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TEST REPORT

APPLICANT : PILKOR Electronics Division. (of COWELL Fashion Co., Ltd.)
ADDRESS : 270, Sinwon-ro(Woncheon-dong), Yeongtong-gu,
Suwon-si, Gyeonggi-do, Korea

REPORT NO. RT20R-S0622-002-E DATE: Mar. 06, 2020

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

NAME/TYPE OF PRODUCT : Resistor
SAMPLE ID NO. : RT20R-S0622-002
ITEM NO. : PPBR/PPSR(OVER 50$^{K\Omega}$)
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 ~ Mar. 06, 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,

Jade Jang / Lab. Technical Manager

Authorized by,

Bo Park / Lab. General Manager

Authenticity check

Intertek Testing Services Korea Ltd.
Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr
Seoul Lab. Address : 7, Achasan-ro 5-gil, Seongdong-gu, Seoul, 04793 Korea
Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea

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TEST REPORT

REPORT NO. RT20R-S0622-002-E
DATE: Mar. 06, 2020

SAMPLE ID NO. : RT20R-S0622-002
SAMPLE DESCRIPTION : Resistor

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	408
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^{6+})	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)				
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.
Polybrominated Diphenyl Ether (PBDEs)				
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 : 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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TEST REPORT

REPORT NO. RT20R-S0622-002-E
DATE: Mar. 06, 2020

SAMPLE ID NO. : RT20R-S0622-002
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

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TEST REPORT

REPORT NO. RT20R-S0622-002-E
DATE: Mar. 06, 2020

SAMPLE ID NO. : RT20R-S0622-002
SAMPLE DESCRIPTION : Resistor

TEST ITEM	CAS NO.	UNIT	TEST METHOD	MDL	RESULT
Phthalates					
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.
Di-n-octyl phthalate (DNOP)	117-84-0	mg/kg		50	N.D.
Diisononyl phthalate (DINP)	28553-12-0 68515-48-0	mg/kg		100	N.D.
Diisodecyl phthalate (DIDP)	26761-40-0 68515-49-1	mg/kg		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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TEST REPORT

REPORT NO. RT20R-S0622-002-E
DATE: Mar. 06, 2020

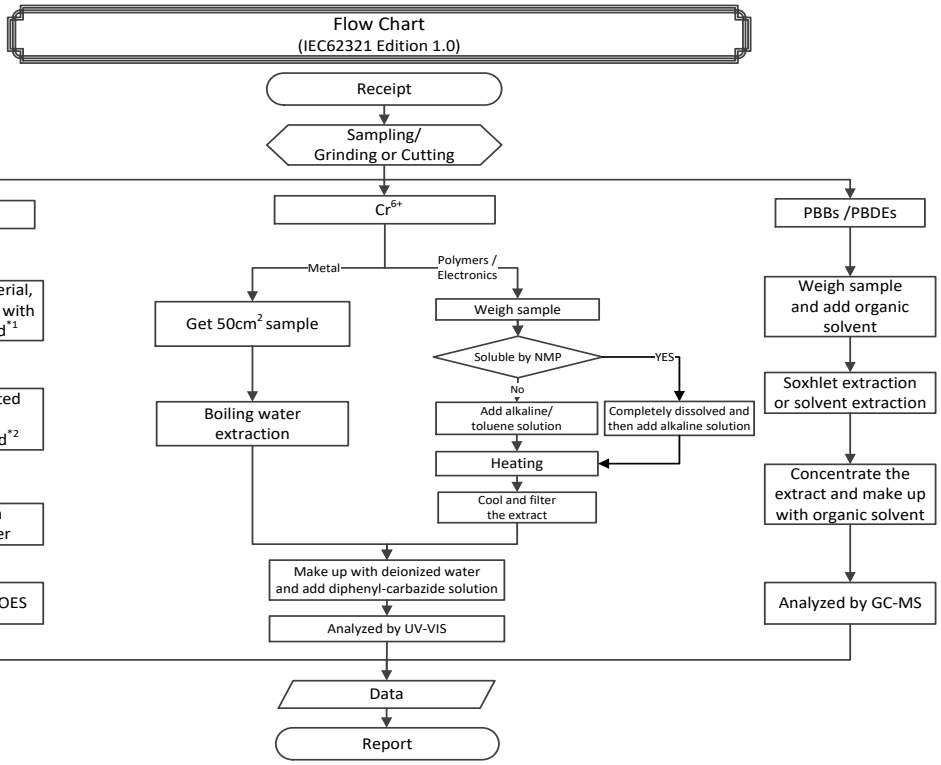
SAMPLE ID NO. : RT20R-S0622-002
SAMPLE DESCRIPTION : Resistor

* View of sample as received;-

TEST REPORT

REPORT NO. RT20R-S0622-002-E DATE: Mar. 06, 2020

SAMPLE ID NO. : RT20R-S0622-002
SAMPLE DESCRIPTION : Resistor



Remarks :
*1 : List of appropriate acid :

Material	Acid added for digestion
Polymers	HNO_3, HCl, HF, H_2O_2, $H3BO_3$
Metals	HNO_3, HCl, HF
Electronics	HNO_3, HCl, H_2O_2, HBF_4

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

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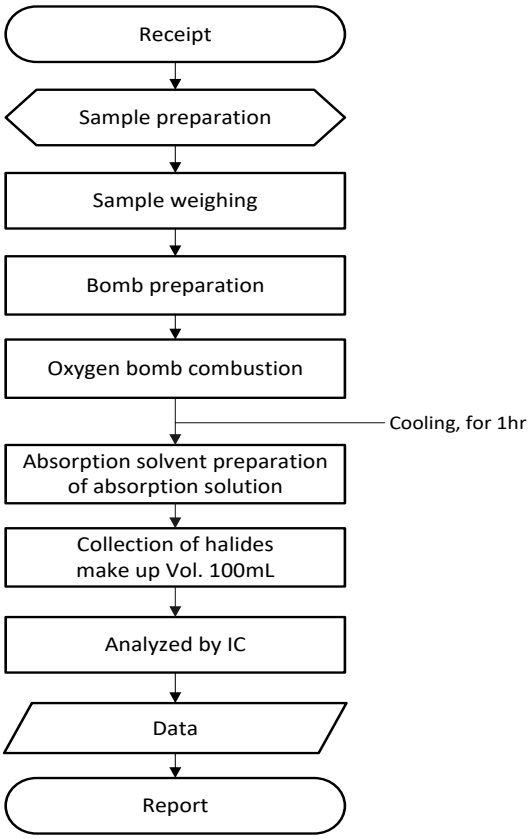
TEST REPORT

REPORT NO. RT20R-S0622-002-E
DATE: Mar. 06, 2020

SAMPLE ID NO. : RT20R-S0622-002
SAMPLE DESCRIPTION : Resistor

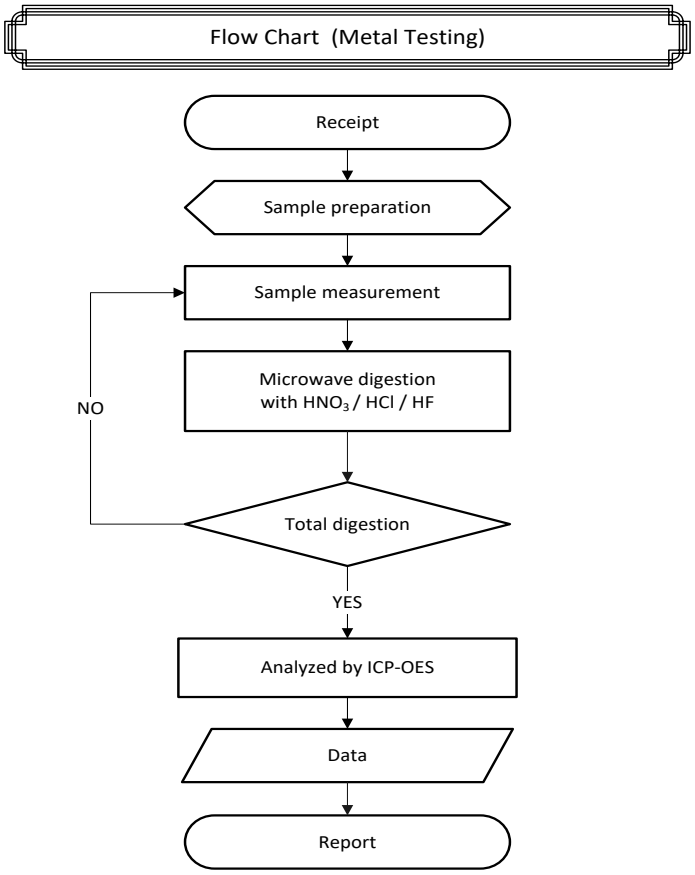
Flow Chart (EN14582)



TEST REPORT

REPORT NO. RT20R-S0622-002-E
DATE: Mar. 06, 2020

SAMPLE ID NO. : RT20R-S0622-002
SAMPLE DESCRIPTION : Resistor



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

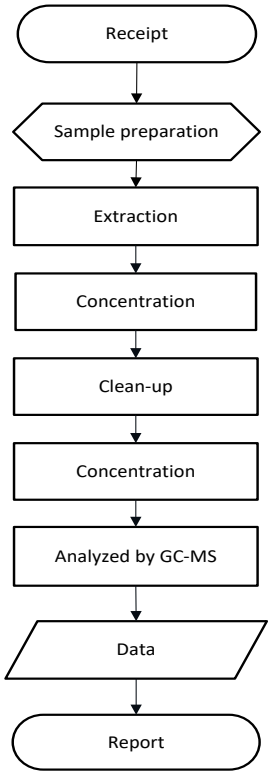
TEST REPORT

REPORT NO. RT20R-S0622-002-E

DATE: Mar. 06, 2020

SAMPLE ID NO. : RT20R-S0622-002
SAMPLE DESCRIPTION : Resistor

Flow Chart (Phthalates)



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

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