东莞市津达电子有限公司
DONGGUAN JINDA ELECTRONICS CO.,LTD.

承 认 书

SPECIFICATION FOR APPROVAL

客　　户
CUSTOMER　MARITEX Leszek LOSIN sp. jawna

品　　名
PART NAME　FFC CABLES

料　　号
PART NO.　A0.5x12x50-4488b1T

样品提供(SAMPLE PROVIDE)		
工程 Engineering	业务 Sales	核准 Approval

客户承认(CUSTOMER APPROVAL)		
工程 Engineering	品管 Q.C	核准 Approval

备注（NOTE）：

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FFC 系列

Scope: This specification covers the FLAT FLEXIBLE CABLE series.
适用范围: 此规格书适用于扁平软排线

Index索引: Page页次

FILE NO	ENS008	APPROVAL	CHECK	DRAWING
ECR/N NO	New spec			

[1. Construction and materials/构造和材料]

ITEM 项目	DESCRIPTION 描述	
Insulation 绝缘体	Material 材料	Flame retardant polyester 阻燃性聚酯
	Color 颜色	White 白色
Conductor 导体	Material 材料	Copper with 1um min. tin-plating 镀锡扁平方角铜线，锡层厚1um以上
	Size 尺寸	参考图纸
Reinforcing Tape 补强板	Material 材料	Flame retardant polyester 阻燃性聚酯
	Color 颜色	Blue 蓝色

[2. Rated voltage and current/额定电压和电流]

ITEM 项目	STANDARD 标准
Part NO/名称	A0.5x12x50-4488b1T
Conductor Size (Thickness*Width)/导体间距	0.035mm x 0.3mm
Rated Voltage/额定电压	60V
Rated Current/额定电流	0.5A (环境温度45°C以下)
Operating Temperature/适用温度	-30°C ~ +80°C
Keeping Temperature/仓储温度	-30°C ~ +85°C

[3. Performance/特性]

3-1. Electrical Performance/电气特性

ITEM 项目		Test condition 测试条件	Requirement 要求	
3-1-1	Conductor resistance 导体电阻	Based upon JIS C-3102 at 20° 依JIS C-3102测试，环境温度 20°	0.1x1.27mm	0.2Ω/m (max.)
			0.1x0.8mm	0.4Ω/m (max.)
			0.1x0.7mm	0.5Ω/m (max.)
			0.05x0.8mm	0.7Ω/m (max.)
			0.05x0.65mm	0.8Ω/m (max.)
			0.05x0.5mm	1Ω/m (max.)
			0.035*0.65mm	1Ω/m (max.)
			0.035*0.3mm	2Ω/m (max.)
3-1-2	Insulation resistance 绝缘阻抗	Apply 500V DC between adjacent conductors. 相邻两导体间接500V直流电压测试。	1000MΩ (min.)	
3-1-3	Dielectric strength 耐高压	Apply 500V AC for 1minute between adjacent conductors. 相邻两导体间接500V交流电压，持续1分钟。	No breakdown 不能击穿	
3-1-4	Continuity 通电	Continuity tester DC3.0V，0.1mA 通电器测试	No open/short 无断路及短路	

3-2. Mechanical Performance/物理特性

ITEM 项目		TEST CONDITION 测试条件	Requirement 要求
3-2-1	Flexibility 柔韧性测试	180° folding test 弯折180°	> 20 cycles(回)
		15mm R，1000 cycles/min. 25mm stroke	> 100,000 cycles(回)

3-2-2	Abrasion test 耐磨测试	Ø0.5mm，600g 60cycles/min.		>10,000 cycles(回)
3-2-3	Insert/Extract 插拔测试			≥20times(次)
3-2-4	Insulation 绝缘体	Elongation 延伸率	Based upon JIS-K-6732 依JIS-K-6732测试	≥60%
		Tensile strength 抗拉强度	Based upon JIS-K-6732 依JIS-K-6732测试	≥3.5KG/sq.mm
	Conductor 导体	Elongation 延伸率	Based upon JIS-K-6732 依JIS-K-6732测试	≥15%

3-3. Environmental Performance/环境特性

ITEM 项目		Test condition 测试条件	Requirement 要求
3-3-1	Heat resistance 耐热性测试	The cable shall be placed in an oven for 96 hours at +85°C 将线放入+85°C测试环境中96小时，然后测试绝缘阻抗及耐压	Insulation resistance and dielectric strength pass 绝缘阻抗及耐压测试正常
3-3-2	Humidity 耐湿性测试	The cable shall be placed in a humidity chamber on the following conditions. Temperature: 40°C Relative humidity: 95% Duration : 96 hours 将线放入恒温恒湿机内96小时，然后测试绝缘阻抗及耐压	Insulation resistance and dielectric strength pass 绝缘阻抗及耐压测试正常
3-3-3	Temperature cycling 温度循环测试	The cable shall be set to temperature cycling for 5 cycles of which 1 cycle consists of : -40°C for 4 hours +85°C for 4 hours +25°C for 1 hours 以上述温度循环条件测试	Insulation resistance and dielectric strength pass 绝缘阻抗及耐压测试正常
3-3-4	Burn test 燃烧试验	UL 1581标准	VW-1合格

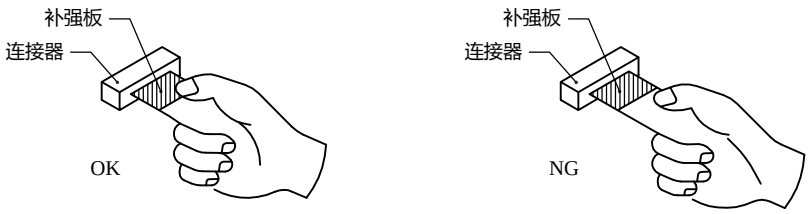
[4. Product shape, Dimensions and materials/产品形状、尺寸和材料]

Refer to the drawing/参考图纸

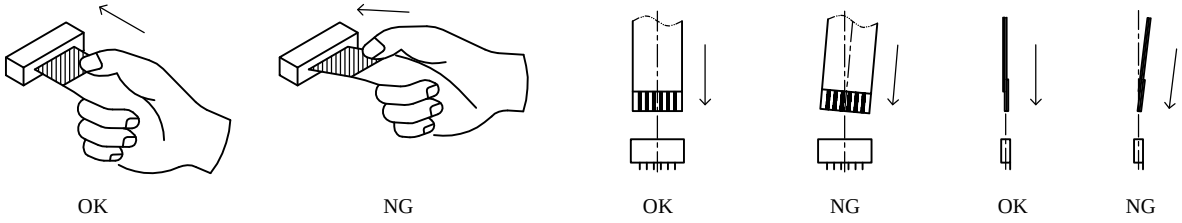
FFC使用和保管的注意事项及说明

一，FFC使用上的注意事项

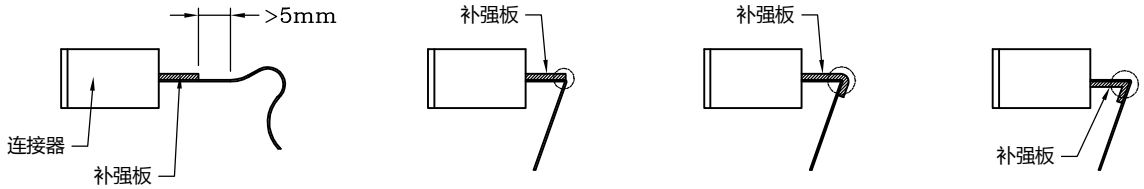
1. 插接时拇指与食指须捏住FFC的补强板，尽可能朝着连接器插座口的中心及垂直方向插拔。



2. 插接时用力方向及插接端须与连接器的插座口保持在同一水平面上，以避免FFC在插接处折弯。



3. 使用时，在补强板的外围尽量不要加上极端的负荷，在不得已的情况下，要考虑加长 FFC的长度使其不处于拉伸状态。补强板位置绝对不能弯折，那样易产生铜线折断的现象。



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4. 插接时,误把FFC掉落地上时，导体外露部分须清理干净后再使用。

5. 操作时应避免手指直接接触导体外露部分，若必须接触，建议带手套或指套作业。

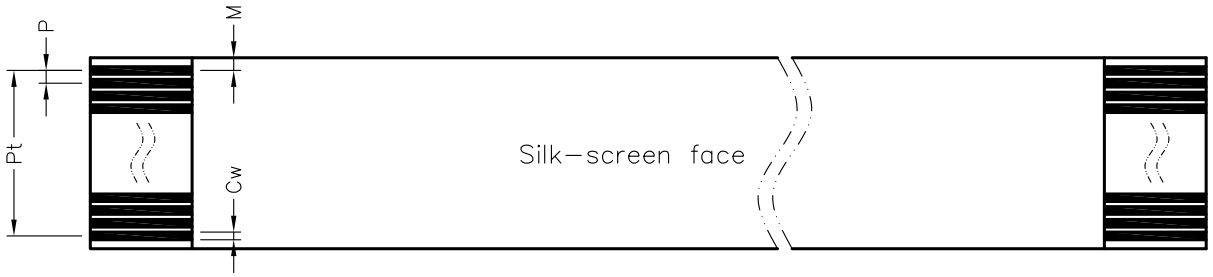
二，FFC保管上的注意事项

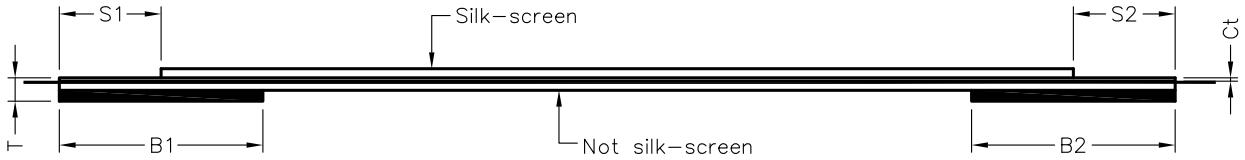
1. 请储存在阴凉干燥的场所，温度要求16~27°C，湿度65RH%以下，避免阳光直射。

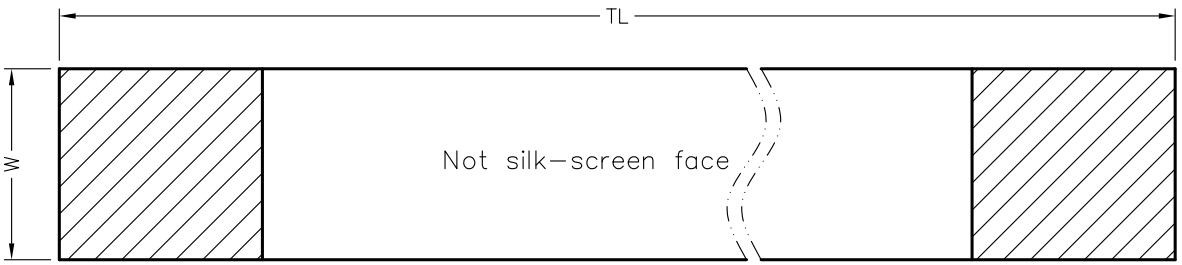
2. 室内储存时请放置在胶垫或货架上，防止受潮。

3. 注意防尘，并远离腐蚀性气体及有机溶剂。

3. 保质期为半年，逾期使用时需对其相关特性进行复检，方可使用。

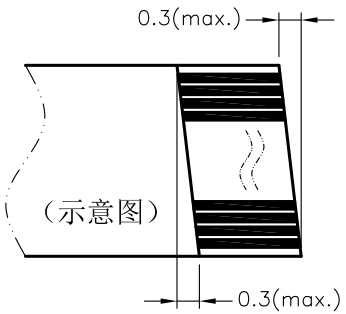






BOM				
No.	Item	Specification		Remarks
1	Insulation film	JINDA UL20624		flame retardant rating VW-1
		White PET(43μm)		
2	Reinforcement plate	Blue PET(225μm)		
3	Conductors (Flat copper wire)	Thickness	0.035mm	±0.005
		Width	0.30mm	±0.03
		Plating	Sn	≥1μm
4	Number of Conductors	N	12	

Dimensions (Unit: mm)				
1	Total length	TL	50	±2
2	Total width	W	6.50	±0.1
3	Margin width	M	0.5	±0.1
4	Pitch	P	0.5	±0.08
5	Span	Pt	5.50	±0.1
6	Thickness of connection area	T	0.3	±0.05
7	Strip length	S1	4	±1.0
		S2	4	±1.0
8	Reinforcemen length	B1	8	±1.0
		B2	8	±1.0



DongGuan JinDa Electronics Co., Ltd.
东莞市津达电子有限公司

GENERAL TOLERANCE			SCALE: 3.5:1	DRAWN: Luoshengrong	DATE: 2023.8.9	DOCUMENT NO: JD-Y-EF001	TITLE: 工程图	REV. A
XX. ±0.40			UNIT: mm	CHECK:	DATE:			
X. ±0.30						PARTS NO: A0.5x12x50-4488b1T		SHEET: 1/1
.X ±0.25	X.° ± 2°		SIZE: A4	APPROVE: Xiaozhijun	DATE: 2023.8.9			
.XX ±0.15	.X° ± 1°							

DWG NO. E:\DWG\PRODUCTION\FFC

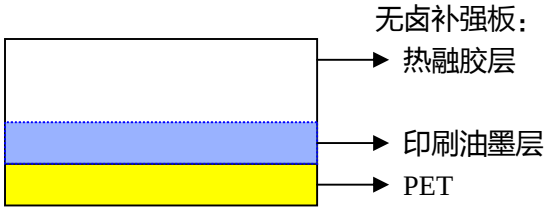
佛山市顺德区莱尔电子材料有限公司

材质证明

1、我司生产的无卤补强板，主要由 PET、热融胶层和印刷油墨组成。PET 主要用途是绝缘、油墨主要用途是印刷颜色、涂料主要用途是粘合。

2、无卤补强板符合卤素法规要求。

如下图视：



序号	品名	型号	PET 厚度（μm）	印刷油墨厚度（μm）	热融胶层厚度（μm）	重量比例	涂料
1	无卤白色综合型补强板	LEB25-55SW	25	1	29	1.1：0.2	无卤综合型
2	无卤蓝色综合型补强板	LEB75-100S	75	1	24	1.1：0.2	无卤综合型
3	无卤黑色综合型补强板	LEBH100-130S	100	1	29	1.1：0.2	无卤综合型
4	无卤透明综合型补强板	LEB100-130ST	100	0	30	1.1：0.2	无卤综合型
5	无卤蓝色综合型补强板	LEB100-130S	100	1	29	1.1：0.2	无卤综合型
6	无卤浅蓝色综合型补强板	LEB100-130SQ	100	1	29	1.1：0.2	无卤综合型
7	无卤紫色综合型补强板	LEB100-130SZ	100	1	29	1.1：0.2	无卤综合型
8	无卤蓝色综合型补强板	LEB125-160S	125	1	34	1.1：0.2	无卤综合型
9	无卤紫色综合型补强板	LEB125-160SZ	125	1	34	1.1：0.2	无卤综合型
10	无卤浅蓝色综合型补强板	LEB125-160SQ	125	1	34	1.1：0.2	无卤综合型
11	无卤高温补强板	LEB125-160A	125	1	34	1.1：0.2	无卤高温
12	无卤高温补强板	LEB150-183A	150	1	32	1.1：0.2	无卤高温
13	无卤蓝色综合型补强板	LEB150-183S	150	1	32	1.1：0.2	无卤综合型
14	无卤蓝色综合型补强板	LEB150-183SQ	150	1	32	1.1：0.2	无卤综合型
15	无卤蓝色不透明补强板	LEB150-183ACZY	150	1	32	1.1：0.2	无卤高温
16	无卤蓝色综合型补强板	LEB175-205S	175	1	29	1.1：0.2	无卤综合型
17	无卤蓝色综合型补强板	LEB175-205SQ	175	1	29	1.1：0.2	无卤综合型
18	无卤透明综合型补强板	LEB188-215ST	188	0	27	1.1：0.2	无卤综合型
19	无卤蓝色综合型补强板	LEB188-225S	188	1	36	1.1：0.2	无卤综合型
20	无卤高温补强板	LEB188-225A	188	1	36	1.1：0.2	无卤高温
21	无卤浅蓝色高温补强板	LEB188-225AQ	188	1	36	1.1：0.2	无卤高温
22	无卤绿色高温补强板	LEB188-225AL	188	1	36	1.1：0.2	无卤高温
23	无卤白色高温补强板	LEB188-225AW	188	1	36	1.1：0.2	无卤高温
24	无卤浅蓝色综合型补强板	LEB188-225SQ	188	1	36	1.1：0.2	无卤综合型
25	无卤蓝色不透明补强板	LEB188-225ACZY	188	1	36	1.1：0.2	无卤高温
26	无卤蓝色综合型补强板	LEB215-250S	215	1	34	1.1：0.2	无卤综合型
27	无卤浅蓝色高温补强板	LEB215-250AQ	215	1	34	1.1：0.2	无卤高温
28	无卤高温补强板	LEB215-250A	215	1	34	1.1：0.2	无卤高温
29	无卤浅蓝色综合型补强板	LEB215-250SQ	215	1	34	1.1：0.2	无卤综合型
30	无卤高温补强板	LEB250-282A	250	1	31	1.1：0.2	无卤高温
31	无卤蓝色不透明补强板	LEB250-282ACZY	250	1	31	1.1：0.2	无卤综合型

32	无卤蓝色综合型补强板	LEB250-282S	250	1	31	1.1：0.2	无卤综合型
33	无卤高温补强板	LEB250-282Y	250	1	31	1.1：0.2	无卤高温
34	无卤高温补强板	LEB250-282YCZY	250	1	31	1.1：0.2	无卤高温
35	无卤白色综合型补强板	LEB150-183SW	150	1	32	1.1：0.2	无卤综合型
36	无卤蓝色综合型补强板	LEB188-215S	188	1	26	1.1：0.2	无卤综合型
37	无卤蓝色综合型补强板	LEB188-218SQ	188	1	29	1.1：0.2	无卤综合型
38	无卤蓝色综合型补强板	LEB188-225Y	188	1	36	1.1：0.2	无卤高温
39	无卤蓝色综合型补强板	LEB215-250Y	215	1	34	1.1：0.2	无卤高温

制表：陈小飞　　审核：吴锦彦

佛山市顺德区莱尔电子材料有限公司

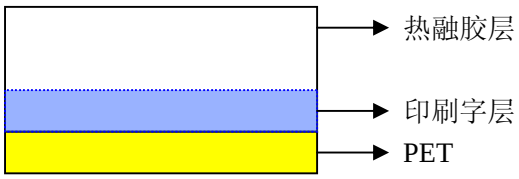
材质证明

1、我司生产的热融胶膜，主要由 PET、热融胶层和印刷油墨组成。PET 主要用途是绝缘、油墨主要用途是印字、涂料主要用途是粘合、阻燃。

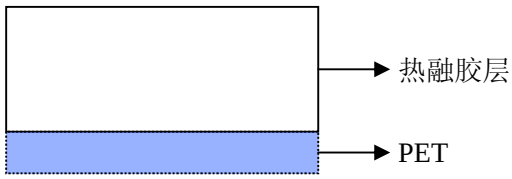
2、环保热融胶膜符合 ROHS 法规要求。

如下图视：

环保印字热融胶膜：



环保无印字热融胶膜：



序号	品名	型号	PET 厚度(μm)	印刷字层(μm)	热融胶层厚度(μm)	重量比例	涂料
1	环保无印字热融胶膜	LEPB19-43	19	0	24	2.0：1.9	80℃ ROHS
2	环保黑色无印字热融胶膜	LEPBH19-43	19	1	23	2.0：1.9	80℃ ROHS
3	环保印字热融胶膜	LEPBZ19-43	19	1	23	2.0：1.9	80℃ ROHS
4	环保黑色印字热融胶膜	LEPBHZ19-43	19	1	23	2.0：1.9	80℃ ROHS
5	环保无印字热融胶膜	LEPB25-50	25	0	21	2.0：2.1	80℃ ROHS
6	环保印字热融胶膜	LEPBZ25-50	25	1	20	2.0：2.1	80℃ ROHS
7	环保无印字热融胶膜	LEPB25-60	25	0	35	1：1	80℃ ROHS
8	环保黑色无印字热融胶膜	LEPBH25-60	25	1	34	1：1	80℃ ROHS
9	环保黑色无印字热融胶膜	LEPBH25-70	25	1	44	1：1	80℃ ROHS
10	环保黑色印字热融胶膜	LEPBHZ25-70	25	1	44	1：1	80℃ ROHS
11	环保印字热融胶膜	LEPBZ25-60	25	1	34	1：1	80℃ ROHS
12	环保黑色印字热融胶膜	LEPBHZ25-60	25	1	34	1：1	80℃ ROHS
13	环保无印字热融胶膜	LEPB43-105	19	0	24	2.0：1.9	105℃ ROHS
14	环保印字热融胶膜	LEPBZ43-105	19	1	23	2.0：1.9	105℃ ROHS
15	环保无印字热融胶膜	LEPB60-105	25	0	35	1：1	105℃ ROHS
16	环保印字热融胶膜	LEPBZ60-105	25	1	34	1：1	105℃ ROHS
17	环保无印字热融胶膜	LEPB60-105A	25	0	35	1：1	105℃ ROHS
18	环保印字热融胶膜	LEPBZ60-105A	25	1	34	1：1	105℃ ROHS
19	环保无印字热融胶膜	LEPB50-80	50	0	30	1：0.6	80℃ ROHS
20	环保印字热融胶膜	LEPBZ50-80	50	1	29	1：0.6	80℃ ROHS
21	环保无印字热融胶膜	LEPB32-80	32	0	48	1：1.6	80℃ ROHS
22	环保印字热融胶膜	LEPBZ32-80	32	1	47	1：1.6	80℃ ROHS
23	环保无印字热融胶膜	LEPB50-100	50	0	50	2.13：2.42	80℃ ROHS
24	环保黑色无印字热融胶膜	LEPBH43-105	19	1	24	2.0：1.9	105℃ ROHS
25	环保黑色无印字热融胶膜	LEPBH60-105	25	1	34	1：1	105℃ ROHS
26	环保黑色印字热融胶膜	LEPBHZ43-105	19	1	24	2.0：1.9	105℃ ROHS
27	环保黑色印字热融胶膜	LEPBHZ60-105	25	1	34	1：1	105℃ ROHS
28	环保无印字热融胶膜	LEPB65-105	25	0	40	1：1.2	80℃ ROHS

29	环保有印字热融胶膜	LEPBZ65-105	25	1	39	1：1.2	105℃ ROHS
30	环保有印字热融胶膜	LEPBZ80-105	32	1	47	1：1.6	105℃ ROHS
31	环保无印字热融胶膜	LEPB80-105	32	0	48	1：1.6	105℃ ROHS

制表：陈小飞　　审核：吴锦彦

Client Name : GUANGDONG LEARY NEW MATERIAL TECHNOLOGY CO.,LTD

Client Address : BEISHUI INDUSTRIAL ZONE, XINGTAN TOWN, SHUNDE DISTRICT, FOSHAN CITY, GUANGDONG PROVINCE.

Sample Name : Hot melt glue film

Model No. : LEPB25-60

Client Ref. Info. : SEE REMARK

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

SGS Job No. : CP23-010550 - GZ

Date of Sample Received : 13 Mar 2023

Testing Period : 13 Mar 2023 - 23 Mar 2023

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
Elementary Analysis	See Results
VOC	See Results
Red Phosphor	See Results
Phthalate	See Results
AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)	See Results
Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives	See Results

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

scan to see the report

D350A5E6

Annie Ren

Annie Ren
Approved Signatory

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Test Result(s) :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN23-035621.003	White 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 .

Test Item(s)	Limit	Unit	MDL	*003*
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 Item(s)	Limit	Unit	MDL	*003*
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.

Elementary Analysis

Test Method : SGS In-house method (GZTC CHEM-TOP-004-01, with reference to EPA 3052:1996), analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	*003*
Beryllium (Be)	mg/kg	5	ND
Cobalt (Co)	mg/kg	5	ND

Notes :

(1) Methods is/are not accredited by CNAS.

VOC

Test Method : With reference to SGS in-house method (GZTC CHEM-TOP-050-37), TVOC test is performed according to Samsung requirement (2020):
TVOC analysis was performed by TVOC portable detector.
Benzene, Toluene, Formaldehyde and Phosphine analysis were performed by gas detecting tubes.

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Test Item(s)	Unit	MDL	003
Sample amount	-	-	768cm2
TVOC	ppmV	16	ND
Benzene	ppmV	0.8	ND
Toluene	ppmV	16	ND
Formaldehyde	ppmV	0.08	0.10
Phosphine	ppmV	0.08	ND

Notes :

1. ppmV: Part per million by volume
2. Tedlar bag: 5L
3. Test condition: 40 °C, 30min
4. Methods is/are not accredited by CNAS.

Red Phosphor

Test Method : SGS In-house method (SGS-CCL-TOP-215-01), analysis was performed by PY-GC/MS/ ICP-OES / GC-MS.

Test Item(s)	Unit	MDL	003
Red phosphorus	mg/kg	500	ND

Notes :

(1) Methods is/are not accredited by CNAS.

Phthalate

Test Method : With reference to EN14372: 2004. Analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	003
Dibutyl Phthalate (DBP)	84-74-2	%(w/w)	0.003	ND
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	%(w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	85-68-7	%(w/w)	0.003	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%(w/w)	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.010	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.010	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%(w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	%(w/w)	0.003	ND
Diisopentyl Phthalate (DIPP)	605-50-5	%(w/w)	0.003	ND

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Test Item(s)	CAS NO.	Unit	MDL	003
Dipentyl Phthalates (DPENP/DnPP)	131-18-0	%(w/w)	0.003	ND
n-pentyl Isopentyl Phthalate (nPIPP)	776297-69-9	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%(w/w)	0.010	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	%(w/w)	0.010	ND
Dicyclohexyl Phthalate (DCHP)	84-61-7	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, dipentyl ester, branched and linear (DPP)	84777-06-0	%(w/w)	0.010	ND
1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid,mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate	68515-51-5/68648 -93-1	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear(DHP)	68515-50-4	%(w/w)	0.010	ND
Di-iso-hexylphthalate (DIHxP)	71850-09-4	%(w/w)	0.010	ND

Notes :

(1) DBP,BBP,DEHP, DIBP Reference information: Entry 51 of Regulation (EU) 2018/2005 amending Annex XVII of REACH Regulation (EC) No 1907/2006:
i) Shall not be used as substances or in mixtures, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.
ii) Shall not be placed on the market in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material. In addition, DIBP shall not be placed on the market after 7 July 2020 in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material.
iii) shall not be placed on the market after 7 July 2020 in articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material in the articles.
Please refer to Regulation (EU) 2018/2005 to get more detail information
(2) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EU) 2015/326 amending Annex XVII of REACH Regulation (EC) No 1907/2006.
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 (EU) 2015/326 to get more detail information
(3) Methods is/are not accredited by CNAS.

AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	003
Naphthalene(NAP)	91-20-3	mg/kg	0.1	ND
Phenanthrene(PHE)	85-01-8	mg/kg	0.1	ND
Anthracene(ANT)	120-12-7	mg/kg	0.1	ND
Fluoranthene(FLT)	206-44-0	mg/kg	0.1	ND
Pyrene(PYR)	129-00-0	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	56-55-3	mg/kg	0.1	ND
Chrysene(CHR)	218-01-9	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	205-99-2	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	205-82-3	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	207-08-9	mg/kg	0.1	ND
Benzo(a)pyrene(BaP)	50-32-8	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	192-97-2	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	193-39-5	mg/kg	0.1	ND
Dibenzo(a,h)anthracene(DBA)	53-70-3	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	191-24-2	mg/kg	0.1	ND
Sum of 4 PAHs (Phenanthrene, Pyrene, Anthracene, Fluoranthene)	-	mg/kg	-	ND
Sum of 15 PAHs	-	mg/kg	-	ND

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AfPS (German commission for Product Safety) : PAHs requirements

Parameter (mg/kg)	Category 1	Category 2		Category 3	
	Materials intended to be placed in the mouth, or materials coming into long-term contact with skin (more than 30s) during the intended use -in toys according to Directive 2009/48/EC or -for the use by children[a,b] up to 3 years of age.	Materials not covered by category 1, coming into long-term contact (more than 30s) or short-term repetitive contact[c] with skin during the intended or foreseeable use[d].		Materials covered neither by category 1 nor by category 2, coming into short-term contact (up to 30s) with skin during the intended or foreseeable use.	
		a. use by children	b. other consumer products	a. use by children	b. other consumer products
Benzo(a)pyrene (BaP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(e)pyrene (BeP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene (BaA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene (BbF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene (BjF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene (BkF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene (CHR)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracene (DBA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene (BPE)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(1,2,3-cd)pyrene (IPY)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Phenanthrene (PHE), pyrene (PYR), anthracene (ANT), fluoranthene (FLT)	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene (NAP)	< 1	< 2		< 10	
Sum of 15 PAHs	<1	< 5	< 10	< 20	< 50

Note:
[a] A “Child” is legally defined as a person before reaching the age of 14 years.
[b] Use by children includes both active and passive contact by children.
[c] Definition “short-term repetitive contact” taken from REACH Annex XVII entry 50 amendment (Regulation (EC) No. 1272/2013)
[d] According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28) “foreseeable use” shall mean the use of a product in a manner that the person placing it on the market, has not intended, but which could be reasonably foreseeable.

Remark: The German committee on Product Safety (AfPS) published a new PAHs document (AfPS GS 2019:01 PAK) on April 10, 2020, which will be binding for the issue of GS mark certificate from July 1, 2020.

Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives

Test Method : With reference to CEN/TS15968:2010, analysis was performed by LC-MS or LC-MS/MS.

Test Item(s)	CAS NO.	Unit	MDL	003
Perfluorooctanoic acid (PFOA) and its salts*	-	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its salts*	-	mg/kg	0.010	ND
Perfluorooctane Sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide(N-MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	4151-50-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol(N-MeFOSE)	24448-09-7	mg/kg	0.010	ND
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol(N-EtFOSE)	1691-99-2	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its derivatives	-	mg/kg	-	ND

Notes :

(1) PFOA and its salts* including PFOA (CAS No. 335-67-1), APFO (CAS No. 3825-26-1), PFOA-Na (CAS No. 335-95-5), PFOA-K (CAS No. 2395-00-8), PFOA-Ag (CAS No. 335-93-3) and PFOA-F (CAS No. 335-66-0). The result of PFOA is used to represent PFOA and its salts.

(2) PFOS and its salts* including PFOS (CAS No. 1763-23-1), POSF(CAS No. 307-35-7), PFOS-K (CAS No. 2795-39-3), PFOS-NH_4 (CAS No. 29081-56-9), PFOS-$N(C_{10}H_{21})_2(CH_3)_2$ (CAS No. 251099-16-8), PFOS-$NH_2(C_2H_4OH)_2$ (CAS No. 70225-14-8), PFOS-Li (CAS No. 29457-72-5), PFOS-$N(C_2H_5)_4$ (CAS No. 56773-42-3) and PFOS-Na (CAS No. 4021-47-0). The result of PFOS is used to represent PFOS and its salts.

(3) Perfluorooctane sulfonates (PFOS) is/are accredited by CNAS.

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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REMARK :

LEPB12-37, LEPBZ12-37, LE25-43, LEZ25-43, LEPB19-43, LEPB19-43-1, LEPBZ19-43, LEPBZ19-43-1, LEPB19-43GZ, LEPBZ19-43GZ, LEPB43-105A, LEPB43-D, LEPB37-H, LEPBZ37-H, LEPB43-H, LEPBZ43-H, LEPB25-55, LEPB25-50, LEPBZ25-50, LEPBZ25-55, LE32-60, LEZ32-60, LEH32-60, LEPB32-60, LEPBZ32-60, LEPB25-60, LEPBZ25-60, LEPB86-105, LE60-H, LEZ60-H, LEPB60-H, LEPBZ60-H, LEPBH60-H, LEPBHZ60-H, LEPB70-H, LEPBZ70-H, LEPB80-H, LEPBZ80-H, LEPB100-H, LEPBZ100-H, LEPB60-F, LEPB25-65, LEPBZ25-65, LEPB25-70, LEPBZ25-70, LEPB32-80, LEPBZ32-80, LEPB50-80, LEPB50-100, LEPBZ50-100, LEPB37-105, LEPBZ37-105, LEPB37-105LE, LEPBZ37-105LE, LE37-105, LEZ37-105, LE37-105-L, LE43-105, LEZ43-105, LEPB43-105, LEPBZ43-105, LEPB43-105LE, LEPBZ43-105LE, LEPBH43-105LE, LEPBZ43-105A, LEPB50-105, LEPBZ50-105, LEPB80-105, LEPB80-105B, LEPBZ80-105, LEPB70-105B, LEPBZ70-105B, LE60-105, LEZ60-105, LEPB60-105, LEPBZ60-105, LEPB63-105, LEPBZ63-105, LEPB60-105LE, LEPBZ60-105LE, LEPB50-80LC, LEPB60-105A, LEPBZ60-105A, LEPB60-105B, LEPBZ60-105B, LEPB60-D-105, LEPB65-105, LEPBZ65-105, LEPB75-105, LEPBZ75-105, LEPB100-105, LEPB100-105LE, LEPBZ100-105, LEPB100-105A, LEPBZ100-105A, LEPB100-105B, LEPBZ100-105B, LEPB100-105YX, LEPBZ100-105YX, LEPB100-105YX -01, LEPBZ100-105YX-01 LEPBH15-37 , LEPBHZ15-37, LEPBH19-43, LEPBHZ19-43, LEPBH25-60, LEPBHZ25-60, LEH60-105, LEHZ60-105, LEPBH25-65, LEPBHZ25-65, LEPBH25-70, LEPBHZ25-70, LEPBH32-80, LEPBHZ32-80, LEPBH50-80, LEPBHZ50-80, LEPBH50-100, LEPBH43-105, LEPBHZ43-105, LEPBH60-105, LPEBHZ60-105, LEPBH60-105LE, LPEBHZ60-105LE, LEPBH65-105, LEPBHZ65-105, LEPBH70-105, LEPBHZ70-105, LEPBH80-105, LEPBHZ80-105, LEPBH100-105, LEPBH100-105LE, LEPBHZ100-105, LEPBH60-105A, LEPBHZ60-105A, LEPBHU43-105, LEPBHU60-105, LEPB19-43MT, LEZ32-60-105, LE32-60-105, LEPB55-105, LEPB19-43 XXS, LEPBZ19-43XXS, LEPBH19-43XXS, LEPBHZ19-43XXS, LEPB25-60VA, LEPBZ25-60VA, LEPB12-37VA, LEPBZ12-37VA, LEPB25-50VA,

LEPBZ25-50VA, LEPB37-K, LEPBZ37-K, LEPB43-K, LEPBZ43-K, LEPB55-K, LEPBZ55-K, LEPB60-K, LEPBZ60-K, LEPB50-80-K, LEPBZ50-80-K, LEPB70-K, LEPBZ70-K, LEPB80-K, LEPBZ80-K, LEPB100-K, LEPBZ100-K, LEPB150-K, LEPBZ150-K, SRJMB50-25-01, SRJMB50-25-02, LEPB63-HL, LEPBZ63-HL, LEPB60-HL, LEPBZ60-HL, LEPB63-H-HL, LEPBZ63-H-HL, LEPB120-105, LEPB25-43, LEPBZ25-43, LEPB37-J, LEPBZ37-J, LEPB43-J, LEPBZ43-J, LEPB55-J, LEPBZ55-J, LEPB60-J, LEPBZ60-J, LEPB70-J, LEPBZ70-J, LEPB80-J, LEPBZ80-J, LEPB100-J, LEPBZ100-J, LEPB150-J, LEPBZ150-J, LEPB25-70VA, LEPBZ25-70VA, LEPBHZ25-70VA, LEPBH25-70VA, LEPB19-37, LEPBZ19-37, LEPB30-60, LEPBZ30-60, LEPBHR85-105A, LEPB2101, LEPB2102, LEPB2103, LEPB2104, LEPB2105, LEPB2106, LEPB2107, LEPB2108, LEPB2109, LEPB2110, LEPB2111, LEPB2112, LEPB2113, LEPB2114, LEPB2115, LEPB2116, LEPB2117, LEPB2118, LEPB2119, LEPB2120, LEPB60-105D, LEPB70-105D, LEPB75-105D, LEPB43-105LE-P, LEPBZ43-105LE-P, LEPB60-105LE-P, LEPBZ60-105LE-P, LENB50-40, LEPBZ60-HM-01, LEPB60-HM-01, LEPB19-43HM-01, LEPBZ19-43HM-01, LEPB63-105-HB-01, LEPBZ63-105-HB-01

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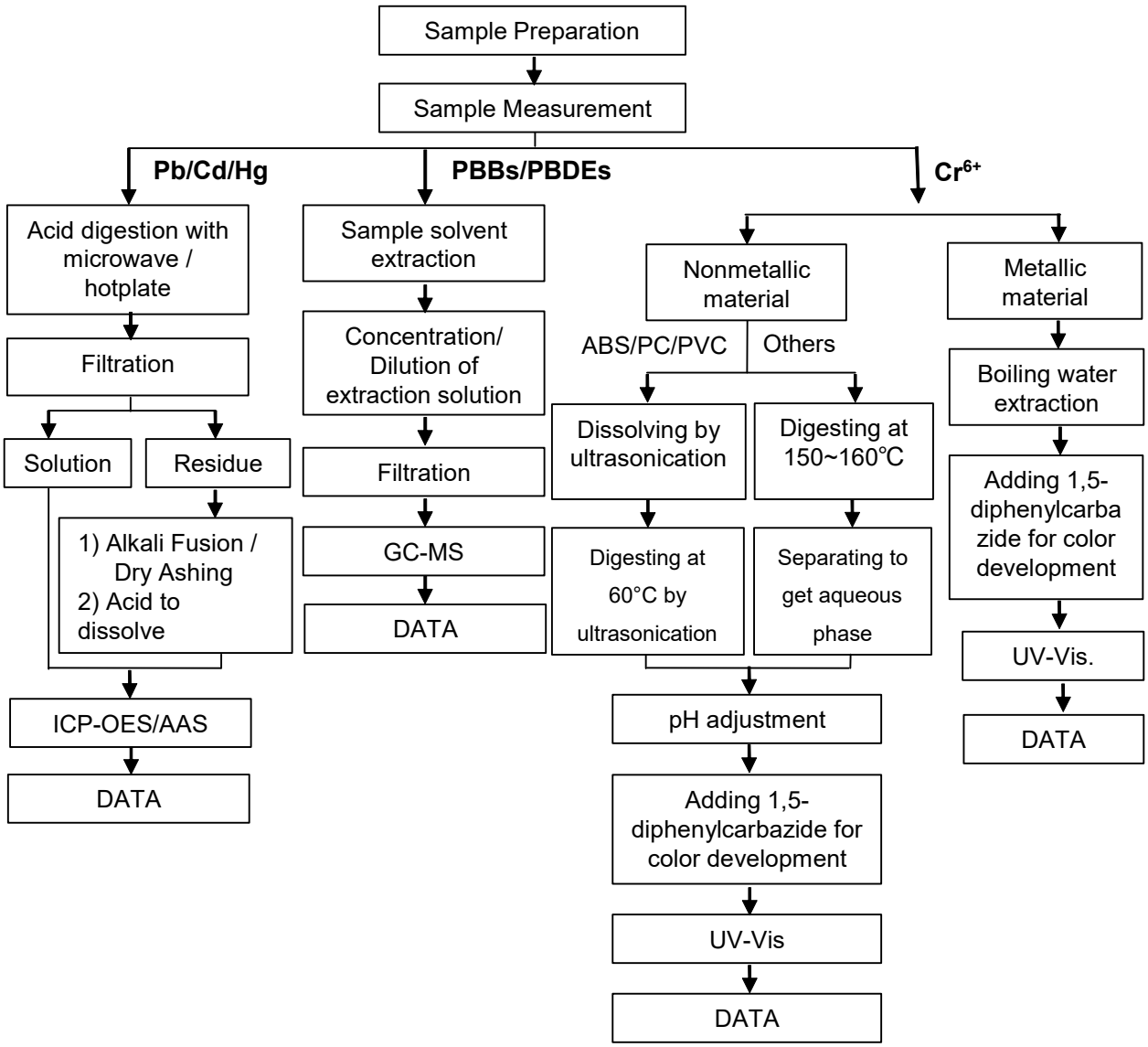
ATTACHMENTS

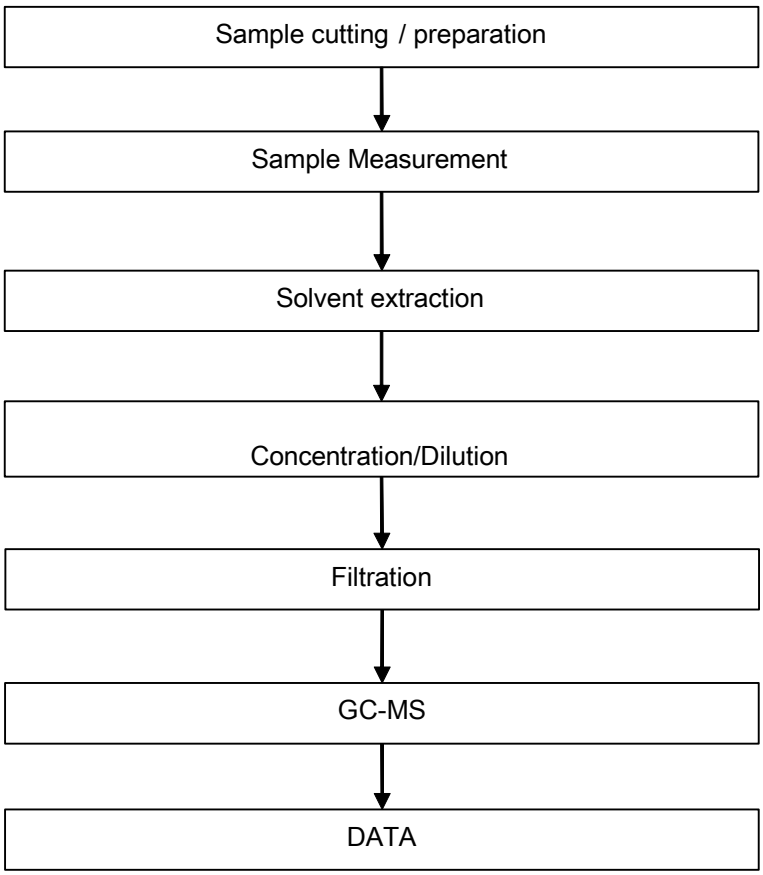
Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

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



ATTACHMENTS

Phthalates Testing Flow Chart



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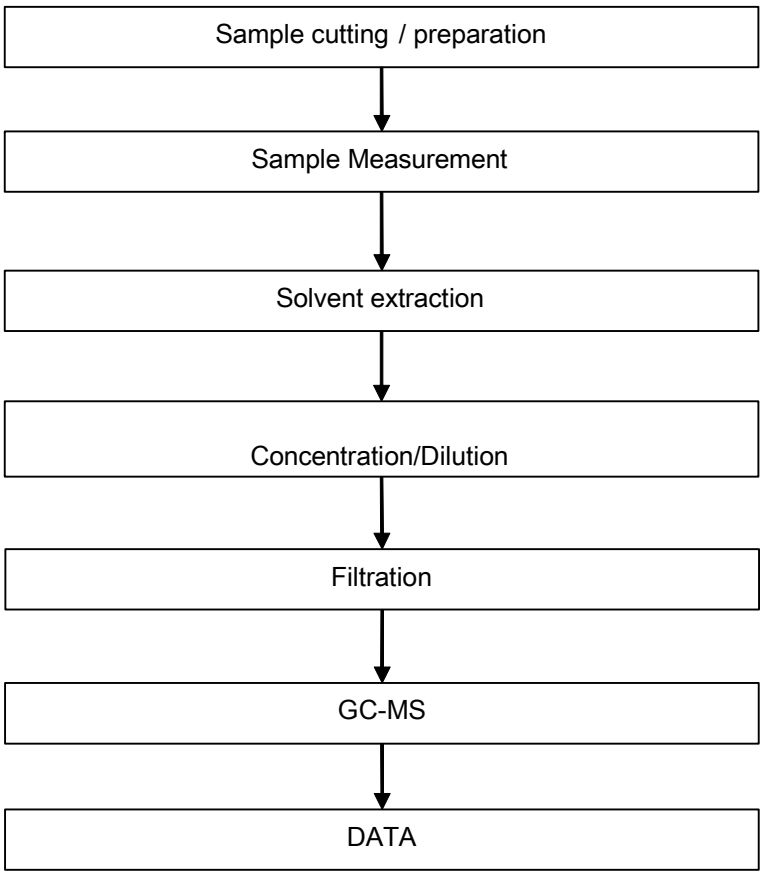
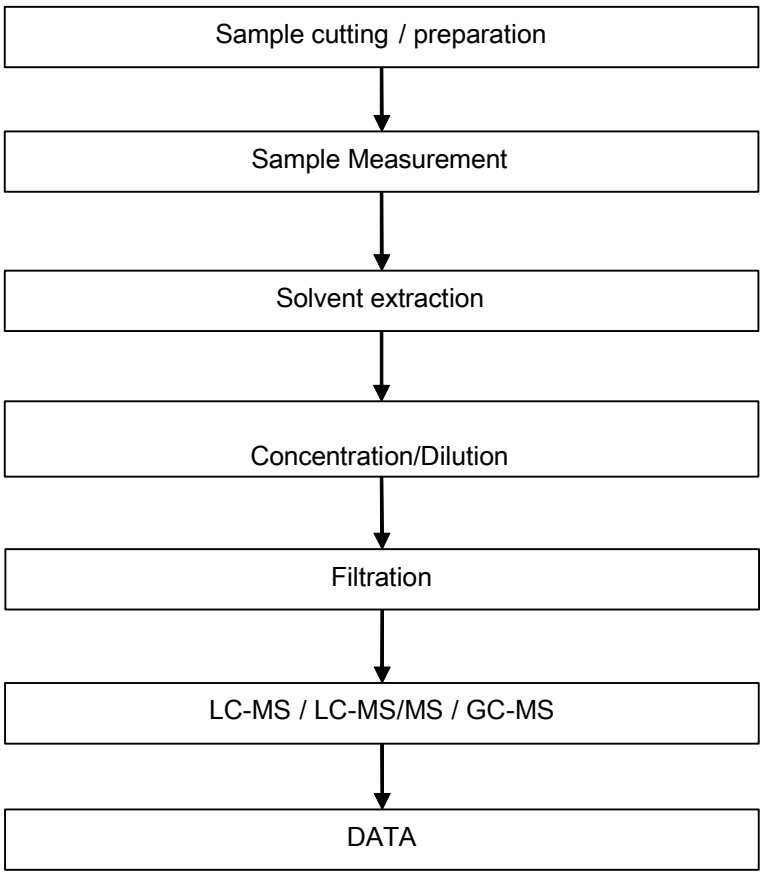
PAHs Testing Flow Chart



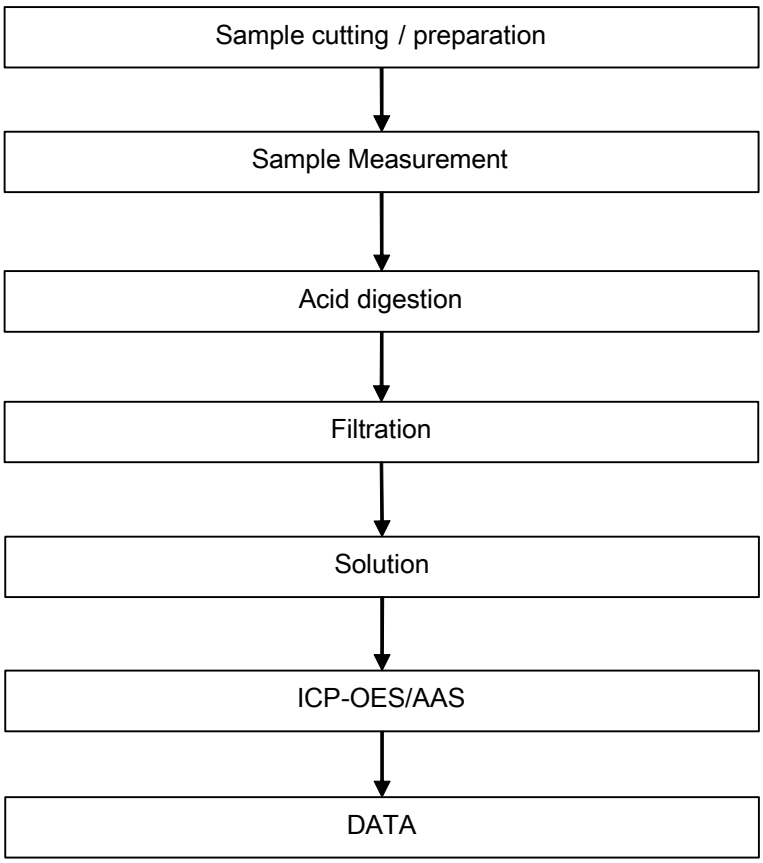
ATTACHMENTS

PFAS Testing Flow Chart



ATTACHMENTS

Elementary Testing Flow Chart



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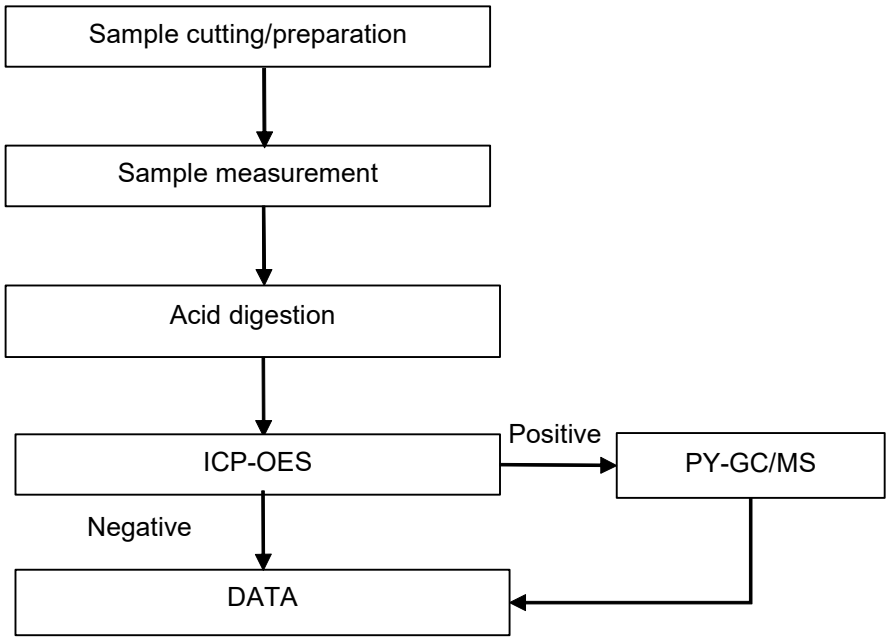
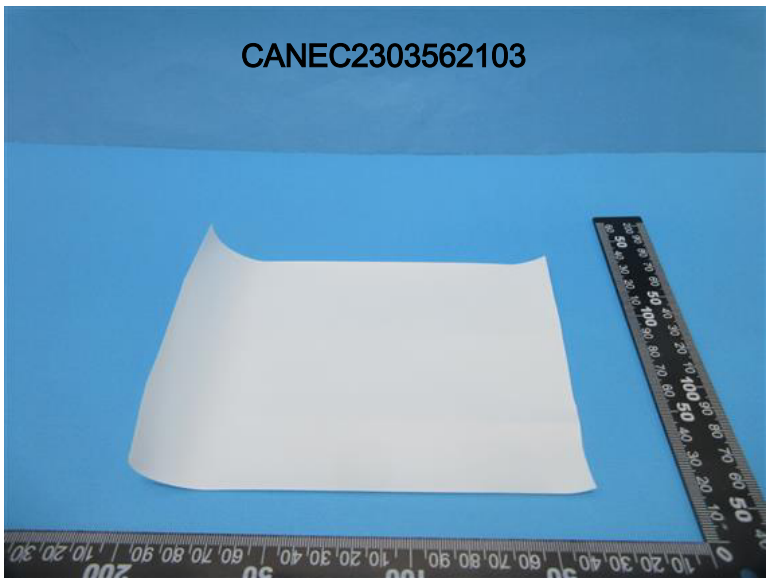
Red phosphorus Testing Flow Chart



Sample photo:



CAN23-035621.003

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No. CANEC2307182507 Date: 27 May 2023 Page 1 of 19

Client Name : GUANGDONG LEARY NEW MATERIAL TECHNOLOGY CO.,LTD

Client Address : BEISHUI INDUSTRIAL ZONE, XINGTAN TOWN, SHUNDE DISTRICT, FOSHAN CITY, GUANGDONG PROVINCE.

Sample Name : Halogen free reinforcement plate

Model No. : LEB188-225S

Client Ref. Info. : SEE REMARK

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

SGS Job No. : GZP23-002253 - GZ

Date of Sample Received : 19 May 2023

Testing Period : 19 May 2023 - 26 May 2023

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
Halogen	See Results
Elementary Analysis	See Results
VOC	See Results
Red Phosphor	See Results
AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)	See Results
Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives	See Results
Phthalate	See Results

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

scan to see the report

695C25CD

Zm guan
Approved Signatory

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Test Result(s) :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN23-071825.001	Blue 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 .

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 (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

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
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.

Halogen

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

Test Item(s)	Unit	MDL	001
Fluorine (F)	mg/kg	20	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Elementary Analysis

Test Method : SGS In-house method (GZTC CHEM-TOP-004-01, with reference to EPA 3052:1996), analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	001
Beryllium (Be)	mg/kg	5	ND
Cobalt (Co)	mg/kg	5	ND

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Notes :

(1) Methods is/are not accredited by CNAS.

VOC

Test Method : With reference to SGS in-house method (GZTC CHEM-TOP-050-37), TVOC test is performed according to Samsung requirement (2020):
TVOC analysis was performed by TVOC portable detector.
Benzene, Toluene and Phosphine analysis were performed by gas detecting tubes.

Test Item(s)	Unit	MDL	*001*
Sample amount	-	-	900cm2
TVOC	ppmV	16	ND
Benzene	ppmV	0.8	ND
Toluene	ppmV	16	ND
Phosphine	ppmV	0.08	ND

Notes :

1. ppmV: Part per million by volume
2. Tedlar bag: 5L
3. Test condition: 40 °C, 30min
4. Methods is/are not accredited by CNAS.

Red Phosphor

Test Method : SGS In-house method (SGS-CCL-TOP-215-01), analysis was performed by PY-GC/MS/ ICP-OES / GC-MS.

Test Item(s)	Unit	MDL	*001*
Red phosphorus	mg/kg	500	ND

Notes :

(1) Methods is/are not accredited by CNAS.

AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Naphthalene(NAP)	91-20-3	mg/kg	0.1	ND
Phenanthrene(PHE)	85-01-8	mg/kg	0.1	ND

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Test Item(s)	CAS NO.	Unit	MDL	001
Anthracene(ANT)	120-12-7	mg/kg	0.1	ND
Fluoranthene(FLT)	206-44-0	mg/kg	0.1	ND
Pyrene(PYR)	129-00-0	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	56-55-3	mg/kg	0.1	ND
Chrysene(CHR)	218-01-9	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	205-99-2	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	205-82-3	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	207-08-9	mg/kg	0.1	ND
Benzo(a)pyrene(BaP)	50-32-8	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	192-97-2	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	193-39-5	mg/kg	0.1	ND
Dibenzo(a,h)anthracene(DBA)	53-70-3	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	191-24-2	mg/kg	0.1	ND
Sum of 4 PAHs (Phenanthrene, Pyrene, Anthracene, Fluoranthene)	-	mg/kg	-	ND
Sum of 15 PAHs	-	mg/kg	-	ND

AfPS (German commission for Product Safety) : PAHs requirements

Parameter (mg/kg)	Category 1	Category 2		Category 3	
	Materials intended to be placed in the mouth, or materials coming into long-term contact with skin (more than 30s) during the intended use -in toys according to Directive 2009/48/EC or -for the use by children[a,b] up to 3 years of age.	Materials not covered by category 1, coming into long-term contact (more than 30s) or short-term repetitive contact[c] with skin during the intended or foreseeable use[d].		Materials covered neither by category 1 nor by category 2, coming into short-term contact (up to 30s) with skin during the intended or foreseeable use.	
		a. use by children	b. other consumer products	a. use by children	b. other consumer products
Benzo(a)pyrene (BaP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(e)pyrene (BeP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene (BaA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene (BbF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene (BjF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene (BkF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene (CHR)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracene (DBA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene (BPE)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(1,2,3-cd)pyrene (IPY)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Phenanthrene (PHE), pyrene (PYR), anthracene (ANT), fluoranthene (FLT)	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene (NAP)	< 1	< 2		< 10	
Sum of 15 PAHs	<1	< 5	< 10	< 20	< 50

Note:
[a] A “Child” is legally defined as a person before reaching the age of 14 years.
[b] Use by children includes both active and passive contact by children.
[c] Definition “short-term repetitive contact” taken from REACH Annex XVII entry 50 amendment (Regulation (EC) No. 1272/2013)
[d] According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28) “foreseeable use” shall mean the use of a product in a manner that the person placing it on the market, has not intended, but which could be reasonably foreseeable.

Remark: The German committee on Product Safety (AfPS) published a new PAHs document (AfPS GS 2019:01 PAK) on April 10, 2020, which will be binding for the issue of GS mark certificate from July 1, 2020.

Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives

Test Method : With reference to CEN/TS15968:2010, analysis was performed by LC-MS or LC-MS/MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Perfluorooctanoic acid (PFOA) and its salts*	-	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its salts*	-	mg/kg	0.010	ND
Perfluorooctane Sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide(N-MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	4151-50-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol(N-MeFOSE)	24448-09-7	mg/kg	0.010	ND
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol(N-EtFOSE)	1691-99-2	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its derivatives	-	mg/kg	-	ND

Notes :

(1) PFOA and its salts* including PFOA (CAS No. 335-67-1), APFO (CAS No. 3825-26-1), PFOA-Na (CAS No. 335-95-5), PFOA-K (CAS No. 2395-00-8), PFOA-Ag (CAS No. 335-93-3) and PFOA-F (CAS No. 335-66-0). The result of PFOA is used to represent PFOA and its salts.
(2) PFOS and its salts* including PFOS (CAS No. 1763-23-1), POSF(CAS No. 307-35-7), PFOS-K (CAS No. 2795-39-3), PFOS-NH_4 (CAS No. 29081-56-9), PFOS-$N(C_{10}H_{21})_2(CH_3)_2$ (CAS No. 251099-16-8), PFOS-$NH_2(C_2H_4OH)_2$ (CAS No. 70225-14-8), PFOS-Li (CAS No. 29457-72-5), PFOS-$N(C_2H_5)_4$ (CAS No. 56773-42-3) and PFOS-Na (CAS No. 4021-47-0). The result of PFOS is used to represent PFOS and its salts.
(3) Perfluorooctane sulfonates (PFOS) is/are accredited by CNAS.

Phthalate

Test Method : With reference to EN14372: 2004. Analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Dibutyl Phthalate (DBP)	84-74-2	%(w/w)	0.003	ND
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	%(w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	85-68-7	%(w/w)	0.003	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%(w/w)	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.010	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.010	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%(w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	%(w/w)	0.003	ND
Diisopentyl Phthalate (DIPP)	605-50-5	%(w/w)	0.003	ND
Dipentyl Phthalates (DPENP/DnPP)	131-18-0	%(w/w)	0.003	ND
n-pentyl Isopentyl Phthalate (nPIPP)	776297-69-9	%(w/w)	0.003	ND

Test Item(s)	CAS NO.	Unit	MDL	001
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%(w/w)	0.010	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, dipentyl ester, branched and linear (DPP)	84777-06-0	%(w/w)	0.010	ND
Dicyclohexyl Phthalate (DCHP)	84-61-7	%(w/w)	0.003	ND
1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid,mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate	68515-51-5/68648-93-1	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear(DHP)	68515-50-4	%(w/w)	0.010	ND
Di-iso-hexylphthalate (DIHxP)	71850-09-4	%(w/w)	0.010	ND

Notes :

(1) DBP,BBP,DEHP, DIBP Reference information: Entry 51 of Regulation (EU) 2018/2005 amending Annex XVII of REACH Regulation (EC) No 1907/2006:

i) Shall not be used as substances or in mixtures, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.

ii) Shall not be placed on the market in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material. In addition, DIBP shall not be placed on the market after 7 July 2020 in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material.

iii) shall not be placed on the market after 7 July 2020 in articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material in the articles.

Please refer to Regulation (EU) 2018/2005 to get more detail information

(2) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EU) 2015/326 amending Annex XVII of REACH Regulation (EC) No 1907/2006.

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 (EU) 2015/326 to get more detail information

(3) Methods is/are not accredited by CNAS.

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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REMARK :

LEB25-55ST, LEB25-55SW, LEB75-100S, LEBH100-130S, LEB100-130SW, LEB100-130AW, LEB100-130ST, LEB100-130SQ, LEB100-130S, LEB100-130A, LEB100-130ACZY , LEB125-160S, LEB125-160SQ, LEB125-160A, LEB125-160Y, LEB125-160SW, LEB125-160ST, LEB125-160AW, LEB125-160ACZY, LEB125-160YCZY, LEB150-183A, LEB150-183ACZY, LEB150-183S, LEB150-183SQ, LEB150-183SW, LEB150-183ST, LEB150-183AW, LEB150-183Y, LEB175-205S, LEB175-205Y, LEB175-205SQ, LEB175-205ST, LEB175-205A, LEB175-205AW, LEB175-205SW, LEB188-215S, LEB188-215ST, LEB188-215SQ, LEB188-215A, LEB188-218S, LEB188-218ST, LEB188-218SQ, LEB188-218SW, LEB188-225S, LEB188-225SY, LEB188-225SQ, LEB188-225ACZY, LEB188-225YCZY, LEB188-225YBZY, LEB188-225 SHF, LEB188-225SQBD, LEB188-225ASHF, LEB188-225SW, LEB188-225ST, LEB188-225AW, LEB188-225DGSHF-Y, LEB188-225A, LEB188-225GSHF-H, LEB188-225Y, LEB225-HF, LEB188-225AL, LEB215-250S, LEB215-250A, LEB215-250Y, LEB215-250ACZY, LEB215-250YCZY, LEB215-250YBZY, LEB220-260GSHF-H, LEB250-282S, LEB250-282Y, LEB250-282A, LEB250-282ACZY, LEB250-282YCZY, LEB250-282YBZY, LEB250-282SQ, LEB250-282GSZY, LEB250-290GSZY, LEB188-215SW, LEB100-130SZ, LEB125-160 SZ, LEB150-183 SZ, LEB175-205 SZ, LEB188-215SZ, LEB188-225 SZ, LEB215-250 SZ, LEB250-282 SZ, LEB188-218DQ, LEB175-205SH, LEB188-225SQBD, LEB125-160SPT, LEB188-225SPT, LEB188-240S, LEB250-282GSZY-04 , LEB250-282KTZY-05, LEB215-250KTZY-01, LEB188-218KTZY-01, LEB150-183KTZY-01, LEB150-190KTZY-01, LEB125-155KTZY-01, LEB188-225WKTZY-01, LEBAL-240S, LEB250-285KTZYS-01, LEB250-282GP, LEB215-250GP, LEB188-218GP, LEB150-183GP, LEB150-190GP, LEB125-155GP, LEB188-225GP, LEB25-55ST, LEB85-105S, LEB150-183SPT, LEB175-205SPT, LEB215-250SR, LEB215-250TSY, LEB188-235SW, LEB188-233SW, LEBF250Q, LEB250-295SQ, LEB75-100SW, LEB100-120S, LEB125-160SZ, LEB125-165S, LEB188-225SZ, LEB215-250SW, LEB50-85S, LEB100-130SL, LEB125-160SL, LEB150-183SL,

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LEB175-205SL, LEB188-215SL, LEB188-218SL, LEB188-225SL, LEB250-282SL, LEB250-295SL, LEB100-130SR, LEB125-160SR, LEB150-183SR, LEB175-205SR, LEB188-215SR, LEB188-218SR, LEB188-225SR, LEB250-282SR, LEB250-295SR, LEB100-130SH, LEB125-160SH, LEB150-183SH, LEB175-205SH, LEB188-215SH, LEB188-218SH, LEB188-225SH, LEB250-282SH, LEB250-295SH, LEB188-233S, LEB188-233SQ, LEB188-233Y, LEB188-233ST, LEB188-233SZ, LEB188-233A, LEB188-233SL, LEB100-130S-D, LEB125-160S-D, LEB150-183S-D, LEB175-205S-D, LEB188-225S-D, LEB215-250S-D, LEB250-282S-D, LEBAL-240, LEBAL-230S, LEBAL-205S, LEBAL202S, LEBAL-225S, LEBA-225, LEBA-100, LEBA-100-HH, LEBA-205, LEBA-205-HH, LEBA-230, LEBA-230-HH, LEB140-AL, LEB50-100ST, LEB75-100ST, LEB215-250ST, LEB250-282ST, LEB25-65KTZY

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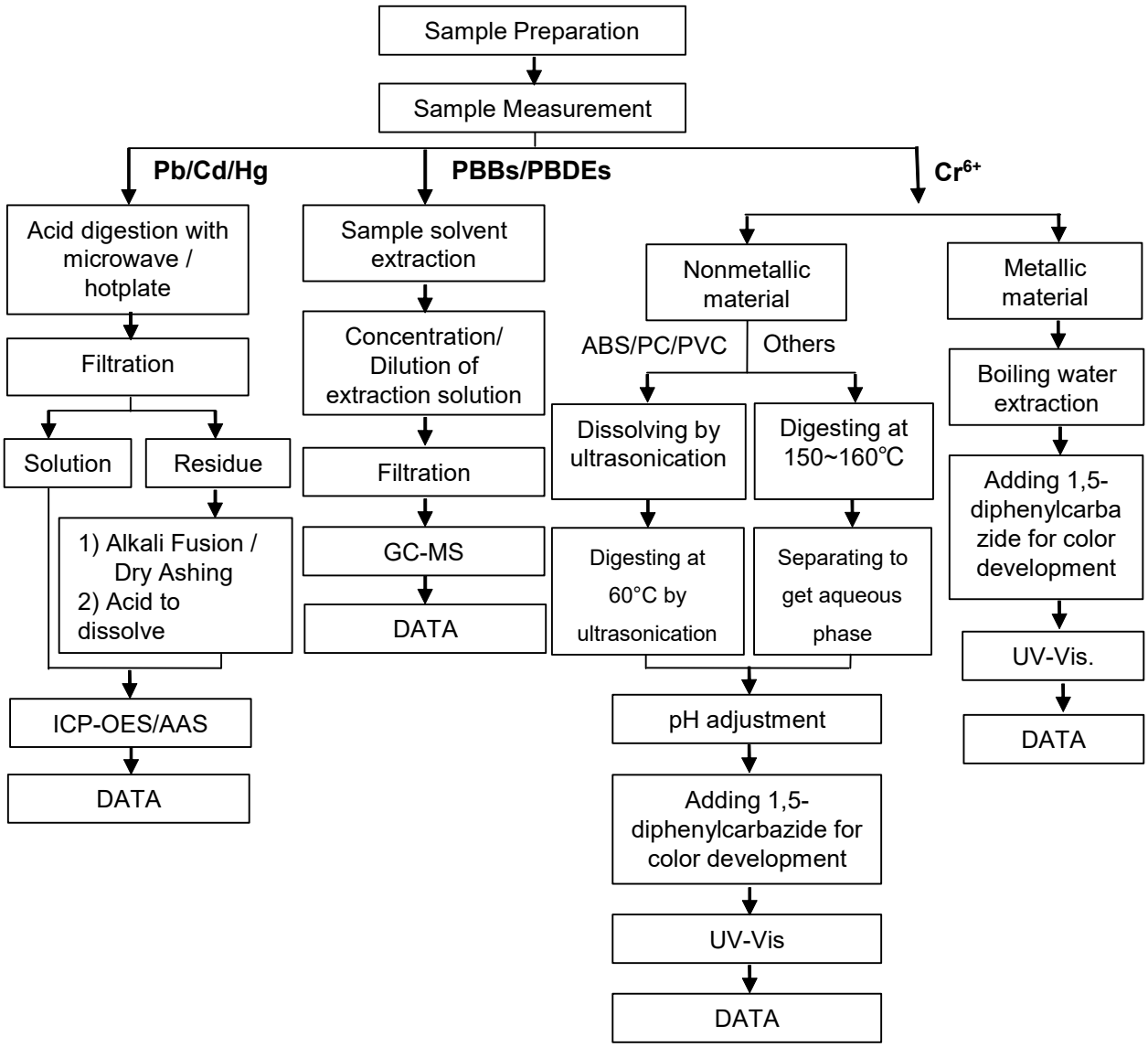
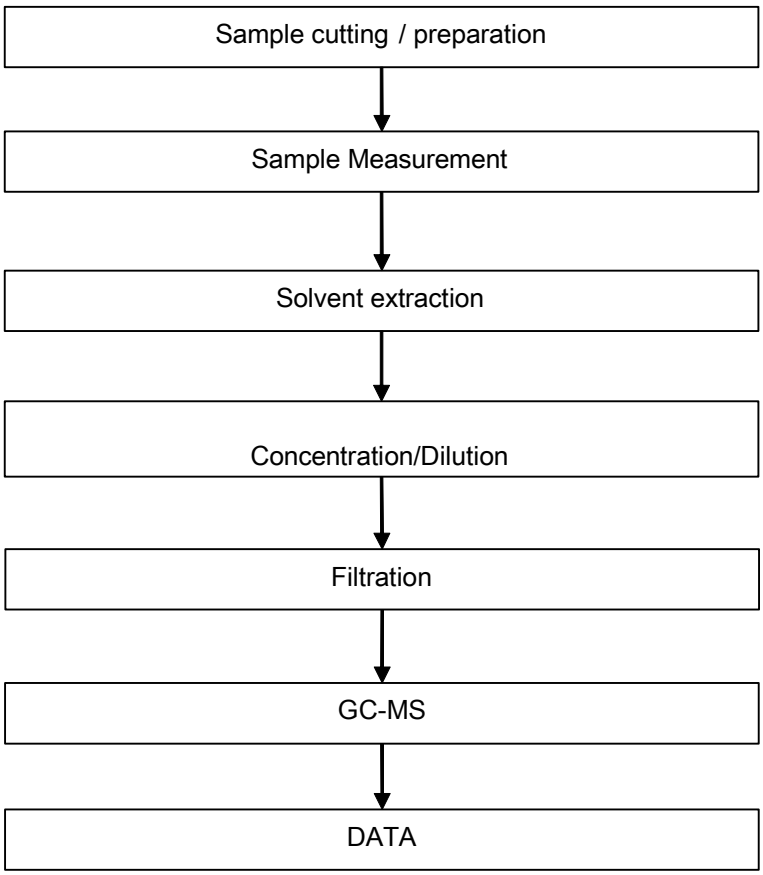
Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

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



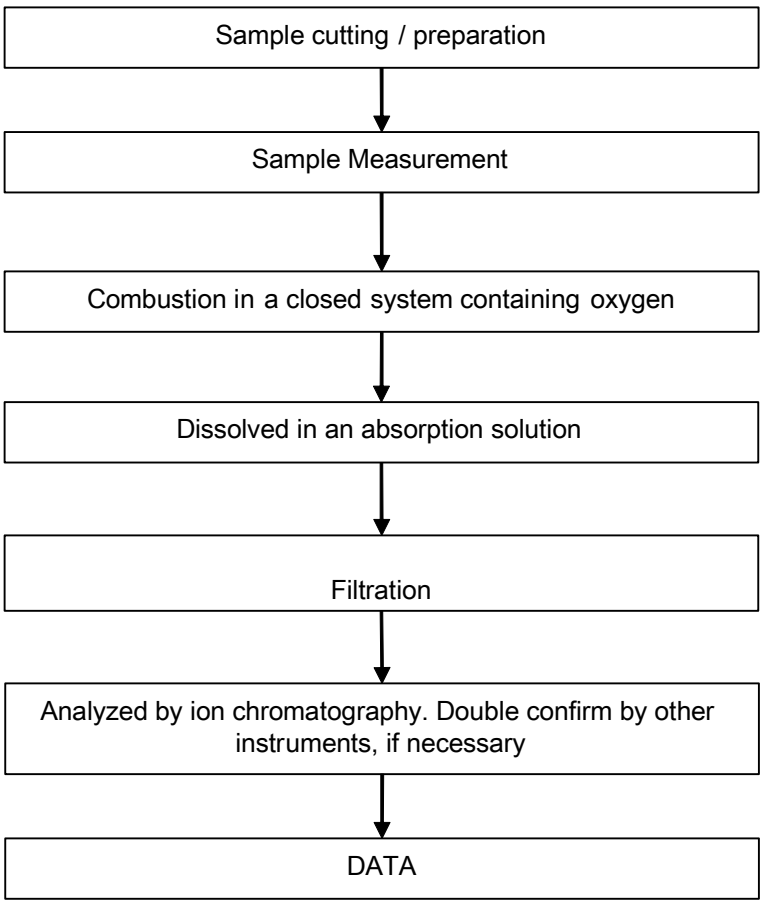
ATTACHMENTS

Phthalates Testing Flow Chart



ATTACHMENTS

Halogen Testing Flow Chart



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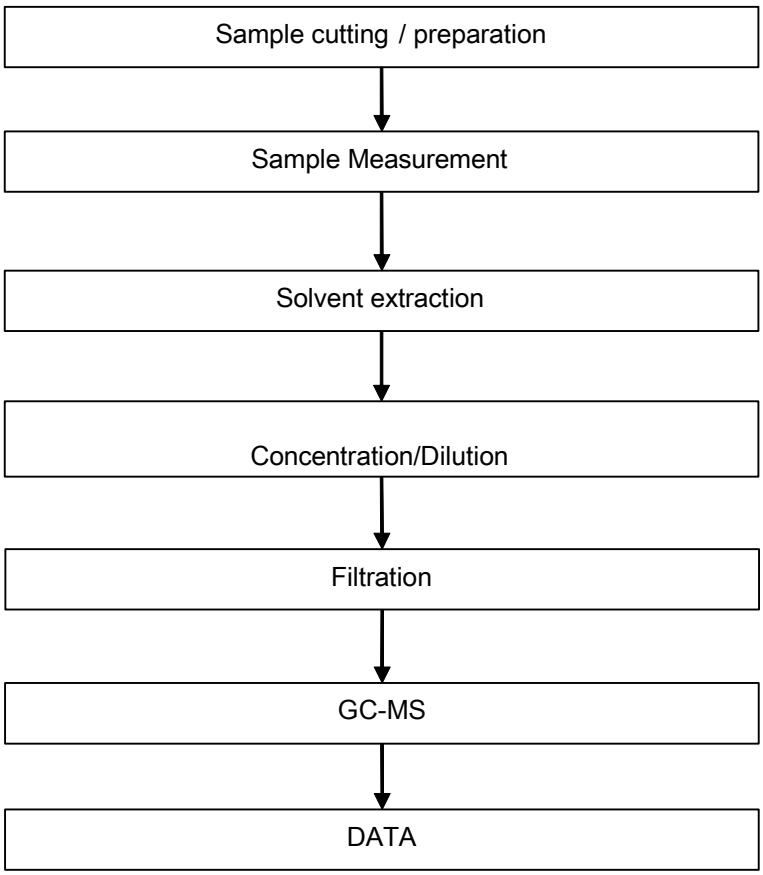
PAHs Testing Flow Chart



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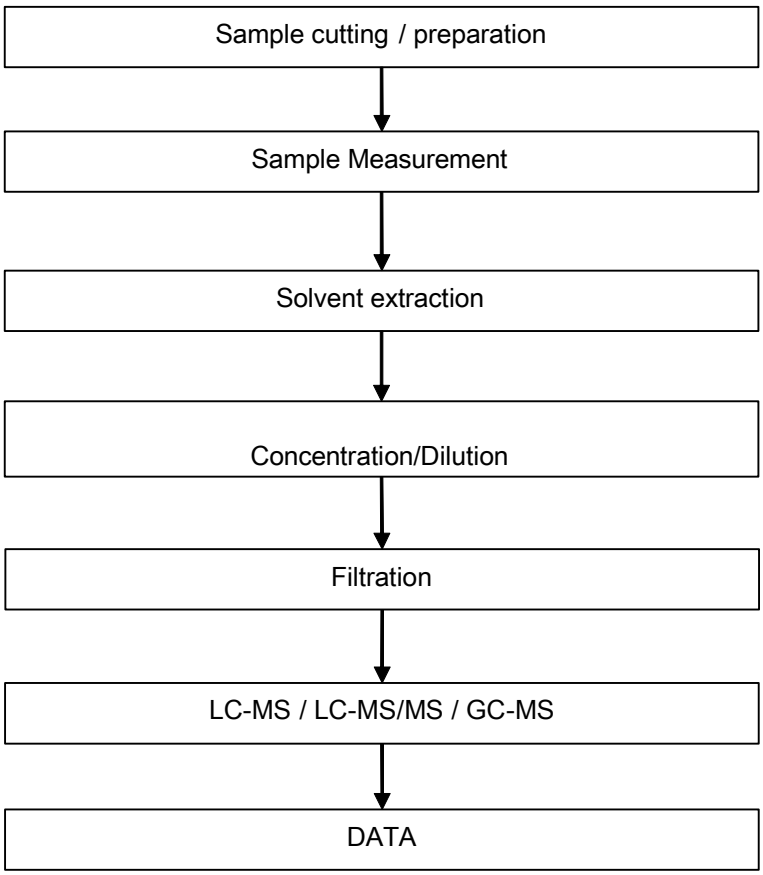
PFAS Testing Flow Chart



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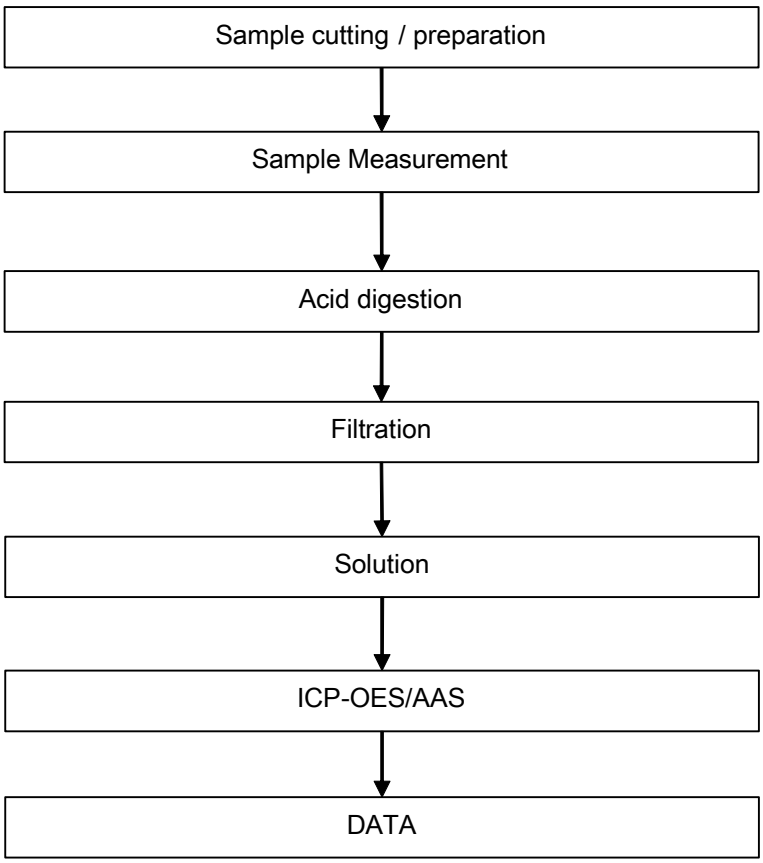
Elementary Testing Flow Chart



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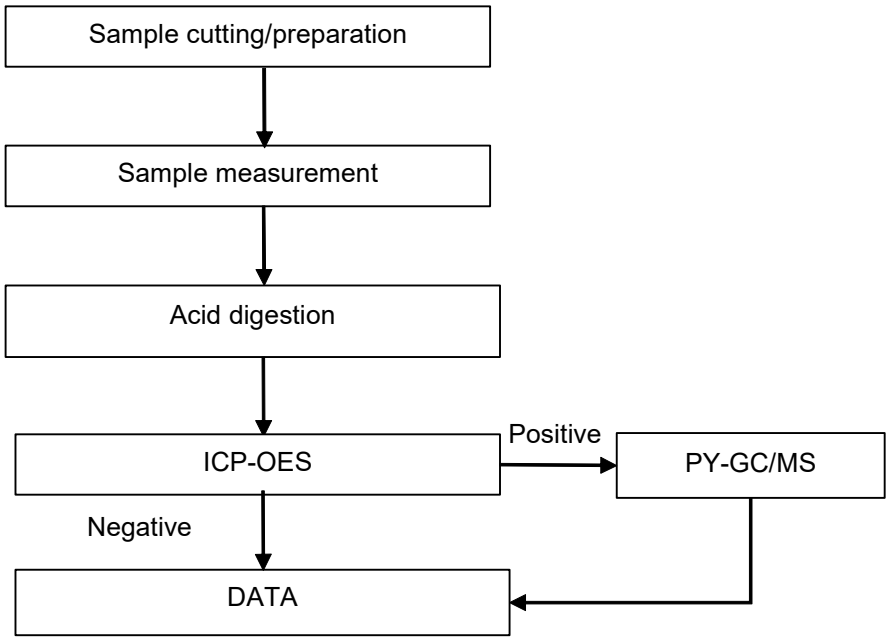
Red phosphorus Testing Flow Chart



Sample photo:

CAN23-071825.001

SGS authenticate the photo on original report only

*** End of Report ***

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东莞市华冠电线制品有限公司

物质成份安全资料表 (MSDS)

一 、物品与厂商资料

物品名称： 镀锡铜线
物品编号：
制 造商或供应商名称： 深圳市暹营电子科技有限公司

二 、成份辩试资料

成份： 铜
同义同称：
化学文摘社登记号码 (CAS NO):铜： 7440-50-8，锡 CAS No：7440-31-5
危害物质成分 (成分百分比) 铜：99.96% ,锡 :0.04%

三、危害辩识资料：

最重要危害效应	健康危害效应： 铜危害很小。
	环境影响： 环保产品 ，低铅低镉 (Pb<5PPm Cd<5PPm Cr<2PPmm Hg<2PPm)
	物理性及化学性危害:锐利可划伤皮肤。
	特殊危害： 无
主要症状： 误食 400g 以上出现呕吐，胸闷	

四、急救措施

不 同暴露途径之急救方法
●食入、吸入： 吸入就医，食入 400g 以上铜出现呕吐、胸闷。
●皮肤接触： 用水清洗 5 分钟以上。
●眼睛接触： 有刺痛送医院治疗。
最重要危害效应:食入 400g 以上出现呕吐、胸闷
对急救人员之防护： 无
对 医师之提示： 尽可能清楚告之感染物，节省救治时效。

五、灭火措施

适用灭火剂： 干粉
灭火时可能遭遇之特殊危害： 无
特殊灭火程序： 无
消防人员之特殊防护设备： 应穿戴防护器具

六 、泄漏处理方法

线材为固体，不存在泄漏隐患。
环境注意事项： 不存放于高温，潮湿，酸碱物质一起。
清理方法： 回收、重熔

七 、安全处置与储存方法

处置： 一般性回收重熔
储存： 避免高温环境及勿接触酸性强物质。

八 、暴露预防措施

工程控制： 避免高温 ，酸碱物质接触
生物指示：
个人防护设备：
●呼吸防护： 劳保口罩
●手部防护： 带手套
●眼睛防护： 防护眼镜

●皮肤及身体防护： 穿好工作服
卫生措施： 意外食入后及时就医

九 、物理及化学性质

物质状态： 固体物	形状： 线状
颜色： 铜 ：玫瑰色	沸点/沸点范围： 无
PH 值： 中性	气味： 无
自然温度：无	爆炸界限： 无
蒸气压力： 无	蒸气密度： 无
密度： 铜：8.89g/cm³	溶解度： 难熔

十 、安定性及反应性

安定性： 常态下保持稳定
特殊状况下可能之危害反应:高温状态下灼伤皮肤
应避免之状况： 避免食入
应避免之物质： 酸碱性物质

十一、毒性资料

急毒性： 无
慢性或长期性毒性： 体内积铜肝、 肾有害
特殊效应： 误食 400g 以上出现恶心、呕吐、胸闷

十二、生态资料

可 能之环境影响/环境： 无

十三 、废弃处置方法

废弃处理方法： 回收重熔

十四、运送资料

特 殊运送方法及注意事项： 线材应避免磕碰 ， 防雨 ， 防潮

十五 、法规资料

适用法规： ROHS 指令

十六 、其他资料

参考文献

制表单位	东 莞市华冠电线制品有限公司	
	地址： 东莞市常平镇苏坑一路 93 号	
	电话：0769-23094606 传真：0769-27384939	
制表人	龚兰兰	

检测报告

编号: SZXEC2202743402　　日期: 2022年08月17日　第1页,共6页

客户名称：　东莞市华冠电线制品有限公司

客户地址：　广东省东莞市常平镇苏坑一路93号7栋201室

样品名称：　镀锡铜线

以上样品及信息由客户提供。

SGS工作编号：　RP22-021458 - SZ

样品接收日期：　2022年08月12日

检测周期：　2022年08月12日 - 2022年08月17日

检测要求：　根据客户要求检测

检测方法：　请参见下一页

检测结果：　请参见下一页

检测结果概要：

检测要求	结论
欧盟RoHS指令2011/65/EU附录II修正指令(EU) 2015/863- 铅, 汞, 镉,六价铬, 多溴联苯(PBBs), 多溴二苯醚(PBDEs) , 邻苯二甲酸二丁酯 (DBP), 邻苯二甲酸丁苄酯(BBP), 邻苯二甲酸二(2-乙基已基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP)	符合

通标标准技术服务有限公司深圳分公司

授权签名

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3F82D96A

Mescal_Ye叶晓键

批准签署人

检测结果 :

检测样品描述 :

样品编号	SGS样品ID	描述
SN1	SZX22-027434.001	带银色镀层的金属线

备注:

(1) 1 mg/kg = 0.0001%
(2) MDL = 方法检测限
(3) ND = 未检出 (< MDL)
(4) "-" = 未规定

欧盟RoHS指令2011/65/EU附录II修正指令(EU) 2015/863- 铅, 汞, 镉,六价铬, 多溴联苯(PBBs), 多溴二苯醚(PBDEs) , 邻苯二甲酸二丁酯 (DBP), 邻苯二甲酸丁苄酯(BBP), 邻苯二甲酸二(2-乙基已基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP)

检测方法 : 参考IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015和IEC 62321-8:2017, 采用ICP-OES,UV-Vis和GC-MS进行分析.

检测项目	限值	单位	MDL	*001*
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1000	mg/kg	2	ND
汞 (Hg)	1000	mg/kg	2	ND
六价铬(Cr(VI))▾	-	μg/cm²	0.10	ND
多溴联苯之和(PBBs)	1000	mg/kg	-	ND
一溴联苯	-	mg/kg	5	ND
二溴联苯	-	mg/kg	5	ND
三溴联苯	-	mg/kg	5	ND
四溴联苯	-	mg/kg	5	ND
五溴联苯	-	mg/kg	5	ND
六溴联苯	-	mg/kg	5	ND
七溴联苯	-	mg/kg	5	ND
八溴联苯	-	mg/kg	5	ND
九溴联苯	-	mg/kg	5	ND
十溴联苯	-	mg/kg	5	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND
一溴二苯醚	-	mg/kg	5	ND
二溴二苯醚	-	mg/kg	5	ND
三溴二苯醚	-	mg/kg	5	ND
四溴二苯醚	-	mg/kg	5	ND

检测项目	限值	单位	MDL	001
五溴二苯醚	-	mg/kg	5	ND
六溴二苯醚	-	mg/kg	5	ND
七溴二苯醚	-	mg/kg	5	ND
八溴二苯醚	-	mg/kg	5	ND
九溴二苯醚	-	mg/kg	5	ND
十溴二苯醚	-	mg/kg	5	ND
邻苯二甲酸二丁酯(DBP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND

备注：

(1) 最大允许极限值引用自RoHS指令(EU) 2015/863。

(2) IEC 62321 系列等同于 EN 62321 系列。

(3) ▾= a. 当六价铬的浓度高于0.13 μg/cm2时，样品为阳性，即含有六价铬；

b. 当六价铬的浓度为ND(低于0.10 μg/cm2)时，样品为阴性，即未检测到六价铬；

c. 当六价铬的浓度介于0.10 μg/cm2与0.13 μg/cm2之间时，无法直接判定是否检测到六价铬，因不同个体的样品表面差异可能会影响测定结果；

由于未获知样品的存储条件和生产日期，样品的六价铬检测结果仅能代表检测时样品含六价铬的状态。

除非另有说明，参照ILAC-G8:09/2019，使用简单接受（w=0）的二元判定规则进行符合性判定。

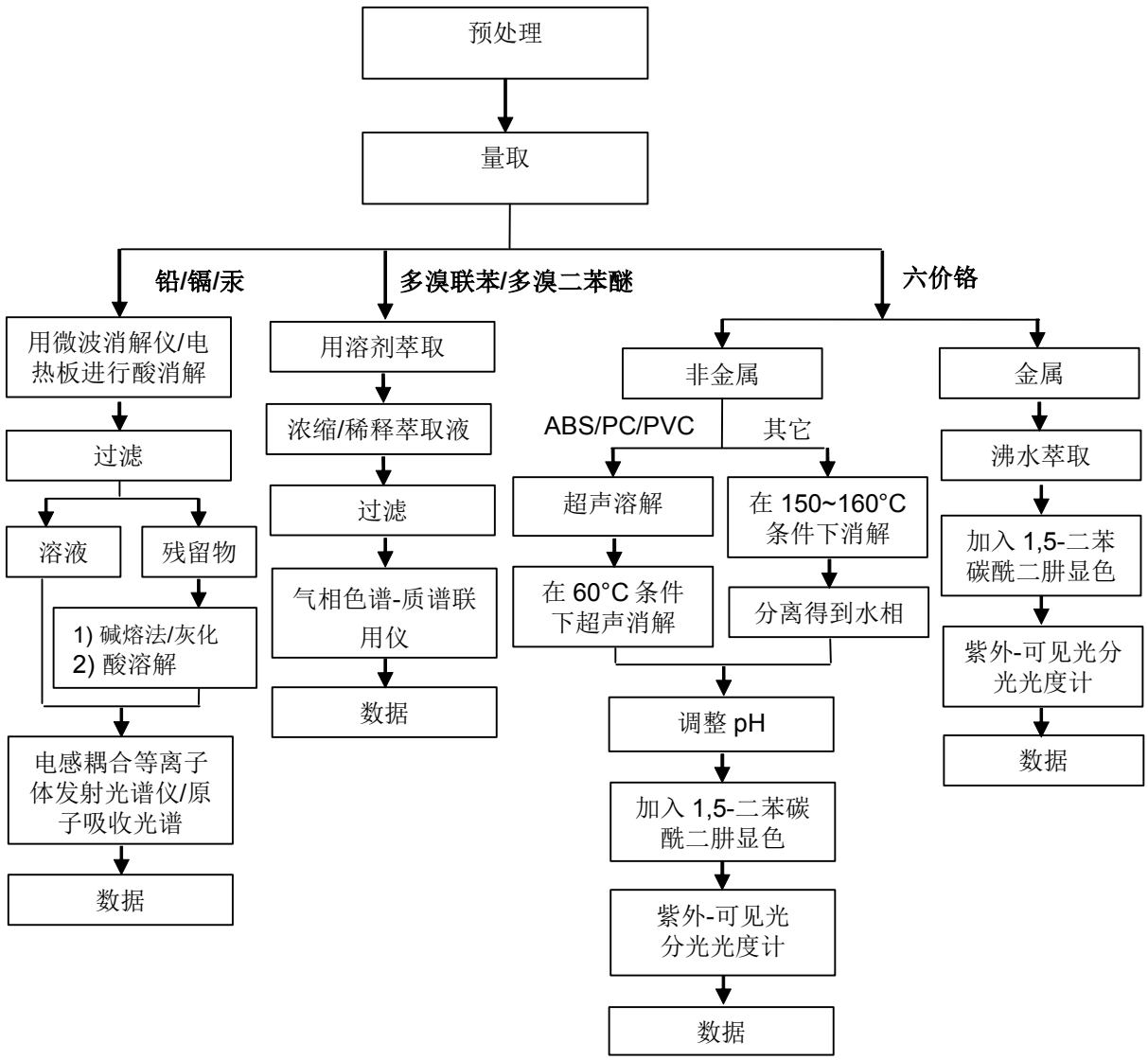
除非另有说明，此报告结果仅对检测的样品负责。本报告未经本公司书面许可，不可部分复制。

检测报告仅用于客户科研、教学、内部质量控制、产品研发等目的，仅供内部参考。

附件

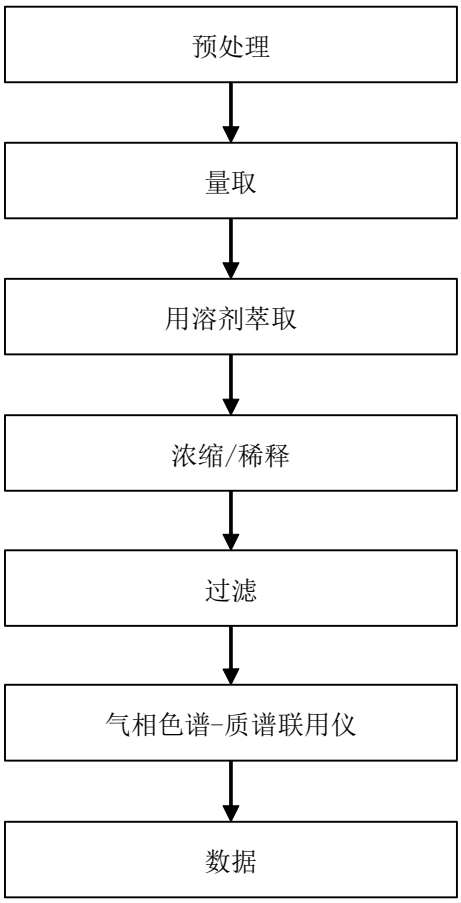
Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs 检测流程图

1) 样品按照下述流程被完全消解（六价铬和多溴联苯/多溴二苯醚测试除外）。

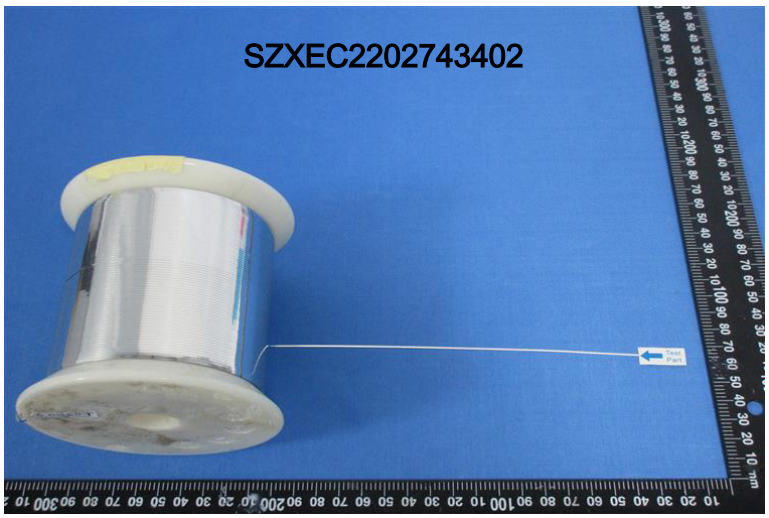


附件

Phthalates 检测流程图



样品照片:



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