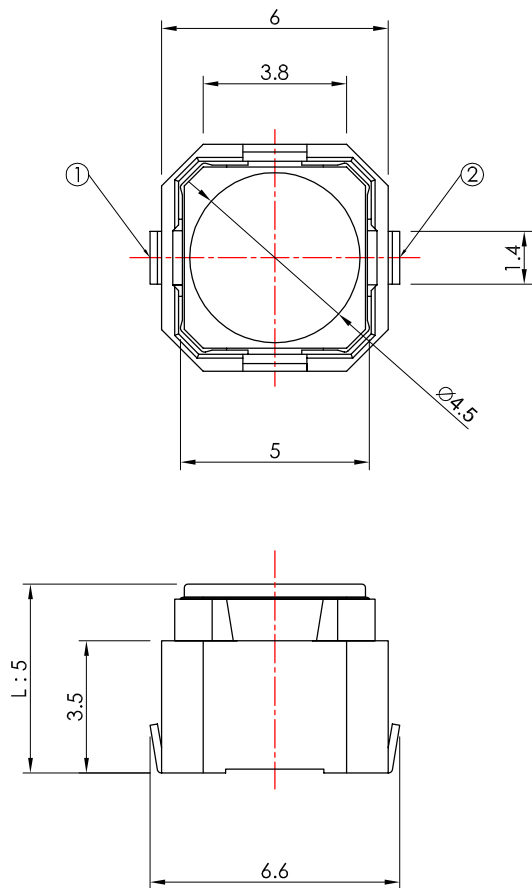
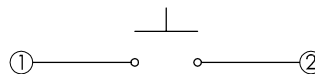


本圖面若與目錄之規格尺寸不符，以本圖面規格尺寸為主。  
Below is our main specification if different from catalog.

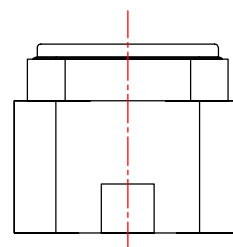
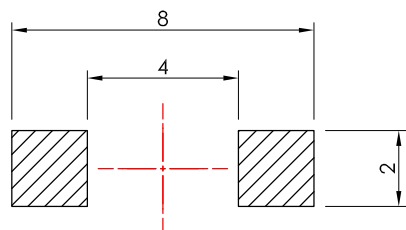
RoHS compliant



CIRCUIT DIAGRAM



P.C.B. LAYOUT



RoHS compliant

IT-1199X-XXXG-G

MODEL NO.	L	OPERATING FORCE
□	4.3	250, 300, 350
A	5.0	
B	5.2	

**SPECIFICATION**

- Rating:** 50mA 16V DC.
- Function:** OFF-(ON).
- Travel:** 1.3±0.3mm.
- Contact resistance:** 500mΩ Max.(initial)
- Operating force:** 250±70g.
- Minimum load:** 10mA 3.3V DC.(reference only)
- Operating Life:** 100,000 Cycles Min.
- Soldering temperature:** 250°C Max. for 3 Sec.
- Soldering time:** 1 time only.
- Note:** Unwashable, don't be immersed by epoxy and organic solvent.



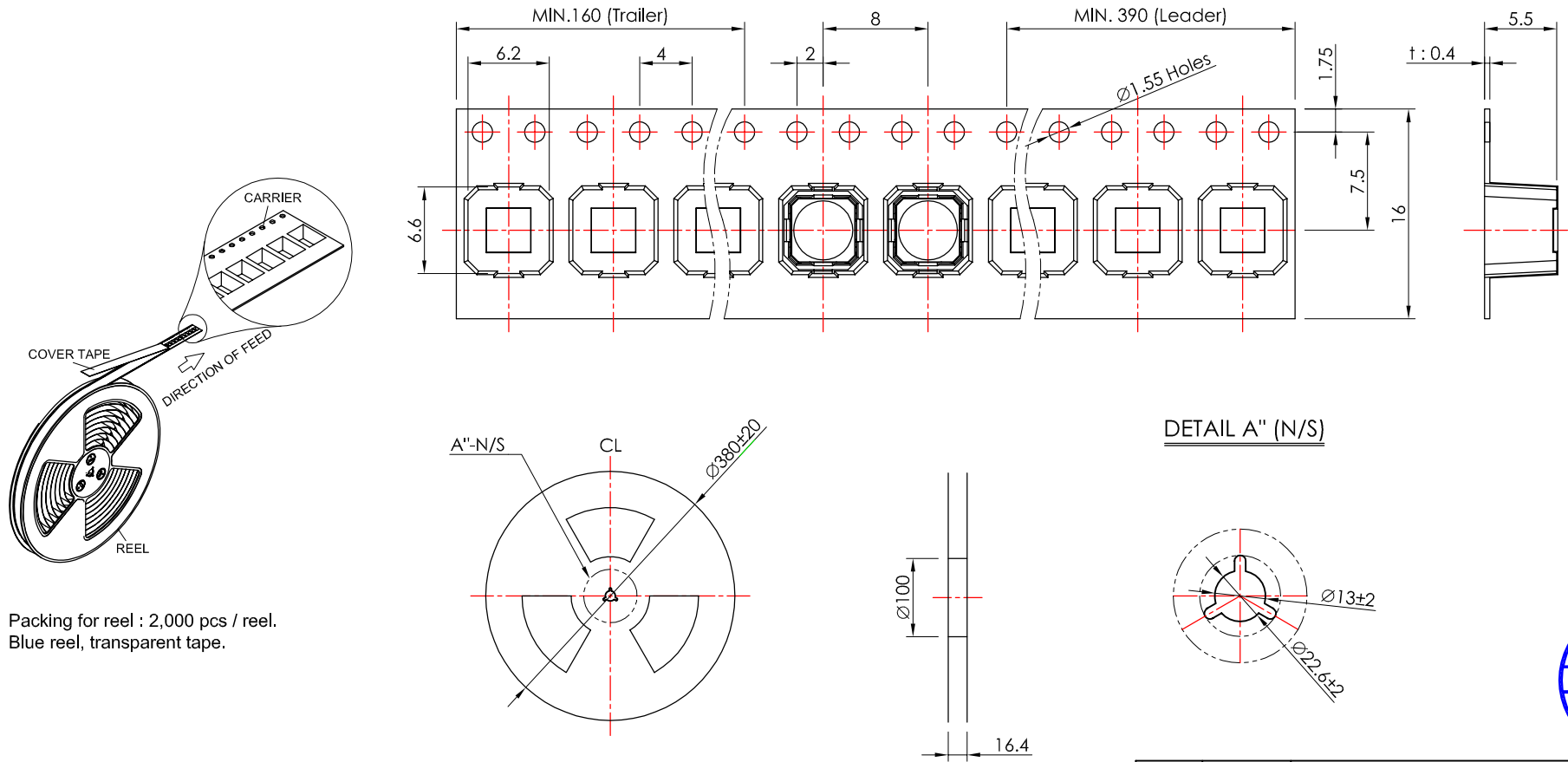
CV3.1	△		
CV3.0	無	新繪製	2011.06.30
版本 VER.	符號 SYMBOL	修改內容 ALTERATION	更新日期 DATE

產品 PRODUCT		Tact Switch		型號 MODEL NO.		IT-1199A-250G-G	
比例 SCALE	5 : 1	單位 UNIT	mm	<p>一綺電子企業股份有限公司</p> <p>總公司：110 台北市信義路四段415號12樓之2 12F-2 NO. 415, SEC. 4, HSIN YI ROAD, TAIPEI, TAIWAN TEL : 886-2-27290229 (Rep.) FAX : 886-2-27582086 URL : http://www.switronic.com.tw E-MAIL : switches@ms36.hinet.net</p>			
公差 TOLERANCE	.X=±0.3mm, .XX=±0.2mm						
製圖 DRAWN BY	核圖 CHECKED BY	主管 APPROVED BY					
Jay Kang	Nail Chen	Margaret Lee					

版本：V2.2

本圖面若與目錄之規格尺寸不符，以本圖面規格尺寸為主。  
Below is our main specification if different from catalog.

RoHS compliant



Packing for reel : 2,000 pcs / reel.  
Blue reel, transparent tape.

**MATERIAL**

**Cover tape:** Polyester.  
**Carrier:** Polystyrene.  
**Reel:** Plastic.

CV3.1	△		
CV3.0	無	新繪製	2011.07.29
版本 VER.	符號 SYMBOL	修改內容 ALTERATION	更新日期 DATE



產品 PRODUCT		Tact Switch		型號 MODEL NO.		IT-1199X T&R	
製圖 DRAWN BY	核圖 CHECKED BY	主管 APPROVED BY		單位 UNIT	mm		
Jay Kang	Neil Chen	Margaret Lee		比例 SCALE	2 : 1		
				公差 TOLERANCE	±0.3mm		

**SWITRONIC**  
INDUSTRIAL CORP.  
**Switches**



一綺電子企業股份有限公司

總公司：110 台北市信義路四段415號12樓之2  
12F-2 NO. 415, SEC. 4, HSIN YI ROAD, TAIPEI, TAIWAN  
TEL : 886-2-27290229 (Rep.) FAX : 886-2-27582086  
URL : <http://www.switronic.com.tw>  
E-MAIL : [switches@ms36.hinet.net](mailto:switches@ms36.hinet.net)

# 一綺電子企業股份有限公司 SWITRONIC INDUSTRIAL CORP.

MODEL NO: IT-1199 Series

CV3.0

V.DATE:2011/06/30

## 1. Features

- 1-1 Horizontal mounting type and small, low profile design..
- 1-2 Reflow solderable.
- 1-3 Soft feeling

## 2. Applications

From the operating various of Auto Mobile, Car AV equipments..

## 3. Temperature range

Parameter	Value	Unit
Operating temperature range	-40 ~ 80	℃
Preservative temperature range	-5 ~ 50	℃

## 4. Standard conditions

Parameter	Value	Unit
Ambient temperature	5 ~ 35	℃
Relative humidity	45 ~ 85	% Rh
Air pressure	860 ~ 1060	mBar

If doubt arises on the design based on the measured values under the above mentioned conditions, the following conditions shall be employed.

Parameter	Value	Unit
Ambient temperature	18 ~ 22	℃
Relative humidity	60 ~ 70	% Rh
Air pressure	860 ~ 1060	mBar

## 5. Contact arrangement

1 Pole / 1 Throw

## 6. Type of actuating

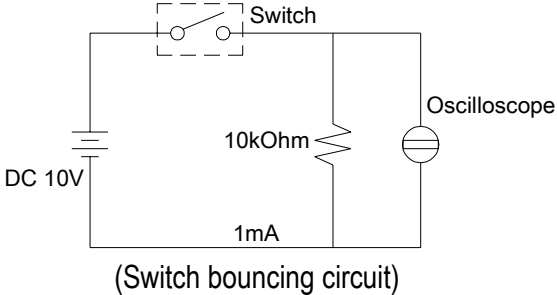
Tactile feedback



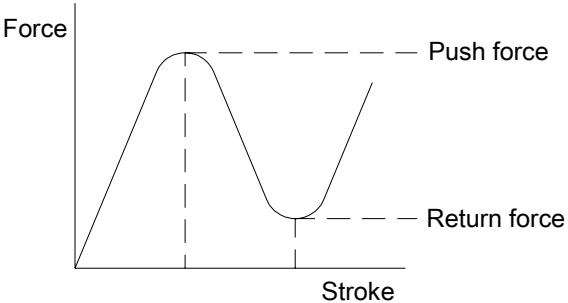
## 7. Rating

Maximum rating	16 V (DC) , 50 mA
Minimum rating	3.3 V (DC) , 10mA

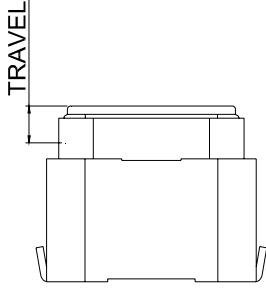
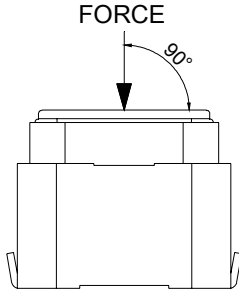
## 8. Electrical characteristics

No	Item	Test conditions	Evaluation
1	Contact resistance	1-1 Push force : Operating force X 2 1-2 Small current contact resistance meter : 1Khz , 20mV , 5 50mA	500mΩ MAX.
2	Insulation resistance	100V (DC) / 1 Minute (Between terminal)	100MΩ MIN.
3	Dielectric withstand voltage	AC 250V (50Hz OR 60Hz) / 1 Minute (Between terminal)	No break down
4	Bouncing	3 to 4 Operations per second 	On / Off : 10ms MAX.

## 9. Mechanical characteristics

No	Item	Test conditions	Evaluation
1	Operating force	 Push by recommended operating conditions	Push force : As per assembly drawing Return force : 10gf MIN.

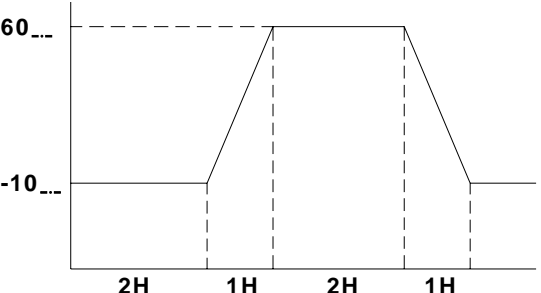


2	Travel	<p>Operating force x 2</p> 	As per assembly drawing
3	Stem strength	<p>3Kgf for 15 sec.</p> 	No damage (Electrical and Mechanical)
4	Soldering heat test	<p>Mounted the switch on P.W.B by adhesive.  1) Reflow process one time.  2) Standard conditions after test : 24 Hours</p>	No damage (Electrical and Mechanical)

## 10. Environmental

No	Item	Test conditions	Evaluation
1	Storage heat	1) $+80 \pm 2$ , 96 Hours 2) Standard conditions after test 1 Hour.	After the test the part shall satisfy. Specifications without any degradation in appearance and performance.
2	Storage cold	1) $-30 \pm 2$ , 96 Hours 2) Standard conditions after test 1 Hour.	
3	Humidity	1) $40 \pm 2$ , 90 95% Rh , 96 Hours 2) Standard conditions after test 1 Hour.	



4	Temperature cycle	1) Test cycles : 5 Cycles 2) Standard conditions after test 1 Hour. 	
---	-------------------	--	--

## 11. Endurance

No	Item	Test conditions	Evaluation
1	Operating life	1) 5V (DC) , 50mA 2) 15 20 Cycles/Min , Maximum value of operating force. 3) 100,000 Cycles MIN.	After the test the part shall satisfy. Specifications without any degradation in appearance and performance.
2	Salt spray	1) Temperature : $35 \pm 2$ 2) Cycle : 8 Hours testing (3 Times) and 1 Hour stop. Based on total 24 hours. 3) Salt solution concentration : $5 \pm 1\%$ by weight.	

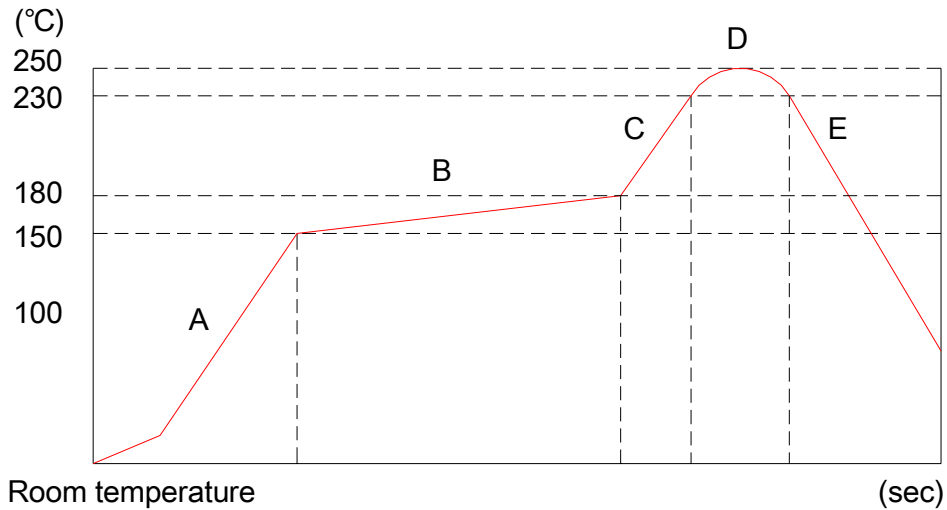
### Notes

As this product is not protected from foreign material entering, please make sure that any foreign material (E.G Magnetic powder, Washing solvent, Flux, Corrosive gas) DO NOT enter this product in your production process.



## 12. Solder conditions

### 12-1 SMD Reflow



Parts	Temperature (°C)	Time at temperature(sec)	Treatments
A	NO - 150		
B	150 - 180	90 ± 30	Pre-heating zone
C	180 - 230		
D	230 – 250 - 230	30 ± 10 (Peak : 3 MAX.)	Soldering zone
E	230 to NO		Cooling zone

\*\* NO : Normal conditions

### 12-2 Solder cream thickness

0.15 ± 0.03

### 12-3 Manual soldering

12-3-1 Iron tip temperature : 350 ± 5°C MAX.

12-3-2 Duration : 3sec MAX.



一綺電子企業股份有限公司  
SWITRONIC INDUSTRIAL CORP.

**Material Certificate Sheet**

Product	Tact Switch
Model No.	IT-1199 Series

CV3.0

DATE : 2011.07.04

No.	Parts Name	Material	Specification	Remark	LAB	Test Report No.
1	Stem	Polymer	KEPAMID 2330GFH NT		SGS	F690501/LF-CTSAYAA10-36522
2	Rubber	Silicone	SE 4708		SGS	F690501/LF-CTSAYAA11-16240
3	Contact	Phosphor bronze-Ag	C5210	Silver Cyanide	SGS	C5210 : F690501/LF-CTSAYAU10-05135 Silver Cyanide : F690501/LF-CTSAYAA11-12813
4	Terminal	Brass	C2680	Silver Cyanide	SGS	C2680 : F690501/LF-CTSAYAU10-05130 Silver Cyanide : F690501/LF-CTSAYAA11-12813
5	Case	Liquid Crystal Polymer	ZENITE 6130L WT		SGS	F690501/LF-CTSAYAA11-02140
6						
7						
8						
9						
10						

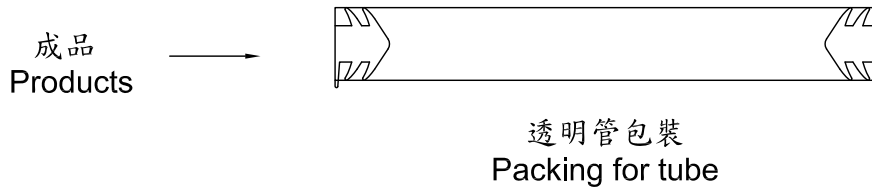


# 一綺電子企業股份有限公司

## SWITRONIC INDUSTRIAL CORP.

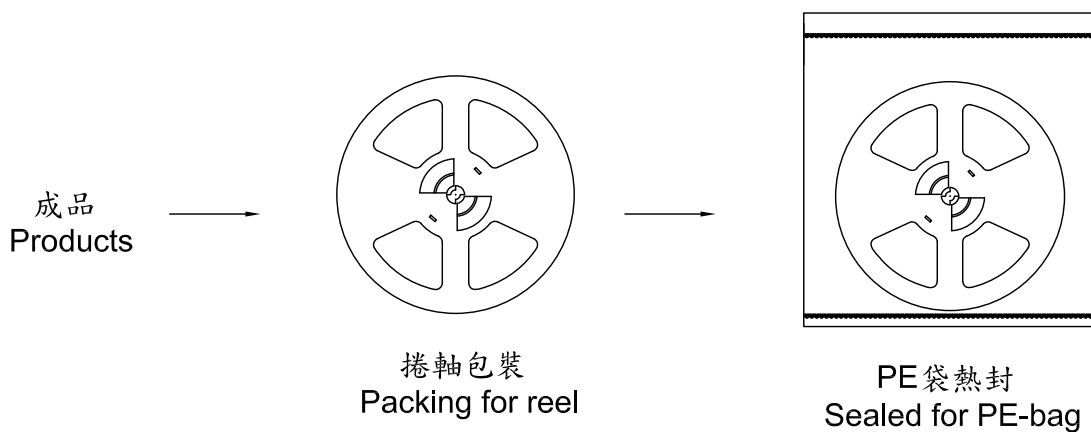
### 入料包裝方式 Packing for Products

管裝方式  
Packing for tube



Packing for tube : \_\_\_\_\_ pcs / tube.

捲裝方式  
Packing for reel



Packing for reel : 2,000 pcs / reel , 1 reel / polybag.

Quantity thickness for polybag : 0.08 mm , Quantity desiccating agent : 1 pcs.

# 一綺電子企業股份有限公司 SWITRONIC INDUSTRIAL CORP.

## 產品綠色環保標章

"G" Mark for All RoHS Compliant Products

## 環保標章式樣

Initial "G": Standing for Green Label



## 外箱標示

Marked on The Outside of Carton As:





**Test Report No. F690501/LF-CTSAYAA10-36522**

Issued Date: October 29, 2010

Page 1 of 4

**To: KOREA ENGINEERING PLASTICS**  
402, Chupal-ri  
Paengsung-ub  
Pyeongtaek-city  
GYEONGGI-DO 451-805  
korea

The following merchandise was submitted and identified by the client as :

**SGS File No.** : AYAA10-36522  
**Product Name** : KEPAMID 2330GFH NT  
**Item No./Part No.** : N/A  
**Client Reference Data** : 2315GF NT, 2315GHS NT, 2320GF NT, 2325GFH NT, 2325GFS NT,  
2330GF NT, 2330GFH NT02, 2333GFH NT02, 2335GFH NT, 2345GF NT  
**Received Date** : Oct. 26, 2010  
**Test Period** : Oct. 27, 2010 to Oct. 29, 2010  
**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results  
**Test Results** : For further details, please refer to following page(s)  
**Comments** : The client has confirmed that the described item No.s/part No.s and client reference data are the same with the sample submitted.

Timothy Jeon  
Jinhee Kim  
Cindy Park  
Jerry Jung/ Testing Person

**SGS Testing Korea Co. Ltd.**

**Jeff Jang / Chemical Lab Mgr**



# Test Report No. F690501/LF-CTSAYAA10-36522

Issued Date: October 29, 2010

Page 2 of 4

Sample No. : AYAA10-36522.001  
Sample Description : KEPAMID 2330GFH NT  
Item No./Part No. : N/A

## Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3051, US EPA 6010B(1996), ICP	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3051, US EPA 6010B(1996), ICP	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3051, US EPA 6010B(1996), ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to US EPA 3060A(1996), US EPA 7196A(1992), UV	1	N.D.

## Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Monobromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.

- NOTE: (1) N.D. = Not detected.(<MDL)  
(2) mg/kg = ppm  
(3) MDL = Method Detection Limit  
(4) - = No regulation  
(5) \*\* = Qualitative analysis (No Unit)  
(6) Negative = Undetectable / Positive = Detectable

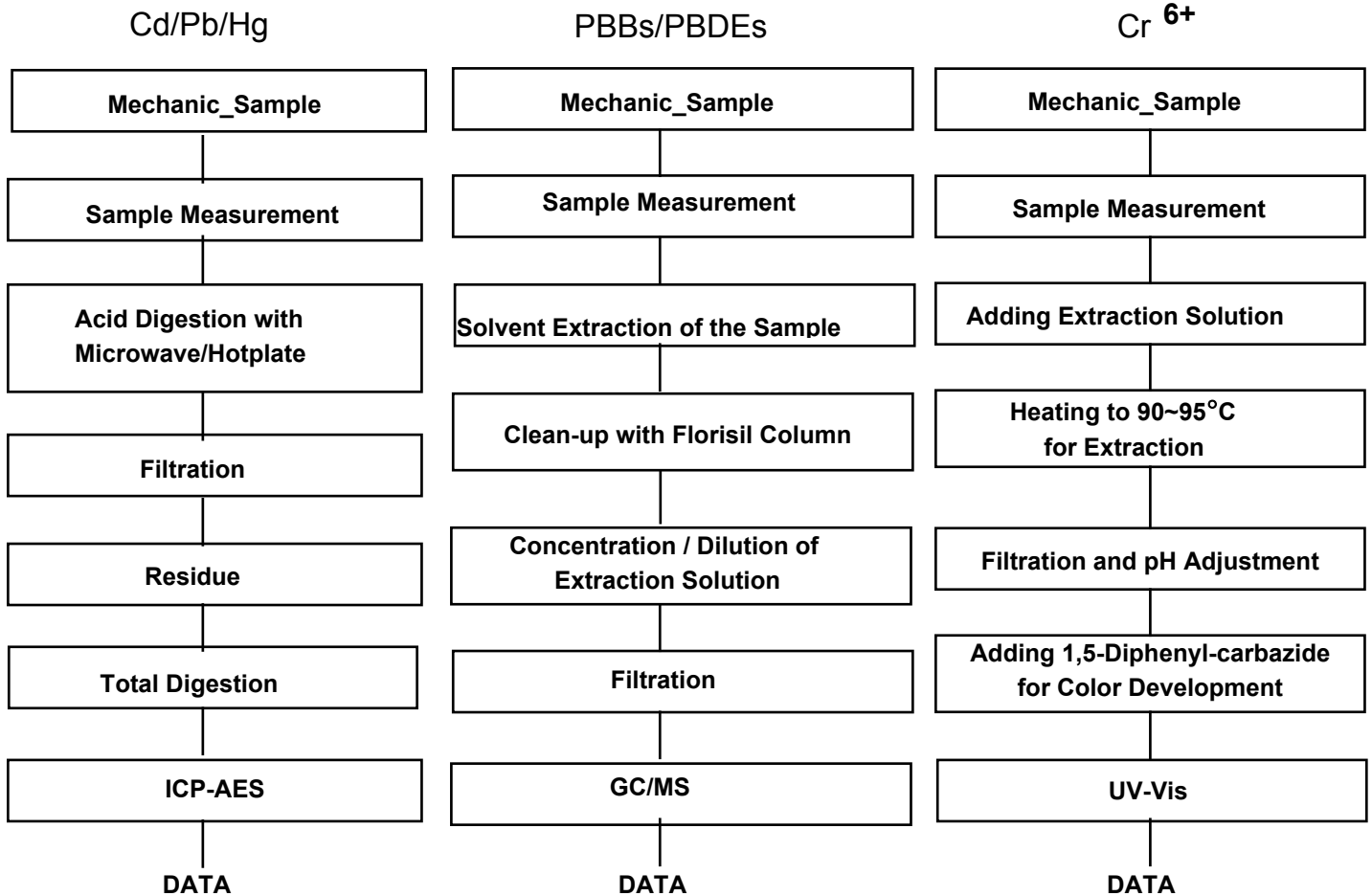
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**Picture of Sample as Received:**



- NOTE:**
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) Negative = Undetectable / Positive = Detectable

### Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup>/PBBs&PBDEs Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Gilse Lee

\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) Negative = Undetectable / Positive = Detectable



**Test Report No. F690501/LF-CTSAYAA11-16240**

Issued Date: 2011. 05. 23 Page 1 of 5

To: **CREATIVE ELECTRONICS CO., LTD**  
Rm 317 Namkwang centlex  
Cheongcheon-dong  
Bupyeong-gu  
INCHEON  
Korea

The following merchandise was submitted and identified by the client as :

**SGS File No.** : AYAA11-16240  
**Product Name** : SE 4708  
**Item No./Part No.** : CTT-1199 Rubber  
**Received Date** : 2011. 05. 18  
**Test Period** : 2011. 05. 19 to 2011. 05. 23  
**Buyer(s)** : SAMSUNG,LG  
**Test Results** : For further details, please refer to following page(s)  
**Test Performed** : SGS Korea tested the sample(s) selected by applicant with following results.

Timothy Jeon  
Jinhee Kim  
Cindy Park  
Jerry Jung/ Testing Person

SGS Korea Co. Ltd.

Jeff Jang / Chemical Lab Mgr



# Test Report No. F690501/LF-CTSAYAA11-16240

Issued Date: 2011. 05. 23 Page 2 of 5

Sample No. : AYAA11-16240.001  
Sample Description : SE 4708  
Item No./Part No. : CTT-1199 Rubber

## Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.

## Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

NOTE: (1) N.D. = Not detected. (<MDL)

(2) mg/kg = ppm

(3) MDL = Method Detection Limit

(4) - = No regulation

(5) \*\* = Qualitative analysis (No Unit)

(6) \* = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

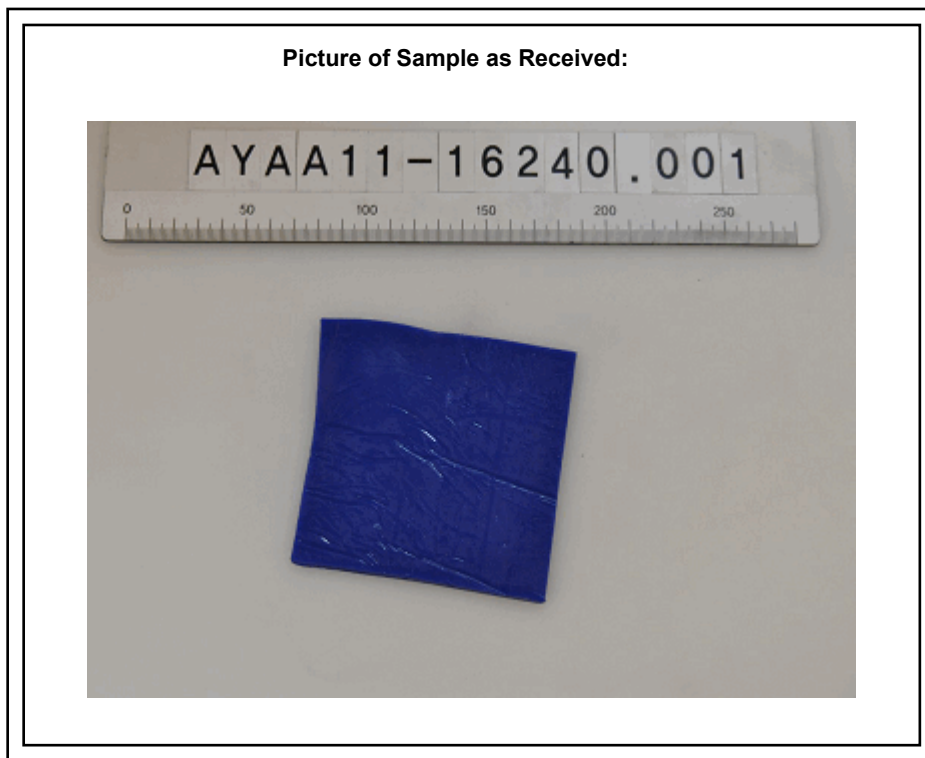
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**Sample No.** : AYAA11-16240.001  
**Sample Description** : SE 4708  
**Item No./Part No.** : CTT-1199 Rubber

**Halogen Contents**

Test Items	Unit	Test Method	MDL	Results
Fluorine(F)	mg/kg	With reference to ASTM D 7359-08 , IC	30	N.D.
Chlorine(Cl)	mg/kg	With reference to ASTM D 7359-08 , IC	30	N.D.
Bromine(Br)	mg/kg	With reference to ASTM D 7359-08 , IC	30	N.D.
Iodine(I)	mg/kg	With reference to ASTM D 7359-08 , IC	50	N.D.

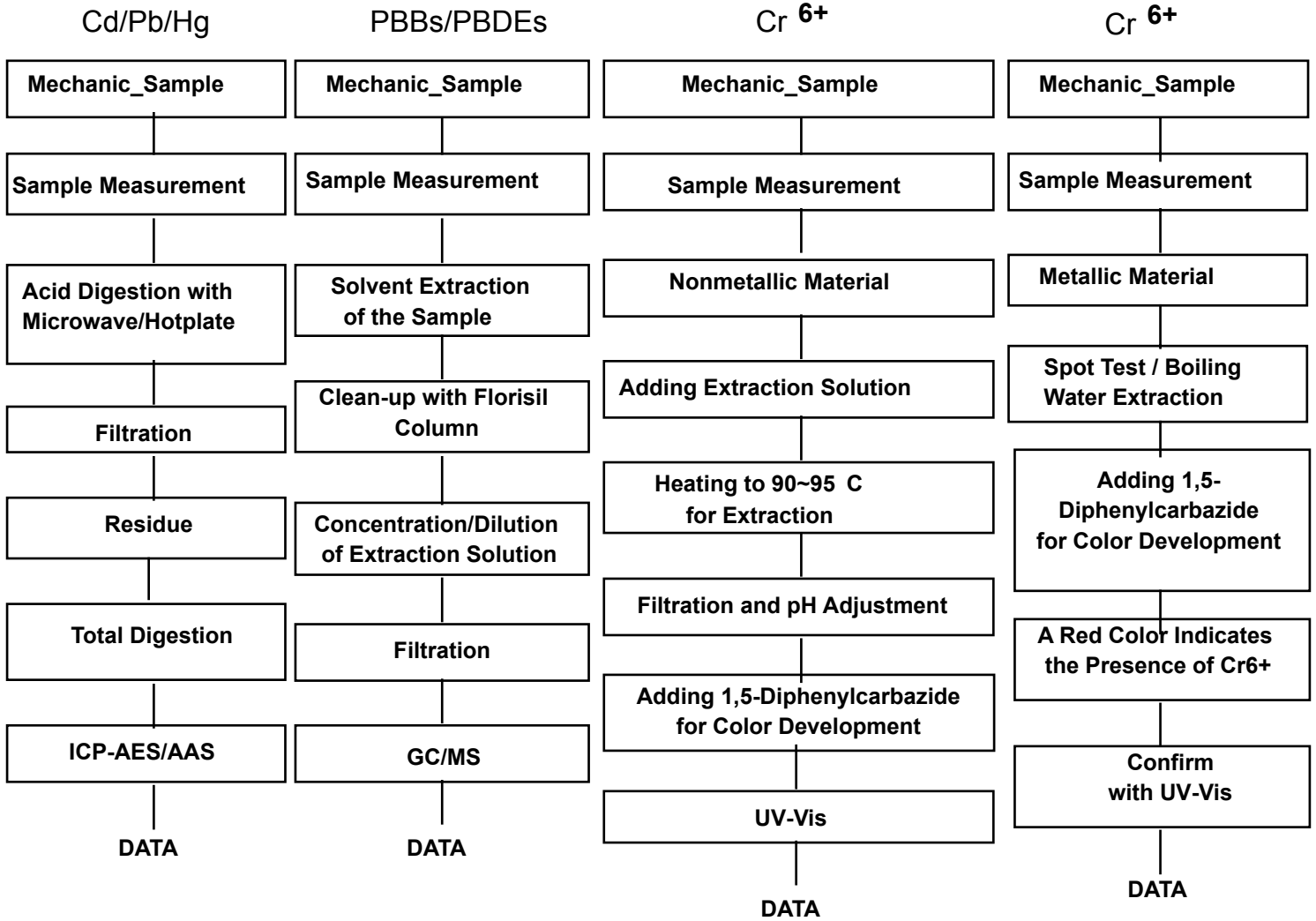


- NOTE:**
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:

Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.



Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup>/PBBs&PBDEs Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Gilsae Yi

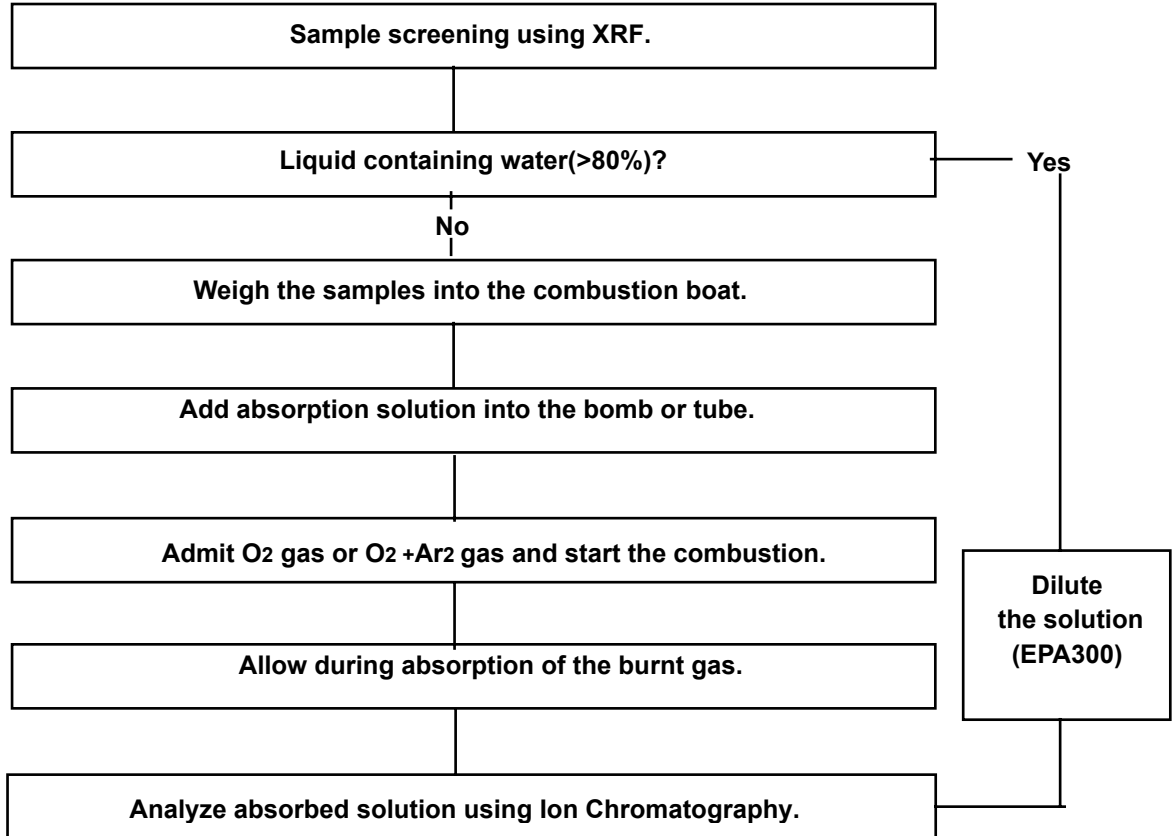
- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:

Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

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### Flow Chart for Halogen Test



\*\*\* End \*\*\*

- NOTE:
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Negative = Absence of CrVI coating  
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**Test Report No. F690501/LF-CTSAYAU10-05135**

Issued Date: November 03, 2010 Page 1 of 3

To: **POONGSAN CORPORATION**  
611 Daejung-ri Onsan-eup  
Uju  
ULSAN  
KOREA

The following merchandise was submitted and identified by the client as :

**SGS File No.** : AYAU10-05135  
**Product Name** : C5210  
**Item No./Part No.** : N/A  
**Received Date** : Oct. 27, 2010  
**Test Period** : Oct. 28, 2010 to Nov. 03, 2010  
**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results  
**Test Results** : For further details, please refer to following page(s)  
**Conclusion** : Based on the performed tests on submitted sample(s), the results **comply with the** RoHS Directive 2002/95/EC and its subsequent amendments.

**SGS Testing Korea Co. Ltd. / Gimhae Laboratory**

**Thomas Hwang / Gimhae Lab. Mgr**

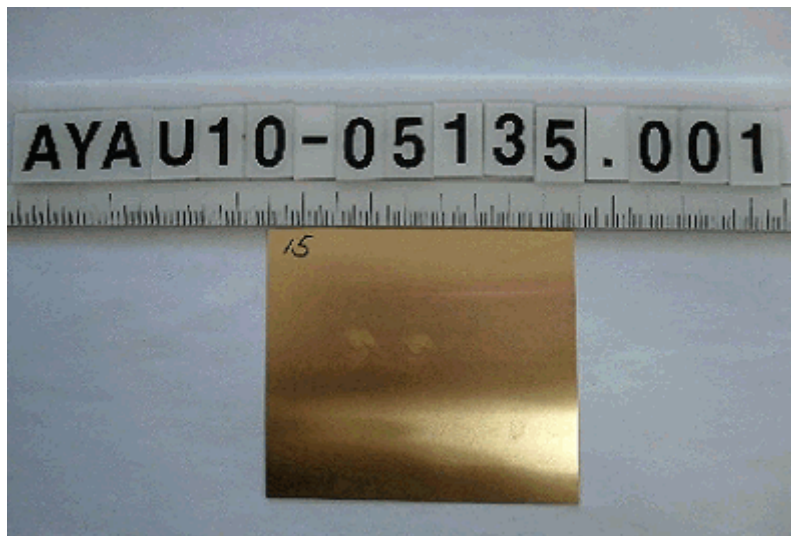
**Sharpless Park**  
**Annie Lim**  
**Jonadan Lee /Testing Person**

Sample No. : AYAU10-05135.001  
 Sample Description : C5210  
 Item No./Part No. : N/A

**Heavy Metals**

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	1	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	34.0
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI) By boiling water extraction*	-	With reference to IEC 62321:2008	-	Negative

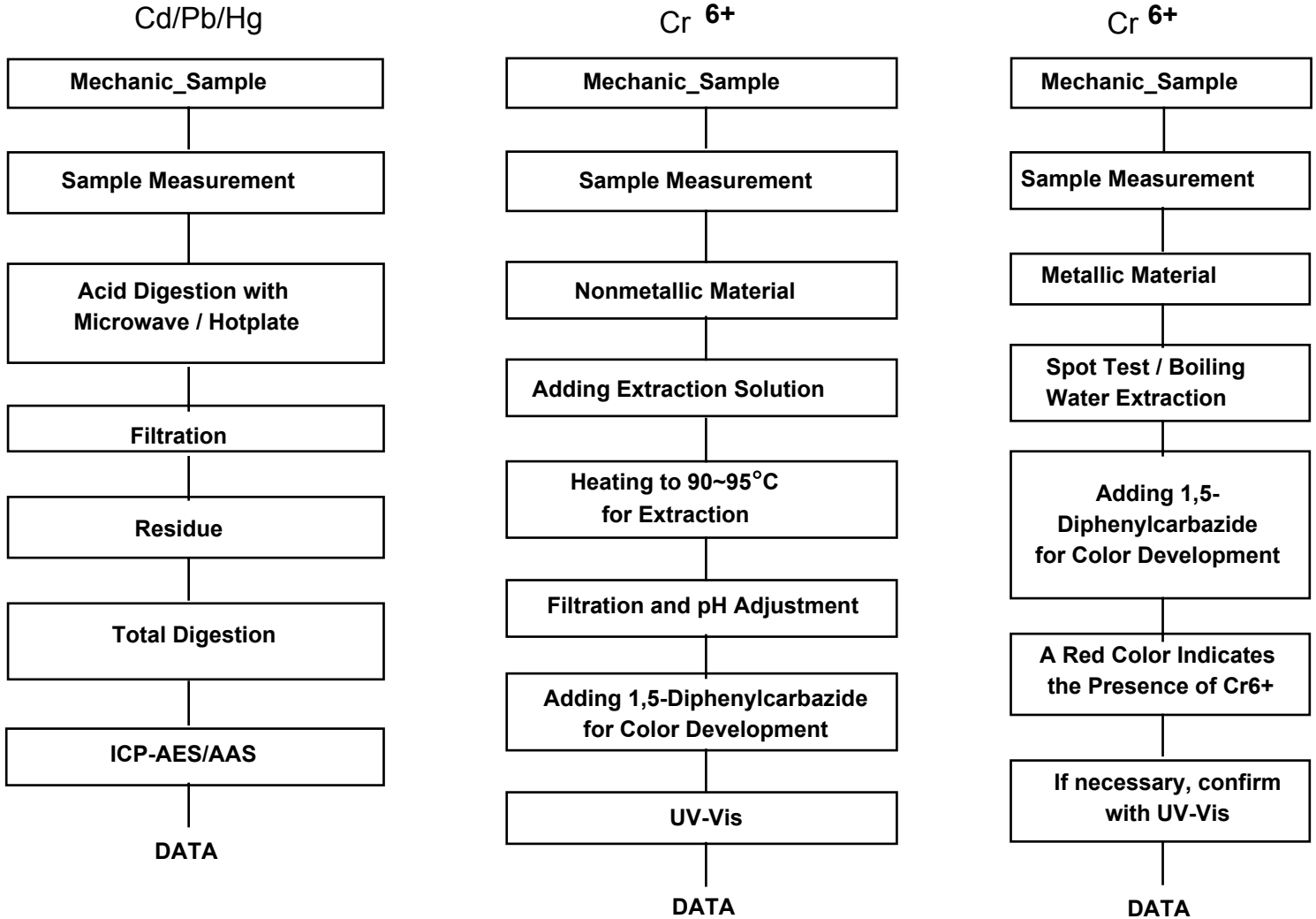
Picture of Sample as Received:



- NOTE:
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  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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 Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 180 days only.

### Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup> Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Sharpless Park

\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.



**Test Report No.** F690501/LF-CTSAYAA11-12813

Issued Date: 2011. 04. 21 Page 1 of 3

**To:** SHIN POONG METAL CO., LTD  
#223-408  
Seoknam-dong  
Seo-gu  
INCHEON 404-220  
Korea

The following merchandise was submitted and identified by the client as :

**SGS File No.** : AYAA11-12813  
**Product Name** : Silver Cyanide  
**Item No./Part No.** : N/A  
**Received Date** : 2011. 04. 18  
**Test Period** : 2011. 04. 19 to 2011. 04. 21  
**Test Results** : For further details, please refer to following page(s)  
**Test Performed** : SGS Korea tested the sample(s) selected by applicant with following results.

Timothy Jeon  
Jinhee Kim  
Cindy Park  
Jerry Jung/ Testing Person

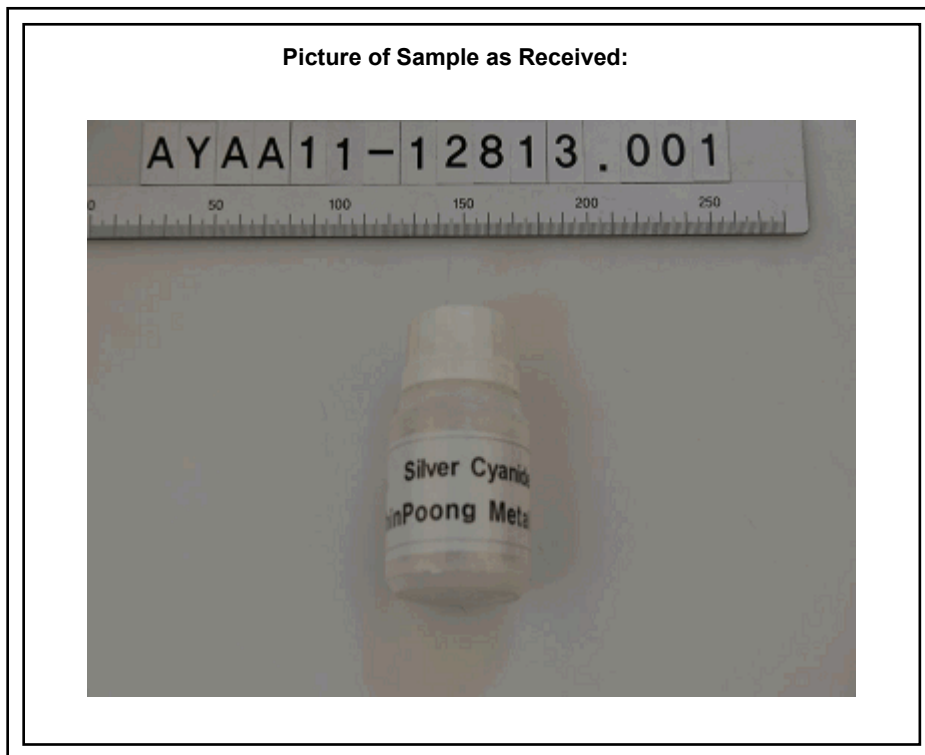
SGS Korea Co. Ltd.

Jeff Jang / Chemical Lab Mgr

**Sample No.** : AYAA11-12813.001  
**Sample Description** : Silver Cyanide  
**Item No./Part No.** : N/A  
**Comments** : Material is Powder.

**Heavy Metals**

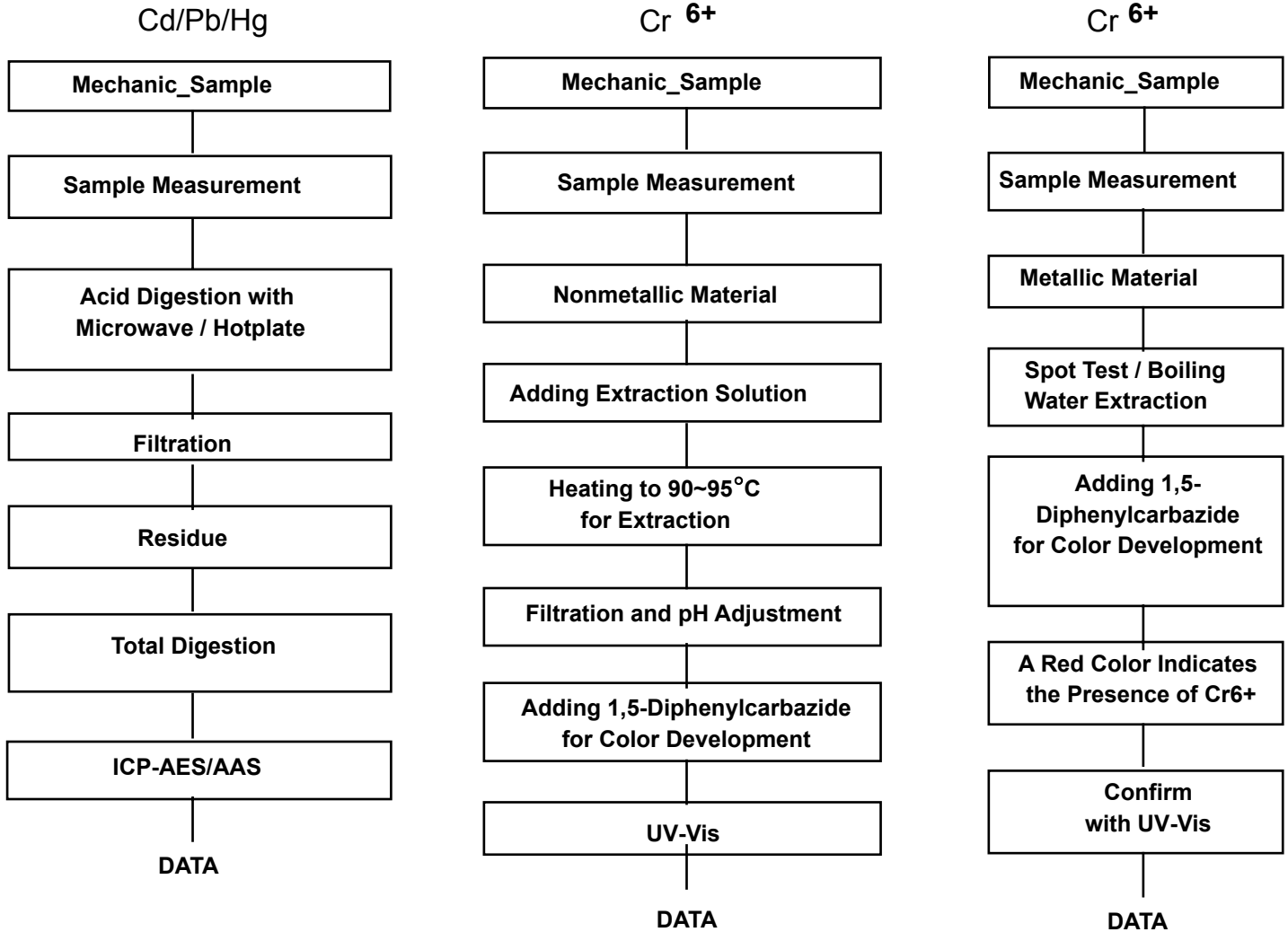
Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.



- NOTE:**
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.



### Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup> Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Gilsae Yi

\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.



**Test Report No. F690501/LF-CTSAYAU10-05130**

Issued Date: November 03, 2010 Page 1 of 3

To: **POONGSAN CORPORATION**  
611 Daejung-ri Onsan-eup  
Ulju  
ULSAN  
KOREA

The following merchandise was submitted and identified by the client as :

**SGS File No.** : AYAU10-05130  
**Product Name** : C2680  
**Item No./Part No.** : N/A  
**Received Date** : Oct. 27, 2010  
**Test Period** : Oct. 28, 2010 to Nov. 03, 2010  
**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results  
**Test Results** : For further details, please refer to following page(s)  
**Conclusion** : Based on the performed tests on submitted sample(s), the results **comply with the** RoHS Directive 2002/95/EC and its subsequent amendments.

**SGS Testing Korea Co. Ltd. / Gimhae Laboratory**

**Thomas Hwang / Gimhae Lab. Mgr**

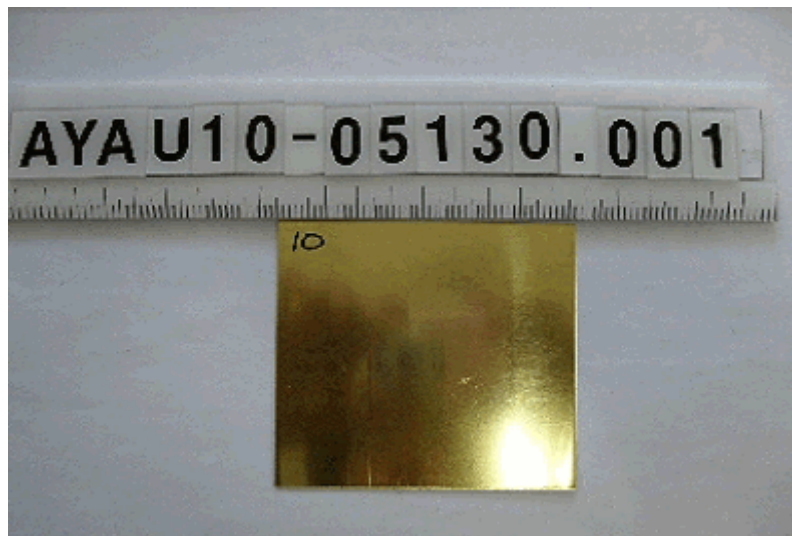
**Sharpless Park**  
**Annie Lim**  
**Jonadan Lee /Testing Person**

Sample No. : AYAU10-05130.001  
 Sample Description : C2680  
 Item No./Part No. : N/A

**Heavy Metals**

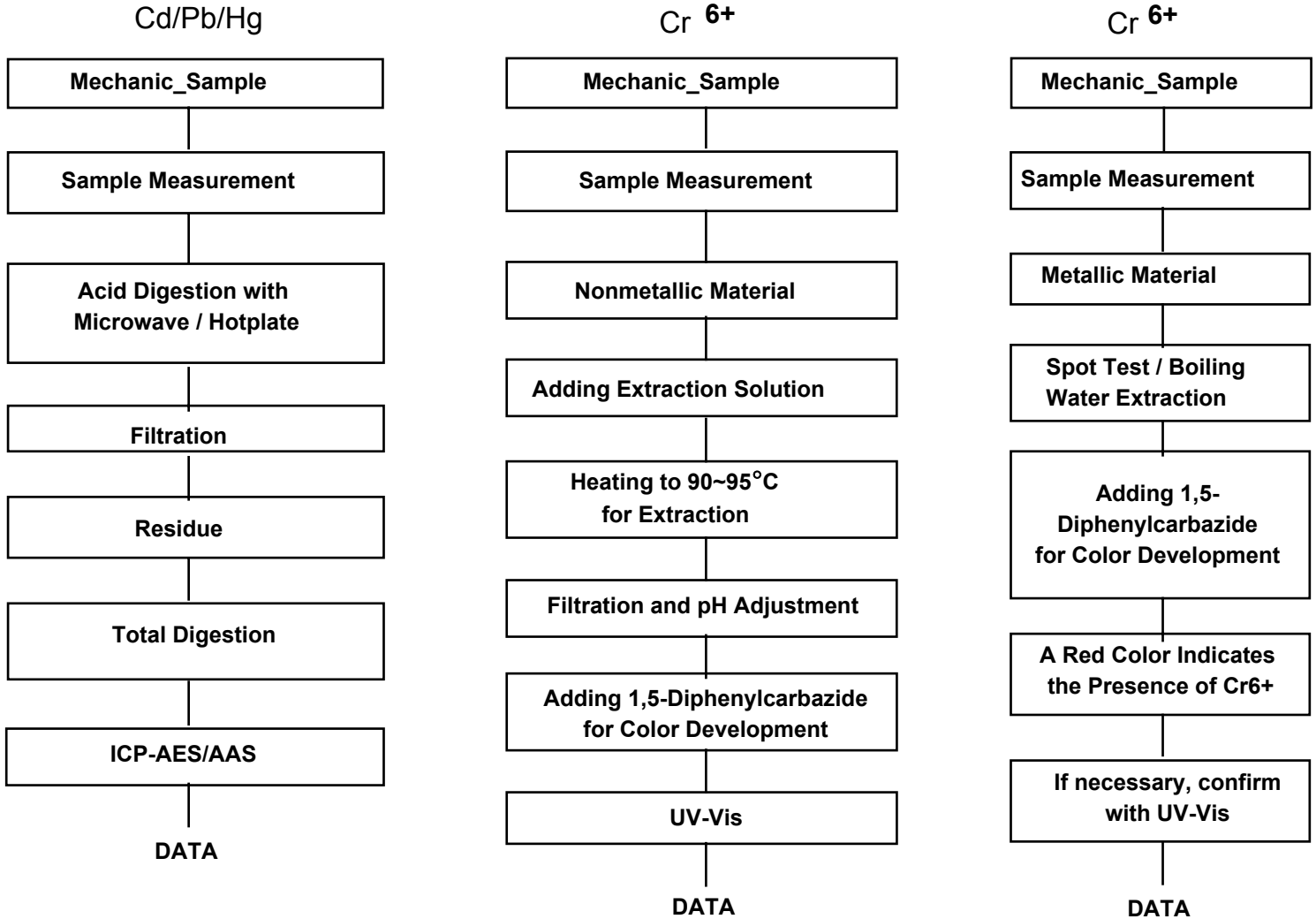
Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	1	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	21.0
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI) By boiling water extraction*	-	With reference to IEC 62321:2008	-	Negative

Picture of Sample as Received:



- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

**Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup> Testing**



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Sharpless Park

\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.



**Test Report No. F690501/LF-CTSAYAA11-02140**

Issued Date: January 21, 2011

Page 1 of 4

To: **NEOCHEM CO., LTD.**  
RM1339 Samsung Lacville  
751 Janghang-dong  
Ilsandong-gu, Goyang-city  
GYEONGGI-DO 410-380  
Korea

The following merchandise was submitted and identified by the client as :

**SGS File No.** : AYAA11-02140  
**Product Name** : ZENITE 6130L WT  
**Item No./Part No.** : N/A  
**Received Date** : Jan. 18, 2011  
**Test Period** : Jan. 19, 2011 to Jan. 21, 2011  
**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results  
**Test Results** : For further details, please refer to following page(s)  
**Buyer(s)** : SAMSUNG, LG

**SGS Testing Korea Co. Ltd.**

**Jeff Jang / Chemical Lab Mgr**

**Timothy Jeon**  
**Jinhee Kim**  
**Cindy Park**  
**Jerry Jung/ Testing Person**

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**Test Report No. F690501/LF-CTSAYAA11-02140**

Issued Date: January 21, 2011

Page 2 of 4

**Sample No.** : AYAA11-02140.001  
**Sample Description** : ZENITE 6130L WT  
**Item No./Part No.** : N/A  
**Comments** : Material is LCP Resin.

**Heavy Metals**

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.

**Flame Retardants-PBBs/PBDEs**

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

NOTE: (1) N.D. = Not detected.(&lt;MDL)

(2) mg/kg = ppm

(3) MDL = Method Detection Limit

(4) - = No regulation

(5) \*\* = Qualitative analysis (No Unit)

(6) \* = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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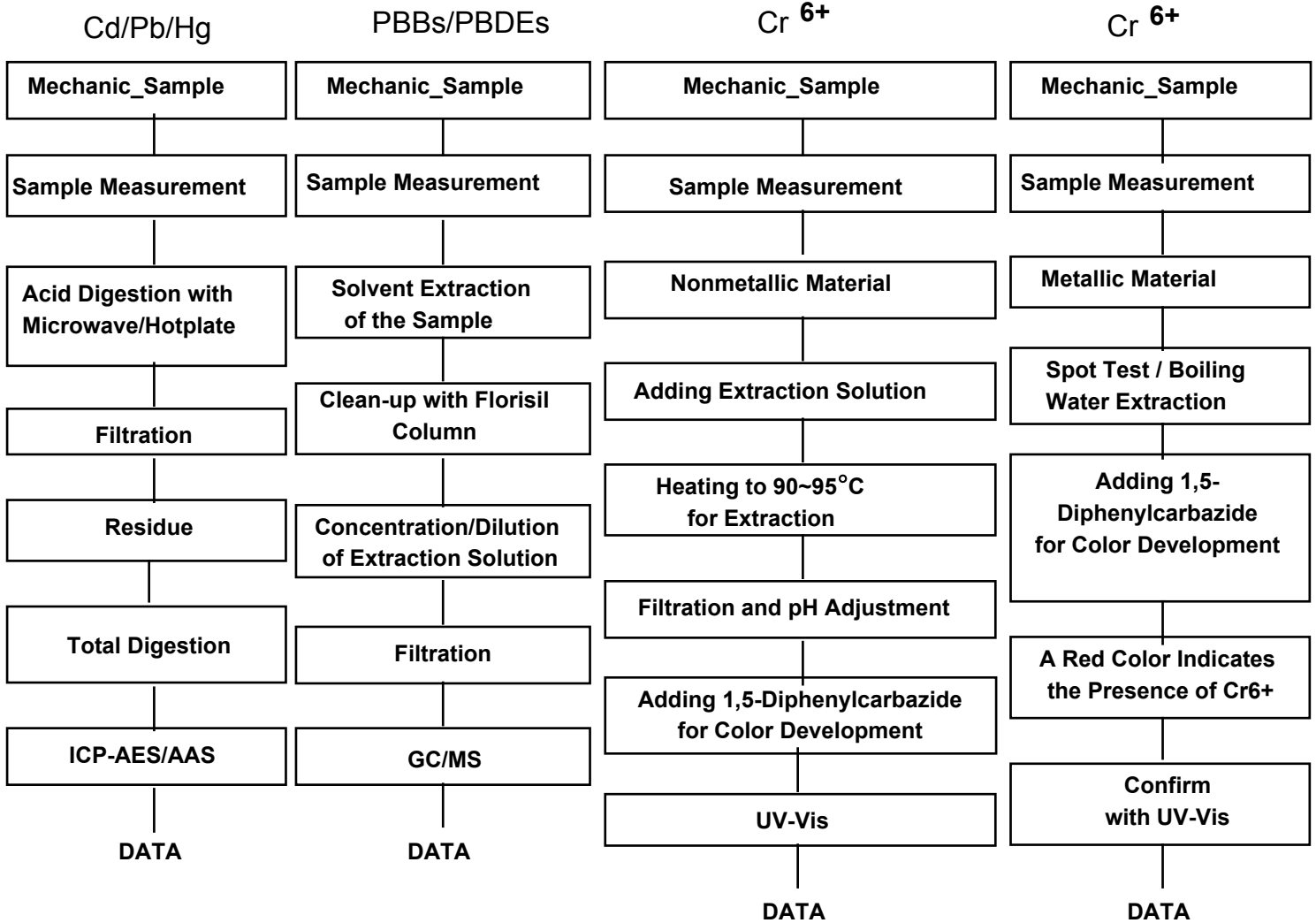
Picture of Sample as Received:



- NOTE:
- (1) N.D. = Not detected.(<MDL)
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  - (6) \* = Boiling-water-extraction:
    - Negative = Absence of CrVI coating
    - Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

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**Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup>/PBBs&PBDEs Testing**



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Gilsae Yi

\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

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