

Applicant Address		Techno Valley, Dunpo-myeon,	
	Asan-City, Ci	nungcheongnam-do, Korea	Page: 1 of 17
Report No.	RT12R-S1076-0	01-E1-R	Date: Mar. 23, 2012
Sample Des	scription	: The following submitted sample(	s) said to be:-
Name/Type	of Product	: Halogen Free CCL	
Sample ID I	No.	: RT12R-S1076-001	
Item No.		: MCH/MDH	
Manufactur	er/Vender	: INNOX Corporation	
Sample rece Testing Date		: Mar. 13, 2012 : Mar. 13, 2012 ~ Mar. 22, 2012	
Testing Env	ironment	: Temperature : ( 24 $\pm$ 2 ) $^{\circ}$ C,	Humidity : ( 60 $\pm$ 5 ) % R.H.
Test Type Test Methoe	d(s)	: RoHS wet chemical analysis : Please see the following page(s).	

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

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

: Please see the following page(s).

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

Approved by,

Test Result(s)

2625

Jade Jang / Lab. Technical Manager

Authorized by,

ne

Bo Park / Lab. General Manager

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#### Intertek Testing Services Korea Ltd.



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Report No. RT12R-S1076-001-E1-R

Sample ID No.	: RT12R-S1076-001
Sample Description	: Halogen Free CCL

Test Item	Unit	Test Method	MDL	Result
Cadmium (Cd)	mg/kg	With reference to IEC 62321 Edition 1.0 : 2008, by acid digestion and determined by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg		5	N.D.
Mercury (Hg)	mg/kg		2	N.D.
Hexavalent Chromium (Cr <sup>6+</sup> ) (For metal)	-	With reference to IEC 62321 Edition 1.0 : 2008, by Spot test	(Threshold of 1 mg/kg)	Negative
Hexavalent Chromium (Cr <sup>6+</sup> ) (For metal)	-	With reference to IEC 62321 Edition 1.0 : 2008, by boiling water extraction and determined by UV-VIS Spectrophotometer	(Threshold of 0.02 mg/kg with 50 cm <sup>2</sup> )	Negative

Tested by : Nikkie Lee, Leo Kim

Notes : mg/kg = ppm = parts per million

 ${\rm mg/kg}~$  with 50  ${\rm cm}^2$  = milligram per kilogram with 50 square centimeter  ${\rm <=}$  Less than

N.D. = Not detected ( < MDL )

MDL = Method detection limit

- Positive = A positive test result indicated the presence of Cr(VI) at the time of testing, equal to or greater than threshold of 1 mg/kg for spot test procedures or 0.02 mg/kg for boiling water extraction procedures with a sample surface area of 50 cm<sup>2</sup> used. However, it shall not be interpreted as the Cr(VI) concentration in the coating layer of the sample and should not be used as a method detection limit for this qualitative test.
- Negative = A negative test result indicates above positive observation was not found at the time of testing. When the spot test showed a negative result, the boiling water extraction procedure shall be used to verify the result.

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### Intertek Testing Services Korea Ltd.



Report No. RT12R-S1076-001-E1-R

Sample ID No. : RT12R-S1076-001 Sample Description : Halogen Free CCL

Test Item	Unit	Test Method	MDL	Result
Polybrominated Biphenyl (PBBs)				
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 Edition 1.0 : 2008,	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 (P	BDEs)	· · · · · · · · · · · · · · · · · · ·		
Monobromodiphenyl ether	mg/kg		5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321 Edition 1.0 : 2008, by solvent extraction and determined by GC/MS	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 : Ellen Jung, Jessica Kang

Notes : mg/kg = ppm = parts per million < = Less than N.D. = Not detected ( <MDL ) MDL = Method detection limit

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Report No. RT12R-S1076-001-E1-R

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Sample ID No. : RT12R-S1076-001 Sample Description : Halogen Free CCL

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	79
Beryllium (Be)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.
Antimony Trioxide (Sb <sub>2</sub> O <sub>3</sub> )	mg <b>/</b> kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.
Tin (Sn)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.
Polyvinyl chloride (PVC)	-	With reference to KS K 0210-1, and determined by FT-IR	N.A.	Negative
Asbestos	-	Determined by FT-IR	N.A.	Negative

Tested by : Nikkie Lee, Leo Kim

Notes : mg/kg = ppm = parts per million < = Less thanN.D. = Not detected ( <MDL ) MDL = Method detection limit N.A. = Not applicable Negative = Undetectable Positive = Detectable Sb<sub>2</sub>O<sub>3</sub> calculated from Sb by the equation. \* Sb<sub>2</sub>O<sub>3</sub> concentration = (Sb<sub>2</sub>O<sub>3</sub> molecular weight × Sb concentration) / (2 × Sb molecular weight) = 1.197 × Sb concentration

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### Intertek Testing Services Korea Ltd.



Report No. RT12R-S1076-001-E1-R

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Sample ID No.: RT12R-S1076-001Sample Description: Halogen Free CCL

Test Item	Unit	Test Method	MDL	Result
Phthalates				
Dibutyl phthalate (DBP)	mg/kg	With reference to US EPA 8061A, by solvent extraction and determined by GC/MS	50	N.D.
Di(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to US EPA 8061A, by solvent extraction and determined by GC/MS	50	N.D.
Di-n-octyl phthalate (DNOP)	mg/kg	With reference to US EPA 8061A, by solvent extraction and determined by GC/MS	50	N.D.
Diisononyl phthalate* (DINP)	mg/kg	With reference to US EPA 8061A, by solvent extraction and determined by GC/MS	100	N.D.
Diisodecyl phthalate** (DIDP)	mg/kg	With reference to US EPA 8061A, by solvent extraction and determined by GC/MS	100	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to US EPA 8061A, by solvent extraction and determined by GC/MS	50	N.D.
Diisobutyl phthalate (DIBP)	mg/kg	With reference to US EPA 8061A, by solvent extraction and determined by GC/MS	50	N.D.

Tested by : Ellen Jung

Notes : mg/kg = ppm = parts per million < = Less than N.D. = Not detected ( <MDL ) MDL = Method detection limit

\* DINP include two types of phthalate (CAS No. 68515-48-0 and 28553-12-0).

\*\* DIDP include two types of phthalate (CAS No. 68515-49-1 and 26761-40-0).

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### Intertek Testing Services Korea Ltd.



Report No. RT12R-S1076-001-E1-R

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Sample ID No. : RT12R-S1076-001 Sample Description : Halogen Free CCL

Test Item	Unit	Test Method	MDL	Result
Pentachlorophenol (PCP)	mg/kg	With reference to DIN 53313, by solvent extraction and determined by GC/MS	5	N.D.
Medium-chain chlorinated paraffin (MCCP)	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by GC/MS and/or GC/ECD	10	N.D.
Tetrabromobisphenol-A (TBBP-A)	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by GC/MS	5	N.D.
Hexabromocyclododecane (HBCDD)	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by GC/MS	10	N.D.
Perfluorooctanoic acid (PFOA)	mg/kg	With reference to US EPA 3550C & 8321B, by ultrasonic extraction and determined by LC/MS/MS	0.1	N.D.
Perfluorooctane sulfonate (PFOS)	mg/kg	With reference to US EPA 3550C & 8321B, by ultrasonic extraction and determined by LC/MS/MS	0.1	N.D.

Tested by : Ellen Jung

Notes : mg/kg = ppm = parts per million < = Less than N.D. = Not detected ( <MDL ) MDL = Method detection limit

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Report No. RT12R-S1076-001-E1-R

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Sample ID No.	: RT12R-S1076-001
Sample Description	: Halogen Free CCL

\* View of sample as received;-



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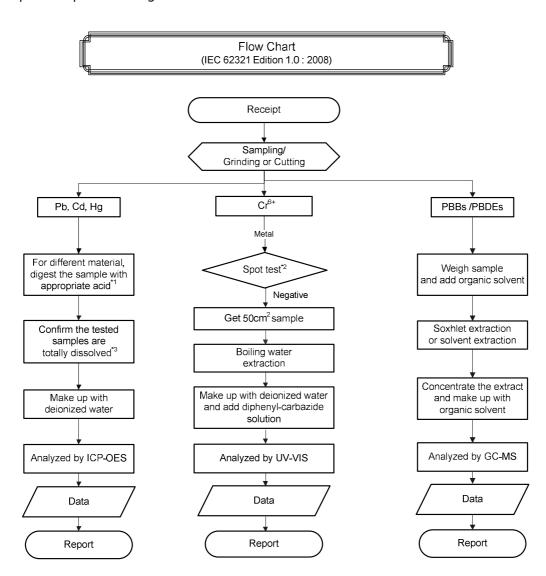


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Sample ID No. Sample Description : Halogen Free CCL

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Remarks :

\*1 : List of appropriate acid :

Acid added for digestion
$HNO_{3}$ , HCI, HF, $H_2O_2$ , $H_3BO_3$
HNO3, HCI, HF
HNO <sub>3</sub> , HCI, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>
-

\*2 : If the result of spot test is positive, Chromium (VI) would be determined as detected. No further analysis is required.

\*3 : The samples were dissolved totally by pre-conditioning method according to above flow chart.

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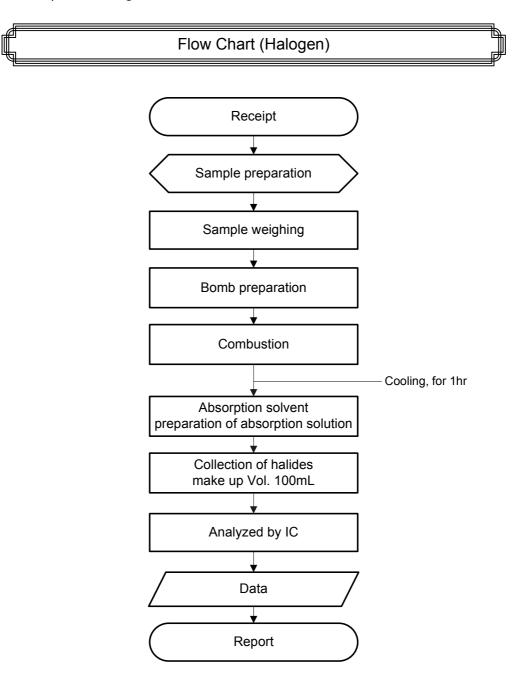
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Sample ID No. Sample Description : Halogen Free CCL

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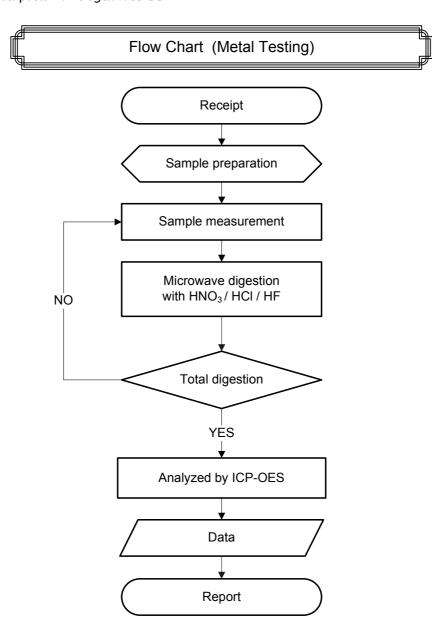


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\*\* Remarks : The samples were dissolved totally by pre-conditioning method according to above flow chart.

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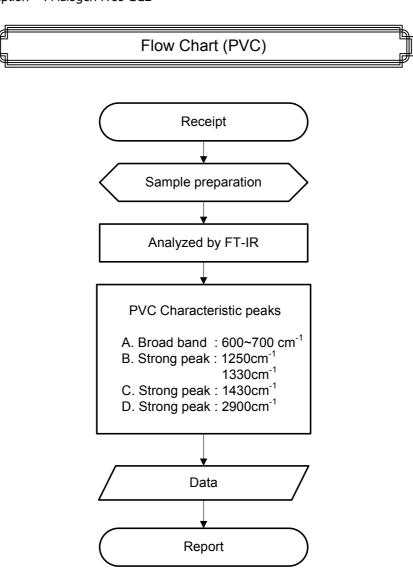
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Report No. RT12R-S1076-001-E1-R

Sample ID No.

: RT12R-S1076-001 Sample Description : Halogen Free CCL



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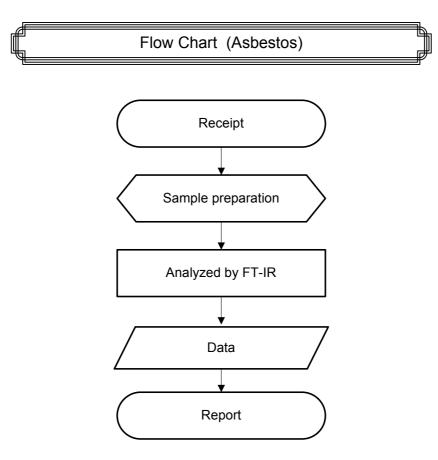
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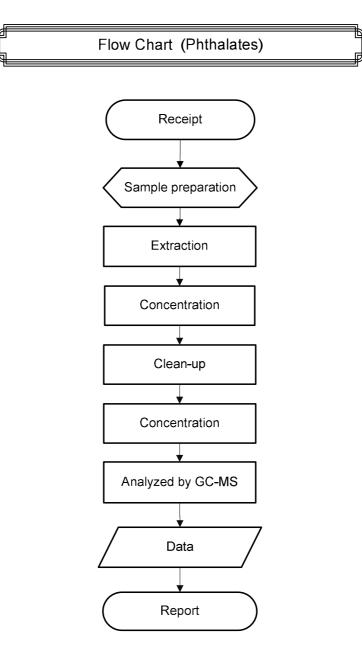


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Sample Description : Halogen Free CCL



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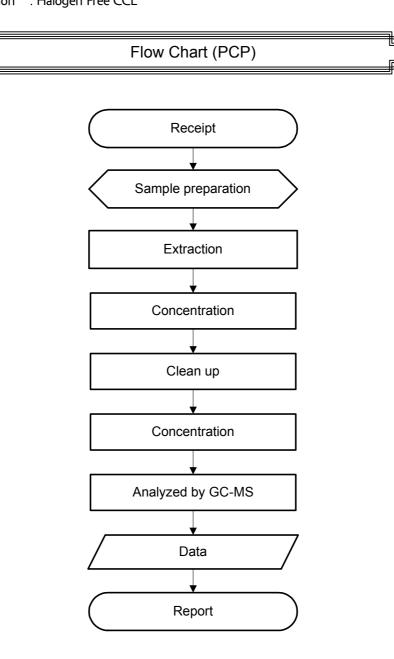
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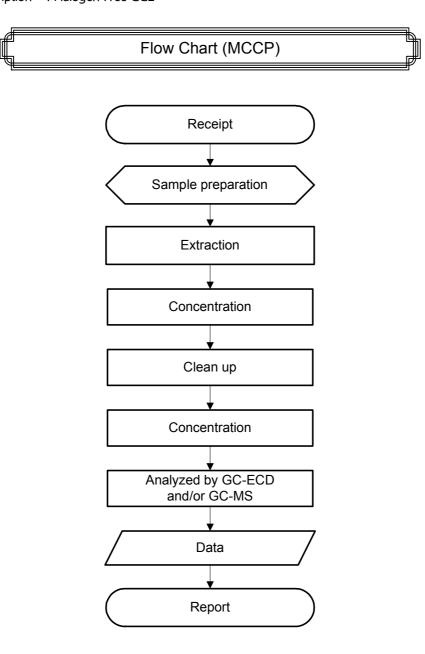
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Sample ID No.

: RT12R-S1076-001 Sample Description : Halogen Free CCL



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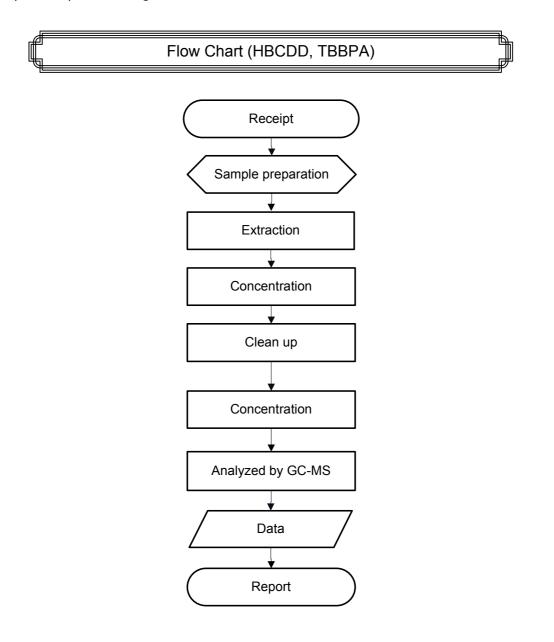
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: RT12R-S1076-001



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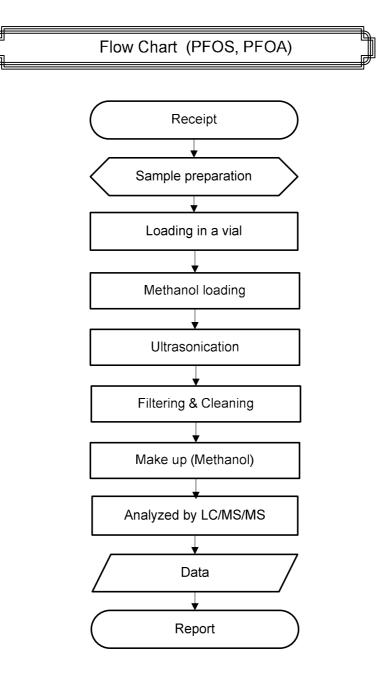
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Sample ID No. Sample Description : Halogen Free CCL

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

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