

## TEST REPORT

APPLICANT : LG Innotek Co., Ltd.  
ADDRESS : 50-9, Suchul-daero 7-gil,  
Gumi-si, Gyeongsangbuk-do, Korea

PAGE: 1 of 10

REPORT NO. RT22R-S2267-E

DATE: May 02, 2022

SAMPLE DESCRIPTION : The following submitted sample(s) said to be:-

NAME/TYPE OF PRODUCT : Cu plating  
SAMPLE ID NO. : RT22R-S2267  
MANUFACTURER/VENDOR : LG Innotek Co., Ltd.

SAMPLE RECEIVED : Apr. 25, 2022  
TESTING DATE : Apr. 26, 2022 ~ May 02, 2022

TEST METHOD(S) : Please see the following page(s).  
TEST RESULT(S) : Please see the following page(s).

\* Note 1 : The test results presented in this report refer only to the object tested.

\* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.

Approved by,



Jade Jang / Lab. Technical Manager

Authorized by,



Bo Park / Lab. General Manager



Authenticity check

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## TEST REPORT

REPORT NO. RT22R-S2267-E

SAMPLE ID NO. : RT22R-S2267

SAMPLE DESCRIPTION : Cu plating

TEST ITEM	UNIT	TEST METHOD	MDL	RESULT
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 Edition 1.0 : 2013, by acid digestion and determined by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg		5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 : 2013/AMD1 : 2017, by acid digestion and determined by ICP-OES	2	N.D.
Hexavalent Chromium (Cr <sup>6+</sup> ) (For metal)	μg/cm <sup>2</sup>	With reference to IEC 62321-7-1 Edition 1.0 : 2015, by boiling water extraction and determined by UV-VIS Spectrophotometer	0.10	Negative

Tested by : Jooyeon Lee, Chano Kim

Notes : mg/kg = ppm = parts per million  
 μg/cm<sup>2</sup> = microgram per square centimeter  
 < = Less than  
 N.D. = Not detected ( <MDL )  
 MDL = Method detection limit

Remarks : Interpretation of Cr<sup>6+</sup> results

Qualitative result	Concentration of Cr <sup>6+</sup> (μg/cm <sup>2</sup> )	Meaning
Negative	< 0.10	The sample coating is considered a non-Cr <sup>6+</sup> based coating.
Inconclusive	0.10 ≤ and ≤ 0.13	Unavoidable coating variation may influence the determination.
Positive	> 0.13	The sample coating is considered to contain Cr <sup>6+</sup> .

- The qualitative results should be determination by the average result of three test results. (If concentration of Cr<sup>6+</sup> is over 0.10μg/cm<sup>2</sup>)
- The above results will be carried out by visual comparison only with the standard.

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SAMPLE ID NO. : RT22R-S2267

SAMPLE DESCRIPTION : Cu plating

TEST ITEM	UNIT	TEST METHOD	MDL	RESULT
<b>Polybrominated Biphenyl (PBBs)</b>				
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6 Edition 1.0 : 2015, by solvent extraction and determined by GC/MS	5	N.D.
Dibromobiphenyl	mg/kg		5	N.D.
Tribromobiphenyl	mg/kg		5	N.D.
Tetrabromobiphenyl	mg/kg		5	N.D.
Pentabromobiphenyl	mg/kg		5	N.D.
Hexabromobiphenyl	mg/kg		5	N.D.
Heptabromobiphenyl	mg/kg		5	N.D.
Octabromobiphenyl	mg/kg		5	N.D.
Nonabromobiphenyl	mg/kg		5	N.D.
Decabromobiphenyl	mg/kg		5	N.D.
<b>Polybrominated Diphenyl Ether (PBDEs)</b>				
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6 Edition 1.0 : 2015, by solvent extraction and determined by GC/MS	5	N.D.
Dibromodiphenyl ether	mg/kg		5	N.D.
Tribromodiphenyl ether	mg/kg		5	N.D.
Tetrabromodiphenyl ether	mg/kg		5	N.D.
Pentabromodiphenyl ether	mg/kg		5	N.D.
Hexabromodiphenyl ether	mg/kg		5	N.D.
Heptabromodiphenyl ether	mg/kg		5	N.D.
Octabromodiphenyl ether	mg/kg		5	N.D.
Nonabromodiphenyl ether	mg/kg		5	N.D.
Decabromodiphenyl ether	mg/kg		5	N.D.

Tested by : Hayan Park

Notes : mg/kg = ppm = parts per million  
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TEST ITEM	UNIT	TEST METHOD	MDL	RESULT
Bromine (Br)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
Chlorine (Cl)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
Beryllium (Be)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.
Antimony (Sb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.
Perfluorooctanoic acid (PFOA)	mg/kg	With reference to DIN CEN/TS 15968, by ultrasonic extraction and determined by LC/MS or LC/MS/MS	0.025	N.D.
Perfluorooctane sulfonate (PFOS)	mg/kg	With reference to DIN CEN/TS 15968, by ultrasonic extraction and determined by LC/MS or LC/MS/MS	0.1	N.D.

Tested by : Chano Kim, Jooyeon Lee, Hayan Park

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## TEST REPORT

PAGE: 5 of 10  
DATE: May 02, 2022

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SAMPLE ID NO. : RT22R-S2267

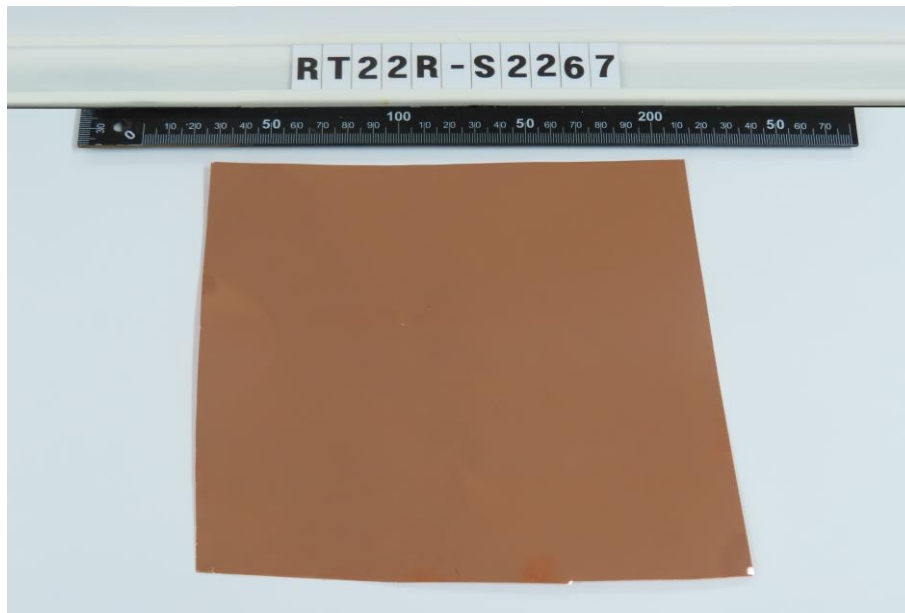
SAMPLE DESCRIPTION : Cu plating

TEST ITEM	CAS NO.	UNIT	TEST METHOD	MDL	RESULT
Dibutyl phthalate (DBP)	84-74-2	mg/kg	With reference to IEC 62321-8 Edition 1.0 : 2017, by solvent extraction and determined by GC/MS	50	N.D.
Di(2-ethylhexyl) phthalate (DEHP)	117-81-7	mg/kg		50	N.D.
Benzyl butyl phthalate (BBP)	85-68-7	mg/kg		50	N.D.
Diisobutyl phthalate (DIBP)	84-69-5	mg/kg		50	N.D.

Tested by : Hayan Park

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\* View of sample as received;-



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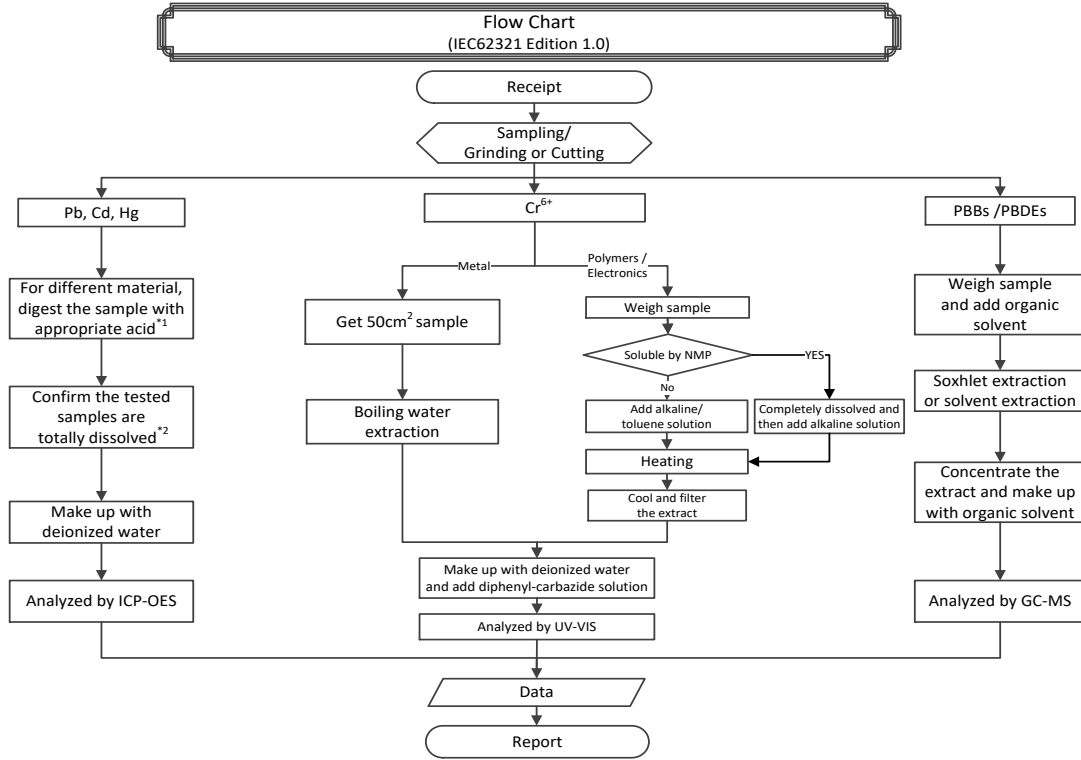


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**TEST REPORT**

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SAMPLE DESCRIPTION : Cu plating



Remarks :

\*1 : List of appropriate acid :

Material	Acid added for digestion
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

\*2 : The samples were dissolved totally by pre-conditioning method according to above flow chart.



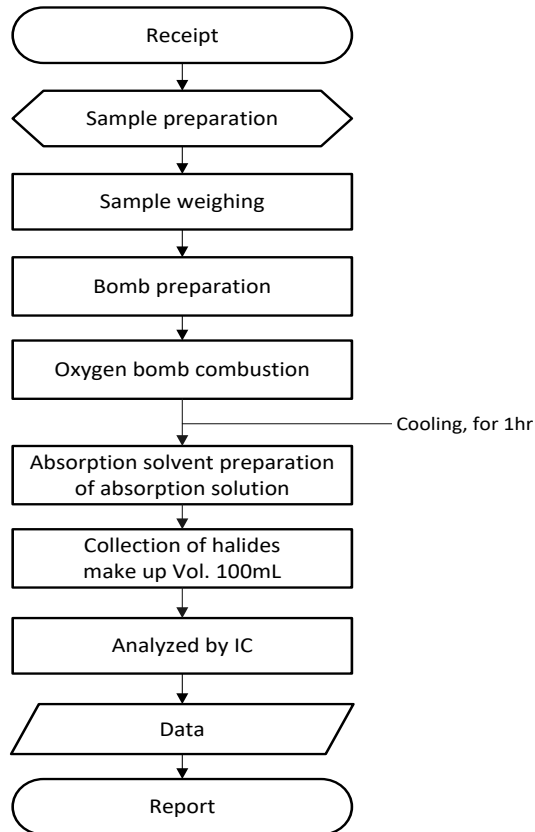
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### Flow Chart (EN14582)



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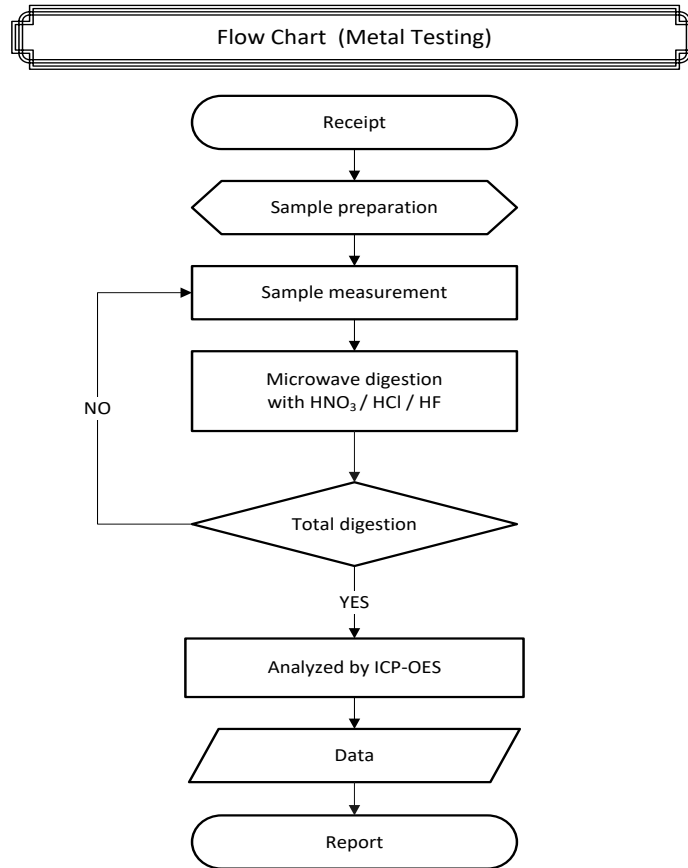
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\*\* Remarks : The samples were dissolved totally by pre-conditioning method according to above flow chart.





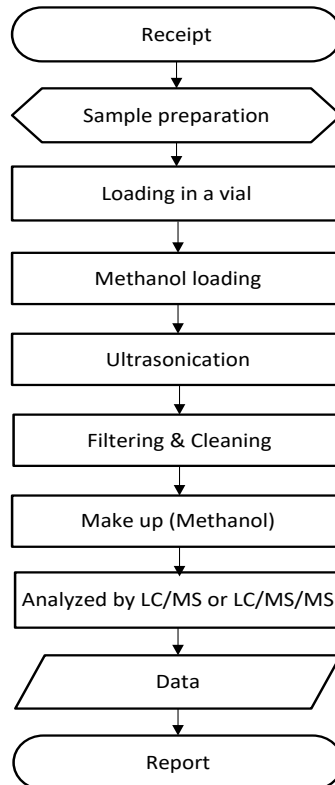
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### Flow Chart (PFOS, PFOA)



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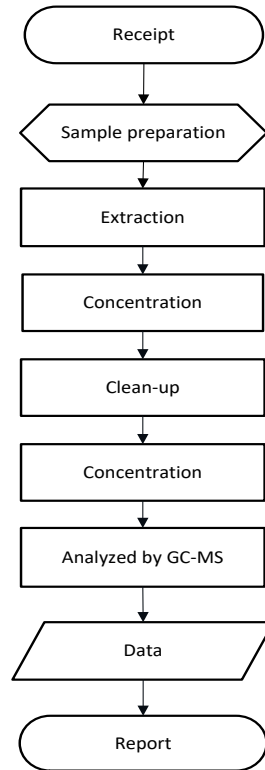
PAGE: 10 of 10  
DATE: May 02, 2022

REPORT NO. RT22R-S2267-E

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### Flow Chart (Phthalates)



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

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