LOTES

NO :

TO :

Halogen Free Part

SPECIFICATION FOR APPROVAL

DESCRIPTION: VERTICAL SODDR4 CONNECTOR

CUSTOMER P/N: ADDR0214-P001C

LOTES P/N: ADDR0214-P001C

COMPLIANT PROCESS: PRODUCT ONLY FOR IR REFLOW PROCESS

CUSTOMER APPROVAL SIGN :

R&D CONFIRM	PREPARE BY
DeFang Hu	Wei Honglei

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LOTES CO., LTD

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PRODUCT SPECIFICATION	REV	ECN No.
	1	N180100

DIMENSION

1.This specification covers VERTICAL SO DDR. connector series.

2.The physical dimensions and the VERTICAL SO DDR connector are shown in drawing.(ADDR0214-*****/ADDR0335-*****)

MATERIAL AND FINISH

1. Housing: High temperature thermoplastic, Color: black.

2. Contact: Copper Alloy, Ni under plated, Gold Plating on contact area, Matte Tin Plating on soldertail.

3. Latch: High temperature thermoplastic, Color black

4.Hook:. Copper Alloy, Ni under plated, Matte Tin Plating on soldertail.

OPERATING PERFORMANCE

1.Operation Temperature: -55℃ to 85℃

2.Voltage Rating: 25V

3.Current Rating: 0.5A

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LOTES CO., LTD	PRODUCT NAME: Vertical SODDR4 260PIN		
	DOCUMENT No: GSP-ADDR0214	REV: 1	PAGE: 1 OF 5
	APPROVED BY: DEFANG HU	CHECKED BY: LIMING ZHANG	WRITTEN BY: RONGMEI ZHANG

PRODUCT SPECIFICATION	REV	ECN No.
	1	N180100

ELECTRICAL PERFORMANCE

Test item	Test Condition	Requirements
Examination of product	· Visual inspection	· No physical damage
Contact resistance	· Mate connectors: apply a current of 10mA(max) at open circuit voltage of 20mV voltage(max) EIA-364-23	· Initial 55mΩ Max. · Final △ LLCR =20mΩ Max.
Insulation resistance	· Applying 500VDC for one minute between adjacent contacts of unmated connectors EIA-364-21	· 500MΩ Min
Dielectric withstanding Voltage	· Measured by applying 250VAC for one minute between adjacent contacts of unmated connector assemblies. EIA-364-20	· No breakdown or flash · Current leakage:0.5mA

MECHANICAL PERFORMANCE

Test item	Condition	Requirements
Vibration test	3.1 G rms, 20 to 500 Hz. 15 minutes duration per axis, 3 axes total. EIA 364-28	· Continuity—No contact discontinuity greater than 1 μs duration. · △ LLCR=20mΩ Max.(Final)

LOTES CO., LTD	PRODUCT NAME: Vertical SODDR4 260PIN		
	DOCUMENT No: GSP-ADDR0214	REV: 1	PAGE: 2OF 5
	APPROVED BY: DEFANG HU	CHECKED BY :LIMING ZHANG	WRITTEN BY: RONGMEI ZHANG

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ENVIRONMENTAL PERFORMANCE

Test item	Test condition	Requirements
Thermal shock	·Expose the connectors to –55℃/30min. and 85℃/30min.(Repeat 5 cycles)	• Contact resistance :△ LLCR=20mΩ Max.(Final) • No physical damage.
Salt spray	·Subject the connector to 5% salt-solution concentration at 35℃ for 24 hours	• Contact resistance :△ LLCR=20mΩMax .(Final) • No physical damage.
Temperature life	EIA-364-17 60℃5 years field temperature , 105°C, 72 Hrs.;	• Contact resistance :△ LLCR=20mΩ Max.(Final) • No physical damage
Temperature life (preconditioning)	• 60℃5 years field temperature. 105°C, 36 Hrs.;	• No physical damage
Resistance to Reflow Soldering Heat	·Test connector on P.C.Board ·Heat Peak : 260℃,10S	• No physical damage
Solderability	·Solder Temperature :245±5℃ ·Solder time : 5+0/-0.5s	• Wet solder coverage:95%Min

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ENVIRONMENTAL PERFORMANCE

Test item	Test condition	Requirements
Mixed flowing gas	EIA-364-65, class IIA, Option 4, perform in mated condition, duration 7 days Chlorine: 10 ppb; Hydrogen Sulfide: 10 ppb; Nitrogen Dioxide: 200 ppb; Sulfur Dioxide: 100 ppb; Temperature: 30°C, Relative Humidity: 70 %;	• No evidence of physical damage
Cyclic temperature & humidity	EIA-364-31B Method III without conditioning,initial measurements,cold shock and vibration. Ramps times should be 0.5 hour and dwell times should be 1.0 hour. Dwell times start when the temperature and humidity have stabilized within specified levels. Perform 24 cycles in mated condition	• None
Thermal Disturbance	EIA-364-1000 Cycle the connector between 15 °C ± 3 °C and 85 °C ± 3 °C ,as measured on the part .Ramps should be a minimum of 2°C/minute.Dwell time should ensure that the contacts reach the temperature extremes (a minimum of 5 minutes),humidity si not controlled ,perform 10 cycle in mated condition	• None

PRODUCT SPECIFICATION	REV	ECN No.
	1	N180100

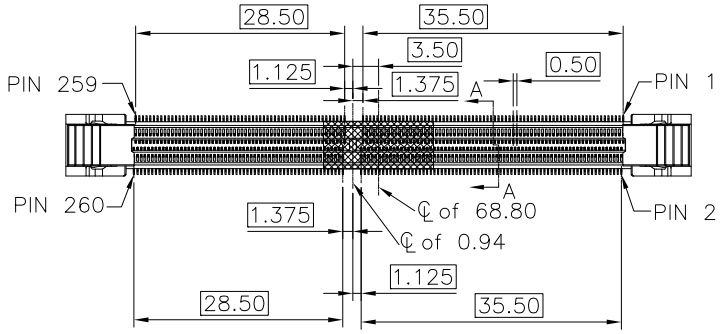
Test Item & Condition & Requirements

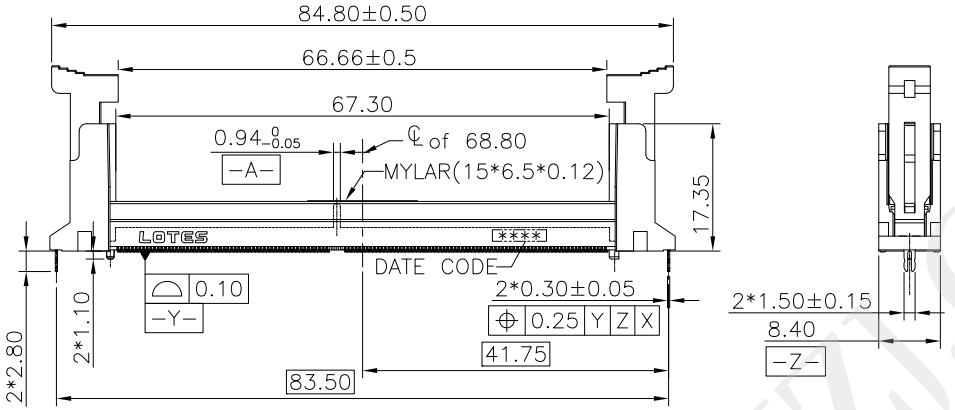
Test or Examination	Test Group(a)							
	A	B	C	D	E	F	G	H
Examination of products	1,8	1,10	1,9	1,9	1,8	1,5	1,3	1,
Contact Resistance	2,5,7	2,5,7,9,	2,4,6,8	2,8		2,4		2,5,7,9,11
Reseating	6	8						10
Dielectric Withstanding Voltage					3,6			
Insulation Resistance					2,7			
Vibration			5					
Mechanical shock			7					
Mating Force				3,6				
Unmating Force				4,7				
Durability				5				
Durability (preconditioning)	3	3	3		4			3
Resistance to soldering heat							2	
Thermal Shock		4						
Salt Spray						3		
Temperature life	4				5			
Temperature life(preconditioning)								4
Cyclic temperature & humidity		6						
Mixed flowing gas								6
Thermal Disturbance								8
Specimen quantity (pcs)	5	5	5	5	5	5	5	5

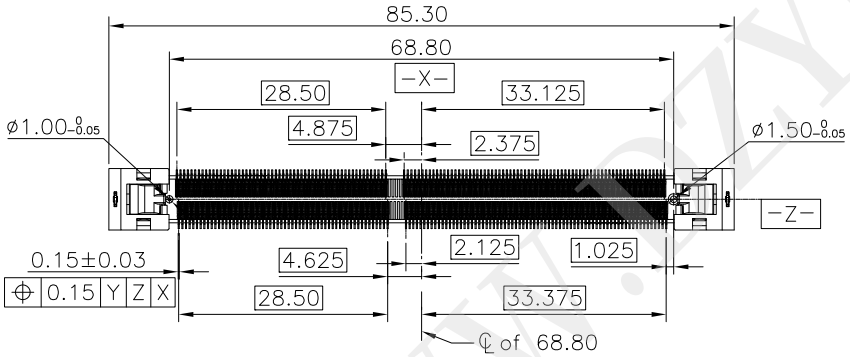
LOTES CO., LTD	PRODUCT NAME: Vertical SODDR4 260PIN		
	DOCUMENT No: GSP-ADDR0214	REV: 1	PAGE: 5 OF 5
	APPROVED BY: DEFANG HU	CHECKED BY: LIMING ZHANG	WRITTEN BY: RONGMEI ZHANG

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REV.	ECN NO./DESCRIPTION	DATE
1	N180100	03/06'18
1A	R190005	05/07'19

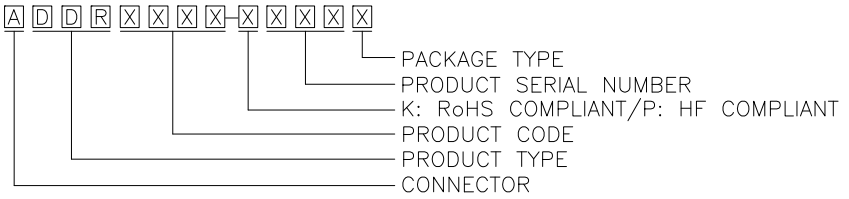






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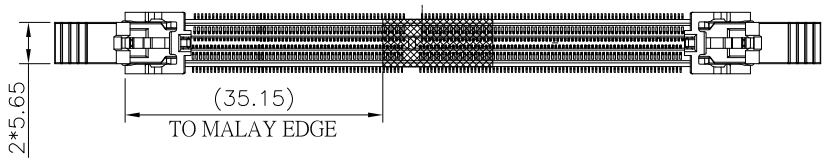
1. MATERIAL SPECIFICATION:
   - 1-1. HOUSING: LCP+40%GF,UL94V-0,COLOR: BLACK.
   - 1-2. CONTACTS:COPPER_C7025,T=0.15mm;
   - 1-3. HOOK: BRASS_C2680,T=0.30mm;
   - 1-4. EJECTOR: HIGH TEMPERATURE THERMOPLASTIC, UL94V-0, COLOR: BLACK.
   - 1-5. MYLAR: INSULATOR MATERIAL, COLOR: BROWN;
2. PLATING SPECIFICATION:
   - 2-1. CONTACT: NICKEL 50u" MIN. UNDER PLATING OVER ALL.MATTE TIN 100u" MIN. PLATING ON SOLDER AREA.GOLD PLATING SEE TABLE1.
   - 2-2. HOOK: NICKEL 50u" MIN. UNDER PLATING OVER ALL. MATTE TIN 100u" MIN. PLATING OVER ALL.
3. RoHS OR HF COMPLIANT;
4. DATE CODE: **** (WEEK / YEAR)
5. MECHANICAL PERFORMANCE:
   - 5-1. MATING FORCE: 11Kgf MAX..
   - 5-2. DURABILITY: 25 CYCLES.
6. ELECTRICAL PERFORMANCE:
   - 6-1. CURRENT: 0.50A MAX. PER PIN.
   - 6-2. VOLTAGE: 25V AC MAX..
   - 6-3. LLCR: 55mΩ MAX. (INITIAL); △20mΩ MAX. (FINAL).
   - 6-4. DIELECTRIC WITHSTANDING VOLTAGE: 250V AC FOR 1 MINUTE.
   - 6-5. INSULATION RESISTANCE: DC 500V 500MΩ.
7. RECOMMENDED PROCESS;
   THE TEMPERATURE SHALL BE 260°C MAINTAINING 10 SECONDS.
8. PRODUCT NUMBER NOTE:

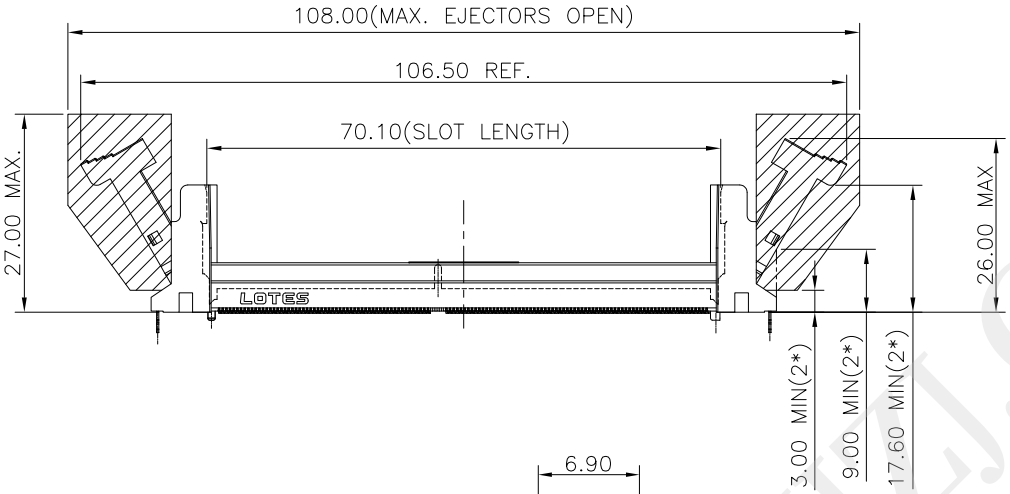


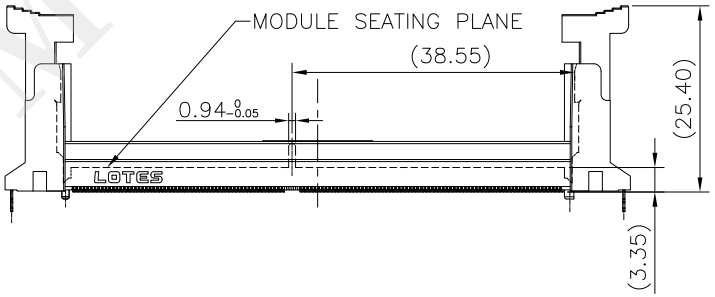
GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE1	LOTES
.X± 0.35	X.°± 3°		
.XX± 0.25	.X°± 2°	APPROVED BY DEFANG.HU	TITLE VERTICAL SODDR4 CONNECTOR
.XXX±0.15	.XX°± 1°		
CUSTOMER DRAWING		CHECKED BY STERLING.HUANG	DWG NO. GAP-ADDR0214
SIZE	UNITS	DRAWN BY RONGMEI.ZHANG	SHEET 1 / 5 · SCALE 1:1 · REV 1A
A4	MM[INCH]		

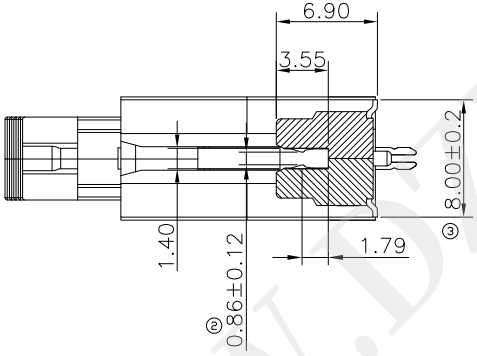
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REV.	ECN NO./DESCRIPTION	DATE
1	N180100	03/06'18
1A	R190005	05/07'19







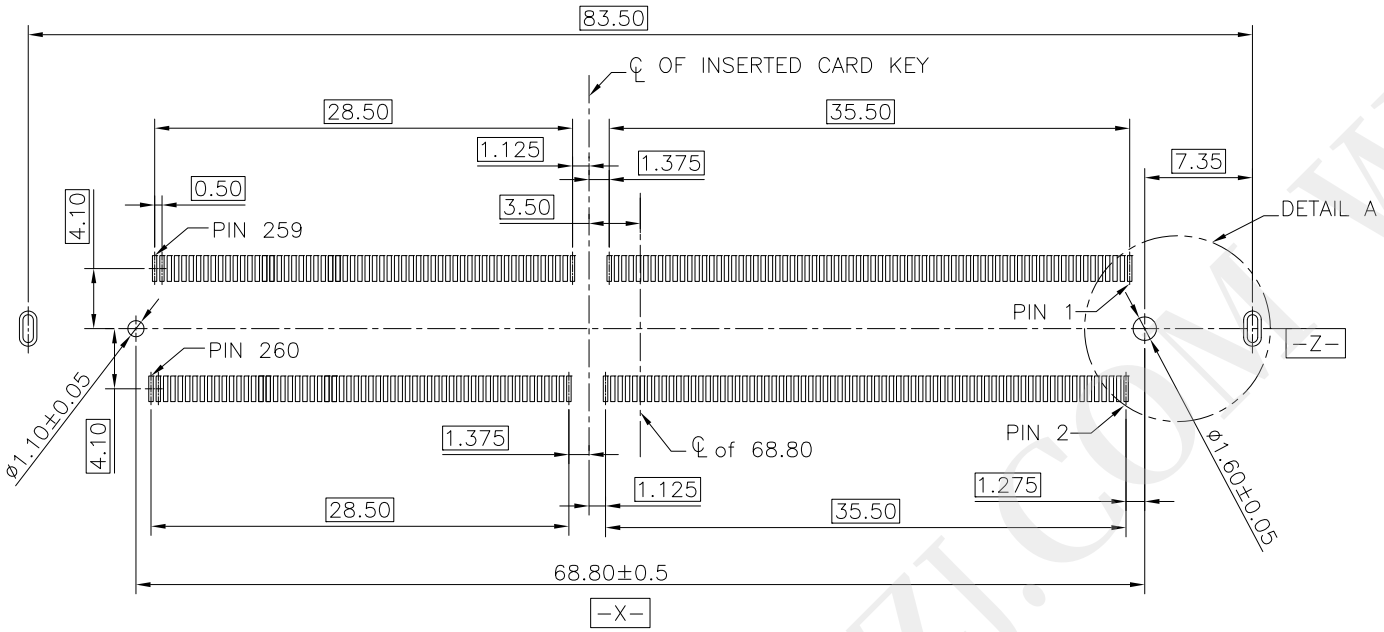


SECTION A–A
SCALE 2:1

GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. ADDR0214-P001C	LOTES
.X± 0.35	X.°± 3°		
.XX± 0.25	.X°± 2°	APPROVED BY DEFANG.HU	TITLE VERTICAL SODDR4 CONNECTOR
.XXX±0.15	.XX°± 1°		
CUSTOMER DRAWING		CHECKED BY STERLING.HUANG	DWG NO. GAP-ADDR0214
SIZE	UNITS	DRAWN BY RONGMEI.ZHANG	SHEET 2 / 5 · SCALE 1:1 · REV 1A
A4	MM[INCH]		

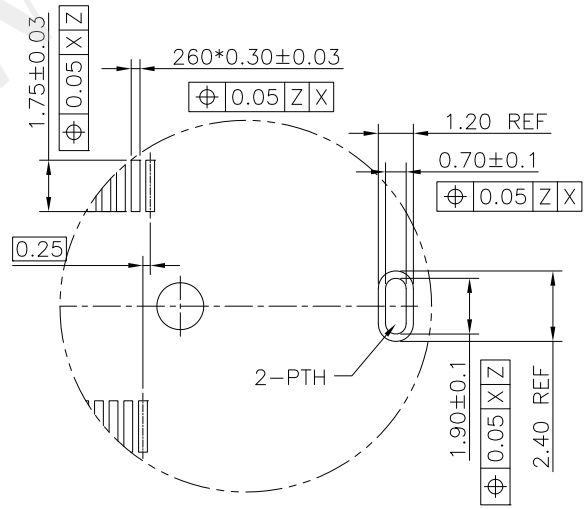
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REV.	ECN NO./DESCRIPTION	DATE
1	N180100	03/06'18
1A	R190005	05/07'19



RECOMMENDED PCB LAYOUT (TOP VIEW)

DEFAULT TOLERANCES:±0.05MM



DETAIL A

SCALE 2:1

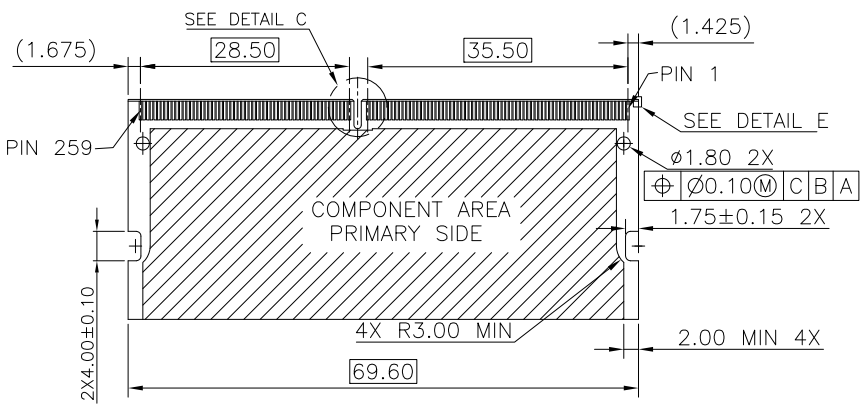
TABLE 1:

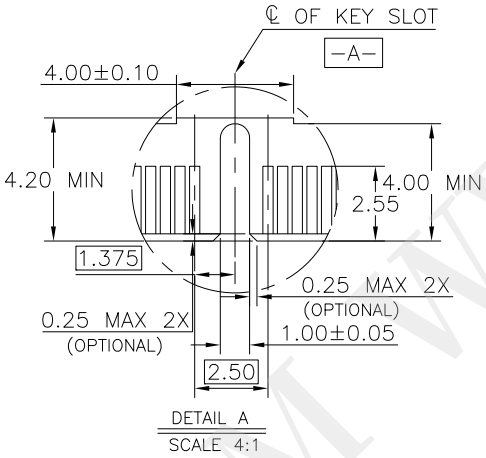
NO.	PART NO.	DESCRIPTION
2	ADDR0214-P002C	LCP_BLACK,Au30u"MIN.,EJECTOR BLACK
1	ADDR0214-P001C	LCP_BLACK,Au15u"MIN.,EJECTOR BLACK

GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE1	LOTES
.X± 0.35	X.°± 3°		
.XX± 0.25	.X°± 2°	APPROVED BY DEFANG.HU	TITLE VERTICAL SODDR4 CONNECTOR
.XXX±0.15	.XX°± 1°		
CUSTOMER DRAWING		CHECKED BY STERLING.HUANG	DWG NO. GAP-ADDR0214
SIZE	UNITS	DRAWN BY RONGMEI.ZHANG	SHEET 3 / 5 · SCALE 2:1 · REV 1A
A4	MM[INCH]		

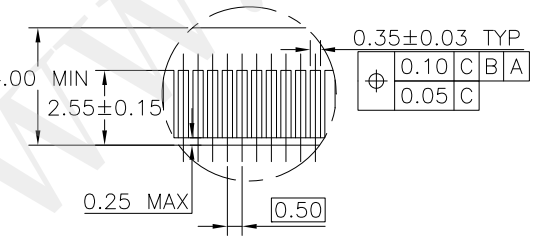
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REV.	ECN NO./DESCRIPTION	DATE
1	N180100	03/06'18
1A	R190005	05/07'19

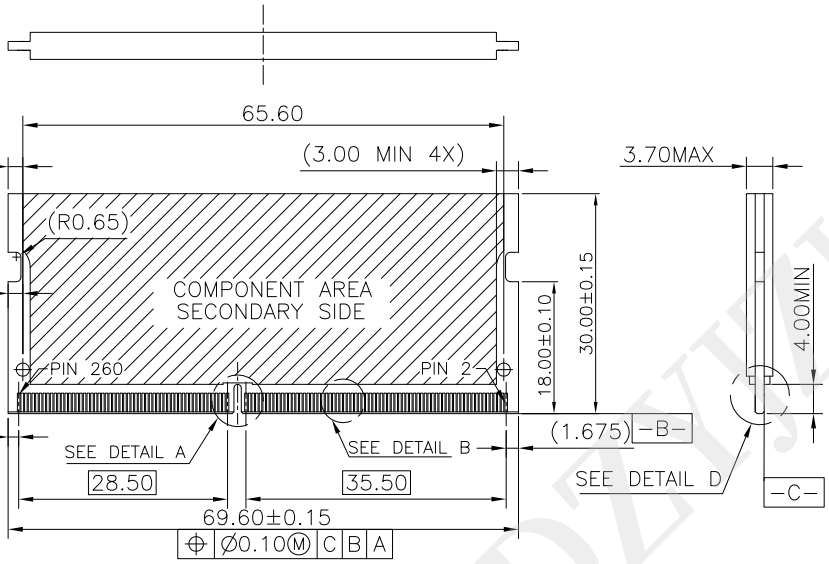


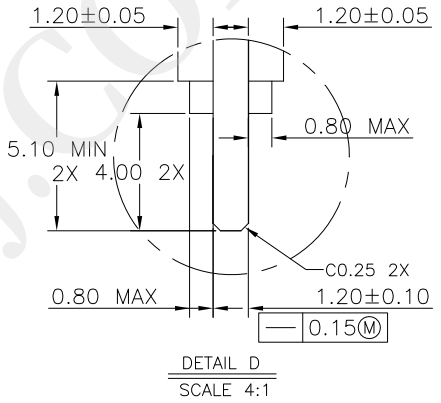


DETAIL A
SCALE 4:1

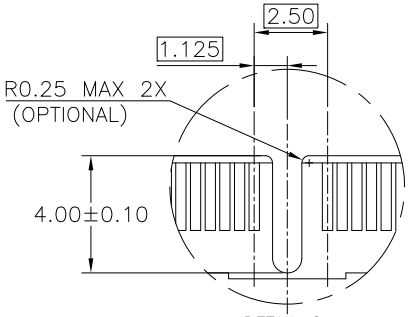


DETAIL B
SCALE 4:1

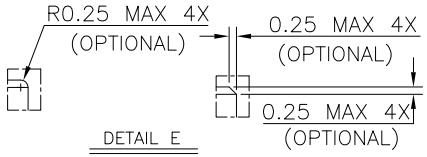




DETAIL D
SCALE 4:1



DETAIL C
SCALE 4:1



DETAIL E
SCALE 4:1

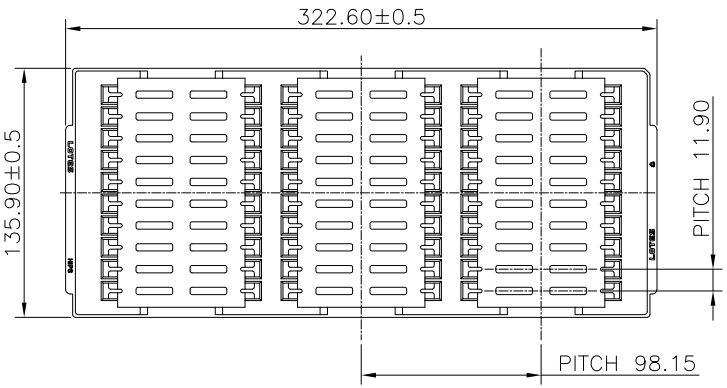
MATING P.C.B NOTES:

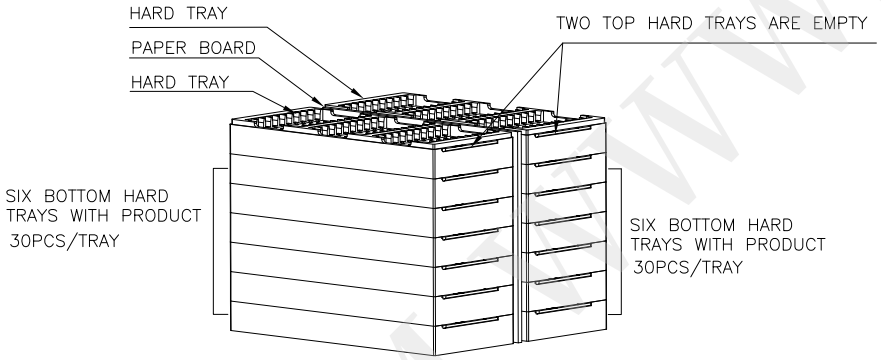
1. TOLERANCE ON ALL DIMENSIONS ±0.05 UNLESS OTHERWISE SPECIFIED;
2. PCB THICKNESS APPLIES ACROSS TABS AND INCLUDES PLATING AND/OR METALIZATION;
3. FINISH OF PAD: Au PLATING 30u''min OVER Ni PLATING 80u'' MIN.;
4. NO BURR.
5. CHAMFER 0.25mm max. X 45° IF EXIST.

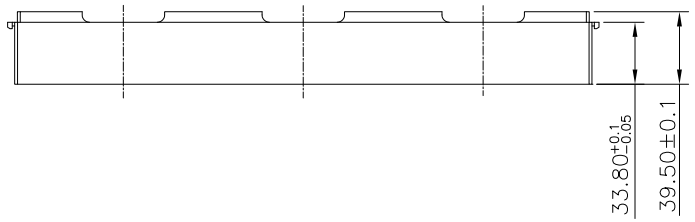
GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE1	LOTES
.X± 0.35	X.°± 3°		
.XX± 0.25	.X°± 2°	APPROVED BY DEFANG.HU	TITLE VERTICAL SODDR4 CONNECTOR
.XXX±0.15	.XX°± 1°		
CUSTOMER DRAWING		CHECKED BY STERLING.HUANG	DWG NO. GAP-ADDR0214
SIZE	UNITS	DRAWN BY RONGMEI.ZHANG	SHEET 4 / 5 · SCALE 1:1 · REV 1A
A4	MM[INCH]		

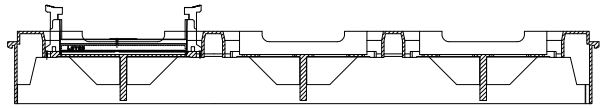
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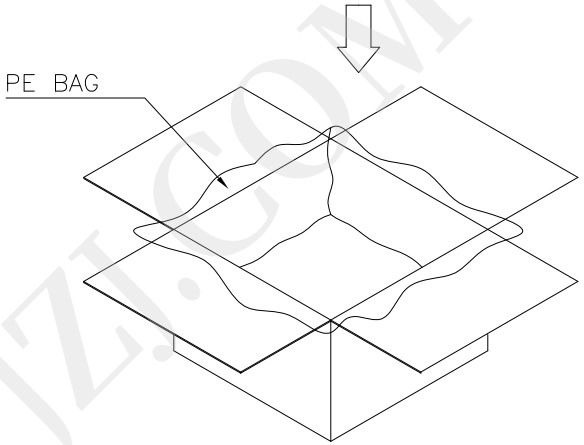
REV.	ECN NO./DESCRIPTION	DATE
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1A	R190005	03/06'18

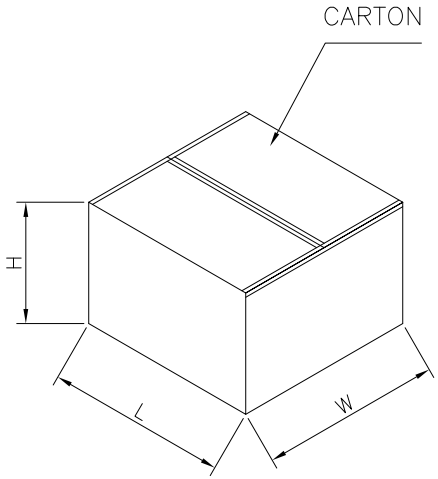












NO.	DESCRIPTION	PART NO.	SPECIFICATION	QT'Y
5	PE BAG	G09-6-50002-K02	400*350*350 T=0.04	1 PCS
4	CARTON	G09-1-25006-P01	285*325*255;K=A	1 PCS
3	PAPER BOARD	G09-3-30018-P01	300*270*6	3 PCS
2	HARD TRAY	G09-A-30216-P01	322.6*135.9*39.50;HIPS_BLACK	14 PCS
1	CONNECTOR	SEE TABLE 1	SEE TABLE 1	360 PCS

GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE1	LOTES
.X± 0.35	X.°± 3°		
.XX± 0.25	.X°± 2°	APPROVED BY DEFANG.HU	TITLE VERTICAL SODDR4 CONNECTOR
.XXX± 0.15	.XX°± 1°		
CUSTOMER DRAWING		CHECKED BY STERLING.HUANG	DWG NO. GAP-ADDR0214
SIZE	UNITS	DRAWN BY RONGMEI.ZHANG	SHEET 5/ 5 · SCALE 1:2 · REV 1A
A4	MM[INCH]		

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PRODUCT RELIABILITY TEST REPORT

ReportNo:GL-RD20150814-07

product:VERTICAL SODDR4 260PIN
Part NO:ADDR0214
Test Object:Product Reliability Test
Sample Quantity:40PCS
Test Environment:Temperature ： 22℃ , Humidity：50%RH
Date of Test:2015-08-20~2015-11-17

Prepared By:陈子正
Checked By:苏士坤
Approved By:周志奇

Test Result Summary:

Qualification Group	*Pass / Fail*	*Comments*
groupA	Qualified	
groupB	Qualified	
groupC	Qualified	
groupD	Qualified	
groupE	Qualified	
groupF	Qualified	
groupG	Qualified	
groupH	Qualified	

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LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

1. Testing Sequence:

No.	Examination item	Test Group							
		A	B	C	D	E	F	G	H
1	Examination of product	1,8	1,10	1,9	1,9	1,8	1,5	1,3	1
2	Contact Resistance	2,5,7	2,5,7,9	2,4,6,8	2,8		2,4		2,5,7,9,11
3	Reseating	6	8						10
4	Dielectric Withstanding Voltage					3,6			
5	Insulation Resistance					2,7			
6	Vibration			5					
7	Mechanical shock			7					
8	Mating Force				3,6				
9	Unmating Force				4,7				
10	Durability				5				
11	Durability (preconditioning)	3	3	3		4			3
12	Resistance to soldering heat							2	
13	Thermal Shock		4						
14	Salt Spray						3		
15	Temperature life	4				5			
16	Temperature life(preconditioning)								4
17	Cyclic temperature & humidity		6						
18	Mixed flowing gas								6
19	Thermal Disturbance								8
Specimen quantity (pcs)		5	5	5	5	5	5	5	5

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LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

2. Test Item & Condition & Requirements ：

Test item		Test Condition	Requirements
1	Examination of product	Visual inspection	No physical damage
2	Low Level Contact Resistance	Mate connectors: apply a current of 10mA(max) at open circuit voltage of 20mV voltage(max) EIA-364-23	Initial 55mΩ Max. Final △LLCR =20mΩ Max.
3	Reseating	Manually unplug/plug the connector. Perform 3 cycles	No physical damage
4	Dielectric Withstanding Voltage	Measured by applying 250VAC for one minute between adjacent contacts of unmated connector assemblies. EIA-364-20	No breakdown or flash Current leakage:0.5mA
5	Insulation Resistance	Applying 500VDC for one minute between adjacent contacts of unmated connectors EIA-364-21	500MΩ Min
6	Vibration	3.1 G rms, 20 to 500 Hz. 15 minutes duration per axis, 3 axes total. EIA 364-28	Continuity—No contact discontinuity greater than 1 μs duration. △LLCR=20mΩ Max.(Final)
7	Mechanical shock	Subject mated connector to50G ,half-sine shock pulses of 11 millisecond duration ,3drops in each direction applied along the 3 mutually perpendicular planes total 18 shock. EIA-364-27	No electrical discontinuity greater than 1 microsecond △LLCR=20mΩMax.(Final) No physical damage
8	Mating Force	insert the card at the specified angle Rotate the card into position Reverse the installation sequence to unmating EIA-364-13	11Kgf Max.(Initial 3 Cycle) 8 Kgf Max. (After 3 Cycle)
9	Unmating Force	insert the card at the specified angle Rotate the card into position Reverse the installation sequence to unmating EIA-364-13	11Kgf Max.(Initial 3 Cycle) 8 Kgf Max. (After 3 Cycle)

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PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

	Test item	Test Condition	Requirements
10	Durability	Repeat insertion the PCB to the connector and extraction PCB from the connector for 25 cycles. EIA-364-09	△LLCR=20mΩ Max.(Final)
11	Durability (preconditioning)	Repeat insertion the PCB to the connector and extraction PCB from the connector for 5 plug/unplug cycles. EIA-364-09	No physical damage
12	Resistance to soldering heat	Test connector on P.C.Board Heat Peak : 260℃,10S	No physical damage
13	Thermal Shock	Expose the connectors to –55℃/30min. and 85℃/30min.(Repeat 5 cycles)	Contact resistance : △LLCR=20mΩ Max. (Final) No physical damage.
14	Salt Spray	Subject the connector to 5% salt-solution concentration at 35℃ for 24 hours	Contact resistance : △LLCR=20mΩ Max . (Final) No physical damage.
15	Temperature life	EIA-364-17 60℃5 years field temperature, 105°C, 72 Hrs. ; Precondition: 105°C, 24 hrs.	Contact resistance : △LLCR=20mΩ Max. (Final) No physical damage
16	Temperature life(preconditioning)	60℃5 years field temperature. 105°C, 36 Hrs.; Precondition: 105°C, 12 hrs.	No physical damage
17	Cyclic temperature & humidity	EIA-364-31B Method III without conditioning, initial measurements, cold shock and vibration. Ramps times should be 0.5 hour and dwell times should be 1.0 hour. Dwell times start when the temperature and humidity have stabilized within specified levels. Perform 24 cycles in mated condition	None

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PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

Test item		Test Condition	Requirements
18	Mixed flowing gas	EIA-364-65, class IIA, Option 4, perform in mated condition,duration 7 days Chlorine: 10 ppb; Hydrogen Sulfide: 10 ppb; Nitrogen Dioxide: 200 ppb; Sulfur Dioxide: 100 ppb; Temperature: 30°C, Relative Humidity: 70 %;	No evidence of physical damage
19	Thermal Disturbance	EIA-364-1000 Cycle the connector between 15 ±3°C and 85 ±3°C ,as measured on the part .Ramps should be a minimum of 2°C /minute.Dwell time should ensure that the contacts reach the temperature extremes (a minimum of 5 minutes),humidity si not controlled ,perform 10 cycle in mated condition	None

3. Testing Result:

Group A:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	17. 41	16. 31	16. 98	16. 67	16. 89	mΩ	Pass
3	Durability (preconditioning)	Normal	Normal	Normal	Normal	Normal	/	Pass
4	Temperature Life	Normal	Normal	Normal	Normal	Normal	/	Pass
5	LLCR	17. 21	17. 06	17. 11	16. 00	15. 82	mΩ	Pass
	ΔLLCR	3. 42	3. 57	3. 58	2. 88	2. 85	mΩ	Pass
6	Reseating	Normal	Normal	Normal	Normal	Normal	/	Pass
7	LLCR	16. 78	17. 46	16. 94	16. 26	16. 21	mΩ	Pass
	ΔLLCR	3. 21	3. 68	4. 30	3. 31	3. 46	mΩ	Pass
8	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

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PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

Group B:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	16. 90	16. 83	17. 31	16. 13	15. 50	mΩ	Pass
3	Durability (preconditioning)	Normal	Normal	Normal	Normal	Normal	/	Pass
4	Thermal Shock	Normal	Normal	Normal	Normal	Normal	/	Pass
5	LLCR	15. 37	14. 71	17. 01	16. 78	17. 36	mΩ	Pass
	ΔLLCR	3. 49	3. 73	2. 88	3. 34	4. 14	mΩ	Pass
6	Cyclic Temp and Humidity	Normal	Normal	Normal	Normal	Normal	/	Pass
7	LLCR	15. 82	15. 14	17. 56	16. 60	17. 13	mΩ	Pass
	ΔLLCR	3. 51	3. 62	2. 93	3. 35	4. 06	mΩ	Pass
8	Reseating	Normal	Normal	Normal	Normal	Normal	/	Pass
9	LLCR	15. 92	14. 92	17. 27	16. 46	17. 29	mΩ	Pass
	ΔLLCR	3. 72	3. 81	2. 49	3. 29	4. 21	mΩ	Pass
10	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

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PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

Group C:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	16. 17	15. 97	15. 65	16. 99	17. 43	mΩ	Pass
3	Durability (preconditioning)	Normal	Normal	Normal	Normal	Normal	/	Pass
4	LLCR	16. 99	16. 48	16. 45	16. 49	16. 75	mΩ	Pass
	ΔLLCR	2. 83	2. 32	3. 30	1. 88	4. 16	mΩ	Pass
5	Vibration	Normal	Normal	Normal	Normal	Normal	/	Pass
6	LLCR	16. 77	17. 43	16. 04	17. 19	17. 20	mΩ	Pass
	ΔLLCR	2. 47	2. 50	3. 75	3. 63	3. 16	mΩ	Pass
7	Mechanical shock	Normal	Normal	Normal	Normal	Normal	/	Pass
8	LLCR	16. 67	16. 31	16. 76	16. 65	16. 55	mΩ	Pass
	ΔLLCR	2. 88	2. 98	3. 23	3. 50	3. 30	mΩ	Pass
9	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

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PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

Group D:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	16.37	17.37	16.67	16.67	16.09	mΩ	Pass
3	Mating Force	5.07	4.98	4.57	5.24	5.36	Kgf	Pass
4	Unmating Force	2.88	3.11	3.07	2.98	3.05	Kgf	Pass
5	Durability	Normal	Normal	Normal	Normal	Normal	/	Pass
6	Mating Force	6.17	5.74	6.07	6.27	6.21	Kgf	Pass
7	Unmating Force	3.58	4.21	3.54	3.49	3.26	Kgf	Pass
8	LLCR	16.88	17.09	15.65	16.76	16.54	mΩ	Pass
	ΔLLCR	3.36	3.58	2.73	2.49	2.40	mΩ	Pass
9	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

Group E:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	Insulation Resistance	＞500	＞500	＞500	＞500	＞500	MΩ	Pass
3	Dielectric withstanding voltage	250	250	250	250	250	VAC	Pass
4	Durability (preconditioning)	Normal	Normal	Normal	Normal	Normal	/	Pass
5	Temperature life	Normal	Normal	Normal	Normal	Normal	/	Pass
6	Dielectric withstanding voltage	250	250	250	250	250	VAC	Pass
7	Insulation Resistance	＞500	＞500	＞500	＞500	＞500	MΩ	Pass
8	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

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PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

Group F:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	17. 19	17. 34	17. 82	16. 10	17. 23	mΩ	Pass
3	Salt Spray	Normal	Normal	Normal	Normal	Normal	/	Pass
4	LLCR	17. 52	17. 13	17. 81	18. 41	18. 81	mΩ	Pass
	ΔLLCR	2. 37	4. 01	4. 36	4. 39	3. 31	mΩ	Pass
5	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

Group G:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	Resistance to soldering heat	Normal	Normal	Normal	Normal	Normal	/	Pass
3	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

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PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

Group H:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	15. 46	15. 09	17. 48	16. 79	17. 04	mΩ	Pass
3	Durability(preconditioning)	Normal	Normal	Normal	Normal	Normal	/	Pass
4	Temperature Life (preconditioning)	Normal	Normal	Normal	Normal	Normal	/	Pass
5	LLCR	16. 46	16. 46	17. 39	16. 68	17. 28	mΩ	Pass
	ΔLLCR	2. 80	3. 06	3. 37	3. 64	4. 07	mΩ	Pass
6	Mixed flowing gas	Normal	Normal	Normal	Normal	Normal	/	Pass
7	LLCR	16. 40	17. 14	17. 51	17. 04	18. 05	mΩ	Pass
	ΔLLCR	3. 18	3. 73	4. 12	3. 81	4. 42	mΩ	Pass
8	Thermal Disturbance	Normal	Normal	Normal	Normal	Normal	/	Pass
9	LLCR	16. 54	16. 90	18. 11	17. 45	17. 63	mΩ	Pass
	ΔLLCR	3. 31	3. 50	4. 49	3. 81	3. 75	mΩ	Pass
10	Reseating	Normal	Normal	Normal	Normal	Normal	/	Pass
11	LLCR	16. 69	17. 10	18. 15	17. 33	17. 31	mΩ	Pass
	ΔLLCR	3. 61	3. 70	4. 03	4. 06	3. 78	mΩ	Pass
12	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

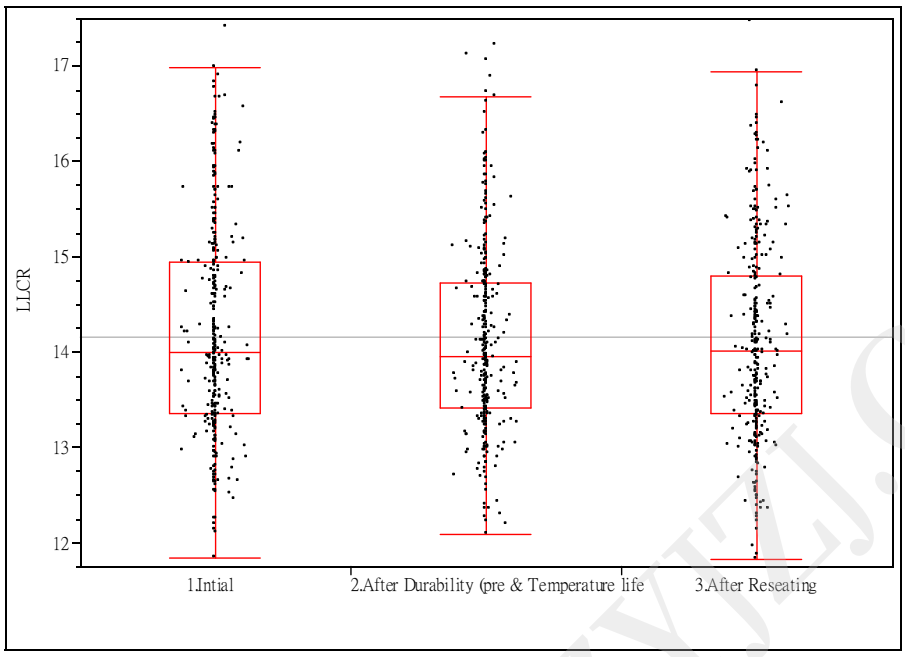
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PRODUCT RELIABILITY TEST REPORT

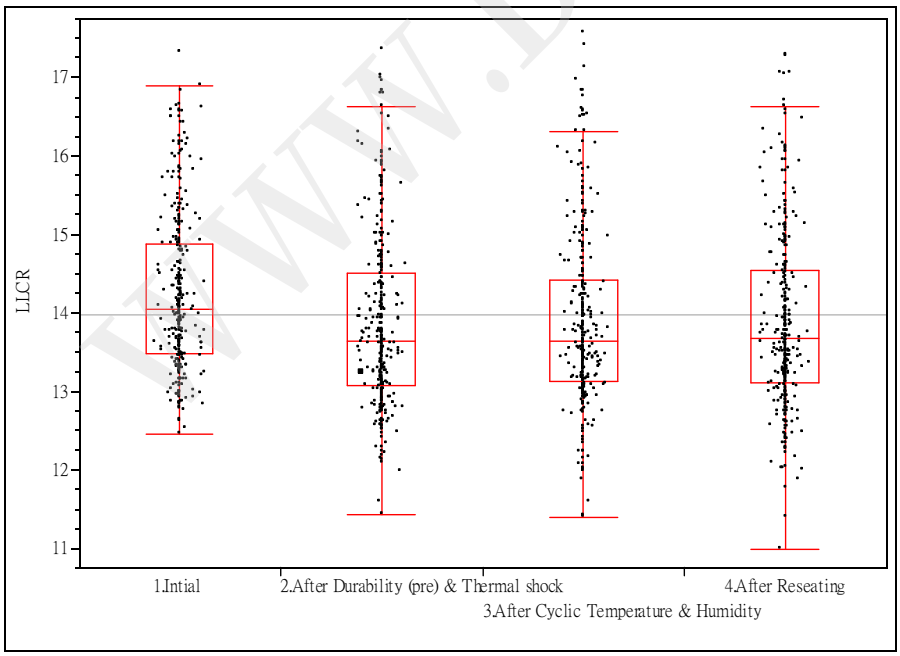
Report No. GL-RD20150814-07 **GL-P-027-005**

4. The JMP of LLCR as follow: (Unit: mΩ)

Group A:



Group B:

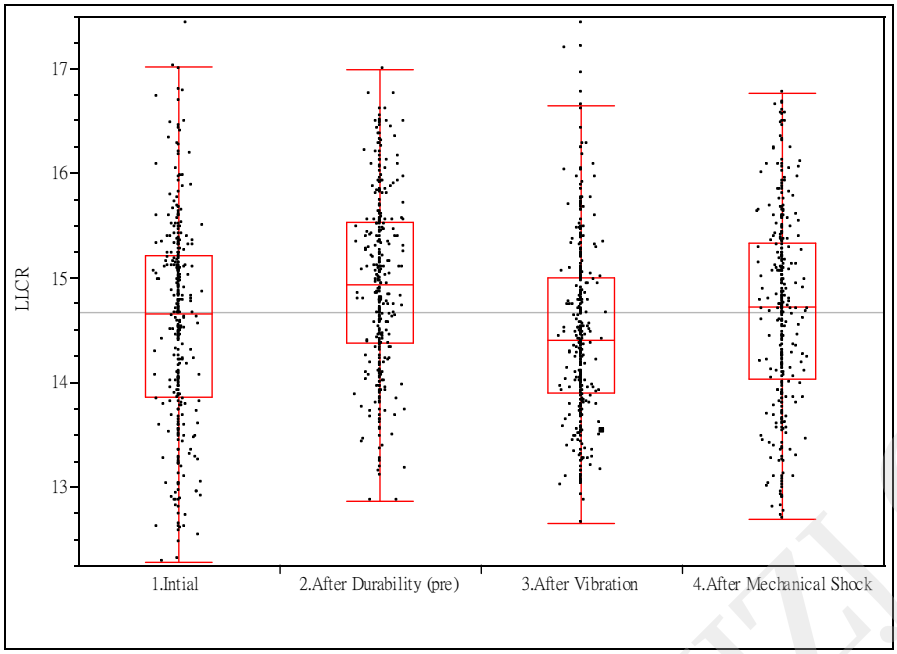


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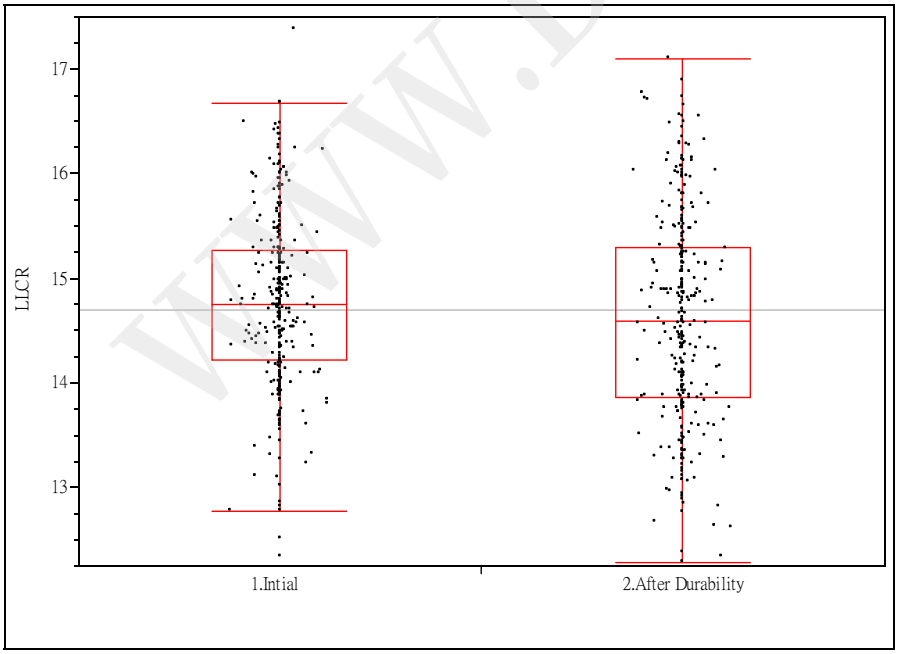
PRODUCT RELIABILITY TEST REPORT

Report No. GL-RD20150814-07 **GL-P-027-005**

Group C:



Group D:

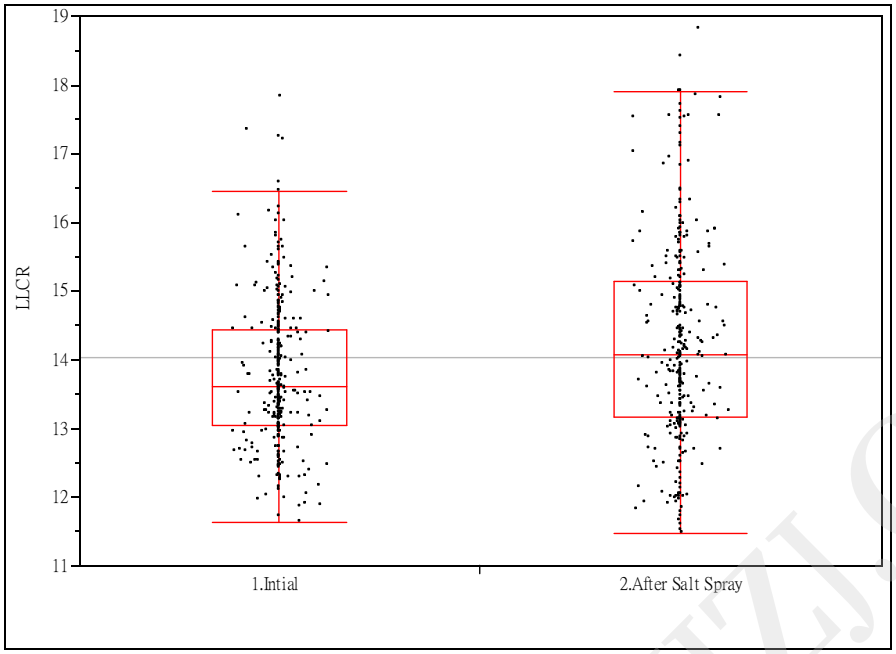


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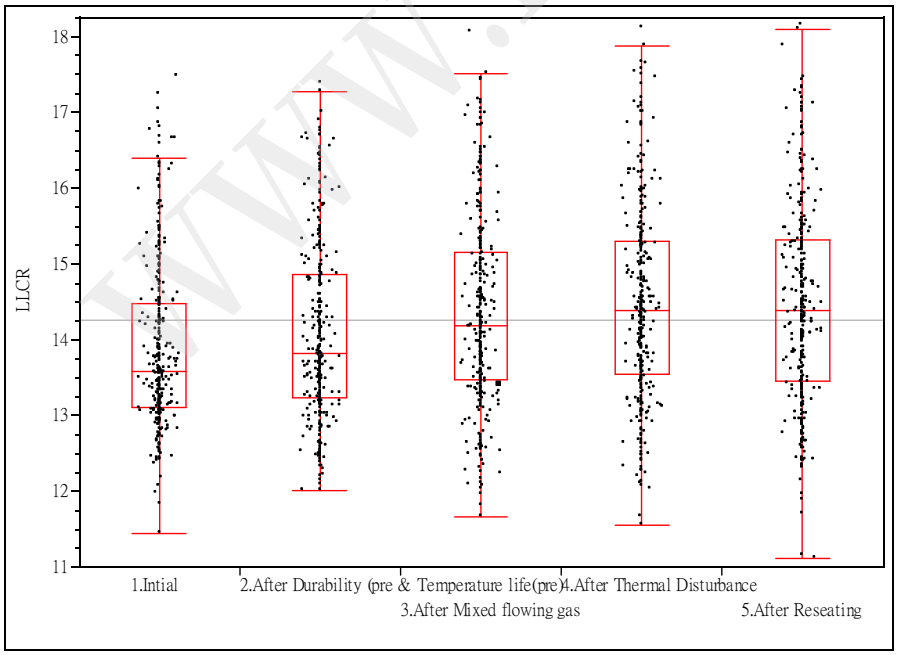
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Group F:



Group H:



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PRODUCT RELIABILITY TEST REPORT

5. The LLCR data as follow：(Unit: mΩ)

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ENEOS LC COMPANY, LIMITED

ENEOS LC COMPANY, LIMITED
Resin Sales & Planning Department
Sales Division

Typical properties of Xydar® NC-301BL

Properties	Unit	Method (ASTM)	NC-301BL
Tensile strength (3.2mmT) 抗拉强度	MPa	D638	135
Tensile Modules (3.2mmT) 抗张弹性率	GPa		17.0
Elongation (3.2mmT) 抗张伸展率	%		1.5
Flexural strength (3.2mmT) 弯曲强度	MPa	D790	185
Flexural modulus (3.2mmT) 弯曲弹性率	GPa		15.1
Poisson's ratio 泊松比	—	—	0.41
Izod impact strength (Un-notched) Izod 冲擊强度 Unnotched - 无缺口	kJ/m^2	D256	33
Rockwell Hardness 洛氏硬度	R Scale	D785	108
Specific gravity 比重	—	D792	1.70
Water absorption 吸水率	%	D570	0.02
Deflection temperature under load (1.82Mpa) 热变形温度(1.82Mpa)	℃	D648	285
Thermal conductivity 导热系数	kcal/m•hr•℃	F433	0.340
Flammability rating (V-0 applied thickness) 难燃性（V-0 取得済み）	mm	UL94	0.20
Oxygen index 氧指数	%	D2863	46
Dielectric strength 耐电强度	kV/mm	D149	44.7

XYDAR® is a trademark of SOLVAY SPECIALTY POLYMERS USA, L.L.C.

本資料掲載的物性數值為代表值並非該材料的最低保証値。

本資料掲載的内容由於改良等原因可能進行更改敬請注意。

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Arc resistance 耐电弧	sec	D495	127

Properties		Unit	Method (ASTM)	NC-301BL
Volume resistivity 体积抵抗率		$X10^{15}\Omega \cdot cm$	D257	15.2
Surface resistivity 表面抵抗率		$X10^{15}\Omega$		28.0
Dielectric constant 誘電率	10^2Hz 10^6Hz	— —	D150	4.4 3.8
Dielectric dissipation factor 誘電正接	10^2Hz 10^6Hz	— —		N/A 0.029

Coefficient of Linear Thermal Expansion (線膨脹係數) Unit:10^{-5}cm/cm/℃

Grade	Direction*	Range of Temperature (溫度範圍) (℃)			
		50-100	100-150	150-200	200-250
NC-301BL	MD	0.4	0.4	0.3	0.1
	TD	5.0	5.9	6.6	6.8

Direction* ： MD= Machine Direction
TD= Transversal Direction
成形品 ： 100mm x 100mm x 3mm 平板

Molding shrinkage(成形收縮率) Unit:%

Grade	MD	TD
NC-301BL	0.02	0.48

Direction： MD= Machine Direction
TD= Transversal Direction
成形品 ： 100mm x 100mm x 1mm 平板

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本資料揭載的内容由於改良等原因可能進行更改敬請注意。

Molding Conditions (成形条件)

成形參數		Unit	NC-301BL 成形範围	NC-301BL 推薦條件
温度 Temp [℃]	后段温度	℃	300~320	300
	中段温度	℃	320~350	340
	前段温度	℃	340~360	360
	射嘴温度	℃	340~360	360
	模具温度	℃	40~120	80~120
射出壓力		MPa	30~120	40~80
射出速度		—	中～高速	中～高速
保持壓力		MPa	20~80	40~60
背压		MPa	3~10	3~5
初期開模速度		%	10 以下	5
冷卻時間		可能範圍內稍長		
干燥条件		Over 150℃; 8~24 hours		

1. 出现流涎时请将喷嘴温度降一些
2. 松退设定过大会较容易卷入空气，请注意
3. 请将残量设低（为防止材料热降解）
4. 冷却时间与计量时间的差较大的情况，推荐设定计量延迟时间
5. 由于固化速度相对较慢，冷却时间请多抓一些，并缓速开模

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View additional material information including performance and processing data

The information presented on the UL Prospector datasheet was acquired by UL Prospector from the producer of the material. UL Prospector makes substantial efforts to assure the accuracy of this data. However, UL Prospector assumes no responsibility for the data values and strongly encourages that upon final material selection, data points are validated with the material supplier.

Component - Plastics E91944

Guide Information

ENEOS LC COMPANY, LIMITED

2647-2 HIRAIDE, TATSUNO-MACHI, KAMIINA-GUN NAGANO 399-0422 JP

NC-301, LCP NC-301

Liquid Crystal Polymer (LCP), furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC, BK	0.2	V-0	-	-	130	130	130
	3.0	V-0	-	-	130	130	130

Comparative Tracking Index (CTI): -
Dielectric Strength (kV/mm): -
High-Voltage Arc Tracking Rate (HVTR): -
Dimensional Stability (%): -
Inclined Plane Tracking (IPT) kV: -
Volume Resistivity (10^x ohm-cm): -
Surface Resistivity (10^x ohms/square): -
High Volt, Low Current Arc Resis (D495): -

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 2000-06-08
Last Revised: 2010-11-05

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IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.2	V-0 (NC, BK)
			3.0	V-0 (NC, BK)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	°C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	°C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	°C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-1	kJ/m^2	-	-

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測試報告
Test Report

號碼(No.): ETR20C06147　　日期(Date): 05-Jan-2021　　

ENEOS LC COMPANY, LIMITED
2647-2, HIRAIDE, TATSUNO-MACHI, KAMIINA-GUN, NGANO, 399-0422 JAPAN

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)	:	ENEOS LC COMPANY, LIMITED
樣品名稱(Sample Name)	:	LIQUID CRYSTAL POLYMER
樣品型號(Style/Item No.)	:	NC-301 BL

==========

收件日(Sample Receiving Date)	:	24-Dec-2020
測試期間(Testing Period)	:	24-Dec-2020 to 05-Jan-2021

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

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

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

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

PIN CODE: D46FF942

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測試報告
Test Report

ENEOS LC COMPANY, LIMITED
2647-2, HIRAIDE, TATSUNO-MACHI, KAMIINA-GUN, NGANO, 399-0422 JAPAN

測試部位敘述 (Test Part Description)

No.1 : 黑色塑膠粒 (BLACK PLASTIC PELLETS)

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	限值 (Limit)
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	100
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	6.15	1000
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	1000
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) (CAS No.: 18540-29-9)	參考IEC 62321-7-2: 2017，以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.	1000
一溴聯苯 (Monobromobiphenyl)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	mg/kg	5	n.d.	-
二溴聯苯 (Dibromobiphenyl)		mg/kg	5	n.d.	-
三溴聯苯 (Tribromobiphenyl)		mg/kg	5	n.d.	-
四溴聯苯 (Tetrabromobiphenyl)		mg/kg	5	n.d.	-
五溴聯苯 (Pentabromobiphenyl)		mg/kg	5	n.d.	-
六溴聯苯 (Hexabromobiphenyl)		mg/kg	5	n.d.	-
七溴聯苯 (Heptabromobiphenyl)		mg/kg	5	n.d.	-
八溴聯苯 (Octabromobiphenyl)		mg/kg	5	n.d.	-
九溴聯苯 (Nonabromobiphenyl)		mg/kg	5	n.d.	-
十溴聯苯 (Decabromobiphenyl)		mg/kg	5	n.d.	-
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.	1000

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一溴聯苯醚 (Monobromodiphenyl ether)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	mg/kg	5	n.d.	-
二溴聯苯醚 (Dibromodiphenyl ether)		mg/kg	5	n.d.	-
三溴聯苯醚 (Tribromodiphenyl ether)		mg/kg	5	n.d.	-
四溴聯苯醚 (Tetrabromodiphenyl ether)		mg/kg	5	n.d.	-
五溴聯苯醚 (Pentabromodiphenyl ether)		mg/kg	5	n.d.	-
六溴聯苯醚 (Hexabromodiphenyl ether)		mg/kg	5	n.d.	-
七溴聯苯醚 (Heptabromodiphenyl ether)		mg/kg	5	n.d.	-
八溴聯苯醚 (Octabromodiphenyl ether)		mg/kg	5	n.d.	-
九溴聯苯醚 (Nonabromodiphenyl ether)		mg/kg	5	n.d.	-
十溴聯苯醚 (Decabromodiphenyl ether)		mg/kg	5	n.d.	-
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.	1000
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP)) (CAS No.: 85-68-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP)) (CAS No.: 84-74-2)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) (CAS No.: 117-81-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) (CAS No.: 84-69-5)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result) No.1	限值 (Limit)
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正戊酯 (DNPP) (Di-n-pentyl phthalate (DNPP)) (CAS No.: 131-18-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正己酯 (DNHP) (Di-n-hexyl phthalate (DNHP)) (CAS No.: 84-75-3)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸雙(2-甲氧基乙基)酯 (DMEP) (Bis(2-methoxyethyl) phthalate (DMEP)) (CAS No.: 117-82-8)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二異戊酯 (DIPP) (Diisopentyl phthalate (DIPP)) (CAS No.: 605-50-5)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二(C7-11支鏈與直鏈)烷基酯 (DHNUP) (1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)) (CAS No.: 68515-42-4)	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 (C6-8支鏈)烷基酯，富C7 (DIHP) (1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)) (CAS No.: 71888-89-6)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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六溴環十二烷及所有主要被辨別出的異構物(HBCDD) (α- HBCDD, β- HBCDD, γ- HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321: 2008，以氣相層析儀/質譜儀分析。(With reference to IEC 62321: 2008, analysis was performed by GC/MS.)	mg/kg	5	n.d.	-
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	171	-
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)		mg/kg	50	n.d.	-
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.	-
中鏈氯化石蠟(C14-C17) (MCCP) (Medium Chain Chlorinated Paraffins(C14-C17) (MCCP)) (CAS No.: 85535-85-9)	參考US EPA 3550C: 2007，以氣相層析儀/質譜儀分析。(With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.)	mg/kg	100	n.d.	-
五氯酚及其鹽類 (Pentachlorophenol and its salts) (CAS No.: 87-86-5 and its salts)	參考US EPA 8041A: 2007，以氣相層析儀/質譜儀分析。(With reference to US EPA 8041A: 2007, analysis was performed by GC/MS.)	mg/kg	1	n.d.	-
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0)	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-41-7)		mg/kg	2	n.d.	-
三氧化二銻 (Sb_2O_3) (Antimony trioxide (Sb_2O_3)) (CAS No.: 1309-64-4)	由銻結果計算得之。(Calculated from the result of Antimony.)	mg/kg	2▲	n.d.	-

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全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	參考US EPA 3550C: 2007，以液相層析儀/質譜儀分析。(With reference to US EPA 3550C: 2007, analysis was performed by LC/MS.)	mg/kg	10	n.d.	-
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考US EPA 3550C: 2007，以液相層析儀/質譜儀分析。(With reference to US EPA 3550C: 2007, analysis was performed by LC/MS.)	mg/kg	10	n.d.	-
聚氯乙烯 (Polyvinyl chloride) (PVC)	參考ASTM E1252: 2013，以傅立葉轉換紅外線光譜儀及焰色法分析。(With reference to ASTM E1252: 2013, analysis was performed by FT-IR and Flame Test.)	**	-	Negative	-

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)
5. **= Qualitative analysis (No Unit) 定性分析(無單位)
6. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)
7. 全氟辛烷磺酸及其鹽類包含 (PFOS and its salts including) :
   CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
8. 全氟辛酸及其鹽類包含 (PFOA and its salts including) :
   CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
9. ▲：MDL是針對元素/測試化合物之評估。(The MDL was evaluated for element / tested substance.)
   換算公式 (Conversion Formula)：AX = A × F

AX	A	F
三氧化二銻 (Antimony trioxide) (Sb_2O_3)	銻 (Antimony)	1.1971

   參數換算表 (Parameter Conversion Table)：
   https://eecloud.sgs.com/Region_TW/DocDownload.aspx#otherDoc
10. 符合性結果之判定係以測試結果與限值做比較。(The statement of compliance conformity is based on comparison of testing results and limits.)

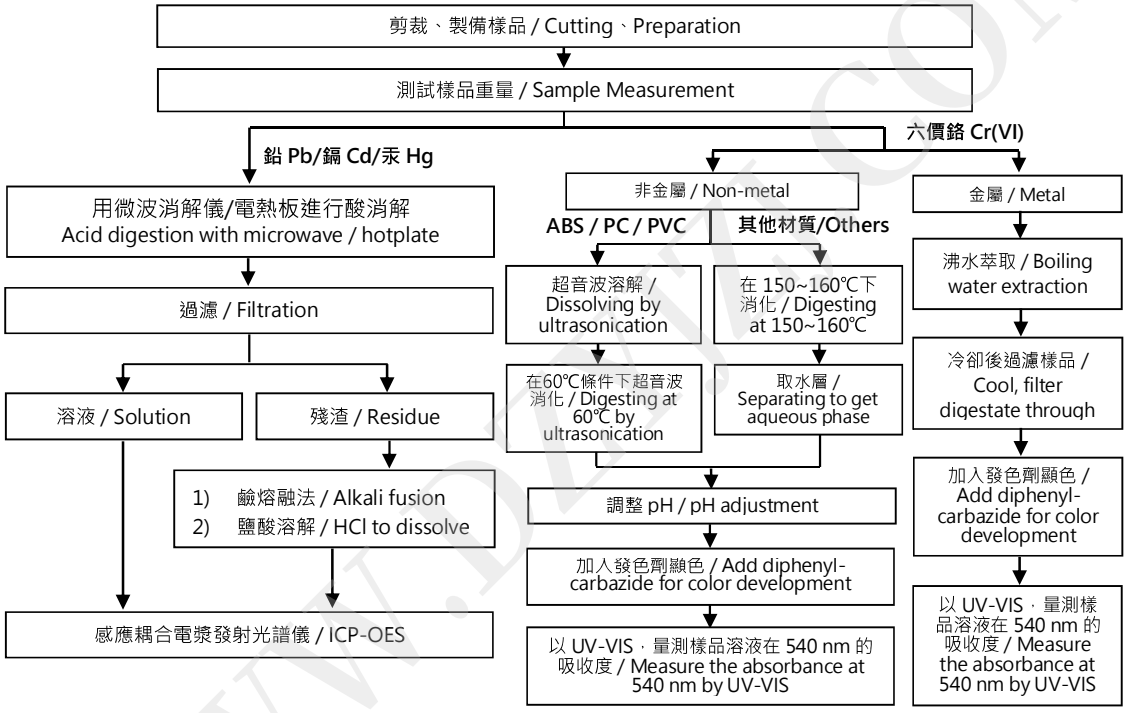
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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）

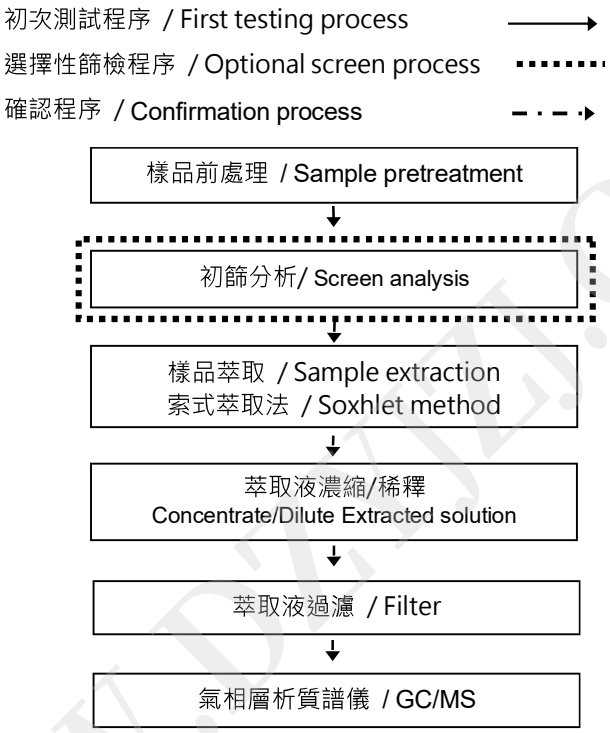
These samples were dissolved totally by pre-conditioning method according to below flow chart.
（Cr^{6+} test method excluded）



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

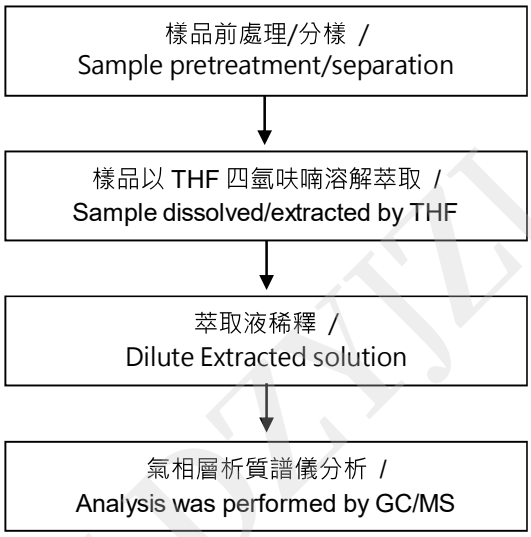


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可塑劑分析流程圖 / Analytical flow chart - Phthalate

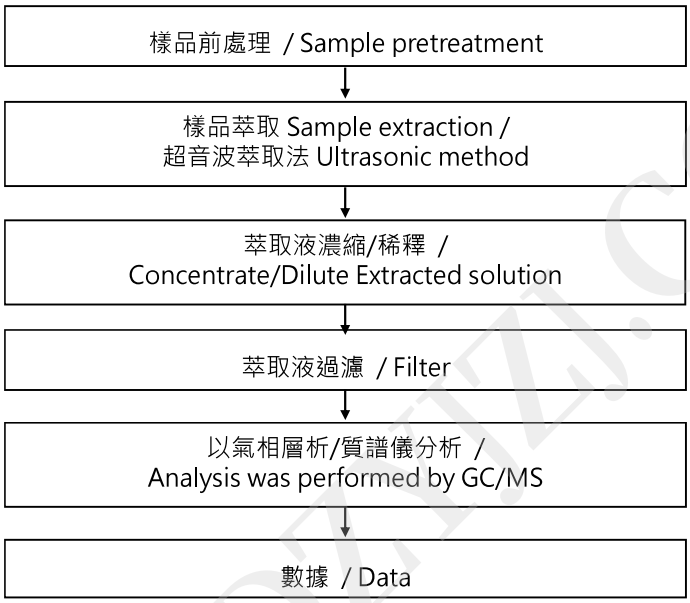
【測試方法/Test method: IEC 62321-8】



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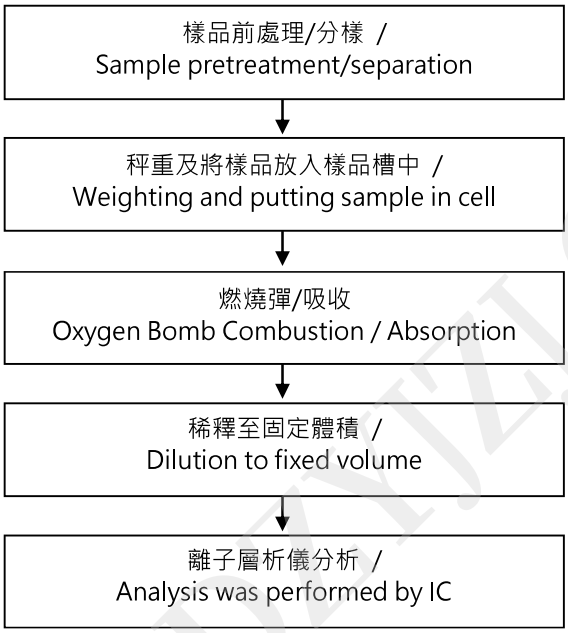
六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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ENEOS LC COMPANY, LIMITED
2647-2, HIRAIDE, TATSUNO-MACHI, KAMIINA-GUN, NGANO, 399-0422 JAPAN

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



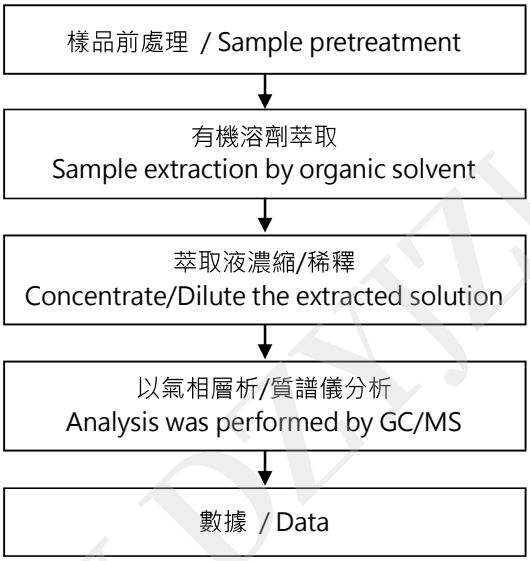
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ENEOS LC COMPANY, LIMITED
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分析流程圖 / Analytical flow chart

【適用於：多氯聯苯、多氯奈、多氯三聯苯、滅蟻靈、氯化石蠟、DBBT】

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



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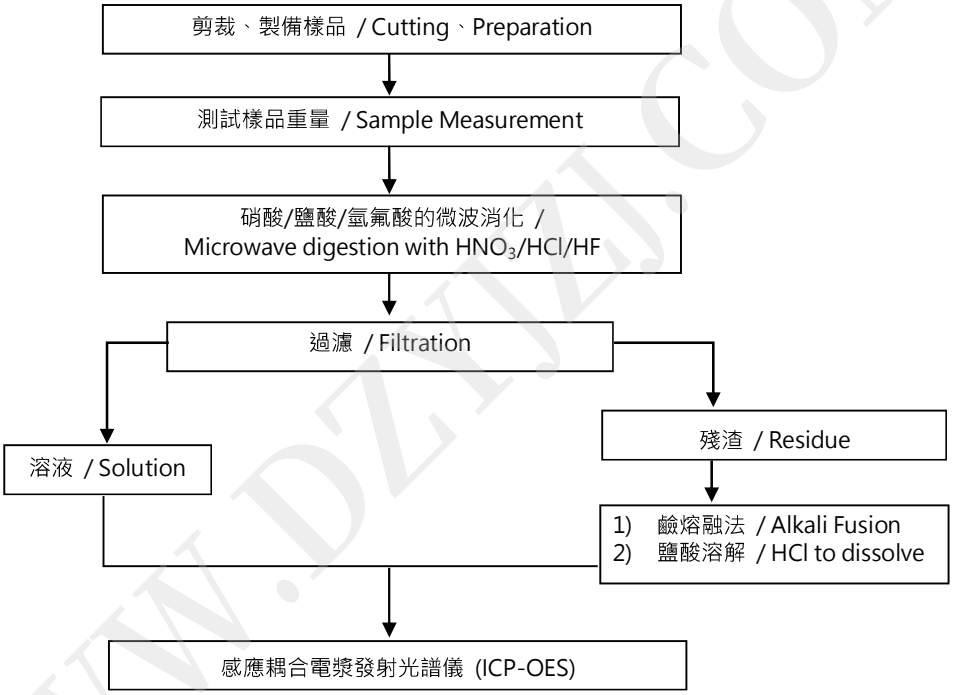
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2647-2, HIRAIDE, TATSUNO-MACHI, KAMIINA-GUN, NGANO, 399-0422 JAPAN

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。

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

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

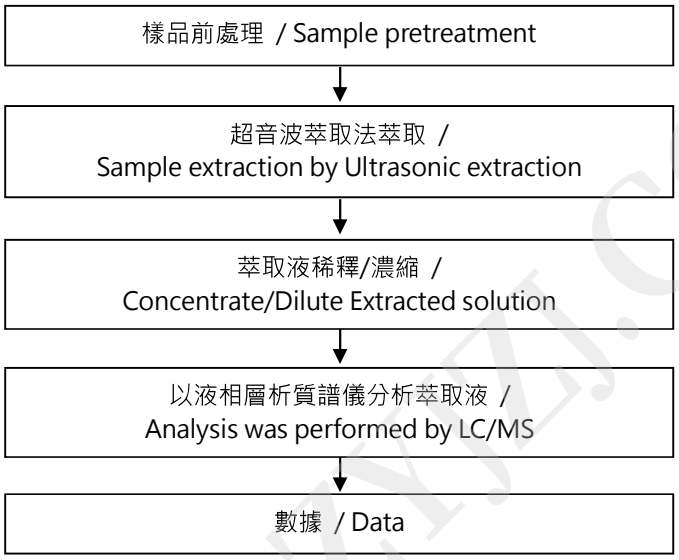


* US EPA 3051 方法未添加氫氟酸 / US EPA 3051 method does not add HF.

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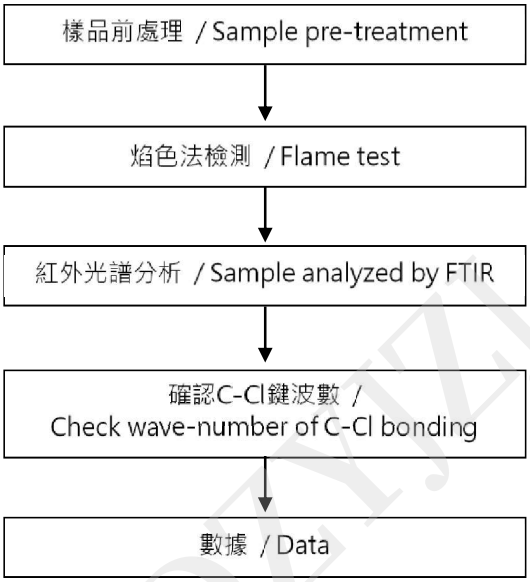
全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS



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ENEOS LC COMPANY, LIMITED
2647-2, HIRAIDE, TATSUNO-MACHI, KAMIINA-GUN, NGANO, 399-0422 JAPAN

聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC



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測試報告
Test Report

ENEOS LC COMPANY, LIMITED
2647-2, HIRAIDE, TATSUNO-MACHI, KAMIINA-GUN, NGANO, 399-0422 JAPAN

*** 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.)

ETR20C06147



** 報告結尾 (End of Report) **

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SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

- Product name : **XYDAR® NC-301 BL**
- Type of product : Liquid Crystal Polymer

1.2 Identified uses / Uses advised against

- Identified uses : -For further information, please contact: Supplier

1.3 Manufacturer or supplier's details

- Company : ENEOS LC COMPANY, LIMITED
- Department : Operation Department
- Address : 2647-2 Hiraide, Tatsuno-machi, Kamiina-gun, Nagano 399-0422,Japan
- Telephone : +81-266-43-3586
- Fax : +81-266-43-1425

1.4 Emergency telephone number

- Emergency telephone number +81-266-43-3586 8:30-17:00 (JAPAN TIME)

1.5 Issued information

- Issued 2002/12/05
- Supersedes 2021/01/01

2 HAZARDS IDENTIFICATION

2.1 GHS Classification

2.1.1 European regulation (EC) 1272/2008, as amended

- Not classified as hazardous according to the European regulation (EC) 1272/2008, as amended

2.1.2 European Directive 67/548/EEC or 1999/45/EC, as amended

- Not classified as hazardous according to European Directive 67/548/EEC or 1999/45/EC, as amended

2.2 EC Label - According to Regulation (EC) 1272/2008, as amended

- *No labelling*

2.3 Occupational Health and Safety Law of Japan.

- This commodity contains "Carbon black". It corresponds to the detriment whose names and related information has to be advised according to Occupational Health and Safety Law of Japan. Please comply with the regulation stipulated in the relevant laws when handling.

2.4 Other hazards which do not result in classification

- Product dust may be irritating to eyes, skin and respiratory system.
- Hazardous decomposition products formed under fire conditions

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SAFETY DATA SHEET

3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Concentration

Substance name	Concentration
Liquid Crystal Polymer CAS-No.: - / EC-No.: - / Index-No.: -	>=50 - <= 70 %
3MgO・4SiO2・H2O CAS-No.: 14807-96-6 / EC-No.: 238-877-9 / Index-No.: -	>=5 - <= 25 %
Fiberglass CAS-No.: 65997-17-3 / EC-No.: 266-046-0 / Index-No.: -	>= 20 - <= 40 %
Carbon black CAS-No.: 1333-86-4 / EC-No.: 215-609-9 / Index-No.: -	>= 0- <= 2 %

4 FIRST AID MEASURES

4.1 Description of necessary first-aid measures

4.1.1 If inhaled

- Remove to fresh air.
- Call a physician immediately.
- Hazardous decomposition products
- Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion.
- Remove the subject from dusty environment and let him blow his nose.

4.1.2 In case of eye contact

- Flush eyes with running water for several minutes, while keeping the eyelids wide open.
- Rinse thoroughly with plenty of water, also under the eyelids.
- If eye irritation persists, consult a specialist.

4.1.3 In case of skin contact

- Wash off with soap and water.
- Wash contaminated clothing before re-use.
- If symptoms persist, call a physician.
- Cool skin rapidly with cold water after contact with hot polymer.
- Do not peel polymer from the skin.
- Obtain medical attention.

4.1.4 If swallowed

- Never give anything by mouth to an unconscious person.
- If a large amount is swallowed, get medical attention.

4.2 Most important symptoms/effects, acute and delayed

4.2.1 Inhalation

- Mechanical irritation from the particulates generated by the product.
- In case of repeated or prolonged exposure: risk of bronchitis (fiber glass).
- Thermal decomposition can lead to release of hazardous gases and vapors

4.2.2 Skin contact

- Mechanical irritation from the particulates generated by the product.
- Risk of itching of the skin/dermatitis (fiber glass).

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4.2.3 Eye contact

- Mechanical irritation from the particulates generated by the product.

4.2.4 Ingestion

- Low ingestion hazard.

5 FIRE-FIGHTING MEASURES

5.1 Extinguishing media

5.1.1 Suitable extinguishing media

- powder
- Foam
- Water
- Water spray
- Carbon dioxide (CO_2)

5.1.2 Unsuitable extinguishing media

- None.

5.2 Specific hazards arising from the chemical

- Combustible material
- In a fire, the polymer melts, producing droplets which may propagate fire.
- Once started, a fire will tend to self extinguish (see section 9).
- Risk of dust explosion.
- Heating can release hazardous gases.

5.3 Special protective actions for fire-fighters

- In the event of fire, wear self-contained breathing apparatus.
- Fire fighters must wear fire resistant personnel protective equipment.
- Wear chemical resistant over suit
- Avoid dust formation.

6 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 Advice for non-emergency personnel

- Refer to protective measures listed in sections 7 and 8.

6.1.2 Advice for emergency responders

- Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions

- Should not be released into the environment.
- Do not flush into surface water or sanitary sewer system.

6.3 Methods and materials for containment and cleaning up

- Sweep up and shovel into suitable containers for disposal.
- Avoid dust formation.
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.
- Treat recovered material as described in the section "Disposal considerations".

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7 HANDLING AND STORAGE

7.1 Precautions for safe handling

- Take measures to prevent the buildup of electrostatic charge.
- Ensure all equipment is electrically grounded before beginning transfer operations.
- Use only equipment and materials which are compatible with the product.
- To avoid thermal decomposition, do not overheat.
- Avoid prolonged or repeated contact with skin.

7.2 Conditions for storage, including incompatibilities

7.2.1 Storage

- Keep container closed.
- Keep away from heat and sources of ignition.
- Keep away from open flames, hot surfaces and sources of ignition.
- To avoid thermal decomposition, do not overheat.
- Avoid dust formation.
- Refer to protective measures listed in sections 7 and 8.
- Do not smoke.

7.3 Specific use(s)

- For further information, please contact: Supplier

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Exposure Limit Values

- US. ACGIH Threshold Limit Values 2007
  time weighted average = 3 mg/m^3
  Remarks: Reparable particles.
- US. ACGIH Threshold Limit Values 2008
  time weighted average = 10 mg/m^3
  Remarks: Inhalable particles.

Fiberglass

- UK. EH40 Workplace Exposure Limits (WELs) 2007
  time weighted average = 5 mg/m^3
  time weighted average = 1 fibers/mL
  Remarks: fibers
- US. ACGIH Threshold Limit Values 2009
  time weighted average = 5 mg/m^3
  Remarks: Alveolar dust fraction
- US. ACGIH Threshold Limit Values 2009
  time weighted average = 1 fibers/cm^3
  Remarks: fibers, F: Reparable fibers: length > 5 micrometers; aspect ratio >= 3:1, as determined by the membrane filter method at 400-450X magnification (4-mm objective), using phase-contrast illumination.

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Carbon black

- UK. EH40 Workplace Exposure Limits (WELs) 2007
  time weighted average = 3.5 mg/m^3
  Remarks: Reparable.
- UK. EH40 Workplace Exposure Limits (WELs) 2007
  time weighted average = 7 mg/m^3
  Remarks: Inhalable
- US. ACGIH Threshold Limit Values 2009
  time weighted average = 3.5 mg/m^3

8.2 Exposure controls

8.2.1 Appropriate engineering controls

- Provide local ventilation appropriate to the product decomposition risk (see section 10).
- Provide appropriate exhaust ventilation at places where dust is formed.
- Refer to protective measures listed in sections 7 and 8.
- Apply technical measures to comply with the occupational exposure limits.

8.2.2 Individual protection measures

8.2.2.1 Respiratory protection

- In case of insufficient ventilation, wear suitable respiratory equipment.
- When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
- Use only respiratory protection that conforms to international/ national standards.
- In case of dust clouds/fog/fumes, dust mask type P1.
- In case of decomposition (see section 10), face mask with combined type B-P2 cartridge.

8.2.2.2 Hand protection

- For prolonged or repeated contact use protective gloves.
- When handling hot material, use heat resistant gloves.

8.2.2.3 Eye protection

- Safety glasses with side-shields
- Dust proof goggles, if dusty.

8.2.2.4 Skin and body protection

- Long sleeved clothing

8.2.2.5 Hygiene measures

- When using does not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

8.2.3 Environmental exposure controls

- Dispose of rinse water in accordance with local and national regulations.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Physical and chemical properties

9.1.1 General Information

■ Appearance	pellets
■ Color	Black
■ Odor	odorless

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9.1.2 Important health safety and environmental information

■ pH	not applicable
■ pKa	No data
■ Melting point/freezing point	330-350 °C, Softening point
■ Boiling point/boiling range	not applicable
■ Flash point	not applicable
■ Evaporation rater	No data
■ Flammability(solid, gas)	No data
■ Flammability	No data
■ Explosive properties	Risk of dust explosion.
– Upper explosion limit	no data available
– Lower explosion limit	no data available
■ Vapor pressure	not applicable
■ Vapor density	No data
■ Density	1.7
■ Relative density	no data available
■ Bulk density	No data
■ Solubility(ies)□□	negligible, Water
■ Solubility /qualitative□	No data
■ Partition coefficient: n-octanol/water	not applicable
■ Autoignition temperature	No data
■ Decomposition temperature	480 °C, Extended period of exposure (ca. 1 hour).
■ Viscosity	No data
■ Oxidizing properties	No data

10 STABILITY AND REACTIVITY

10.1 Chemical stability

- Stable under normal conditions.
- Hazardous Polymerization: no

10.2 Conditions to avoid

- Heat, flames and sparks.
- To avoid thermal decomposition, do not overheat.
- Avoid dust formation.

10.3 Materials to avoid

- no data available

10.4 Hazardous decomposition products

- Carbon monoxide, the release of other hazardous decomposition products is possible.

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11 TOXICOLOGICAL INFORMATION

11.1 Acute toxicity

11.1.1 Acute oral toxicity

- no data available

11.1.2 Mutagenicity

- no data available

11.1.3 Other information

- The product is biologically inert.
- Because the components are encapsulated in the resin and may not be bioavailable in the body, they may not exert the above mentioned health effects.
- Product dust may be irritating to eyes, skin and respiratory system.
- Description of possible hazardous to health effects is based on experience and/or toxicological characteristics of several components.

12 ECOLOGICAL INFORMATION

12.1 Toxicity

- no data available

12.2 Persistence and degradability

12.2.1 Abiotic degradation

- Result: no data available

12.2.2 Biodegradation

- no data available

12.3 Bioaccumulative potential

- Result: no data available

12.4 Mobility

- no data available

12.5 Other adverse effects

- no data available
- The product is biologically inert.
- Ingestion of solids may cause harm to wildlife due to intestinal mechanical blockage or starvation from false feeling of satiation.

13 DISPOSAL CONSIDERATIONS

13.1 Waste disposal methods

- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
- Can be landfilled, when in compliance with local regulations.

13.2 Contaminated packaging

- Empty containers.
- Dispose of as unused product.

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SAFETY DATA SHEET

14 TRANSPORT INFORMATION

14.1 International transport regulations

- Sea (IMO/IMDG) : not regulated
- Air (ICAO/IATA) : not regulated
- European Road/Rail (ADR/RID) : not regulated
- Inland waterway transport : not regulated
- Other cautions : Handle with care so as not to give damages to containers or not to be subjected to wetting.

15 REGULATORY INFORMATION

15.1 Applicable Laws or Regulations

15.2 Notification status

Inventory Information	**Status**
Toxic Substance Control Act list (TSCA)	- Listed on inventory
EU list of existing chemical substances (EINECS)	- In compliance with inventory
Canadian Domestic Substances List (DSL)	- One or more components not listed on inventory
Japanese Existing and New Chemical Substances (MITI List) (ENCS)	- Listed on inventory
Australian Inventory of Chemical Substances (AICS)	- One or more components not listed on inventory
Korean Existing Chemicals List (ECL)	- Listed on inventory
Philippine Inventory of Chemicals and Chemical Substances (PICCS)	- Listed on inventory
Inventory of Existing Chemical Substances (China) (IECS)	- Listed on inventory

16 OTHER INFORMATION

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as permission or recommendation for the use of any product in a matter that might infringe existing patents. No warranty is made, either expresses or implied.

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KURARAY CO., LTD
(KABUSIKI KAISHA KURARAY)
1-3, 1-CHOME, OTEMACHI, CHIYODA-KU, TOKYO, 100-8115, JAPAN
TELEPHONE 81-3-6701-1681
FACSIMILE 81-3-6701-1580

To whom It may concern;

Date ; SEP. 15, 2010

We are pleased to submit the INSPECTION REPORT OF GENESTAR as follows;

INSPECTION REPORT OF GENESTAR

Grade : GP2450NH
Type :
Color : KB327
Lot No. : 0629K39
Quantity : 1,000 KG
P/O No. : WT-123
KT99110

Item	Test method	Unit	Test result
Tensile strength	ASTM-D638	MPa	134
Tensile elongation	ASTM-D638	%	3
Flexural strength	ASTM-D790	MPa	186
Flexural modulus	ASTM-D790	GPa	13.6
Notched izod impact strength	ASTM-D256	J/m	106.8

Takao Ishiyashi

GENESTAR
QUALITY CONTROL SECTION
GENESTAR DIVISION

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View additional material information including performance and processing data

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Component - Plastics E90350

Guide Information

KURARAY CO LTD

GENESTAR DIV, OTE CENTER BLDG 1-1-3, OTEMACHI, CHIYODA-KU TOKYO 100-8115 JP

GP2450NH(rr)

Polyamide 9T (PA9T) "Genestar", furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.150	V-0	-	-	-	-	-
	0.40-0.44	V-0	3	3	140	120	130
	1.5	-	-	-	140	120	130
	3.0	-	-	-	140	125	140

Comparative Tracking Index (CTI): 0
Dielectric Strength (kV/mm): -
High-Voltage Arc Tracking Rate (HVTR): 0
Dimensional Stability (%): -
Inclined Plane Tracking (IPT) kV: -
Volume Resistivity (10^x ohm-cm): -
Surface Resistivity (10^x ohms/square): -
High Volt, Low Current Arc Resis (D495): 4

(rr) - Virgin and regrind up to 50% by weight have the same basic material characteristics.

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 2009-10-28
Last Revised: 2020-01-21

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IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.150	V-0 (ALL)
			0.40-0.44	V-0 (ALL)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	°C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	°C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	°C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-1	kJ/m^2	-	-

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Contact [illegible] GS
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測試報告
Test Report

號碼(No.): ETR21201700　　日期(Date): 24-Feb-2021　　

KURARAY CO., LTD.
OTE CENTER BUILDING, 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO 100-8115, JAPAN

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)	:	KURARAY CO., LTD.
樣品名稱(Sample Name)	:	NEW HEAT RESISTANT POLYAMIDE RESIN
樣品型號(Style/Item No.)	:	GP2450NH BLACK

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收件日(Sample Receiving Date)	:	08-Feb-2021
測試期間(Testing Period)	:	08-Feb-2021 to 24-Feb-2021

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

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

結　論(Conclusion) : (2) 根據客戶所提供的樣品，多環芳香烴測試結果符合德國產品安全委員會(AfPS) GS PAHs第 1 類 之限值要求。(Based upon the performed tests on the submitted sample(s), the test results of PAHs (15 items) comply with the limits of PAHs requirement (Category 1) as set by German Committee on Product Safety (AfPS) GS PAHs.)

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

CHECK REPORT
PIN CODE: 43BC27BE

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測試報告
Test Report

KURARAY CO., LTD.
OTE CENTER BUILDING, 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO 100-8115, JAPAN

測試部位敘述 (Test Part Description)

No.1 : 黑色塑膠粒 (BLACK PLASTIC PELLETS)

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)	限值 (Limit)
				No.1	
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-
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	5.45	-
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	限值 (Limit)
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)	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(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) (CAS No.: 117-81-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) (CAS No.: 84-69-5)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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測試報告
Test Report

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OTE CENTER BUILDING, 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO 100-8115, JAPAN

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result) No.1	限值 (Limit)
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
六溴環十二烷及所有主要被辨別出的異構物(HBCDD) (α- HBCDD, β- HBCDD, γ- HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321: 2008，以氣相層析儀/質譜儀分析。(With reference to IEC 62321: 2008, analysis was performed by GC/MS.)	mg/kg	5	n.d.	-
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	1900	-
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	參考US EPA 3550C: 2007，以液相層析儀/質譜儀分析。(With reference to US EPA 3550C: 2007, analysis was performed by LC/MS.)	mg/kg	10	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	限值 (Limit)
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考US EPA 3550C: 2007，以液相層析儀/質譜儀分析。(With reference to US EPA 3550C: 2007, analysis was performed by LC/MS.)	mg/kg	10	n.d.	-
多環芳香烴 (Polycyclic Aromatic Hydrocarbons) (PAHs)					
苯駢(a)芘 (Benzo[a]pyrene) (CAS No.: 50-32-8)	參考AfPS GS 2019:01 PAK，以氣相層析儀/質譜儀分析。(With reference to AfPS GS 2019:01 PAK, analysis was performed by GC/MS.)	mg/kg	0.2	n.d.	-
苯駢(e)芘 (Benzo[e]pyrene) (CAS No.: 192-97-2)		mg/kg	0.2	n.d.	-
苯駢蒽 (Benzo[a]anthracene) (CAS No.: 56-55-3)		mg/kg	0.2	n.d.	-
苯(b)苯駢芴 (Benzo[b]fluoranthene) (CAS No.: 205-99-2)		mg/kg	0.2	n.d.	-
苯(j)苯駢芴 (Benzo[j]fluoranthene) (CAS No.: 205-82-3)		mg/kg	0.2	n.d.	-
苯(k)苯駢芴 (Benzo[k]fluoranthene) (CAS No.: 207-08-9)		mg/kg	0.2	n.d.	-
䓛 (Chrysene) (CAS No.: 218-01-9)		mg/kg	0.2	n.d.	-
二苯駢蒽 (Dibenzo[a,h]anthracene) (CAS No.: 53-70-3)		mg/kg	0.2	n.d.	-
苯駢苝 (Benzo[g,h,i]perylene) (CAS No.: 191-24-2)		mg/kg	0.2	n.d.	-
茚酮芘 (Indeno[1,2,3-c,d]pyrene) (CAS No.: 193-39-5)		mg/kg	0.2	n.d.	-
蒽 (Anthracene) (CAS No.: 120-12-7)		mg/kg	0.2	n.d.	-
苯駢芴 (Fluoranthene) (CAS No.: 206-44-0)		mg/kg	0.2	n.d.	-
菲 (Phenanthrene) (CAS No.: 85-01-8)		mg/kg	0.2	n.d.	-
芘 (Pyrene) (CAS No.: 129-00-0)		mg/kg	0.2	n.d.	-
萘 (Naphthalene) (CAS No.: 91-20-3)		mg/kg	0.2	n.d.	-
多環芳香烴15項總和 (Sum of 15 PAHs)		mg/kg	-	n.d.	Δ

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備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出)；小於MDL / Less than MDL
4. "-" = Not Regulated (無規格值)
5. 全氟辛烷磺酸及其鹽類包含 (PFOS and its salts including)：
   CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
6. 全氟辛酸及其鹽類包含 (PFOA and its salts including)：
   CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
7. 符合性結果之判定係以測試結果與限值做比較。(The statement of compliance conformity is based on comparison of testing results and limits.)

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Δ 德國產品安全委員會(AfPS): GS PAHs 要求
AfPS (German commission for Product Safety): GS PAHs requirements

項目 (Parameter)	第 1 類(Category 1)	第 2 類(Category 2)		第 3 類(Category 3)	
	意圖放入口中的材料或者長時間接觸皮膚(超過 30 秒)的 2009/48/EC 定義的玩具材料和 3 歲以下兒童使用的產品(Materials intended to be placed in the mouth, or materials in toys (Directive 2009/48/EC) or articles for children up to 3 years of age with intended long-term skin contact (> 30 seconds))	不屬於第 1 類的材料，並意圖或可預見與皮膚接觸逾 30 秒(長期皮膚接觸)或重複的短時間接觸(Materials that are not in Category 1, with intended or foreseeable long-term skin contact (> 30 seconds) or short-term repetitive contact with the skin)		不屬於第 1 類或第 2 類的材料，並意圖或可預見與皮膚接觸不超過 30 秒(短期皮膚接觸)(Materials not covered by Category 1 or 2, with intended or foreseeable short-term skin contact (≦ 30 seconds))	
		a. 供 14 歲以下兒童使用的產品(Use by children under 14)	b. 其它產品(Other consumer products)	a. 供 14 歲以下兒童使用的產品(Use by children under 14)	b. 其它產品(Other consumer products)
Naphthalene	< 1	< 2		< 10	
Phenanthrene	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Anthracene					
Fluoranthene					
Pyrene					
Benzo[a]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[b]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[j]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[k]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[a]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[e]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno[1,2,3-c,d] pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo[a,h]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[g,h,i]perylene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
15 項 PAH 總濃度 (Sum of 15 PAH)	< 1	< 5	< 10	< 20	< 50

單位(Unit)：mg/kg

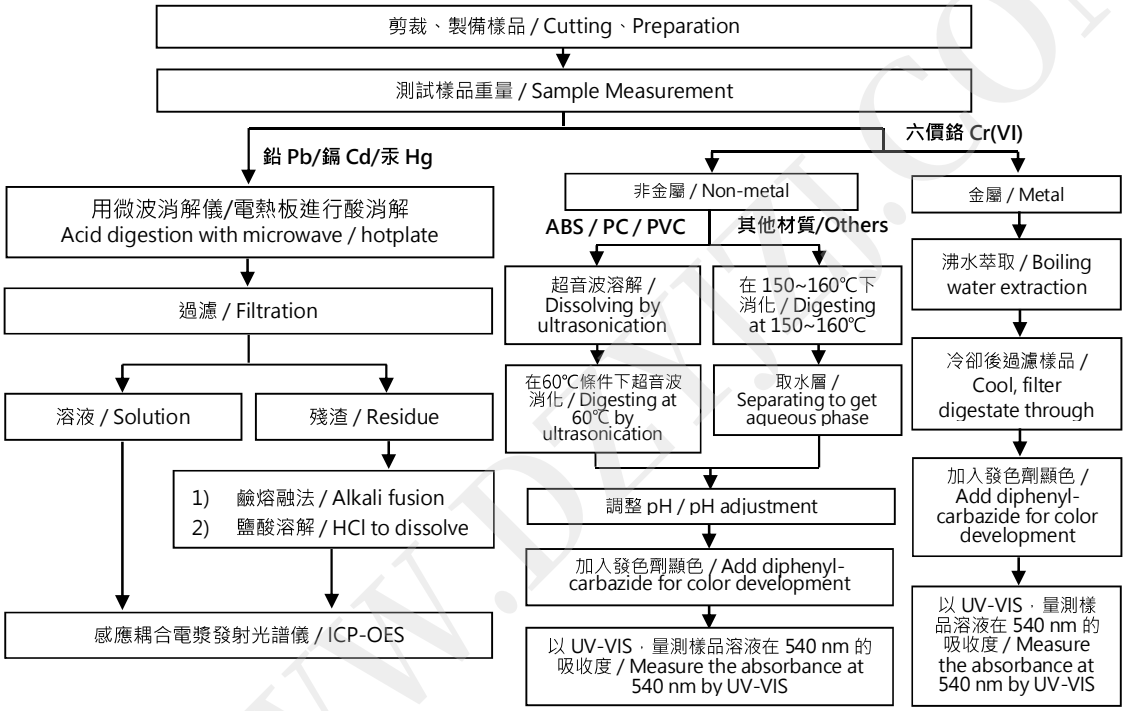
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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）

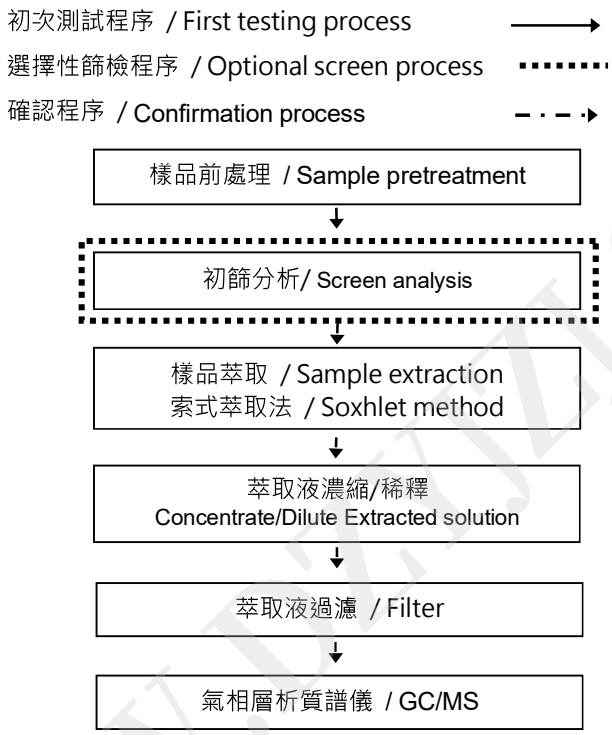
These samples were dissolved totally by pre-conditioning method according to below flow chart.
（Cr^{6+} test method excluded）



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

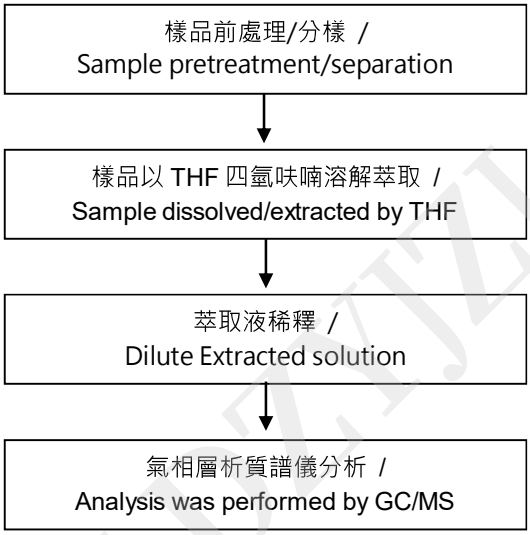


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可塑劑分析流程圖 / Analytical flow chart - Phthalate

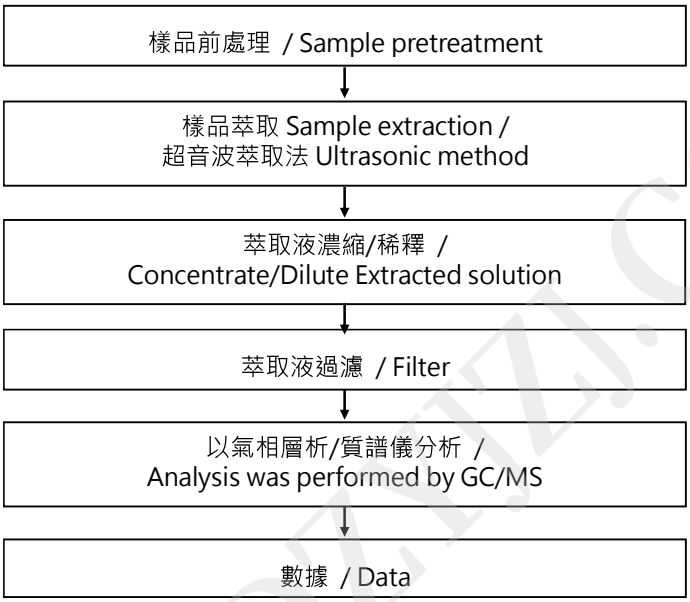
【測試方法/Test method: IEC 62321-8】



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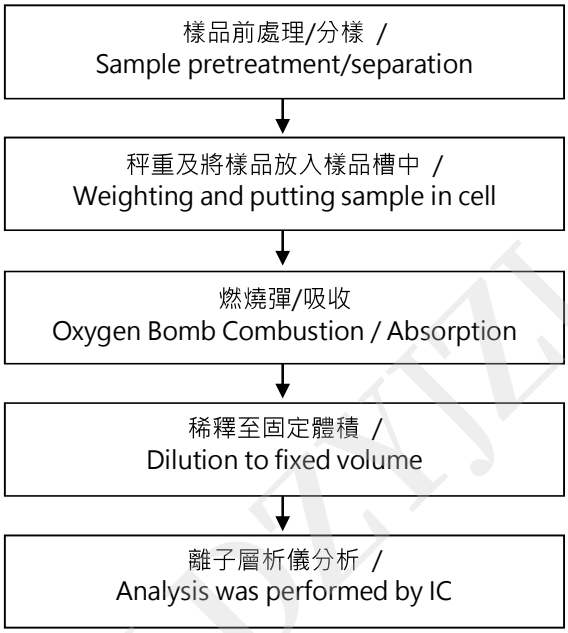
六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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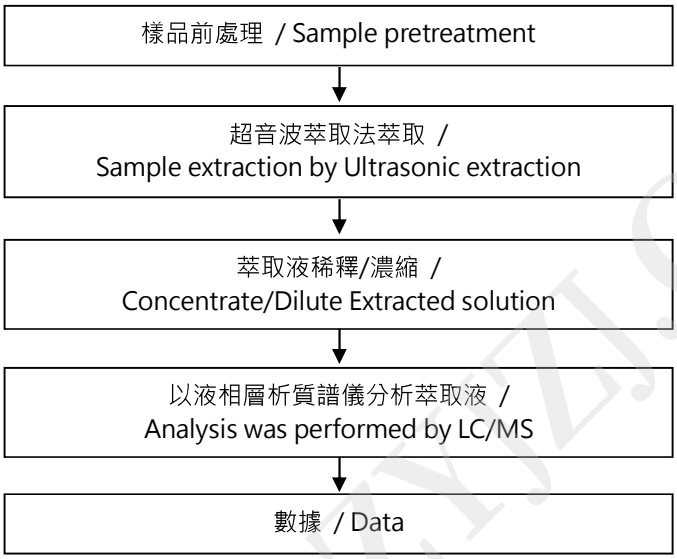
鹵素分析流程圖 / Analytical flow chart - Halogen



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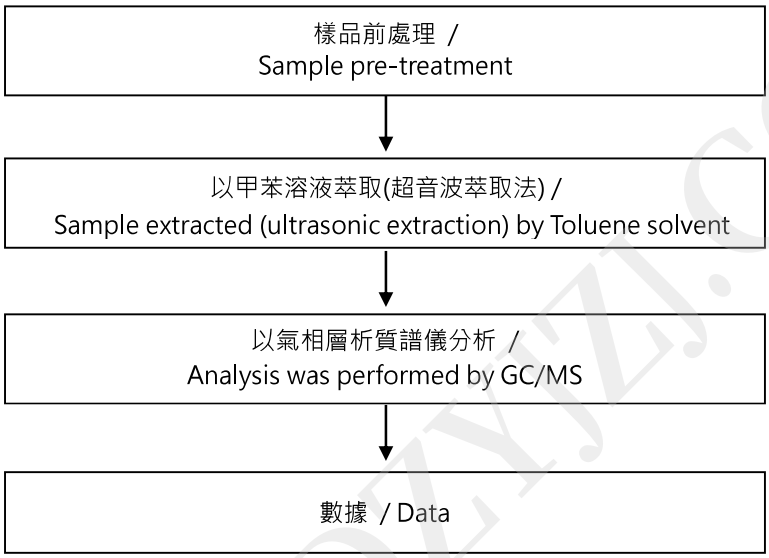
全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS



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多環芳香烴分析流程圖 /
Analytical flow chart - PAHs (Polycyclic Aromatic Hydrocarbons)



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測試報告
Test Report

KURARAY CO., LTD.
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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.)

ETR21201700



** 報告結尾 (End of Report) **

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SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification of the product :

Genestar GP2450NH BLACK	Genestar GP2450NH NATURAL
Genestar GP2450NH KB030	Genestar GP2450NH KB327
Genestar GP2450NH KH064	Genestar GP2450NH KW300
Genestar GP2450NH-2 BLACK	Genestar GP2450NH-2 NATURAL
Genestar GP2450NH-2 KB032	Genestar GP2450NH-2 KB033
Genestar GP2450NH-2 KB327	Genestar GP2450NH-2 KG020
Genestar GP2450NH-2 KG022	Genestar GP2450NH-2 KH068
Genestar GP2450NH-2 KR016	Genestar GP2450NH-2 KV008
Genestar GP2450NH-2 KW300	Genestar GP2450NH-2 KY019

Supplier & Manufacture

Name : Kuraray Co., Ltd.

Section : Genestar Division

Address : 1-1-3, Otemachi, Chiyoda-ku, Tokyo, 100-8115, JAPAN

Telephone number : +81-3-6701-1626

Fax number : +81-3-6701-1580

E-mail address : Sds06_Kucsr@kuraray.co.jp

Emergency telephone number : +81-3-6701-1626

Recommended uses and restrictions on use : Material for molding

2. HAZARDS IDENTIFICATION

GHS classification : Not Hazardous

Pictograms or symbols : None

Signal word(s) : None

Hazard statement(s) and precautionary statement(s) : None

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance / mixture : Mixture

Chemical Name	CAS-No	Weight %
1,4-Benzenedicarboxylic acid polymer with 2-methyl-1,8-octanediamine and 1,9-nonanedianime (hereinafter referred to as PA9T)	169284-22-4	30-60
Glass Fiber	65997-17-3	30-60

4. FIRST-AID MEASURES

Inhalation :

- When a gas generated from the molten material has been inhaled, remove fresh air without delay and wait until the victim is recovered.
- If symptoms persist, call a physician.

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Skin contact :

- Cool the contacted skin with clean water without delay, when the skin has been contacted with the material in a molten form.
- Don't peel off the polymer from the skin forcibly.
- Get medical attention when the unpleasantness remains.

Eye contact :

- Cool and rinse the eye with clean water for at least 15 minutes when the eyes had contact with molten materials. In case of wearing contact lenses, remove the lenses as soon as possible, and ask a physician for advice. When the eye had contact with materials in an ordinary solid form, rinse the eye with clean water without delay. If the discomfort persists, ask a physician for advice.

Ingestion :

- Vomit as much as possible, and get medical attention when the unpleasantness remains.

5. FIRE-FIGHTING MEASURES

Extinguish media :

- In case of fire, use water spray, foam, dry chemical powder, carbon dioxide or dry sand.

Extinguish media not suitable :

- No information available.

Specific hazards :

- Toxic gases (carbon monoxide, nitrogen oxides, etc.) will form upon combustion.
- Keep product and empty container away from heat and sources of ignition.

Specific extinguishing methods:

- Wear the fire fighting protective clothing (includes fire fighting helmet, coat, boots, and gloves) and do the extinction work from the windward.
- Prohibit staying the fire occurrence place except the relating person.
- Water and cool off neighboring facilities not to be sprinkled on the machine.
- Appropriate measures are done so that the material that influences the environment should not flow out.
- Evacuate to the safety area except the relating person.

Precautions for fire-fighters :

- Firefighters should wear proper protective equipment (gloves, glasses, and mask).
- Wear self-contained breathing apparatus (SCBA) when toxic gases (carbon monoxide etc.) will form upon combustion.
- Do the extinction work from the windward to avoid inhaling toxic gases.
- Wear self-contained breathing apparatus (SCBA), if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures :

- Don't touch molten.
- Collect the scraps not to slip on the floor and roll.

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- Wear proper protective equipment.
- Ensure adequate ventilation. Avoid dust formation.

Environmental precautions :

- Don't dispose materials in environment.
- Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and methods and materials for cleaning up :

Recovery :

- As the small quantity, collect with unsparking tools (a vacuum cleaner or a broom).
- Pick or collect materials with ordinary cleaning tools and put into a suitable container for disposal as a non-hazardous waste.
- Use an industrial vacuum cleaner to clean up dust.
- The collection thing is incinerated in a safe condition.

Disposal:

- Consult an expert on the disposal of recovered material.

7. HANDLING AND STORAGE

Handling:

Precaution for safe handling :

Technical measures :

- Collect the scraps not to slip on the floor and roll.
- Don't allow hot materials to stay for a long time in the processing machines.
- Don't adhere the materials to the skin, eyes, and clothes.
- Wear proper protective equipment (gloves, glasses, and mask), if necessary.
- Use exhaust device to avoid inhaling of gases generated from the molten materials.

Precautions :

- Don't touch molten form directly.
- Don't use of fire nearby because the material is combustion.

Prevention of contact:

- Strong acids. Strong bases. Oxidizing agents.

Storage :

Conditions for safe storage :

Storage conditions :

- Keep away from heat, steam, pipe or sunlight.
- Keep indoors.
- Keep dampproof.

Technical measures :

- Collapse of cargo piles prevention
- Fall prevention.
- Don't wet the package.

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- Avoid handling the package violently.

Incompatible substances and mixtures :

- Strong acids. Strong bases.
- Oxidizing agents.

Packaging material :

- Use the paper bag lined by aluminum etc because this material is hygroscopicity.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Permissible concentration :

As the product : Not established

As the ingredient :

	Exposure Limits		
Chemical Name	**JSOH**	**ACGIH**	**OSHA PEL**
Carbon black	1mg/m^3(respirable dust), 4mg/m^3(total dust)	3.5mg/m^3 (TWA)	3.5mg/m^3 (TWA)

Engineering controls : Ensure adequate ventilation, especially in confined areas.

Personal protective equipment :

Respiratory protection :

- Use appropriate certified respirators (a dust protective mask, a simple dust protective mask), as appropriate.
- Use exhaust device to handle molten materials.

Hand protection :

- Use appropriate certified protective equipments (gloves), as appropriate.
- Use heatproof gloves to handle molten materials.

Eye protection :

- Wear safety glasses (normal type, side-shields' type) or goggles with/without a face protector, as appropriate.
- Use safety glasses to handle molten materials.

Skin and body protection :

- Wear protection clothes, a protection apron, safety-shoes, and/or electric resistant shoes, as appropriate.
- Use protection clothes to handle molten materials.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state ;

Form : Solid (pellet)

Colour : Various specified colors

Odour : None

pH : Not available

Melting point/freezing point : 295～311 °C (as PA9T)

Boling point initial boiling point and boiling range : Not available

Flashpoint : >400°C (as PA9T)

Upper/lower flammability or explosive limits : Not available

Vapour pressure : Not available

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Vapour density: Not available

Density/relative density : >1.0 g/cm^3 (25 °C)

Solubilities ; (as PA9T)

—**water solubility :** Insoluble

—**fat solubitlity:** 1,1,1,3,3,3-hexafluoro-2-propanol : soluble

n-Octanol/water partition coefficient : Not available

Auto-ignition temperature : Not available

Decomposition temperature : Not available

Evaporation rate : Not available

Flammability (solid, gas) : Not available

Viscosity : Not available

Oxidizing properties : Not available

10. STABILITY AND REACTIVITY

Chemical Stability : This product is considered a stable material under normal and anticipated storage and handling conditions.

Hazardous reactions : None under normal use.

Conditions to avoid : Avoid the moisture uptake because it becomes the obstacle of molding.

Incompatible materials : Strong acids. Strong bases. Oxidizing agents.

Hazardous decomposition products : Not available

11. TOXICOLOGICAL INFORMATION

Acute toxicity : No relevant information found.

Skin irritation/ corrosion : No relevant information found.

Eye damage/ irritation : No relevant information found.

Respiratory or skin sensitization : No relevant information found.

Reproductive cell mutagenicity : No relevant information found.

Carcinogenicity; as the product : No relevant information found.

as the ingredient : Carbon black GHS Category 2 (Suspected of causing cancer).

Reproductive toxicity : No relevant information found

Specific target organ toxicity – single exposure : No relevant information found.

Specific target organ toxicity – repeated exposure : No relevant information found.

Aspiration hazard : No relevant information found.

Toxicokinetics, metabolism and distribution : No relevant information found.

12. ECOLOGICAL INFORMATION

Ecotoxicity : No relevant information found.

Persistence and degradability : No relevant information found.

Bioaccumulative potential : No relevant information found.

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Mobility in soil : No relevant information found.

13. DISPOSAL CONSIDERATIONS

Waste from residues :

- This product may be burned in a chemical incinerator under national and local regulations.
- Comply with all EU, with national and local regulations.
- Do not dump this product into sewers, on the ground or into any body of water.

Contaminated container / Contaminated packaging :

- May be burned in a chemical incinerator under national and local regulations.
- An empty container is abandoned after contents are completely removed.

14. TRANSPORT INFORMATION

International regulations : No allocated

UN number : No allocated

Marine pollutant (Y/N) : N

Transport in bulk according to MARPOL 73/78, Annex II, and the IBC Code [A] : No allocated

Follow all regulations in your country.

15. REGULATORY INFORMATION

Regulations :

Industrial Safety and Health Act :

Notifiable Substances (Cabinet Order appended table 9) :

- Cabinet Order No. 38 Stibium and its compounds : <3% (KH064)
- Cabinet Order No. 130 Carbon black : <1% (BLACK, KB030, KH064, KH068)
- Cabinet Order No. 142 Chrome and its compounds : <3% (KH064)
- Cabinet Order No. 191 Titanium oxide : <5% (KW300)
- Cabinet Order No. 379 Copper and its compounds : <2% (KB030, KB327, KG020, KG022)

The Fire Services Act: Article 9-4 designated flammable goods (designated quantity : 3000kg)

16. OTHER INFORMATION

To the best of our knowledge, the information contained here in is accurate. However, neither Kuraray Co., Ltd. nor any subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used in caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.

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C7025 物性表

板带产品

高强度和良好的导电性能，抗应力松弛性能优异。用于 DDR、USB、Press-fit 等高可靠连接器/接插件和引线框架等。

牌号	
中国 GB	—
美国 UNS	C70250
欧洲 EN	CuNi3SiMg
日本 JIS	C7025

化学成分		
镍（Ni）	2.2-4.2	%
硅（Si）	0.25-1.2	%
镁（Mg）	0.05-0.30	%
铜（Cu）	余量	

特点

本合金属于 CuNiSi 系合金，通过冷加工和固溶时效强化热处理获得优良的综合性能；

本合金具有出色的折弯性能，优异的冷、热成型性能，强度高，抗腐蚀性能好；

由于组织有 NiSi 析出强化相，本合金具有优异的抗应力松弛性能。

物理性能		
密度	8.8	g/cm^3
导电率	43	%IACS
电导率	25	MS/m
热膨胀系数*	17.6	$10^{-6}/K$
导热率	190	W/(m•K)
弹性模量	130	GPa
比热	0.399	J/(g•K)
泊松比	0.34	

常规测试温度为室温。

*温度 0-300℃。

加工性能	
冷加工	很好
切削性能	不太适合
电镀	好
热浸镀锡	好
焊接	好

机械性能

状态	厚度 mm	硬度 HV	抗拉强度 MPa	屈服强度 MPa	延伸率 %
TM00	0.08-3.0	180-210	580-680	≥500	≥10
TM02	0.08-3.0	190-240	650-780	≥585	≥7
TM03	0.08-1.0	210-250	680-800	≥655	≥5
TM04	0.08-1.0	220-270	750-840	≥710	≥2
TM06	0.08-0.6	250-290	800-880	≥780	≥1
TR02	0.08-0.8	180-220	607-726	≥550	≥6

地址：中国浙江省宁波市鄞州区滨海工业园区
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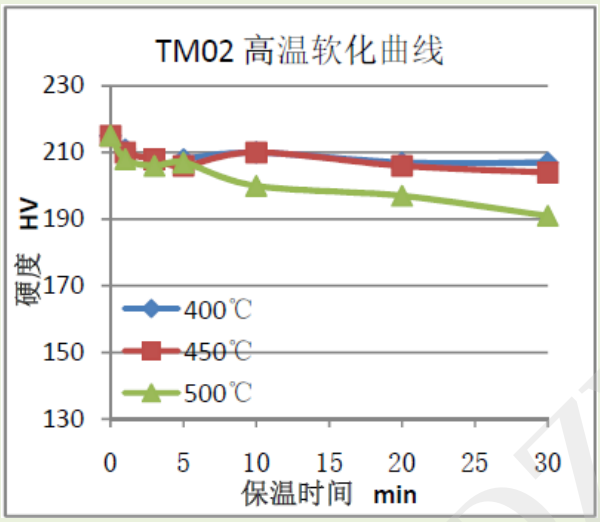
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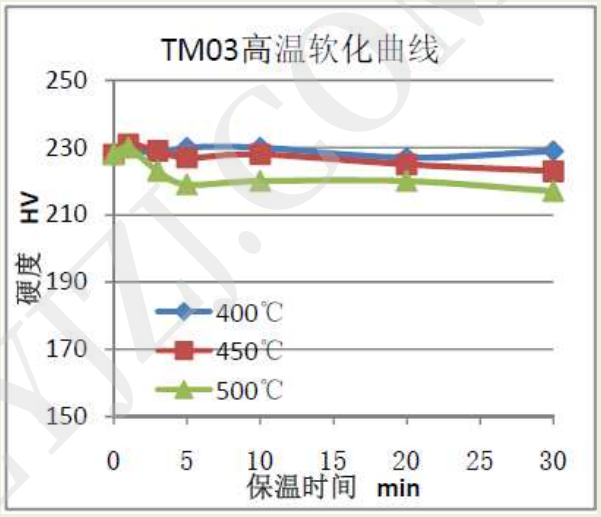
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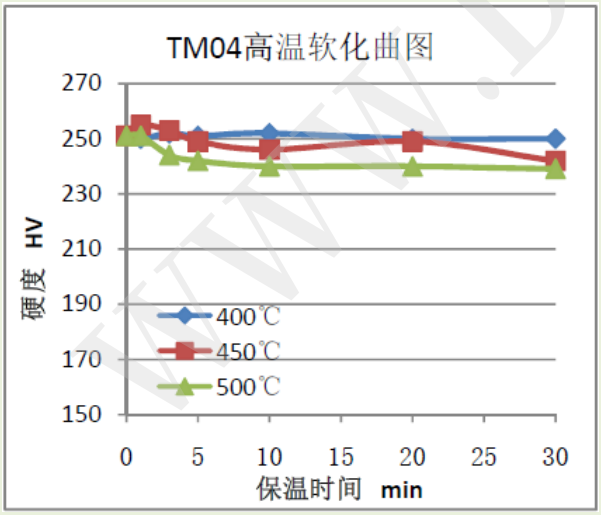
弯折性能

状态	适用厚度范围 mm	90° R/T		180° R/T	
		Good Way	Bad Way	Good Way	Bad Way
TM00	≤0.5	0	0	0.5	0.5
TM02	≤0.5	0.5	0.5	1.5	2
TM03	≤0.5	1	1	2	2
TM04	≤0.5	1.5	1.5	2.5	2.5
TM06	≤0.5	2	3	-	-
TR02	≤0.5	0.5	3	1	5

抗高温软化性能







固溶温度：≥800℃

软化温度：650-800℃

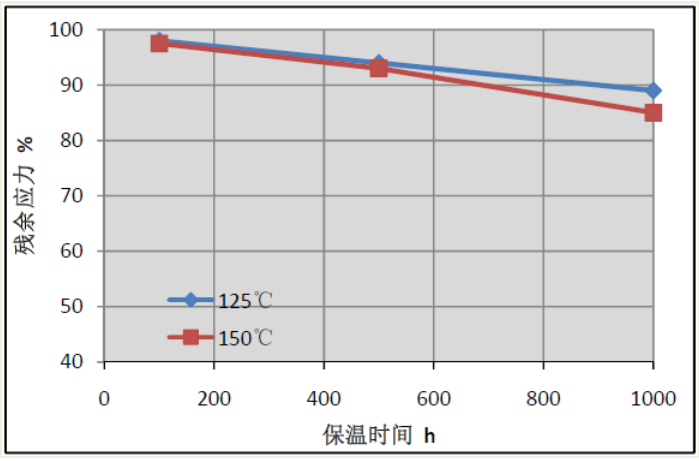
时效温度：400-550℃

去应力温度：200-350℃

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抗热应力松弛性能



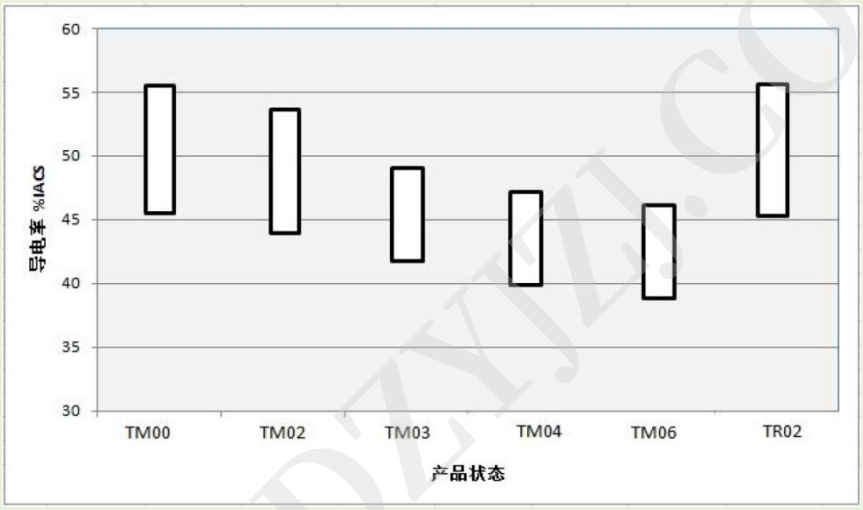
测试条件：

状态：TM03

方向：平行轧制方向

初始应力：50%×$Rp_{0.2}$

导电率



厚度公差

厚度 mm	公差 mm
0.08-0.1	±0.003
>0.1-0.2	±0.004
>0.20-0.30	±0.005
>0.30-0.50	±0.006
>0.50-0.80	±0.008
>0.80-1.00	±0.010
>1.00-3.00	±0.030

宽度公差

宽度 mm	厚度 mm	
	0.08-0.5	0.5-1.0
≤50	±0.05	±0.10
>50-100	±0.10	±0.15
>100-200	±0.20	±0.20
>200-400	±0.30	±0.30

物性表数据仅供参考。

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The following sample(s) was/were submitted and identified on behalf of the clients as : C7025

SGS Job No. :	NBIN2012015175PC - NB
Date of Sample Received :	07 Dec 2020
Testing Period :	07 Dec 2020 - 11 Dec 2020
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).

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

Kell Li
Approved Signatory

scan to see the report
NGBML2005892801

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	NGB20-058928.001	COPPERY METAL SHEET

Remarks :

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

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

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

Test Item(s)	Limit	Unit	MDL	*001*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▾	-	µg/cm²	0.10	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND

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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
Bis(2-ethylhexyl) Phthalate(DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

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

(2) ▼ = a. The sample is positive for 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 ND (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
Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

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

(4) The restriction of DEHP, BBP, DBP and DIBP shall not apply to toys which are already subject to the restriction of DEHP, BBP, DBP and DIBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.'

Element(s)

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

Test Item(s)	Unit	MDL	001
Antimony (Sb)	mg/kg	10	ND
Beryllium (Be)	mg/kg	5	ND

Perfluorooctanoic Acid (PFOA)

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

Test Item(s)	Unit	MDL	001
Perfluorooctyl Acid (PFOA)	mg/kg	10	ND

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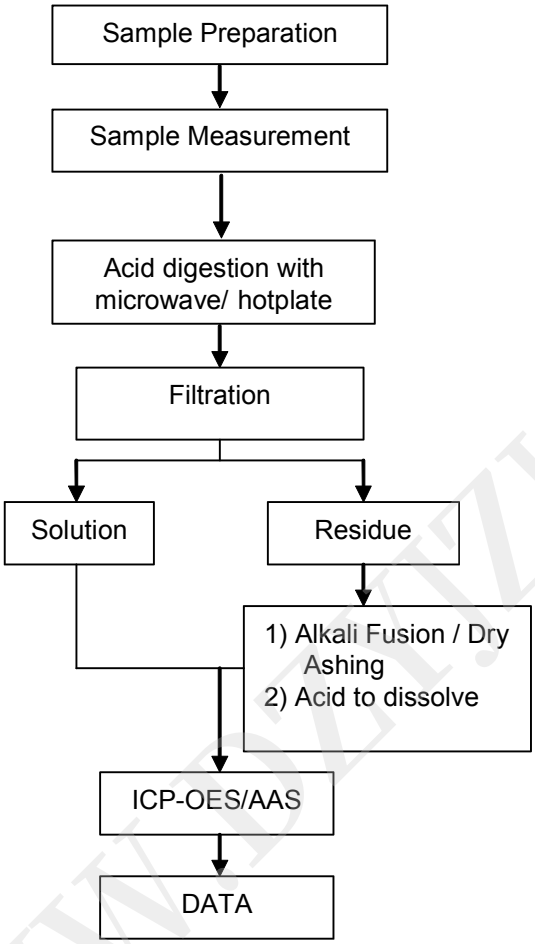
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Elements (IEC62321) Testing Flow Chart

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

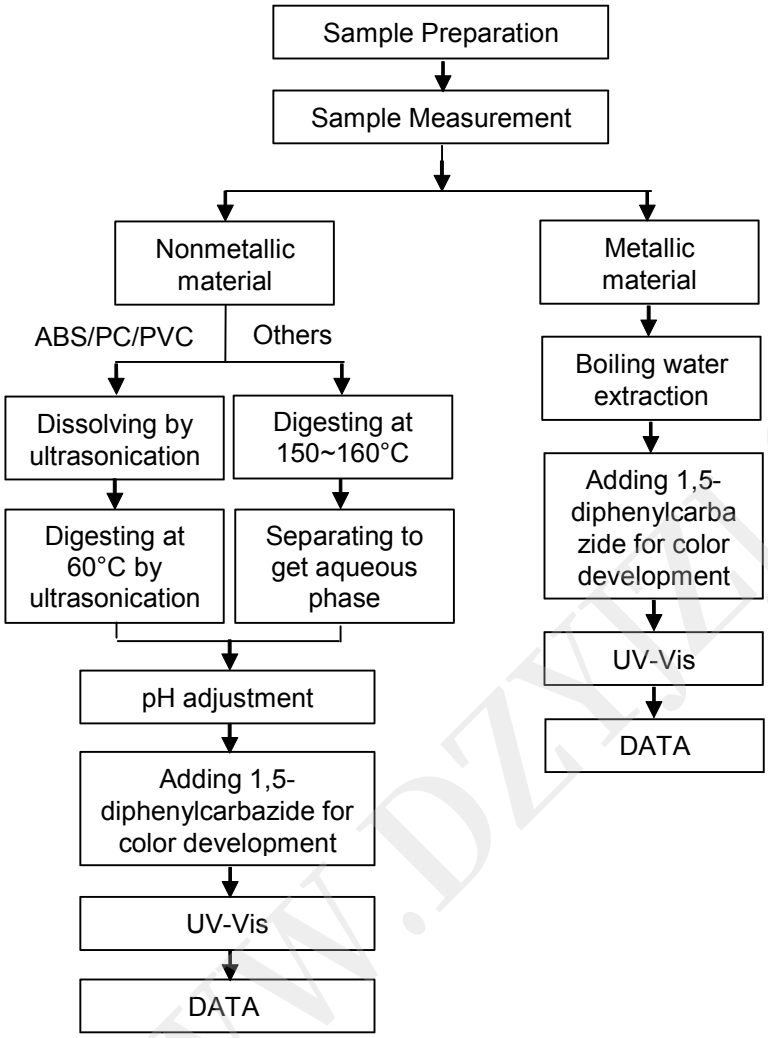


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Hexavalent Chromium (Cr(VI)) Testing Flow Chart

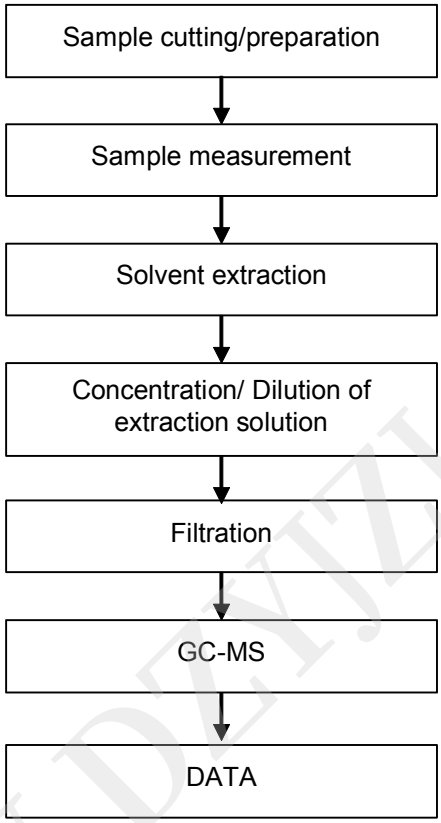


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PBBs/PBDEs Testing Flow Chart

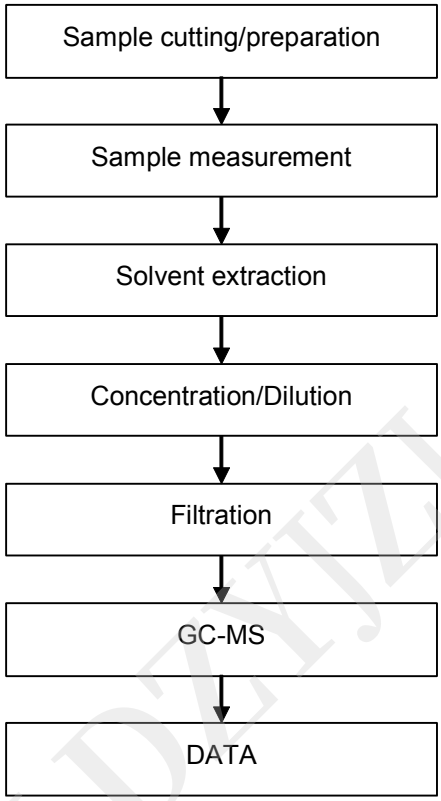


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Phthalates Testing Flow Chart

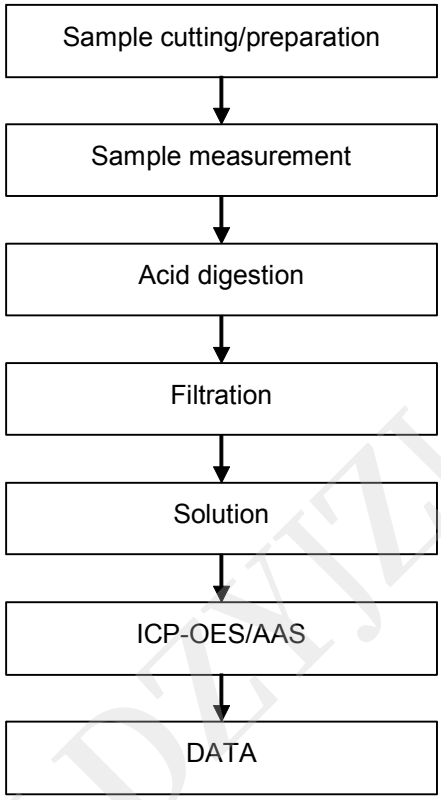


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Elements Testing Flow Chart

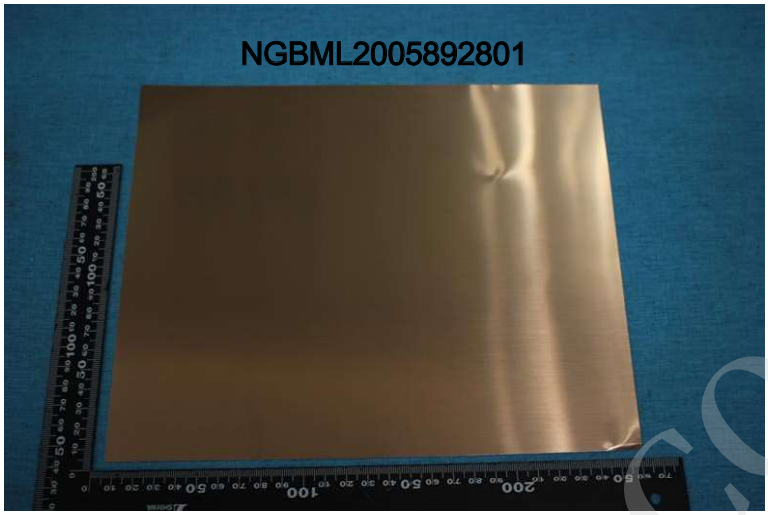


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物质安全资料表

物质安全资料表编号：	04
版次：	B01
编制日期：	2018-10-12

1、物品与厂商资料：

物品名称：	铜镍硅材料		
物品牌号：	C7025、CuNi2Si（C7026）、PW49702、C19010		
化学名称：	Cu-Ni-Si 金属合金		
类别：	金属混合物		
制造商或供应商名称：	宁波博威合金板带有限公司		
制造商或供应商地址：	浙江省宁波市鄞州区瞻歧镇滨海工业园区宏港路 288 号		
制造商或供应商电话：	86-574-89016105	传真：	86-574-89016059
制造商或供应商网址：	http://www.pwalloy.com/		
紧急联络电话：	86-574-89016105		

2.成份辨认资料：

成分	化学名称	成分含量（%）			化学文摘社登记号码（CAS.NO.）
		C7025、PW49702	C19010	CuNi2Si（C7026）	
铜	Cu	余量	余量	余量	7440-50-8
镍	Ni	2.2-4.2	0.8-1.8	1.6-2.5	7440-02-0
镁	Mg	0.05-0.3	/	/	7439-95-4
硅	Si	0.25-1.2	0.15-0.35	0.4-0.7	7440-21-3

备注：本产品在固体时不具危险性，其粉尘及烟雾时具有危险性。

3、危险辨认资料

警告：
长时间暴露与粉尘及烟雾的工作环境下，对眼睛、呼吸系统、皮层会造成刺激伤害，必须佩带保护器具，包括护目镜、适当衣物、必要保护全身体。身体被接触之部位，必须彻底清洗干净。

种类的名称：	铜、镍、硅混合物
危险标示类别：	金属粉尘或烟雾将对皮肤、眼睛造成刺激性且对肺具有毒性，但金属成品本身不具有危害性。
危险级数（粉尘及烟雾）：	健康：1；可燃性：0（0 为最低、4 为最高）； 物质危害：无

4、急救措施

对于粉尘及烟雾危害：

眼睛接触：	以大量清净水冲洗上下眼皮内部（至少 15 分钟），若眼睛被刺激不适者，立即送医检查。
食入时：	大量喝水并催吐，迅速送医检查。
皮肤接触：	以清水清洗干净。

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吸入时：	送至通风良好较阴凉处休息，以毛布保暖，严重者迅速送医院检查诊断。

5、火灾及爆炸危害资料：

可燃性资料：

爆炸性：	无
可燃性：	无
燃烧性：	无
闪火性：	不适用
自然性：	不适用

灭火剂：

灭火方式：使用灭火剂于材料表面即可

消防建议：

注意粉尘可能会导致爆炸或产生可燃烧气体

6、泄漏处置

本产品在加工时产生粉尘时，有可能产生保证，必须将火源移除，也惟有粉尘型态才可能产生泄漏，所以必须装社吸尘装置，过滤空气中的粉尘，以降低其粉尘浓度。	
泄漏于空气中：	不适用
泄漏于水中：	不适用
泄漏于地面中：	不适用

7、取用及储运方式：

取用注意事项：

轧延产品的端面容易割伤皮肤，应小心取用。 切削加工时会产生粉尘，所以一定要小心，眼睛、皮肤及呼吸应佩带保护器具。 要注意粉尘不可泄漏到空气中去。 需注意产品有翻倒的危险，容易造成压伤，在吊运过程中要十分注意。 打包带剪除时，要小心其末端会弹起，容易对身体、皮肤及眼睛造成割伤。 衣物或器具上的粉尘应用水洗掉或者用吸尘器清洁，而不能用拍打或其他方式处理。

储存条件：

仓库储存最高容许温度：无 避免防止在潮湿或碱性物质或酸/碱性气体的场所。

8、人员暴露防护措施：

Cu 暴露标准：		OSHA（PEL）		ACGIH（TLV）	
		ppm	Mg/m^3	ppm	Mg/m^3
	烟雾	无	0.1	无	0.2

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	粉尘	无	1	无	1
Ni 暴露标准：		OSHA(PEL)		ACGIH(TLV)	
		ppm	Mg/m^3	ppm	Mg/m^3
	粉尘	无	1	无	1
Si 暴露标准：		OSHA(PEL)		ACGIH(TLV)	
		ppm	Mg/m^3	ppm	Mg/m^3
	粉尘	无	20	无	10
呼吸保护：	长时间暴露于粉尘及烟雾的工作环境下，需要呼吸保护器具，佩带 NIOSH 认证防护口罩。				
通风防护：	工作场所中，若是会产生烟雾及粉尘时，必须要有通风设施及集尘装置，且工作中不可饮食及抽烟。				
眼睛及皮肤保护：	需要佩带护目镜、防护手套以防割伤。				
人员保护：	作业时应穿戴合适的工作服及安全鞋。				

9、物理及化学性质：

外观	有青灰色光泽的固态金属
熔点	1040- 1085℃
沸点	无资料
比重	8. 82g/ cm^3
热导率	大于 190 W(m• K)
导电率	大于 43% ACS;
蒸汽压	不适用
溶解度	不适用
25℃时的 PH 值	不适用

10、安全性及反应性资料：

非活性物质

11、毒性资料：

来源途径：

粉尘：食入、皮肤接触、吸入、眼睛接触 烟雾：吸入、眼睛接触、皮肤接触 本产品的成品不具毒性

动性毒性：本合金产品不具毒性
其单一成分的毒性说明如下（仅供参考）： 皮肤腐蚀性：无此资料 刺激性（对眼睛、皮肤）：铜产品会产生接触性皮炎，锌对眼睛有危害性。 急性毒性：铜的粉末不小心误食，会有急性中毒症状----呕吐、无力感及胃疼；粉尘吸入过多，会有胸疼、发烧等症状。 粉尘、烟雾会让有气喘、肺气肿的病患者病情加重。

12、生态资料：

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本产品的成品对生态不具毒性

分解性：无资料
蓄积性：无资料
突发性：本产品没有资料显示会造成突发性
鱼毒性：水中，尤其在软水中，铜的浓度达到 0.015~3.0mg/1 时，曾有报告说会对许多种类的鱼、甲壳类的动物及软体动物、浮游生物等有毒性。

13、废品处理

本主品不属于危害性废弃物，当必须丢弃时可以委托回收商予以回收再生处理。

14、运输资料

运送时不要直接与水接触，并且主要会有滑落、翻落的危险发生

15 法规资料

通常无特定法令规定，但是在会产生粉尘的场所必须遵守劳工安全卫生法。劳工作业环境空气中有害物质浓度要在容许浓度标准之内。

16、其他资料

本 MSDS 内容资料应被所有使用、运送储存或暴露于本产品的公司人员充分了解与接受并其应用于使用、加工、制程或管理与本产品有关的作业规定上。本 MSDS 资料内容在编订时可能已经将最新的资料纳入，但并不对所有内容予以任何保证。

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Test Report

Report No. A2210077337101005

Company Name shown on Report	LOTES GUANGZHOU CO.,LTD
Address	NO.526,NORTH OF JIN LING ROAD,NAN SHA ECONOMIC AND TECHOLOGY,DEVELOPMENT ZONE GUANGZHOU,CHINA

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

Sample Name	NICKEL/GOLD/TIN/ELECTROPLATING(C7025)
Material	C7025
Buyer	LOTES GUANGZHOU CO.,LTD
Supplier	ZHONGSHAN CITY XING CHENG METAL PRODUCTS SURFACE TREATMENT CO.,LTD
Sample Received Date	Mar. 10, 2021
Testing Period	Mar. 10, 2021 to Mar. 15, 2021
Test Requested	As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)) in the submitted sample(s).
Test Method	Please refer to the following page(s).
Test Result(s)	Please refer to the following page(s).

Tested by Qianzhong He

Reviewed by Guange Feng

Approved by Wenjun Wang

Date Mar. 15, 2021

Wenjun Wang

Technical Director

No. R340234050

Centre Testing International Group Co.,Ltd. Shunde Branch
Yongying Building, Section 2, No.8, East of Rongqi Avenue, Ronggui, Shunde District, Foshan, Guangdong, China

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Test Report

Report No. A2210077337101005

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	Refer to IEC 62321-5:2013	ICP-OES
Cadmium (Cd)	Refer to IEC 62321-5:2013	ICP-OES
Mercury (Hg)	Refer to IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium (Cr(VI))	IEC 62321-7-1:2015	UV-Vis

Test Result(s)

Tested Item(s)	**Result**	**MDL**
Lead(Pb)	N.D.	2 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg
Mercury(Hg)	N.D.	2 mg/kg
Hexavalent Chromium(Cr(VI))	N.D. ▼	0.10 μg/cm² (LOQ)

Sample/Part Description Golden plating

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

-MDL = Method Detection Limit

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

-mg/kg = ppm = parts per million

-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm²

-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm². The coating is considered a non-Cr(VI) based coating.

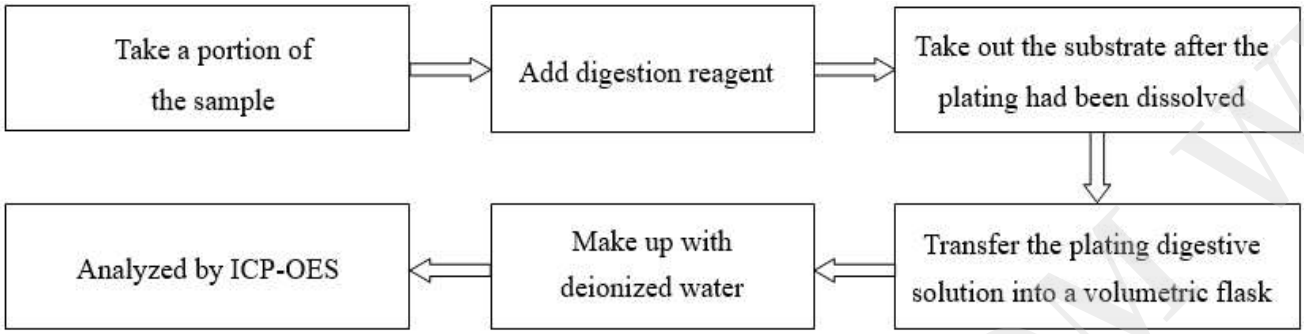
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Test Report

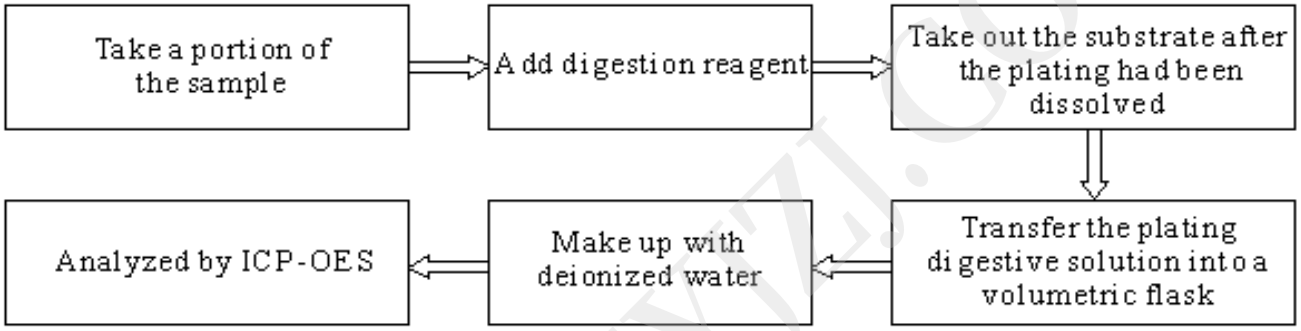
Report No. A2210077337101005

Test Process

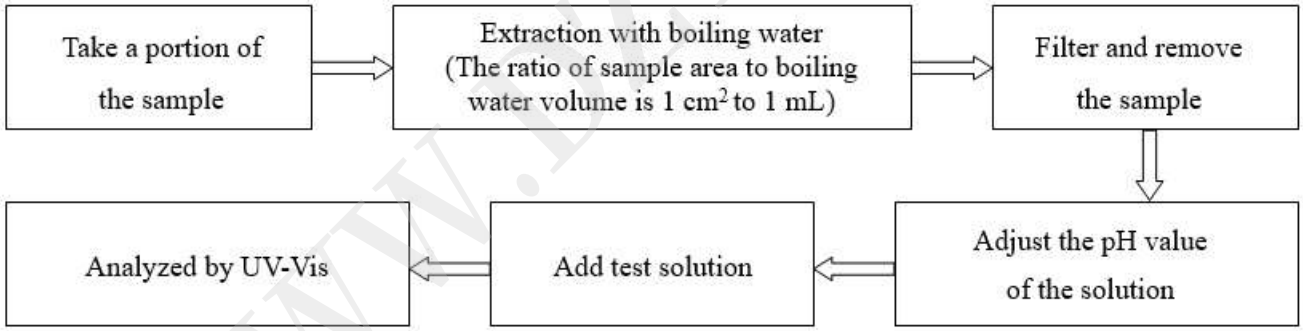
1. Lead (Pb), Cadmium (Cd)



2. Mercury (Hg)



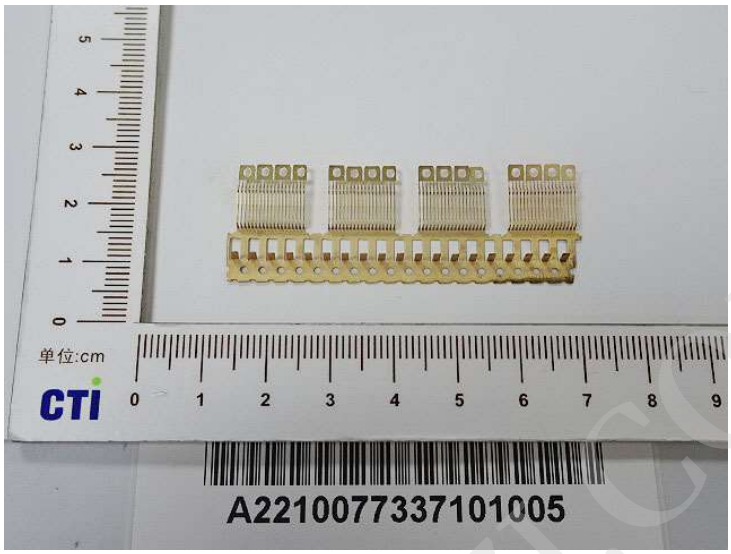
3. Hexavalent Chromium (Cr(VI))



Test Report

Report No. A2210077337101005

Photo(s) of the sample(s)



Statement:

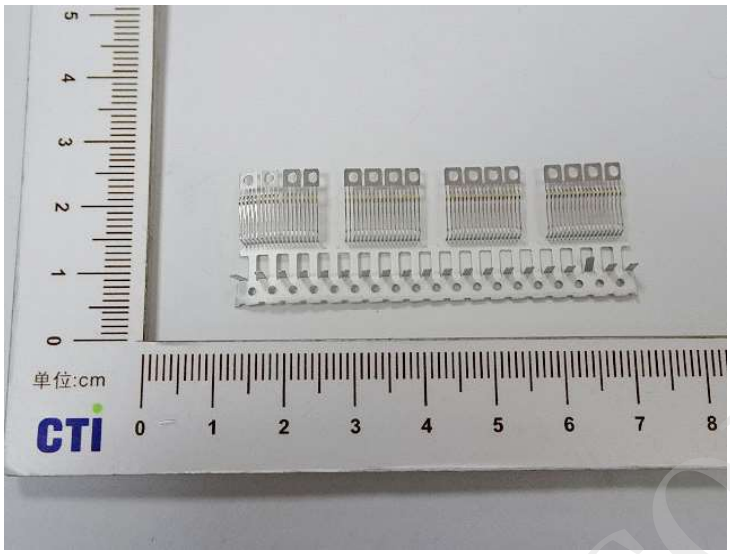
1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;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

*** End of report ***

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Appendix

Client Reference Photo (Non-tested sample)



Statement:

The Appendix Information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

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XC

電鍍端子安全資料說明書

MSDS 文件更新日期：2015 年 11 月 17 日

1. 產品與公司識別

產品名稱：五金端子

企業名稱：中山市行程金屬表面處理有限公司

企業地址：中山市三角鎮高平工業區錦成西三街 1 號

企業電話：0760-22812092/22812091

企業傳真：0760-22812093

緊急聯絡電話：0760-22812092

2. 產品成份

產品名稱：五金端子

成份名稱：鎳鍍層(Ni)　金鍍層(Au)　錫鍍層(Sn)

鎳 CAS NO：7440-02-0　　鎳鍍層含量≧99%

金 CAS NO：7440-57-5　金鍍層含量≧99.6 %

錫 CAS NO：7440-31-5　錫鍍層含量≧99.9%

3. 危害性說明

警告：

長時間用手接觸電鍍端子，會造成重金屬中毒；檢查時需配戴手套或手指套。

種類的名稱：銅鎳混合物

危險標示類別：嚴禁用手直接接觸，會造成重金屬中毒。產品本身沒有刺激性和有

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毒性氣體，不會對眼睛，呼吸道造成危害。

4．急救措施

食入時：大量喝水並催吐，迅速送醫就診。

對於長時間皮膚接觸危害：長時間接觸會導致患皮膚病，發現皮膚瘙癢，應立即用酒清洗，嚴重時求醫醫治。

5． 火災及爆炸危害資料

爆炸性：無

可燃性：無

燃燒性：無

閃火點：不適用

自然性：不適用

滅火劑

滅火方式：使用滅火劑於材料表面即可

消防建議

注意粉塵可能導致爆炸或產生可燃氣體。

6．洩漏的處置

洩露於空氣中：不適用

洩露於水中：不適用

洩露於地面中：不適用

7．取用及儲運方式

取用注意事項：

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產品之端面易割傷皮膚應小心取用。

取用時需配戴手套。

儲存條件：

倉儲存放溫濕度：恆溫恆濕

避免放置於高溫高濕或酸/鹹性物質或酸/鹹性氣體之場所。

8．人員曝露及防護措施

皮膚防護：需要配戴防護手套

9．物理及化學性質

物理性質：固體

外觀：金色/銀色/銀白色

氣味：無味

溶點：　金：1063℃　鎳：1453℃　錫：232℃

沸點：　金：2970℃　鎳：2730℃　錫：2270℃

密度：　金：19.32 g/cm^3　鎳：8.9 g/cm^3　錫：7.2 g/cm^3

10．安定性及反應

非活性物質

11．毒性資料

來源途徑

重金屬：皮膚接觸

動物毒性：無此資料

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12．生態資料

分解性：會產生有害物質，對土壤，空氣有危害。

蓄積性：不具有毒性。

突變形：不會造成突變性。

魚毒性：水中的重金屬會對魚類、軟體動物、浮游生物具有毒性。

13．廢棄處理

丟棄時可以委托回收商予以回收再生處理

14．運輸資料

運送時本產品不能直接與水接觸

15．法規資料

有害物質依照歐盟法要求執行

16．其他資料

本 MSDS 內料資料應補所有使用、運送、儲存或暴露於本產品之公司/人員充分了解與接受，並將其應用於使用、加工、制造或管理與本產品有關之作業規定上。本 MSDS 資料內容在編訂時已盡可能將最新資料納入，但對所有內容並不予以任何保證。

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REPORT OF MATERIAL TEST

怡程金属（深圳）有限公司
地址：深圳市龙岗区坪山镇深圳出口加工区荔景路
TEL：0755-61291589 FAX：0755-61291289

DATE：NOV.10.09

Customer: 得意		Commodity: C 2680 R BRASS STRIP (SH)	INVOICE/NO:LT981110
Applied Standard:CNS 4383 Brass Sheets, Plates and Strips			

Chemical Analysis Test

I/No.	Size of product			Cu(%)	Fe(%)	Pb(%)	Zn(%)			
	Thickness (mm)	Width (mm)	Length (mm)							
	Standard			64.00 - 68.00	max. 0.050	max. 0.070	REM.			
1	0.3	14		65.62	0.035	0.0069	REM.			

Mechanical & Physical Test

I/No.	Size of product			Dimensicn Test		Tension Test		Hardness Test HV	Grain Size (mm)	Electric Conductirity (%)
	Thickness (mm)	Width (mm)	Length (mm)	Thickness (mm)	Width (mm)	TensileStrength (kgf/mm2)	Elongation (%)			
	Standard			-	(-)0.10 - (+) 0.00	min-53	-	min-	-	-
1	0.3	14		G00D.	G00D.	57.43	7.57	184	-	24.00

QC Supervisor: 李绚宁

怡程金属（深圳）有限公司 业务专用章

签名无效
For Quest Please
Contact th GS
www.sgs.com.tw

測試報告
Test Report

怡程金屬(深圳)有限公司 (YI CHENG (SHENZHEN) CO., LED)
深圳市龍崗區坪山鎮深圳出口加工區蘭金四路1號 (LIJING RD, SHENZHEN EXPORT PROCESSING ZONE, PINGSHAN REGION, SHENZHEN CHINA)

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)	:	怡程股份有限公司 (LIGHTWAY INTERNATIONAL CO., LTD.)
樣品名稱(Sample Name)	:	黃銅
樣品型號(Style/Item No.)	:	C2680

==========

收件日(Sample Receiving Date)	:	05-Oct-2020
測試期間(Testing Period)	:	05-Oct-2020 to 13-Oct-2020

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

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

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

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

PIN CODE: A4044628

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測試報告
Test Report

怡程金屬(深圳)有限公司 (YI CHENG (SHENZHEN) CO., LED)
深圳市龍崗區坪山鎮深圳出口加工區蘭金四路1號 (LIJING RD, SHENZHEN EXPORT PROCESSING ZONE, PINGSHAN REGION, SHENZHEN CHINA)

測試部位敘述 (Test Part Description)

No.1 : 黃銅色金屬 (BRASS METAL)

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	限值 (Limit)
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	100
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	12.1	1000
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	1000
六價鉻 (Hexavalent Chromium) Cr(VI) (CAS No.: 18540-29-9) (#2)	參考IEC 62321-7-1: 2015，以UV-VIS分析。(With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.)	μg/cm²	0.1	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.	1000

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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result) No.1	限值 (Limit)
一溴聯苯醚 (Monobromodiphenyl ether)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	mg/kg	5	n.d.	-
二溴聯苯醚 (Dibromodiphenyl ether)		mg/kg	5	n.d.	-
三溴聯苯醚 (Tribromodiphenyl ether)		mg/kg	5	n.d.	-
四溴聯苯醚 (Tetrabromodiphenyl ether)		mg/kg	5	n.d.	-
五溴聯苯醚 (Pentabromodiphenyl ether)		mg/kg	5	n.d.	-
六溴聯苯醚 (Hexabromodiphenyl ether)		mg/kg	5	n.d.	-
七溴聯苯醚 (Heptabromodiphenyl ether)		mg/kg	5	n.d.	-
八溴聯苯醚 (Octabromodiphenyl ether)		mg/kg	5	n.d.	-
九溴聯苯醚 (Nonabromodiphenyl ether)		mg/kg	5	n.d.	-
十溴聯苯醚 (Decabromodiphenyl ether)		mg/kg	5	n.d.	-
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.	1000
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP)) (CAS No.: 85-68-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP)) (CAS No.: 84-74-2)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) (CAS No.: 117-81-7)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) (CAS No.: 84-69-5)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	1000
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result) No.1	限值 (Limit)
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-41-7)	參考US EPA 3050B: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-
砷 (As) (Arsenic (As)) (CAS No.: 7440-38-2)	參考US EPA 3050B: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考CEN/TS 15968: 2010，以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.	-
全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	參考CEN/TS 15968: 2010，以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.	-
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0)	參考US EPA 3050B: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-

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備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出)；小於MDL / Less than MDL
4. "-" = Not Regulated (無規格值)
5. 全氟辛烷磺酸及其鹽類包含 (PFOS and its salts including)：
   CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
6. 全氟辛酸及其鹽類包含 (PFOA and its salts including)：
   CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
7. (#2) =
   a. 當六價鉻結果大於0.13 μg/cm²，表示樣品表層含有六價鉻。(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. 當六價鉻結果為n.d. (濃度小於0.10 μg/cm²)，表示表層不含六價鉻。(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. 當六價鉻結果介於 0.10 及 0.13 μg/cm² 時，無法確定塗層是否含有六價鉻。(The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.)

8. 符合性結果之判定係以測試結果與限值做比較。(The statement of compliance conformity is based on comparison of testing results and limits.)

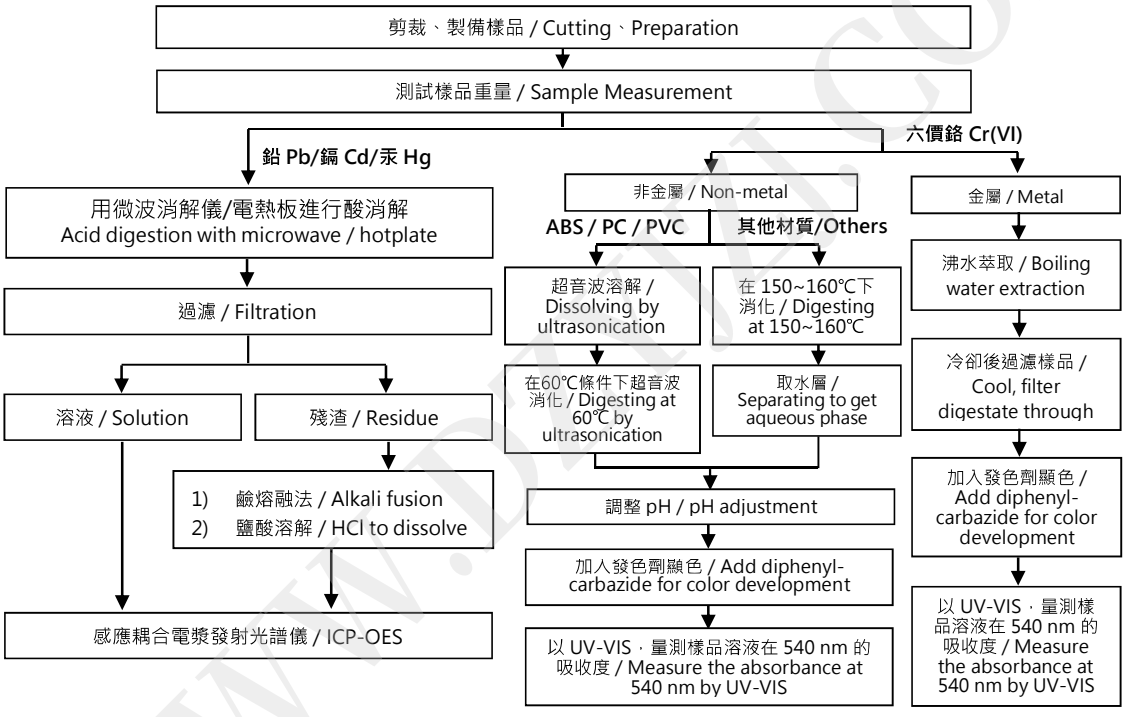
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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）

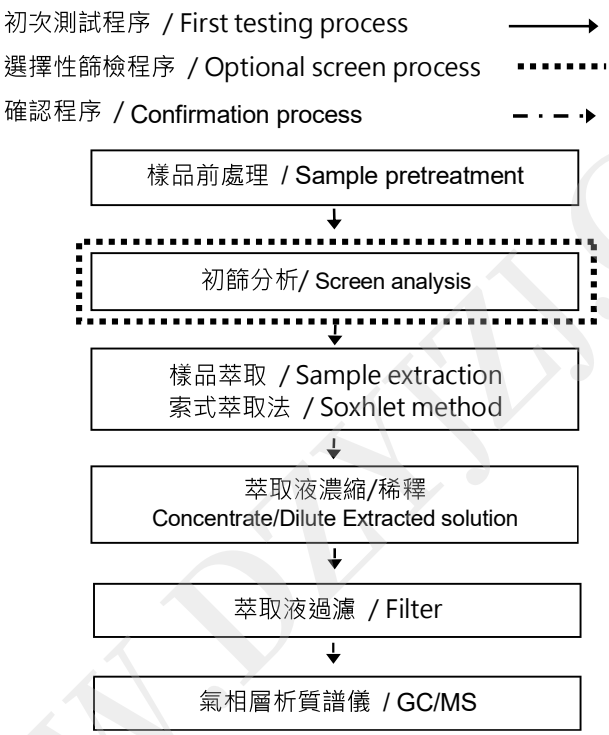
These samples were dissolved totally by pre-conditioning method according to below flow chart.
（Cr^{6+} test method excluded）



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

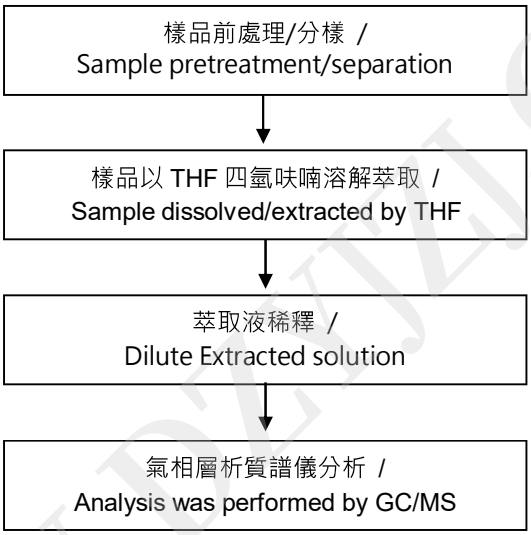


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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



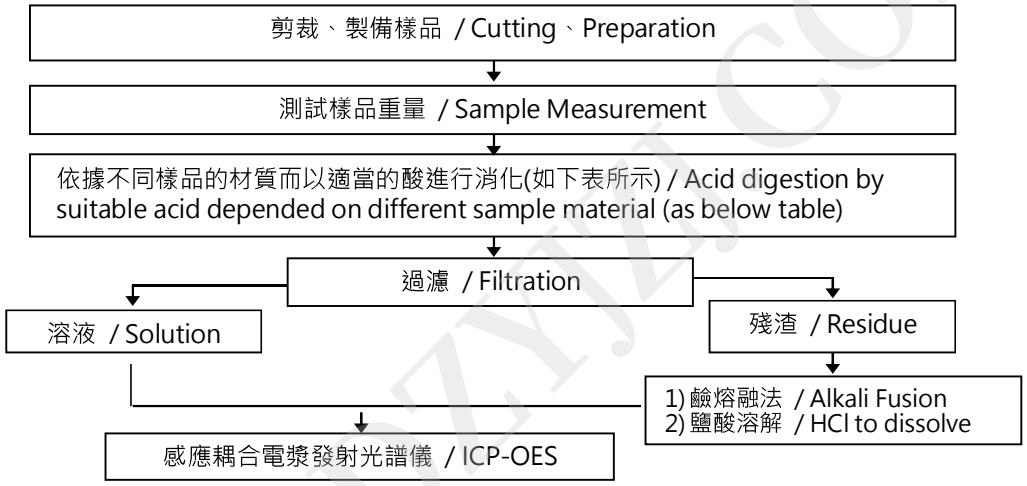
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元素以 ICP-OES 分析的消化流程圖

(Flow Chart of digestion for the elements analysis performed by ICP-OES)

根據以下的流程圖之條件，樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.

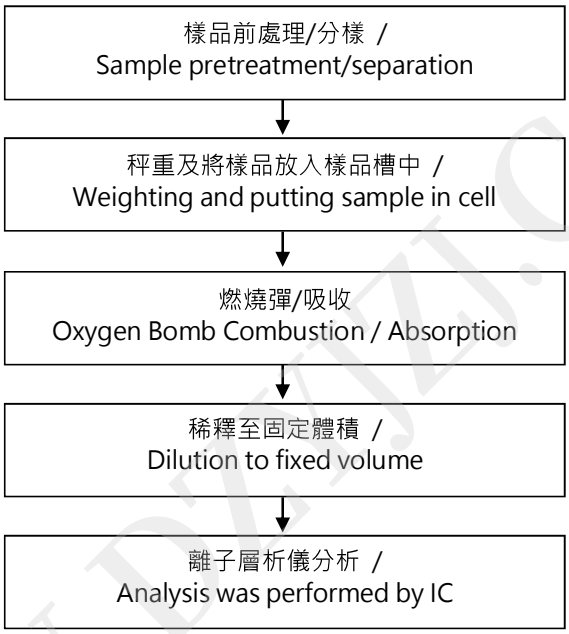


鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNO_3, HCl, HF, H_2O_2
玻璃 / Glass	硝酸,氫氟酸 / HNO_3/HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO_3
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H_2SO_4, H_2O_2, HNO_3, HCl
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion

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怡程金屬(深圳)有限公司 (YI CHENG (SHENZHEN) CO., LED)
深圳市龍崗區坪山鎮深圳出口加工區蘭金四路1號 (LIJING RD, SHENZHEN EXPORT PROCESSING ZONE, PINGSHAN REGION, SHENZHEN CHINA)

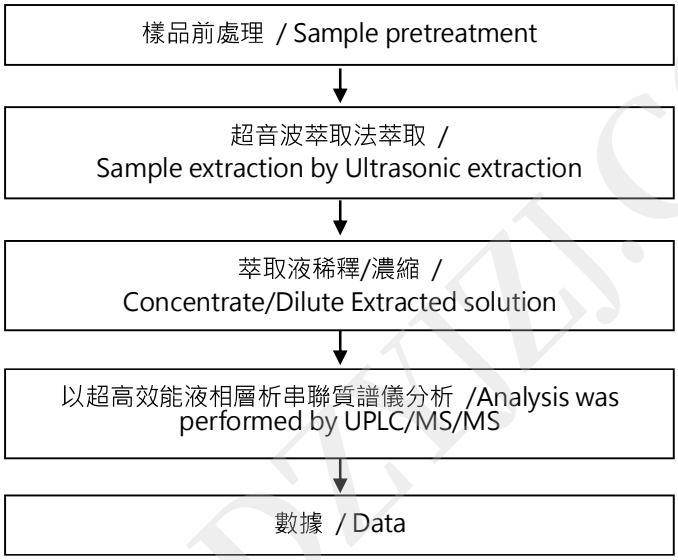
鹵素分析流程圖 / Analytical flow chart - Halogen



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深圳市龍崗區坪山鎮深圳出口加工區蘭金四路1號 (LIJING RD, SHENZHEN EXPORT PROCESSING ZONE, PINGSHAN REGION, SHENZHEN CHINA)

全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS



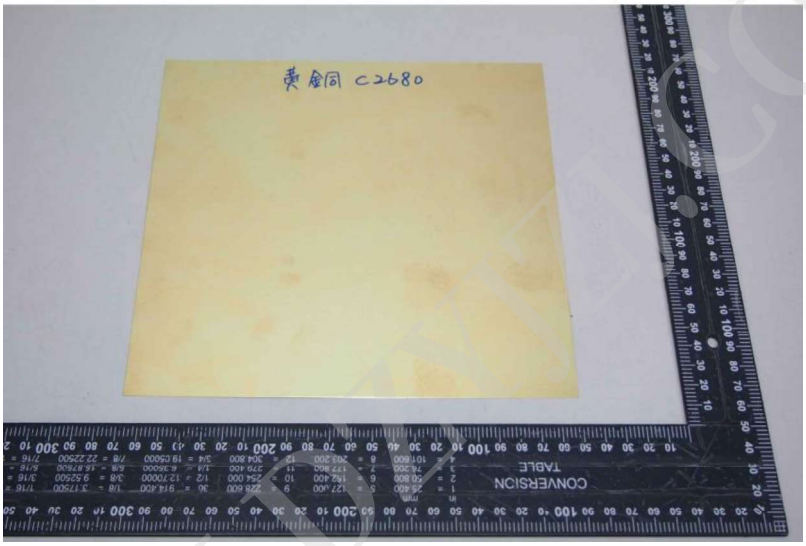
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測試報告
Test Report

怡程金屬(深圳)有限公司 (YI CHENG (SHENZHEN) CO., LED)
深圳市龍崗區坪山鎮深圳出口加工區蘭金四路1號 (LIJING RD, SHENZHEN EXPORT PROCESSING ZONE, PINGSHAN REGION, SHENZHEN CHINA)

*** 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.)

ETR20A00079



** 報告結尾 (End of Report) **

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怡程金属
名佳利金属

物质安全资料表

MSDS C2600-C2801

怡程金属（深圳）有限公司物质安全资料表编号：	**MCL002**
版次：	**3**
出版日期：	**2014-1-1**

1 物品与厂商资料

物品中（英）文名称：	黄铜（BRASS ALLOY）		
物品代码：	C2600-C2681		
化学名称：	Cu-Zn 金属合金		
类别：	金属混合物		
制造商或供应商名称：	怡程金属（深圳）有限公司		
制造商或供应商地址：	深圳市龙岗区坪山镇深圳出口加工区		
制造商或供应商电话：	0755-61291589	传真：	0755-61291289
制造商或供应商网址：			
紧急联络电话：	0755-61291589		

2 产品成份

化学名称：	铜（Cu）
CAS 编号：	7440-50-8
比例：	C2680 64.0-68.0%

化学名称：	锌（Zn）
CAS 编号：	7440-66-6
比例：	余量

OHSA:本产品在固体时不具危险性.其粉尘及烟雾:具有危害性

怡程金属（深圳）有限公司 业务专用章

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3.危害辨识资料

警告： 长时间暴露于粉尘及烟雾的工作环境下，对于眼睛、呼吸系统、皮肤会造成刺激伤害，必须配戴保护器具，包括护目镜，适当衣物，必须要保护全部身体 身体被接触知部位，必须彻底清洗干净。

种类的名称：	铜、锌之混合物
危险标示类别：	金属粉尘或烟雾对皮肤、眼睛造成刺激性且对肺具有毒性，但金属成品本身不具危害性
危险级数（粉尘及烟雾）：	健康：1；可燃：0 （0=低、4=极高）

4.急救错置

对于粉尘及烟雾危害：

眼睛接触：	以大量清净水冲洗上下眼皮内部（至少 15 分钟），若眼睛被刺激不适者，立即送医检查
食入时：	大量喝水并催吐，迅速送医院检查
皮肤接触：	以清水清洗干净
吸入时：	送至通风良好较阴凉处休息，以毛布保暖，严重者迅速送医院检查诊断

5.火灾及爆炸危害资料

燃烧性资料：

爆炸性：	无
可燃性：	无
燃烧性：	无
闪火点：	不适用
自然性：	不适用

灭火剂

灭火方式：使用灭火剂于材料表面即可

消防建议

注意粉尘可能导致爆炸或产生可燃烧气体

6.泄漏的处置

本产品在加工时产生粉尘时，有可能产生爆炸，必须将火源移除，也唯有粉尘型态时才可能产生泄露，所以必须装设吸尘装置，过滤空气中之粉尘，以降低其粉尘浓度。	
泄露于空气中：	不适用
泄露于水中：	不适用
泄露于地面中：	不适用



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怡程金属
名佳利金属

7.取用及储运方式

取用注意事项

扎延产品之端面易割伤皮肤应小心取用。 切削加工时会产生粉尘应小心眼睛、皮肤及呼吸应配戴保护器具。 小心粉尘不可泄漏至空气中。 需注意产品有翻倒之危险性易造成压伤，吊运时要十分注意。 打包带剪除时，小心其末端会弹起，对人员之身体、皮肤及眼睛造成割伤。 衣物或器具上之粉尘应以水洗或吸尘器清洁，不可用拍打或其它方式处理。

储存条件

仓储最高容许温度：无 避免放置于潮湿或酸/咸性物质或酸/咸性气体之场所。

8 人员曝露防护措施

Cu 曝露标准：		**OSHA（PEL）**		**ACGIH（TLV）**	
		ppm	**mg/m^3**	**ppm**	**mg/m^3**
	烟雾	无	**0.1**	无	**0.2**
	粉尘	无	**1**	无	**1**
Zn 曝露标准：		**OSHA（PEL）**		**ACGIH（TLV）**	
		ppm	**mg/m^3**	**ppm**	**mg/m^3**
	粉尘	无	无	无	无
呼吸防护：	长时间曝露于粉尘及烟雾的工作环境下,需要呼吸防护器具,配戴 NIOSH 认证防尘口罩				
通风防护：	工作场所中,若是会产生烟雾及粉尘时,必须要有通风设备及集尘装置,且工作中不可饮食及抽烟				
眼睛及皮肤防护：	需要配戴护目镜,防护手套防止割伤				
人员防护：	作业时应穿适当之工作服及安全鞋				

9 物理及化学性质

外观：	黄色光泽的固度金属
熔点：	**930-1065℃**
沸点：	无资料
比重：	**8.66**
蒸气压：	不适用
溶解度：	不适用
PH 值 25℃：	不适用

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名佳利金属

10 安定性及反应性资料

非活性物质

11 毒性资料

来源途径

粉尘：食入、皮肤接触、吸入、眼睛接触 烟雾：吸入、眼睛接触、皮肤接触 本产品的成品不具毒性

动物毒性：本合金产品不具毒性
其单成份之毒性说明如下供参考 皮肤腐蚀性：无此资料 刺激性（皮肤、眼睛）：铜产品会产生接触性皮肤炎，锌对眼睛有危害性 急性毒性：铜的粉末经口食入，会有急性中毒症状：呕吐、无力感及胃疼，粉尘吸入过多，会有胸痛，发烧等症状。 粉尘、烟雾会让原有气喘、肺气肿之病患病情加重

12 生态资料

本产品的成品对生态不个毒性

分解性：无资料 蓄积性：无资料 突变性：本产品没有资料显示会造成突变性 鱼毒性：水中的铜浓度，在 0.015-3.0mg/1,尤其在软水中，会有报告会对许多种类的鱼、甲壳类的动物及软体动物、浮游生物具有毒性

13 废弃处理

本产品不属于危害性废弃物，须丢弃时可以委托回收商予以回收再生处理

14 运输资料

运送时本产品不要直接与水接触，并且要注意会有滑落、翻落的危险发生

15 法规资料

通常无特定法令规定，但是在会产生粉尘的场所必须遵守劳工安全卫生法劳工作业环境空气中有害物质容许浓度标准
USA/OHSA:Occupational Safety ＆ Health Administration
USA/ACGIH Guide to protective Clothing Cincinnati,OH;American Conference of Government Industrial Hygienists,1987
USA/SARA313



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怡程金属
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16．其他资料

本 MSDS 内容资料应被所有使用、运送、储存或曝露于本产品之公司/人员充份了解与接受并将其应用于使用、加工、制造或管理与本产品有产之作业规定上。本 MSDS 资料内容在编订时已尽可能将最新之资料纳入，但对所有内容并不予以任何保证。



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Test Report

Report No. A2200474475101003

Company Name shown on Report	LOTES GUANGZHOU CO.,LTD
Address	NO.526,NORTH OF JIN LING ROAD,NAN SHA ECONOMIC AND TECHOLOGY,DEVELOPMENT ZONE GUANGZHOU,CHINA

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

Sample Name	NICKEL/TIN/ELECTROPLATING(C2680)
Material	C2680
Buyer	LOTES GUANGZHOU CO.,LTD
Supplier	ZHONGSHAN CITY XING CHENG METAL PRODUCTS SURFACE TREATMENT CO.,LTD
Sample Received Date	Dec. 29, 2020
Testing Period	Dec. 29, 2020 to Jan. 4, 2021
Test Requested	As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)) in the submitted sample(s).
Test Method	Please refer to the following page(s).
Test Result(s)	Please refer to the following page(s).

Tested by: Qianzhong He

Approved by: Wenjun Wang

Wenjun Wang

Technical Director

Reviewed by: Guange Feng

Date: Jan. 4, 2021

No. R340239495

Centre Testing International Group Co.,Ltd. Shunde Branch
Yongying Building, Section 2, No.8, East of Rongqi Avenue, Ronggui, Shunde District, Foshan, Guangdong, China

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Test Report

Report No. A2200474475101003

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	Refer to IEC 62321-5:2013	ICP-OES
Cadmium (Cd)	Refer to IEC 62321-5:2013	ICP-OES
Mercury (Hg)	Refer to IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium (Cr(VI))	IEC 62321-7-1:2015	UV-Vis

Test Result(s)

Tested Item(s)	**Result**	**MDL**
Lead(Pb)	28 mg/kg	2 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg
Mercury(Hg)	N.D.	2 mg/kg
Hexavalent Chromium(Cr(VI))	N.D. ▼	0.10 μg/cm² (LOQ)

Sample/Part Description Silvery plating

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

-MDL = Method Detection Limit

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

-mg/kg = ppm = parts per million

-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm²

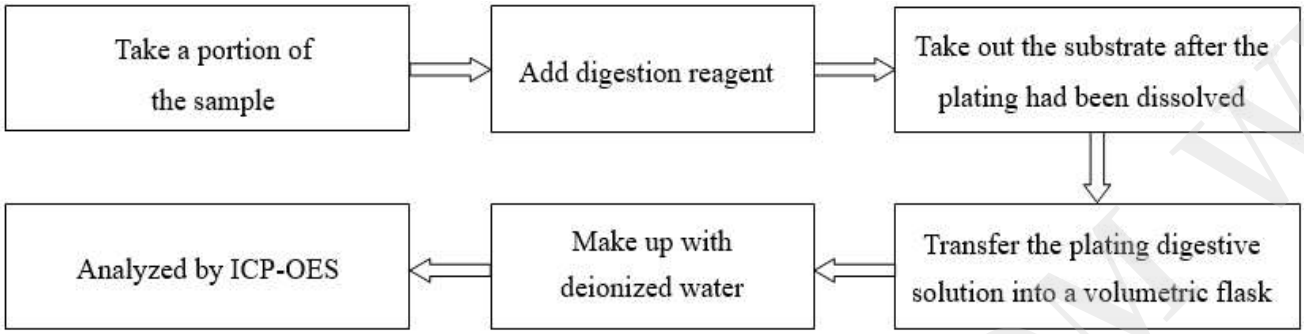
-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm². The coating is considered a non-Cr(VI) based coating.

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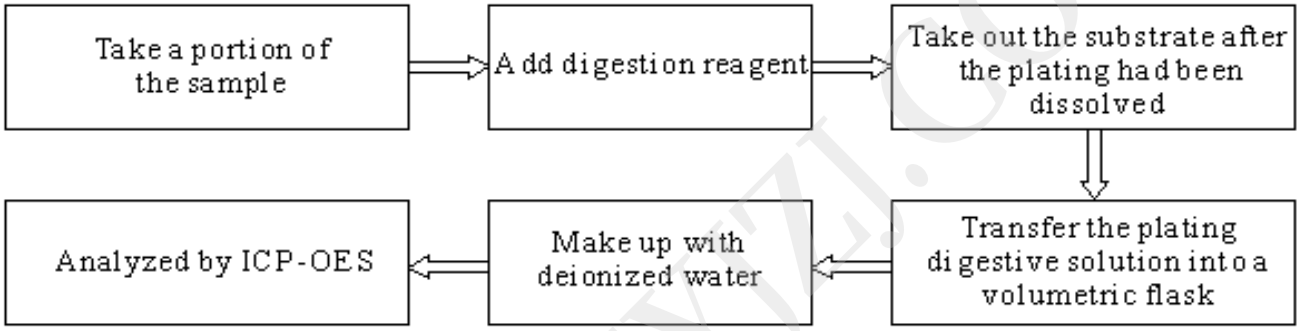
Test Report

Test Process

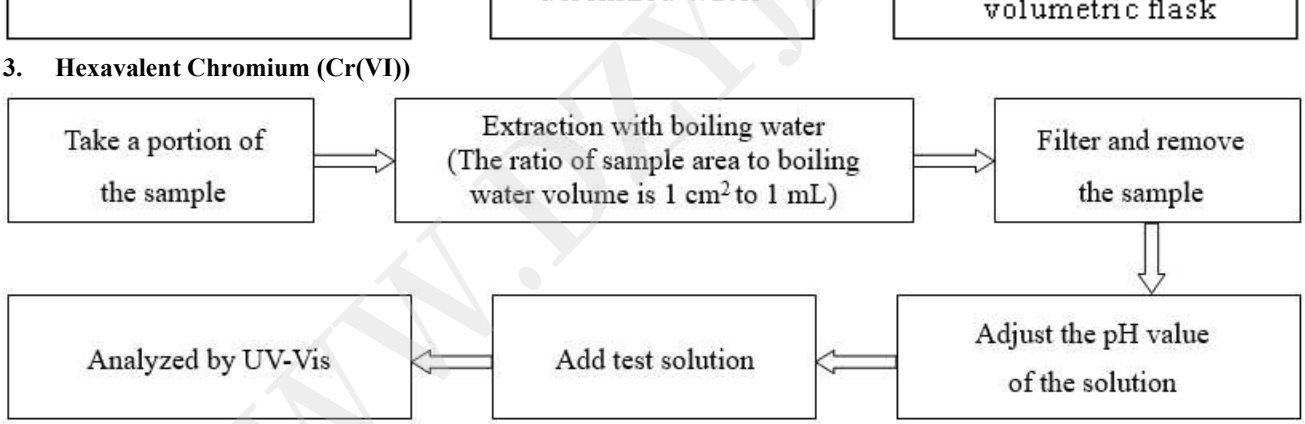
1. Lead (Pb), Cadmium (Cd)



2. Mercury (Hg)



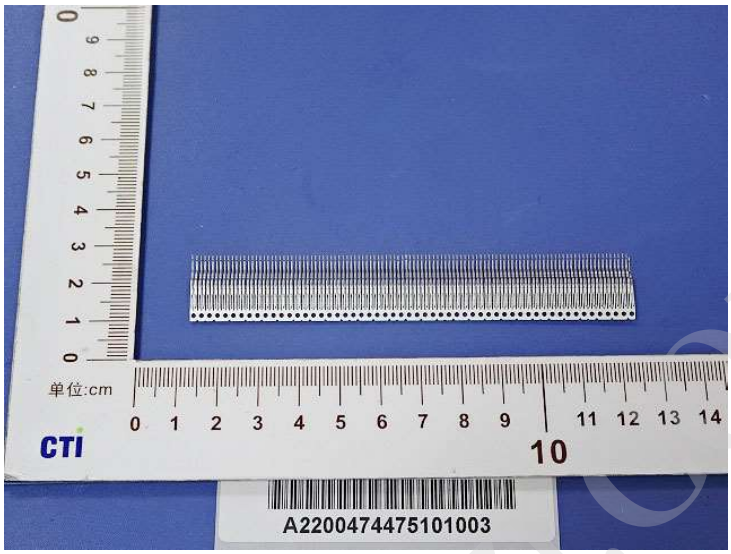
3. Hexavalent Chromium (Cr(VI))



Test Report

Report No. A2200474475101003

Photo(s) of the sample(s)



Statement:

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

*** End of report ***

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XC

Material SafetyData

Plating MSDS

Section 1:Chemical Product and Company Identification

Product Name: Nickel Tin plating layer

Manufacturer Name:Zhongshan city Xingcheng metal products surface treatment co., LTD

Manufacturer Address:1F, two area workshop, No. 1, Jincheng West Third Street , Gaoping Industyial Zone, Sanjiao Town, zhongshan Guangdong. P. R. China

Tel:0760-228156899

Fax:0760-22812093

Emergrency tel:0760-22812093

Section 2:Composition and Information on Ingredients

Composition: Nickel Tin

Nickel CAS NO：7440-02-0 Nickel content: 63.5%

Tin CAS NO：7440-31-5 Tin content：36.5%

Section 3:Hazards Identification

Potential Acute Health Effects:Sightly hazardous in case of ingestion,.Non-irritant for skin

Carcinogenic not available.Mutagenic effects:Not available.

Teratogenic effects:Not available.

Developmental toxicity:Not available.Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4:First Aid Measures

Eye Contact:

Check for and remove any contact lenses.In case of contact,immediately flush eyes with plenty of water for at least 15，minutes.Get medical attention if irritation occurs.

Skin Conteact:Not available.

In jestion:Do not induce vomiting unless directed to do so by medical personnel.Never give

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anything by mouth to an unconscious person.
If large quantities of this material are swallowed,call a physician immediately.Loosen tight clothing such as a collar,tie,belt or waistband.
Serious Ingestion:Not available.

Section 5:Fire and Explosion Data

Flammability of the Product:Non-flammable.
Auto-Ignition Temperature:Not applicable.
Flash Points:Not applicable.
Flammable Limits: Not applicable.
Products of Combustion: Not available.
Fire Hazards in presence of Various Substances: Not applicable.
Explosion Hazards in presence of Various Substances: Not applicable.
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge:Not available.
Fire Fighting Media and Instructions: Not applicable.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards: Not available

Section 6:Accidental Release Measures

Spill: Not available

Section 7:Handling and Storage

Precautions:The product surface is easy to cut the skin,using finger stall or tweezers can better protect your skin from harm.
Storage:Keep container in a Constant temperature and humidity area.Avoid placed in high t temperature and high humidity and acid or alkaline substances area. places of acid-base gasqualitaive is also harmful to the product.

Section 8:Exposure Controls/Personal Protection

Exposure Controls: Not available
Personal Protection:finger stall

Section 9:Physical and Chemical Properties

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Physical property:Solid.

Color: Silver/Nickel Silver/Tin

Taste: Tasteless.

Melting Point: Nickel：1453℃ Tin：232℃

Boiling Point: Nickel：2730℃ Tin：2270℃

Specific Gravity: Nickel：8.9 g/cm3 Tin：7.2 g/cm3

Section 10:Stability and Reactivity Data

Inactive substance

Section 11:Toxicological Infomation

Routes of Entry: Not available

Toxicity to Animals:LD50: Not available

Chronic Effects onHumans: Not available

Other Toxic Effects on Humans:Slightly hazardous in case of INGESTION,.Non-irritant for skin.

Special Remarks on Toxicity to Animals Not available

Special Remarks on Chronic Effects on Humans: Not available

Section 12:Ecological Information

Ecotoxicity: Not available

BOD and COD: Not available

Products of Biodegradation:Possibly hazardous short term degradation products are not likely. However,long term degradation products may arise.

Toxicity of the Products of Biodegradation:The product itself and its products of degradation . are not toxic.

Special Remarks on the Products of Biodegradation: Not available

Section 13:Disposal Considerations

Waste Disposal: Waste must be disposed of in accordance with federal,state and local environmental control regulations.

Section 14:Transport Information

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

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Section 15:Other Regulatory Information

Harmful substances in accordance with EU regulations

HMIS(U.S.A.):

Health Hazard:1

Fire Hazard:1

Reactivity:0

Personal Protection:B

National Fire Protection Association (U.S.A.).

Health:1

Flammability:0

Reactivity:0

Protective Equipment:finger stall

Section 16:Other Information

References: Not available.

Other Special Considerations: Not available.

Created:5/14/2020 10:00 AM

Next Updated: 5/14/2022 10:00 AM

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CTI 华测检测 CENTRE TESTING INTERNATIONAL

CMA 180000343904

Test Report

Report No. A2210080615101002

Company Name shown on Report	DONGGUAN JINGWEI OPTOELECTRONICS MATERIAL CO.,LTD
Address	GUANGDONG SHIJIE TOWN DONGGUAN CITY YONG KOU GUAN LI QU TIAN XIN STREET NO. 6

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

Sample Name	PI Tape
Part No.	PI
Material	PI Tape
Sample Received Date	Mar. 12, 2021
Testing Period	Mar. 12, 2021 to Mar. 16, 2021
Test Requested	As specified by client, to test Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I) in the submitted sample(s).
Test Method	Please refer to the following page(s).
Test Result(s)	Please refer to the following page(s).

Tested by: Kid Zhang

Approved by: Hill Zheng

Hill Zheng
Technical Manager

Reviewed by:

Date: Mar. 16, 2021

No. R183997355

Centre Testing International Group Co.,Ltd.
CTI Building, Xing Dong Community, Xin'an Sub-district, Bao'an District, Shenzhen City, Guangdong Province, P.R. China

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Test Report

Report No. A2210080615101002

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Fluorine (F)	Refer to EN 14582:2016	IC
Chlorine (Cl)	Refer to EN 14582:2016	IC
Bromine (Br)	Refer to EN 14582:2016	IC
Iodine (I)	Refer to EN 14582:2016	IC

Test Result(s)

Tested Item(s)	**Result**	**MDL**
Fluorine(F)	N.D.	10 mg/kg
Chlorine(Cl)	N.D.	10 mg/kg
Bromine(Br)	N.D.	10 mg/kg
Iodine(I)	N.D.	10 mg/kg

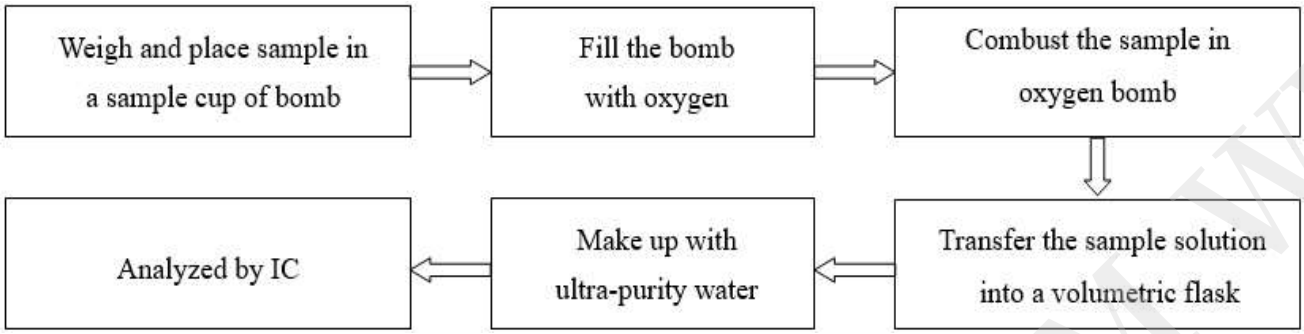
Sample/Part Description Dark brown adhesive tape

Remark: -MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million

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Test Report

Test Process

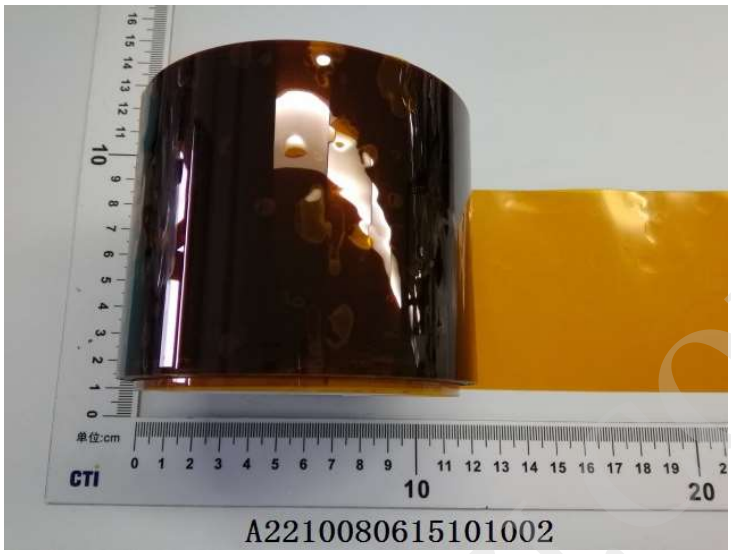


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Test Report

Report No. A2210080615101002

Photo(s) of the sample(s)



Statement:

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

*** End of report ***

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CTI 华测检测 CENTRE TESTING INTERNATIONAL

CMA 180000343904

Test Report

Report No. A2210080615101001

Company Name shown on Report	DONGGUAN JINGWEI OPTOELECTRONICS MATERIAL CO.,LTD
Address	GUANGDONG SHIJIE TOWN DONGGUAN CITY YONG KOU GUAN LI QU TIAN XIN STREET NO. 6

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

Sample Name	PI Tape
Part No.	PI
Material	PI Tape
Sample Received Date	Mar. 12, 2021
Testing Period	Mar. 12, 2021 to Mar. 16, 2021
Test Requested	As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)), Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs), Phthalates (DBP, BBP, DEHP, DIBP) in the submitted sample(s).
Test Method	Please refer to the following page(s).
Test Result(s)	Please refer to the following page(s).

Tested by: Kid Zhang

Approved by: Hill Zheng

Hill Zheng
Technical Manager

Reviewed by:

Date: Mar. 16, 2021

No. R183997355

Centre Testing International Group Co.,Ltd.
CTI Building, Xing Dong Community, Xin'an Sub-district, Bao'an District, Shenzhen City, Guangdong Province, P.R. China

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Test Report

Report No. A2210080615101001

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	IEC 62321-5:2013	ICP-OES
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium (Cr(VI))	IEC 62321-7-2:2017 and/or determination of Total Chromium by IEC 62321-5:2013	UV-Vis/ICP-OES
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS

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Test Report

Report No. A2210080615101001

Test Result(s)

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

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

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

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Test Report

Report No. A2210080615101001

Test Result(s)

Tested Item(s)	Result	MDL
Phthalates (DBP, BBP, DEHP, DIBP)		
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg
Butyl benzyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-(2-ethylhexyl) phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg
Diisobutyl phthalate(DIBP) CAS#:84-69-5	N.D.	50 mg/kg

Sample/Part Description Dark brown adhesive tape

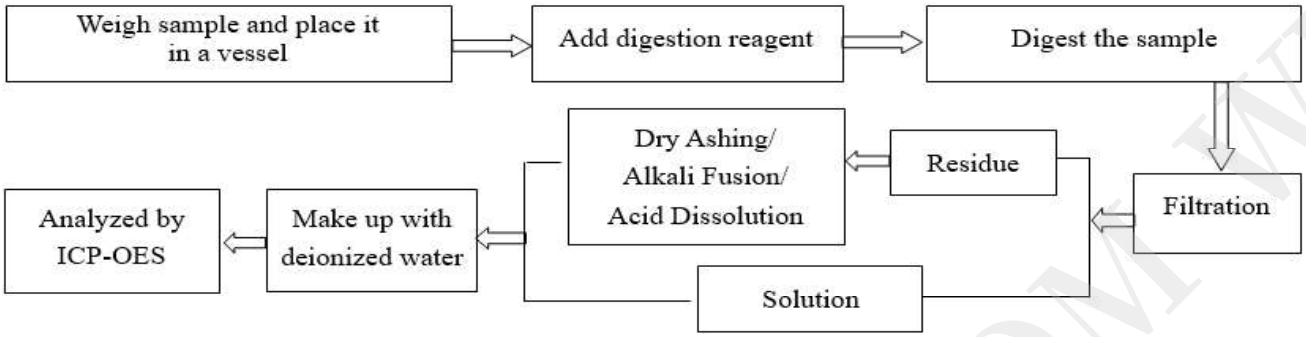
Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million

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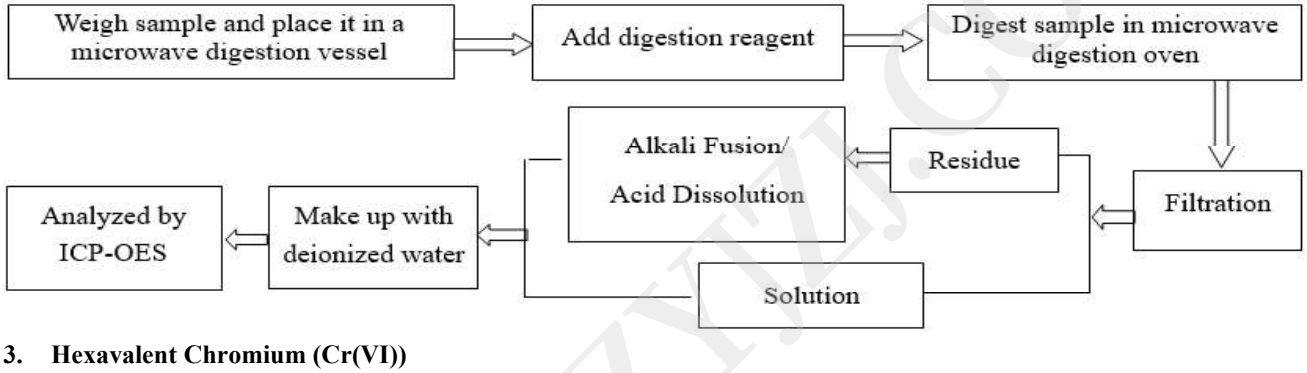
Test Report

Test Process

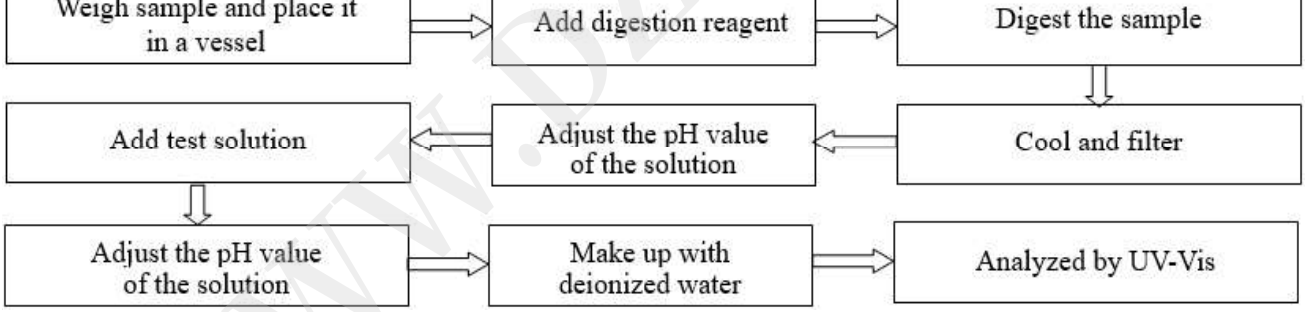
1. Lead (Pb), Cadmium (Cd), Chromium (Cr)



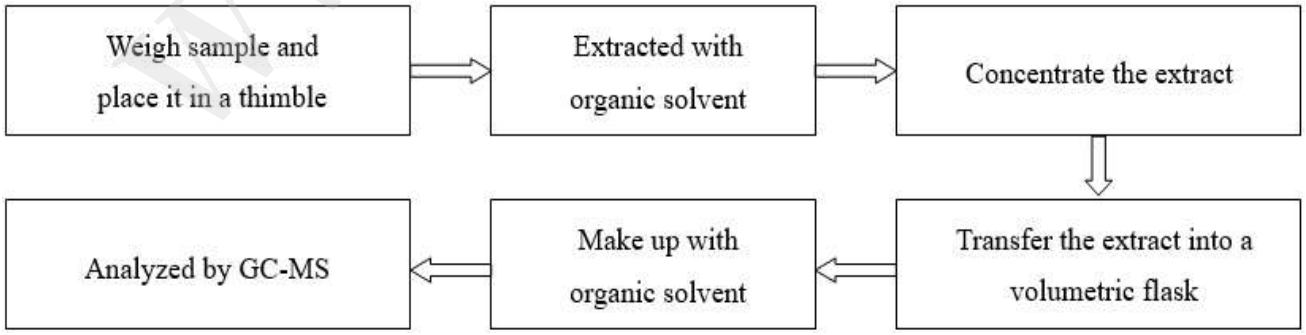
2. Mercury (Hg)



3. Hexavalent Chromium (Cr(VI))



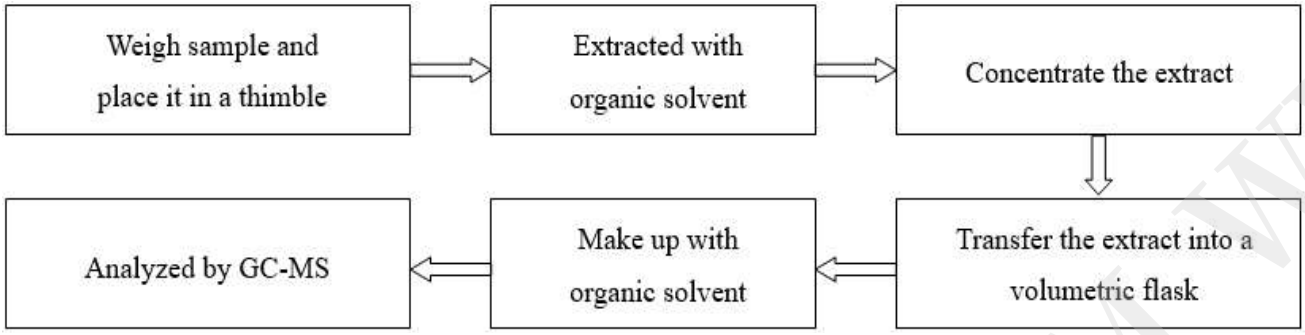
4. Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)



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Test Report

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

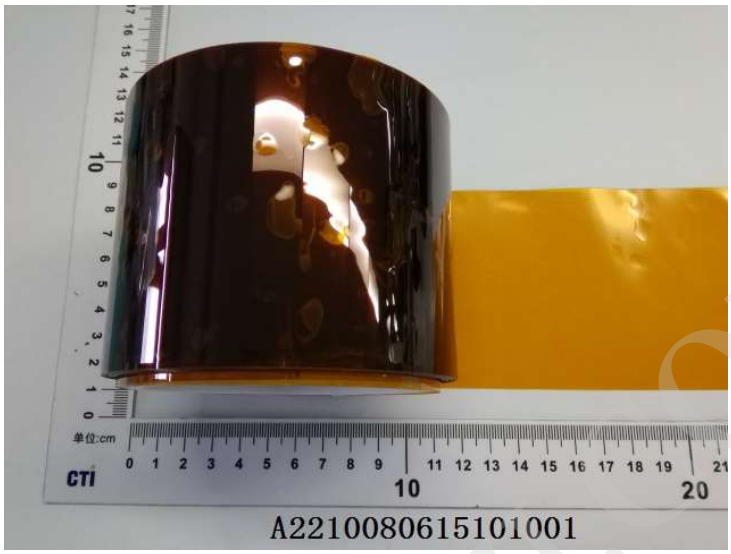


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Test Report

Report No. A2210080615101001

Photo(s) of the sample(s)



Statement:

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
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*** End of report ***

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GUANGYE

SHENZHEN GUANGYE ELECTRONICS TECHNOLOGY CO., LTD

Bao'an District, Shenzhen City Furong Xinqiao Furong Road Dah Sing Industrial Zone

TEL: 0755-39353387 FAX: 0755-39476421

文件編號：**WJ-056-A**

No：WI/E PTD O04

Issue：A/0

Date：FEB 16

化學品物質安全數據表（MSDS）

MATERIALS SAFETY DATE SHEET(MSDS)

化學產品&公司鑒訂 Chemical Product and Company Identification			
產品名稱 Product name	**PI-TAPE**	同義詞 Synonym	POLYIMIDE FILM TAPE
簡要說明 Formulation	專用於產品外包裝的防護材料		
危險等級（等級說明：0＝ 最小 1＝ 輕微 2＝ 中等 3＝ 嚴重 4＝ 劇烈） Classification of hazard (explain: 0＝minimal 1 = slight 2 =moderate 3 =serious 4 = severe)			
專案 Item	NPCA/HMIS	NFPA 704	
健康 Health	最小	最小	
可燃性 Flammability	輕微	輕微	
活 性 Reactivity	最小	最小	

1. 物料成份與資訊 Composition/information on ingredients			
名称 Name	成分 Component	CAS NO	百分百 Percentage
基材 base material	聚酰亚胺薄膜 Polyimide film	31975-60-7	45-60%
	氧化铝 Alumina	1344-28-1	10-15%
	碳黑 Carbon black	1333-86-4	5-10%
硅酮聚合物	过氧化苯甲酰 Xylene(ortho meta,para)	1330-20-7	10-20%

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Silicone polymer	二甲基硅氧烷 Dimethyl siloxane,dimethyl-hydeoxy	63148-62-9	5-8%

2. 危險鑒定/緊急狀況說明
Determination of hazard/Emergency explain

狀態 State	正常
吸入 Inhalation	無法吸入
攝取 Ingestion	無
皮膚接觸 Skin contact	無不良現象
眼睛接觸 Eye contact	無
致癌物 Carcinogenic	IARC— 無 ，NTP— 無 ，OSHA—無

3. 緊急情況時的第一求援措施
Emergency and first aid procedures

吸入 Inhalation	無
攝取 Ingestion	無需特殊處理措施。 No special measures necessary.
皮膚接觸 Skin contact	無需特殊處理措施。 No special measures necessary.
眼睛接觸 Eye contact	.無

5.消防措施
Fire-fighting measures

易燃性 Flammability	禁止明火		
專用滅火程式或設備 Specific Exposure Prevention Equipment	無 None		
突然起火/爆炸危險 fire or explode	無 None		

6.意外釋放措施
Accidental release measures

無數據

7.處理&存儲
Handling and Storage

保持通風良好，避免堆積。遠離熱和火源。

Provide good ventilation. Avoid the formation and deposition of dust. Keep away from sources of heat and ignition.

8.暴露控制/個人保護
Exposure controls /personal protection

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9.物理/化學成份(物理/化學性質) Physical and Chemical Properties			
外觀/狀態 Form	薄膜 Powder	氣味 Odor	無味 odorless
溶解性（水） Solubility in water	不溶 insoluble	分子量 molecular weight	無數據
10.穩定性/反應活性 Stability/reactivity			
無此方面的資訊。 Not observed			
11.毒性 Toxicological information			
無此方面的資訊。 Not observed			
12.環保 Ecological Information			
可自然氧化降解			
13.處理 Disposal Considerations			
無此方面的資訊。 Not observed			
14.運輸 Transportation			
在國際，國內的公路，鐵路和空運中無危險運輸的可能性。 The product does not constitute a hazardous substance in nation / international road , rail, see and air transport.			
15.管制 Regulatory			
無此方面的資訊。 Not observed			
16.其他 others			
MSDS 中的縮寫： CERCLA=全面環境相應補償和義務法案(Comprhensive Environmental Response Compensation and Liability Act) CFR=聯邦規章法規(Code of Federal Regulations) IARC=國際癌症調查機構(International Agency for Research on cancer) NFPA=國家防火協會(National Fire Protection Association) NPCA/HMIS=全國顏料與塗料協會（國家顏料與塗料協會危險物質資訊系統）(National paint & Coatings Association’s Hazardous Materials Information System) NTP=國家毒理學綱要(National Toxicology Program) OSHA=職業安全與健康機(Occupatonal Safety& Health Administration)			

編制 author	劉沛珠	審核 censor	張再金	批准 sanction	張再金

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Test Report

Report No. A2200357747101001

Company Name shown on Report	DONGGUAN JINGWEI OPTOELECTRONICS MATERIAL CO.,LTD
Address	GUANGDONG SHIJIE TOWN DONGGUAN CITY YONG KOU GUAN LI QU TIAN XIN STREET NO. 6

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

Sample Name	Glue透明
Part No.	硅胶剂
Material	Glue透明
Sample Received Date	Oct. 9, 2020
Testing Period	Oct. 14, 2020 to Oct. 16, 2020

Test Requested	As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs), Phthalates (DBP, BBP, DEHP, DIBP), Hexabromocyclododecane (HBCDD), Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), Phthalates, Perfluorooctane Sulfonates(PFOS) in the submitted sample(s).
Test Method	Please refer to the following page(s).
Test Result(s)	Please refer to the following page(s).

Tested by Ada Zhang

Approved by Hill Zheng

Hill Zheng

Technical Manager

Reviewed by Danna Yan

Date Oct. 16, 2020

No. R183992886

Centre Testing International Group Co.,Ltd.
CTI Building, Xing Dong Community, Xin'an Sub-district, Bao'an District, Shenzhen City, Guangdong Province, P.R. China

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Test Report

Report No. A2200357747101001

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead(Pb)	IEC 62321-5:2013	ICP-OES
Cadmium(Cd)	IEC 62321-5:2013	ICP-OES
Mercury(Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321-7-2:2017 and/or determination of Total Chromium by IEC 62321-5:2013	UV-Vis/ICP-OES
Polybrominated Biphenyls(PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS
Hexabromocyclododecane (HBCDD)	Refer to US EPA 3540C:1996 & US EPA 8270E:2018	GC-MS
Fluorine (F)	Refer to EN 14582:2016	IC
Chlorine (Cl)	Refer to EN 14582:2016	IC
Bromine (Br)	Refer to EN 14582:2016	IC
Iodine (I)	Refer to EN 14582:2016	IC
Phthalates	Refer to EN 14372:2004(E)	GC-MS
Perfluorooctane Sulfonates(PFOS)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS

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Test Report

Report No. A2200357747101001

Test Result(s)

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

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

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

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Test Report

Report No. A2200357747101001

Test Result(s)

Tested Item(s)	Result	MDL
Phthalates (DBP, BBP, DEHP, DIBP)		
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg
Butyl benzyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-(2-ethylhexyl) phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg
Diisobutyl phthalate(DIBP) CAS#:84-69-5	N.D.	50 mg/kg

Tested Item(s)	Result	MDL
Hexabromocyclododecane(HBCDD)	N.D.	5 mg/kg

Tested Item(s)	Result	MDL
Fluorine(F)	N.D.	10 mg/kg
Chlorine(Cl)	N.D.	10 mg/kg
Bromine(Br)	N.D.	10 mg/kg
Iodine(I)	N.D.	10 mg/kg

Tested Item(s)	Result	MDL
Phthalates		
Di-n-octyl phthalate(DNOP) CAS#:117-84-0	N.D.	30 mg/kg
Di-isononyl phthalate(DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
Di-iso-decyl phthalate(DIDP) CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg
Dipentyl phthalate(DPP) CAS#:131-18-0	N.D.	30 mg/kg
Di-n-hexyl phthalate(DNHP) CAS#:84-75-3	N.D.	30 mg/kg

Tested Item(s)	Result	MDL
Perfluorooctane Sulfonates(PFOS)	N.D.	0.01 mg/kg

Sample/Part Description Transparent liquid(Dry weight)

Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million
-The sample was tested after drying for 2 hours under 105℃.

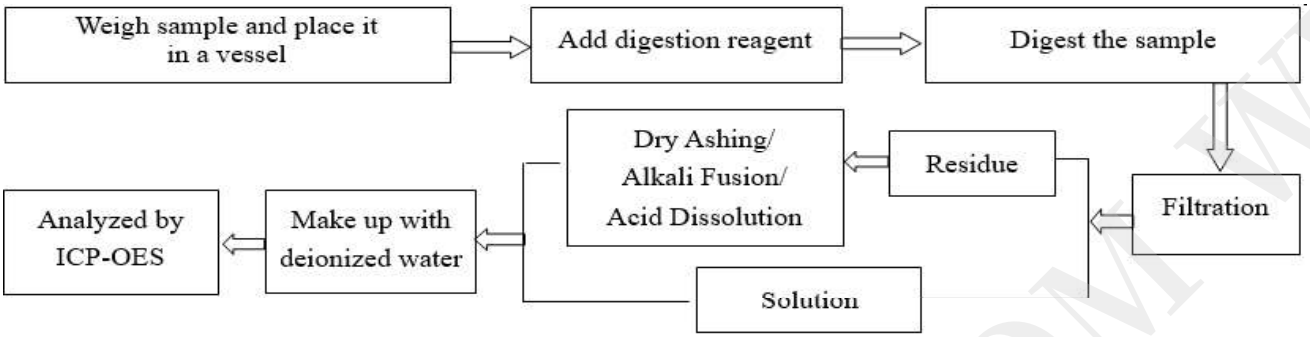
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Test Report

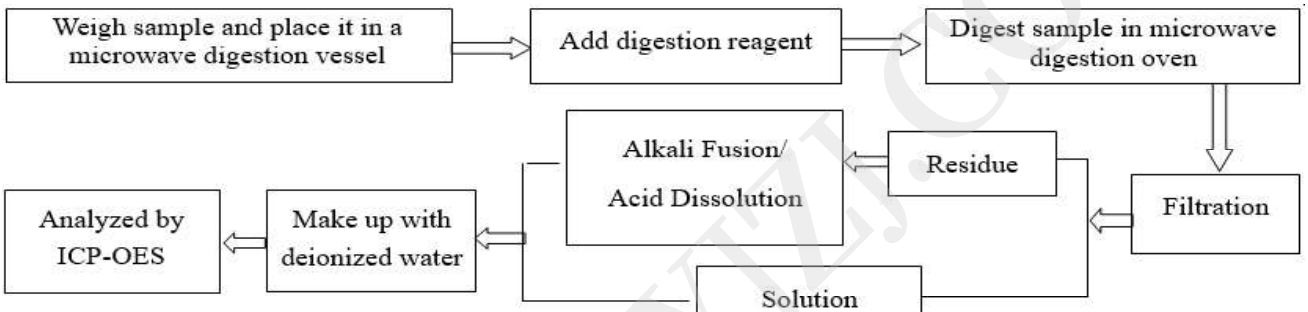
Report No. A2200357747101001

Test Process

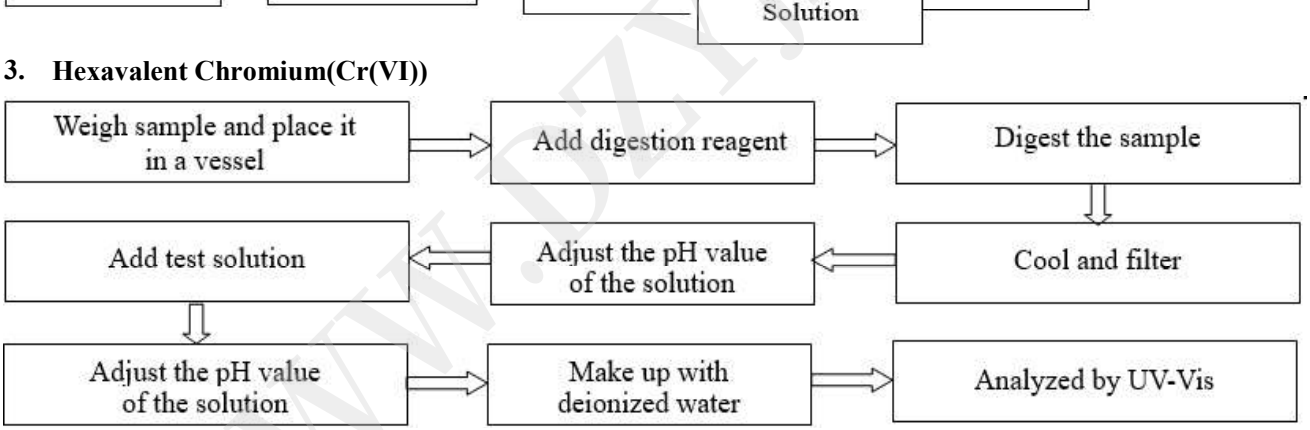
1. Lead(Pb), Cadmium(Cd), Chromium(Cr)



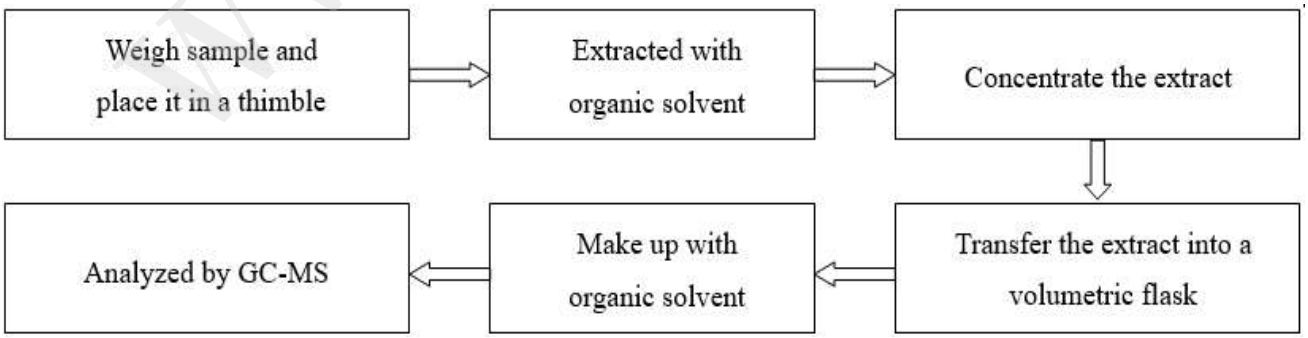
2. Mercury(Hg)



3. Hexavalent Chromium(Cr(VI))



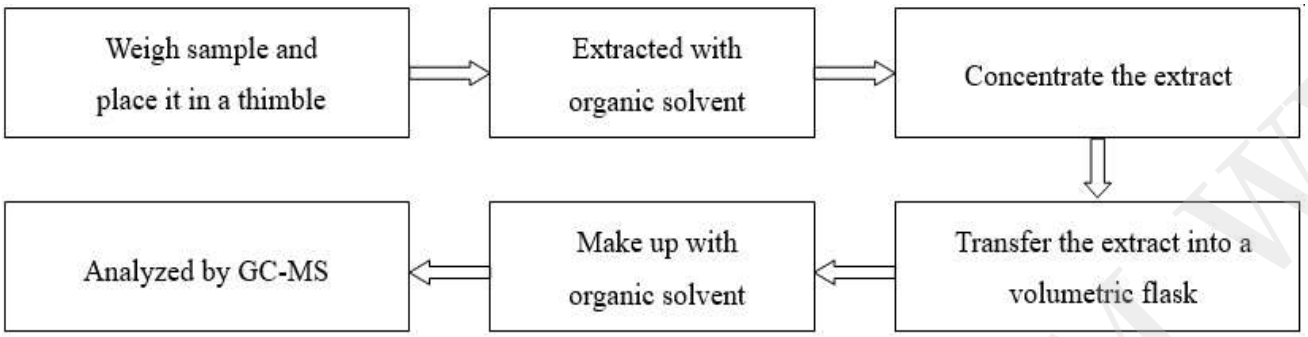
4. Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs)



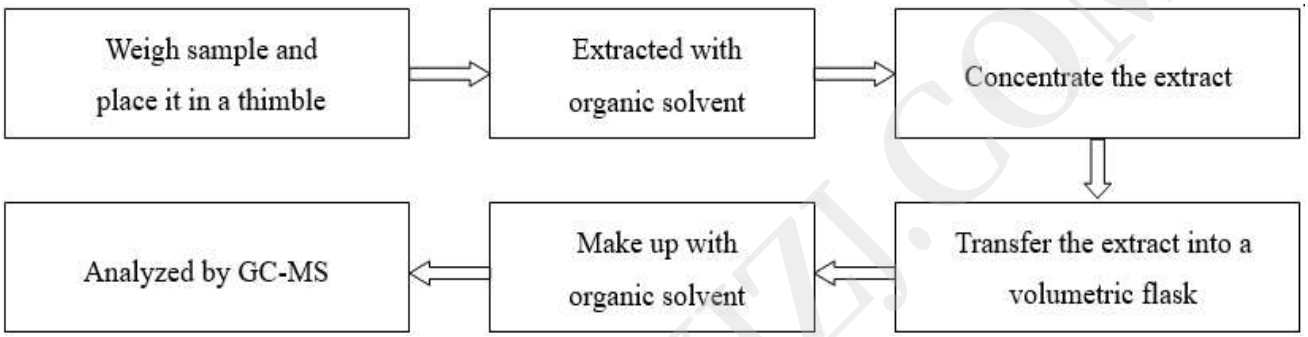
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Test Report

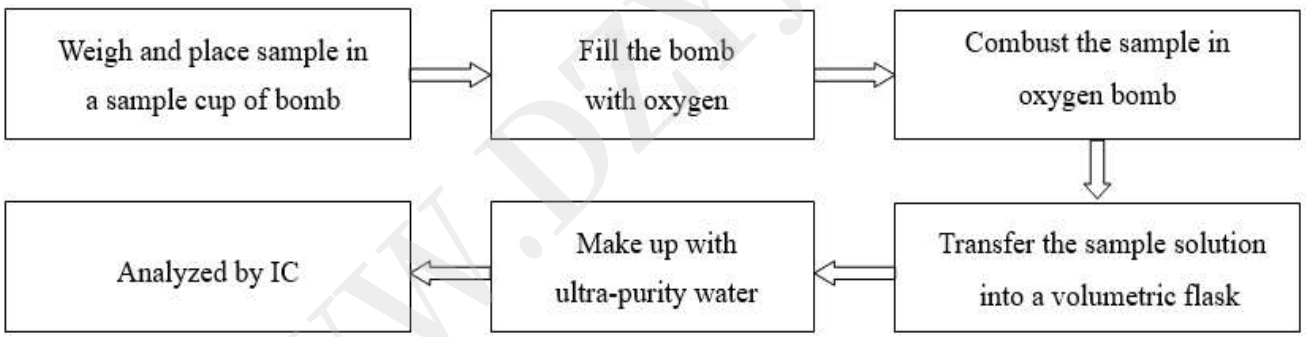
5. Phthalates (DBP, BBP, DEHP, DIBP)



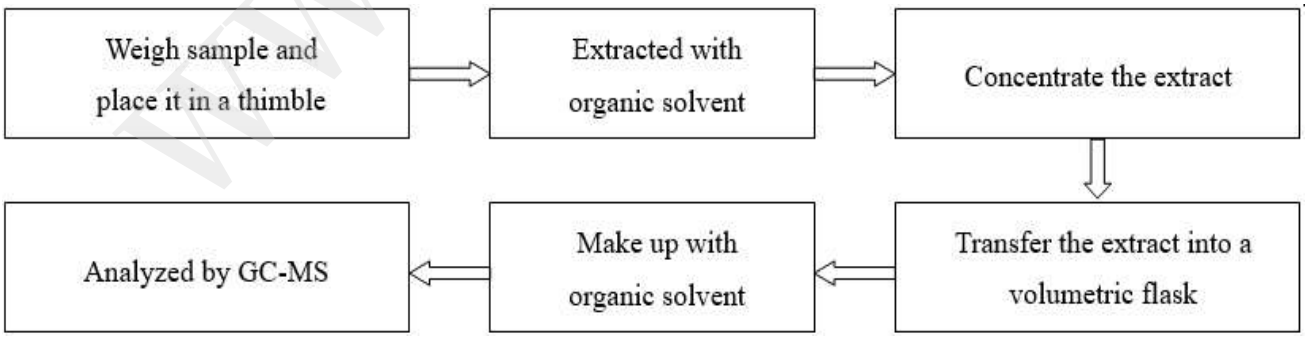
6. Hexabromocyclododecane (HBCDD)



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



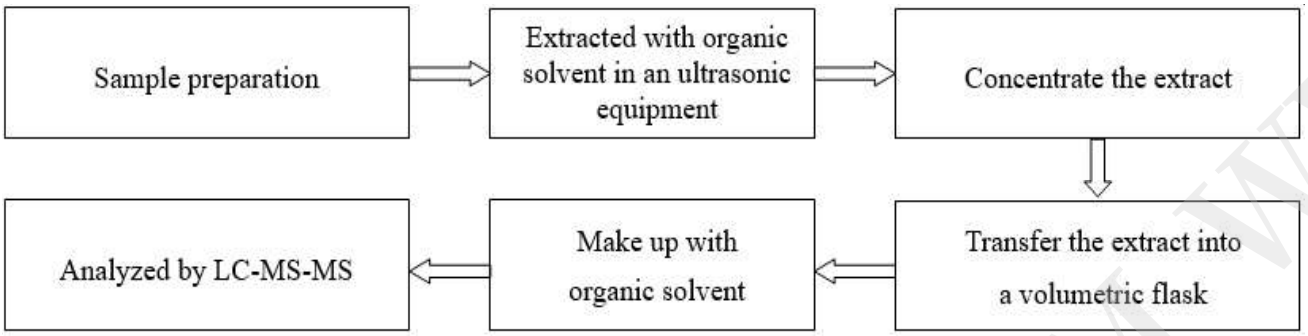
8. Phthalates



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Test Report

9. Perfluorooctane Sulfonates(PFOS)

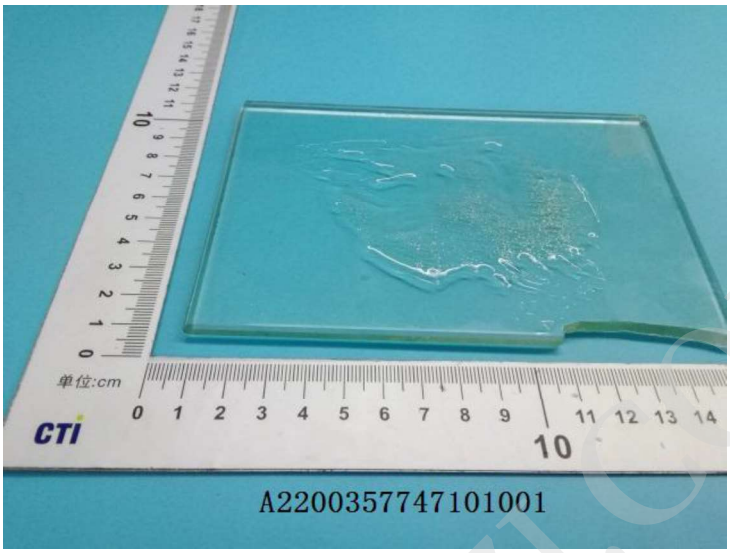


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Test Report

Report No. A2200357747101001

Photo(s) of the sample(s)



Statement:

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

*** End of report ***

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GUANGYE

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文件編號：**WJ-056-A**
No：WI/E PTD O04
Issue：A/0
Date：FEB 16

化學品物質安全數據表（MSDS）

MATERIALS SAFETY DATE SHEET(MSDS)

化學產品&公司鑒訂 Chemical Product and Company Identification			
產品名稱 Product name	**glue**	同義詞 Synonym	POLYIMIDE FILM TAPE
簡要說明 Formulation	專用於產品外包裝的防護材料		
危險等級（等級說明：0＝ 最小 1＝ 輕微 2＝ 中等 3＝ 嚴重 4＝ 劇烈） Classification of hazard (explain: 0＝minimal 1 = slight 2 =moderate 3 =serious 4 = severe)			
專案 Item	NPCA/HMIS	NFPA 704	
健康 Health	最小	最小	
可燃性 Flammability	輕微	輕微	
活 性 Reactivity	最小	最小	

1. 物料成份與資訊 Composition/information on ingredients			
名称 Name	成分 Component	CAS NO	百分百 Percentage
硅酮聚合物 Silicone polymer	过氧化苯甲酰 Xylene(ortho meta,para)	1330-20-7	60-70%
	二甲基硅氧烷 Dimethyl siloxane,dimethyl-hydeoxy	63148-62-9	20-30%
2. 危險鑒定/緊急狀況說明 Determination of hazard/Emergency explain			

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状態 State	正常
吸入 Inhalation	無法吸入
攝取 Ingestion	無
皮膚接觸 Skin contact	無不良現象
眼睛接觸 Eye contact	無
致癌物 Carcinogenic	IARC—　　無　　，NTP—　　無　　，OSHA—無

3. 緊急情況時的第一求援措施
Emergency and first aid procedures

吸入 Inhalation	無
攝取 Ingestion	無需特殊處理措施。 No special measures necessary.
皮膚接觸 Skin contact	無需特殊處理措施。 No special measures necessary.
眼睛接觸 Eye contact	.無

5. 消防措施
Fire-fighting measures

易燃性 Flammability	禁止明火		
專用滅火程式或設備 Specific Exposure Prevention Equipment	無 None		
突然起火/爆炸危險 fire or explode	無 None		

6. 意外釋放措施
Accidental release measures

無數據

7. 處理&存儲
Handling and Storage

保持通風良好，避免堆積。遠離熱和火源。
Provide good ventilation. Avoid the formation and deposition of dust. Keep away from sources of heat and ignition.

8. 暴露控制/個人保護
Exposure controls /personal protection

9. 物理/化學成份(物理/化學性質)
Physical and Chemical Properties

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外觀/狀態 Form	薄膜 Powder	氣味 Odor	無味 odorless
溶解性（水） Solubility in water	不溶 insoluble	分子量 molecular weight	無數據

10. 穩定性/反應活性
Stability/reactivity

無此方面的資訊。
Not observed

11. 毒性
Toxicological information

無此方面的資訊。
Not observed

12. 環保
Ecological Information

可自然氧化降解

13. 處理
Disposal Considerations

無此方面的資訊。
Not observed

14. 運輸 Transportation

在國際，國內的公路，鐵路和空運中無危險運輸的可能性。
The product does not constitute a hazardous substance in nation / international road , rail, see and air transport.

15. 管制
Regulatory

無此方面的資訊。
Not observed

16. 其他
others

MSDS 中的縮寫：
CERCLA=全面環境相應補償和義務法案(Comprhensive Environmental Response Compensation and Liability Act)
CFR=聯邦規章法規(Code of Federal Regulations)
IARC=國際癌症調查機構(International Agency for Research on cancer)
NFPA=國家防火協會(National Fire Protection Association)
NPCA/HMIS=全國顏料與塗料協會（國家顏料與塗料協會危險物質資訊系統）(National paint & Coatings Association's Hazardous Materials Information System)
NTP=國家毒理學綱要(National Toxicology Program)
OSHA=職業安全與健康機(Occupatonal Safety& Health Administration)

編制 author	劉沛珠	審核 censor	張再金	批准 sanction	張再金

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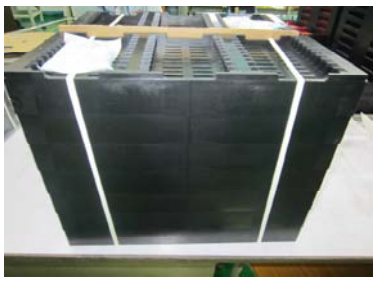
LOTES

得意精密電子工業有限公司

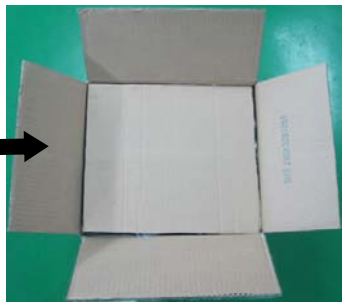
成品包裝規范 ECR NO.:R131054 頁次：1/1

品　　名	Vertical SO DDR4 260PIN	料　　號	ADDR0214-P001C	文件編號	GPK-DDR-024B
制定日期	2015/11/19	修定日期		REV	A

1.包裝圖示說明.





C角防呆，產品存放時，注意產品短

2.包裝作業說明.

1).將檢驗OK之成品放入硬TRAY,_30PCS /盤.

2).產品包裝分成兩列，其中以6盤產品疊放起來放入膠袋內,且在最上層放入一個空盤，此為一列,第二列也用相同方法且在包裝兩列之間放置隔板，(需在空盤最上層放入干燥劑並封好)共用硬TRAY 7PCS.

3).紙箱底層需放置隔板，將疊好之產品用橡皮筋扎好放入紙箱內（14盤/箱 ,共360PCS）在最上層放置隔板後封存

3.包裝BOM.

DESCRIPTION	P/N	SPECIFICATION	Q'TY(PCS)	單重(g)	包裝容量：
1.成品	ADDR0214-P001C	LCP黑;特殊銅C7025_15u";PA9T黑色	360PCS/箱	6.9917	360PCS/箱
2.硬TRAY	G09-A-30216-P01	HIPS_黑;322.6*135.9*39.5	14PCS/箱	178.67g	30PCS/盤
3.膠袋	G09-6-50002-K02	520*320*460;PE03;T=0.03mm	1PCS/箱	20g	14盤/袋
4.紙箱	G09-1-25006-P01	280*320*255、材質為K=A	1PCS/箱	523g	14盤/箱
5.干燥劑	G09-7-00002-K01	30g/包	2包/箱	30g	2包/箱
6. 紙板	G09-3-30018-P01	300*270*6;B=C	3PCS/箱	52g	3PCS/箱
7.橡皮筋	G09-7-00007-K04	白色 L320*W8.0*T2	4PCS/箱	5.48g	4PCS/箱

修訂摘要	核准	審核	制定
新訂	胡德芳	張麗鳴	張容妹

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