亞 驪 企 業 股 份 有 限 公 司
ARISTOTLE ENTERPRISES

承 認 申 請 書

ROHS COMPLIANCE

客戶名稱: Customer	虹堡科技股份有限公司
廠商料號: Part No.	RFA-25-JP322-70-110
品名: Description	Dual Band
圖號: Drawing No.	RFA-25-JP322-70-110
客戶料號: Drawing No.	311600160000

出廠簽章:

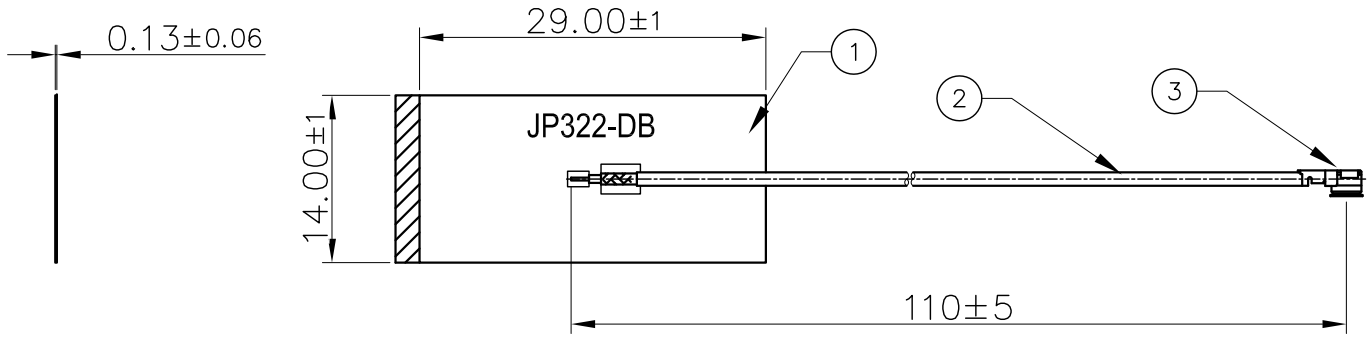
檢　　查 TEST BY	核　　對 CHECK BY	承　　認 APPROVE BY
方美鑾	劉蘇華	廖煥文

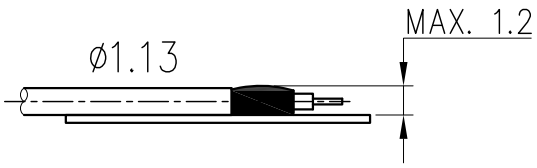
承認簽章:

檢　　查 TEST BY	核　　對 CHECK BY	承　　認 APPROVE BY

地址:新北市中和區莒光路 63 號 8 樓
電話:02-2225-8209
傳真:02-2225-7523

NO.	NAME	FINSH	MAT'L	Q'TY	MEMO
1.	FPC	BLACK	PI	1	
2.	Cable	GRAY	--	1	ø1.13
3.	IPEX	GOLD PLATED	BRASS	1	MHF1





3.				REV.	B			
2.				SHEET	1/1	CHKD.		
1.				SIZE	SCALE			
REV.	ECN.	NAME	DATE	A4	1:1	DRAW	Gino	20221201

PROJECTION	TOLERANCE UNLESS OTHERWISE SPECIFIED	亞驪企業股份有限公司 ARISTOTLE ENTERPRISES INC.
	LINER / ANGLE	
UNITS: MM	.X ±1.0 / X° ±5°	
	.XX ±0.5	TITLE
	.XXX ±0.2	RFA-25-JP322-70-110
		DWG NO. RFA-25-JP322-70-110

(0,0)

亞驪企業股份有限公司
ARISTOTLE ENTERPRISES INC.

FAI Report

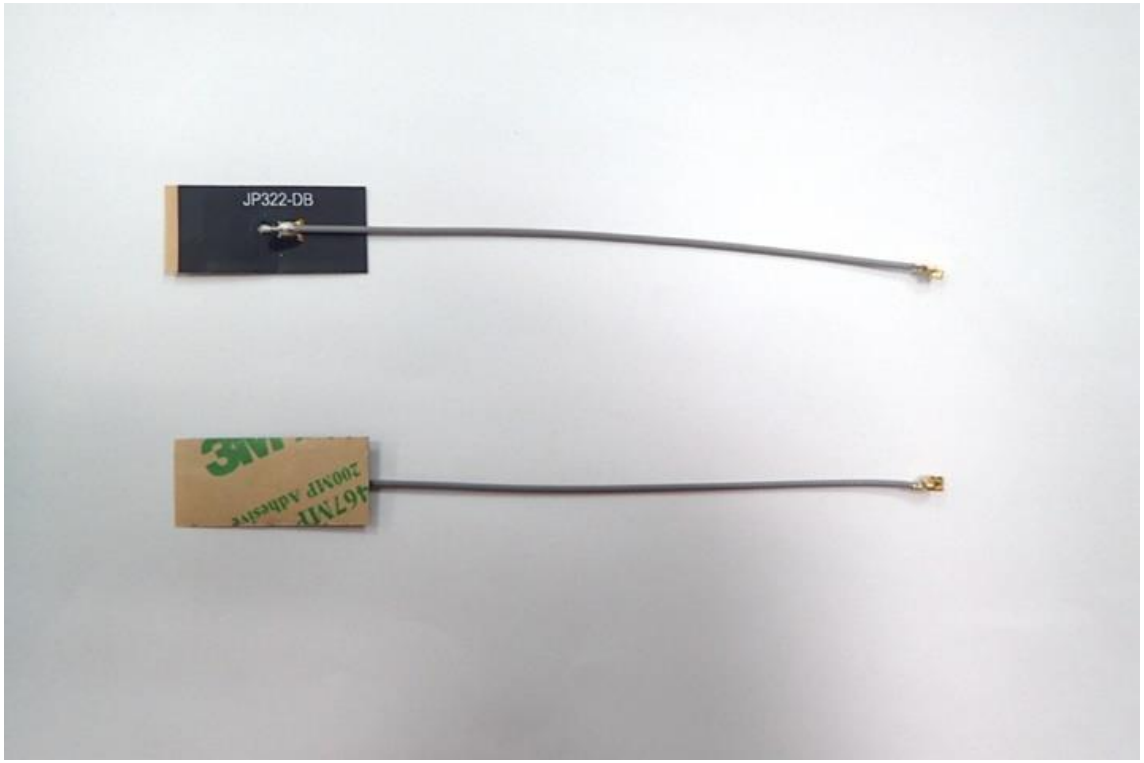
客戶簡稱	C606	客戶料號	311600160000	亞驪料號	RFA-25-JP322-70-110

項次	測量點	1	2	3	判定	備註
1	0.13±0.06	0.13	0.13	0.13	V	
2	14±1	14.01	14	14.01	V	
3	29±1	29	29	29.01	V	
4	110±5	111	110	111	V	
5						
6						
7						
8						
9						
10						

備註：

Aristotle
CONNECT TO THE WORLD

產品照片&單重



單重:0.6g

亞驪企業股份有限公司

文件編號		文件名稱	C606_RFA-25-JP322-70-110	發行版本	A	頁次	1/1

客戶代號：	C606	最小包裝	PCS	50
客戶料號/品名：	311600160000	中包裝	PCS	1000
亞驪料號/品名：	RFA-25-JP322-70-110	大包裝	PCS	10000
相關配件		備註		

1. 最小包裝(50PCS-夾鏈袋)

示意圖

2. 中包裝(1000PCS-PE 袋)

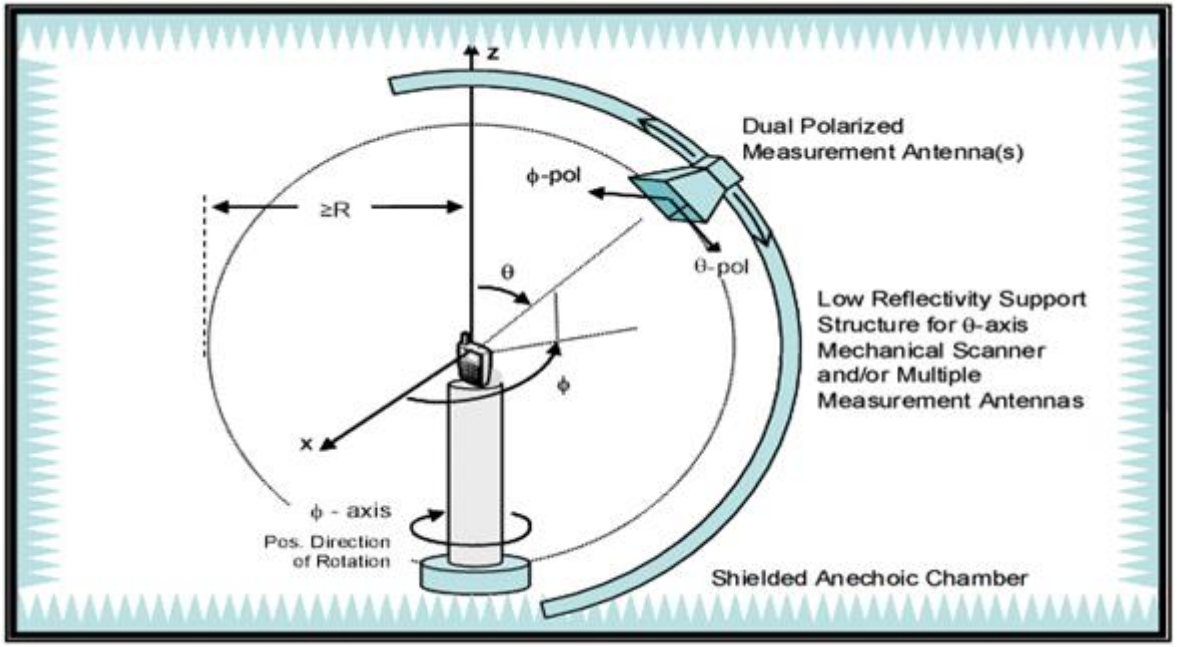
示意圖

3. 大包裝(10000PCS-1 箱)

示意圖

Equipment Description	Manufacturer	Identification no.	Current calibration date	Next calibration date
Universal Radio Communication tester	Anritsu	MT8821C	2022/07/19	2023/07/18
Network Analyzer	Keysight	E5063A	2021/12/02	2024/12/01
Sleeve Dipole	MVG	SD740	2022/05/23	2025/05/22
Dual Ridge Horn	MVG	SH600-25	2022/05/23	2025/05/22
Wideband Dipole	MVG	WD6000-20	2022/05/23	2025/05/22
StarLab probe array	MVG	StarLab	2022/05/23	2023/05/22
Measurement software	MVG	Wave Studio 2020.2.7	N/A	N/A
Wireless protocol tester	Anritsu	MT8862A	2022/07/19	2023/07/18

測試人員：Jerry
測試日期：2021/04/27



ARISTOTLE ENTERPRISES INC.

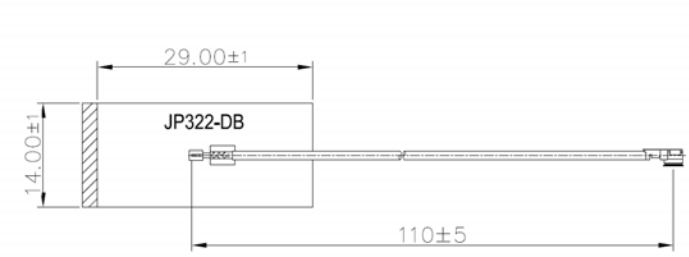
Specifications

Antenna Type：Dipole

RFA-25-JP322-70-110

Electrical Specifications

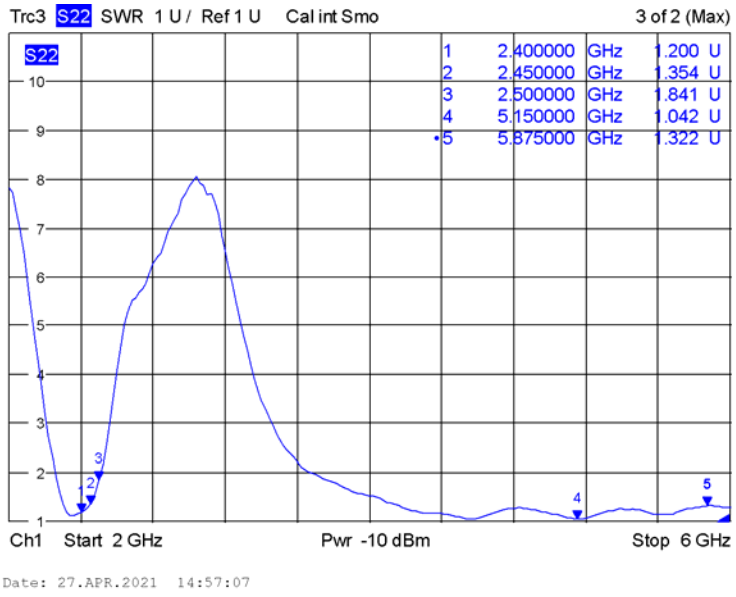
Frequency range	2400-2500 MHz	5150-5875 MHz
Peak gain	2.67dBi	4.15 dBi
Efficiency	65.54 %	66.12 %
VSWR(in Device)	2.5 : 1 Max.	2.0 : 1 Max.
Polarization	Linear, vertical	
Impedance	50 Ω	
Connector	IPEX	
Cable	Ø1.13	



Environmental & Mechanical Characteristics

Temperature	- 10℃ to +55℃
Humidity	95% @ 25℃

VSWR

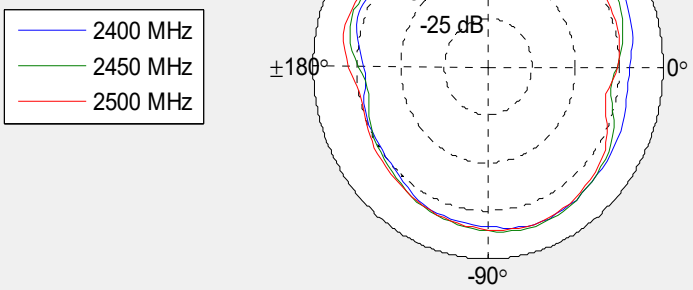


ARISTOTLE
8F, No.63, Juguang Rd, Zhonghe Dist, New Taipei City 235, Taiwan, R.O.C.
Tel : +886-2-2225-8209 Fax: +886-2-2225-7523 www.aristotle.com.tw

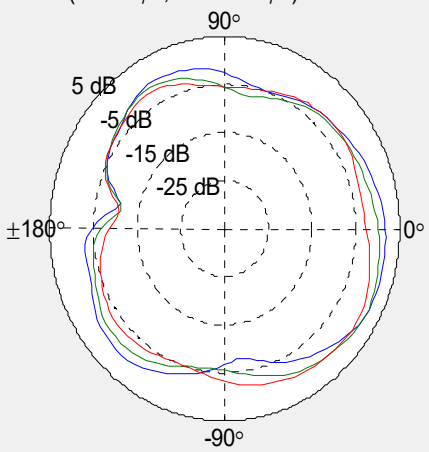
Radiation Pattern

2G Band = 2400 - 2500 MHz % 2G BAND

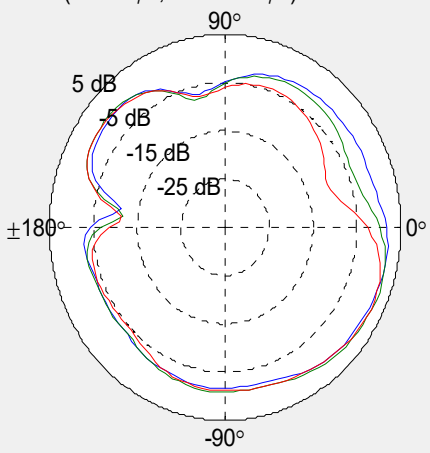
XY Plane (+X = 0¢X, +Y = +90¢X) / Elevation = 90 ¢X



ZX Plane (+Z = 0¢X, +X = +90¢X) / Azimuth = 0 ¢X



YZ Plane (+Z = 0¢X, +Y = +90¢X) / Azimuth = 90 ¢X



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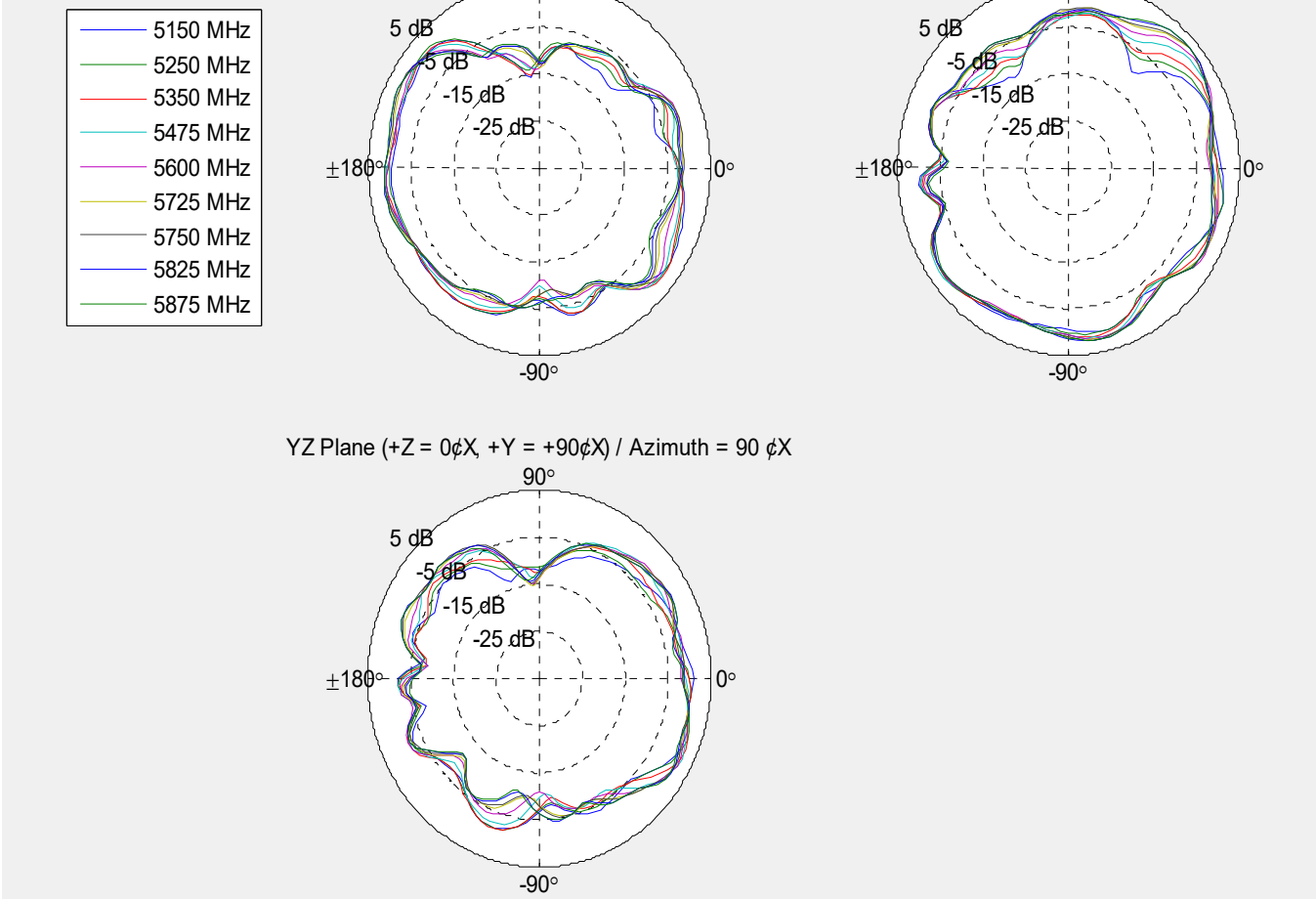
Tel : +886-2-2225-8209 Fax: +886-2-2225-7523 www.aristotle.com.tw

Radiation Pattern

5G Band = 5150 - 5900 MHz



ARISTOTLE
8F, No.63, Juguang Rd, Zhonghe Dist, New Taipei City 235, Taiwan, R.O.C.
Tel : +886-2-2225-8209 Fax: +886-2-2225-7523 www.aristotle.com.tw

MHF® I Connector

Ground contact gold plating
(Anti-static reel version)

Part No. Plug: 20278-1**R-** Receptacle: 20279-001E-0*

Product Specification

Qualification Test Report No. TR-12044

Rev.	ECN	Date	Prepared by	Checked by	Approved by
10	S22224	June 1, 2022	S. Tsuboki	K. Yufu	Y. Hashimoto
9	S21589	November 11, 2021	S. Taguchi		M. Takemoto
8	S20594	November 11, 2020	S. Taguchi	J. Tonai	M. Takemoto
7	S20398	August 6, 2020	K. Ikeshita	J. Tonai	M. Takemoto

1. Scope

This Product Specification defines the test conditions and the performances of the MHF I Connector.

2. Product Name and Parts No.

2.1 Product Name

MHF I Connector

2.2 Parts No.

Plug: 20278-1**R-08,-13,-32,-18
Receptacle: 20279-001E-0* (Anti-static reel version)

3. Product Shape, Dimensions and Material.

Refer to the drawing

4. Rating

4.1 Applicable cable

4.1.1 Part No. 20278-101R-08, 20278-111R-08, 20278-102R-08, 20278-112R-08

(1) Description

Inner conductor : AWG#36(7/0.05) ,Silver plating copper wire
Dielectric core : Fluoro-plastics ,diameter 0.40(+0.04,-0.02)mm
Outer conductor : Braid of 0.05mm, diameter 0.65(±0.1)mm ,
silver plating copper wire or tin plating copper wire
Jacket : Fluoro-plastics , diameter 0.81(+0.04,-0.03)mm

(2) Requirements

Characteristic impedance : 50±3Ω by TDR method
Nominal capacitance(Reference value): 96 pF/m
Dielectric withstand voltage : no breakdown at AC 1,000V for 1 minutes.

4.1.2 Part No. 20278-101R-13, 20278-111R-13, 20278-102R-13, 20278-112R-13

(1) Description

Inner conductor : AWG#32(7/0.08), Silver plating copper wire
Dielectric core : Fluoro-plastics , diameter 0.70(±0.05)mm
Outer conductor : Braid of 0.05mm, diameter0.93(±0.09)mm ,
silver plating copper wire or tin plating copper wire
Jacket : Fluoro-plastics , diameter 1.13(+0.08,-0.05)mm

(2) Requirements

Characteristic impedance : 50±2Ω by TDR method
Nominal capacitance(Reference value) : 97 pF/m
Dielectric withstand voltage : no breakdown at AC 1,000V for 1 minutes.

4.1.3 Part No. 20278-101R-32, 20278-111R-32, 20278-102R-32, 20278-112R-32

(1) Description

Inner conductor : AWG#32(7/0.08), Silver plating copper wire
Dielectric core : Fluoro-plastics , diameter 0.66(±0.05)mm
First outer conductor : Braid of 0.05mm, tin plating copper wire
Second outer conductor : Braid of 0.05mm, diameter 1.12(±0.1)mm , tin plating copper wire
Jacket : Fluoro-plastics , diameter 1.32(±0.1)mm

(2) Requirements

Characteristic impedance : 50±2Ω by TDR method
Nominal capacitance(Reference value): 95 pF/m
Dielectric withstand voltage : no breakdown at AC 1,500V for 1 minutes.

4.1.4 Part No. 20278-101R-18, 20278-111R-18, 20278-102R-18, 20278-112R-18

RG178 B/U

(1) Description

Inner conductor : AWG#30(7/0.102), silver plating copper clad steel wire
Dielectric core : Fluoro-plastics , diameter 0.84(±0.03)mm
Outer conductor : Braid of 0.1mm , diameter 1.35(±0.14)mm , silver plating copper wire
Jacket : Fluoro-plastics , diameter 1.8(±0.1)mm

(2) Requirements

Characteristic impedance : 50±2Ω by TDR method
Nominal capacitance(Reference value): 95 pF/m
Dielectric withstand voltage : no breakdown at AC 2,000V for 1 minutes.

4.2 Operating Condition

Voltage : 60V AC (per contact pin)
Operating Temperature : 233～363K(-40℃～+90℃)
(Containing temperature rise by current)
Nominal characteristic impedance : 50Ω
Frequency : DC~9.0GHz
VSWR : Plug: 1.30 MAX. at 0.1~3GHz, 1.50 MAX. at 3~6GHz, 1.90 MAX. at 6~9GHz (0.81 O.D., 1.13 O.D., 1.80 O.D.)
1.30 MAX. at 0.1~3GHz, 1.50 MAX. at 3~6GHz, 1.60 MAX. at 6~9GHz (1.32 O.D.)
Receptacle: 1.30 MAX. at 0.1~3GHz. 1.40 MAX. at 3~6GHz, 1.80 MAX. at 6~9GHz
Storage condition : Temperature 248K～333K(-25℃～+60℃)
Humidity：85% MAX.（No condensation）

5. Test and Performance

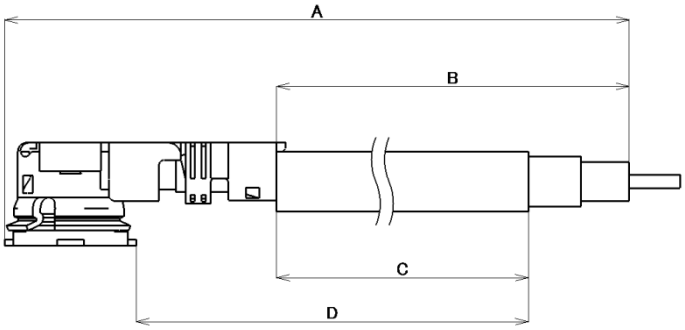
Test Condition

This initial test is equal to it's at shipping condition and unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with MIL-STD-202.

Temperature … 288K～308K（15℃～35℃）
Pressure … 866hPa～1066hPa（650mmHg～800mmHg）
Relative Humidity … 45～75%R.H.

5.1. Electrical Performance

1. Contact resistance	
Reference standard:	MIL-STD-202G, Method 307
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, then measure the contact resistance as shown in Fig. 1 by the four terminal method. Open circuit voltage: 20mV MAX Circuit current:10mA MAX.



Inner contact
=A-B

Ground contact
=D-C

Fig. 1

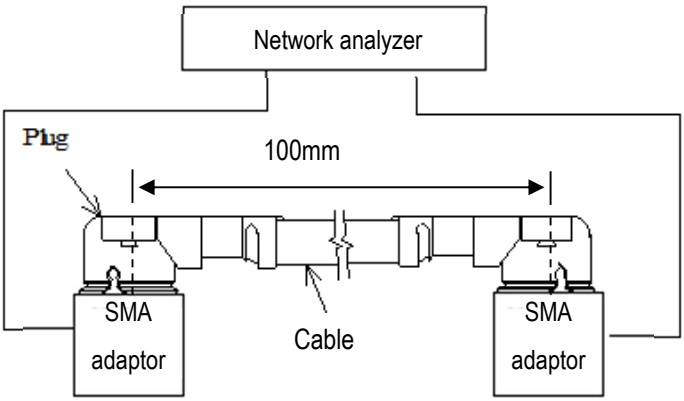
Pass criteria:	Inner contact Initial： 20mΩ MAX. After testing： 25mΩ MAX. Ground contact Initial： 10mΩ MAX. After testing： 15mΩ MAX.

2. Insulation resistance	
Reference standard:	MIL-STD-202-302, Test condition A
Test conditions:	Mate the plug and receptacle connector together, and then apply DC 100 V between the inner contact and the ground contact.
Pass criteria:	Initial ：500 MΩ MIN. After testing ：100 MΩ MIN.

3. Dielectric withstanding voltage	
Reference standard:	MIL-STD-202-301
Test conditions:	Mate the receptacle and plug connector together, then apply AC 200V(rms) between the neighboring contacts for a minute.
Pass criteria:	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

5.1. Electrical Performance

4. VSWR	
Reference standard:	
Test conditions:	Measure the VSWR as shown in Fig. 2 by the network analyzer. Frequency : 100MHz~9.0GHz



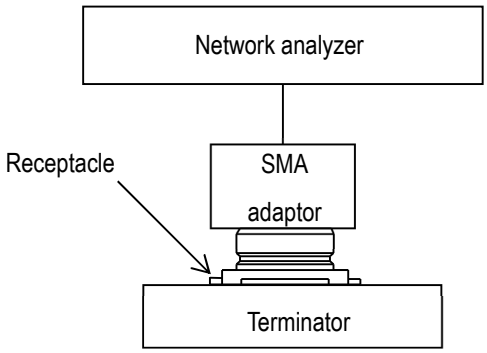


Fig. 2

Pass criteria:	Plug 0.1～3GHz 1.30 MAX., 3～6GHz 1.50 MAX., 6～9GHz 1.90 MAX. (0.81 O.D., 1.13 O.D., 1.80 O.D.) 0.1～3GHz 1.30 MAX., 3～6GHz 1.50 MAX., 6～9GHz 1.60 MAX. (1.32 O.D.) Receptacle 0.1～3GHz 1.30 MAX., 3～6GHz 1.40 MAX., 6～9GHz 1.80 MAX.

5.2. Mechanical Performance

1. Unmating force	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on push-on/pull-off machine, measure of initial and mating/un-mating 30 cycles at a speed 25±3mm/min. along the mating axis.
Pass criteria:	Total unmating force Initial: 5N Min. After 30 cycles: 3N Min. Unmating force of inner contact Initial: 0.15N Min. After 30 cycles: 0.10N Min.

2. Crimp strength	
Reference standard:	-
Test conditions:	Pull the cable as shown in Fig. 3 at a speed 25±3mm/minutes by tensile strength machine.

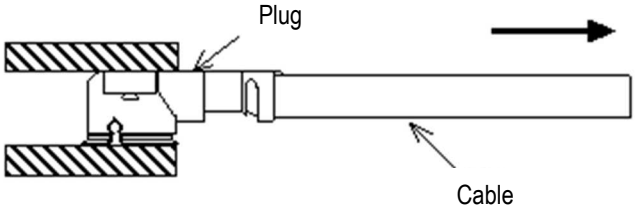
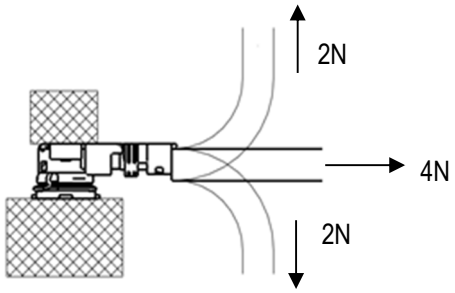


Fig. 3

Pass criteria:	20278-1**R-08,13, 32: 10N MIN. 20278-1**R-18: 15N MIN.

5.2. Mechanical Performance

3. Durability	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on the push-on/pull-off machine, and repeat mating and un-mating 30cycles at a speed 25±3mm/min. along the mating axis.
Pass criteria:	[Contact Resistance] Shall meet 5.1.1.

4. Cable retention force	
Reference standard:	-
Test conditions:	Apply force on the cable as shown in Fig. 4. During the testing, run 100mA DC to check electrical discontinuity.  Fig. 4
Pass criteria:	[Contact Resistance] Shall meet 5.1.1. [Electrical discontinuity] No electrical discontinuity greater than 1μs shall occur. [Appearance] No abnormality adversely affecting the performance shall occur.

5. Vibration	
Reference standard:	-
Test conditions:	Apply the following vibration to the mating connector. During the testing, run 100mA DC to check electrical discontinuity. Frequency: 10Hz→100Hz→10Hz / approx. 15 minutes. Half amplitude ,Peak value of acceleration 1.5mm or 59m/s2 (6G) Directions , cycle 3 mutually perpendicular direction 5 cycles(approx. 75min)about each direction
Pass criteria:	[Contact Resistance] Shall meet 5.1.1. [Electrical discontinuity] No electrical discontinuity greater than 1μs shall occur. [Appearance] No abnormality adversely affecting the performance shall occur.

6. Shock	
Reference standard:	-
Test conditions:	Apply the following vibration to the mating connector. During the testing, run 100mA DC to check electrical discontinuity. Peak value of acceleration : 735m/s^2 (75G) Duration: 11msec Wave Form: half sinusoidal Directions, cycle: 6 mutually perpendicular direction, 3 cycles about each direction
Pass criteria:	[Contact Resistance] Shall meet 5.1.1. [Electrical discontinuity] No electrical discontinuity greater than 1μs shall occur. [Appearance] No abnormality adversely affecting the performance shall occur.

5.3. Environmental Performance

1. Thermal Shock	
Reference standard:	-
Test conditions:	Apply the following environment to the mating connector. Temperature ,duration: 233K(-40℃)/30 minutes →278～308K(5～35℃)/5 minutes MAX. →363K(90℃)/30 minutes →278～308K(5～35℃)/5 minutes MAX. Number of cycles : 5 cycles
Pass criteria:	[Contact Resistance] Shall meet 5.1.1. [Insulation Resistance] Shall meet 5.1.2. [Appearance] No abnormality adversely affecting the performance shall occur.

2. Humidity (Steady State)	
Reference standard:	MIL-STD-202G, Method 103, Condition B
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 313±2 K (40±2℃) Humidity: 90～95%RH Duration: 96 hours
Pass criteria:	[Contact Resistance] Shall meet 5.1.1. [Insulation Resistance] Shall meet 5.1.2. [Appearance] No abnormality adversely affecting the performance shall occur.

3. Salt Water Spray	
Reference standard:	MIL-STD-202G, Method 101, Condition B
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 308±2K (35±2℃) Salt water density: 5±1% [by weight] Duration: 48 hours
Pass criteria:	[Contact Resistance] Shall meet 5.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

4. High Temperature Life	
Reference standard:	-
Test conditions:	Apply the following environment to the mating connector. Temperature: 363±2K (90±2℃) Duration: 96 hours
Pass criteria:	[Contact Resistance] Shall meet 5.1.1. [[Appearance] No abnormality adversely affecting the performance shall occur.

5.4. Others

1. Solder ability	
Reference standard:	-
Test conditions:	Dip the solder tine of the contact in the solder bath at 518±5K （245±5℃） for 5±0.5 seconds after immersing the tine in the flux of RMA or R type for 5 to 10 seconds.
Pass criteria:	More than 95% of the dipped surface shall be evenly wet.

2. Soldering Heat Resistance	
Reference standard:	-
Test conditions:	Put on the receptacle connector to PCB, apply the heat 2 cycles as shown in Fig. 5.

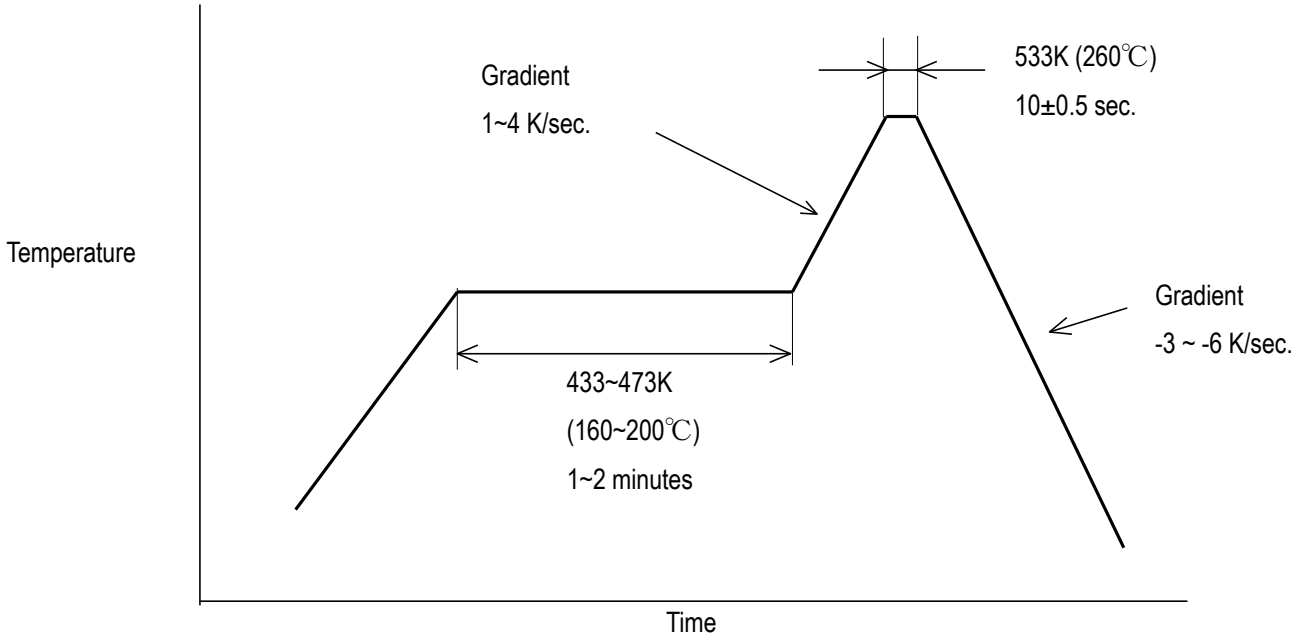


Fig. 5

Pass criteria:	[Appearance] No abnormality adversely affecting the performance shall occur.

5.5 Test Sequence and Sample Quantity

Table 1 Test Sequence and Sample Quantity

Test Item		Group													
		A	B	C	D	E	F	G	H	J	K	L	M	N	P
Contact Resistance						1,3	1,3	1,3	1,3	1,4	1,4	1,3	1,3		
Insulation Resistance										2,5	2,5				
Dielectric Withstanding Voltage		1													
VSWR			1												
Unmating Force				1											
Crimp Strength					1										
Durability						2									
Cable Retention Force							2								
Vibration								2							
Shock									2						
Thermal Shock										3					
Humidity (Steady State)											3				
Salt Water Spray												2			
High Temperature Life													2		
Solder ability														1	
Soldering Heat Resistance															1
Sample Quantity	Plug	10	10	10	10	10	10	10	10	10	10	10	10	-	-
	Receptacle		5		-									10	10

Numbers indicate sequence in which tests are performed.

6. Recommended Metal Mask

Refer to drawing for the recommended metal mask thickness and opening dimension.

SPECIFICATION FOR APPROVAL

DOCUMENT: A3132TS001

STYLE： COAXIAL CABLE
105℃ 30V

SIZE: 32AWG×1C
BRAID ：TD

RECOGNIZED: UL 1979
MEET VW-1

WONDERFUL HI-TECH CO.,LTD.

OFFICE：72WU KONG 6TH ROAD,
WU KU IND. DISTRICT
TAIPEI HSIEN,TAIWAN

TEL：(02)22988033
FAX：(02)22988031-2

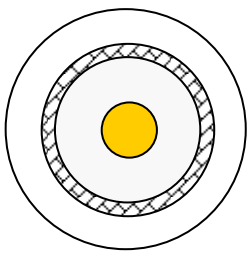
FACTORY：17 PEI YUAN ROAD,
CHUNG-LI IND. PARK
TAIWAN, R.O.C.

TEL：(03)4527777
FAX：(03)4517214

WONDERFUL HI-TECH CO., LTD.
SPECIFICATION

STYLE	105℃ 30V UL 1979	DOCUMENT NO : A3132TS001
SIZE	32AWG	ESTABLISHED DATE: Mar/16/2005

STANDARD :

Conductor	Size	AWG	32
	Material	----	Silver Cover Copper
	Conductors No.	----	7
	Conductors Size	mm	0.085
	O.D.	mm	0.26
Insulation	Average Thickness	mm	0.22
	Diameter	mm	0.70 ± 0.03
	Material	----	FEP
	Color	----	Clear
Braid	Material	----	Tinned Copper
	Construction	mm	16 / 4 / 0.050
	Coverage	%	89.4
Jacket	Average Thickness	mm	0.12
	Diameter	mm	1.13 ± 0.05
	Material	----	FEP
	Color	----	According to customer
Marking	Non		
Drawing			

MAKER : H. C. KUO CONFIRM : C. Y. Chen APPROVAL : W. J. Wang

WONDERFUL HI-TECH CO., LTD.
SPECIFICATION

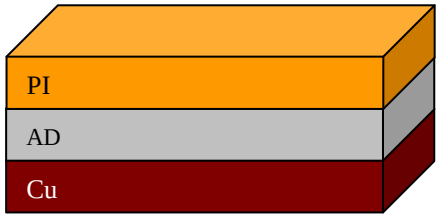
Electrical & Physical Properties			
Item			32AWG
Rating Temp Voltage			105℃ 30V
Conductor Resistance			497 OHM/KM/20℃ MAX.
Insulation Resistance			3000 MEGA OHM-KM MIN.
Dielectric Strength			AC 1000 V/Minute
Spark Test			2 KV
Insulation	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / ㎟)
		Elongation	200% MIN.
	Aged	Tensile Strength	UNAGED MIN. 75%(168HRS×232℃)
		Elongation	UNAGED MIN. 75%(168HRS×232℃)
Jacket	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / ㎟)
		Elongation	200% MIN.
	Aged	Tensile Strength	UNAGED MIN.75%(168HRS×232℃)
		Elongation	UNAGED MIN.75%(168HRS×232℃)
Nom. Impedance			50 ± 3 Ohms
Nom. Capacitance			96 ± 3 pF/m
Nom. Vel. of Prop.			69%
Storage Temperature			-40℃~+80℃
VSWR Test (0 – 6 GHZ)			Max 1.3
Flame Test			VW-1 OK

Attenuation (dB/1m)	**2.0GHZ**	2.4GHZ	2.5GHZ	5.0GHZ	6.0 **GHZ**
	2.90	3.20	3.28	5.05	5.40

MAKER : H. C. KUO CONFIRM : C.Y. Chen APPROVAL : W.J. Wang

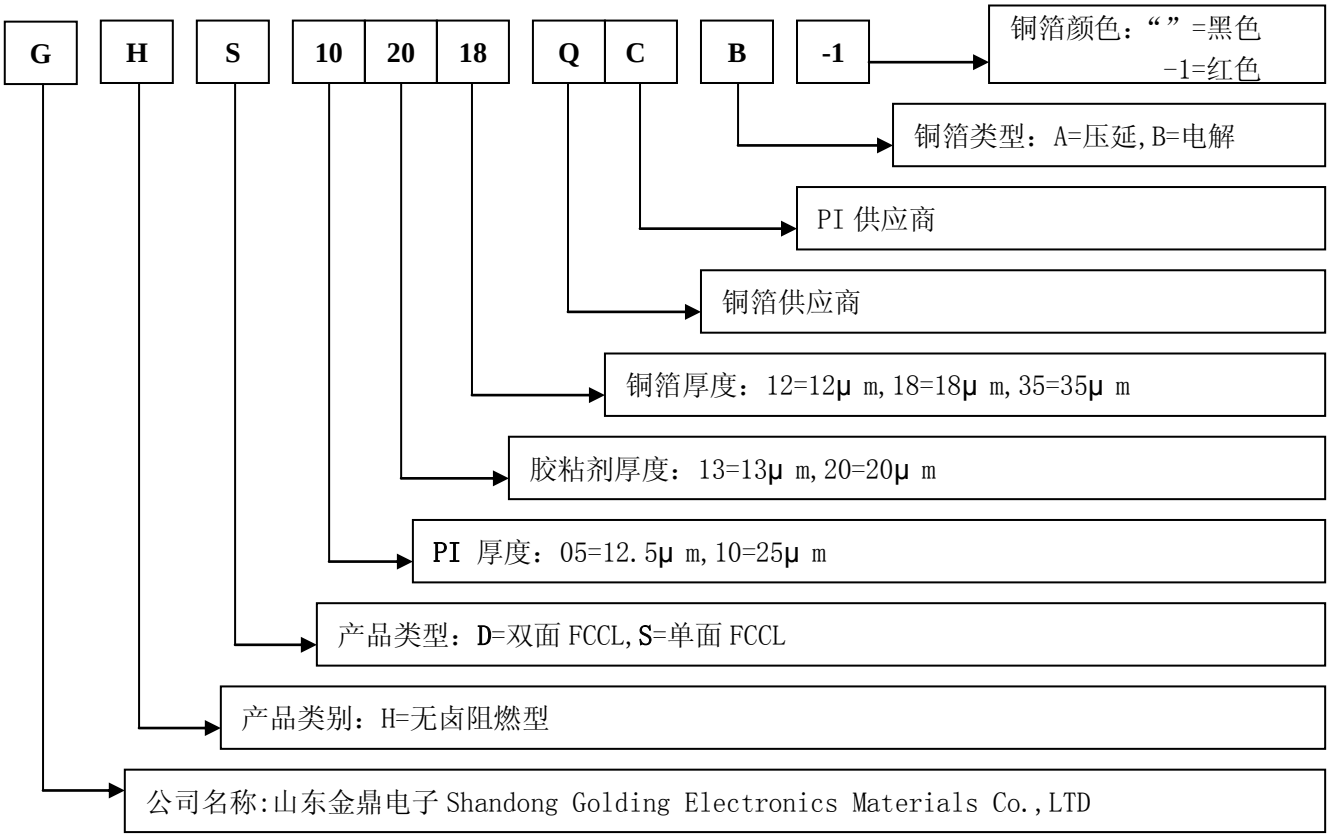
一、产品结构

产品规格	单位	厚度
总厚度	μm	63
Cu 厚度	μm	18
AD 厚度	μm	20
PI 厚度	μm	25



结构图

二、编码原则



三、质量规格

项目	单位	质量规格	实测	测试方法
厚度	μm	63±5	63±3	JIS C 6471-1995 6.2
剥离强度	N/mm	≥1.0	≥1.0	IPC-TM-650 2.4.9
耐焊性	\	300℃×10sec	PASS	IPC-TM-650 2.4.13
尺寸稳定性	%	TD：±0.15	PASS	IPC-TM-650 2.2.4
		MD：±0.15	PASS	IPC-TM-650 2.2.4
体积电阻率	Ω.cm	$\geq 1.0\times10^{13}$	$\geq 2.0*10^{13}$	JIS C 6471-1995 7.1
表面绝缘电阻	Ω	$\geq 1.0\times10^{11}$	$\geq 2.0*10^{11}$	JIS C 6471-1995 7.2
表面耐电压 AC500V	\	无飞弧	PASS	JIS C 6471-1995 7.3
层间耐电压 AC500V	\	无绝缘层破坏	PASS	JIS C 6471-1995 7.4
介电常数	\	≤4.0	3.2-3.5	JIS C 6471-1995 7.5
耐酸 2mol/LHCl	\	10min	PASS	IPC-TM-650 2.3.2
耐碱 2mol/L NaOH	\	10min	PASS	IPC-TM-650 2.3.2
耐溶剂（MEK、IPC)	\	10min	PASS	IPC-TM-650 2.3.2

四、保存环境及保存期限

1、保存环境：温度：(25±10) ℃，湿度：(50±20) %，无化学腐蚀气体。

2、保存期限：一年

467MP Transfer Tape

Product Data Sheet

Updated : February 1999
Supersedes : February 1996

Product Description

A-30 is a firm acrylic pressure-sensitive adhesive system. It features high ultimate bond strength with excellent high temperature performance and excellent solvent resistance. Bond strength increases substantially with natural ageing.

467 is a long ageing resistant product used extensively by the nameplate industry.

Physical Properties

Not for specification purposes

Adhesive Type	Firm Acrylic	**3M ref :** A-30
Thickness (ASTM D-3652) Tape Liner Total	 50 µm 2 Thou 100 µm 150 µm	
Release Liner	Tan printed polycoated paper.	
Tape Colour	Clear	
Shelf Life	12 months from date of despatch by 3M when stored in the original carton at 21°C (70°F) & 50 % Relative Humidity	

Performance Characteristics

Not for specification purposes

Adhesion to Stainless Steel ASTM D-3330	5.5 N/10mm	
Shear Resistance	High	
Temperature Performance Max : Minutes / Hours Max : Days / Weeks Minimum	 204 °C 149 °C -30 °C	
Solvent Resistance	Excellent. When the adhesive is properly applied to impervious materials, it will resist solvent attack and adhesive softening through edge contact with mild acids and alkalines, oils, grease, gasoline kerosene, JP-4 fuel, and many other standard aromatic and aliphatic solvents. However, it is not recommended for uses where continuous immersion is required.	

Date : February 1999
467MP Transfer Tape

Performance Characteristics (Cont..) Not for specification purposes	**UV Light Resistance**	Excellent. Will not oxidise when exposed to air or sunlight UV.
	Water Resistance	Excellent. There are no evident adverse effects on the bond of properly applied materials after immersion in 21°C water for about 100 hours.

Additional Product Information

The legend Hi Performance No. 467 is imprinted on the release liner.

467MP is designed with a moisture resistant release liner which resists cockling or wrinkling from high humidity.

The 50 micron thick adhesive is ideally suited for joining materials that are relatively smooth, thin and have low residual stress. If rough or thick materials with a small degree of residual stress are to be joined, then the 130 micron thick adhesive should be considered

Application Techniques

1. Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact & thus improves bond strength.

2. To obtain optimum adhesion, the bonding surfaces must be clean dry and well unified. A typical surface cleaning solvent is isopropyl alcohol & water. Use proper safety precautions for handling solvents.

3. Ideal tape application temperature range is 21°C to 38°C (70°F to 100°F).

Initial tape application to surfaces at temperatures below 10°C (50°F) is not recommended because the adhesive becomes too firm to adhere readily. However once properly applied low temperature holding is generally satisfactory.

Applications

467MP is well suited for bonding together a wide variety of similar and dissimilar materials such as metals, paints, wood, glass and some plastics.

An excellent adhesive for mounting nameplates and decorative trim.

Automotive Industry.

Specifications

This tape meets the requirements of U.S. Government specification MIL-P-19834, Amendment 1, Type 1.

467MP is a UL and AGA recognised product.

Values presented have been determined by standard test methods and are average values not to be used for specification purposes.
Our recommendations on the use of our products are based on tests believed to be reliable but we would ask that you conduct your own tests to determine their suitability for your applications.
This is because 3M cannot accept any responsibility or liability direct or consequential for loss or damage caused as a result of our recommendations.

3M

Specialty Tapes & Adhesives

3M United Kingdom PLC
3M House,
28 Great Jackson Street,
Manchester,
M15 4PA

Customer Service :

Tel 0161 236 8500
Fax 0161 237 1105

3M Ireland
3M House, Adelphi Centre,
Upper Georges Street,
Dun Laoghaire,Co. Dublin,
Ireland

Customer Service :

Tel (01) 280 3555
Fax (01) 280 3509

RoHS REPORT INDEX

	NAME		RoHS report
1	IPEX		
1-1	HOUSING	POLYPLASTICS TAIWAN CO., LTD.	EKR22401642
1-2	CONTACT	JX NIPPON MINING & METALS CORPORATION	ETR22803072M01
1-3	GROUND CONTACT	JX NIPPON MINING & METALS CORPORATION	ETR22803071M01
2	Cable-Ø1.13		
2-1	外被	WONDERFUL HI-TECH CO., LTD.	TWNC01046253
2-2	金屬線	WONDERFUL HI-TECH CO., LTD.	TWNC01046255
2-3	FEP	大金氟化工(中國)有限公司.	SHAEC2127178503
3	FPC	SHANDONG GOLDING ELECTRONICS MATERIAL CO.,LTD .	TAOEC2107771001
4	背膠	3M CHINA LIMITED .	ETR22102437

Test Report

No.: EKR22401642 Date: 29-Apr-2022

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

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

Sample Submitted By	:	POLYPLASTICS TAIWAN CO., LTD.
Sample Name	:	PBT
Style/Item No.	:	310NF ED3002 / Lot No.1174490

==========

Sample Receiving Date	:	22-Apr-2022
Testing Period	:	22-Apr-2022 to 29-Apr-2022

Test Requested :

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

(2) As specified by client, to test Halogen-Fluorine, Chlorine, Bromine, Iodine in the submitted sample.

Test Results : Please refer to following pages.

Ray Chang, Ph.D./Department Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory-Kaohsiung

CHECK REPORT
PIN CODE: BB7274DF

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

Test Part Description

No.1 : ED3002 PBT

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result
				No.1
Cadmium (Cd) (CAS No.: 7440-43-9)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Lead (Pb) (CAS No.: 7439-92-1)		mg/kg	2	n.d.
Mercury (Hg) (CAS No.: 7439-97-6)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Hexavalent Chromium Cr(VI) (CAS No.: 18540-29-9)	With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.	mg/kg	8	n.d.
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.
Dibromobiphenyl		mg/kg	5	n.d.
Tribromobiphenyl		mg/kg	5	n.d.
Tetrabromobiphenyl		mg/kg	5	n.d.
Pentabromobiphenyl		mg/kg	5	n.d.
Hexabromobiphenyl		mg/kg	5	n.d.
Heptabromobiphenyl		mg/kg	5	n.d.
Octabromobiphenyl		mg/kg	5	n.d.
Nonabromobiphenyl		mg/kg	5	n.d.
Decabromobiphenyl		mg/kg	5	n.d.
Sum of PBBs		mg/kg	-	n.d.
Monobromodiphenyl ether	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.
Dibromodiphenyl ether		mg/kg	5	n.d.
Tribromodiphenyl ether		mg/kg	5	n.d.
Tetrabromodiphenyl ether		mg/kg	5	n.d.
Pentabromodiphenyl ether		mg/kg	5	n.d.
Hexabromodiphenyl ether		mg/kg	5	n.d.
Heptabromodiphenyl ether		mg/kg	5	n.d.
Octabromodiphenyl ether		mg/kg	5	n.d.
Nonabromodiphenyl ether		mg/kg	5	n.d.
Decabromodiphenyl ether		mg/kg	5	n.d.
Sum of PBDEs		mg/kg	-	n.d.

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

Test Item(s)	Method	Unit	MDL	Result
				No.1
Butyl benzyl phthalate (BBP) (CAS No.: 85-68-7)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Dibutyl phthalate (DBP) (CAS No.: 84-74-2)		mg/kg	50	n.d.
Diisobutyl phthalate (DIBP) (CAS No.: 84-69-5)		mg/kg	50	n.d.
Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7)		mg/kg	50	n.d.
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	925
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.
Iodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.

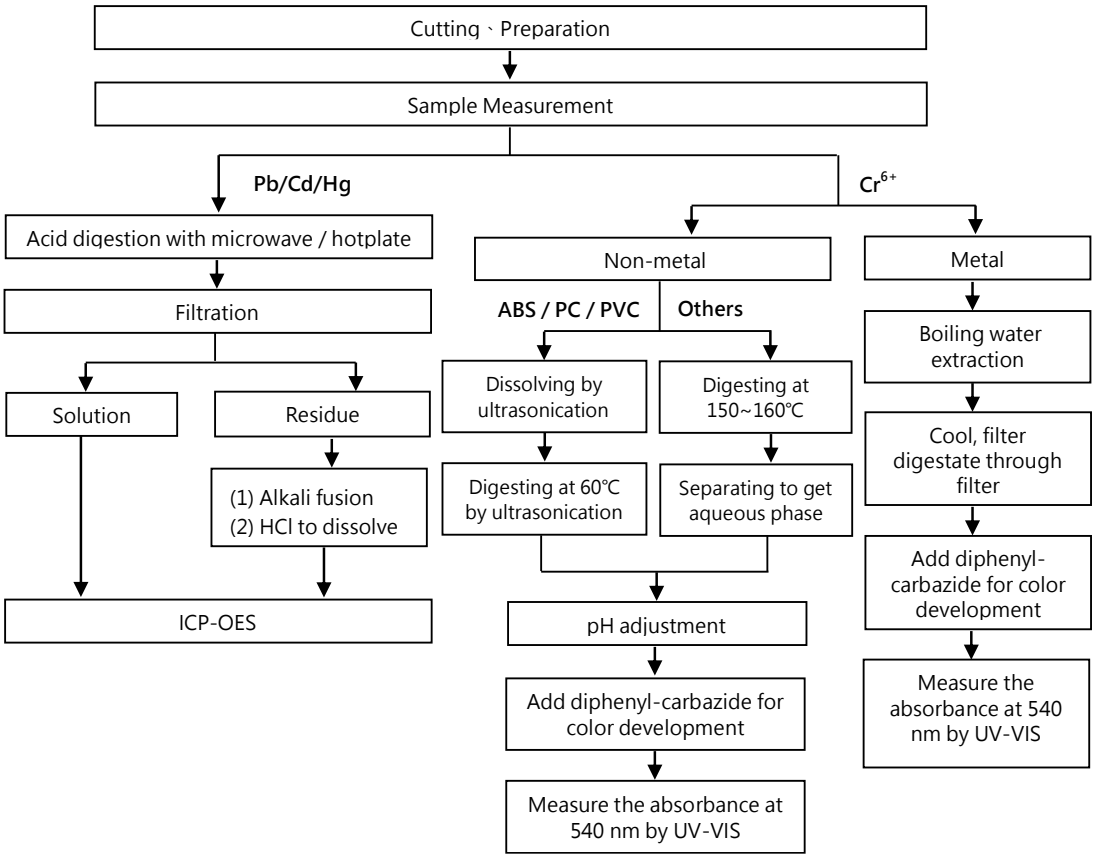
Note：

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

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

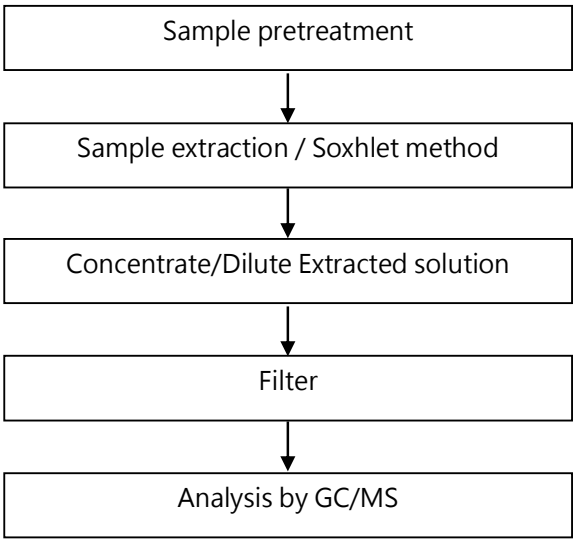
Analytical flow chart of Heavy Metal

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



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

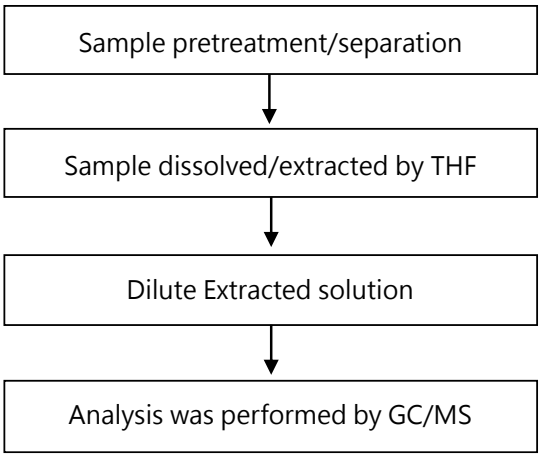
PBB/PBDE analytical FLOW CHART



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

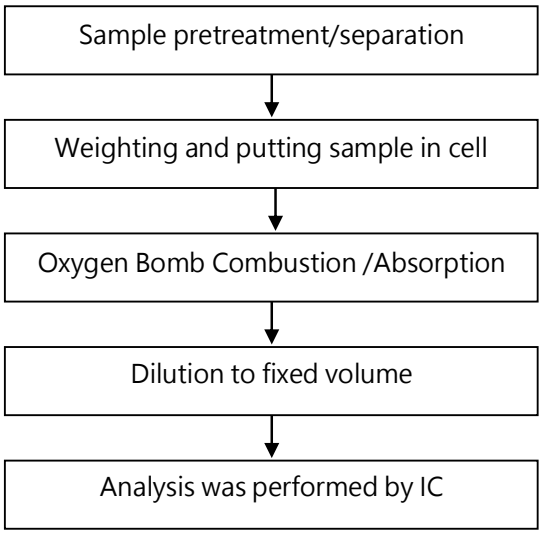
Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



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

Analytical flow chart of Halogen



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

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

EKR22401642

** End of Report **

Test Report

No.: ETR22803072M01 Date: 01-Sep-2022

JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

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

Sample Submitted By	:	JX NIPPON MINING & METALS CORPORATION
Sample Name	:	COPPER ALLOY
Style/Item No.	:	C5210

==========

Sample Receiving Date	:	17-Aug-2022
Testing Period	:	17-Aug-2022 to 01-Sep-2022

Test Requested : As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI) contents in the submitted sample(s).

Test Results : Please refer to following pages.

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

CHECK REPORT
PIN CODE: E5A694D5

JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

Test Part Description

No.1 : COPPER COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result
				No.1
Cadmium (Cd) (CAS No.: 7440-43-9)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Lead (Pb) (CAS No.: 7439-92-1)		mg/kg	2	22.8
Mercury (Hg) (CAS No.: 7439-97-6)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Hexavalent Chromium Cr(VI) (CAS No.: 18540-29-9) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	μg/cm²	0.1	n.d.

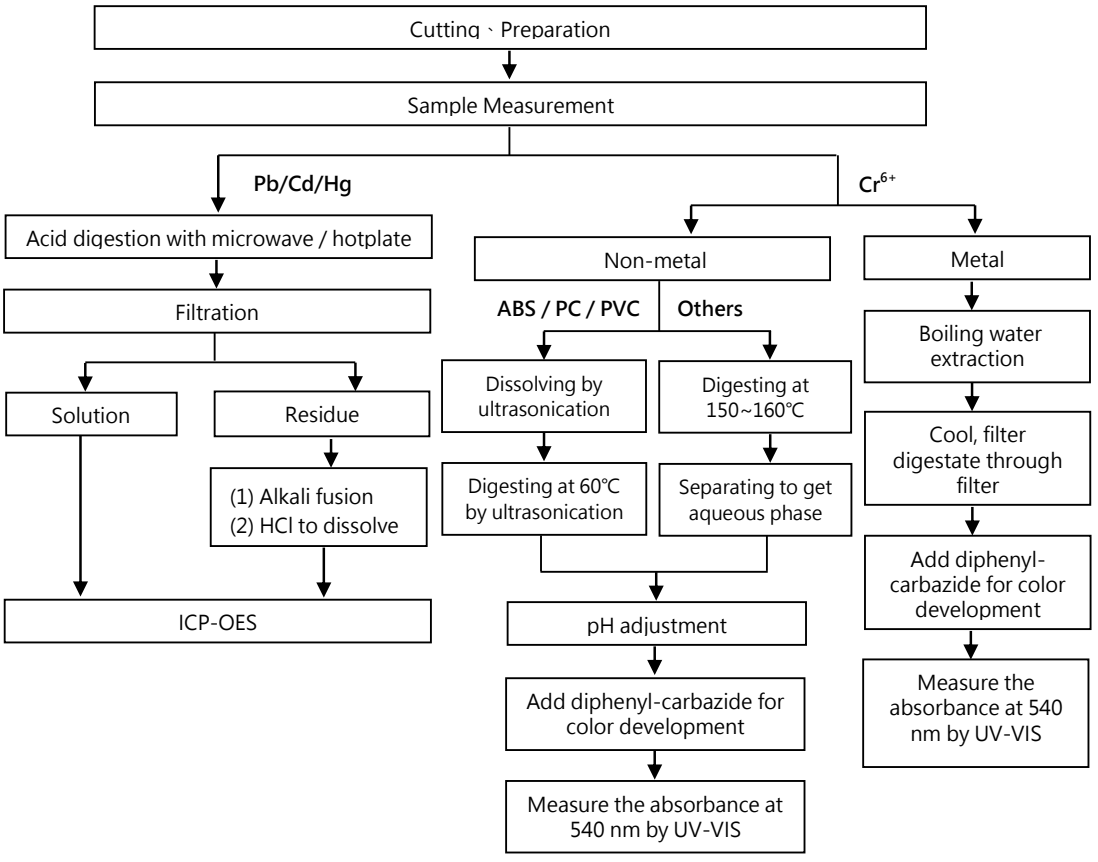
Note：

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
5. This is the additional test report of ETR22803072.

JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

Analytical flow chart of Heavy Metal

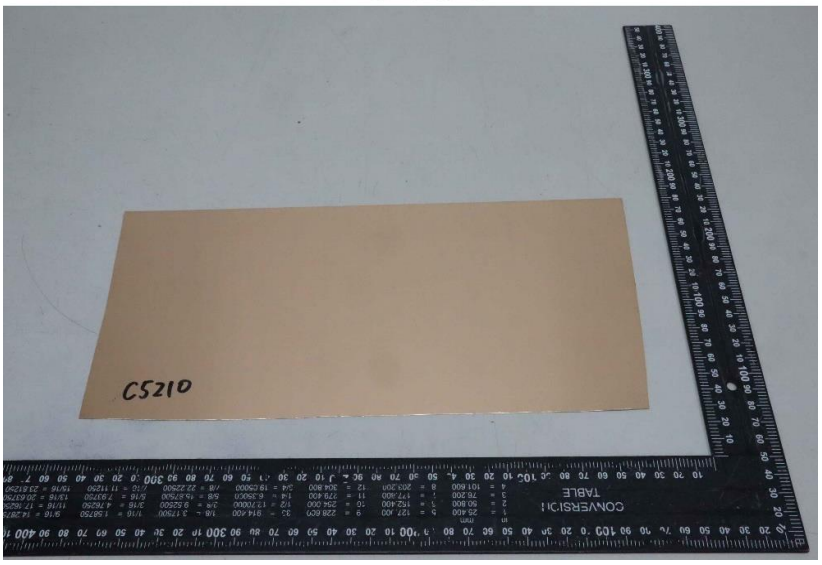
These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr^{6+} test method excluded)



JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

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

ETR22803072



** End of Report **

Test Report

No.: ETR22803071M01 Date: 01-Sep-2022

JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

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

Sample Submitted By	:	JX NIPPON MINING & METALS CORPORATION
Sample Name	:	COPPER ALLOY
Style/Item No.	:	C5191

==========

Sample Receiving Date	:	17-Aug-2022
Testing Period	:	17-Aug-2022 to 01-Sep-2022

Test Requested : As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI) contents in the submitted sample(s).

Test Results : Please refer to following pages.

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

CHECK REPORT
PIN CODE: EED45489

JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

Test Part Description

No.1 : COPPER COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result
				No.1
Cadmium (Cd) (CAS No.: 7440-43-9)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Lead (Pb) (CAS No.: 7439-92-1)		mg/kg	2	15.0
Mercury (Hg) (CAS No.: 7439-97-6)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Hexavalent Chromium Cr(VI) (CAS No.: 18540-29-9) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	μg/cm²	0.1	n.d.

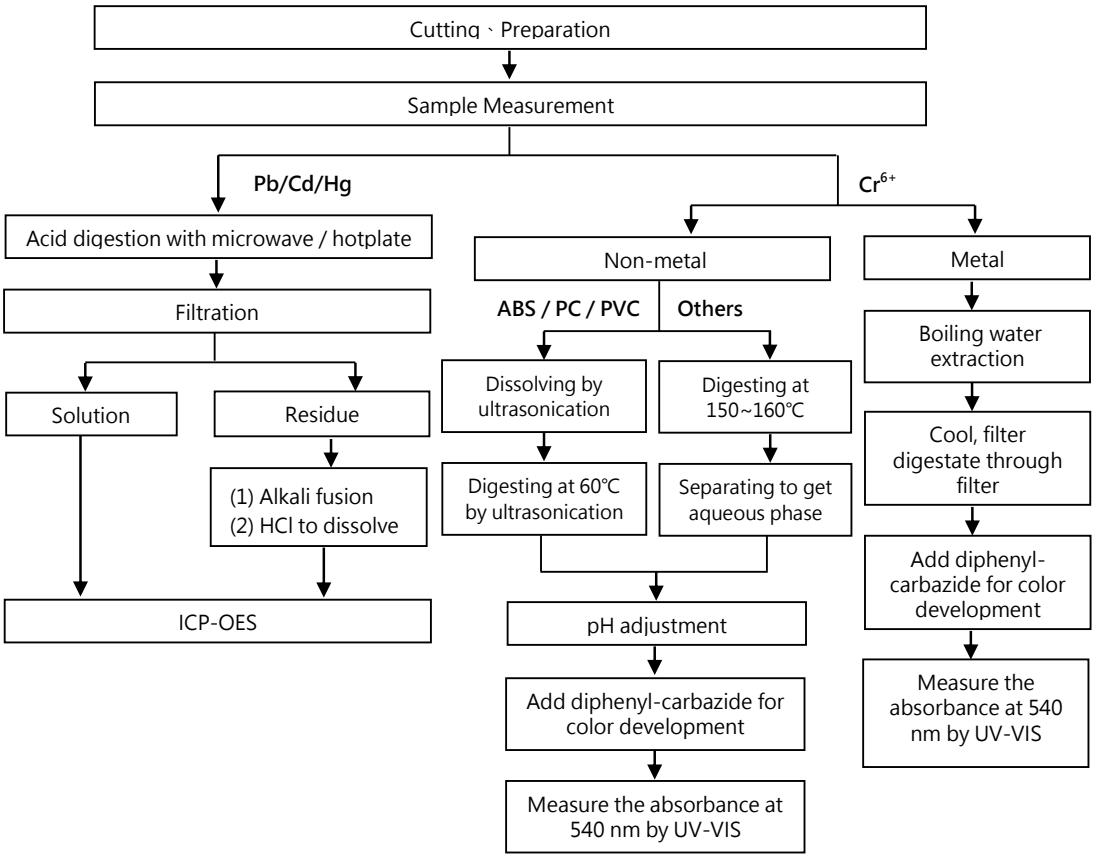
Note：

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
5. This is the additional test report of ETR22803071.

JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

Analytical flow chart of Heavy Metal

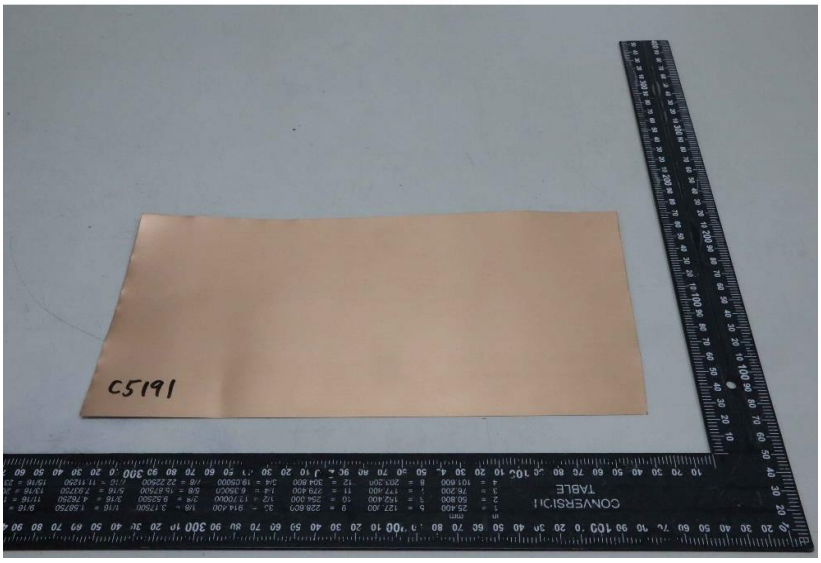
These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr^{6+} test method excluded)



JX NIPPON MINING & METALS CORPORATION
3 KURAMI, SAMUKAWA, KOZA, KANAGAWA 253-0101, JAPAN

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

ETR22803071



** End of Report **

intertek
Total Quality. Assured.

Test Report 測試報告

Number 報告號碼 : TWNC01046253

Applicant: 申請廠商
WONDERFUL HI-TECH CO., LTD.
萬泰科技股份有限公司
No.17, Beiyuan Rd., Zhongli Dist.,
Taoyuan City 320, Taiwan (R.O.C.)
桃園市中壢區工業區北園路 17 號

Issue Date 報告發行日期 : Jan 11, 2022

Sample Description 樣品敘述:

One (1) Group of Submitted Samples Said To Be :
以下測試樣品乃供應商所提供及確認:

Sample Submitted By 送樣廠商	: WONDERFUL HI-TECH CO., LTD. 萬泰科技股份有限公司
Sample Description 樣品名稱	: RF COAXIAL CABLE RG-6U, RG-59, RG-11, 12G-SDI, RG-58A/U, RG-142/U, RG-178 B/U, RG-179/U, RG-316U, MINI 0.8mm, 0.98mm, 1.13mm, 1.27mm, 1.32mm, 1.37mm, 1.48mm, 1.13LL, 1.37LL, RF405A, UL 1330, 1331, 1332, 1333, 1726, 1727, 1867, 1979, 10231, 10064, 10362
Style / Item No. 產品型號	: BLACK, BROWN, RED, ORANGE, YELLOW, GREEN, BLUE, PURPLE, GRAY, WHITE
Date Sample Received 收件日期	: Dec 21, 2021
Date Test Started 開始測試日期	: Dec 21, 2021

Test Conducted 測試執行:

As requested by the applicant, for details please refer to attached pages.
依申請商之要求, 細節請參考附頁.

Conclusion 結論:

Please see page two.
請見第二頁。

Authorized By:
On behalf of Intertek Testing Services Taiwan Limited

Matt Wang
Director

Signed by:

Thomas Chou
Manager

Intertek Testing Services Taiwan Ltd.
全國公證檢驗股份有限公司
8F., No. 423, Ruiguang Rd., Neihu District, Taipei, 114690, Taiwan, R.O.C.
114690 台北市內湖區瑞光路 423 號 8 樓
Tel: (+886-2) 6602-2888 · 2797-8885
Fax: (+886-2) 6602-2420
www.intertek-twn.com

Test Report 測試報告

Number : TWNC01046253
報告號碼

Conclusion 結論:

Tested Sample 測試樣品	Standard 標準	Result 結果
Test Components of Submitted Samples 測試部位	Restriction of Hazardous Substances (RoHS) 危害物質限制 – As per applicant's request with reference to 2011/65/EU and amendment (EU) 2015/863 依據客戶要求參考歐盟指令 2011/65/EU 及其更新指令(EU) 2015/863	Pass 合格
	As per applicant's request 依據客戶要求	
	– Antimony (Sb) Content 銻含量	See Test Conducted 請見測試內容
	– Phthalates Content 可塑劑含量	See Test Conducted 請見測試內容
	– Halogen Content 鹵素含量	See Test Conducted 請見測試內容
	– Perfluorooctane Sulfonates (PFOS) Content 全氟辛磺酸	See Test Conducted 請見測試內容
	– Perfluorooctanoic Acid (PFOA) Content 全氟辛酸	See Test Conducted 請見測試內容

Tested Components 測試元件:

(1) Black plastic pellets
(2) Brown plastic pellets
(3) Red plastic pellets
(4) Orange plastic pellets
(5) Yellow plastic pellets
(6) Green plastic pellets
(7) Blue plastic pellets
(8) Purple plastic pellets
(9) Grey plastic pellets
(10) White plastic pellets

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Matt Wang
Director

Signed by:

Thomas Chou
Manager

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Test Conducted 測試內容：

Test Result Summary 測試結果：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (1)	Result 結果 (2)	Result 結果 (3)	RL
Heavy Metal 重金屬						
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4:2013+AMD1:2017, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4:2013+AMD1:2017，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Antimony (Sb) Content 銻含量	ppm	With reference to USEPA 3052, by microwave digestion and determined by ICP-OES. 參考 USEPA 3052，以微波消化法並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Chromium VI (Cr(VI)) Content 六價鉻含量	ppm	With reference to IEC 62321-7-2: 2017, organic solvent was used to dissolve or swell sample matrix, followed by alkaline digestion and determined by UV-Vis Spectrophotometer. 參考 IEC 62321-7-2:2017，以有機溶劑溶解或使樣品基質膨脹，再進行鹼液消化，用紫外光-可見光分光光度計分析。	ND	ND	ND	8

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (1)	Result 結果 (2)	Result 結果 (3)	RL
Polybrominated Biphenyls (PBBs) 多溴聯苯						
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	ND	5
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	ND	ND	5
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm		ND	ND	ND	5
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm		ND	ND	ND	5
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm		ND	ND	ND	5
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm		ND	ND	ND	5
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm		ND	ND	ND	5
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm		ND	ND	ND	5
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	ND	ND	5
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	ND	ND	5
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚						
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	ND	5
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm		ND	ND	ND	5
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	ND	ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	ND	ND	5
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	ND	ND	5
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	ND	ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	ND	ND	5
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	ND	ND	5
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	ND	ND	5
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	ND	ND	5

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (1)	Result 結果 (2)	Result 結果 (3)	RL
Phthalates 鄰苯二甲酸酯						
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS. 參考 IEC 62321-8:2017，以溶劑萃取並用氣相層析質譜儀分析。	ND	ND	ND	50
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	ppm		ND	ND	ND	50
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	ppm		ND	ND	ND	50
Di-(Iso-Nonyl) Phthalate (DINP) 鄰苯二甲酸二異壬酯	ppm		ND	ND	ND	50
Di-(Iso-Decyl) Phthalate (DIDP) 鄰苯二甲酸二異癸酯	ppm		ND	ND	ND	50
Di-(N-Octyl) Phthalate (DNOP) 鄰苯二甲酸二辛酯	ppm		ND	ND	ND	50
Di-n-hexyl Phthalate (DNHP) 鄰苯二甲酸二正己酯	ppm		ND	ND	ND	50
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	ppm		ND	ND	ND	50
Halogen Content 鹵素含量						
Fluorine (F) 氟	ppm	With reference to EN 14582:2016 by combustion bomb with oxygen and determined by Ion Chromatography. 參考 EN 14582:2016，以氧彈燃燒集氣法並用離子層析儀分析。	511407	485764	481565	50
Chlorine (Cl) 氯	ppm		ND	ND	ND	50
Bromine (Br) 溴	ppm		ND	ND	ND	50
Iodine (I) 碘	ppm		ND	ND	ND	50
Others 其他						
Perfluorooctane Sulfonates Including PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE 全氟辛磺酸含 PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	ND	ND	0.01
Perfluorooctanoic Acid (PFOA) 全氟辛酸	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	ND	ND	0.01

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (4)	Result 結果 (5)	Result 結果 (6)	RL
Heavy Metal 重金屬						
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4:2013+AMD1:2017, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4:2013+AMD1:2017，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Antimony (Sb) Content 銻含量	ppm	With reference to USEPA 3052, by microwave digestion and determined by ICP-OES. 參考 USEPA 3052，以微波消化法並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	2
Chromium VI (Cr(VI)) Content 六價鉻含量	ppm	With reference to IEC 62321-7-2: 2017, organic solvent was used to dissolve or swell sample matrix, followed by alkaline digestion and determined by UV-Vis Spectrophotometer. 參考 IEC 62321-7-2:2017，以有機溶劑溶解或使樣品基質膨脹，再進行鹼液消化，用紫外光-可見光分光光度計分析。	ND	ND	ND	8

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (4)	Result 結果 (5)	Result 結果 (6)	RL
Polybrominated Biphenyls (PBBs) 多溴聯苯						
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	ND	5
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	ND	ND	5
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm		ND	ND	ND	5
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm		ND	ND	ND	5
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm		ND	ND	ND	5
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm		ND	ND	ND	5
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm		ND	ND	ND	5
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm		ND	ND	ND	5
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	ND	ND	5
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	ND	ND	5
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚						
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	ND	5
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm		ND	ND	ND	5
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	ND	ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	ND	ND	5
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	ND	ND	5
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	ND	ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	ND	ND	5
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	ND	ND	5
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	ND	ND	5
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	ND	ND	5

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (4)	Result 結果 (5)	Result 結果 (6)	RL
Phthalates 鄰苯二甲酸酯						
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS. 參考 IEC 62321-8:2017，以溶劑萃取並用氣相層析質譜儀分析。	ND	ND	ND	50
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	ppm		ND	ND	ND	50
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	ppm		ND	ND	ND	50
Di-(Iso-Nonyl) Phthalate (DINP) 鄰苯二甲酸二異壬酯	ppm		ND	ND	ND	50
Di-(Iso-Decyl) Phthalate (DIDP) 鄰苯二甲酸二異癸酯	ppm		ND	ND	ND	50
Di-(N-Octyl) Phthalate (DNOP) 鄰苯二甲酸二辛酯	ppm		ND	ND	ND	50
Di-n-hexyl Phthalate (DNHP) 鄰苯二甲酸二正己酯	ppm		ND	ND	ND	50
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	ppm		ND	ND	ND	50
Halogen Content 鹵素含量						
Fluorine (F) 氟	ppm	With reference to EN 14582:2016 by combustion bomb with oxygen and determined by Ion Chromatography. 參考 EN 14582:2016，以氧彈燃燒集氣法並用離子層析儀分析。	426926	506452	532184	50
Chlorine (Cl) 氯	ppm		ND	ND	ND	50
Bromine (Br) 溴	ppm		ND	ND	ND	50
Iodine (I) 碘	ppm		ND	ND	ND	50
Others 其他						
Perfluorooctane Sulfonates Including PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE 全氟辛磺酸含 PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	ND	ND	0.01
Perfluorooctanoic Acid (PFOA) 全氟辛酸	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	ND	ND	0.01

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (7)	(8)	(9)	(10)	RL
Heavy Metal 重金屬							
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	ND	2
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	ND	2
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4:2013+AMD1:2017, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4:2013+AMD1:2017，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	ND	2
Antimony (Sb) Content 銻含量	ppm	With reference to USEPA 3052, by microwave digestion and determined by ICP-OES. 參考 USEPA 3052，以微波消化法並用感應耦合電漿原子發射光譜儀分析。	ND	ND	ND	ND	2
Chromium VI (Cr(VI)) Content 六價鉻含量	ppm	With reference to IEC 62321-7-2: 2017, organic solvent was used to dissolve or swell sample matrix, followed by alkaline digestion and determined by UV-Vis Spectrophotometer. 參考 IEC 62321-7-2:2017，以有機溶劑溶解或使樣品基質膨脹，再進行鹼液消化，用紫外光-可見光分光光度計分析。	ND	ND	ND	ND	8

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114690 台北市內湖區瑞光路 423 號 8 樓
Tel: (+886-2) 6602-2888 · 2797-8885
Fax: (+886-2) 6602-2420
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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (7)	(8)	(9)	(10)	RL
Polybrominated Biphenyls (PBBs) 多溴聯苯							
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	ND	ND	5
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	ND	ND	ND	5
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm		ND	ND	ND	ND	5
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm		ND	ND	ND	ND	5
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm		ND	ND	ND	ND	5
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm		ND	ND	ND	ND	5
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm		ND	ND	ND	ND	5
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm		ND	ND	ND	ND	5
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	ND	ND	ND	5
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	ND	ND	ND	5
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚							
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	ND	ND	5
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm		ND	ND	ND	ND	5
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	ND	ND	ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	ND	ND	ND	5
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	ND	ND	ND	5
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	ND	ND	ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	ND	ND	ND	5
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	ND	ND	ND	5
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	ND	ND	ND	5
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	ND	ND	ND	5

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (7)	(8)	(9)	(10)	RL
Phthalates 鄰苯二甲酸酯							
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS. 參考 IEC 62321-8:2017，以溶劑萃取並用氣相層析質譜儀分析。	ND	ND	ND	ND	50
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	ppm		ND	ND	ND	ND	50
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	ppm		ND	ND	ND	ND	50
Di-(Iso-Nonyl) Phthalate (DINP) 鄰苯二甲酸二異壬酯	ppm		ND	ND	ND	ND	50
Di-(Iso-Decyl) Phthalate (DIDP) 鄰苯二甲酸二異癸酯	ppm		ND	ND	ND	ND	50
Di-(N-Octyl) Phthalate (DNOP) 鄰苯二甲酸二辛酯	ppm		ND	ND	ND	ND	50
Di-n-hexyl Phthalate (DNHP) 鄰苯二甲酸二正己酯	ppm		ND	ND	ND	ND	50
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	ppm		ND	ND	ND	ND	50
Halogen Content 鹵素含量							
Fluorine (F) 氟	ppm	With reference to EN 14582:2016 by combustion bomb with oxygen and determined by Ion Chromatography. 參考 EN 14582:2016，以氧彈燃燒集氣法並用離子層析儀分析。	355081	397143	494977	462637	50
Chlorine (Cl) 氯	ppm		ND	ND	ND	ND	50
Bromine (Br) 溴	ppm		ND	ND	ND	ND	50
Iodine (I) 碘	ppm		ND	ND	ND	ND	50
Others 其他							
Perfluorooctane Sulfonates Including PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE 全氟辛磺酸含 PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	ND	ND	ND	0.01
Perfluorooctanoic Acid (PFOA) 全氟辛酸	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	ND	ND	ND	0.01

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Test Conducted 測試內容：

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg
備註 百萬分之一，依據測試樣品重量計算 = 毫克/公斤
ND = Not detected 未檢測出
RL = Reporting limit, quantitation limit of analyte in sample
報告極限，測試樣品之定量偵測極限

Responsibility of Chemist 分析人員 : Melody Lee/ Vita Fu

Date Sample Received 樣品收件日期 : Dec 21, 2021
Test Period 樣品測試期間 : Dec 21, 2021 to Jan 03, 2022

RoHS Limit RoHS 限值

Restricted Substances 限用物質	Limits 限值
Cadmium (Cd) content 鎘含量	0.01% (100ppm)
Lead (Pb) content 鉛含量	0.1% (1000ppm)
Mercury (Hg) content 汞含量	0.1% (1000ppm)
Chromium VI (Cr(VI)) content 六價鉻含量	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs) 多溴聯苯	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚	0.1% (1000ppm)
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	0.1% (1000ppm)
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	0.1% (1000ppm)
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	0.1% (1000ppm)
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	0.1% (1000ppm)

The limits were quoted from Annex II of 2011/65/EU and Amendment (EU) 2015/863 for homogeneous material.
本限值是依據歐盟指令 2011/65/EU 及其更新指令(EU) 2015/863 之附錄二針對均質材質所訂定。

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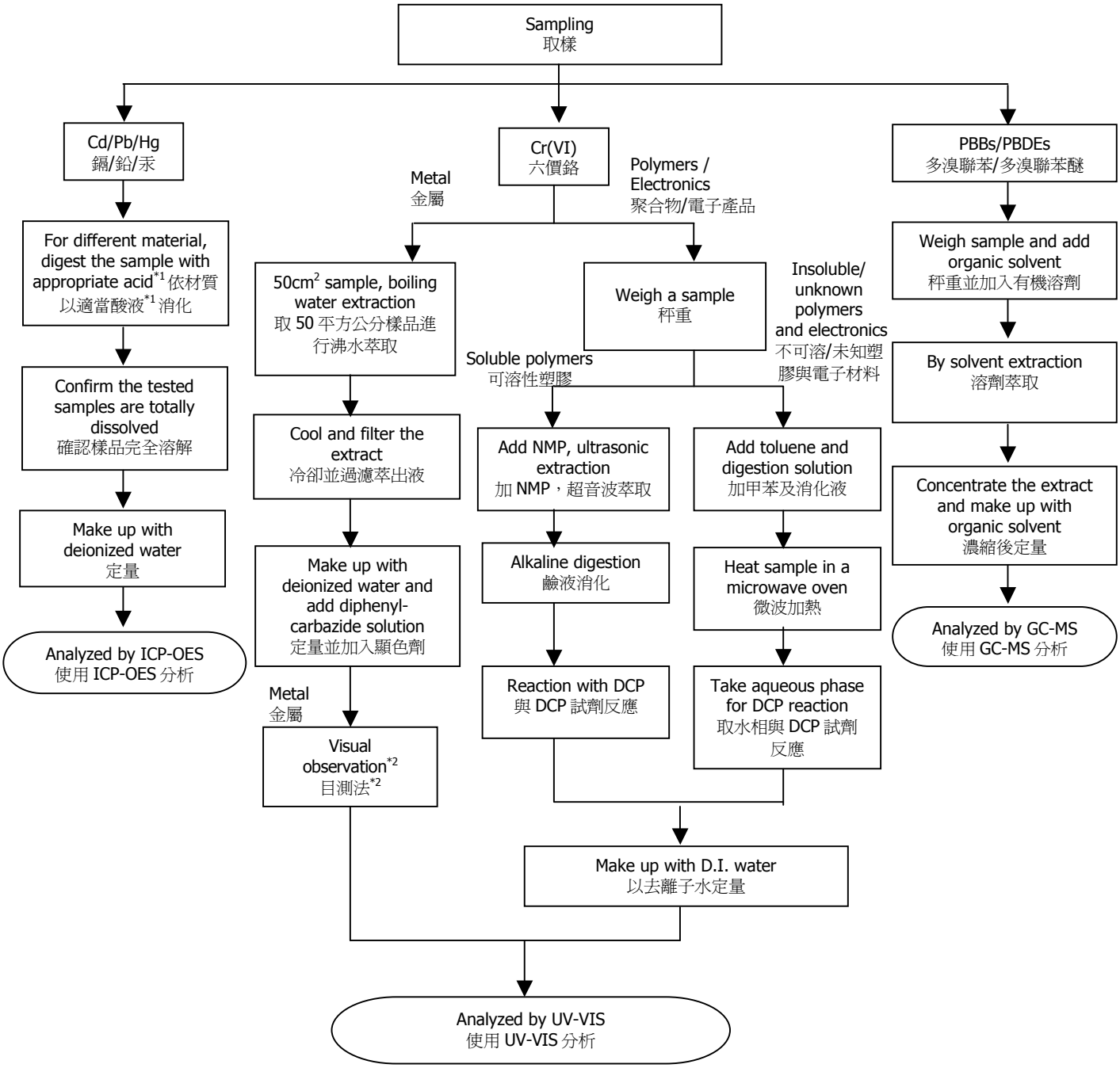
Test Conducted 測試內容：

Measurement Flowchart 測試流程圖:

Test for Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Content RoHS 六項測試
Reference Method 參考方法: Cd/Pb: IEC 62321-5:2013; Hg: IEC 62321-4:2013+AMD1:2017;
Chromium (VI): IEC 62321-7-1:2015 (boiling water extraction);
Chromium (VI): IEC 62321-7-2:2017 (solvent and alkaline extraction);
PBBs/PBDEs: IEC 62321-6:2015



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Test Conducted 測試內容：

Remark 備註:

*1: List of Appropriate Acid 各材質添加酸液如下表：

Material 材質	Acid Added for Digestion 添加酸液種類
Polymers 聚合物	HNO_3,HCl,HF,H_2O_2,H_3BO_3 硝酸、鹽酸、氫氟酸、雙氧水、硼酸
Metals 金屬	HNO_3,HCl,HF 硝酸、鹽酸、氫氟酸
Electronics 電子產品	HNO_3,HCl,H_2O_2,HBF_4 硝酸、鹽酸、雙氧水、氟硼酸

*2: If sample solution is significantly more intense than 0.13 μg/cm^2 equivalent comparison standard, Chromium VI would be determined as detected, the result of visual observation is positive.
當待測樣品溶液顏色明顯比 0.13 μg/cm^2 深，採用目測法判定六價鉻結果爲陽性。

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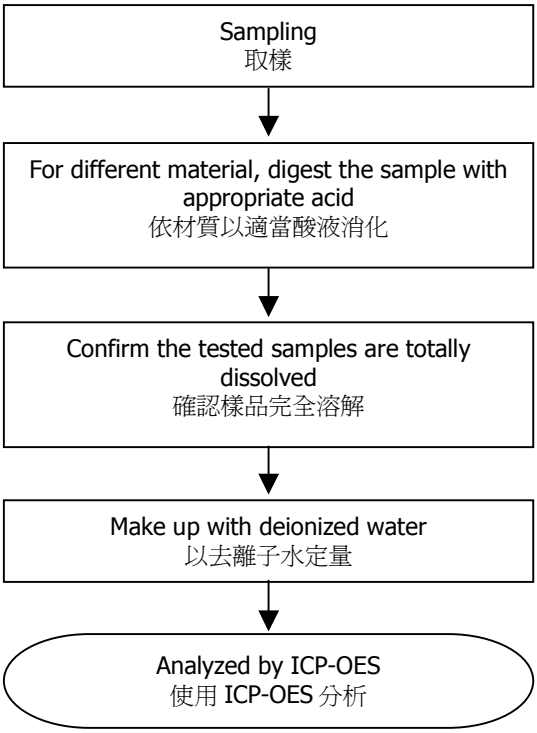
Test Conducted 測試內容：

Measurement Flowchart 測試流程圖:

Test for Heavy Metal (Sb) Content 重金屬(銻)
Reference Method 參考方法：USEPA 3052



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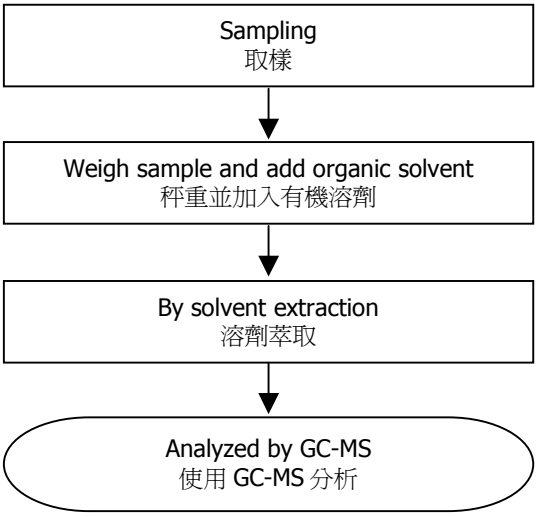
Test Conducted 測試內容：

Measurement Flowchart 測試流程圖:

Test for Phthalates Content 鄰苯二甲酸酯測試
Reference Method 參考方法: IEC 62321-8:2017



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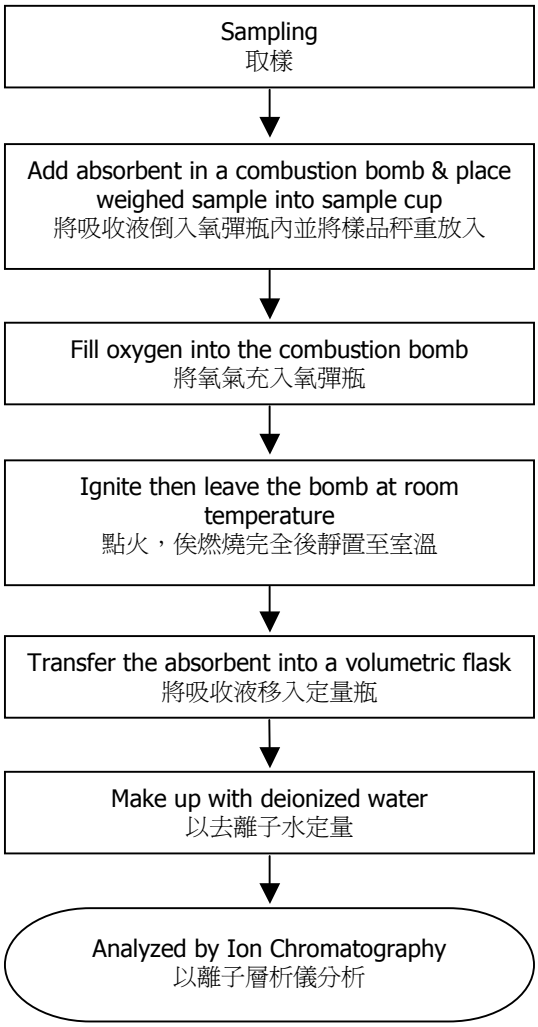
Test Conducted 測試內容：

Measurement Flowchart 測試流程圖:

Test for Halogen Content 鹵素測試
Reference Method 參考方法：EN 14582: 2016



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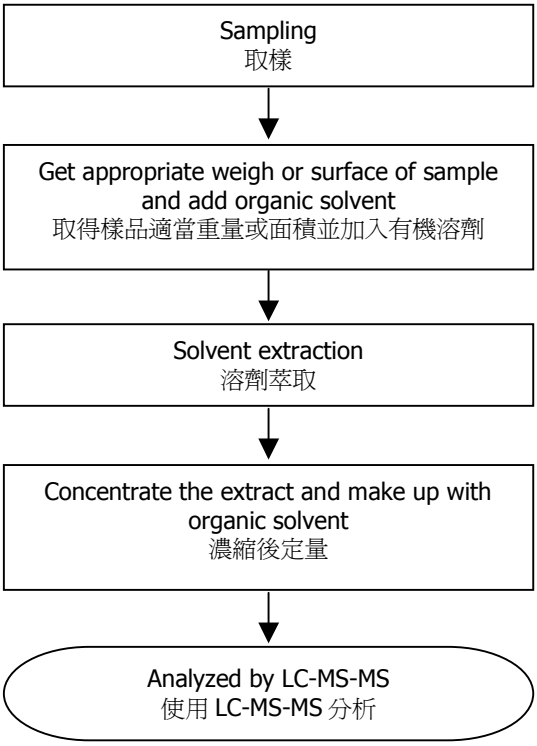
Test Conducted 測試內容：

Measurement Flowchart 測試流程圖:

Test for Perfluorooctane Sulfonates (PFOS) / Perfluorooctanoic Acid (PFOA) Content 全氟辛磺酸 /全氟辛酸測試
Reference Method 參考方法: CEN/TS 15968:2010



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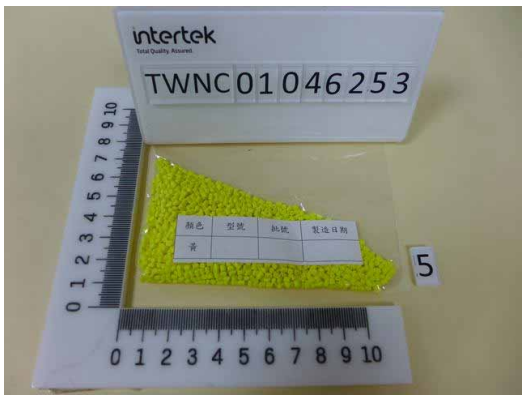
Sample photo 樣品照片：



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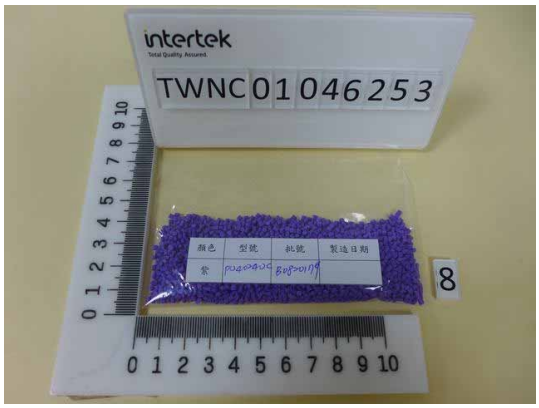
Sample photo 樣品照片：



End of Report

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114690 台北市內湖區瑞光路 423 號 8 樓
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Test Report 測試報告

Number : TWNC01046255
報告號碼

Applicant: WONDERFUL HI-TECH CO., LTD.
申請廠商 萬泰科技股份有限公司
No.17, Beiyuan Rd., Zhongli Dist.,
Taoyuan City 320, Taiwan (R.O.C.)
桃園市中壢區工業區北園路 17 號

Issue Date : Feb 11, 2022
報告發行日期

Sample Description 樣品敘述:
One (1) Group of Submitted Samples Said To Be :
以下測試樣品乃供應商所提供及確認：

Sample Submitted By 送樣廠商	:	WONDERFUL HI-TECH CO., LTD. 萬泰科技股份有限公司
Sample Description 樣品名稱	:	裸銅線, 鍍銀銅線, 鍍錫銅線, 鍍銀銅包鋼線 (COPPER, SILVER-PLATED COPPER WIRE, TIN-PLATED COPPER WIRE, SILVER-PLATED COPPER CLAD STEEL WIRE)
Style / Item No. 產品型號	:	裸銅 COPPER/鍍銀層 SILVER-PLATED/鍍錫層 TIN-PLATED/銅包鋼 SILVER-PLATED COPPER CLAD STEEL
Date Sample Received 收件日期	:	Dec 21, 2021 / Jan 26, 2022
Date Test Started 開始測試日期	:	Dec 21, 2021 / Jan 26, 2022

Test Conducted 測試執行：
As requested by the applicant, for details please refer to attached pages.
依申請商之要求，細節請參考附頁 .

Conclusion 結論:

Tested Sample 測試樣品	Standard 標準	Result 結果
Test Components of Submitted Samples 測試部位	Restriction of Hazardous Substances (RoHS) 危害物質限制 – As per applicant's request with reference to 2011/65/EU and amendment (EU) 2015/863 依據客戶要求參考歐盟指令 2011/65/EU 及其更新指令(EU) 2015/863	Pass 合格

Tested Components 測試元件：
(1) Silvery metal wire
(2) Coppery metal wire
(3) Silvery metal wire
(4) Silvery metal wire

Authorized By:
On behalf of Intertek Testing Services Taiwan Limited

Matt Wang
Director

Signed by:

Thomas Chou
Manager

Intertek Testing Services Taiwan Ltd.
全國公證檢驗股份有限公司
8F., No. 423, Ruiguang Rd., Neihu District, Taipei, 114690, Taiwan, R.O.C.
114690 台北市內湖區瑞光路 423 號 8 樓
Tel: (+886-2) 6602-2888 · 2797-8885
Fax: (+886-2) 6602-2420
www.intertek-twn.com

Test Conducted 測試內容：

Test Result Summary 測試結果：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (1)	Result 結果 (2)	RL
Heavy Metal 重金屬					
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	2
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	2
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4:2013+AMD1:2017, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4:2013+AMD 1:2017，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	2
Chromium VI (Cr(VI)) Content 六價鉻含量 @	$\mu g/cm^2$	With reference to IEC 62321-7-1: 2015, by boiling water extraction and determined by UV-Vis Spectrophotometer or visual observation. 參考 IEC 62321-7-1: 2015，以沸水萃取並用紫外光-可見光分光光度計分析或目測法判定。	Negative	Negative	0.10

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8F., No. 423, Ruiguang Rd., Neihu District, Taipei, 114690, Taiwan, R.O.C.
114690 台北市內湖區瑞光路 423 號 8 樓
Tel: (+886-2) 6602-2888 · 2797-8885
Fax: (+886-2) 6602-2420
www.intertek-twn.com

Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (1)	Result 結果 (2)	RL
Polybrominated Biphenyls (PBBs) 多溴聯苯					
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	5
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	ND	5
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm		ND	ND	5
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm		ND	ND	5
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm		ND	ND	5
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm		ND	ND	5
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm		ND	ND	5
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm		ND	ND	5
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	ND	5
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	ND	5
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚					
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	5
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm		ND	ND	5
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	ND	5
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	ND	5
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	ND	5
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	ND	5
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	ND	5
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	ND	5

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (1)	Result 結果 (2)	RL
Phthalates 鄰苯二甲酸酯					
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS. 參考 IEC 62321-8:2017，以溶劑萃取並用氣相層析質譜儀分析。	ND	ND	50
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	ppm		ND	ND	50
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	ppm		ND	ND	50
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	ppm		ND	ND	50

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (3)	Result 結果 (4)	RL
Heavy Metal 重金屬					
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	2
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	2
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4:2013+AMD1:2017, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4:2013+AMD1:2017，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	ND	2
Chromium VI (Cr(VI)) Content 六價鉻含量 @	μg/ cm^2	With reference to IEC 62321-7-1: 2015, by boiling water extraction and determined by UV-Vis Spectrophotometer or visual observation. 參考 IEC 62321-7-1: 2015，以沸水萃取並用紫外光-可見光分光光度計分析或目測法判定。	Negative	Negative	0.10

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114690 台北市內湖區瑞光路 423 號 8 樓
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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (3)	Result 結果 (4)	RL
Polybrominated Biphenyls (PBBs) 多溴聯苯					
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	5
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	ND	5
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm		ND	ND	5
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm		ND	ND	5
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm		ND	ND	5
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm		ND	ND	5
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm		ND	ND	5
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm		ND	ND	5
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	ND	5
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	ND	5
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚					
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	ND	5
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm		ND	ND	5
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	ND	5
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	ND	5
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	ND	5
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	ND	5
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	ND	5
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	ND	5

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Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果 (3)	Result 結果 (4)	RL
Phthalates 鄰苯二甲酸酯					
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS. 參考 IEC 62321-8:2017，以溶劑萃取並用氣相層析質譜儀分析。	ND	ND	50
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	ppm		ND	ND	50
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	ppm		ND	ND	50
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	ppm		ND	ND	50

Remarks: 備註
ppm = Parts per million based on weight of tested sample = mg/kg
百萬分之一，依據測試樣品重量計算 = 毫克/公斤
ND = Not detected 未檢測出
RL = Reporting limit, quantitation limit of analyte in sample
報告極限，測試樣品之定量偵測極限

@ The explanation of Chromium VI (Cr(VI)) analysis results 六價鉻分析結果說明

Colorimetric result 比色結果	Qualitative Result 定性結果	Explanation 說明
< 0.10 μg/cm^2	Negative 陰性	The result of sample is negative for Cr(VI). The sample coating is considered a non-Cr(VI) based coating. 六價鉻結果爲陰性。樣品之鍍層可視爲不含六價鉻。
≥ 0.10 μg/cm^2 and ≤ 0.13 μg/cm^2	Inconclusive 不確定	The result of sample is considered to be inconclusive. If addition samples are available, recommend to add trials and get the average result for the final determination. 六價鉻結果爲不確定。若可取得較多樣品，建議增加測試次數並取得其平均值，以評估最後結果。
> 0.13 μg/cm^2	Positive 陽性	The result of sample is positive for Cr(VI). The sample coating is considered to contain Cr(VI). 六價鉻結果爲陽性。樣品之鍍層可視爲含有六價鉻。 A result expresses as Positive, while not an actual value, which indicates a visual observation was used. 當結果以陽性表示，而非數值時，爲使用目測法判定。

Responsibility of Chemist 分析人員 : Melody Lee/ Vita Fu

Date Sample Received 樣品收件日期 : Dec 21, 2021/ Jan 26, 2022
Test Period 樣品測試期間 : Dec 21, 2021 to Jan 03, 2022/ Jan 26, 2022 to Feb 11, 2022

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全國公證檢驗股份有限公司
8F., No. 423, Ruiguang Rd., Neihu District, Taipei, 114690, Taiwan, R.O.C.
114690 台北市內湖區瑞光路 423 號 8 樓
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Test Conducted 測試內容：

RoHS Limit RoHS 限值

Restricted Substances 限用物質	Limits 限值
Cadmium (Cd) content 鎘含量	0.01% (100ppm)
Lead (Pb) content 鉛含量	0.1% (1000ppm)
Mercury (Hg) content 汞含量	0.1% (1000ppm)
Chromium VI (Cr(VI)) content 六價鉻含量	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs) 多溴聯苯	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚	0.1% (1000ppm)
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	0.1% (1000ppm)
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	0.1% (1000ppm)
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	0.1% (1000ppm)
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	0.1% (1000ppm)

The limits were quoted from Annex II of 2011/65/EU and Amendment (EU) 2015/863 for homogeneous material.
本限值是依據歐盟指令 2011/65/EU 及其更新指令(EU) 2015/863 之附錄二針對均質材質所訂定。

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8F., No. 423, Ruiguang Rd., Neihu District, Taipei, 114690, Taiwan, R.O.C.
114690 台北市內湖區瑞光路 423 號 8 樓
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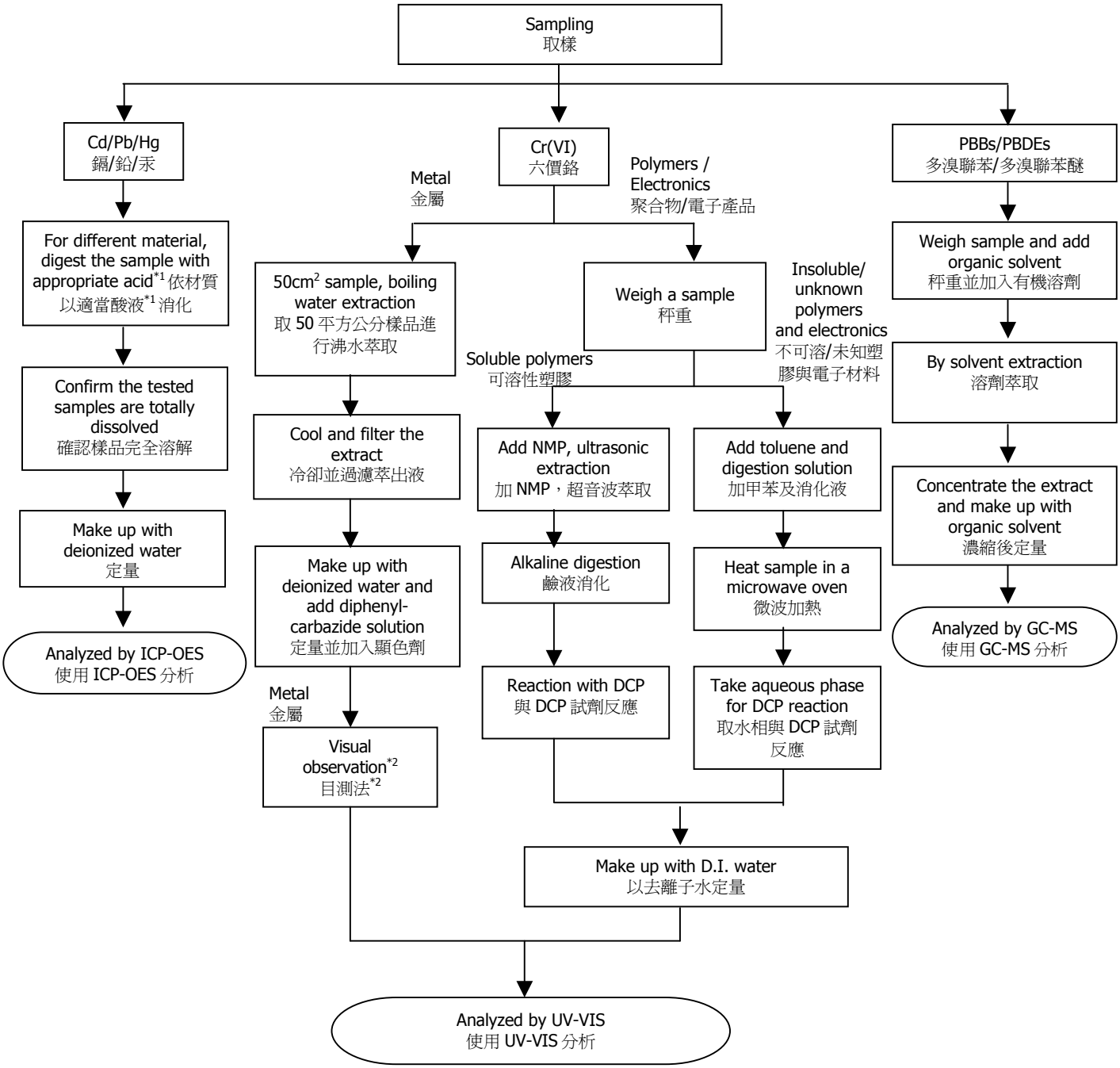
Test Conducted 測試內容：

Measurement Flowchart 測試流程圖:

Test for Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Content RoHS 六項測試
Reference Method 參考方法: Cd/Pb: IEC 62321-5:2013; Hg: IEC 62321-4:2013+AMD1:2017;
Chromium (VI): IEC 62321-7-1:2015 (boiling water extraction);
Chromium (VI): IEC 62321-7-2:2017 (solvent and alkaline extraction);
PBBs/PBDEs: IEC 62321-6:2015



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Test Conducted 測試內容：

Remark 備註:

*1: List of Appropriate Acid 各材質添加酸液如下表：

Material 材質	Acid Added for Digestion 添加酸液種類
Polymers 聚合物	HNO_3,HCl,HF,H_2O_2,H_3BO_3 硝酸、鹽酸、氫氟酸、雙氧水、硼酸
Metals 金屬	HNO_3,HCl,HF 硝酸、鹽酸、氫氟酸
Electronics 電子產品	HNO_3,HCl,H_2O_2,HBF_4 硝酸、鹽酸、雙氧水、氟硼酸

*2: If sample solution is significantly more intense than 0.13 μg/cm^2 equivalent comparison standard, Chromium VI would be determined as detected, the result of visual observation is positive.
當待測樣品溶液顏色明顯比 0.13 μg/cm^2 深，採用目測法判定六價鉻結果爲陽性。

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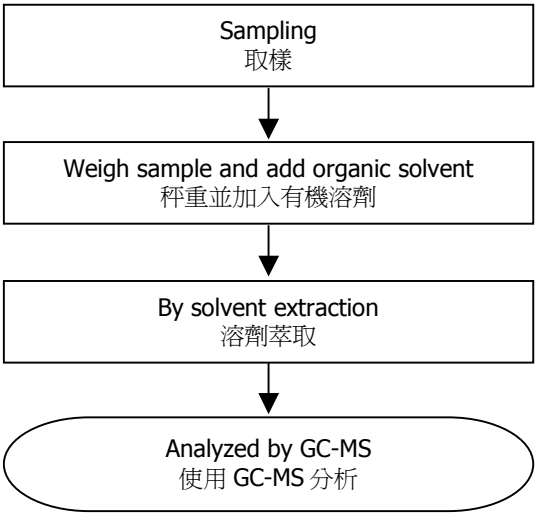
Test Conducted 測試內容：

Measurement Flowchart 測試流程圖:

Test for Phthalates Content 鄰苯二甲酸酯測試
Reference Method 參考方法: IEC 62321-8:2017



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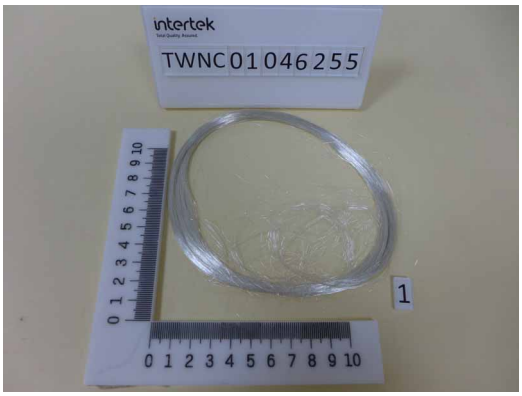
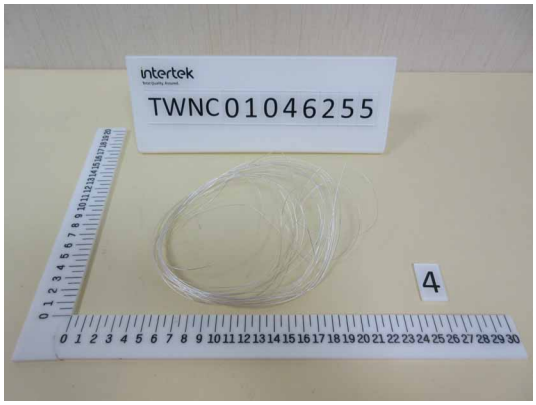
Sample photo 樣品照片：





End of Report

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114690 台北市內湖區瑞光路 423 號 8 樓
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The following sample(s) was/were submitted and identified on behalf of the clients as : NEOFLON FEP

SGS Job No. :	SP21-038470 - SH
Model No. :	
Date of Sample Received :	13 Dec 2021
Testing Period :	13 Dec 2021 - 21 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 Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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

scan to see the report

F93E4497

Carol Luo

Carol Luo
Approved Signatory

3rd Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA21-271785.002	Translucent solid pellet

Remarks :

(1) 1 mg/kg = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

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

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

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

3rd Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

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

Notes :

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

(2) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments,including industrial monitoring and control instruments, from 22 July 2021.

Halogen

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

Test Item(s)	Unit	MDL	*002*
Fluorine (F)	mg/kg	50	>100000
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Element(s)

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

Test Item(s)	Unit	MDL	*002*
Phosphorus (P)	mg/kg	20	ND
Beryllium (Be)	mg/kg	5	ND
Cobalt (Co)	mg/kg	5	ND

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Element(s)

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

Test Item(s)	Unit	MDL	*002*
Antimony (Sb)	mg/kg	50	ND

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

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

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

Hexabromocyclododecane (HBCDD/HBCD)

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

Test Item(s)	CAS NO.	Unit	MDL	*002*
Hexabromocyclododecane (HBCDD/HBCD)	25637-99-4/ 3194-55-6	mg/kg	10	ND

Tetrabromobisphenol A (TBBP-A)

Test Method : With reference to US EPA 3540C: 1996, analysis was performed byGC-MS/LC-MS.

Test Item(s)	Unit	MDL	*002*
Tetrabromobisphenol A (TBBP-A)	mg/kg	10	ND

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Phthalates Content

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

Test Item(s)	CAS NO.	Unit	MDL	002
Diisononyl Phthalate (DINP)	28553-12-0 /68515-48-0	%	0.01	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 /68515-49-1	%	0.01	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%	0.003	ND
Diisooctyl Phthalate (DiOP)	27554-26-3	%	0.01	ND
Dimethyl Phthalate (DMP)	131-11-3	%	0.003	ND
Di-n-pentyl Phthalates (DnPP)	131-18-0	%	0.003	ND
Diethyl Phthalate (DEP)	84-66-2	%	0.003	ND
Dicyclohexyl Phthalate (DCHP)	84-61-7	%	0.003	ND
Dipropyl Phthalate (DPrP)	131-16-8	%	0.003	ND
Dinonyl Phthalate (DNP)	84-76-4	%	0.003	ND
Dibenzyl Phthalate (DBzP)	523-31-9	%	0.003	ND
Diphenyl Phthalate (DPhP)	84-62-8	%	0.003	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%	0.003	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%	0.003	ND
Diisoheptyl phthalate (DIHP)	71888-89-6	%	0.01	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%	0.01	ND
Di(2-ethyhexy)adipate(DEHA)	103-23-1	%	0.003	ND
Diisopentylphthalate (DIPP)	605-50-5	%	0.003	ND

Polycyclic aromatic hydrocarbons (PAHs)

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

Test Item(s)	Unit	MDL	002
Benzo(a)pyrene(BaP)	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	mg/kg	0.1	ND
Chrysene(CHR)	mg/kg	0.1	ND

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Test Item(s)	Unit	MDL	002
Dibenzo(a,h)anthracene(DBA)	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	mg/kg	0.1	ND
Phenanthrene(PHE)	mg/kg	0.1	ND
Pyrene(PYR)	mg/kg	0.1	ND
Anthracene(ANT)	mg/kg	0.1	ND
Fluoranthene(FLT)	mg/kg	0.1	ND
Sum of Phenanthrene(PHE), Pyrene(PYR), Anthracene(ANT), Fluoranthene(FLT)	mg/kg	-	ND
Naphthalene(NAP)	mg/kg	0.1	ND
Sum of 15 PAHs	mg/kg	-	ND

AfPS (German commission for Product Safety) : PAHs requirements

Parameter Unit : 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.

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Bisphenol-A

Test Method : Extraction by organic solvent, analysis by HPLC-DAD-MS.

Test Item(s)	Unit	MDL	002
Bisphenol-A	mg/kg	1	ND

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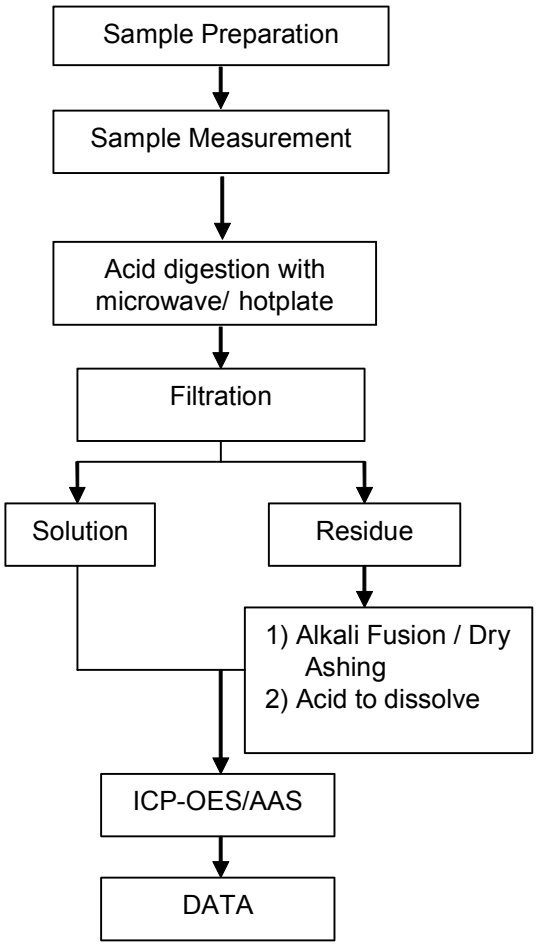
ATTACHMENTS

Elements (IEC62321) Testing Flow Chart

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



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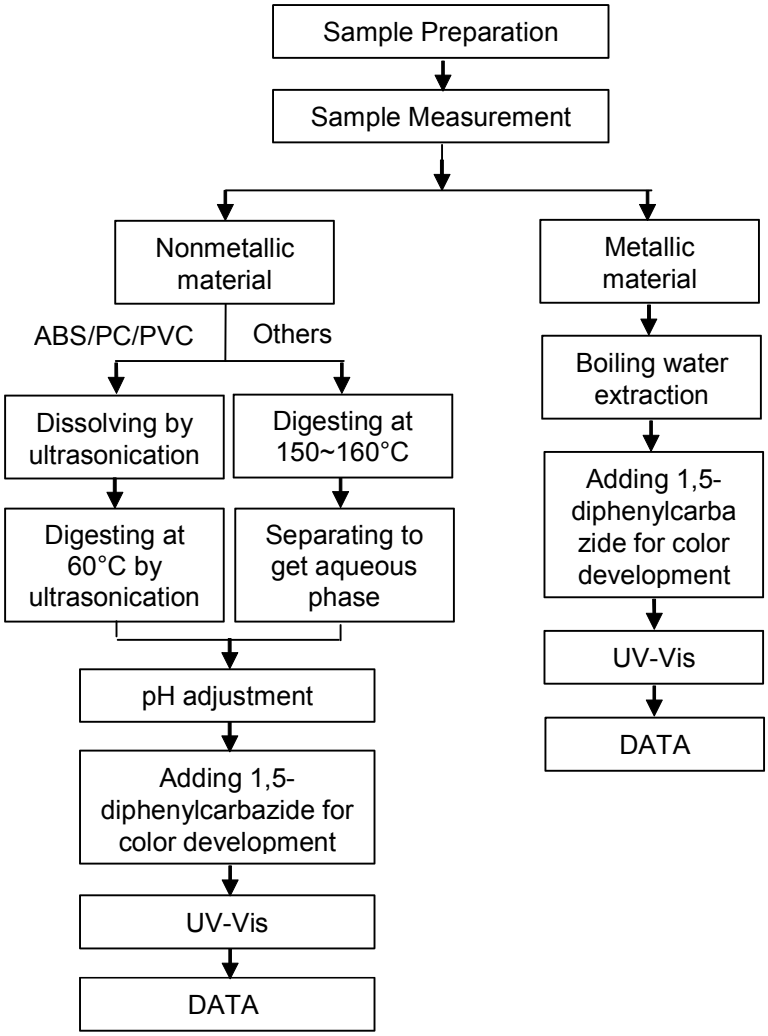
Hexavalent Chromium (Cr(VI)) Testing Flow Chart



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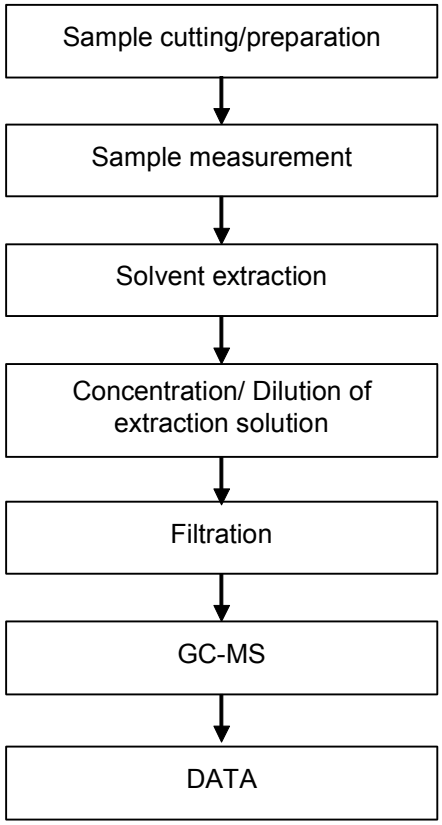
ATTACHMENTS

PBBs/PBDEs Testing Flow Chart



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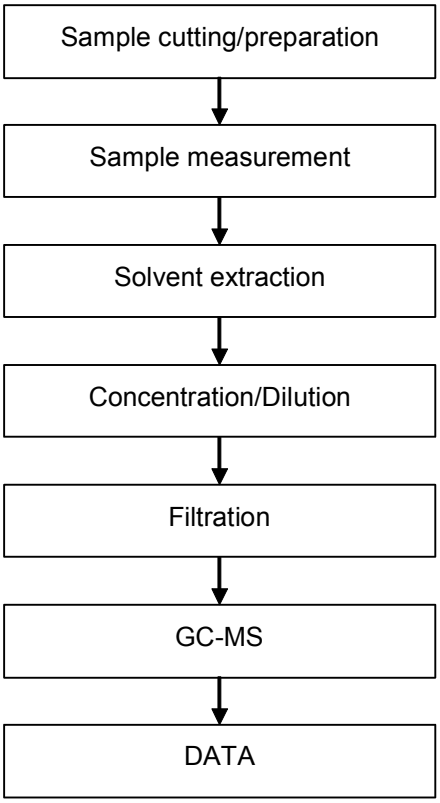
Phthalates Testing Flow Chart



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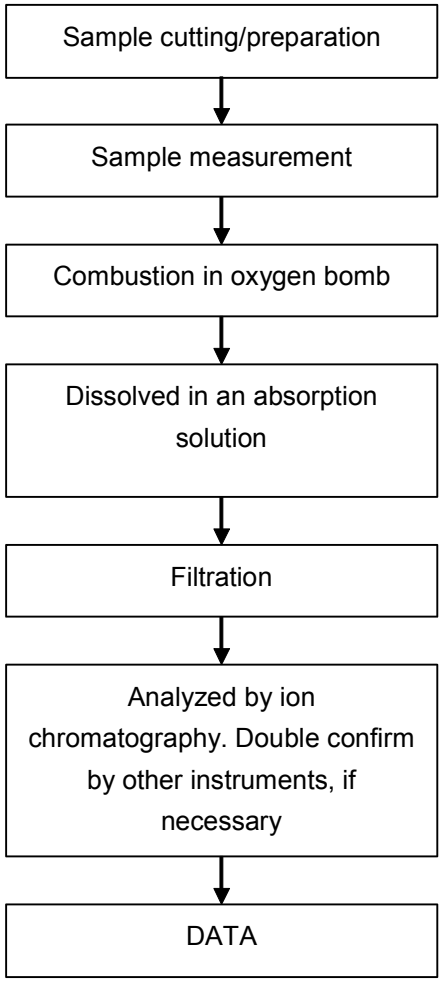
Halogen Testing (oxygen bomb) Flow Chart



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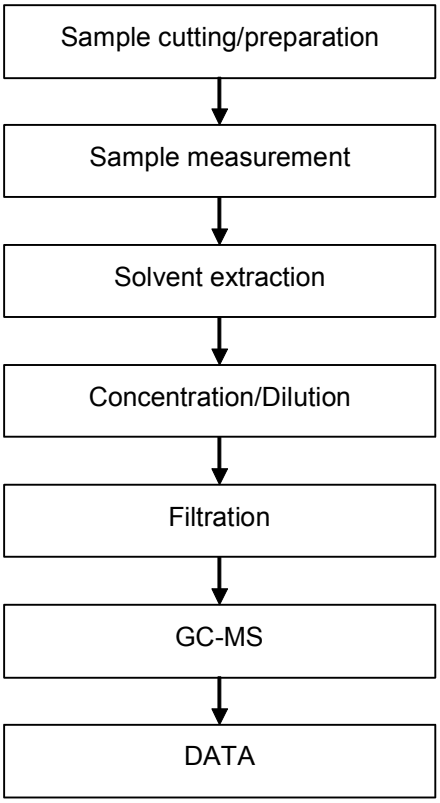
HBCDD Testing Flow Chart



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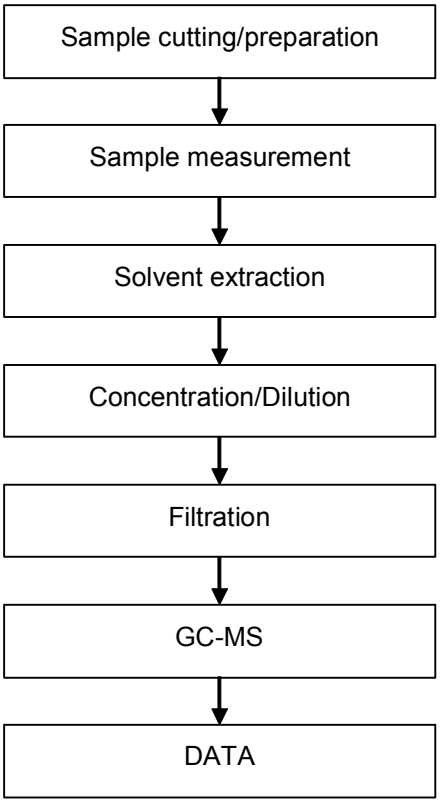
PAHs Testing Flow Chart



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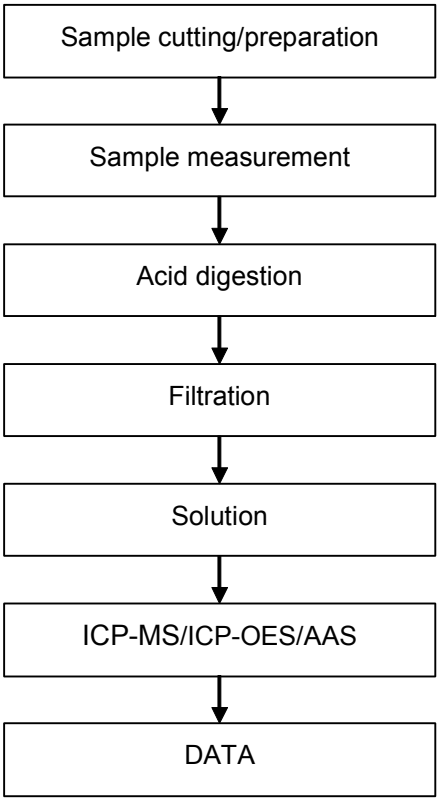
Elements Testing Flow Chart



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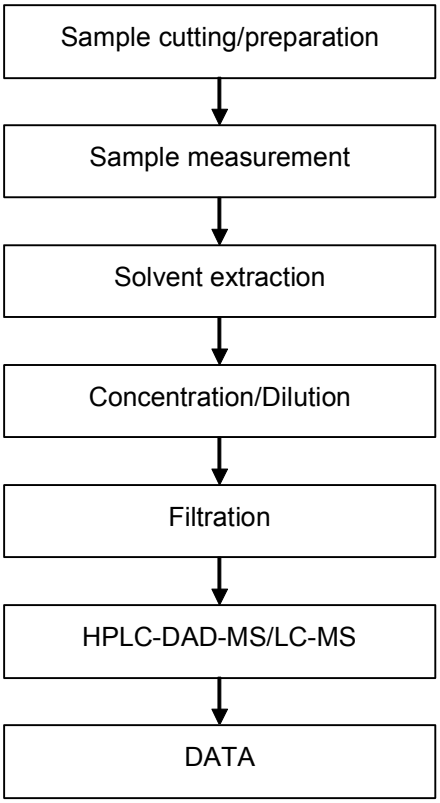
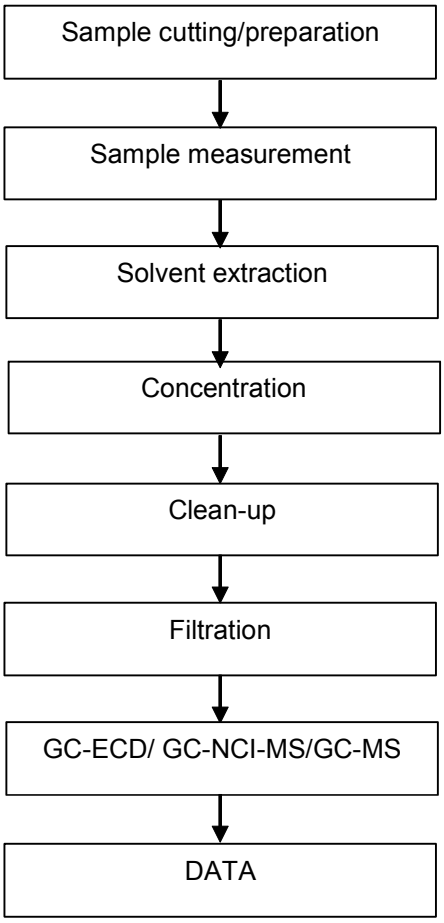
BPA Testing Flow Chart



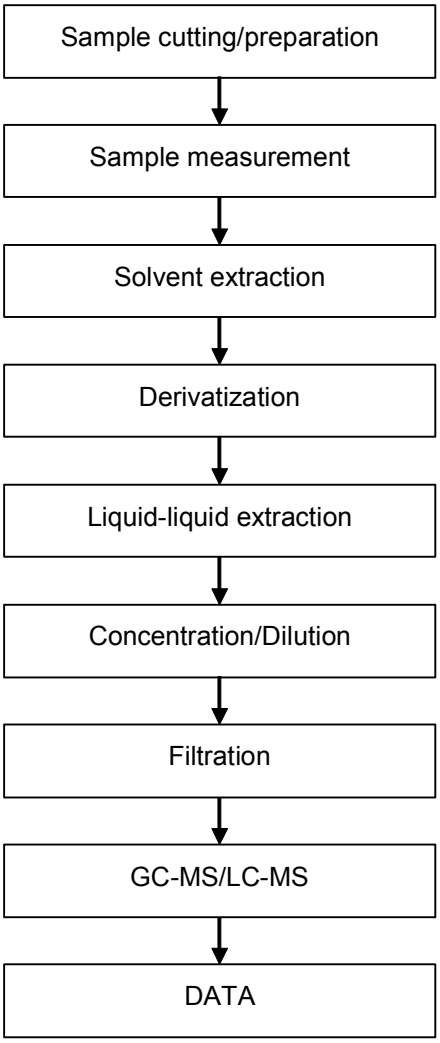
ATTACHMENTS

Chlorinated Paraffin Testing Flow Chart



ATTACHMENTS

TBBP-A Testing Flow Chart



Sample photo:

SHA21-271785.002

SGS authenticate the photo on original report only

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Test Report

No. TAOEC2107771001 Date: 07 Jan 2022 Page 1 of 8

SHANDONG GOLDING ELECTRONICS MATERIAL CO.,LTD

SOUTH OF KEJI ROAD, HI-TECH DEVELOPMENT ZONE, GANGCHENG DISTRICT, JINAN CITY, SHANDONG PROVINCE

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

SGS Job No. :	QP21-005027 - QD
Client Ref. Information :	GHD,GHS
Date of Sample Received :	30 Dec 2021
Testing Period :	30 Dec 2021 - 07 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 (Qingdao) Co., Ltd.

Wang Bo, Claire
Approved Signatory

scan to see the report
92F799C9

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	TAO21-077710.001	coppery 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 62321-5:2013, IEC 62321-4:2013+AMD1:2017, 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 (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND

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

Notes :

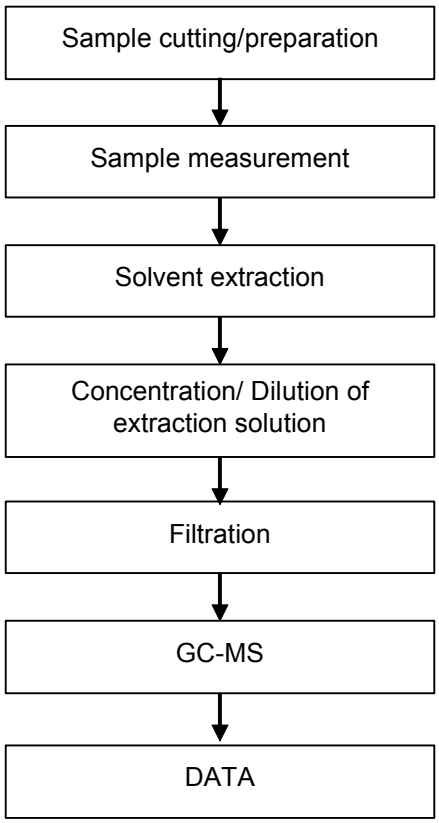
(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.

(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) 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.

ATTACHMENTS

PBBs/PBDEs Testing Flow Chart



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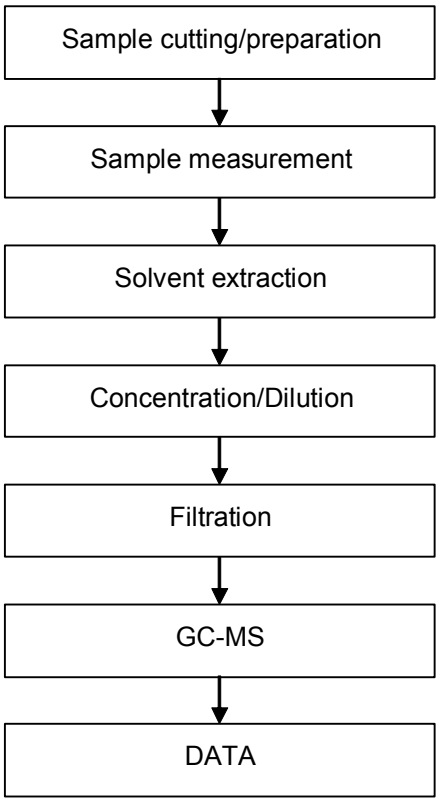
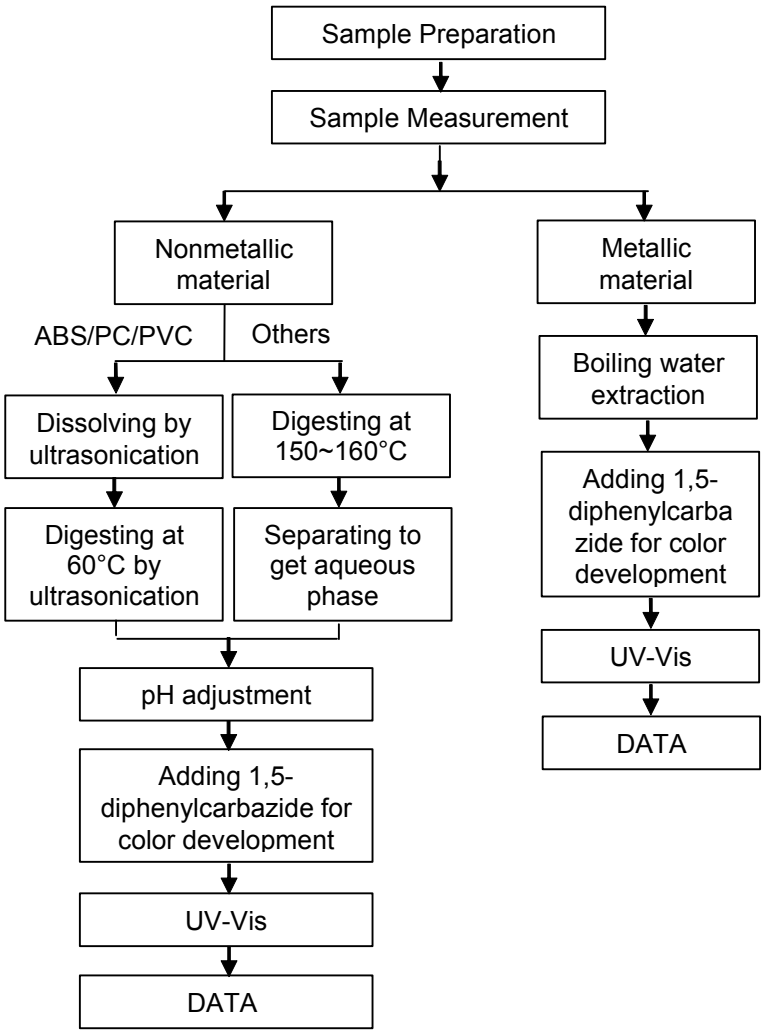
Phthalates Testing Flow Chart



ATTACHMENTS

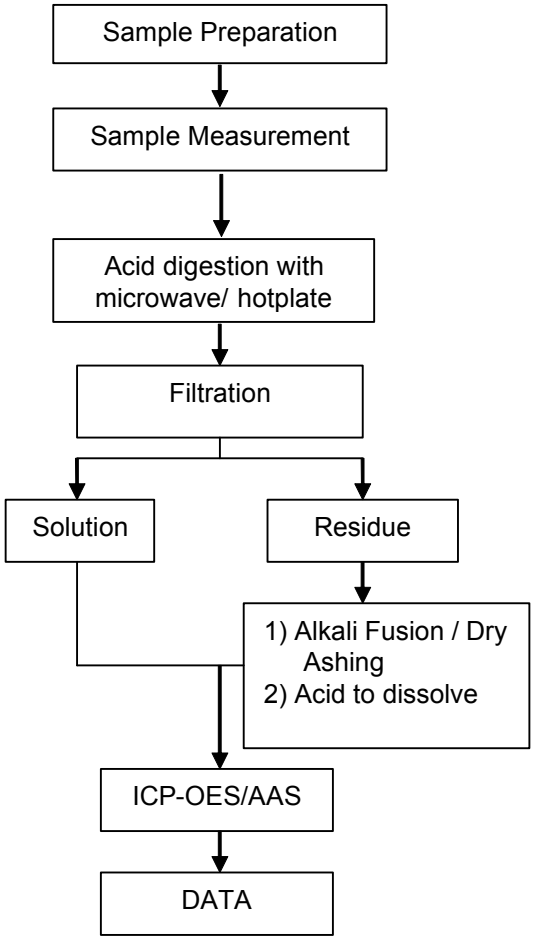
Hexavalent Chromium (Cr(VI)) Testing Flow Chart



ATTACHMENTS

Elements (IEC62321) Testing Flow Chart

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



Sample photo:

TAO21-077710.001

SGS authenticate the photo on original report only

*** End of Report ***

測試報告
Test Report

號碼(No.): ETR22102437　　日期(Date): 17-Jan-2022　　

台灣明尼蘇達礦業製造股份有限公司 (3M TAIWAN LTD.)
桃園市楊梅區中山南路800巷66號 (NO. 66, LANE 800, CHUNG-SHAN S. RD., YANG-MEI DISTRICT, TAOYUAN CITY 326, TAIWAN (R. O. C.))

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

送樣廠商(Sample Submitted By)	:	台灣明尼蘇達礦業製造股份有限公司 (3M TAIWAN LTD.)
樣品名稱(Sample Name)	:	3M DOUBLE COATED TAPE WITH 100MP,200MP,220,420 ADHESIVE
樣品型號(Style/Item No.)	:	F9460PC, F9469PC, F9473PC, 467MP, 468MP, 467MPF, 468MPF, 467MPR, 7952MP, 7955MP, 7962MP, 965MP, 9172MP, 9172PT, 9185MP, 9188, 9667MP, 9668MP, 9676, 9502, 9505, 9502HL, 9505HL, F9752PC, F-9755PC, 9492MP, 9492MPR, 9495MP, 9495MPF, 9495FL, 9795, 9799, 7952MP, 7962MP, 7953MP, 7955MP, 7965MP, 7945MP, 7956MP, 7957MP, 7959MP, 7961MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP, 7993MP, 7995MP, 7997MP, 82210, 82215, 82220, 82310, 82315, 82320, 467MC, 467MCF, 468MC, 468MCF, F9465PC,9082,9085

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收件日(Sample Receiving Date)	:	10-Jan-2022
測試期間(Testing Period)	:	10-Jan-2022 to 14-Jan-2022

測試需求(Test Requested) :

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

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

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

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

CHECK REPORT
PIN CODE: 18674534

測試報告
Test Report

台灣明尼蘇達礦業製造股份有限公司 (3M TAIWAN LTD.)
桃園市楊梅區中山南路800巷66號 (NO. 66, LANE 800, CHUNG-SHAN S. RD., YANG-MEI DISTRICT, TAOYUAN CITY 326, TAIWAN (R. O. C.))

測試部位敘述 (Test Part Description)

No.1 : 透明雙面膠(不含雙面離型膜) (TRANSPARENT TWIN ADHESIVE (EXCLUDING THE DOUBLE RELEASE PAPER))

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) (CAS No.: 18540-29-9)	參考IEC 62321-7-2: 2017，以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.
一溴聯苯 (Monobromobiphenyl)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	mg/kg	5	n.d.
二溴聯苯 (Dibromobiphenyl)		mg/kg	5	n.d.
三溴聯苯 (Tribromobiphenyl)		mg/kg	5	n.d.
四溴聯苯 (Tetrabromobiphenyl)		mg/kg	5	n.d.
五溴聯苯 (Pentabromobiphenyl)		mg/kg	5	n.d.
六溴聯苯 (Hexabromobiphenyl)		mg/kg	5	n.d.
七溴聯苯 (Heptabromobiphenyl)		mg/kg	5	n.d.
八溴聯苯 (Octabromobiphenyl)		mg/kg	5	n.d.
九溴聯苯 (Nonabromobiphenyl)		mg/kg	5	n.d.
十溴聯苯 (Decabromobiphenyl)		mg/kg	5	n.d.
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.

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

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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	參考BS EN 14582: 2016，以離子層析儀分析。 (With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)		mg/kg	50	141
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)		mg/kg	50	n.d.
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)		mg/kg	50	n.d.

備註(Note)：

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

測試報告
Test Report

號碼(No.): ETR22102437　　日期(Date): 17-Jan-2022　　

台灣明尼蘇達礦業製造股份有限公司 (3M TAIWAN LTD.)
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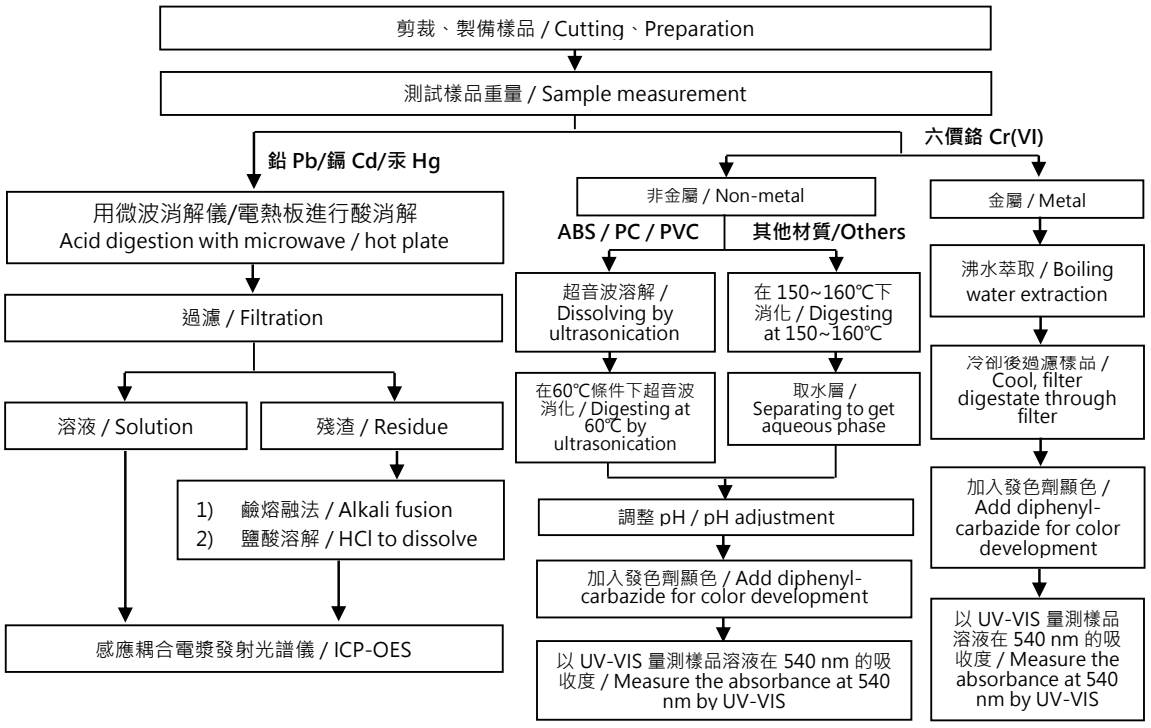
重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件，樣品已完全溶解。（六價鉻測試方法除外）

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



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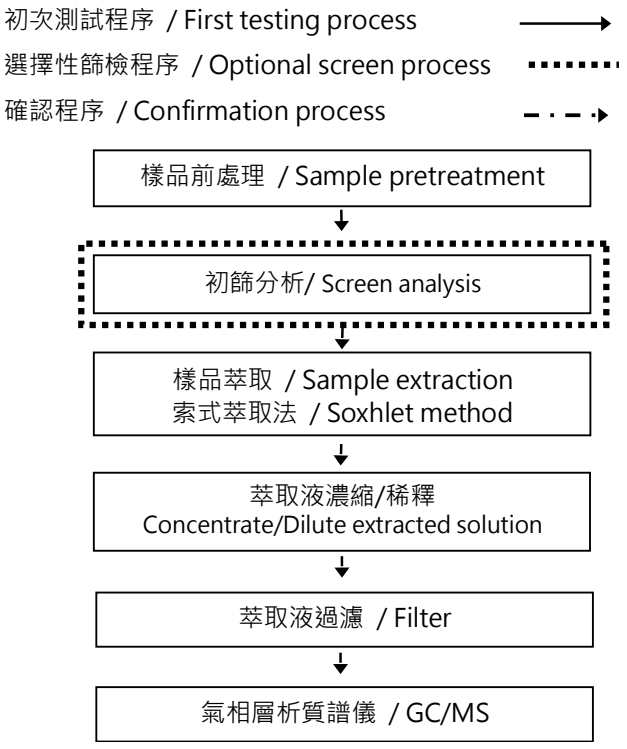
多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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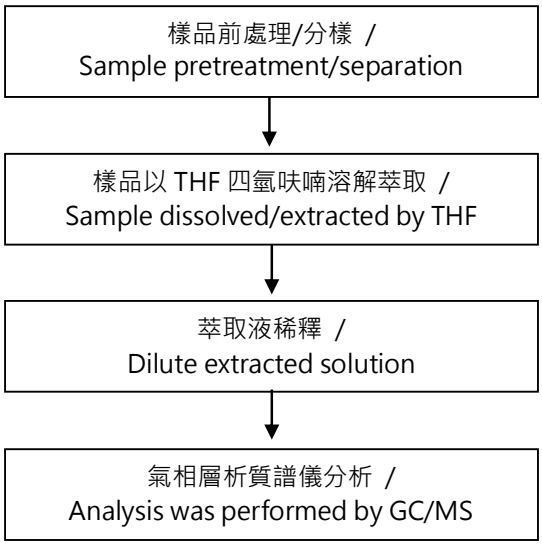
可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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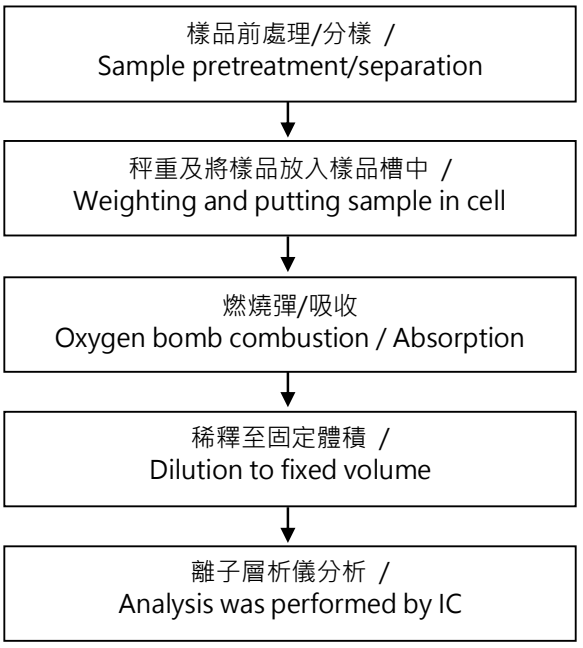
鹵素分析流程圖 / Analytical flow chart - Halogen



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

ETR22102437

** 報告結尾 (End of Report) **