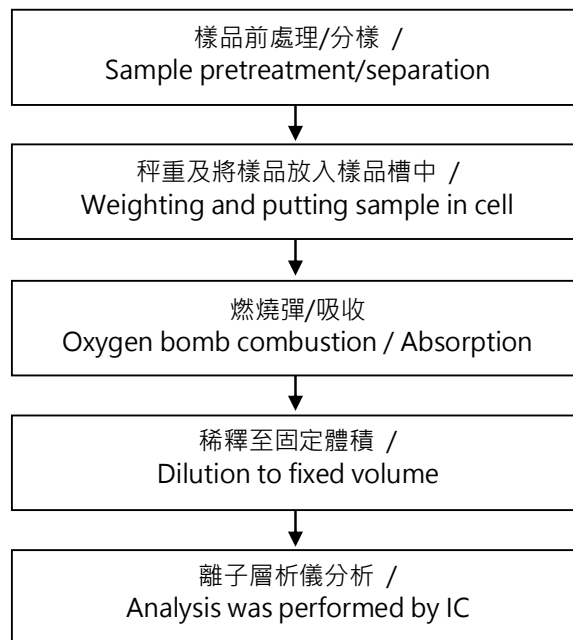
備註(Note) :

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出) ; 小於MDL / Less than MDL

優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

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



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測試報告

Test Report

號碼(No.): ETR22705913

日期(Date): 05-Aug-2022

頁數(Page): 4 of 4

優立實業股份有限公司 (UNIRES CHEMICAL IND. CO., LTD.)

桃園市觀音工業區經建四路22號 (NO.22, JINGJIAN 4TH RD., GUANYIN DISTRICT, TAOYUAN CITY, TAIWAN)

* 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.)

ETR22705913



** 報告結尾 (End of Report) **

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測試報告

Test Report

號碼(No.): ETR22A01347M01

日期(Date): 17-Oct-2022

頁數(Page): 1 of 15

川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)

桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

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 the applicant as) :

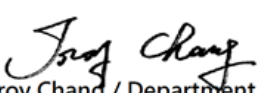
送樣廠商(Sample Submitted By) : 川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)
樣品名稱(Sample Name) : INK(ZSR-150)W
樣品型號(Style/Item No.) : ZM-400WF, 400WF, ZM-400WF(HF), ZM-400WF-1, 400WF-1, ZM-400WF(N), ZM-400WB, ZM-480, ZM-480W, ZM-680W, WNY, WNA, WNB, NWB, WH, WM, WN, WL, WH(N), WH(H), 13A089, PC-W, IC-W, 100W, SW, 580W, SP-W, 2K-W, FMW, FMW-1, PHP-80, PHP-80K, 928

=====
收件日(Sample Receiving Date) : 07-Oct-2022
測試期間(Testing Period) : 07-Oct-2022 to 17-Oct-2022

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

(2) 其他測試項目請見下一頁。(Please refer to next pages for the other item(s).)
測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages.)

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


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



PIN CODE: 8264D219

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測試報告

Test Report

號碼(No.): ETR22A01347M01

日期(Date): 17-Oct-2022

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川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)

桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

測試部位敘述 (Test Part Description)

No.1 : 白色塊狀 (WHITE LUMP)

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)	限值 (Limit)
				No.1	
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	100
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	1000
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	1000
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) (CAS No.: 18540-29-9)	參考IEC 62321-7-2: 2017 · 以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.	1000
一溴聯苯 (Monobromobiphenyl)	參考IEC 62321-6: 2015 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.	-
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.	1000

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測試報告

Test Report

號碼(No.): ETR22A01347M01

日期(Date): 17-Oct-2022

頁數(Page): 3 of 15

川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)

桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)	限值 (Limit)
				No.1	
一溴聯苯醚 (Monobromodiphenyl ether)	參考IEC 62321-6: 2015 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.	-
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.	1000
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP)) (CAS No.: 85-68-7)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP)) (CAS No.: 84-74-2)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) (CAS No.: 117-81-7)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) (CAS No.: 84-69-5)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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測試報告

Test Report

號碼(No.): ETR22A01347M01

日期(Date): 17-Oct-2022

頁數(Page): 4 of 15

川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)

桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)	限值 (Limit)
				No.1	
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正己酯 (DNHP) (Di-n-hexyl phthalate (DNHP)) (CAS No.: 84-75-3)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正戊酯 (DNPP) (Di-n-pentyl phthalate (DNPP)) (CAS No.: 131-18-0)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二異戊酯 (DIPP) (Diisopentyl phthalate (DIPP)) (CAS No.: 605-50-5)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸雙(2-甲氧基乙基)酯 (DMEP) (Bis(2-methoxyethyl) phthalate (DMEP)) (CAS No.: 117-82-8)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二乙酯 (DEP) (Di-ethyl phthalate (DEP)) (CAS No.: 84-66-2)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二甲酯 (DMP) (Dimethyl phthalate (DMP)) (CAS No.: 131-11-3)	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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測試報告

Test Report

號碼(No.): ETR22A01347M01

日期(Date): 17-Oct-2022

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川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)

桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)	限值 (Limit)
				No.1	
六溴環十二烷及所有主要被辨別出的異構物(HBCDD) (α- HBCDD, β- HBCDD, γ- HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321-9: 2021 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.)	mg/kg	20	n.d.	-
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	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.)	mg/kg	50	77.7	-
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)	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.)	mg/kg	50	591	-
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)	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.)	mg/kg	50	n.d.	-
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)	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.)	mg/kg	50	n.d.	-
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考DIN CEN/TS 15968: 2010 · 以液相層析串聯質譜儀分析。(With reference to DIN CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.	-
全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	參考DIN CEN/TS 15968: 2010 · 以液相層析串聯質譜儀分析。(With reference to DIN CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.	-
短鏈氯化石蠟(C10-C13) (SCCP) (Short Chain Chlorinated Paraffins(C10-C13) (SCCP)) (CAS No.: 85535-84-8)	參考ISO 18219: 2015 · 以氣相層析儀/質譜儀分析。(With reference to ISO 18219: 2015, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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測試報告

Test Report

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川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)

桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)	限值 (Limit)
				No.1	
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0)	參考US EPA 3052: 1996 · 以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-
砷 (As) (Arsenic (As)) (CAS No.: 7440-38-2)	參考US EPA 3052: 1996 · 以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-

備註(Note) :

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出) ; 小於MDL / Less than MDL
4. "-" = Not Regulated (無規格值)
5. 全氟辛烷磺酸及其鹽類包含等物質 (PFOS and its salts including) :
CAS No.: 1763-23-1, 2795-39-3, 29457-72-5, 29081-56-9, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7, 91036-71-4, 4021-47-0 and others.
6. 全氟辛酸及其鹽類包含等物質 (PFOA and its salts including) :
CAS No.: 335-67-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 3825-26-1 and others.
7. 除非另有說明 · 參照ILAC-G8:09/2019 · 採用簡單二元(w=0)允收規則進行符合性判定 ; 根據此規則 · 符合性結果之判定係以測試結果與限值做比較。(Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.)
8. 本報告為 ETR22A01347 之異動報告。(This is the additional test report of ETR22A01347.)

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川裕工業股份有限公司 (CHUNG YU INDUSTRY CORPORATION)

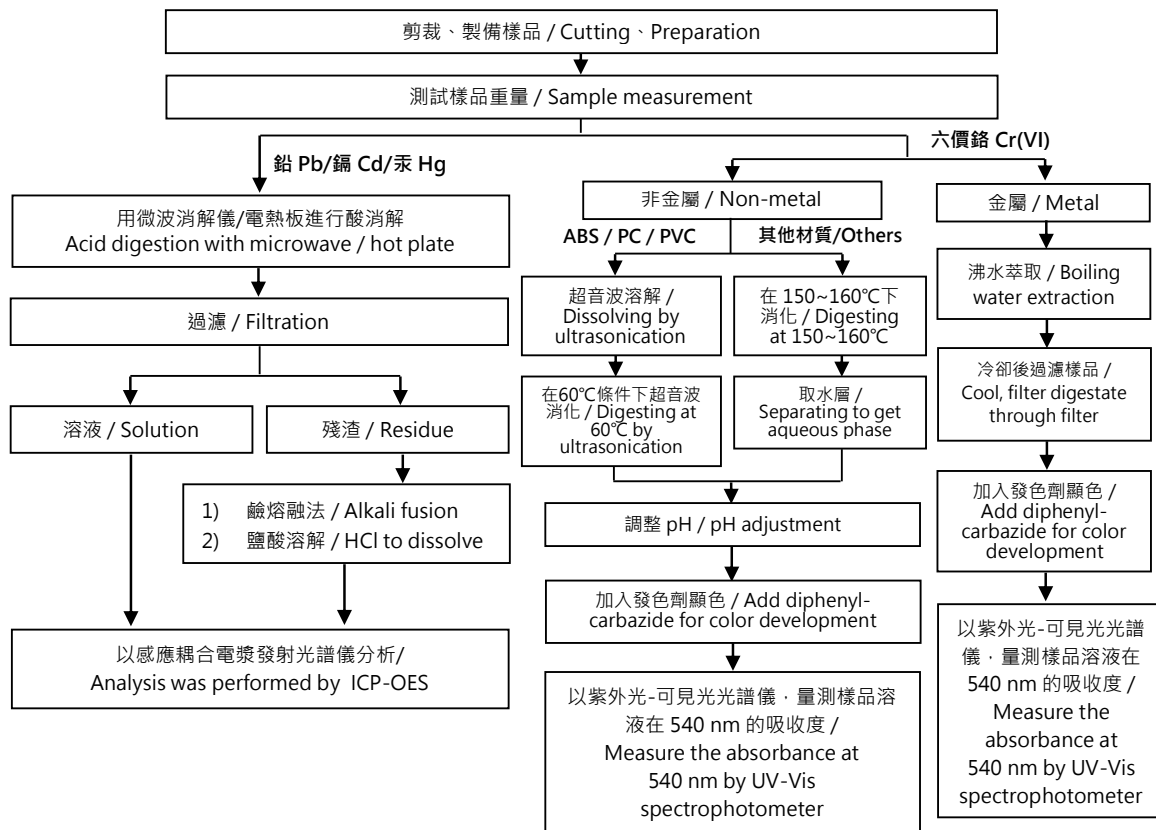
桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

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)



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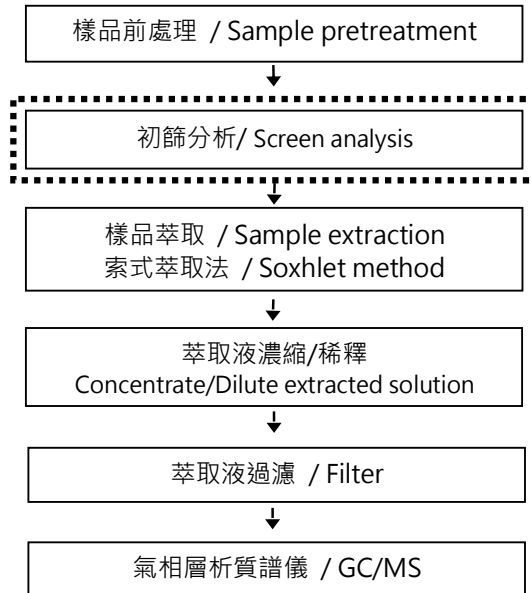
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桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs

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 - - - ->



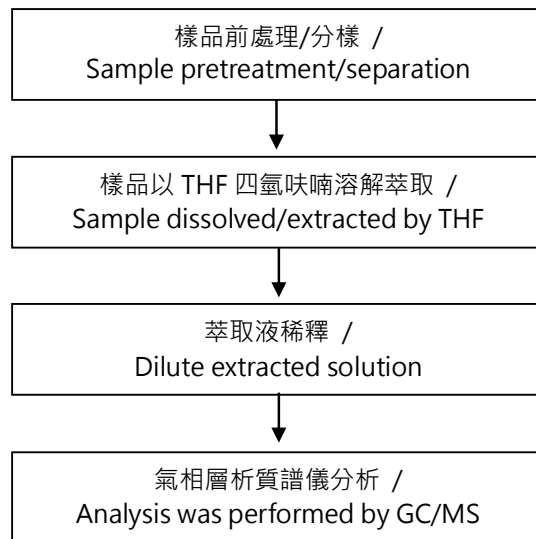
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桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

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

【測試方法/Test method: IEC 62321-8】



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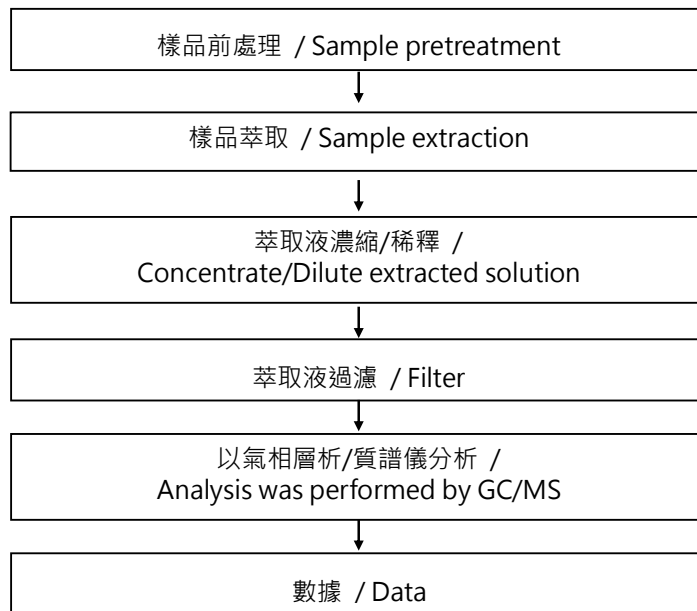
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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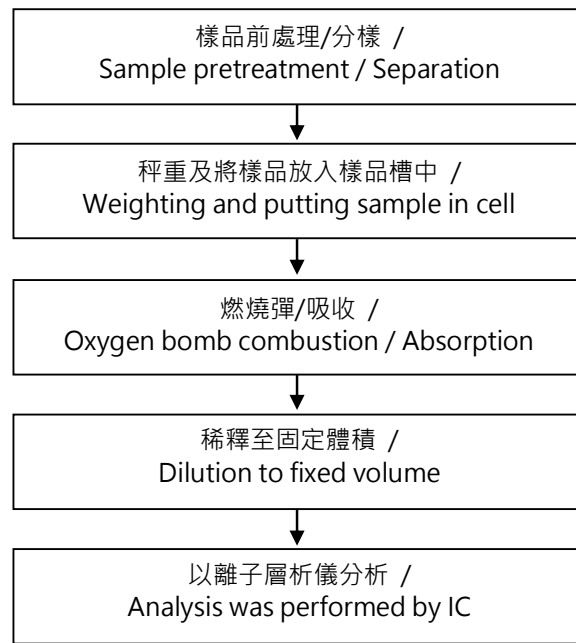
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鹵素分析流程圖 / Analytical flow chart - Halogen



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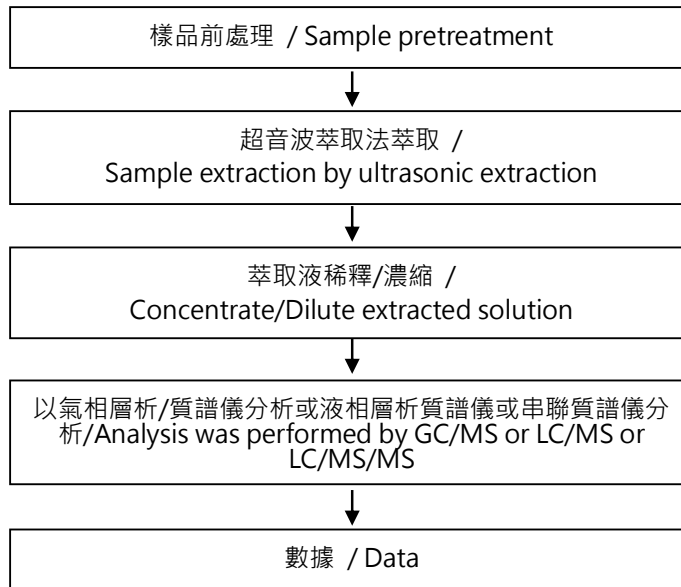
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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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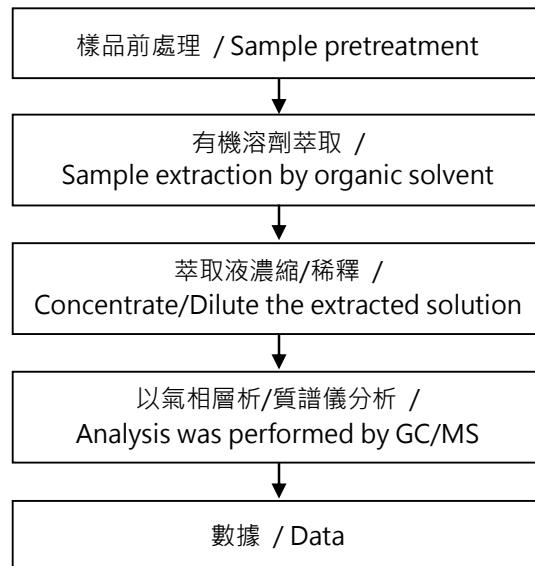
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桃園市平鎮區延平路三段618號 (NO. 618, SEC. 3, YANPING RD., PINGZHEN DIST., TAOYUAN CITY 324013, TAIWAN)

分析流程圖 / Analytical flow chart

【適用於：多氯聯苯、多氯奈、多氯三聯苯、滅蟻靈、氯化石蠟、DBBT】

*Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



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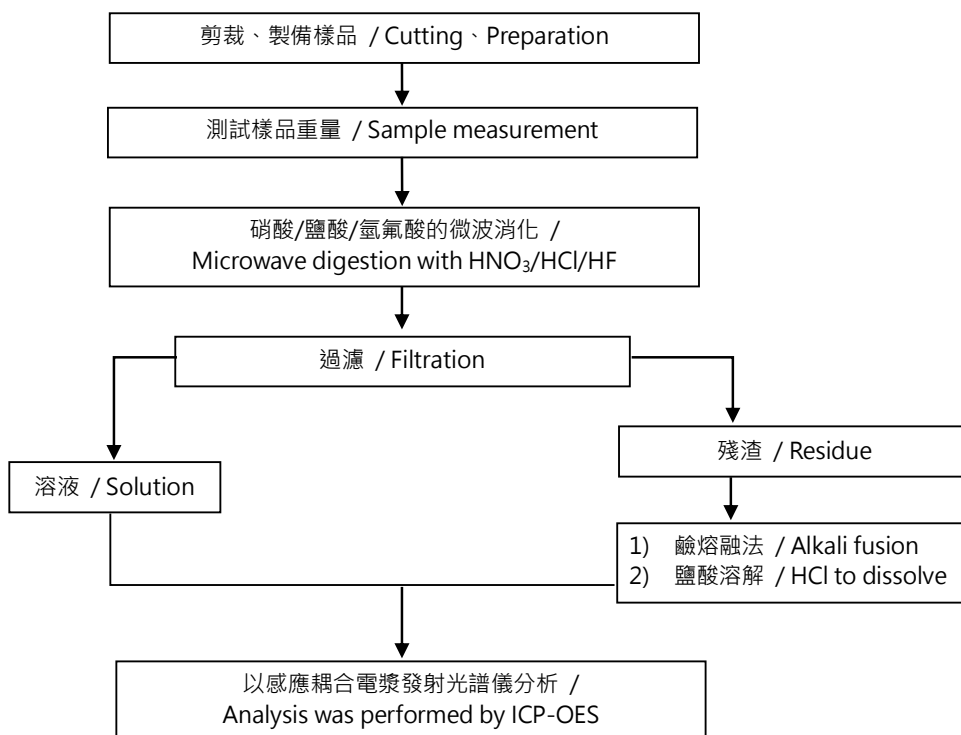
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元素(含重金屬)分析流程圖 / Analytical flow chart of elements (Heavy metal included)

根據以下的流程圖之條件，樣品已完全溶解。

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

【參考方法/Reference method : US EPA 3051A、US EPA 3052】



* US EPA 3051A 方法未添加氫氟酸 / US EPA 3051A method does not add HF.

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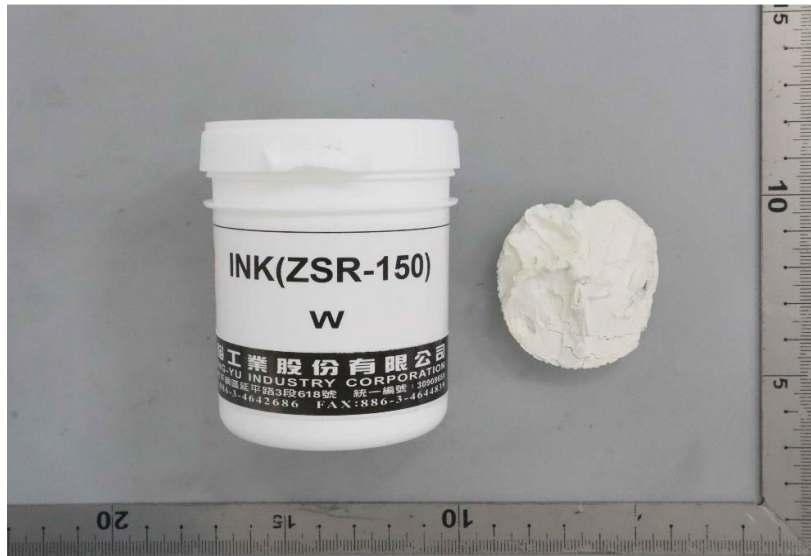
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* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*

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

ETR22A01347



** 報告結尾 (End of Report) **

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