# Dreamus Corp.

# APPROVAL SHEET

	SE200				
NO	MODEL	FRE	QUENCY		
1	HWI-WIFI-SE200	WIFI/BT	2400~2484 MHz		

	SUPPLIER			CUSTOMER	
Engineer	Review	Approved	Engineer	Review	Approved
00					
20/04/13		20/04/13			

HANWOOL TECHNOLOGY CO., LTD
#1002 IT303-DONG, PUCHONTECHNOPARK III 36-1
SAMJUNG-DONG, OHJUNG-GU, KYOUNG GI-DO, KOREA

TEL: 032) 624-2555 FAX: 032) 624-2559

# **HISTORY SHEET**

ITEM	PCB AN	ITENNA	Developed by	Kyoung-Min Lee	00
Part Name	HWI-WII	FI-SE200	Director		
Rev. No.	Date		Description		Etc.
0	2020-04-13	Initial Version			

## ANTENNA SPECIFICATION

1. MODEL: HWI-WIFI-SE200

### 2. APPLICATION:

This specification is provided for WIFI/BT ANTENNA.

#### 3 ANTENNA used condition

■Portable ■Fixing ■Movement ■Out-door ■In-door ■Etc( )

### 4. ANTENNA Drawing

#3. Attached: Drawing paper

#### 5. Electrical specification and performance

Satisfied next data with real used or similar environment conditions.

No.	ELECTRICAL DATA	SPECIFICATIONS		REMARK
5. 1	FREQUENCY RANGE	WIFI/BT	2400~2484 MHz	
5. 2	IMPEDANCE	50 Ω NOMINAL		
5. 3	V. S. W. R	WIFI/BT	Less than 1:3.90	#1. Attached
5. 4	PEAK GAIN	WIFI/BT	1.119 dBi	#2. Attached
5. 5	RADIATION PATTERN	OMNI - DIRECTIONAL		
5. 6	POLARIZATION		LINEAR	

### 6. Hardware specification and mechanical

No.	MECHANICAL	SPECIFICATIONS	REMARK
2. 6. 1	PCB Size [W X H X T]	55.90 X 36.15 X 0.40 (mm)	

#### 7. SINUSOIDAL VIBRATION

Vibration Frequencies : 5-55 Hz (1 cycle)

Sweep Rate : 1 cycle/min

Maximum Amplitude : A - 1 mm

Maximum Acceleration : 2 g

Measuring method

Antenna is combined in the test equipment.

The vibration is done X and Y direction (left, right, up and down) according to below image.

It continued for 2 hours each direction.

#### 8. OPERATING TEMPERATURE

Temperature :  $-30^{\circ}$  /  $+70^{\circ}$ 

Demands : Set Antenna and Cable for 48 hours each temperature.

No visual and mechanical changes.

The fitting and mold will be unchanged mechanically during the test.

The antenna shall satisfy the electrical data

#### 9. HUMIDITY

Condition :  $90\% \sim 95\% / +40\%$ 

Measuring method

Antenna is placed in climatic chamber for 48 hours.

Antenna is taken out from the chamber and measured

after another 24 hours in room temperature

Demands : No visual and mechanical changes.

The fitting and mold will be unchanged mechanically during the test.

The antenna shall satisfy the electrical data.

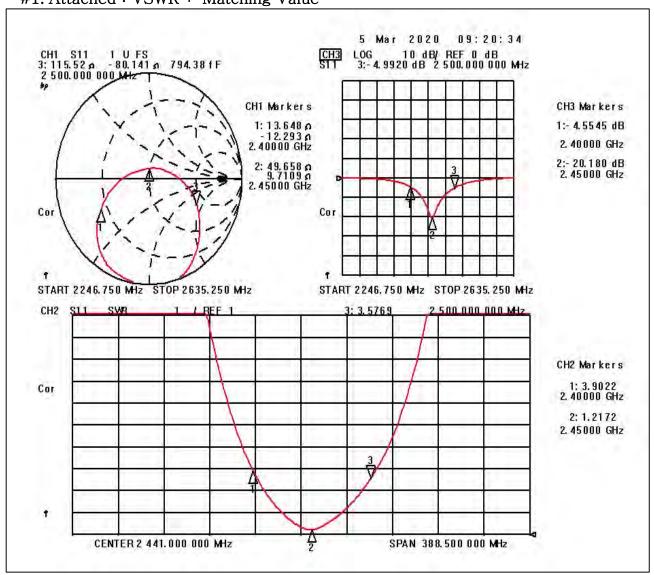
#### 10. TEST and Q/C

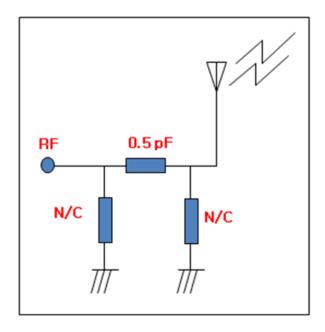
This specification is according to fixed demands and suitable Hanwool technology Q/C provision.

But it is possible to skip No. 7~9 demands, after consultation with buyer.

DQ No.	HW-200413-30	Modify No.		Write	Kyoung-Min Lee
Supply to	Dreamus Corp.	Date	2020-04-13	Approval	Chang-gi. Nam

### - #1. Attached: VSWR + Matching Value





+2. Attached: RADIATION PATTERN(GAIN)\_WIFI/BT 105 Screen capture User Info 3D Graph Report Print Delete Open Save 135 150 + Select Graph ☐ Summary Save as EXIT Add Sort 0 4 2 2 2 2 2 3 188 0 198 345 STOP 330 Efficiency[%] WI-FI 30.223% 29.515% 31.095% 30.627% 31.703% 30.526% 27.888% 26.345% 225 E2 plan 240 300 Select Frequency 255 88 2 2D Avg[dBi] START 0000000 8 8 120 8 3D Avg[dBi] 5.177 5.119 4.969 5.133 5.773 H+V POL ▼ ħ 如 农 界 粉 等 0 49 £8888888 贸 Measurement Pol 8 345 Plan - Vertical 88888888 88 F 225 Measurement Setup -18.880 -17.193 -17.354 -17.354 -18.344 -20.379 -22.206 -23.383 plan 240 300 Calibration Plan - Horizontal Angle Step 15 255 23 108 12 2 E2 plan 45 Plan plan 8 3D Measurement KIM Theta[deg] Data | HV Sum Line | H Line | V Line | Polar E Hor+Ver | Horizontal | Vertical | Highan | 2 2 2 2 2 이 땅을 188 0 Peak Value 0.853 0.872 0.582 0.497 0.190 0.367 2020-03-24 오전 9:51:08 195 385 2D Measurement Frequency[MHz] 330 2400.000 2412.000 2424.000 2436.000 2448.000 2460.000 2472.000 2480.000 225 H plan 240 8 285 2

- #3. Drawing paper Technology Date 0 0 Finish HWI-WIFI-SE200 Checked 0 0 디립어스 BOTTOM BOTTOM 0.0 Hanwool 0 0 0 HanwoolTech (트립어스) HWI-WIFI-SE200 (V.0) Meterial Description by Approved by File Name Model 0 0 CG Nam Revision Note 0 0 -. PSR 처리: BLACK Color SILK 인坐: WHITE Color TOP TOP PCB 0 Checked 0 0 Part Name XX ±0.1 N/A 200331-50 Drawn by J.O.LIM Title Decimal Angle E E, 0 Scale Š 2 € 0 BOTTOM 0 사리) 양면기판(0.4T+0.09) 0 부분은 BLACK으로 표시는 실크인쇄 영역임. 표AI는 客些 Area임 표시는 금도금 Area 임 41.7 0 VIA HILE \$0.5 55,9±0,2 TOP 0.47 V-CUT 办업 0 -. PATTERN: くい日と FR-4 0 36.15±0.2 KIa



Issued Date: 2019. 01. 24

Page 1 of 9

DONGYANG INK CO., LTD.

338-6 Gagok-ri, Jinwi-myeon Pyeongtaek-si, Gyeonggi-do

Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No. : AYAA19-01590
Product Name : DYS 2000 Black

Item No./Part No. : N/A

Client Reference Data : HFDK-[M, G, Gray], Black-[M, G]

Received Date : 2019. 01. 07

Test Period ; 2019. 01. 07 to 2019. 01. 24

Report Comments : By the applicant's request, item No.s/part No.s & client reference information are stated/added on

report.

Test Results : For further details, please refer to following page(s)

SGS Korea Co., Ltd.

Jeff Jang / Chemical Lab Mgr

This document is listed by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/terms-ed-conditions.aspx">http://www.sas.com/terms-ed-conditions.aspx</a>
and, for elaborated force to company subject to Terms and Conditions for Electronic Documents at <a href="http://www.sas.com/terms-ed-comment.htm">www.sas.com/terms-ed-comment.htm</a>
Active to the published of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the company's findings at the gibbs of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exactly present the public of the same provided parties of the same provided attention forgory or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the limits of the sample(s).

SIGS Kores Co Ltd

322 The Civalley, 76 LS-m Dongan-go. Anyang-si: Gyeongyielo, Korea 14117. 1-92 (0)31 4508 DOL F-92 (0)31 4508 058 http://www.sgagroup.kr



: AYAA19-01590.001

: DYS 2000 Black Sample Description : N/A Item No./Part No. : N/A Materials

Sample No.

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Cadmium by ICP-OES)	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Lead by ICP-OES)	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013 (Determination of Mercury by ICP-OES)	2	N.D.
Hexavalent Chromium (Cr VI)*	mg/kg	With reference to IEC 62321-7-2:2017, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis and Microwave system/or with reference to IEC 62321-5:2013, determination of Chromium by ICP-OES.	8	N.D.
Antimony (Sb)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.

Issued Date: 2019.01.24

Page 2 of 9

#### Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6;2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/en/Terms-and-Conditions.aspy-and">http://www.sas.com/en/Terms-and-Conditions.aspy-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sas.com/terms-e-document.htm">www.sas.com/terms-e-document.htm</a>—Attention is drewn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that Information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not excensive parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or faisflication of the contents or appearance of this document is unlawful and offenders may be presecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

302 The Civalley, 75 US-to Dongan-ge Anyang-si Gyeongy eto, Korea 14117 SGS Morea Co. Ltd. 1482 (031) 9500 DDT F492 (033) 9500 050 http://www.sgsgroup.kr



: AYAA19-01590.001

Sample No. : DYS 2000 Black Sample Description

: N/A Item No./Part No. : N/A Materials

Flame	Retardan	te-PRRs	PROFE
FIGILIE	netalual	IST DOS	FDUES

Test Items	Unit	Test Method	MDL	Results
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

#### Phthalates

Test Items	Unit	Test Method	MDL	Results
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isodecyl phthalate (DIDP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isononyl phthalate (DINP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-n-octyl phthalate (DNOP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.

#### Halogen Content

Test Items	Unit	Test Method	MDL	Results
Bromine(Br)	mg/kg	With reference to EN 14582:2016, IC	30	N.D.
Chlorine(CI)	mg/kg	With reference to EN 14582:2016, IC	30	238

#### Flame Retardants

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/en/Terms-and-Conditions.aspy-and">http://www.sas.com/en/Terms-and-Conditions.aspy-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sas.com/terms-e-document.htm">www.sas.com/terms-e-document.htm</a>—Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unautorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be presecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

265 Norea Co Ltd

322 The Clualley, 76 LS-in Danganign Anyangi-si Gyeongyi-do, Korea 14117 1 +82 (6)31 9509 001 7 +429 (6)34 4608 059 http://www.sgsgroup.kr

Issued Date: 2019.01.24

Page 3 of 9



: AYAA19-01590.001

Sample No. : DYS 2000 Black Sample Description

: N/A Item No./Part No. Materials : N/A

#### Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Tetrabromobisphenol A bis (dibromopropyl ether)	mg/kg	EPA 3540C, HPLC/DAD/MS	5	N.D.
Tetrabromobisphenol A	mg/kg	US EPA 3540C, GC/MS	10	N.D.

Issued Date: 2019.01.24

Page 4 of 9

#### Other(s)

Test Items	Unit	Test Method	MDL	Results
PFOA (Perfluorooctanoic acid)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.
PFOS (Perfluorooctane Sulfonates-Acid/Metal Salt/Amide)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.

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

(2) mg/kg = ppm

(3) MDL = Method Detection Limit

(4) -= No regulation

(5) Negative = Undetectable / Positive = Detectable

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

(7) \* = a. The result of Hexavalent Chromium (Cr(VI)) is "ND" as the result of Chromium (Cr) is "ND", and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.

b. If the Chromium (Cr) content is greater than the MDL of Hexavalent Chromium (Cr(VI)), confirmation test of Hexavalent Chromium (Cr(VI)) is required.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-end-Conditions.aspx">http://www.sgs.com/terms-end-Conditions.aspx</a>-and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a> <a href="http://www.sgs.com/terms-end-Conditions.aspx</a>-and conditions is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document exencising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

PGS Kores Co Ltd

322 The Q valley, 75 ES-ro, Dongan-ge, Anyong-et, Syeongyiedo, Korsa 14117. [482/0]91.4505.000\_f-402.(033).4509.039.http://www.sgsgroup.kr



Page 5 of 9

Issued Date: 2019.01.24



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sqs.com/len/Terms-and-Conditions.aspx-and">http://www.sqs.com/len/Terms-and-Conditions.aspx-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sqs.com/len/Terms-and-Conditions-e-document.htm">www.sqs.com/len/Terms-and-Conditions-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized atteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SGS Korea Co Ltd

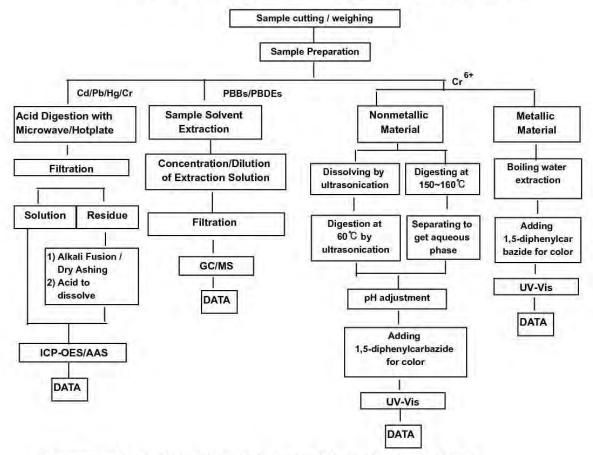
and the control of th



Issued Date: 2019.01.24

Page 6 of 9

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



The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg Section Chief: Minkyu Park

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/en/Terms-and-Conditions.ags.com/en/Terms-and-Condition

F401 Version4

SGS Kores Co Ltd

322 The D valley, 75 LS-ro. Dongan-go. Anyong-di. Gyeongyiedo, Korea 14117. [ 482 roje i 4508 001 1 4502 (013) 4506 059 http://www.sgsgroup.kr

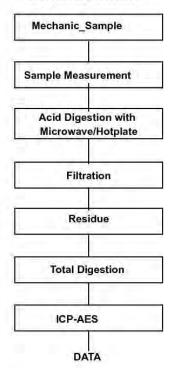


Issued Date: 2019.01.24

Page 7 of 9

#### Flow Chart for Inorganic Elements Testing

#### Inorganic Elements



Major Inorganic Heavy Metals

Antimony(Sb), Beryllium(Be), Phosphorus(P), Arsenic(As) etc.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sqs.com/en/Terms-and-Conditions.appx-and">http://www.sqs.com/en/Terms-and-Conditions.appx-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sqs.com/en/Terms-and-Conditions-6-document.htm">http://www.sqs.com/en/Terms-and-Conditions-6-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

\$22 The Civalley, 75 LS-m Dengtin-gu Anyang-ir Gyeonggido, Korea 14117.

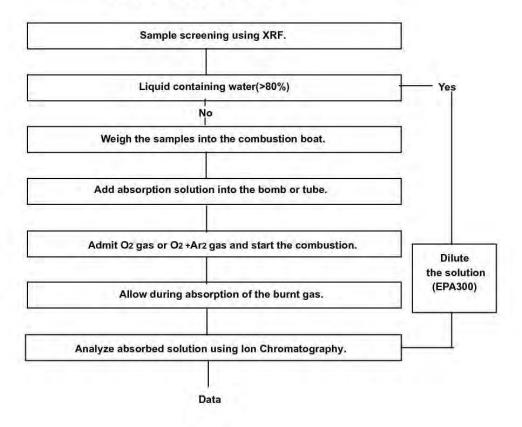
1482 6081 9609 600 F402 (0.02) 4808 050 http://www.sqagroup.kr



Issued Date: 2019. 01. 24

Page 8 of 9

#### Flow Chart for Halogen Test



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/en/Terms-and-Conditions.ags.px">http://www.ags.com/en/Terms-and-Conditions.ags.px</a>
and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.ags.com/terms-e-document.htm">www.ags.com/terms-e-document.htm</a>
Attention is drawn to the limitation of liability, Indemnification and jurisdiction issues defined therein. Any holder of this document is advised that Information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SGS Mores Co. Ltd.

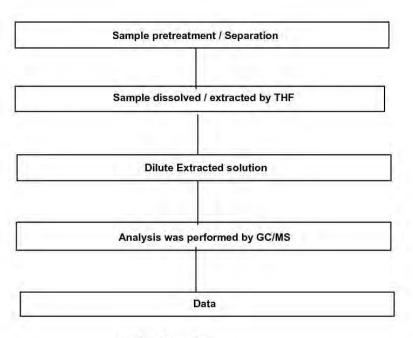
322 The Civalley, 75 LS-to Dongan-ge Anyong-et Gyeongyiedo, Korea 14117. I +82 (o.g.) yeog con 5 +82 (o.g.) 4608 059 http://www.sgsgroup.kr



Issued Date: 2019. 01. 24

Page 9 of 9

#### Flow Chart for Phthalate Test



\*\*\* End of Report \*\*\*

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/in/Terms-and-Conditions.appeared">http://www.ags.com/in/Terms-and-Conditions.appeared</a>
Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or fastification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SISS Korea Co Lid

322 The O'valley, 75 IS-ro, Dongan-go, Anyong-si, Gyeongyiedo, Korea 14+17 1482 (0)81 4698 001 F-402 (0)31 4608 059 http://www.sgsgroup.kr



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24

DONGYANG INK CO., LTD.

338-6, Gagok-ri, Jinwi-myeon Pyeongtaek-si, Gyeonggi-do

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No. : AYAA19-01583

DYS 2000 Black **Product Name** 

Item/Part Name

: HFDK-[M, G, Gray], Black-[M, G] Client reference data

**Received Date** : 2019.01.07

**Test Period** : 2019.01.07 ~ 2019.01.24

One hundred- Ninety one (191) substances in the Candidate List of Substances of Very **Test Requested** 

High Concern (SVHC) for authorization published by European Chemicals Agency (ECHA) on June 27, 2018 regarding Regulation (EC) No 1907/2006 concerning the

REACH.

Six (6) substances in the Public Consultation List of potential Substances of Very High Concern (SVHC) published by European Chemicals Agency (ECHA) on September 4,

2018 regarding Regulation (EC) No 1907/2006 concerning the REACH

By the applicant's request, item No.s/part No.s & client reference information are **Report Comments** 

stated/added on report.

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

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

SGS Korea Co., Ltd

Jeff Jang / Chemical Lab Mgr

the Company subject to its General Conditions of Service printed overleat, available on request or accessib-ronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="www.sgs.com/terms\_e-d-ation and jurisdiction issues defined therein. Any holder of this document is advised that information contained he y and within the limits of Citent's instructions, if any. The Company's sole responsibility is Client and this do their rights and obligations under the transaction documents. This document cannot be reproduced except in f ation, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the results shown in this test report refer only to the sample(s).

322, The O valley, 76, LS-to, Dongar-qu. Anyang-st. Gyeonggl-do, Korea 14117 1-482 (0)31 4608 000 1-482 (0)31 4605 059 http://www.sgsgroup.kr



Issued Date: 2019. 01. 24 Page 2 of 16

#### Test Method:

SGS In-House method - Analyzed by ICP-OES, PLM, UV/VIS, LC/MS ,GC/MS and colorimetric method

#### Remarks:

- 1. The chemical analysis of specified SVHC is performed by means of currently available analytical techniques against the following SVHC related documents published by ECHA:
  - http://echa.europa.eu/web/guest/candidate-list-table (Candidate list)
  - http://echa.europa.eu/proposals-to-identify-substances-of-very-high-concern-previous-
  - consultations?p p id=substancetypelist WAR substanceportlet&p p lifecycle=0&p p state=normal&p p mode =view&p p col id=column-1&p p col pos=2&p p col count=4& substancetypelis
  - (Proposals to identify SVHC consulations)
  - This list is under evaluation by ECHA and may subject to change in the future.
- 2. In accordance with Regulation (EC) No 1907/2006, any producer or importer of articles shall notify ECHA, in accordance with paragraph 2 of Article 7, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1) of the Regulation, if (a) the substance is present in those articles in quantities totaling over one tonne per producer or importer per year; and (b) the substance is present in those articles above a concentration of 0.1 % weight by weight (w/w).
- 3. Article 33 of Regulation (EC) No 1907/2006 requires supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0.1 % weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance in the Candidate List.
- 4. If a SVHC is found over the reporting limit, client is suggested to identify the component which contains the SVHC and the exact concentration of the SVHC by requesting further quantitative analysis from the laboratory.

This document is issued by the Company subject to its General Conditions of Service printed overleat, available on request or accessible at <a href="http://www.sgs.com/terms-and-Conditions.aspx.and">http://www.sgs.com/terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>, Attention is drawn to the imitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction document. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SGS Koren Co., Ltd.

322. The E valley, 75, L5-rd, Dongan-gu, Anyang-si, Gyeonggi-do, 1+82 (0)31-4608 000 (1+82 (0)31-4608 050 (1+82)



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 3 of 16

#### Test Result(s)

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
j.	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	287-476-5	0.05	N.D.
2	Anthracene	120-12-7	204-371-1	0.05	N.D.
3	Benzyl butyl phthalate (BBP)	85-68-7	201-622-7	0.05	N.D.
4	Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	204-211-0	0.05	N.D.
5	Bis(tributyltin)oxide	56-35-9	200-268-0	0.05	N.D.
6	Cobalt dichloride*	7646-79-9	231-589-4	0.005	N.D.
7	4,4-Diaminodiphenylmethane	101-77-9	202-974-4	0.05	N.D.
8	Diarsenic pentaoxide*	1303-28-2	215-116-9	0.005	N.D.
9	Diarsenic trioxide*	1327-53-3	215-481-4	0.005	N.D.
10	Dibutyl phthalate (DBP)	84-74-2	201-557-4	0.05	N.D.
11	Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β-HBCDD, γ-HBCDD)	25637-99-4 3194- 55-6 (134237-51- 7, 134237-50-6, 134237-52-8)	247-148-4 221-695-9	0.05	N.D.
12	Lead hydrogen arsenate*	7784-40-9	232-064-2	0.005	N.D.
13	Sodium dichromate (Sodium dichromate, dehydrate)	10588-01-9 (7789-12-0)	234-190-3	0.005	N.D.
14	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	201-329-4	0.05	N.D.
15	Triethyl arsenate*	15606-95-8	427-700-2	0.005	N.D.
16	Di-isobutyl phthalate(DIBP)	84-69-5	201-553-2	0.05	N.D.
17	2,4-Dinitrotoluene	121-14-2	204-450-0	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sas.com/en/Terms-and-Conditions.aspx.and">https://www.sas.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sas.com/erms-e-document.htm">www.sas.com/erms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SGS Korea (%), Lab. SSC. The D valley, 75, L5-ra, Dongar-gu, Anyang-ai, Gyeanngi-tio, Korea (4) (7, 1+62 (0)3), 4eo8 (0)5 (1+82 (0)3), 4e



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 4 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
18	Tris(2-chloroethyl) phosphate	115-96-8	204-118-5	0.05	N.D.
19	Anthracene oil	90640-80-5	292-602-7	0.05	N.D.
20	Anthracene oil, anthracene paste; distn. Lights	91995-17-4	295-278-5	0.05	N.D.
21	Anthracene oil, anthracene paste, anthracene fraction	91995-15-2	295-275-9	0.05	N.D.
22	Anthracene oil, anthracene-low	90640-82-7	292-604-8	0.05	N.D.
23	Anthracene oil, anthracene paste	90640-81-6	292-603-2	0.05	N.D.
24	Coal tar pitch, high temperature	65996-93-2	266-028-2	0.05	N.D.
25	Lead sulfochromate yellow (C.I. Pigment Yellow 34)*	1344-37-2	215-693-7	0.005	N.D.
26	Lead chromate molybdate sulfate red (C.I. Pigment Red 104)*	12656-85-8	235-759-9	0.005	N.D.
27	Lead chromate*	7758-97-6	231-846-0	0.005	N.D.
28	Acrylamide	79-06-01	201-173-7	0.05	N.D.
29	Boric acid*	10043-35-3 11113-50-1	233-139-2 234-343-4	0.005	N.D.
30	Disodium tetraborate, anhydrous*	1330-43-4 12179-04-3 1303-96-4	215-540-4	0.005	N.D.
31	Tetraboron disodium heptaoxide, hydrate*	12267-73-1	235-541-3	0.005	N.D.
32	Trichloroethylene	79-01-6	201-167-4	0.05	N.D.
33	Sodium chromate	7775-11-3	231-889-5	0.005	N.D.
34	Ammonium dichromate*	7789-09-5	232-143-1	0.005	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sqs.com/en/Terms-and-Conditions.aspx.and">https://www.sqs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sqs.com/erms.e-document.htm">www.sqs.com/erms.e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SSS Kores (%), Ltd. S22. The D valley, 75, LS-ra, Dongar-gu, Anyang-si, Gyeonogi-do, Korea (4) (7 1 +82 (0)3) 4608 000 (1 +82 (0)3) 4608 050 http://www.agsgroup.kr



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 5 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
35	Potassium dichromate*	7778-50-9	231-906-6	0.005	N.D.
36	Potassium chromate*	7789-00-6	232-140-5	0.005	N.D.
37	Cobalt(II) sulphate*	10124-43-3	233-334-2	0.005	N.D.
38	Cobalt(II) dinitrate*	10141-05-6	233-402-1	0.005	N.D.
39	Cobalt(II) carbonate*	513-79-1	208-169-4	0.005	N.D.
40	Cobalt(II) diacetate*	71-48-7	200-755-8	0.005	N.D.
41	2-Methoxyethanol	109-86-4	203-713-7	0.05	N.D.
42	2-Ethoxyethanol	110-80-5	203-804-1	0.05	N.D.
43	Chromium trioxide*	1333-82-0	215-607-8	0.005	N.D.
44	Acids generated from chromium trioxide and their oligomers:  Chromic acid Dichromic acid Oligomers of chromic acid and dichromic acid*	7738-94-5 13530-68-2 -	231-801-5 236-881-5 -	0.005	N.D.
45	1-methyl-2-pyrrolidone	872-50-4	212-828-1	0.05	N.D.
46	2-ethoxyethyl acetate	111-15-9	203-839-2	0.05	N.D.
47	1,2-benzenedicarboxylic acid, di-C6- 8-branced alkyl esters, C7-rich	71888-89-6	276-158-1	0.05	N.D.
48	1,2-benzenedicarboxylic acid, di-C7- 11-branched and linear alkyl esters	68515-42-4	271-084-6	0.05	N.D.
49	1,2,3-trichloropropane	96-18-4	202-486-1	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sqs.com/en/Terms-and-Conditions.aspx.and">https://www.sqs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sqs.com/erms.e-document.htm">www.sqs.com/erms.e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SGS Kores (%), Ltd. | S22, The D yalley, 75, L5-ra, Dongan-gu, Anyang-si, Gyeonogi-do, Kores 14 | 17 | 1-82 (0)31 -4808 (0)0 (1-82 (0)3) 4808 (0)0 (1-82 (0)3) 4808 (0)0 (1-82 (0)3)



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 6 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
50	Hydrazine	7803-57-8 302-01-2	206-114-9	0.05	N.D.
51	Strontium chromate*	7789-06-2	232-142-6	0.005	N.D.
52	1,2-Dichloroethane	107-06-2	203-458-1	0.05	N.D.
53	2,2'-dichloro-4,4'-methylenedianiline (MOCA)	101-14-4	202-918-9	0.05	N.D.
54	2-Methoxyaniline o-Anisidine	90-04-0	201-963-1	0.05	N.D.
55	4-(1,1,3,3-tetramethylbutyl) phenol, (4-tert-Octylphenol)	140-66-9	205-426-2	0.05	N.D.
56	Aluminosilicate Refractory Ceramic Fibres* (RCF)	650-017-00-8 (Index no.)	- 8	0.005	N.D.
57	Arsenic acid*	7778-39-4	231-901-9	0.005	N.D.
58	Bis(2-methoxyethyl) ether	111-96-6	203-924-4	0.05	N.D.
59	Bis(2-methoxyethyl) phthalate	117-82-8	204-212-6-	0.05	N.D.
60	Calcium arsenate*	7778-44-1	231-904-5	0.005	N.D.
61	Dichromium tris(chromate)*	24613-89-6	246-356-2	0.005	N.D.
62	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	500-036-1	0.05	N.D.
63	Lead diazide*	13424-46-9	236-542-1	0.005	N.D.
64	Lead dipicrate*	6477-64-1	229-335-2	0.005	N.D.
65	Lead styphnate*	15245-44-0	239-290-2	0.005	N.D.
66	N,N-dimethylacetamide (DMAC)	127-19-5	204-826-4	0.05	N.D.
67	Pentazinc chromate octahydroxide*	49663-84-5	256-418-0	0.005	N.D.
68	Phenolphthalein	77-09-8	201-004-7	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sas.com/en/Terms-and-Conditions.aspx.and">https://www.sas.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sas.com/errms-e-document.htm">www.sas.com/errms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SGS Kores (%), Ltd. | \$22. The D yalley, 75, L5-ra, Dongan-gu, Anyang-a, Gyeonogi-do, Korea 14 | 17 | 1 +82 (9)3 | 4:68 (9)5 | 4:52 (9)3 | 4:68 (9)5 | 4:68 (9)5 | 5:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 |



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 7 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
69	Potassium hydroxyocta- oxodizincatedichromate*	11103-86-9	234-329-8	0.005	N.D.
70	Trilead diarsenate*	3687-31-8	222-979-5	0.005	N.D.
71	Zirconia Aluminosilicate Refractory Ceramic Fibres (Zr-RCF)*	650-017-00-8 (Index no.)		0.005	N.D.
72	1,2-bis(2-methoxyethoxy) ethane (TEGDME; triglyme)	112-49-2	203-977-3	0.05	N.D.
73	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	203-794-9	0.05	N.D.
74	Diboron trioxide*	1303-86-2	215-125-8	0.005	N.D.
75	Formamide	75-12-7	200-842-0	0.05	N.D.
76	Lead(II) bis(methanesulfonate)*	17570-76-2	401-750-5	0.005	N.D.
77	TGIC(1,3,5-tris (oxiranyl methyl)- 1,3,5-triazine-2,4,6(1H,3H,5H)-trione)	2451-62-9	219-514-3	0.05	N.D.
78	β-TGIC (1,3,5-tris[(2S and 2R)-2,3- epoxypropyl]-1,3,5-triazine-2,4,6- (1H,3H,5H)-trione)**	59653-74-6	423-400-0	0.05	N.D.
79	4,4'-bis(dimethylamino) benzophenone (Michler's ketone)	90-94-8	202-027-5	0.05	N.D.
80	N,N,N',N'-tetramethyl-4,4'- methylenedianiline (Michler's base)	101-61-1	202-959-2	0.05	N.D.
81	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien- 1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3)	548-62-9	208-953-6	0.05	N.D.
82	[4-[[4-anilino-1-naphthyl][4- (dimethylamino)phenyl]methylene]cy clohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26)	2580-56-5	219-943-6	0.05	N.D.
83	α,α-Bis[4-(dimethylamino) phenyl]-4 (phenylamino) naphthalene-1- methanol (C.I. Solvent Blue 4)	6786-83-0	229-851-8	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sqs.com/en/Terms-and-Conditions.aspx.and">https://www.sqs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sqs.com/erms.e-document.htm">www.sqs.com/erms.e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SSS Kores (%), Ltd. S22. The D valley, 75. L5-ra, Dongar-gu, Anyang-si, Gyeonogi-do, Korea (4) (7. 1-62 (6)3). 4608 (60) (4-82 (6)3). 4608 (60) (4-82 (6)3).



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 8 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
84	4,4'-bis(dimethylamino)-4"- (methylamino)trityl alcohol	561-41-1	209-218-2	0.05	N.D.
85	Bis(pentabromophenyl) ether (DecaBDE)	1163-19-5	214-604-9	0.05	N.D.
86	Pentacosafluorotridecanoic acid	72629-94-8	276-745-2	0.05	N.D.
87	Tricosafluorododecanoic acid	307-55-1	206-203-2	0.05	N.D.
88	Henicosafluoroundecanoic acid	2058-94-8	218-165-4	0.05	N.D.
89	Heptacosafluorotetradecanoic acid	376-06-7	206-803-4	0.05	N.D.
90	4-(1,1,3,3-tetramethylbutyl) phenol, ethoxylated - covering well-defined substances and UVCB substances, polymers and homologues	. 18	T <sub>e</sub>	0.05	N.D.
91	4-Nonylphenol, branched and linear – substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof	N. E.	()+C	0.05	N.D.
92	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	204-650-8	0.05	N.D.
93	Cyclohexane-1,2-dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA)	85-42-7 13149-00-3 14166-21-3	201-604-9, 236-086-3, 238-009-9	0.05	N,D.
94	Hexahydromethylphathalic anhydride, Hexahydro-4- methylphathalic anhydride, Hexahydro-1-methylphathalic anhydride, Hexahydro-3- methylphathalic anhydride	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9	247-094-1, 243-072-0, 256-356-4, 260-566-1	0.05	N.D.
95	Methoxy acetic acid	625-45-6	210-894-6	0.05	N.D.
96	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	284-032-2	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sas.com/en/Terms-and-Conditions.aspx.and">https://www.sas.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sas.com/erms-e-document.htm">www.sas.com/erms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SGS Kores (%), Ltd. | S22, The D yalley, 75, L5-ra, Dongan-gu, Anyang-si, Gyeonogi-do, Kores 14 | 17 | 1-82 (0)31 -4808 (0)0 (1-82 (0)3) 4808 (0)0 (1-82 (0)3) 4808 (0)0 (1-82 (0)3)



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 9 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
97	Diisopentylphthalate (DIPP)	605-50-5	210-088-4	0.05	N.D.
98	N-pentyl-isopentylphtalate	3-3-	18	0.05	N.D.
99	1,2-Diethoxyethane	629-14-1	211-076-1	0.05	N.D.
100	N,N-dimethylformamide; dimethyl formamide	68-12-2	200-679-5	0.05	N.D.
101	Dibutyltín dichloride (DBT)	683-18-1	211-670-0	0.05	N.D.
102	Acetic acid, lead salt, basic*	51404-69-4	257-175-3	0.005	N.D.
103	Basic lead carbonate (trilead bis(carbonate)dihydroxide)*	1319-46-6	215-290-6	0.005	N.D.
104	Lead oxide sulfate (basic lead sulfate)*	12036-76-9	234-853-7	0.005	N.D.
105	[Phthalato(2-)]dioxotrilead (dibasic lead phthalate)*	69011-06-9	273-688-5	0.005	N.D.
106	Dioxobis(stearato)trilead*	12578-12-0	235-702-8	0.005	N.D.
107	Fatty acids, C16-18, lead salts*	91031-62-8	292-966-7	0.005	N.D.
108	Lead bis(tetrafluoroborate)*	13814-96-5	237-486-0	0.005	N.D.
109	Lead cyanamidate*	20837-86-9	244-073-9	0.005	N.D.
110	Lead dinitrate*	10099-74-8	233-245-9	0.005	N.D.
111	Lead oxide (lead monoxide)*	1317-36-8	215-267-0	0.005	N.D.
112	Lead tetroxide (orange lead)*	1314-41-6	215-235-6	0.005	N.D.
113	Lead titanium trioxide*	12060-00-3	235-038-9	0.005	N.D.
114	Lead Titanium Zirconium Oxide*	12626-81-2	235-727-4	0.005	N.D.
115	Pentalead tetraoxide sulphate*	12065-90-6	235-067-7	0.005	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sgs.com/en/Terms-and-Conditions.aspx.and">https://www.sgs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sgs.com/errms-e-document.htm">www.sgs.com/errms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SGS Korea (%), Ltd. | S22, The D yalley, 75, L5-ra, Dongan-gu, Anyang-a, Gyeanagi-do, Korea (4) (7) | 1-82 (9)3 (4608 000 (1-82 (9)3) 4608 059 http://www.sassroup.kr



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 10 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
116	Pyrochlore, antimony lead yellow*	8012-00-8	232-382-1	0.005	N.D.
117	Silicic acid, barium salt, lead-doped*	68784-75-8	272-271-5	0.005	N.A.
118	Silicic acid, lead salt*	11120-22-2	234-363-3	0.005	N.D.
119	Sulfurous acid, lead salt, dibasic*	62229-08-7	263-467-1	0.005	N.D.
120	Tetraethyllead*	78-00-2	201-075-4	0.005	N.D.
121	Tetralead trioxide sulphate*	12202-17-4	235-380-9	0.005	N.D.
122	Trilead dioxide phosphonate*	12141-20-7	235-252-2	0.005	N.D.
123	Furan	110-00-9	203-727-3	0.05	N.D.
124	Propylene oxide; 1,2-epoxypropane; methyloxirane	75-56-9	200-879-2	0.05	N.D.
125	Diethyl sulphate	64-67-5	200-589-6	0.05	N.D.
126	Dimethyl sulphate	77-78-1	201-058-1	0.05	N.D.
127	3-ethyl-2-methyl-2-(3-methylbutyl)- 1,3-oxazolidine	143860-04-2	421-150-7	0.05	N.D.
128	Dinoseb	88-85-7	201-861-7	0.05	N.D.
129	4,4'-methylenedi-o-toluidine	838-88-0	212-658-8	0.05	N.D.
130	4,4'-oxydianiline and its salts	101-80-4	202-977-0	0.05	N.D.
131	4-Aminoazobenzene; 4-Phenylazoaniline	60-09-3	200-453-6	0.05	N.D.
132	4-methyl-m-phenylenediamine (2,4-toluene-diamine)	95-80-7	202-453-1	0.05	N.D.
133	6-methoxy-m-toluidine (p-cresidine)	120-71-8	204-419-1	0.05	N.D.
134	Biphenyl-4-ylamine	92-67-1	202-177-1	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sas.com/en/Terms-and-Conditions.aspx.and">https://www.sas.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sas.com/errms-e-document.htm">www.sas.com/errms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

SGS Kores (%), Ltd. | \$22. The D yalley, 75, L5-ra, Dongan-gu, Anyang-a, Gyeonogi-do, Korea 14 | 17 | 1 +82 (9)3 | 4:68 (9)5 | 4:52 (9)3 | 4:68 (9)5 | 4:68 (9)5 | 5:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 | 6:50 |



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 11 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
135	o-aminoazotoluene	97-56-3	202-591-2	0.05	N.D.
136	o-Toluidine; 2-Aminotoluene	95-53-4	202-429-0	0.05	N.D.
137	N-methylacetamide	79-16-3	201-182-6	0.05	N.D.
138	1-bromopropane; n-propyl bromide	106-94-5	203-445-0	0.05	N.D.
139	Cadmium	7440-43-9	231-152-8	0.005	N.D.
140	Cadmium oxide*	1306-19-0	215-146-2	0.005	N.D.
141	Dipentyl phthalate (DPP)	131-18-0	205-017-9	0.05	N.D.
142	4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	2	.4.	0.05	N.D.
143	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	223-320-4	0.05	N.D.
144	Pentadecafluorooctanoic acid (PFOA)	335-67-1	206-397-9	0.05	N.D.
145	Dihexyl phthalate	84-75-3	201-559-5	0.05	N.D.
146	Trixylyl phosphate	25155-23-1	246-677-8	0.05	N.D.
147	Imidazolidine-2-thione; 2-imidazoline-2-thiol	96-45-7	202-506-9	0.05	N.D.
148	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	217-710-3	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sas.com/en/Terms-and-Conditions.aspx.and">https://www.sas.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sas.com/errms-e-document.htm">www.sas.com/errms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 12 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
149	Disodium 3,3'-[[1,1'-biphenyl]-4,4'- diylbis(azo)]bis(4-aminonaphthalene- 1-sulphonate) (C.I. Direct Red 28)	573-58-0	209-358-4	0.05	N.D.
150	Cadmium sulphide*	1306-23-6	215-147-8	0.005	N.D.
151	Lead di(acetate)*	301-04-2	206-104-4	0.005	N.D.
152	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	271-093-5	0.05	N.D.
153	Cadmium chloride*	10108-64-2	233-296-7	0.005	N.D.
154	Sodium perborate*; perboric acid, sodium salt*	3	239-172-9 234-390-0	0.005	N.D.
155	Sodium peroxometaborate*	7632-04-4	231-556-4	0.005	N.D.
156	2-benzotriazol-2-yl-4,6-di-tert- butylphenol (UV-320)	3846-71-7	223-346-6	0.05	N.D.
157	2-(2H-benzotriazol-2-yl)-4,6- ditertpentylphenol (UV-328)	25973-55-1	247-384-8	0.05	N.D.
158	2-ethylhexyl 10-ethyl-4,4-dioctyl-7- oxo-8-oxa-3,5-dithia-4- stannatetradecanoate (DOTE)	15571-58-1	239-622-4	0.05	N.D.
159	Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	7	2	0.05	N.D.
160	Cadmium fluoride	7790-79-6	232-222-0	0.005	N.D.
161	Cadmium sulphate	10124-36-4; 31119-53-6	233-331-6	0.005	N.D.
162	1,2-benzenedicarboxylic acid, di-C6- 10-alkyl esters; 1,2- benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5 68648-93-1	271-094-0 272-013-1	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sas.com/en/Terms-and-Conditions.aspx.and">https://www.sas.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sas.com/erms-e-document.htm">www.sas.com/erms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 13 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
163	5-sec-butyl-2-(2,4-dimethylcyclohex- 3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex- 3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]	è		0.05	N.D.
164	1,3-propanesultone	1120-71-4	214-317-9	0.05	N.D.
165	2,4-di-tert-butyl-6-(5- chlorobenzotriazol-2-yl)phenol (UV- 327)	3864-99-1	223-383-8	0.05	N.D.
166	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)- 6-(sec-butyl)phenol (UV-350)	36437-37-3	253-037-1	0.05	N.D.
167	Nitrobenzene	98-95-3	202-716-0	0.05	N.D.
168	Perfluorononan-1-oic acid (2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluorononanoic acid and its sodium and ammonium salts	375-95-1 21049-39-8 4149-60-4	206-801-3	0.05	N.D.
169	Benzo[def]chrysene (Benzo[a]pyrene)	50-32-8	200-028-5	0.05	N.D.
170	4,4'-isopropylidenediphenol (bisphenol A)	80-05-7	201-245-8	0.05	N.D.
171	4-Heptylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	3	4	0.05	N.D.
172	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	3108-42-7 335-76-2 3830-45-3	206-400-3 221-470-5	0.05	N.D
173	p-(1,1-dimethylpropyl)phenol	80-46-6	201-280-9	0.05	N.D

This document is issued by the Company subject to its General Conditions of Service printed overleat, available on request or accessible at <a href="https://www.sgs.com/en/Terms-and-Conditions.aspx.and">https://www.sgs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sgs.com/erms-e-document.htm">www.sgs.com/erms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 14 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
174	Perfluorohexane-1-sulphonic acid and its salts	355-46-4	206-587-1	0.05	N.D.
175	1,6,7,8,9,14,15,16,17,17,18,18 Dodecachloropentacyclo[12.2.1.16,9. 02,13.05,10] octadeca-7,15-diene (Dechlorane PlusTM) [covering any of its individual anti- and syn-isomers or any combination thereof]	i d	4	0.05	N.D.
176	Benz[a]anthracene	56-55-3	200-280-6	0.05	N.D.
177	Cadmium nitrate	10325-94-7	233-710-6	0.005	N.D.
178	Cadmium carbonate	513-78-0	208-168-9	0.005	N.D.
179	Cadmium hydroxide	21041-95-2	244-168-5	0,005	N.D.
180	Chrysene	218-01-9	205-923-4	0.05	N.D.
181	Reaction products of 1,3,4- thiadiazolidine-2, 5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ≥0.1% w/w 4-heptylphenol, branched and linear]	- 2	16	0.05	N.D.
182	Benzo[ghi]perylene (BgP)	191-24-2	205-883-8	0.05	N.D.
183	Decamethylcyclopentasiloxane (D5)	541-02-6	208-764-9	0.05	N.D.
184	Disodium octaborate	12008-41-2	234-541-0	0,005	N.D.
185	Dodecamethylcyclohexasiloxane (D6)	540-97-6	208-762-8	0.05	N.D.
186	Ethylenediamine	107-15-3	203-468-6	0.05	N.D.
187	Lead	7439-92-1	231-100-4	0.005	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sqs.com/en/Terms-and-Conditions.aspx.and">https://www.sqs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sqs.com/erms-e-document.htm">www.sqs.com/erms-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not expense parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or fasification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

S35 Kores (%), Ltd. S22. The D valley, 75, L5-ra, Dongar-gu, Anyang-si, Gyeonogi-do, Kores (4) (7 1 +82 (0)3) 4608 000 (1 +82 (0)3) 4608 059 http://www.agsgroup.kr



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 15 of 16

No.	Substance Name	CAS number	EC number	Reporting Limit (%)	Concentration (%)
188	Octamethylcyclotetrasiloxane (D4)	556-67-2	209-136-7	0.05	N.D.
189	Terphenyl hydrogenated	61788-32-7	262-967-7	0.05	N.D.
190	Dicyclohexyl phthalate(DCHP)	84-61-7	201-545-9	0.05	N.D.
191	Benzene-1,2,4-tricarboxylic acid 1,2 anhydride (trimellitic anhydride; TMA)	552-30-7	209-008-0	0.05	N.D.
192	2,2-bis(4'-hydroxyphenyl)-4- methylpentane	6807-17-6	401-720-1	0.05	N.D.
193	Benzo[k]fluoranthene	207-08-9	205-916-6	0.05	N.D.
194	Fluoranthene	206-44-0	205-912-4	0.05	N.D.
195	Phenanthrene	85-01-8	201-581-5	0.05	N.D.
196	Pyrene	129-00-0	204-927-3	0.05	N.D.
197	Undecafluorohexanoic acid and its ammonium salt	307-24-4 21615-47-4	206-196-6 244-479-6	0.05	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sgs.com/en/Terms-and-Conditions.aspx.and">https://www.sgs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sgs.com/errms-e-document.htm">www.sgs.com/errms-e-document.htm</a>, Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

S33 Korea Co., Ltd. | 322. The D yalley, 75, L5-rd, Dongan-gu, Anyang-a, Gyeanggi-do, Korea 14 | 17 | 1-82 (m3) - 4698 (n) 0 | 1-82 (m3) - 4608 (n



No. F690101/LF-CTSAYAA19-01583

Issued Date: 2019. 01. 24 Page 16 of 16

#### Note:

- 1. RL = Reporting Limit, 0.1% (w/w) = 1,000 ppm = 1,000 mg/kg
- 2. N.D. = Not detected (lower than RL)
  - N.A. = Not applicable for respective material type.

The submitted sample was found to contain significant amount of specific element(s) of SVHC. Upon further test verification and also information provided from client, the possibility that the element(s) content originate from SVHC is very unlikely, even though their presence cannot be exclude entirely. It may be assumed that the detected element(s) have a non-SVHC source.

 \*.The test result is based on the calculation of selected element(s) / marker(s) and to the worst-case scenario. For detail information, please refer to the SGS REACH website: <a href="www.reach.sgs.com/substance-of-very-high-concern-analysis-information-page.htm">www.reach.sgs.com/substance-of-very-high-concern-analysis-information-page.htm</a>

The client is advised to review the chemical formulation to ascertain above metal substances present in the article.

RL = 0.005% is evaluated for element (i.e. cobalt, arsenic, lead, sodium, chromium, chromium(VI), silicon, aluminum, zirconium, boron, and potassium respectively), except molybdenum RL=0.0005%

- 4. \*\*. -TGIC is one of the isomers for TGIC compounds and hence, tested together. The reported test result is based the proposed ratio as according to ECHA dossier.
- 5. \*\*\*.The sample was diluted with solvent because of matrix effect, so there could be slight increase in MDL and it may have an effect on RL.



\*\*\* End of Report \*\*\*

This document is issued by the Company subject to its General Conditions of Service printed overleat, available on request or accessible at <a href="http://www.sgs.com/en/Terms-and-Conditions.sgs/s.aspx.and">http://www.sgs.com/en/Terms-and-Conditions.sgs/s.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/en/ms-e-document.htm">www.sgs.com/en/ms-e-document.htm</a>. Attention is drawn to the imitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, any unauthorized alteration, foregy or fasification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F415 version 3

RGS Korea Co., Ltd.

322, The Civalley, 76; LS-10, Dongari-gu, Agyang-si, Gyeonggi-do, Korea 141.17. t +82 (0)31 4608 000 f +82 (0)31 4608 059 http://www.sgsgroup.kr



Issued Date: 2019.02.11

Page 1 of 9

SEOUL CHEMICAL RESEARCH LABORATORY CO., LTD.

#1MA 605-5 Shihwa Ind. 63, Gongdan 2-daero Siheung-si, Gyeonggi-do

Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No. : AYAA19-09079R1

Product Name : SPI-707G TC WITH SH-2

Item No./Part No. : N/A

Client Reference Data : SPI-707G TC-2 WITH SH-2,SPI-707G TC-3 WITH SH-2,SPI-707G TC-4 WITH SH-2,SPI-707G

TC-5 WITH SH-2,SPI-707G TC-7 WITH SH-2,SPI-707G TC-8 WITH SH-2,SPI-707G MATT WITH SH-2,SPI-707G MATT(1) WITH SH-2,SPI-707G SEMIMATT WITH SH-2, SPI-707G

MATT(U) WITH SH-2

Received Date : 2019. 01. 30

Test Period : 2019. 01. 30 to 2019. 02. 11

Report Comments: By the applicant's request, item No.s/part No.s & client reference information are stated/added

on report.

Supercede/Referral: The test report supercedes previous report number, "F690101/LF-CTSAYAA19-09079" issued by

SGS Korea Co., Ltd.

Test Results : For further details, please refer to following page(s)

SGS Korea Co., Ltd.

Jeff Jang / Chemical Lab Mgr

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-and-Conditions-assay:">http://www.sgs.com/terms-and-Conditions-assay:</a>
and, for request of company subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>
Attention is described in the state of the first of the state o

SRS linnes Chi Ltd

322 The Civalley, 75 LS-m Dongan-gu. Anyang-si. Gyeonogiedo, Korea 14117. 1 482 (0)3 1 (608 000 F-402 (0)3) 4608 059 http://www.sgsgroup.kr



: AYAA19-09079R1.001 Sample No. : SPI-707G TC WITH SH-2 Sample Description

: N/A Item No./Part No. : N/A Materials

Heavy	۷	e'	ta	S
-------	---	----	----	---

Test Items	Unit	Test Method	MDL	Results
Antimony (Sb)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.
Arsenic (As)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.
Beryllium (Be)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	5	N.D.
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Cadmium by ICP-OES)	0,5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Lead by ICP-OES)	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013 (Determination of Mercury by ICP-OES)	2	N.D.
Hexavalent Chromium (Cr VI)*	mg/kg	With reference to IEC 62321-7-2:2017, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis and Microwave system/or with reference to IEC 62321-5:2013, determination of Chromium by ICP-OES.	8	N.D.

#### Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-end-Conditions.aspx">http://www.sgs.com/terms-end-Conditions.aspx</a>
and, for electronic formet documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>
Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's flodings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not excrierate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or faisification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

365 Voice Co Ltd

322 The O'vailey, 75 LS-ro. Dongan-on. Anyong-si: Gyeongyiedo, Korsa 14+1 i 1+82 /ors1 4509 con. r-459 (0'24 4508 0'59 <u>http://www.sqsgroup.kr</u>

Member of the SGS Group (Sodifie Generale de Surveillation)

Page 2 of 9

Issued Date: 2019.02.11



Sample No.

### Test Report No. F690101/LF-CTSAYAA19-09079R1

: AYAA19-09079R1.001 : SPI-707G TC WITH SH-2

Sample Description : SPI-Item No./Part No. : N/A Materials : N/A

Test Items	Unit	Test Method	MDL	Results
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N,D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

Test Items	Unit	Test Method	MDL	Results
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isodecyl phthalate (DIDP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isononyl phthalate (DINP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-n-octyl phthalate (DNOP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-ethyl phthalate(DEP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-methyl phthalate (DMP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
[di(C7-C11 alkyl)phthalate] linear and branched (DHNUP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sqs.com/en/Terms-and-Conditions.aspv-and">http://www.sqs.com/en/Terms-and-Conditions.aspv-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sqs.com/terms-e-document.htm">www.sqs.com/terms-e-document.htm</a>. Attention is do drawn to the limitation of liability, indemnification and pursisticion issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exorierate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company and unauthorized alteration, forgerpy or fallsification of the content or appearance of this document is unlawful and offendors may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

S65 Novea Co Ltd

322 The O'vailey, 75 LS-ro. Dongan-on. Anyong-si: Gyeongyiedo, Korsa 14+1 i 1+82 /ors1 4509 con. r-459 (0'24 4508 0'59 <u>http://www.sqsgroup.kr</u>

Issued Date: 2019.02.11

Page 3 of 9



: AYAA19-09079R1.001 Sample No. : SPI-707G TC WITH SH-2 Sample Description

: N/A Item No./Part No. : N/A Materials

Test Items	Unit	Test Method	MDL	Results
[di(C6-C8 alkyl)phthalate] branched (DIHP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Bis(2-methoxyethyl) phthalate (BMP, BMEP, DMEP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-iso-pentyl phthalate(DIPP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-n-hexyl phthalate (DNHP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-n-pentyl phthalate(DPP, DnPP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.

Issued Date: 2019.02.11

Page 4 of 9

#### Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Hexabromocyclododecane (HBCDD)	mg/kg	USEPA 3540C, LC/MS	5	N.D.

#### Other(s)

Test Items	Unit	Test Method	MDL	Results
PFOA (Perfluorooctanoic acid)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.
PFOS (Perfluorooctane Sulfonates-Acid/Metal Salt/Amide)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.

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

(2) mg/kg = ppm

(3) MDL = Method Detection Limit

(4) - = No regulation

(5) Negative = Undetectable / Positive = Detectable

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

(7) \* = a. The result of Hexavalent Chromium (Cr(VI)) is "ND" as the result of Chromium (Cr) is "ND", and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.

b. If the Chromium (Cr) content is greater than the MDL of Hexavalent Chromium (Cr(VI)), confirmation test of Hexavalent Chromium (Cr(VI)) is required.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-end-Conditions.aspx-and.">http://www.sgs.com/terms-end-Conditions.aspx-and.</a> for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's florings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exenterate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or fatsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

322 The Civalley, 76 LS-m Dangan-ga Anyang-si Gyeology-do, Korsa 14117 1+82 (o;31 4500 oon 1+429 (o;31 4500 o;56 <u>http://www.sqsgroup.kr</u>



Page 5 of 9



Issued Date: 2019. 02. 11

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/en/Terms-end-Conditions.aspx-and">http://www.sas.com/en/Terms-end-Conditions.aspx-and</a>, for electronic format documents, subject to Torms and Conditions for Electronic Documents at <a href="http://www.sas.com/en/Terms-end-cument.htm">www.sas.com/en/Terms-end-cument.htm</a>. Attention is drawn to the limitation of liability, Indemnification such administration of liability, Indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's sole responsibility is to its Client and this document does not exenerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any naunthorized alteration, forgery or fallsfitted not fit to content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SGS Korea Co Ltd

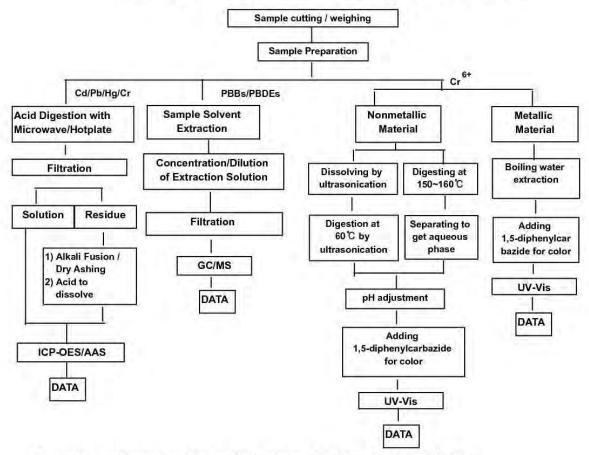
322. The O valley, 76, LS-ro. Dongan-gu. Anyang-si, Gyeonggi-do, Korea 14+17 1+82 (0)31 4508 000 F+82 (0)31 4508 059 http://www.sgsgroup.kr



Issued Date: 2019. 02. 11

Page 6 of 9

### Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr6+ /PBBs&PBDEs Testing



The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg Section Chief: Minkyu Park

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-end-Conditions.aspx">http://www.sgs.com/terms-end-Conditions.aspx</a>
and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's florings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not excenerate parties to a transaction from exercising all their rights and obligations under the transaction from exercising all their rights and obligations under the transaction from exercising all their rights and obligations under the transaction from exercising in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SIGS Works Co Ltd

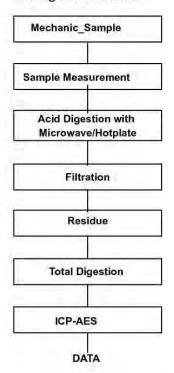
322 The Civalley, 75 (LS-ro. Dongan-go, Anyorg-st Gyeongy-do, Koras 141) ( [482 (6)8) 4505 D00 F402 (6)3) 4506 659 http://www.sasaroup.kr



Issued Date: 2019.02.11 Page 7 of 9

### Flow Chart for Inorganic Elements Testing

### Inorganic Elements



Major Inorganic Heavy Metals

Antimony(Sb), Beryllium(Be), Phosphorus(P), Arsenic(As) etc.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-end-Conditions.aspx2-and">http://www.sgs.com/terms-end-Conditions.aspx2-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's florings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

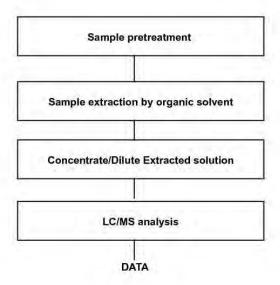
\$22 The 0 valley, 75 LS-p. Dengan-go. Anyaro-si. Gyeongy-do, Korea 14117 SGS Korea Co. Ltd. 1482 (0)91 4505 (0)7 F402 (0)31 4506 (055 http://www.sasaroup.kr



Page 8 of 9

### **Testing Flow Chart for HBCD**

Issued Date: 2019. 02. 11



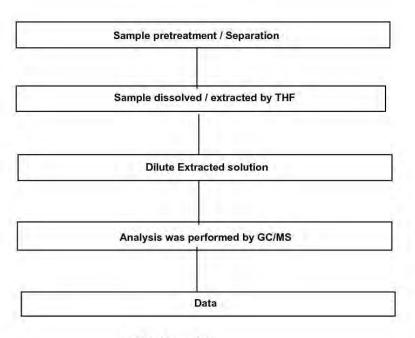
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-end-Conditions.aspx2-and">http://www.sgs.com/terms-end-Conditions.aspx2-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

322 The 0 valley, 75 LS-to, Dengan-go, Anyang-si, Gyeongy-do, Korea 14117
SGS Korea Co, Ltd. 1482 (0)91 4505 001 F402 (0)31 4506 055 http://www.sqsgroup.kr



Issued Date: 2019. 02. 11 Page 9 of 9

#### Flow Chart for Phthalate Test



\*\*\* End of Report \*\*\*

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms-end-Conditions-aspectants">http://www.sgs.com/terms-end-Conditions-aspectants</a>, and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's flodings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

EGS Kores Co Ltd

322 The O'valley, 75 IS-ro. Dongan-go. Anyong-si. Gyeongyiedo, Korea 14+17 14-82 (0):91 4508 000 17-912 (0):31 4508 059 http://www.sqsgroup.kr

# 원자재

KB-6160,KB-6060, KB-6160A, KB-6060A,KB-6160C,KB-6060C,KB-6150, KB-6050, KB-6150C, KB-6050C RoHS test report



**Test Report** 

No. HKGEC1800006212

Date: 19 Jan 2018 Page 1 of 6

KINGBOARD LAMINATES HOLDINGS LIMITED 23/F DELTA HOUSE, 3 ON YIU STREET, SHATIN, HONG KONG

The following sample was submitted and identified on behalf of the client as: KB-6160

3961222 - HK YELLOW SHEET SGS Job No. Color

Model No. KB-6160

Client Reference No. KB-6060, KB-6160A, KB-6060A, KB-6160C, KB-6060C, KB-6150,

KB-6050, KB-6150C, KB-6050C

Date of Sample Received

Testing Period

03 Jan 2018

03 Jan 2018 - 18 Jan 2018

Test Requested : Please refer to the result summary.

Test Method Please refer to next page(s).

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

Based on the performed tests on submitted sample(s), the results of Conclusion

Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set

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

2011/65/EU.

Signed for and on behalf of SGS Hong Kong Limited

Lam Ka Yung, Allen

Chemist

563 Hung Kang Emilias | Laboracory: 1/F. 3/F. 4/F & 5/F. On Wui Centre, 25 Lok Yio Road, On Lok Tsuen, Facling, New Territories, Hong Kong www.sgsgroup.com/rk Office: 17/F. The Octagen, 6 Sha Tsui Road, Tsuen Wan, New Territories, Hong Kong t (852) 2334 4481 1 (652) 2764 3126 e mktg.hk@sgs.com



Test Report No. HKGEC1800006212 Date: 19 Jan 2018 Page 2 of 6

Test Results:

#### Test Part Description:

1

Specimen No. SGS Sample ID Description

HKG18-000062.008 Yellow sheet (only test yellow part only without red "KB" printing)

#### Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

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

Test Method: With reference to IEC 62321-4:2013+A1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	008
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	11
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-51	ND
Monobromobiphenyl		mg/kg	5	ND
Dibromobiphenyl		mg/kg	5	ND
Tribromobiphenyl	6	mg/kg	5	ND
Tetrabromobiphenyl	4	mg/kg	5	ND
Pentabromobiphenyl		mg/kg	5	ND
Hexabromobiphenyl	. 4	mg/kg	5	ND
Heptabromobiphenyl	(4.7)	mg/kg	5	ND
Octabromobiphenyl	lia.	mg/kg	5	ND
Nonabromobiphenyl	1,2	mg/kg	5	ND
Decabromobiphenyl	(4)	mg/kg	5	ND

This document is issued by the Company subject to its General Conditions of Service printed overlead, available on request or accessible at <a href="http://www.sas.com/inffernean-foothions.agg/">http://www.sas.com/inffernean-foothions.agg/</a> and, for electronic foothions and conditions of the Company subject to Terms and Conditions for Electronic Consumers at subject and the Company subject to Terms and Conditions of Consumers at subject to Terms and Conditions of Consumers and Conditions of Consumers at subject to Terms and Conditions and Infference and Conditions and Conditions and Infference and Conditions and Conditions and Conditions and Consumers and Consumers and Conditions and Consumers and Consu

Unless otherwise stated the results shown in this lest report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

563 Hung Keng Emitter | Laboracory: 1/F. 2/F. 4/F & 5/F. On Wui Centre, 25 Lok Yio Road. On Lok Tsuen: Faoling. New Territories. Hong Kong www.sgsgroup.com/bk Office: 17/F. The Octagon, 6 Sha Tsui Road. Tsuen Wan, New Territories. Hong Kong t (852) 2334 4481 | 1/852) 2764 3126 | e mktg.hk@sgs.com



Test Report	No. HKGEC18000062	12	Date : 19 c	lan 2018	Page 3 of 6
Sum of PBDEs	1,000	mg/kg	11.50	ND	
Monobromodiphenyl ether	14	mg/kg	5	ND	
Dibromodiphenyl ether	1.0	mg/kg	5	ND	
Tribromodiphenyl ether	- 4	mg/kg	5	ND	
Tetrabromodiphenyl ether		mg/kg	5	ND	
Pentabromodiphenyl ether	9	mg/kg	5	ND	
Hexabromodiphenyl ether	4	mg/kg	5	ND	
Heptabromodiphenyl ether	19	mg/kg	5	ND	
Octabromodiphenyl ether	1.3	mg/kg	5	ND	
Nonabromodiphenyl ether	4	mg/kg	5	ND	
Decabromodiphenyl ether	. 9	mg/kg	5	ND	
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	
Bis (2-ethylhexyl) phthalate (DEHP	1000	mg/kg	50	ND	
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND	

#### Notes:

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.IEC 62321 series is equivalent to EN 62321 series

http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP\_ORG\_ID,FSP\_LANG\_ID :1258637,25

Remark: The test results were obtained from a SGS affiliated laboratory.

563 Hung Keng Emiliar | Laboracory: 1/F. 2/F. 4/F & 5/F. On Wui Centre, 25 Lik Yio Road. On Lok Tsuen: Faciling. New Territories. Hong Kong www.sgsgroup.com.hk
Office: 17/F. The Octagon, 6 Sha Tsui Road. Tsuen Wan. New Territories. Hong Kong t (852) 2334 4481 | 1/852) 2764 3126 | emiktg.hk@sgs.com



**Test Report** 

No. HKGEC1800006212

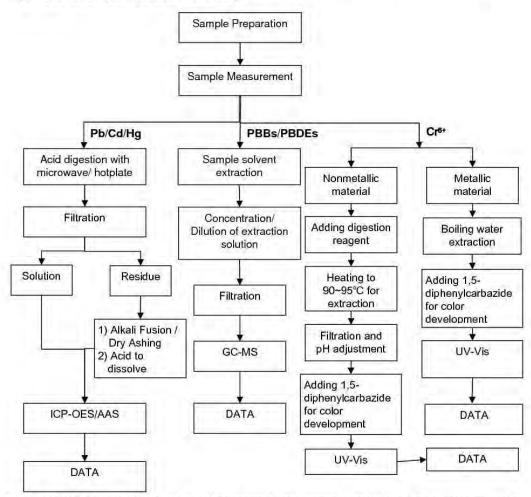
Date: 19 Jan 2018

Page 4 of 6

# **ATTACHMENTS**

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

- 1) Name of the person who made testing: Edith Zhang / Sunny Hu
- 2) Name of the person in charge of testing: Bella Wang / Qiong Liu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded).



This document is issued by the Company subject to its General Conditions of Service printed overfeat, available on request or accessible at <a href="https://www.sas.com/en/Terms.and-Conditions.aagu and, for electronic forms.and-Conditions.aagu and, for electronic forms.and-Conditions.aagu and Conditions for Electronic for Terms.and-Conditions.aagu and the first time of its liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the first of Clerk's instructions, it any. The Company's sole responsibility is etf. Clerk and this document cannot be concertage parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized afteration forcers or labellification of the content or assessment or appearance of this document is unabserved.

Unless otherwise stated the results shown in this lest report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

563 Hung Keng Emitter | Laboracory: 1/F. 2/F. 4/F & 5/F. On Wui Centre, 25 Lok Yio Road. On Lok Tsuen: Faoling. New Territories. Hong Kong www.sgsgroup.com/bk Office: 17/F. The Octagon, 6 Sha Tsui Road. Tsuen Wan, New Territories. Hong Kong t (852) 2334 4481 | 1/852) 2764 3126 | e-mktg.hk@sgs.com



**Test Report** 

No. HKGEC1800006212

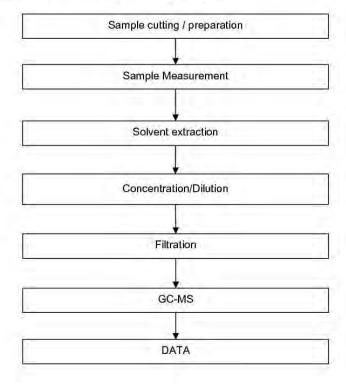
Date: 19 Jan 2018

Page 5 of 6

### **ATTACHMENTS**

## Phthalates Testing Flow Chart

- 1) Name of the person who made testing: Sunny Hu
- 2) Name of the person in charge of testing: Qiong Liu



This document is issued by the Company subject to its General Conditions of Service printed overlead, available on request or accessible at <a href="https://www.sos.com/en/Terms.and-Conditions.agg/">https://www.sos.com/en/Terms.and-Conditions.agg/</a> and, for electronic forms and countering, subject to Ferms and Conditions for Electronic for Countering at https://www.sos.com/en/Terms.and-Conditions.agg/</a> and the limitation of limitations and limitation of the limitation of limitation is a service of limitation of the limitation of limitation of limitations of limitation of limitations of l

Unless otherwise stated the results shown in this lest report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

ESS Hung Kung Emilias | Laboracory: 1/F. 2/F. 4/F & 5/F. On Wui Centre, 25 Lok Yio Road. On Lok Tsuen: Faoling. New Territories. Hong Kong www.sgsgroup.com/bk Office: 17/F. The Octagon, 6 Sha Tsui Road. Tsuen Wan. New Territories. Hong Kong t (852) 2334 4481 | f (852) 2764 3126 | e mktg.hk@sgs.com



**Test Report** 

No. HKGEC1800006212

Date: 19 Jan 2018

Page 6 of 6

Sample photo:



SGS authenticate the photo on original report only

\*\*\* End of Report \*\*\*

This document is issued by the Company subject to its General Conditions of Service printed overlead, available on request or accessible at <a href="https://document.org/lines/angles/a

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

S63 Hung Kong Guides Laboratory: 1/F, 3/F, 4/F & 5/F, On Wui Centre, 25 Lok Yio Road. On Lok Tsuen, Faciling, New Territories, Hong Kong www.sgsgroup.com.hk
Office: 17/F, The Octagon, 6 Sha Tsui Road, Tsuen Wan, New Territories, Hong Kong t (852) 2334 4481 f (852) 2764 3126 e mktg.hk@sgs.com



Issued Date: 2019. 01. 09

Page 1 of 8

CHEMPROS CO., LTD.

4Na 303, 1294-2 Jeongwang-dong Siheung-si, Gyeonggi-do Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No.

: AYAA19-01488

**Product Name** 

: CP OS-100C

Item No./Part No.

: N/A

Buyer(s)

: SAMSUNG

Received Date

: 2019. 01. 04

**Test Period** 

: 2019. 01. 04 to 2019. 01. 09

Conclusion

: The halogens on the test reports were performed with the water-diluted solution of the submitted

sample, and the dilution ratio to water was one to one hundred.

**Test Results** 

: For further details, please refer to following page(s)

SGS Korea Co., Ltd.

Jeff Jang / Chemical Lab Mgr

SIGS Wores Co Ltd.

322 The O'valley, 76 LS-m Dongan-go. Anyang-si: Gyeongyi-do, Korea 14+17 1+82 (0)31 4508 DOL 1-412 (0)31 4508 058 http://www.sgsgroup.kr



: AYAA19-01488.001

: CP OS-100C Sample Description

: N/A Item No./Part No. : N/A Materials

Н	ea	٧y	M	0	ta	S
=		-	_	-		_

Sample No.

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Cadmium by ICP-OES)	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Lead by ICP-OES)	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013 (Determination of Mercury by ICP-OES)	2	N.D.
Hexavalent Chromium (Cr VI)*	mg/kg	With reference to IEC 62321-7-2:2017, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis and Microwave system/or with reference to IEC 62321-5:2013, determination of Chromium by ICP-OES.	8	N.D.
Antimony (Sb)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.

Issued Date: 2019.01.09

Page 2 of 8

Flame	Retarda	nts-PBBs	/PRDEs
I Idillo	Hetalual	119 1 009	/I ODES

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/en/Terms-and-Conditions.aspy-and">http://www.sas.com/en/Terms-and-Conditions.aspy-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sas.com/terms-e-document.htm">www.sas.com/terms-e-document.htm</a>—Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unautorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be presecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

265 Norea Co Ltd

422 The O'vailey, 76 LS-m Dongan-on Anyang-si Gyeongy-do, Korea 1-kt (7 ) 1+82 (0/31 4-609 001 1-4-92 (0/31 4-609 059 http://www.sgsgroup.kr



Sample No.

# Test Report No. F690101/LF-CTSAYAA19-01488

: AYAA19-01488.001

: CP OS-100C Sample Description

: N/A Item No./Part No. : N/A Materials

Flame	Retardan	ts-PBBs	/PBDFs

Test Items	Unit	Test Method	MDL	Results
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

Issued Date: 2019.01.09

Page 3 of 8

#### Phthalates

Test Items	Unit	Test Method	MDL	Results
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.

#### Halogen Contents

Test Items	Unit	Test Method	MDL	Results
Bromide (Br-)	mg/L	US EPA300.0, IC	30	N.D.
Chloride (Cl-)	mg/L	US EPA300.0, IC	30	N.D.
Fluoride (F-)	mg/L	US EPA300.0, IC	30	N.D.
lodide (I-)	mg/L	US EPA300.0, IC	50	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/en/Terms-and-Conditions.aspx-and">http://www.sas.com/en/Terms-and-Conditions.aspx-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sas.com/terms-e-document.htm">www.sas.com/terms-e-document.htm</a>—Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unautorized attention, forgery or falsification of the content or appearance of this document is unlawful and offenders may be presecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

302 The Civalley, 75 US-to Dongan-ge Anyang-si Gyeongy eto, Korea 14117 SGS Morea Co. Ltd. 1482 (031) 9500 DDT F492 (033) 9500 050 http://www.sgsgroup.kr



Issued Date: 2019. 01. 09 Page 4 of 8

NOTE:

- (1) N.D. = Not detected.(<MDL)
- (2) mg/kg = ppm
- (3) MDL = Method Detection Limit
- (4) = No regulation
- (5) Negative = Undetectable / Positive = Detectable
- (6) \*\* = Qualitative analysis (No Unit)
- (7) \* = a. The result of Hexavalent Chromium (Cr(VI)) is "ND" as the result of Chromium (Cr) is "ND", and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.
  - b. If the Chromium (Cr) content is greater than the MDL of Hexavalent Chromium (Cr(VI)), confirmation test of Hexavalent Chromium (Cr(VI)) is required.



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sqs.com/len/Terms-and-Conditions.aspx-and">http://www.sqs.com/len/Terms-and-Conditions.aspx-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sqs.com/len/Terms-and-Conditions-e-document.htm">www.sqs.com/len/Terms-and-Conditions-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all thier rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized atteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SGS Korea Co. Ltd.

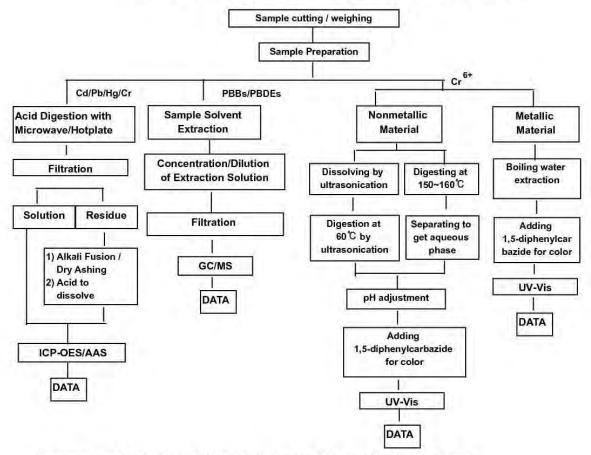
322 The O valley, 76. LS-ro. Dongar-gu, Anyang-si, Gyeonggi-do, Korea 14+17 1+82 (0)31 4508 000 F+82 (0)31 4508 059 http://www.sgsgroup.kr



Issued Date: 2019.01.09

Page 5 of 8

### Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr6+ /PBBs&PBDEs Testing



The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg Section Chief: Minkyu Park

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/en/Terms-and-Conditions.ags.com/en/Terms-and-Condition

F401 Version4

SGS Kores Co Ltd

322 The D valley, 75 LS-ro. Dongan-go. Anyong-di. Gyeongyiedo, Korea 14117. [ 482 roje i 4508 001 1 4502 (013) 4506 059 http://www.sgsgroup.kr

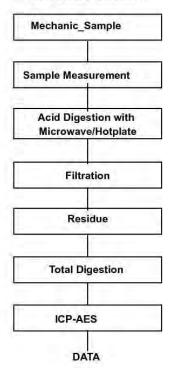


Issued Date: 2019.01.09

Page 6 of 8

### Flow Chart for Inorganic Elements Testing

## Inorganic Elements



Major Inorganic **Heavy Metals** 

Antimony(Sb), Beryllium(Be), Phosphorus(P), Arsenic(As) etc.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/in/Terms-and-Conditions.ags.com/in/Terms-and-Condition

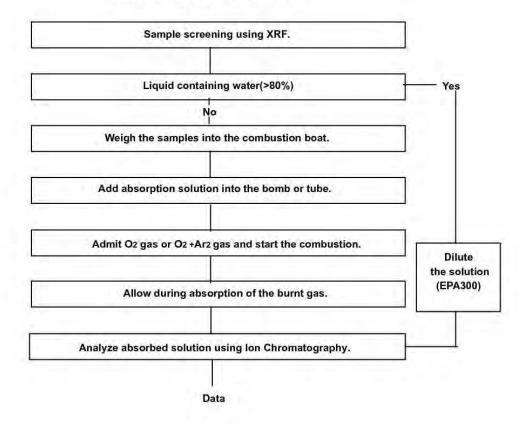
\$22 The 0 valley, 75 LS-p. Dengan-go. Anyang-4: Gyeongyido, Korea 14117 \$6\$ Korea Co. Lid. 1482 (0)91 4508 (0)7 F402 (0)31 4508 (0) 59 http://www.sasgroup.kr



Issued Date: 2019.01.09

Page 7 of 8

### Flow Chart for Halogen Test



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/en/Terms-and-Conditions.ags.com/en/Terms-and-Condition

F401 Version4

SGS Mores Co Ltd

322 The Civalley, 75 LS-to Dongan-ge Anyong-et Gyeongyiedo, Korea 14117. I +82 (o.g.) yeog con 5 +82 (o.g.) 4608 059 http://www.sgsgroup.kr

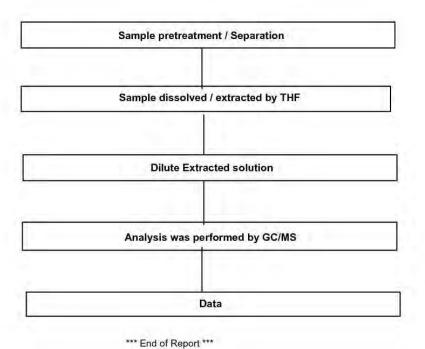
The Mark of the Control of the Contr



Issued Date: 2019.01.09

Page 8 of 8

#### Flow Chart for Phthalate Test



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accossible at <a href="http://www.sgs.com/terms-e-document.htm">http://www.sgs.com/terms-e-document.htm</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms-e-document.htm">www.sgs.com/terms-e-document.htm</a> <a href="http://www.sgs.com/terms-e-document.htm">http://www.sgs.com/terms-e-document.htm</a> <a href="http://www.sgs.com/terms-e-document.htm">http://www.sgs.com/terms-e-document.htm</a> <a href="http://www.sgs.com/terms-e-document.htm</a> <a href=

F401 Version4

SGS Kores Co Lid

322 The Civalley, 75 I.S-ro, Dongan-go, Anyong-4; Gyeongyiedo, Korea 14117 1482 (5)81 4598 (5)0 1540 (5)34 4508 (5)5 http://www.sgsgroup.kr



Issued Date: 2019.01.09

Page 1 of 8

CHEMPROS CO., LTD.

4Na 303, 1294-2 Jeongwang-dong Siheung-si, Gyeonggi-do Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No.

: AYAA19-01488

Product Name

: CP OS-100C

Item No./Part No.

: N/A

Buyer(s) Received Date : SAMSUNG

Modelited Bu

: 2019. 01. 04

**Test Period** 

; 2019. 01. 04 to 2019. 01. 09

Conclusion

; The halogens on the test reports were performed with the water-diluted solution of the submitted

sample, and the dilution ratio to water was one to one hundred.

**Test Results** 

: For further details, please refer to following page(s)

SGS Korea Co., Ltd.

Jeff Jang / Chemical Lab Mgr

This document is used by the Company subject to its General Conditions of Service printed overleas, available on request or accessible at <a href="http://www.sos.com/en/Terms-and-Conditions.aspx">http://www.sos.com/en/Terms-and-Conditions.aspx</a> and Conditions for Electronic Documents at <a href="http://www.sos.com/en/Terms-and-Conditions.aspx">www.sos.com/en/Terms-and-Conditions.aspx</a> to the policy of this document is advised that information contained hereon reflects the company in the finance of the company is not responsibility in the Client and this document does not vooterate parties a ransaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written provided attention, forgery or faithfactation of the Company's sole responsibility is to its Client and this document does not provided attention, forgery or faithfactation of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the Land to the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the Land to the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the Land to the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the Land to the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the Land to the Land to

SGS Kores Co Lid

322 The Civalley, 76 LS-ro, Dongan-go, Anyong-si, Gyeongyiedo, Korea 14117. 1482 (5)81 4508 000 F492 (5)31 4508 059 http://www.sgsgroup.kr

Membras of the SCS Commission Commence of Surveillance



: AYAA19-01488.001

Sample Description : CP OS-100C

Item No./Part No. : N/A
Materials : N/A

	BOOK STORY		TOTAL PROPERTY.	100
н	eavv	M	eta	IS

Sample No.

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Cadmium by ICP-OES)	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Lead by ICP-OES)	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013 (Determination of Mercury by ICP-OES)	2	N.D.
Hexavalent Chromium (Cr VI)*	mg/kg	With reference to IEC 62321-7-2:2017, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis and Microwave system/or with reference to IEC 62321-5:2013, determination of Chromium by ICP-OES.	8	N.D.
Antimony (Sb)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.

Issued Date: 2019.01.09

Page 2 of 8

#### Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6;2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/en/Terms-and-Conditions.aspy-and">http://www.sas.com/en/Terms-and-Conditions.aspy-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sas.com/terms-e-document.htm">www.sas.com/terms-e-document.htm</a>—Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unautorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be presecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SGS Norea Co. Lid

322 The Owalley, 76 LS-m Dongan-ge Anyang-si Gyeongy-do, Korea 1-kt (7 ) 1+82 (0/31 4509 (0/1 1+92) (0/31 4509 (0/1 1+92)



Sample No.

# Test Report No. F690101/LF-CTSAYAA19-01488

: AYAA19-01488.001

Sample Description : CP OS-100C

Item No./Part No. : N/A
Materials : N/A

Flame	Retardan	ts-PRRs	PRDES
I Idille	netaluali	to reco	DULO

Test Items	Unit	Test Method	MDL	Results
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
exabromodiphenyl ether mg/kg		With reference to IEC 62321-6;2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Heptabromodiphenyl ether mg/kg		With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Nonabromodiphenyl ether mg/kg		With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS)	5	N.D.

### <u>Phthalates</u>

Test Items	Unit	Test Method	MDL	Results
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8; 2017, GC/MS	50	N.D.

#### Halogen Contents

Test Items	Unit	Test Method	MDL	Results
Chloride (CI-)	mg/L	US EPA300.0, IC	30	N.D.
Fluoride (F-)	mg/L	US EPA300.0, IC	30	N.D.
lodide (I-)	mg/L	US EPA300.0, IC	50	N.D.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sas.com/en/Terms-and-Conditions.aspx-and">http://www.sas.com/en/Terms-and-Conditions.aspx-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sas.com/terms-e-document.htm">www.sas.com/terms-e-document.htm</a>—Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's Instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, Any unautorized attention, forgery or falsification of the content or appearance of this document is unlawful and offenders may be presecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

SGS Mores Co. Ltd

322 The Clualley, 76 LS-in Danganign Anyangi-si Gyeongyi-do, Korea 14117 1 +82 (6)31 9509 001 7 +429 (6)31 4608 059 http://www.sgsgroup.kr

Issued Date: 2019.01.09

Page 3 of 8



Issued Date: 2019. 01. 09 Page 4 of 8

NOTE:

- (1) N.D. = Not detected.(<MDL)
- (2) mg/kg = ppm
- (3) MDL = Method Detection Limit
- (4) = No regulation
- (5) Negative = Undetectable / Positive = Detectable
- (6) \*\* = Qualitative analysis (No Unit)
- (7) \* = a. The result of Hexavalent Chromium (Cr(VI)) is "ND" as the result of Chromium (Cr) is "ND", and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.
  - b. If the Chromium (Cr) content is greater than the MDL of Hexavalent Chromium (Cr(VI)), confirmation test of Hexavalent Chromium (Cr(VI)) is required.



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sqs.com/len/Terms-and-Conditions.aspx-and">http://www.sqs.com/len/Terms-and-Conditions.aspx-and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sqs.com/len/Terms-and-Conditions-e-document.htm">www.sqs.com/len/Terms-and-Conditions-e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereor reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all thier rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized atteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version4

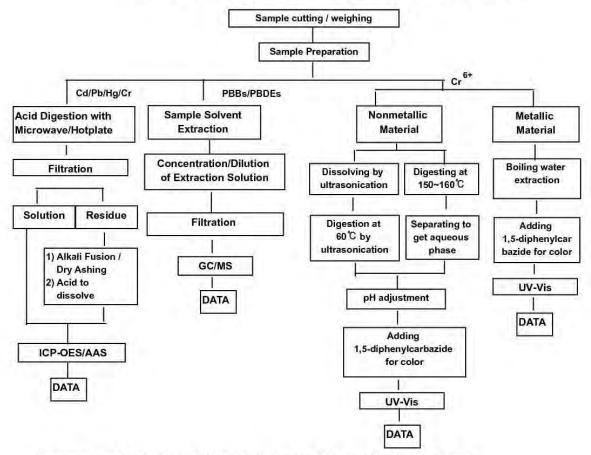
SGS Korea Co Lld



Issued Date: 2019.01.09

Page 5 of 8

### Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr6+ /PBBs&PBDEs Testing



The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg Section Chief: Minkyu Park

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/en/Terms-and-Conditions.ags.com/en/Terms-and-Condition

F401 Version4

SGS Kores Co Ltd

322 The D valley, 75 LS-ro. Dongan-go. Anyong-di. Gyeongyiedo, Korea 14117. [ 482 roje i 4508 001 1 4502 (013) 4506 059 http://www.sgsgroup.kr

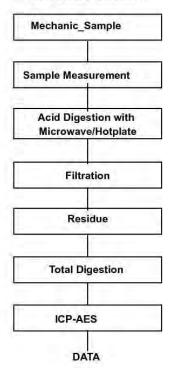


Issued Date: 2019.01.09

Page 6 of 8

### Flow Chart for Inorganic Elements Testing

## Inorganic Elements



Major Inorganic **Heavy Metals** 

Antimony(Sb), Beryllium(Be), Phosphorus(P), Arsenic(As) etc.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/in/Terms-and-Conditions.ags.com/in/Terms-and-Condition

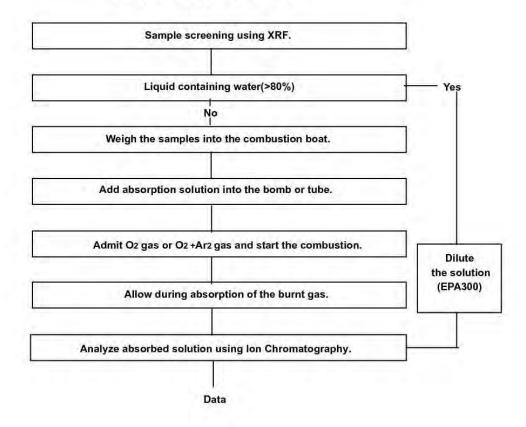
\$22 The 0 valley, 75 LS-p. Dengan-go. Anyang-4: Gyeongyido, Korea 14117 \$6\$ Korea Co. Lid. 1482 (0)91 4508 (0)7 F402 (0)31 4508 (0) 59 http://www.sasgroup.kr



Issued Date: 2019.01.09

Page 7 of 8

### Flow Chart for Halogen Test



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/en/Terms-and-Conditions.ags.com/en/Terms-and-Condition

F401 Version4

SISS Mores Co. Ltd.

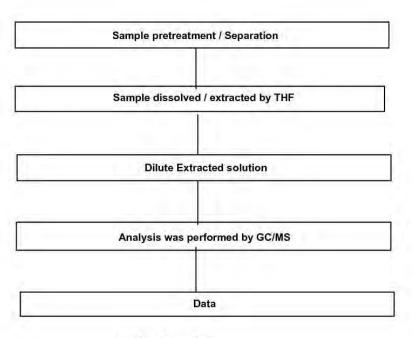
322 The O'vailey, 75 LS-m Dangan-on Anyang-si Gyeongyido, Korea n4r17 [1+82 (0731 4509 001 1+92 (0731 4509 059 http://www.sgsgroup.kr



Issued Date: 2019.01.09

Page 8 of 8

#### Flow Chart for Phthalate Test



\*\*\* End of Report \*\*\*

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.ags.com/en/Terms-and-Conditions.ags.com/en/Terms-and-Condition

F401 Version4

SIGS Korea Co Ltd

322 The Civalley, 75 US-m, Dongan-ga, Anyong-si, Gyeongyiedo, Koras 14+17 [+82 rojs] 4608 Con, F+92 (Ota) 4608 058 <u>http://www.sqsqroup.kr</u>