

APPLICANT: PILKOR Electronics Division. (of COWELL Fashion Co., Ltd.)

ADDRESS: 270, Sinwon-ro(Woncheon-dong), Yeongtong-gu,

Suwon-si, Gyeonggi-do, Korea

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REPORT NO. RT20R-S0622-001-E DATE: Feb. 21, 2020

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

NAME/TYPE OF PRODUCT : Resistor

SAMPLE ID NO. : RT20R-S0622-001 ITEM NO. : PMSR/PPRR/PSFR

MANUFACTURER/VENDOR : PILKOR Electronics Division. (of COWELL Fashion Co., Ltd.)

NAME OF BUYER : Sony, Samsung, LG

SAMPLE RECEIVED : Feb. 10, 2020

TESTING DATE : Feb. 10, 2020 ~ Feb. 21, 2020

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.

\* Note 3: The item no. is assigned by client and indicated according to their requirement and guarantee letter.

Approved by,

Authorized by,

ET:W

Jade Jang / Lab. Technical Manager

Bo Park / Lab. General Manager

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REPORT NO. RT20R-S0622-001-E DATE: Feb. 21, 2020

SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION : Resistor

TEST ITEM	UNIT	TEST METHOD	MDL	RESULT	
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 Edition 1.0 : 2013,	0.5	N.D.	
Lead (Pb)	mg/kg	by acid digestion and determined by ICP-OES	5	N.D.	
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 Edition 1.0 : 2013, by acid digestion and determined by ICP-OES	2	N.D.	
Hexavalent Chromium (Cr <sup>6+</sup> )	mg/kg	With reference to IEC 62321-7-2 Edition 1.0: 2017, by alkaline/toluene digestion and determined by UV-VIS Spectrophotometer	8	N.D.	
Polybrominated Biphenyl (PBBs)	1				
Monobromobiphenyl	mg/kg		5	N.D.	
Dibromobiphenyl	mg/kg		5	N.D.	
Tribromobiphenyl	mg/kg		5	N.D.	
Tetrabromobiphenyl	mg/kg	With reference to	5	N.D.	
Pentabromobiphenyl	mg/kg	IEC 62321-6 Edition 1.0 : 2015,	5	N.D.	
Hexabromobiphenyl	mg/kg	by solvent extraction and	5	N.D.	
Heptabromobiphenyl	mg/kg	determined by GC/MS	5	N.D.	
Octabromobiphenyl	mg/kg		5	N.D.	
Nonabromobiphenyl	mg/kg		5	N.D.	
Decabromobiphenyl	mg/kg		5	N.D.	
Polybrominated Diphenyl Ether (PBDEs)					
Monobromodiphenyl ether	mg/kg		5	N.D.	
Dibromodiphenyl ether	mg/kg		5	N.D.	
Tribromodiphenyl ether	mg/kg	]	5	N.D.	
Tetrabromodiphenyl ether	mg/kg	With reference to	5	N.D.	
Pentabromodiphenyl ether	mg/kg	IEC 62321-6 Edition 1.0 : 2015,	5	N.D.	
Hexabromodiphenyl ether	mg/kg	by solvent extraction and	5	N.D.	
Heptabromodiphenyl ether	mg/kg	determined by GC/MS	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 : Jooyeon Lee, Seulgi Park, Miseon Lee

Notes: mg/kg = ppm = parts per million

< = Less than

N.D. = Not detected ( <MDL ) MDL = Method detection limit

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REPORT NO. RT20R-S0622-001-E DATE: Feb. 21, 2020

SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION: Resistor

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.
Antimony (Sb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.

Tested by: Hyojoo Kim, Jooyeon Lee

Notes: mg/kg = ppm = parts per million

< = Less than

N.D. = Not detected ( <MDL )
MDL = Method detection limit

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REPORT NO. RT20R-S0622-001-E DATE: Feb. 21, 2020

SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION: Resistor

TEST ITEM	CAS NO.	UNIT	TEST METHOD	MDL	RESULT
Phthalates					
Dibutyl phthalate (DBP)	84-74-2	mg/kg		50	N.D.
Di(2-ethylhexyl) phthalate (DEHP)	117-81-7	mg/kg		50	N.D.
Di-n-octyl phthalate (DNOP)	117-84-0	mg/kg		50	N.D.
Diisononyl phthalate (DINP)	28553-12-0 68515-48-0	mg/kg	With reference to IEC 62321-8 Edition 1.0 : 2017,	100	N.D.
Diisodecyl phthalate (DIDP)	26761-40-0 68515-49-1	mg/kg	by solvent extraction and determined by GC/MS	100	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.
Di-n-hexyl phthalate (DNHP)	84-75-3	mg/kg		50	N.D.

Tested by : Miseon Lee

Notes: mg/kg = ppm = parts per million

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DATE: Feb. 21, 2020

REPORT NO. RT20R-S0622-001-E

SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION : Resistor

\* View of sample as received;-



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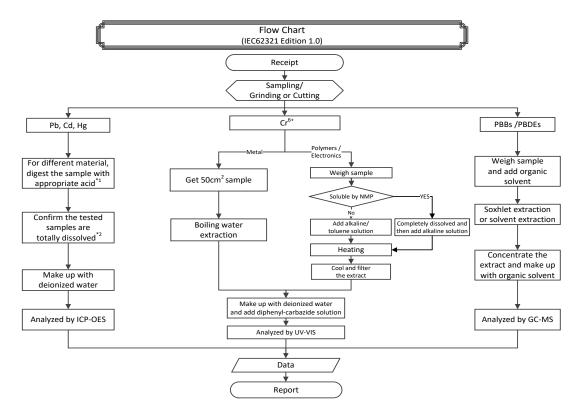
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DATE: Feb. 21, 2020

SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION: Resistor



Remarks:
\*1: List of appropriate acid:

- :	1. Elst of appropriate acid.					
	Material	Acid added for digestion				
	Polymers	HNO₃, HCl, HF, H <sub>2</sub> O <sub>2</sub> , H3BO₃				
	Metals	HNO₃, HCl, HF				
	Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>				

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

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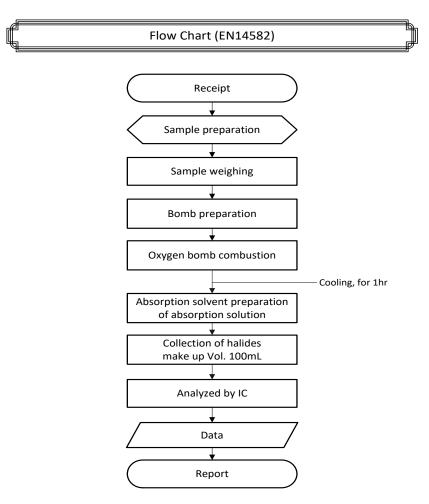


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REPORT NO. RT20R-S0622-001-E DATE: Feb. 21, 2020

SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION: Resistor



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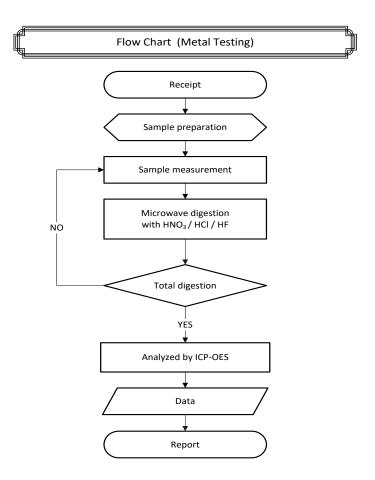
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REPORT NO. RT20R-S0622-001-E

DATE: Feb. 21, 2020

SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION : Resistor



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

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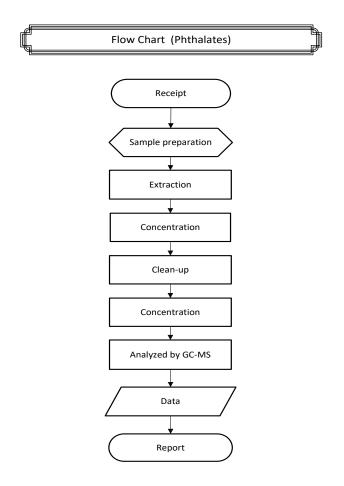


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REPORT NO. RT20R-S0622-001-E

DATE: Feb. 21, 2020 SAMPLE ID NO. : RT20R-S0622-001

SAMPLE DESCRIPTION: Resistor



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

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