

东莞市掬运五金科技有限公司

产 品 规 格 书

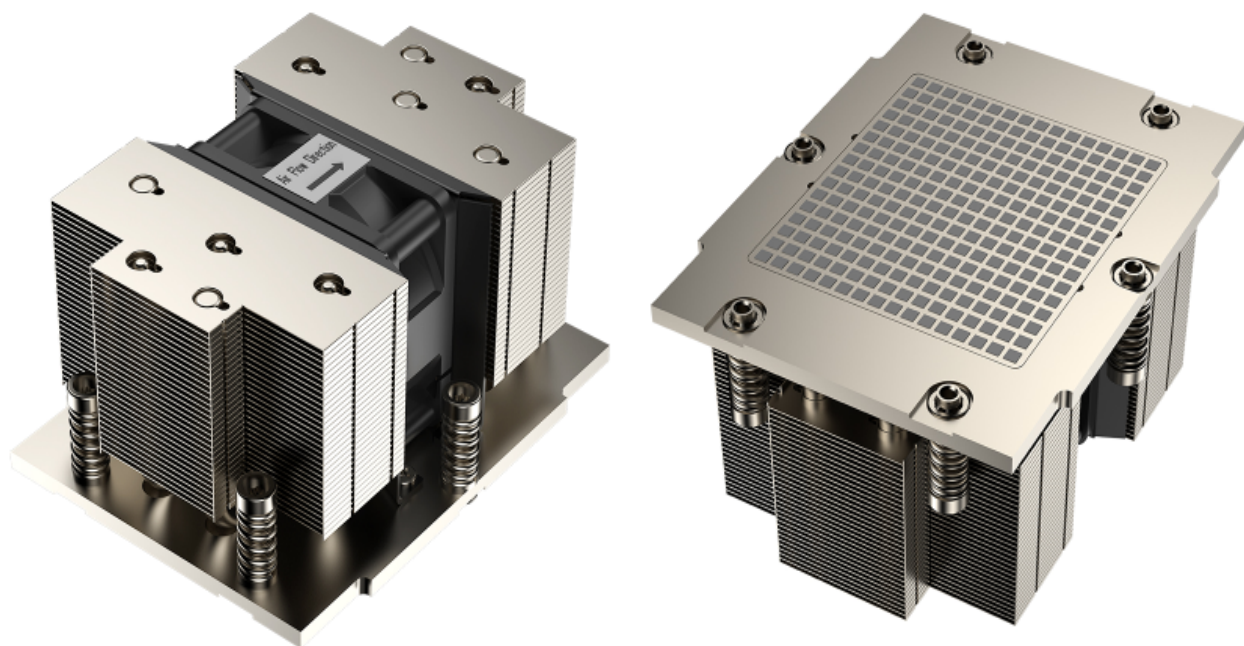
SPECIFICATION FOR APPROVAL

客户名称:	
CUSTOMER	
品 名:	CPU COOLER
DESCRIPTION	
客户料号:	
PART NO.	
掬运料号:	SP5-S87
PART NO.	
日 期:	2023.09.27
DATE	

东莞市掬运五金科技有限公司	
核准 APPROVAL	刘建国
工程 ENGINEER	王传峰
品管 QC	曾建
制作 PREPARE	王李发

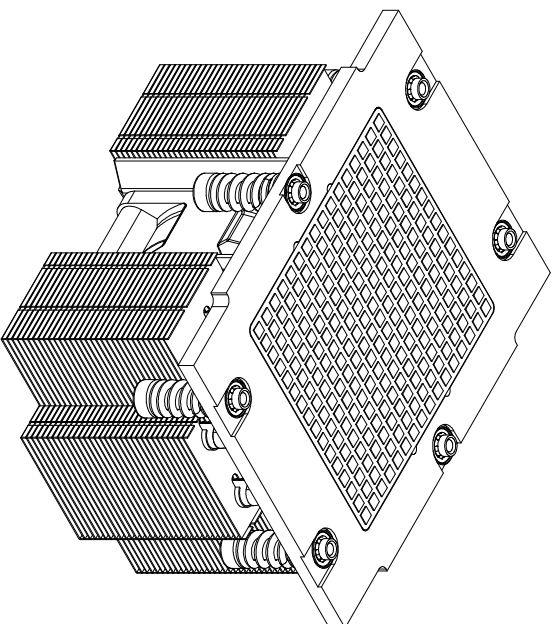
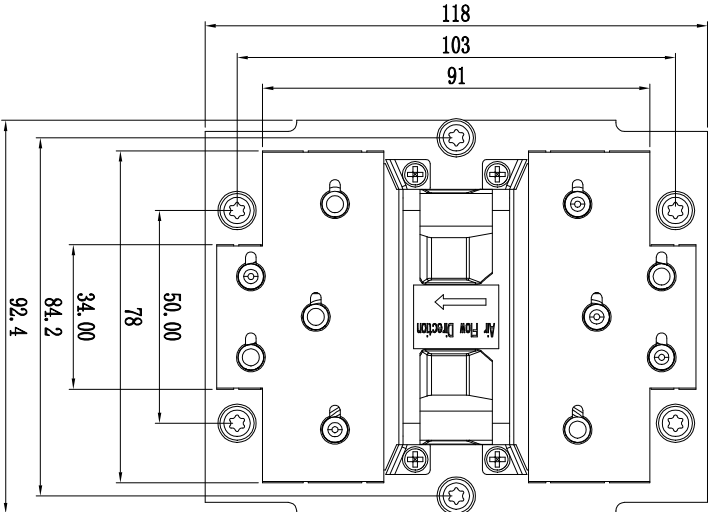
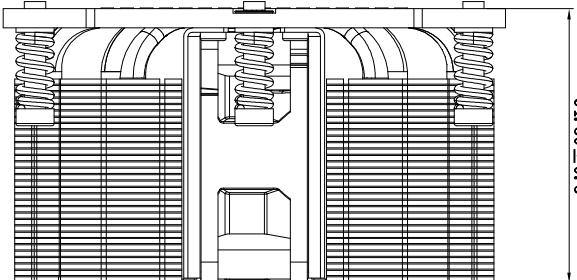
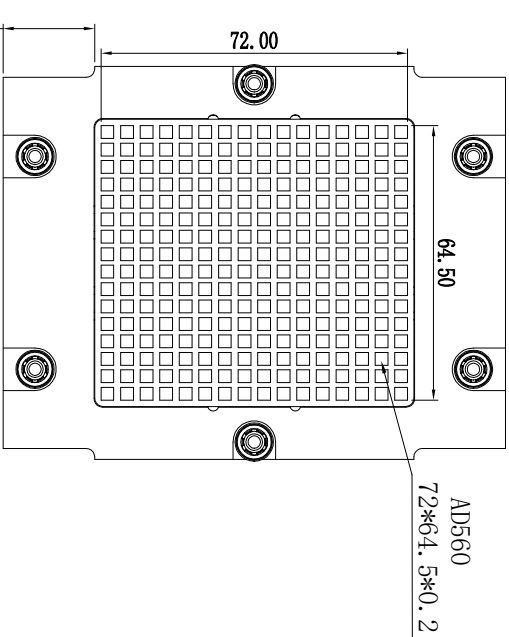
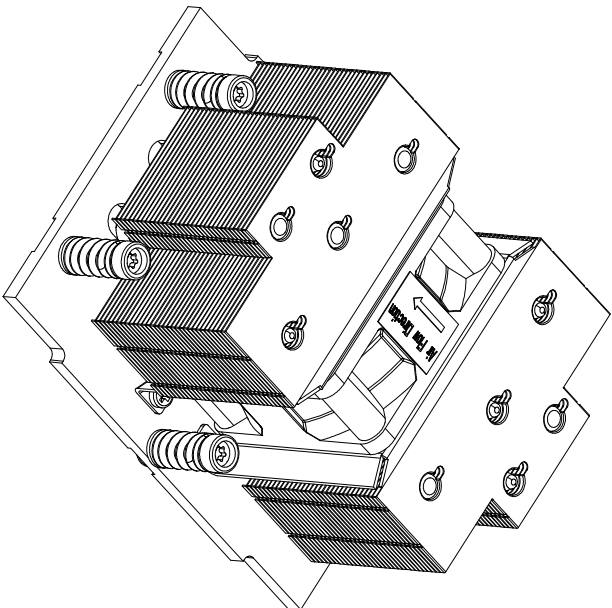
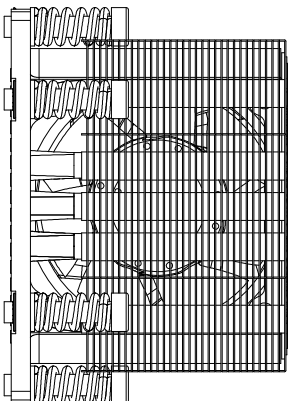
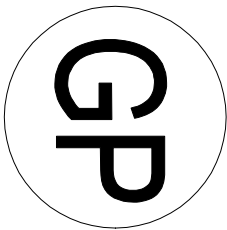
客户 签 认 SIGNATURES	
核准 APPROVAL	
工程 ENGINEER	
品管 QC	
承认结果 RESULT	

SP5-S87



Application	SP5-S87
Specification	
Weight	408 ± 10克
Dimension	118 L x 92.4 W x 64.5H (mm)
Heat sink	
Model	
Material	Copper
Fin pitch	1.50MM
Fin thickness	0.30MM
Backplate	
Material	SPCC
DC FAN	
Rated Voltage	DC 12V
Rated Current	1.4A
Rated Speed	11000RPM±10%

项目	修改内容	修图担当	修图日期	备注
首次发行		—		



东莞市掬运五金科技有限公司

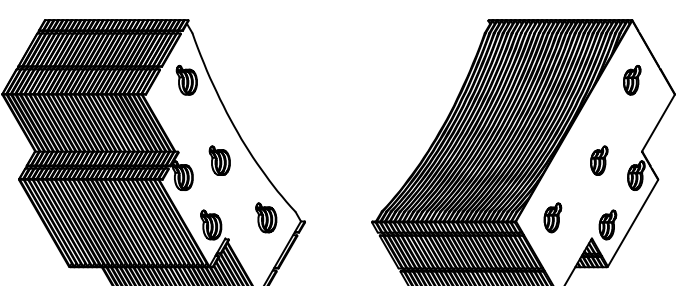
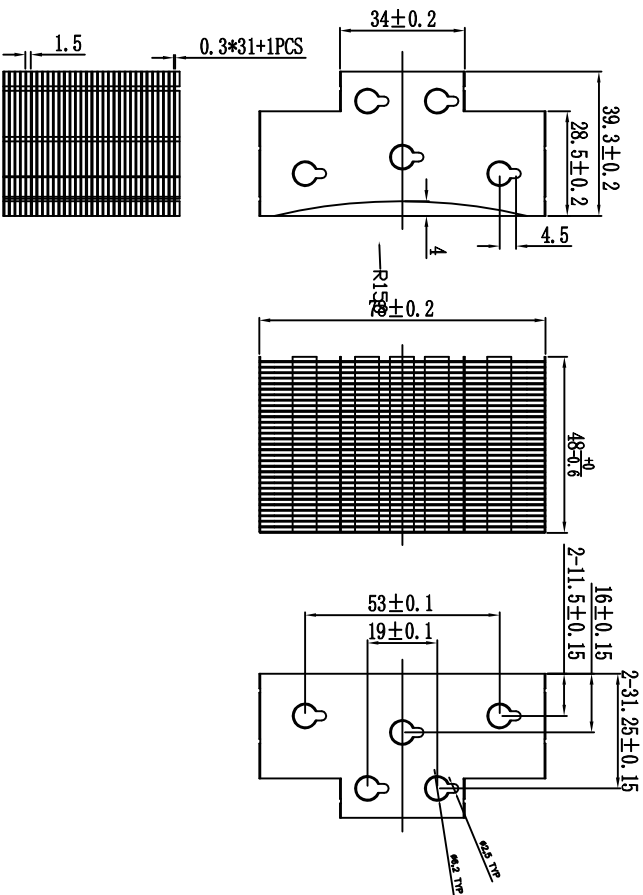
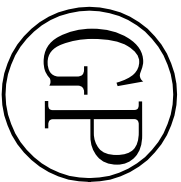
DONGGUANSHI JUYUN ELECTRON CO., LTD.

编号	成品图	品名	118*92.4*64.5	客户料号	—
图号		料号	SP5-M87	客户图号	—
材质		料厚		处理	模号
版本	A	比例	1:1	单位	MM
核 准		第 1 页 共 1 页		日期	2023.11.01
核 准		审 核		制 图	
刘建国		刘大刚		王传峰	

备注:

- 1、制程：焊接
- 2、后处理：抗氧化
- 3、FIN变形量不可超过1/3gap
- 4、FIN长度不可超出BASE、焊接无虚焊、漏焊等不良
- 5、产品外观无氧化、手印、刮伤、压痕等不良
- 6、尺寸公差标示处为重点检验尺寸
- 7、产品需符合ROHS环保要求

精 度	公 差	TOLERANCE			
CLASS	I	II	III	IV	
3 以下	0.03	0.05	0.10	0.20	
3.01~10	0.05	0.08	0.15	0.25	
10.01~30	0.08	0.10	0.20	0.30	
30.01~50	0.10	0.20	0.30	0.40	
50.01~100	0.15	0.25	0.40	0.50	
100.01~250	0.20	0.30	0.50	0.60	
未注尺寸公差		±0.20			
未注孔径公差		±0.10			
未注角度公差		±1°			



项目	修改内容	修图担当	修图日期	备注
首次发行	—			

NOTE:

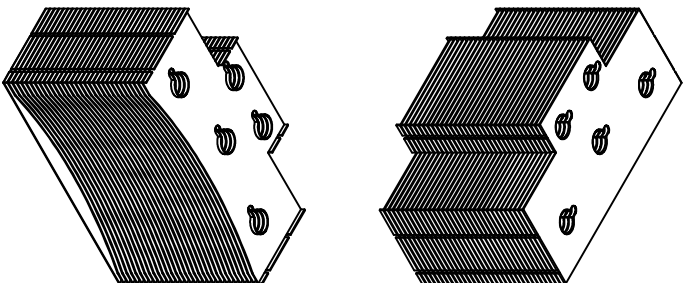
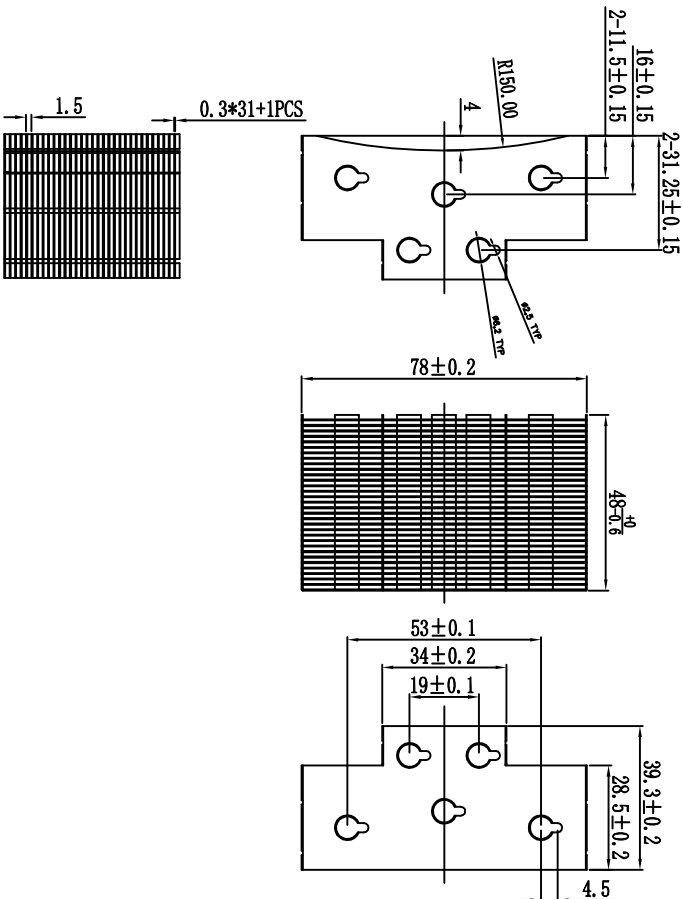
1. 表面需鍍化學鍍，化鍍厚度大于1.0um, 且具有可焊性。
 2. 铝带的导电率在53%以上
 3. 鳍片不可有毛邊、尖角，須符合UL 1439 銳利邊緣測試規範。
 4. 本部品符合有害物質管制規範。
 5. 鳍片需扣合緊密，不可鬆脫掉落。
- 最后一排上面扣点需紧貼FIN, 不能翹起。

精 度 CLASS	公 差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±0.5°			

东莞市掬运五金科技有限公司
DONGGUANSHI JUUYUN ELECTRON CO., LTD.

编号	品名	铝FIN	客户料号	—
图号	料号	6AF02UST-A-SP5	客户图号	—
材质	料厚		处理	化学镍
版本	比例	1:1	单位	MM
			图幅	A4

核 准	第 1 页 共 1 页	日期	2023.11.01
刘建国	审 核	制 图	
	刘大刚	王传峰	

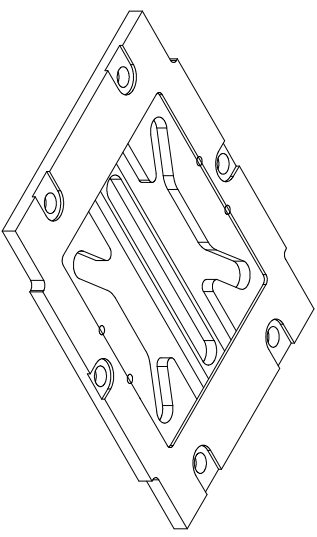
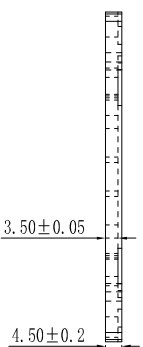


项目	修改内容	修图担当	修图日期	备注
首次发行				

精 度 CLASS	公 差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±0.5°			

- NOTE:
- 1.表面需鍍化學鍍，化鍍厚度大于1.0um,且具有可焊性。
 - 2.铝带的导电率在58%以上
 3. 鳍片不可有毛邊、尖角，須符合UL 1439 銳利邊緣測試規範。
 4. 本部品符合有害物質管制規範。
 5. 鳍片需扣合緊密，不可鬆脫掉落。
- 最后一排上面扣点需紧贴FIN,不能翘起。

东莞市掬运五金科技有限公司									
DONGGUANSHI JUYUN ELECTRON CO., LTD.									
编号		品名	铝FIN		客户料号	—			
图号		料号	6AF02UST-B-SP5		客户图号	—			
材质	AL1100	料厚		处理	化学镍	模号	—		
版本	A	比例	1:1	单位	MM	图幅	A4		
		第 1 页 共 1 页		日期	2023.11.01				
核 准		审 核			制 图				
刘建国		刘大刚			王传峰				



项目	修改内容	修图担当	修图日期	备注
①	首次发行	—		
②		—		
③		—		

精度 CLASS	公差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	F6~g6			
未注孔径公差	±0.10			
未注角度公差	±1°			

NOTES:

1. 未标示之公差参照公差表
2. 材质：AL6063
3. 表面处理：镀化学镍，化镍厚度 $>1.0\mu\text{m}$ ，且具有可焊接性；
4. 底面(CNC加工后)拉丝。
5. 底部平面度控制在 0.10mm 以下
6. 所有钻孔均需倒角 $\text{CO}.3$ ，倒角不得有不规则形状发生
7. 铝板无变形、碰伤、毛刺、脏污等不良；
8. 铝板导电率 $\geq 52\%$ ；
9. 产品需符合有害物质管制规范。

东莞市掬运五金科技有限公司

DONGGUANSHI JUYUN ELECTRON CO., LTD.

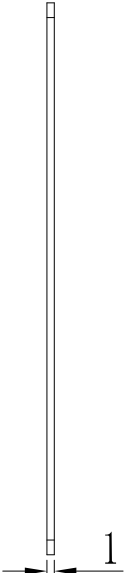
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图号	-	料号	6AB0S11-1	客户图号	-
材质	AL6063	料厚	——	处理	——
版本	A	比例	1:1	单位	MM
				模号	A4

	第 1 页 共 1 页	日期	2022.04.12
核 准	审 核	制 图	
刘建国	刘大刚	王传峰	

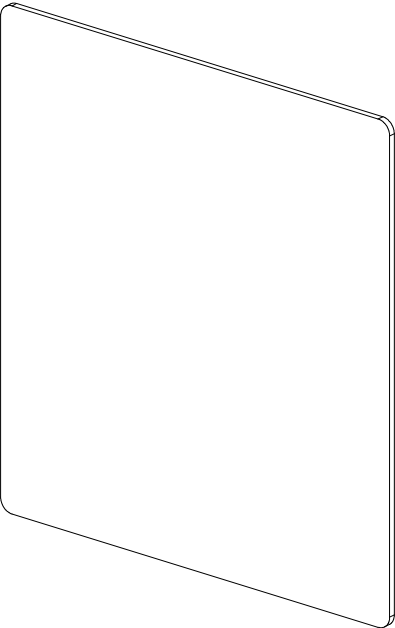


75±0.2

67.5±0.2



项目	修改内容	修图担当	修图日期	备注
△1	首次发行	-		
△2		-		
△3		-		



东莞市掬运五金科技有限公司

DONGGUANSHI JUYUN ELECTRON CO., LTD.

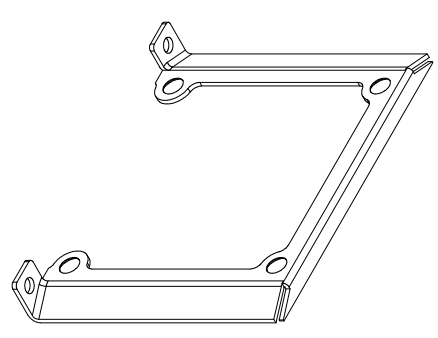
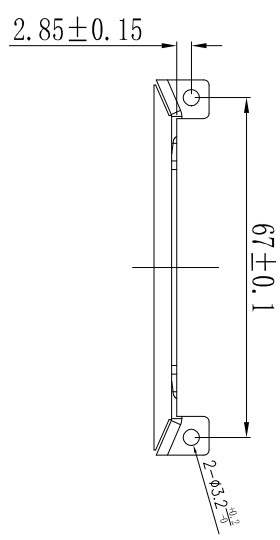
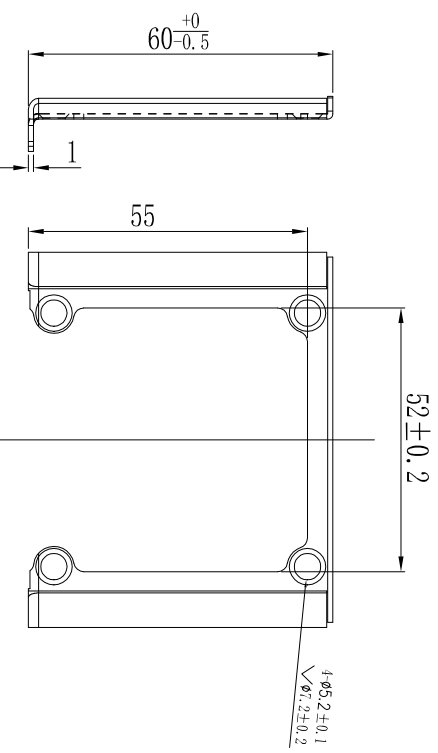
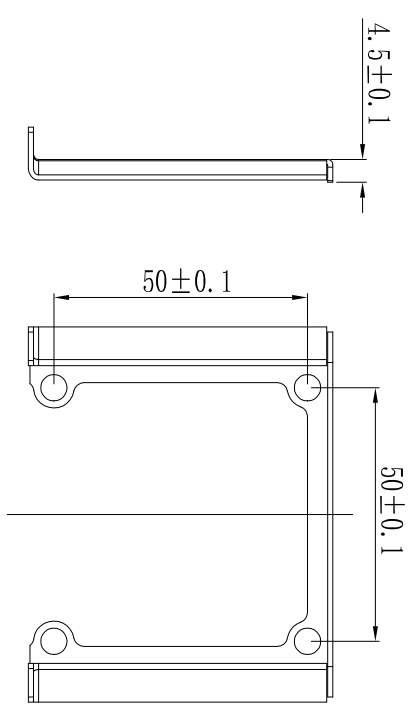
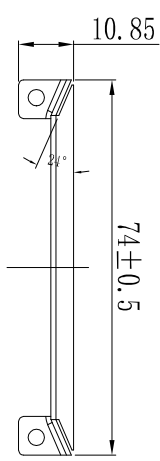
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图号	-	料号	6CB0S11	客户图号	-
材质	CU1100	料厚	1.0MM	处理	抗氧化
版本	A	比例	1:1	单位	MM
				图幅	A4

核 准	第 1 页 共 1 页	日 期	2021.10.20	制 图
刘建国	审 核			王传峰

技术要求:

1. 未标示之公差参照公差表
2. 标示“*”为重点检验尺寸, () 为参考尺寸
3. 底部平面度控制在0.05mm以下
4. 所有外观不得有毛刺残留, 不得有不利于情况发生
5. 目视检验: 距离45CM停留10秒, 六面共6次
6. 所有外观需均色, 不得有药剂残留现象
7. 底部不可有氧化, 气泡, 水印, 白斑, 脏污等现象发生

精 度 CLASS	公 差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±1°			



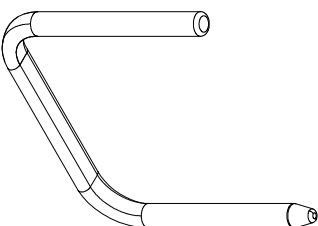
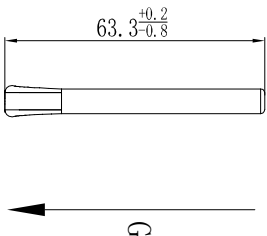
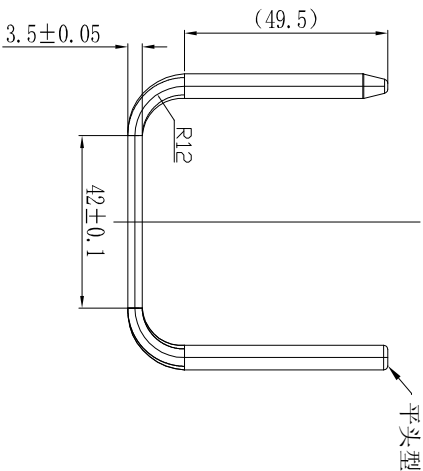
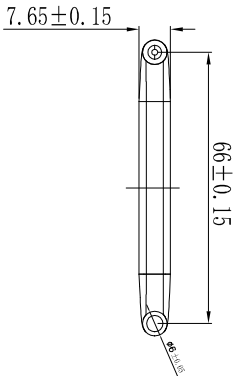
项目	修改内容	修图担当	修图日期	备注
首次发行		-		
		-		
		-		

技术要求:

- 未标示之公差参照公差表
- 标示公差为的重点管控尺寸
- 所有外观不得有毛刺残留, 不得有不利手情况发生
- 目视检验: 距离45CM停留10秒, 六面共6次
- 所有外观需均色, 不得有药剂残留现象
- 底部不可有刮痕, 水印, 白斑, 脏污等现象发生
- 不可以采用拉丝方式获得表面

精度 CLASS	公差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±1°			

东莞市掬运五金科技有限公司									
DONGGUANSHI JUYUN ELECTRON CO., LTD.									
编号	风扇盖	品名	74*60*10.85	客户料号	-				
图号	-	料号	6AG02UST	客户图号	-				
材质	SPCC	料厚	—	处理	镀亮镍	模号	—		
版本	A	比例	1:1	单位	MM	图幅	A4		
核 准		第 1 页 共 1 页		日 期		2023.06.14			
		审 核				制 图			
		刘大刚				王传峰			



项目	修改内容	修图担当	修图日期	备注
首次发行		—		

技术要求:

1. 热管製程说明: 烧结管, $\phi 6\text{mm}$ $\tau=0.3\text{mm}$;
2. QMAX 40W;
3. 表面处理: 镀化镍;
4. 标注公差尺寸为重點檢驗尺寸;
5. 產品符合ROHS2.0要求;
6. 用量: 1/1;
7. 7. 所有的热管无效端长度不超过6.0mm, 有效端长度不超过2.0mm

东莞市掬运五金科技有限公司

DONGGUANSHI JUYUN ELECTRON CO., LTD.

编号	热管1	品名	料号	$\phi 6$	客户料号	—
图号		料号	6R02UST-A	处理	客户图号	—
材质	C1020	料厚		镀化镍	模号	—
版本	A	比例	1:1	单位	MM	图幅 A4



第 1 页 共 1 页

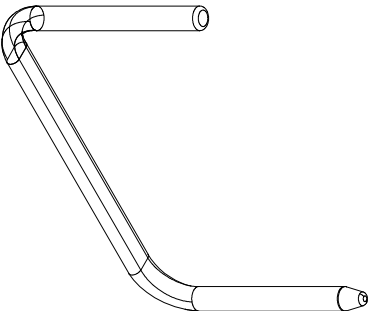
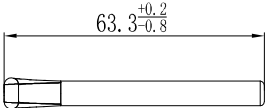
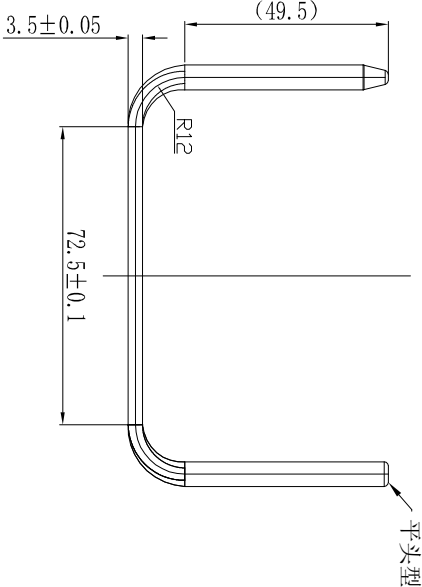
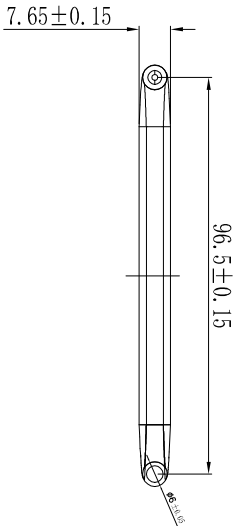
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核 准

审 核

制 图

精 度 CLASS	公 差 TOLERANCE	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20	0.20
3.01~10	0.05	0.08	0.15	0.25	0.25
10.01~30	0.08	0.10	0.20	0.30	0.30
30.01~50	0.10	0.20	0.30	0.40	0.40
50.01~100	0.15	0.25	0.40	0.50	0.50
100.01~250	0.20	0.30	0.50	0.60	0.60
未注尺寸公差		± 0.20			
未注孔径公差		± 0.10			
未注角度公差		$\pm 1^\circ$			



G

精度 CLASS	差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±1°			

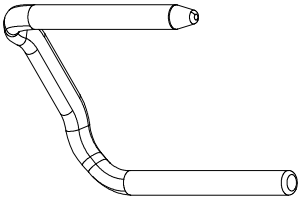
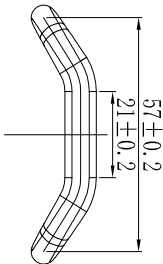
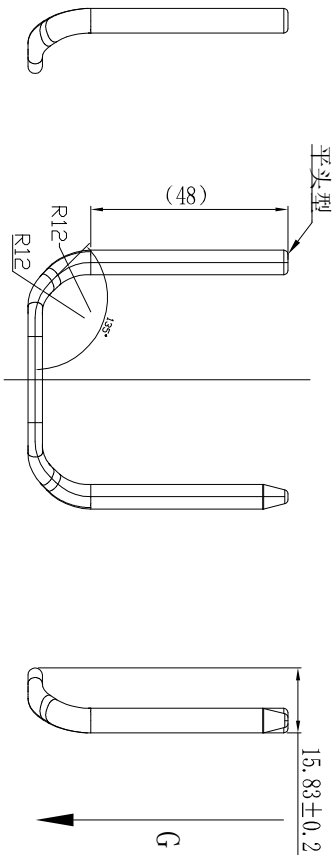
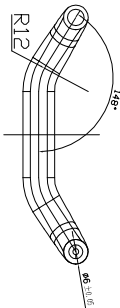
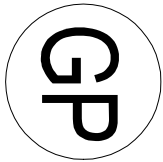
技术要求:

1. 热管製程说明: 烧结管, $\phi 6\text{mm}$ $1=0.3\text{mm}$;
2. QMAX 40W;
3. 表面处理: 镀化镍;
4. 标注公差尺寸为重點檢驗尺寸;
5. 產品符合ROHS2.0要求;
6. 用量: 2/1;
7. 所有的热管无效端长度不超过6.0mm, 有效端长度不超过2.0mm

东莞市掬运五金科技有限公司

DONGGUANSHI JUYUN ELECTRON CO., LTD.

编号	热管2	品名	Ø 6		客户料号	-
图号		料号	6R02UST-B		客户图号	-
材质	C1020	料厚		处理	镀化镍	模号
版本	A	比例	1:1	单位	MM	图幅
		第 1 页 共 1 页			日期	2023.06.19
核 准		审 核			制 图	
					Frank	



精 度 CLASS	差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±1°			

技术要求:

1. 熱管製程述明： 燒結管， $\phi 6\text{mm}$ $\tau=0.3\text{mm}$;
2. QMAX 60W;
3. 表面處理： 鍍化鎳;
4. 标注公差尺寸為重點檢驗尺寸;
5. 產品符合ROHS2.0要求;
6. 用量：2/1;
7. 所有的熱管無效端長度不超過6.0mm，有效端長度不超過2.0mm

項目	修改內容	修圖擔當	修圖日期	備注
△	首次發行	—		

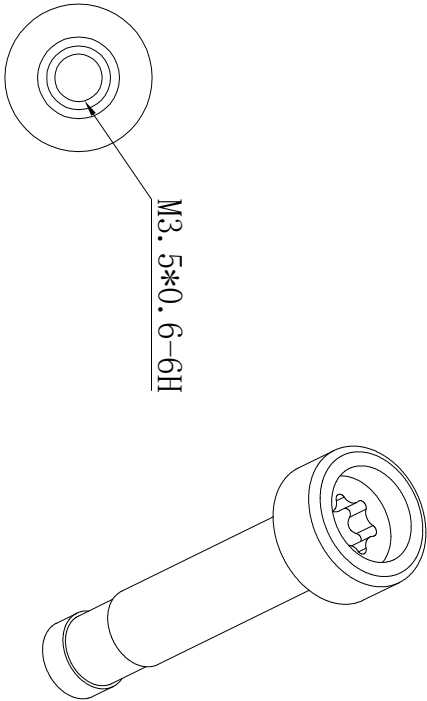
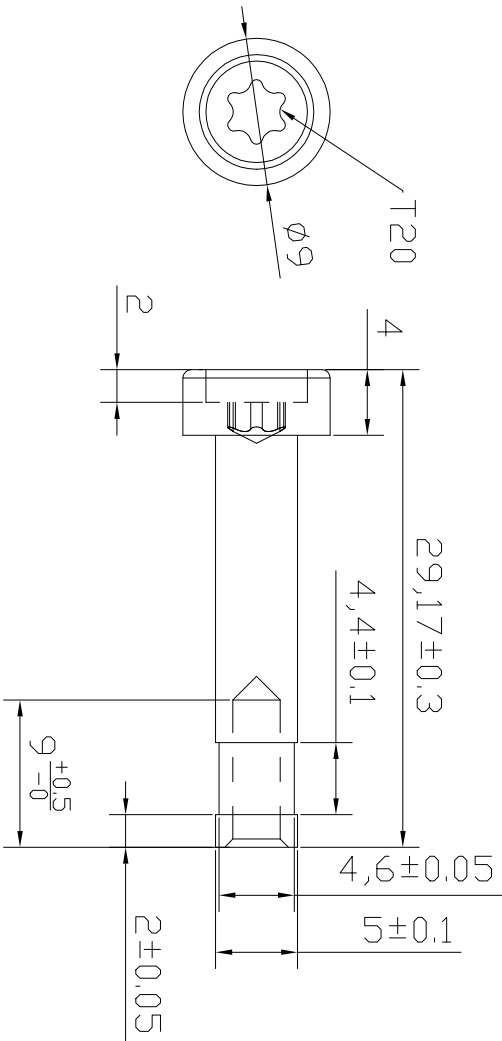
东莞市掬运五金科技有限公司

DONGGUANSHI JUYUN ELECTRON CO., LTD.

编号	热管3	品名	品名	客户料号	—
图号		料号	6R02UST-C	客户图号	—
材质	C1020	料厚	处理	鍍化鎳	—
版本	A	比例	1:1	单位	MM
核 准		第 1 页 共 1 页		日期	2023.06.19
制 图		审 核		Frank	



项目	修改内容	修图担当	修图日期	备注
首次发行		—		



技术要求:

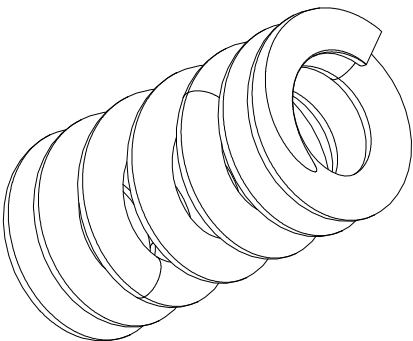
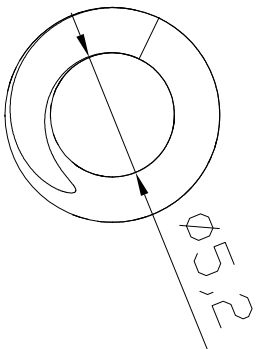
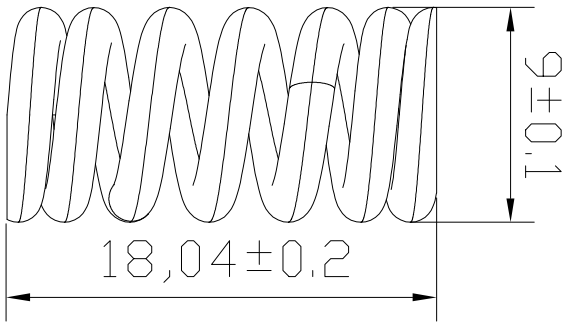
1. 材質: SAE1018;
2. 後處理: 鍍鎳 ;
3. 未标注公差见公差表;
4. 产品不得刮花, 变形, 毛刺;

精度 CLASS	公差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.10			
未注孔径公差	±0.10			
未注角度公差	±1°			

东莞市掬运五金科技有限公司
DONGGUANSHI JUYUN ELECTRON CO., LTD.

编号	螺丝	品名	M3. 5*29. 17	客户料号	—
图号		料号	6L00SP5	客户图号	—
材质	SAE1018	料厚		处理	镀亮镍
版本	A	比例	1:1	单位	MM
				图幅	A4

核 准	第 1 页 共 1 页	日期	2021.10.20	制 图
刘建国	审 核	刘大刚		王传峰



项目	修改内容	修图担当	修图日期	备注
首次发行		—		

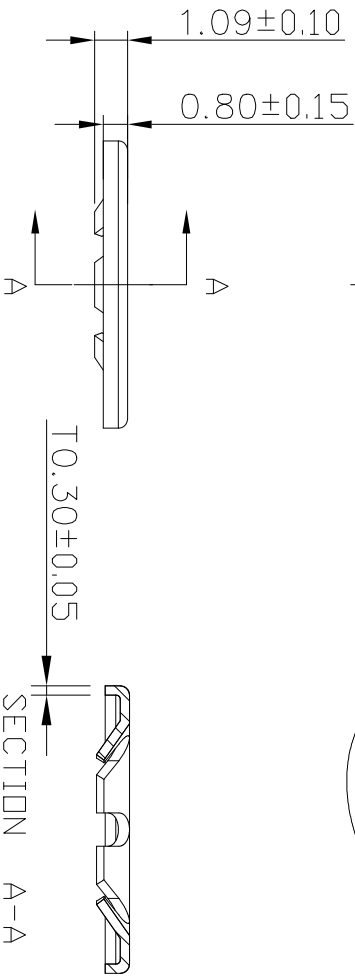
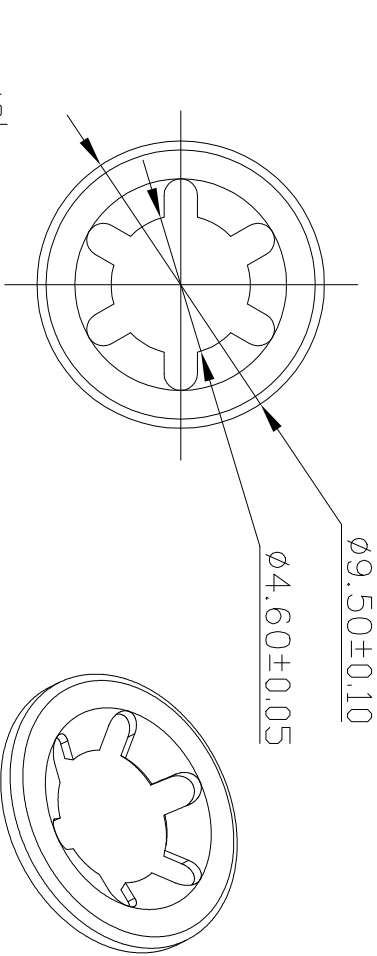
- 技术要求:
1. 标有“*”的尺寸为检验重点.
 2. 此弹簧端部型式为并紧, 磨平, 支承圈为1圈(YI).
 3. 热处理后硬度HRC35~45, 精度等级2级.

精 度 CLASS	差 差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±1°			

东莞市掬运五金科技有限公司									
DONGGUANSHI JUYUN ELECTRON CO., LTD.									
编号	弹簧	品名	Φ9.0*18.0*1.9		客户料号	—			
图号		料号	6T00SP5		客户图号	—			
材质	SWC	料厚		处理	镀镍	模号	—		
版本	A	比例	1:1	单位	MM	图幅	A4		
		第 1 页 共 1 页		日期	2021.10.20				
核准		审核			制图				
刘建国				刘大刚		王传峰			



项目	修改内容	修图担当	修图日期	备注
首次发行	-			



SECTION A-A

NOTES:

1. 材质: SPCC;
2. 表面处理: 镀雾镍 过盐雾测试8小时;
3. 产品需符合有害物质管制规范.

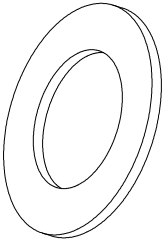
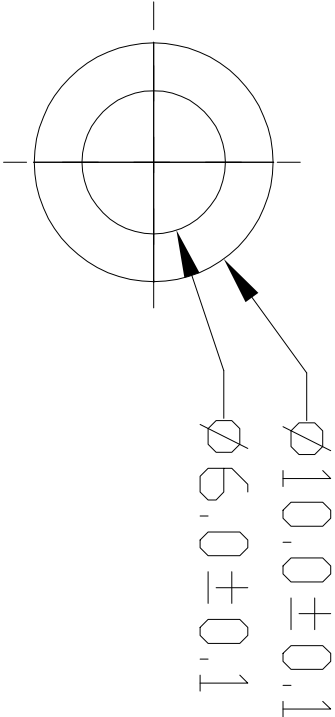
精度 CLASS	公差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±1°			

东莞市掬运五金科技有限公司
DONGGUANSHI JUYUN ELECTRON CO., LTD.

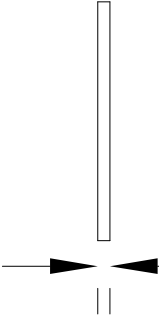
编号		品名	0形扣环		客户料号	_____		
图号		料号	6P08008A		客户图号	_____		
材质	SPCC	料厚	_____		处理	镀雾镍	模号	_____
版本	A	比例	1:1		单位	MM	图幅	A4
		第 1 页 共 1 页			日期	2016.09.09		
核 准		审 核			制 图			
刘建国		刘大刚			王传峰			



项目	修改内容	修图担当	修图日期	备注
△	首次发行	—		



0.5±0.05



技術要求

- 材質: SPCC
- 表面處理: 鍍鎳
- 去除所有毛刺及鋒利毛邊
- 標有 1 — X 為重點檢測尺寸

东莞市掬运五金科技有限公司

DONGGUANSHI JUYUN ELECTRON CO., LTD.

编号	垫片	品名	Ø6.0*Ø10*0.5	客户料号	—
图号		料号	F17SD08403-1	客户图号	—
材质	SPCC	料厚		处理	鍍鎳
版本	A	比例	1:1	单位	MM
				图幅	A4

审核	第 1 页 共 1 页	日期	2018.04.21
徐玉	刘大刚		
		制图	徐玉

精度 CLASS	公差 TOLERANCE			
	I	II	III	IV
3 以下	0.03	0.05	0.10	0.20
3.01~10	0.05	0.08	0.15	0.25
10.01~30	0.08	0.10	0.20	0.30
30.01~50	0.10	0.20	0.30	0.40
50.01~100	0.15	0.25	0.40	0.50
100.01~250	0.20	0.30	0.50	0.60
未注尺寸公差	±0.20			
未注孔径公差	±0.10			
未注角度公差	±1°			



SPECIFICATION FOR APPROVAL

Customer Code:	B0005F
Description:	DC Fan
Customer Part Number:	
Factory Model Number:	F6025UD12B-P20 (60*60*25mm)-11000rpm
Factory Part Number:	F06250020

Edition Data and Revised records		
Edition:	Description	Date:
V01	First Revision	2022-12-20

Notice:

1. All of product comply to RoHS 2.0 requirement.
2. This offer is made according to your current inquiry. Unless otherwise revised, this specification will be final for all future production of orders from your company.
3. Kindly study in detail and send back to us the specification sheets with your confirmation signature in order to make an arrangement for production.

Customer Approved	Check:	Initiator
	Simon_Wang	Simon

DONGGUANJUYUN Electron Co.Ltd.

Add: Zhao Lin JinChuan Er Lu, Xiegang Town, DongguanCity,Guangdong Province
Building 1.No.6,Jinming Nothrth Road.

Tel:+86 18100275217

E-mail: E-mail: liu7981@163.com

1. Scope:

This specification defines the electrical and mechanical characteristics of the DC Brushless fan.

2. Characters:

Item		Description
1	Rated Voltage	DC 12 V
2	Operation Voltage	10.8V ~ 13.2 V
3	Start-up Voltage	6.0 VDC (100% duty cycle at 25°C Power on/off)
4	Speed	11000RPM±10%
5	Max. Air Flow (in free air) (at zero static pressure)	1.76m³/min(62CFM)
6	Max. Air Pressure (in free air) (at zero pressure)	38.5mm-H2O(1.52inch-H2O)
7	Input Current	1.4 A (Max.1.5A)
8	Input Power	16.8 W (Max.18W)
9	Acoustical noise	58.5 dBA (max)
10	Insulation Type	UL: Class A
12	Life Expectancy	70,000hrs continuous at 40°C, 15~65% relative humidity
12	Insulation Resistance	Min 10Meg Ohm between internal stator and lead wire (+) at 500VDC
13	Dielectric Strength	5mA max at 600VAC 50Hz 1 second between frame and (+) terminal
14	Rotation	Clockwise Air Discharged
15	Lead Wires	UL 1061, awg 24 or Equivalent; 85°C or More “+”: Yellow; “-”:Black; “S”:Green; “PWM”:Blue

3. Mechanical:

Items		Description
1.	Dimension	Display as Drawing
2.	Frame	PBT UL 94V-0 (Black)
3.	Impeller	PBT UL 94V-0 (Black)
4.	Bearing System	Two Ball bearing
5.	Weight	73±5 grams

4. Environmental:

Items		Description
1.	Operating Temperature and Humidity	-10°C to 70°C, 5% to 90% RH
2.	Storage Temperature and Humidity	-40°C to 80°C, 5% to 95% RH
3.	Drop Proof Test	Fans are packaged in a standard size shipping box and are dropped to the ground from certain heights and angles depending on the weight of the particular box.
4.	Vibration Proof Test	Vibration with an amplitude 2mm and a frequency of 5-55-5hz is applied in all 3 directions (X,Y,Z), in cycles of 1 hour each, for a total vibration time of 3hours.
5.	Acoustic Noise	Measured in a semi-anechoic chamber with background noise level below 16dB(A) The fan is running in free air under shaft horizontal condition with microphone at distance of one meter from the fan intake. (Figure A.)

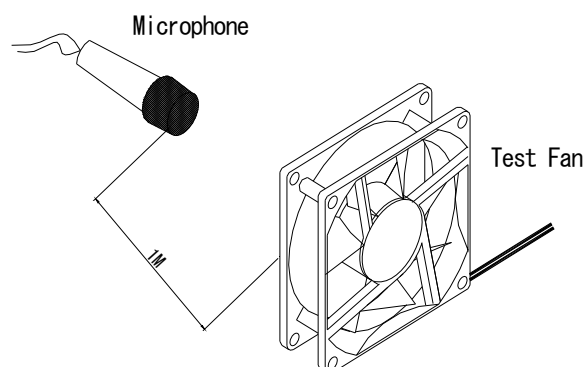
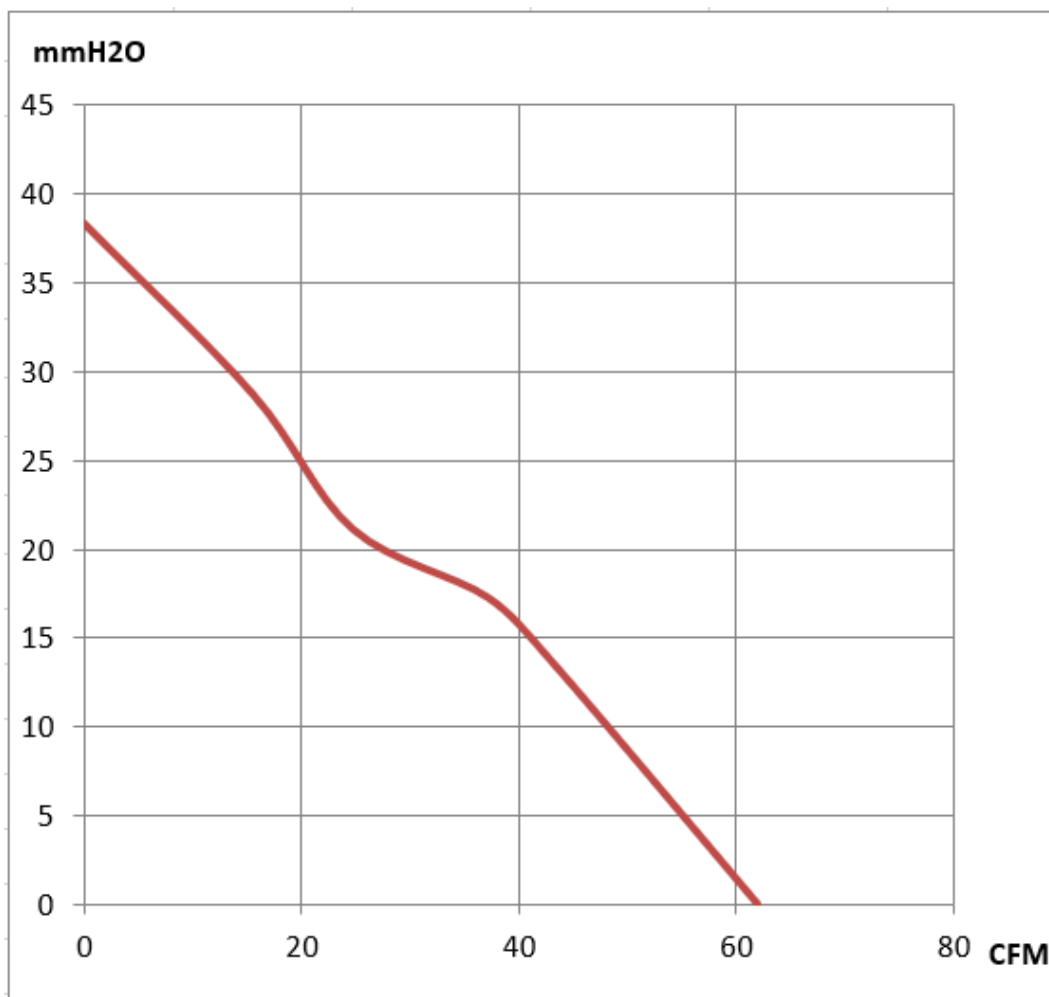


Figure A – Noise Level is measure at rated voltage in anechoic chamber in free air as above.

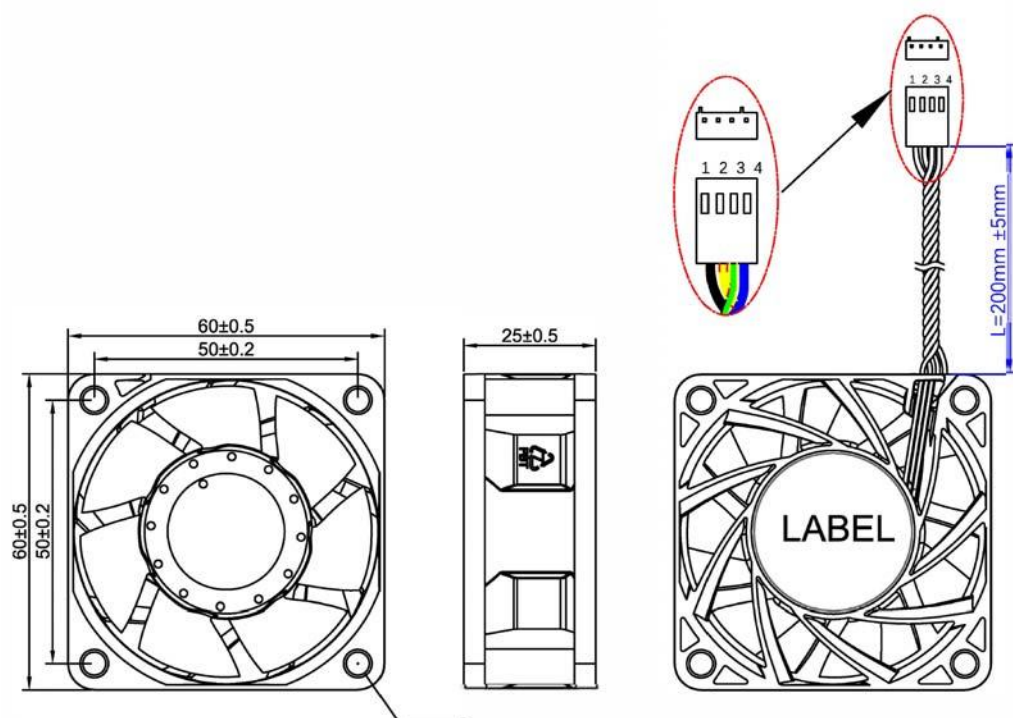
5. Protection:

Items		Description
1.	Locked Rotor Protection	Impedance of motor winding protects motor from damage in 72 hours of locked rotor condition at the rated voltage
2.	Polarity Protection	Be capable of withstanding if reverse connection for positive and negative leads
3.	Auto-Restart Protection	When the fan motor is locked the device will cut off the drive current for a while and restart automatically later. If the lock situation is continued the device will work as the above situation repeatedly till the lock is released.

6. Performance Curve:



7. Dimension Drawing:



Items		Description	Remark
1	Frame	PBT UL:94V-0	Black
2	Impeller	PBT UL:94V-0	Black
3	Housing	White of Molex 47054-1000	Or Equivalent
4	Lead Wire	UL1061 #24AWG 85°C or More PIN 1: Black Wire ----- Ground PIN 2: Yellow Wire ----- Power PIN 3: Green Wire ----- Signal PIN 4: Blue Wire ----- PWM	L=200mm Twisted Wire

8. Output of rotary Signal:

1. Output method- open collector method

2. Circuit specification:

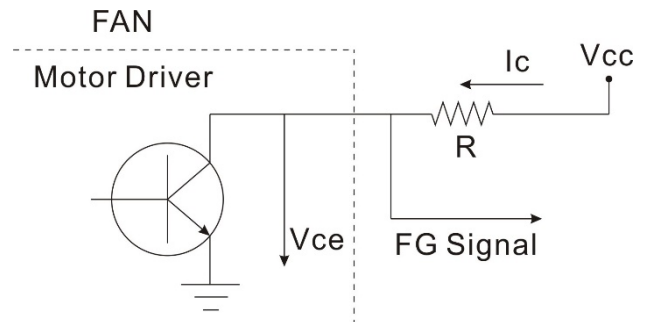
2-1. Specification:

$$V_{cc} = 13.2V(\text{Max})$$

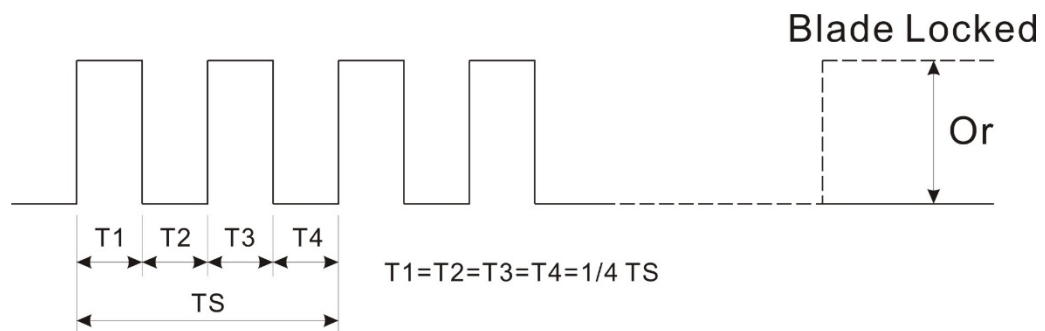
$$V_{ce}(\text{sat}) = 1.0V(\text{Max})$$

$$I_c = 5mA(\text{Max})$$

$$R \geq V_{cc}/I_c$$



2-2. Frequency Generator Waveform:



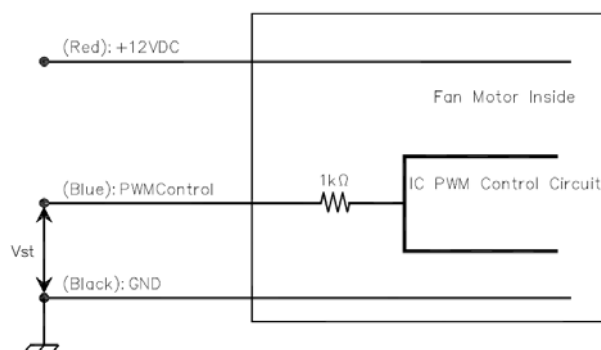
One Fan Rotation

N : Revolution per minute(rpm)

$$T1 \sim T4 \approx 1/4 TS = 60/4N(\text{sec}).$$

$$\text{Pulse width duty} = T1 \div (T1 + T2) = 50 \pm 5\%$$

9. PWM Input Signal:



1. Vst: PWM Control Voltage

Vst=0V~0.8V → Duty 0% = Low Speed

Vst=3.0V~5.0V → Duty 100% = Full Speed

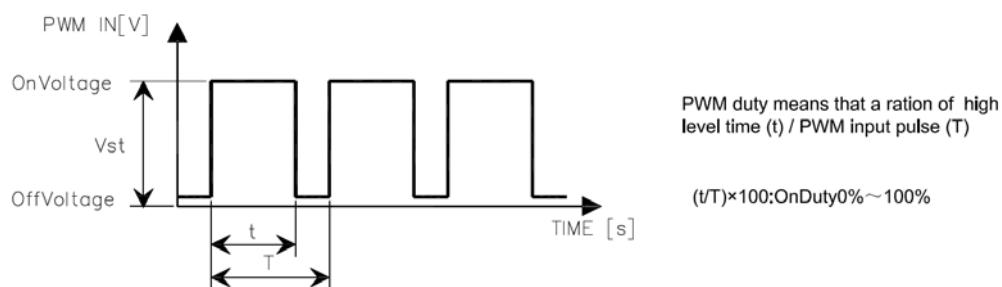
Vst = Open → Full Speed

REFERENCE PWM Duty VS Speed

Conditions: at rating voltage, Vst=5V, f=25kHz, Ta=25°C

PWM Duty(%)	Speed R.P.M.(REF.)
100	11000 ±5%
0	3000±500

2. The condition for PWM control are as follows.



PWM Frequency f=25±5kHz

- When you use this under PWM control, always be sure the motor's operation under practical mounting state. Fan motor may not start up caused by PWM control at very low speed condition.
- To run at Rating Voltage +12VDC.
- Please use the start with Duty 20% or more.[Rated voltage input]



Test Report

No. CANEC2212215303

Date: 13 Jun 2022

Page 1 of 6

Client Name : FOSHANG JIANTOU HUAHONG COPPER CO.,LTD

Client Address : EAST INDUSTRIAL AVENUE,SONGGANG SONGXIA INDUSTRIAL PARK, NANHAI DISTRICT,
FOSHAN CITY
CHINA

Sample Name : COPPER BUS BAR

Model No. : Red copper

Supplier : FOSHAN HUA HONG COPPER TUBE CO.LTD

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

SGS Job No. : CP22-031521 - GZ

Date of Sample Received : 08 Jun 2022

Testing Period : 08 Jun 2022 - 13 Jun 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).

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

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

Coral Qiu

Coral Qiu
Approved Signatory



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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

SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Inspection & Testing Laboratory

198 Kechu Road, Sientech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663

t (86-20) 82155555 www.sgs.com.cn
t (86-20) 82155555 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Test Report

No. CANEC2212215303

Date: 13 Jun 2022

Page 2 of 6

Test Result(s) :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN22-122153.002	Copper metal

Remarks :

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

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

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	002
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm ²	0.10	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND



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No. CANEC2212215303

Date: 13 Jun 2022

Page 3 of 6

Test Item(s)	Limit	Unit	MDL	002
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
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (3) ▼= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI
 b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI based coating
 c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination
 Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
 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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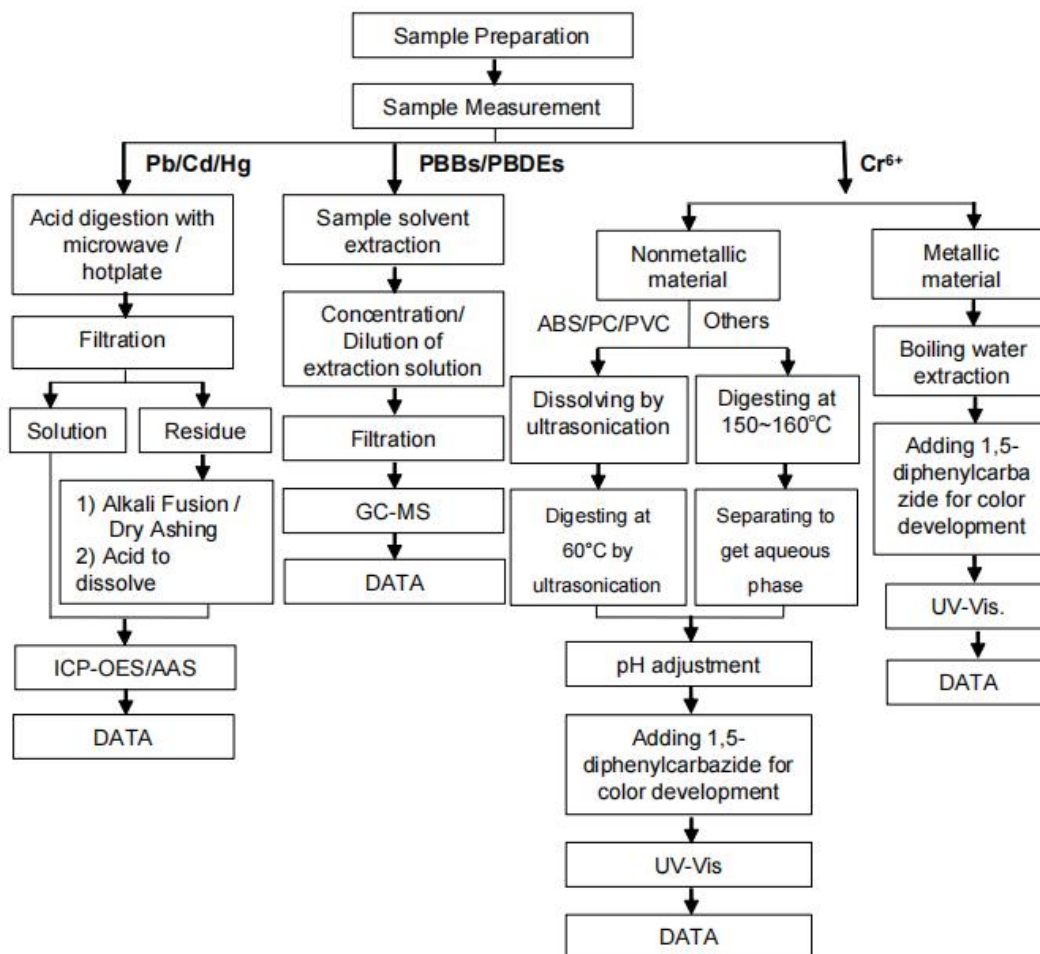
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Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

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

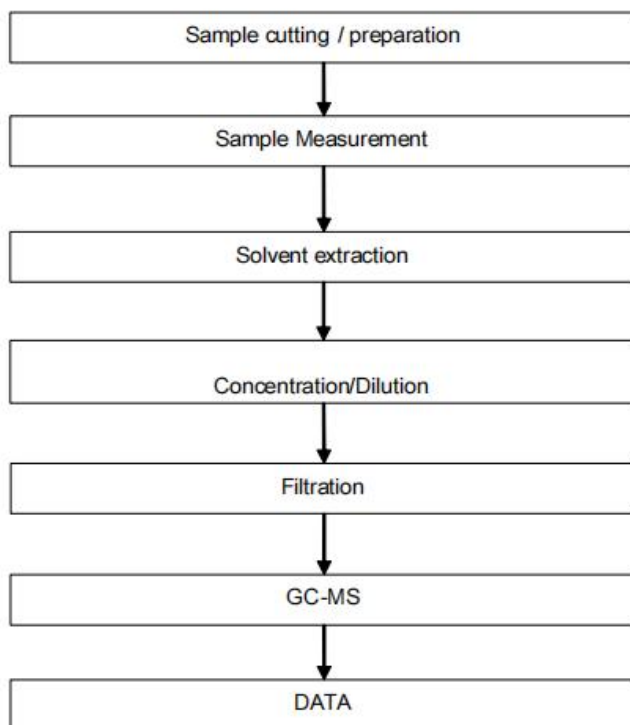


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Phthalates Testing Flow Chart



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Test Report

No. CANEC2212215303

Date: 13 Jun 2022

Page 6 of 6

Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***



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测试报告

No. CANEC2123012604

日期: 2021年12月13日 第1页,共6页

广东润盛科技材料有限公司

东莞市松山湖科技产业园区工业北二路1号

以下测试之样品是由申请者所提供及确认: 铝板(1100)

SGS工作编号: CP21-065128 - GZ
生产厂家: 国产料
样品接收日期: 2021年12月07日
测试周期: 2021年12月07日 - 2021年12月13日
测试要求: 根据客户要求测试
测试方法: 请参见下一页
测试结果: 请参见下一页

结论: 基于所送样品进行的测试, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

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李嘉欣

Jessie Li 李嘉欣
批准签署人



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测试报告

No. CANEC2123012604

日期: 2021年12月13日 第2页,共6页

测试结果:

测试样品描述:

样品编号	SGS样品ID	描述
SN1	CAN21-230126.002	银色金属片

备注:

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

RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 参考IEC 62321-4:2013+A1:2017, 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。

测试项目	限值	单位	MDL	002
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1,000	mg/kg	2	12
汞 (Hg)	1,000	mg/kg	2	ND
六价铬(Cr(VI))▼	-	µg/cm²	0.10	ND
多溴联苯之和(PBBs)	1,000	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)	1,000	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
五溴二苯醚	-	mg/kg	5	ND



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No. CANEC2123012604

日期: 2021年12月13日 第3页,共6页

测试项目	限值	单位	MDL	002
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)最大允许限值引用自RoHS指令(EU) 2015/863。

(2) IEC 62321 系列等同于 EN 62321 系列

https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(3) ▼a. 当六价格的浓度高于0.13 µg/cm²时, 样品为阳性, 即含有六价格;

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

c. 当六价格的浓度介于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格, 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, 样品的六价格测试结果仅能代表测试时样品含六价格的状态。

除非另有说明, 此报告结果仅对测试的样品负责。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。



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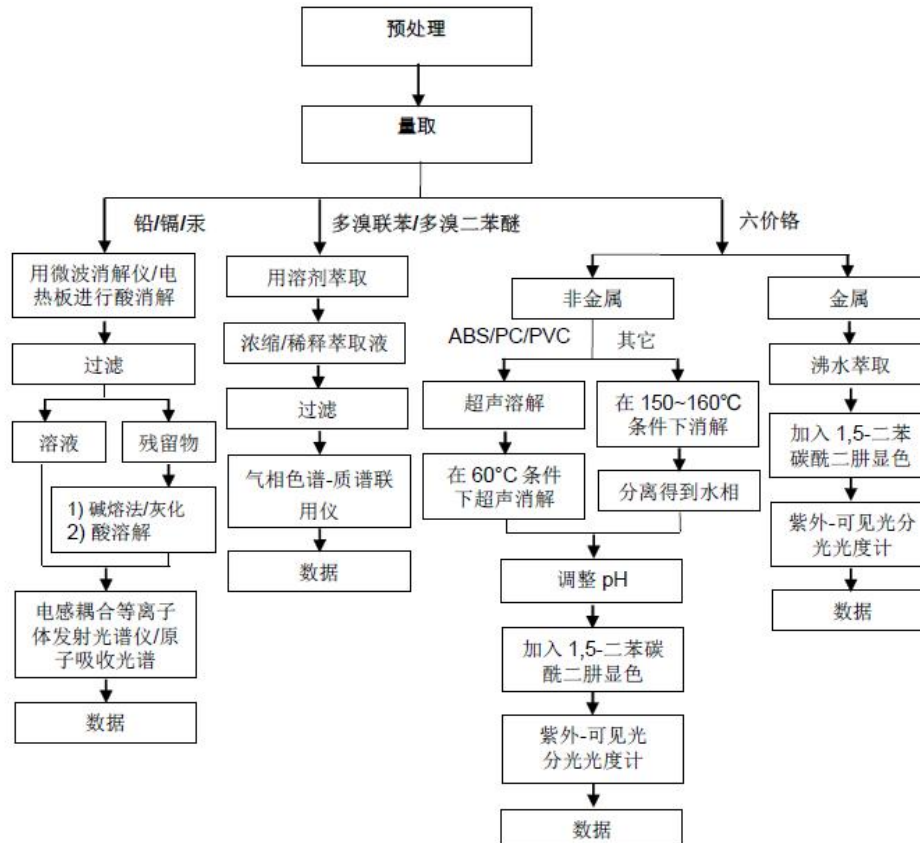
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附件

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 测试流程图

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)。



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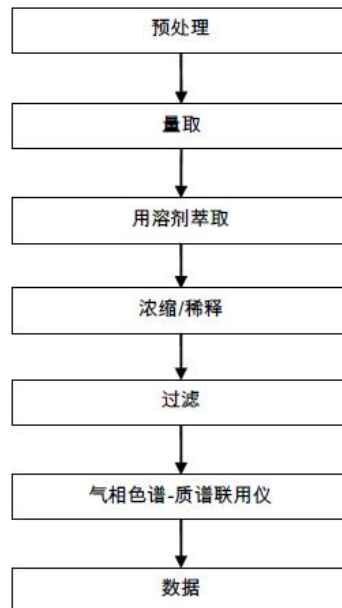
测试报告

No. CANEC2123012604

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附件

Phthalates 测试流程图



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测试报告

No. CANML2113369602

日期: 2021年07月23日 第1页,共6页

广东兴发铝业有限公司

中国广东省佛山市禅城区南庄镇人和路23号

以下测试之样品是由申请者所提供及确认: 6063-T5 铝合金型材

SGS工作编号: GZIN2107041422PC - GZ

内部编号: GZIN2107041237ML

样品接收日期: 2021年07月20日

测试周期: 2021年07月20日 - 2021年07月23日

测试要求: 根据客户要求测试

测试方法: 请参见下一页

测试结果: 请参见下一页

结论: 基于所送样品进行的测试, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

通标标准技术服务有限公司广州分公司
授权签名

陈江梨

Allie Chen陈江梨
批准签署人



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测试报告

No. CANML2113369602

日期: 2021年07月23日 第2页,共6页

测试结果:

测试样品描述:

样品编号	SGS样品ID	描述
SN1	CAN21-133696.001	银色金属

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

RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 参考IEC 62321-4:2013+A1:2017, 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。

测试项目	限值	单位	MDL	001
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1,000	mg/kg	2	8
汞 (Hg)	1,000	mg/kg	2	ND
六价铬(Cr(VI))▼	-	µg/cm²	0.10	ND
多溴联苯之和(PBBs)	1,000	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)	1,000	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
五溴二苯醚	-	mg/kg	5	ND



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测试报告

No. CANML2113369602

日期: 2021年07月23日 第3页,共6页

测试项目	限值	单位	MDL	001
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)最大允许限值引用自RoHS指令(EU) 2015/863。
- (2) IEC 62321 系列等同于 EN 62321 系列
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (3) ▽=a. 当六价格的浓度高于0.13 µg/cm²时, 样品为阳性, 即含有六价格;
b. 当六价格的浓度为ND(低于0.10 µg/cm²)时, 样品为阴性, 即未检测到六价格;
c. 当六价格的浓度介于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格, 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, 样品的六价格测试结果仅能代表测试时样品含六价格的状态。

除非另有说明, 此报告结果仅对测试的样品负责。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。



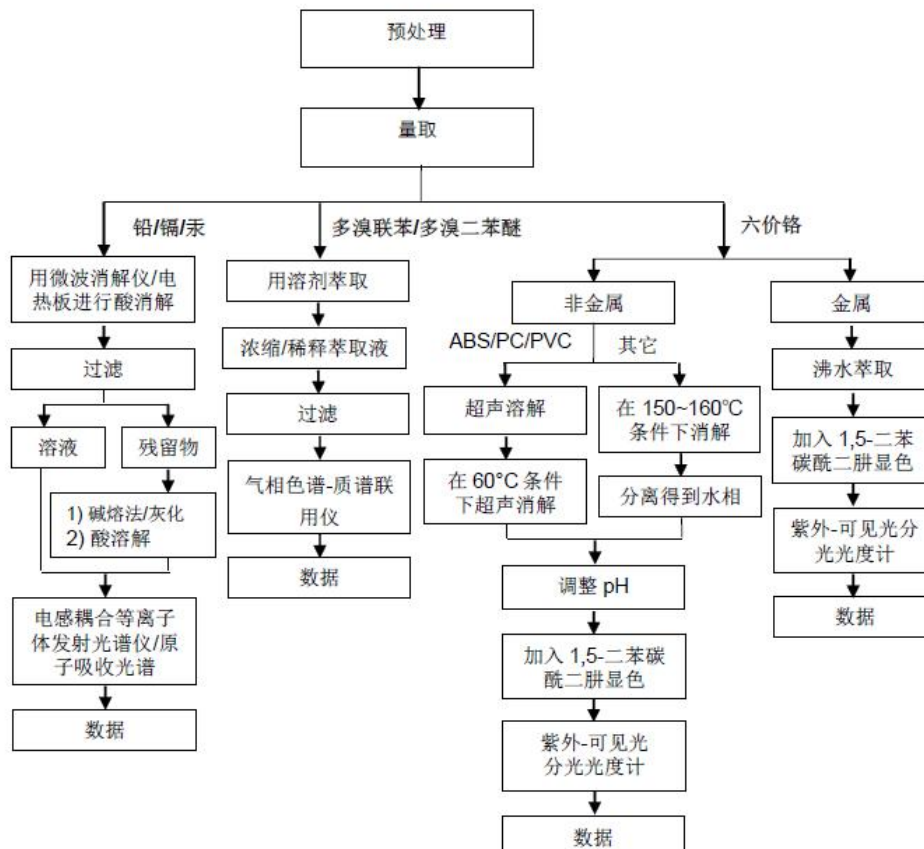
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附件

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 测试流程图

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)。





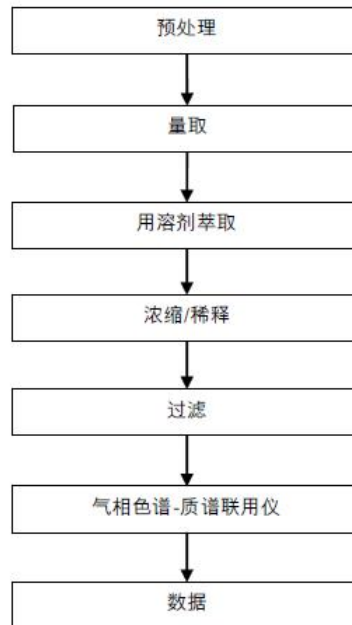
测试报告

No. CANML2113369602

日期: 2021年07月23日 第5页,共6页

附件

Phthalates 测试流程图



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测试报告

No. CANML2113369602

日期: 2021年07月23日 第6页,共6页

样品照片:



此照片仅限于随SGS正本报告使用

*** 报告完 ***



SGS (Shanghai) Technical Services Co., Ltd.
Guangzhou Branch Testing Center/Clinical Laboratory

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测试报告

No. CANEC2118141002

日期: 2021年10月12日 第1页,共14页

江西耐乐铜业有限公司
江西省鹰潭市余江区五湖工业园

以下测试之样品是由申请者所提供及确认: 铜管

SGS工作编号: 22137082 - CQ
样品接收日期: 2021年09月28日
测试周期: 2021年09月28日 - 2021年10月12日
测试要求: 根据客户要求测试
测试方法: 请参见下一页
测试结果: 请参见下一页
结论: 基于所送样品进行的测试, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁苯酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

通标标准技术服务有限公司广州分公司
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李嘉欣

Jessie Li 李嘉欣
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SGS-CSI Technical Services Co., Ltd.
Guangzhou Branch Testing & Inspection Laboratory

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测试报告

No. CANEC2118141002

日期: 2021年10月12日 第2页,共14页

测试结果:

测试样品描述:

样品编号	SGS样品ID	描述
SN1	CAN21-181410.001	铜色金属管

备注:

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

RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 参考IEC 62321-4:2013+A1:2017, 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。

测试项目	限值	单位	MDL	001
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1,000	mg/kg	2	ND
汞 (Hg)	1,000	mg/kg	2	ND
六价铬(Cr(VI))▼	-	µg/cm²	0.10	ND
多溴联苯之和(PBBs)	1,000	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)	1,000	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
五溴二苯醚	-	mg/kg	5	ND



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测试项目	限值	单位	MDL	001
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) 最大允许限值引用自RoHS指令(EU) 2015/863。
- (2) IEC 62321 系列等同于 EN 62321 系列
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (3) ▼a. 当六价格的浓度高于0.13 µg/cm²时, 样品为阳性, 即含有六价格;
b. 当六价格的浓度为ND(低于0.10 µg/cm²)时, 样品为阴性, 即未检测到六价格;
c. 当六价格的浓度介于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格, 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, 样品的六价格测试结果仅能代表测试时样品含六价格的状态。

卤素

测试方法: 参考EN 14582:2016, 用 IC 分析。

测试项目	单位	MDL	001
氟 (F)	mg/kg	50	ND
氯 (Cl)	mg/kg	50	ND
溴 (Br)	mg/kg	50	ND
碘 (I)	mg/kg	50	ND

元素分析

测试方法: SGS内部方法 (GZTC CHEM-TOP-009-01, 参考EPA 3050B:1996), 采用ICP-OES进行分析。



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测试项目	单位	MDL	001
砷 (As)	mg/kg	10	ND
铍 (Be)	mg/kg	5	ND
镍 (Ni)	mg/kg	5	ND

六溴环十二烷(HBCDD)

测试方法: SGS 内部方法(GZTC CHEM-TOP-073, 参考EPA 3550C:2007), 采用GC-MS进行分析。

测试项目	CAS NO.	单位	MDL	001
六溴环十二烷(HBCDD) 及其非对映异构体(α -HBCDD, β -HBCDD, γ -HBCDD)	25637-99-4 3194-55-6 134237-50-6 134237-51-7 134237-52-8	mg/kg	10	ND

全氟辛酸(PFOA)及其盐 & 全氟辛烷磺酸 (PFOS)及其衍生物

测试方法: 参考CEN/TS 15968:2010, 采用LC-MS或LC-MS/MS进行分析。

测试项目	CAS NO.	单位	MDL	001
全氟辛酸 (PFOA) 及其盐+	335-67-1	mg/kg	0.010	ND
全氟辛烷磺酸 (PFOS) [^]	1763-23-1	mg/kg	1	ND
全氟辛基磺酰胺 (PFOSA)	754-91-6	mg/kg	1	ND
N-甲基全氟辛烷磺酰胺(MeFOSA)	31506-32-8	mg/kg	1	ND
N-乙基全氟辛烷磺酰胺(EtFOSA)	4151-50-2	mg/kg	1	ND
2-(N-甲基全氟辛基磺酰胺)乙醇(MeFOSE)	24448-09-7	mg/kg	1	ND
2-(N-乙基全氟辛基磺酰胺)乙醇(EtFOSE)	1691-99-2	mg/kg	1	ND
全氟辛烷磺酸 (PFOS) 及其衍生物	-	mg/kg	-	ND

备注:

- (1) + PFOA 及其盐包含PFOA-Na (CAS No.: 335-95-5), PFOA-K (CAS No.: 2395-00-8), PFOA-Ag (CAS No.: 335-93-3), PFOA-F (CAS No.: 335-66-0) 和 APFO (CAS No.: 3825-26-1);
- (2) ^ 全氟辛烷磺酸 (PFOS) 包含 PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), PFOS-NH₄ (CAS No.: 29081-56-9), PFOS-NH(OH)₂ (CAS No.: 70225-14-8), PFOS-N(C₂H₅)₄ (CAS No.: 56773-42-3), PFOS-DDA (CAS No.: 251099-16-8) 和 POSF (CAS No.: 307-35-7)

多环芳香烃

测试方法: 参考AfPS GS 2019:01 PAK 测试, 采用 GC-MS 进行分析。



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测试报告

No. CANEC2118141002

日期: 2021年10月12日 第5页,共14页

测试项目	CAS NO.	单位	MDL	001
萘 (NAP)	91-20-3	mg/kg	0.1	ND
菲 (PHE)	85-01-8	mg/kg	0.1	ND
蒽 (ANT)	120-12-7	mg/kg	0.1	ND
荧蒽 (FLT)	206-44-0	mg/kg	0.1	ND
比 (PYR)	129-00-0	mg/kg	0.1	ND
苯并(a)蒽 (BaA)	56-55-3	mg/kg	0.1	ND
蒎 (CHR)	218-01-9	mg/kg	0.1	ND
苯并(b)荧蒽 (BbF)	205-99-2	mg/kg	0.1	ND
苯并(j)荧蒽 (BjF)	205-82-3	mg/kg	0.1	ND
苯并(k)荧蒽 (BkF)	207-08-9	mg/kg	0.1	ND
苯并(a)比 (BaP)	50-32-8	mg/kg	0.1	ND
苯并(e)比 (BeP)	192-97-2	mg/kg	0.1	ND
茚并(1,2,3-c,d)比 (IPY)	193-39-5	mg/kg	0.1	ND
二苯并(a,h)蒽(DBA)	53-70-3	mg/kg	0.1	ND
苯并(g,h,i)比(二苯嵌苯) (BPE)	191-24-2	mg/kg	0.1	ND
萘烯(ANY)	208-96-8	mg/kg	0.1	ND
萘(蒽嵌戊烷) (ANA)	83-32-9	mg/kg	0.1	ND
芴 (FLU)	86-73-7	mg/kg	0.1	ND
7项多环芳香烃总和[萘烯(ANY), 萘(蒽嵌戊烷) (ANA), 芴 (FLU), 菲 (PHE), 比 (PYR), 蒽 (ANT), 荧蒽 (FLT)]	-	mg/kg	-	ND
18项多环芳香烃总和	-	mg/kg	-	ND



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客户要求

参数 (mg/kg)	1 类	2 类		3 类	
	设计意图为放入口中的材料, 或与皮肤长期接触 (超过 30 秒) 的材料用于 -2009/48/EC 定义的玩具, 或 -供3岁以下儿童 ^{a,b} 使用。	不属于第 1 类, 设计意图或可预见 ^d 与皮肤长期接触 (超过 30 秒) 或短期重复接触 ^c 的材料		不属于第 1 和 2 类, 设计意图或可预见与皮肤短期接触 (不超过 30 秒) 材料	
		a. 供儿童使用的产品	b. 其他产品	a. 供儿童使用的产品	b. 其他产品
苯并(a)芘 (BaP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(e)芘 (BeP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(a)蒽 (BaA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(b)荧蒽 (BbF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(j)荧蒽 (BjF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(k)荧蒽 (BkF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
蒽 (CHR)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
二苯并(a,h)蒽 (DBA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(g,h,i)芘(二苯并芘) (BPE)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
蒽(1,2,3-c,d)芘 (IPY)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT), 蒽烯 (ANY), 苊(苯并戊烷) (ANA), 苊 (FLU), 7 PAH 之和	< 1 (总和)	< 5 (总和)	< 10 (总和)	< 20 (总和)	< 50 (总和)
萘 (NAP)	< 1	< 2		< 10	
18 PAH 之和	< 1	< 5	< 10	< 20	< 50

注释:

^a 儿童是指法定年龄未满 14 周岁的人。

^b 供儿童使用包括儿童的主动接触或被动接触。

^c “短期重复接触”的定义摘自 REACH 附录 XVII 第 50 条修正案 ((EC) No. 1272/2013)。

^d 根据德国产品安全法 (ProdSG) (第一章第 2 条第 28 款) 的定义, “可预见的使用”是指将产品投放市场的人无意但可以合理预见的方式使用产品。

备注: 材料的分类参考 2020 年 4 月 10 日发布的 AfPS GS 2019:01 PAK 标准。苊烯(ANY)、苊(苯并戊烷) (ANA)和苊 (FLU) 不在 AfPS GS 2019:1 PAK 的范围内, 但是结合其在 AfPS GS 2014:01 PAK 的范围内, 以及考虑到 LFGB 章节 30 的产品安全要求, 推荐进行测试。

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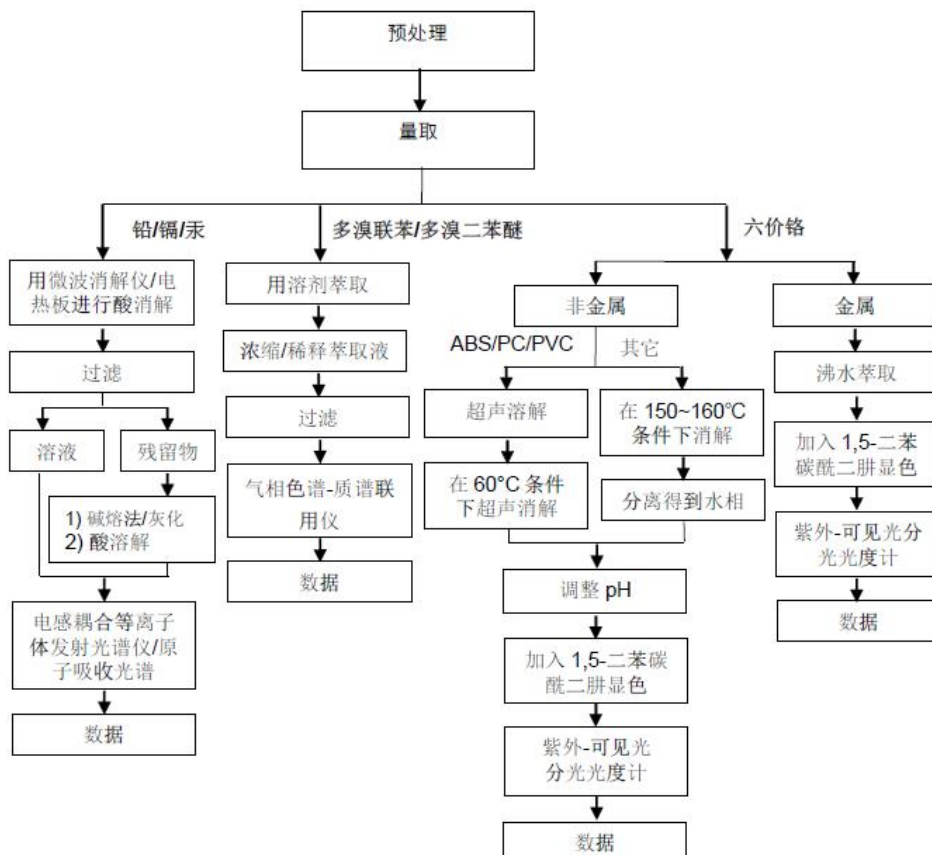
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附件

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 测试流程图

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)。





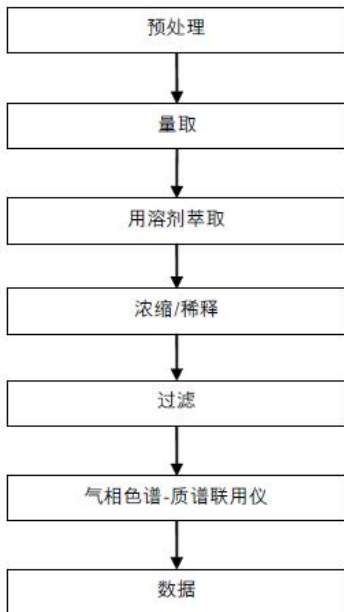
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No. CANEC2118141002

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附件

Phthalates 测试流程图



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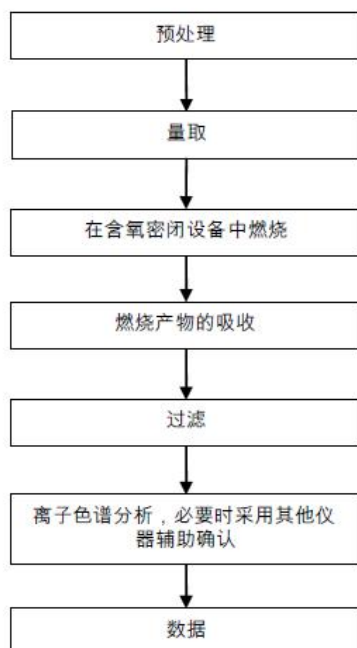
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Halogen 测试流程图



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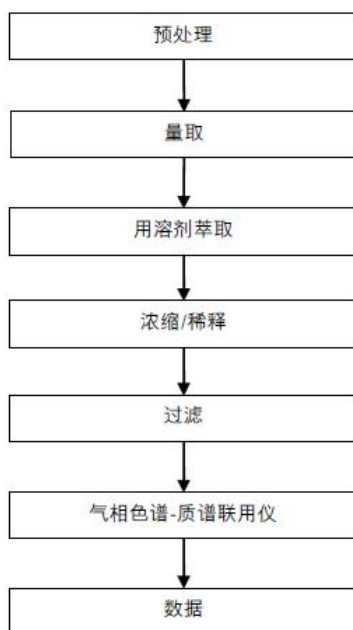
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No. CANEC2118141002

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附件

HBCDD 测试流程图



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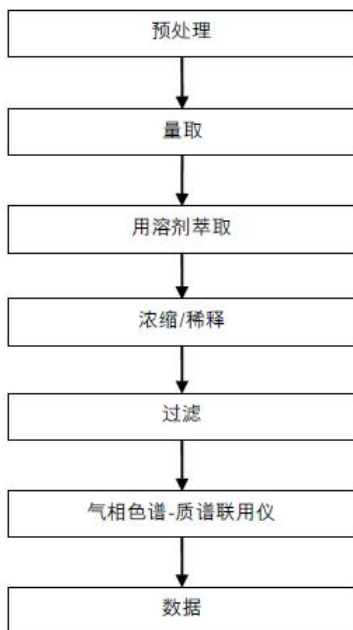
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PAHs 测试流程图



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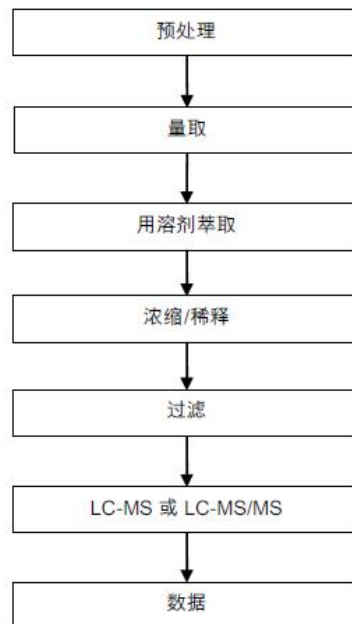
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PFOA / PFOS 测试流程图



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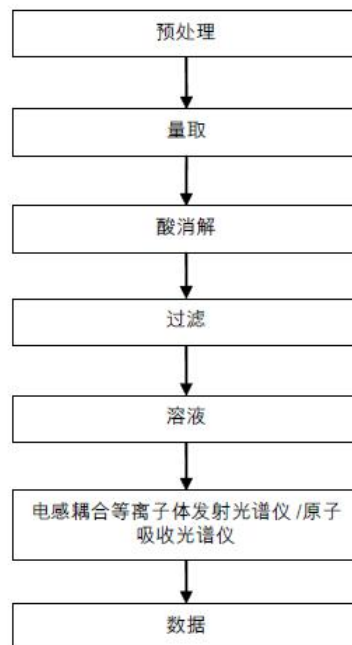
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No. CANEC2118141002

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元素测试流程图



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Test Report

No. CANEC2200632951

Date: 18 Jan 2022

Page 1 of 6

SHOUGANG JINGTANG UNITED IRON & STEEL CO.,LTD
CAOFEIDIAN INDUSTRIAL ZONE, TANGSHAN CITY, HEBEI, PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : CONTINUOUS
ANNEALING STEEL

SGS Job No. : CP22-001020 - GZ
Internal Reference No. : TP21-009094
Date of Sample Received : 11 Jan 2022
Testing Period : 11 Jan 2022 - 18 Jan 2022
Test Requested : Selected test(s) as requested by client.
Test Method : Please refer to next page(s).
Test Results : Please refer to next page(s).
Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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

Sasa zhi

Sasa Zhi
Approved Signatory



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Test Report

No. CANEC2200632951

Date: 18 Jan 2022

Page 2 of 6

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN22-006329.007	Silver-grey metal board

Remarks :

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

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

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	007
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm ²	0.10	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND



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No. CANEC2200632951

Date: 18 Jan 2022

Page 3 of 6

Test Item(s)	Limit	Unit	MDL	007
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
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (3) ▼= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI
 b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI based coating
 c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination
 Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

Remark: Results & photo(s) of this report refer to test report CANEC2200632949.



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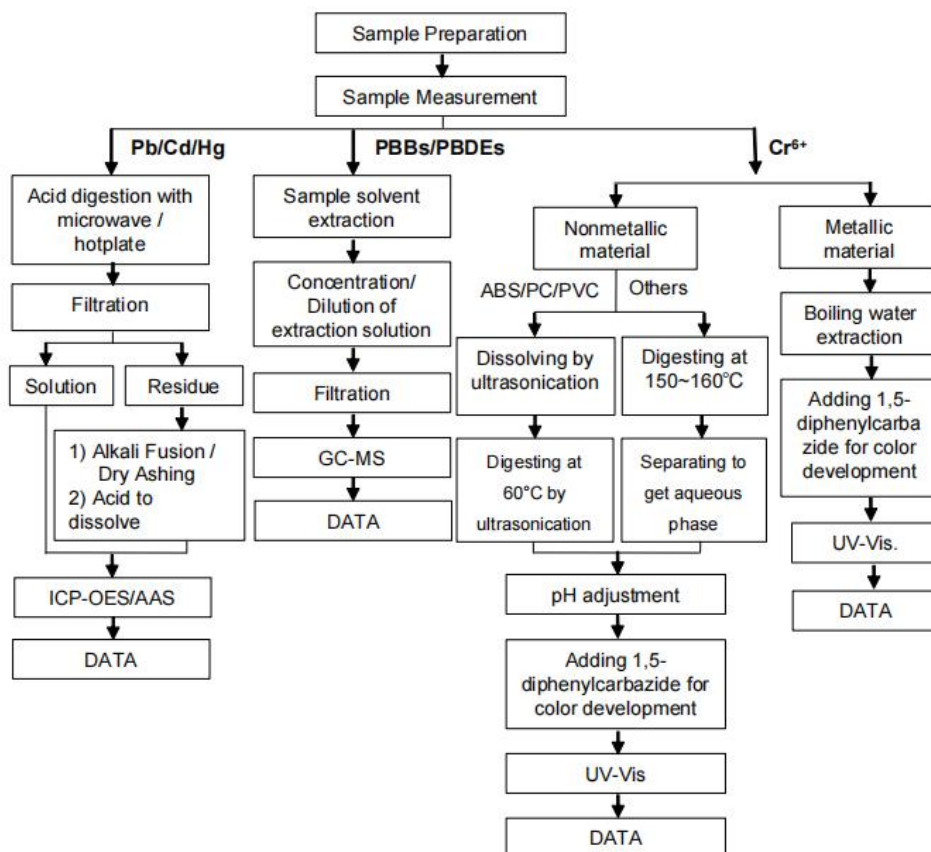
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Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

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



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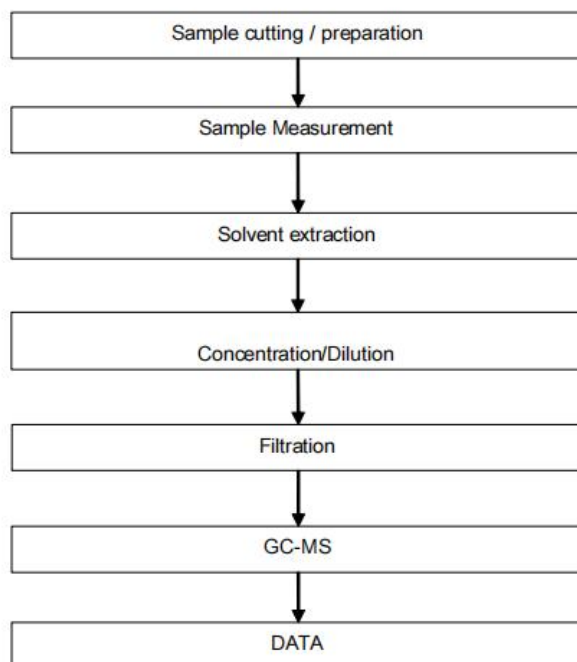
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Phthalates Testing Flow Chart



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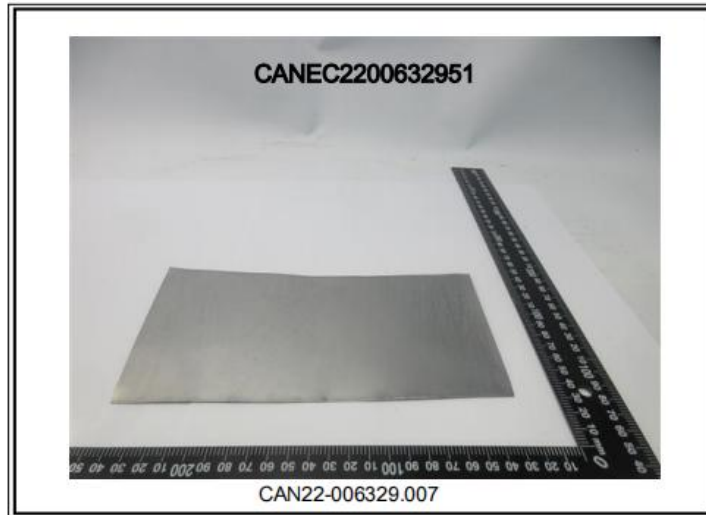
Test Report

No. CANEC2200632951

Date: 18 Jan 2022

Page 6 of 6

Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***



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Guangzhou Branch Testing Center Chemical Laboratory

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Test Report

No. SZXEC2103641102

Date: 01 Dec 2021

Page 1 of 6

CHUNYU(DONGGUAN)METAL PRODUCTS CO.,LTD

SONG-MU-SHAN PROVINCE,DALANG,DONGGUAN,GUANGDONG

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

SGS Job No. : RP21-028209 - SZ

Material No. : SWRCH18A

Date of Sample Received : 26 Nov 2021

Testing Period : 26 Nov 2021 - 01 Dec 2021

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

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

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

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

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

Ford

Ford Shi
Approved Signatory

scan to see the report



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Test Report

No. SZXEC2103641102

Date: 01 Dec 2021

Page 2 of 6

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SZX21-036411.002	Dark grey metal

Remarks :

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

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

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

Test Item(s)	Limit	Unit	MDL	002
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	18
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm²	0.10	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND



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No. SZXEC2103641102

Date: 01 Dec 2021

Page 3 of 6

Test Item(s)	Limit	Unit	MDL	002
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 Phthalate (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
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (3) ▽= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI
b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI based coating
c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

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



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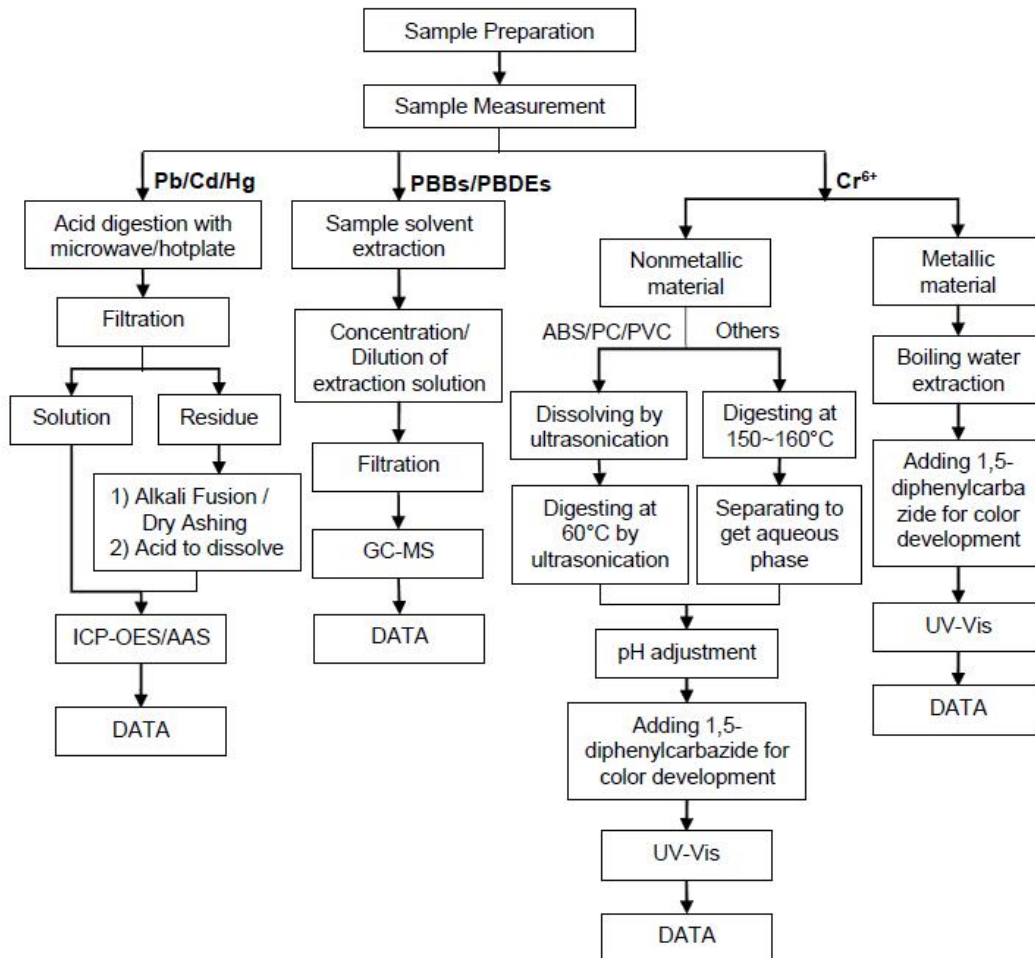
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Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

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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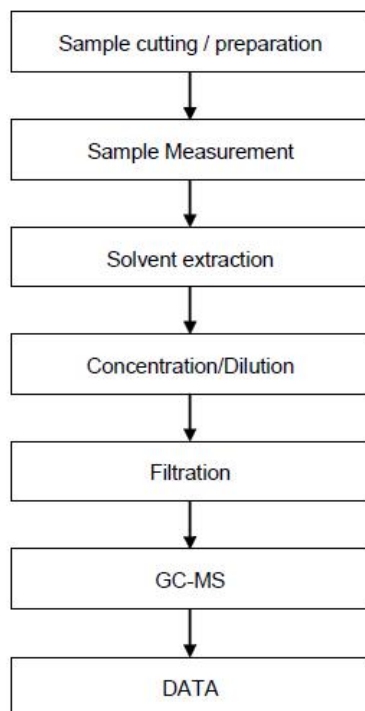
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ATTACHMENTS

Phthalates Testing Flow Chart



SGS-CTI Standards Technical Services Co., Ltd.
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Test Report

No. SZXEC2103641102

Date: 01 Dec 2021

Page 6 of 6

Sample photo:



SGS authenticate the photo on original report only

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测试报告

No. SZXEC2103277002

日期: 2021年10月28日 第1页,共6页

南通豪杰金属制品有限公司

江苏省南通市开发区竹行镇东方大道293号

以下测试之样品是由申请者所提供及确认: 碳素弹簧钢丝

SGS工作编号: RP21-025127 - SZ

样品接收日期: 2021年10月25日

测试周期: 2021年10月25日 - 2021年10月28日

测试要求: 根据客户要求测试

测试方法: 请参见下一页

测试结果: 请参见下一页

结论: 基于所送样品进行的测试, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁基酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

通标标准技术服务有限公司深圳分公司
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石常福

Ford Shi 石常福
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Shenzhen Branch Testing & Calibration Laboratory

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测试报告

No. SZXEC2103277002

日期: 2021年10月28日 第2页,共6页

测试结果:

测试样品描述:

样品编号	SGS样品ID	描述
SN1	SZX21-032770.001	银灰色金属

备注:

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

RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 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.

测试项目	限值	单位	MDL	QOI
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1,000	mg/kg	2	ND
汞 (Hg)	1,000	mg/kg	2	ND
六价铬(Cr(VI))▼	-	µg/cm²	0.10	ND
多溴联苯之和(PBBs)	1,000	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)	1,000	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
五溴二苯醚	-	mg/kg	5	ND



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测试报告

No. SZXEC2103277002

日期: 2021年10月28日 第3页,共6页

测试项目	限值	单位	MDL	001
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) 最大允许限值引用自RoHS指令(EU) 2015/863。

(2) IEC 62321系列等同于 EN 62321系列

https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

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

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

c. 当六价格的浓度介于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格, 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, 样品的六价格测试结果仅能代表测试时样品含六价格的状态。

除非另有说明, 此报告结果仅对测试的样品负责。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。



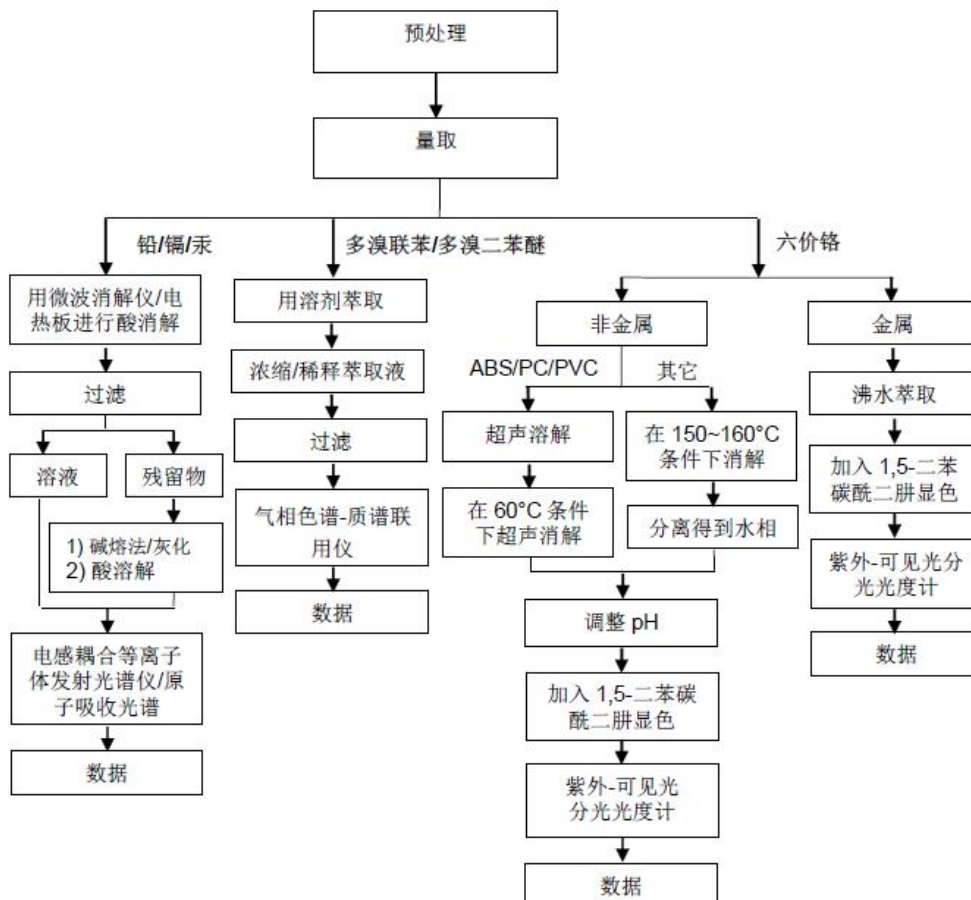
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附件

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 测试流程图

1) 样品按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)。



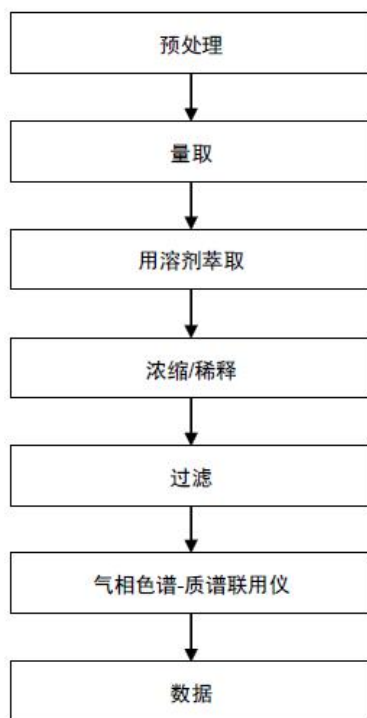
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附件

Phthalates 测试流程图



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No. SZXEC2103277002

日期: 2021年10月28日 第6页,共6页

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