

Samtec Inc.  
520 Park East Blvd  
New Albany, IN 47150  
United States

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

**Laminated Coax Cable – Color Dull Metallic – Foil Outer Laminate – Foil Inner Shield – FEP inner dielectric – Copper Conductors with Tin Plating  
Country of Destination: USA  
Model/ Part No.: TTF-LC**

Sample Received Date: 01/19/2023

Testing Period: 01/24/2023 – 02/06/2023

Test Requested : Please refer to the result summary.

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

Result Summary :

Test(s) Requested	Conclusion
1. RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU	See Test Results
2. Halogen Content	See Test Results

Signed for and on behalf of SGS North America, Inc.

Prepared By:



Brian Murphy  
Laboratory supervisor, Chemistry laboratory

Suzie Banik  
Technical Report Writer, Chemistry Laboratory

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**1. RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU**

Test Item(s):	Unit	Test Method	Results	MDL
			1	
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Cd and Pb by ICP-OES and /or ICP-MS)	ND	2
Lead (Pb)	mg/kg		ND	2
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+A1:2017 (Determination of Hg by ICP-OES and/ or ICP-MS)	ND	2
Hexavalent Chromium (CrVI)	mg/kg	With reference to IEC 62321-7-2:2017 (Determination of CrVI by UV-Vis)	ND*	8
<b>Sum of PBBs</b>	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB and PBDE by GC-MS)	ND	-
Monobromobiphenyl	mg/kg		ND	5
Dibromobiphenyl	mg/kg		ND	5
Tribromobiphenyl	mg/kg		ND	5
Tetrabromobiphenyl	mg/kg		ND	5
Pentabromobiphenyl	mg/kg		ND	5
Hexabromobiphenyl	mg/kg		ND	5
Heptabromobiphenyl	mg/kg		ND	5
Octabromobiphenyl	mg/kg		ND	5
Nonabromobiphenyl	mg/kg		ND	5
Decabromobiphenyl	mg/kg		ND	5
<b>Sum of PBDEs</b>	mg/kg		ND	-
Monobromodiphenyl ether	mg/kg		ND	5
Dibromodiphenyl ether	mg/kg		ND	5
Tribromodiphenyl ether	mg/kg	ND	5	
Tetrabromodiphenyl ether	mg/kg	ND	5	
Pentabromodiphenyl ether	mg/kg	ND	5	
Hexabromodiphenyl ether	mg/kg	ND	5	
Heptabromodiphenyl ether	mg/kg	ND	5	
Octabromodiphenyl ether	mg/kg	ND	5	
Nonabromodiphenyl ether	mg/kg	ND	5	
Decabromodiphenyl ether	mg/kg	ND	5	
Bis (2-ethylhexyl) Phthalate (DEHP)	mg/kg	IEC 62321-8:2017 (Determination of DEHP, BBP, DBP and DIBP by GC-MS)	ND	50
Butyl Benzyl Phthalate (BBP)	mg/kg		ND	50
Dibutyl Phthalate (DBP)	mg/kg		ND	50
Diisobutyl Phthalate (DIBP)	mg/kg		ND	50

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Test Item(s):	Unit	Test Method	Results		MDL
			2	3	
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013	ND	ND	2
Lead (Pb)	mg/kg	(Determination of Cd and Pb by ICP-OES and /or ICP-MS)	ND	3.20	2
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+A1:2017 (Determination of Hg by ICP-OES and/ or ICP-MS)	ND	ND	2
Hexavalent Chromium (CrVI)	mg/kg	With reference to IEC 62321-7-2:2017 (Determination of CrVI by UV-Vis)	ND*	ND*	8

Test Item(s):	Unit	Test Method	Results	MDL
			4	
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013	ND	2
Lead (Pb)	mg/kg	(Determination of Cd and Pb by ICP-OES and /or ICP-MS)	ND	2
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+A1:2017 (Determination of Hg by ICP-OES and/ or ICP-MS)	ND	2
Hexavalent Chromium (CrVI)	mg/kg	With reference to IEC 62321-7-2:2017 (Determination of CrVI by UV-Vis)	ND*	8

**Sample Description:**

1. Bag 21 – Green FEP Dielectric Insulation
2. Bag 21 – Outer Laminated Foil
3. Bag 21 – Inner Foil Shield Wrapped Around Green
4. Bag 21 – Tin Plated Copper Conductor Inside Green

**Note:**

- (a) mg/kg = ppm ; 0.1wt% = 1000ppm
- (b) ND= not detected
- (c) MDL = Method Detection Limit
- (d) - = not regulated
- (e) \* = Total Chromium analysis by ICP-MS and/or ICP-OES was not detected in submitted sample. Therefore, Hexavalent Chromium determination using UV-Visible Spectroscopy was not performed.
- (f) 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](http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)

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## 2. Halogen Content

Test Method(s): With reference to IEC 62321-3-2:2020 “Determination of certain substances in electrotechnical products – Part 3-2: Screening – Fluorine, bromine and chlorine in polymer and electronics by combustion-ion chromatography (C-IC), and/or with reference to BS EN 14582:2016 – Analysis was performed by ion chromatography.

Test Item(s):	Unit	Results (ppm)	Reporting Limit (ppm)
		1	
Fluorine (F)	mg/kg	2970	50
Chlorine (Cl)	mg/kg	ND	50
Bromine (Br)	mg/kg	ND	50
Iodine (I)	mg/kg	ND	50

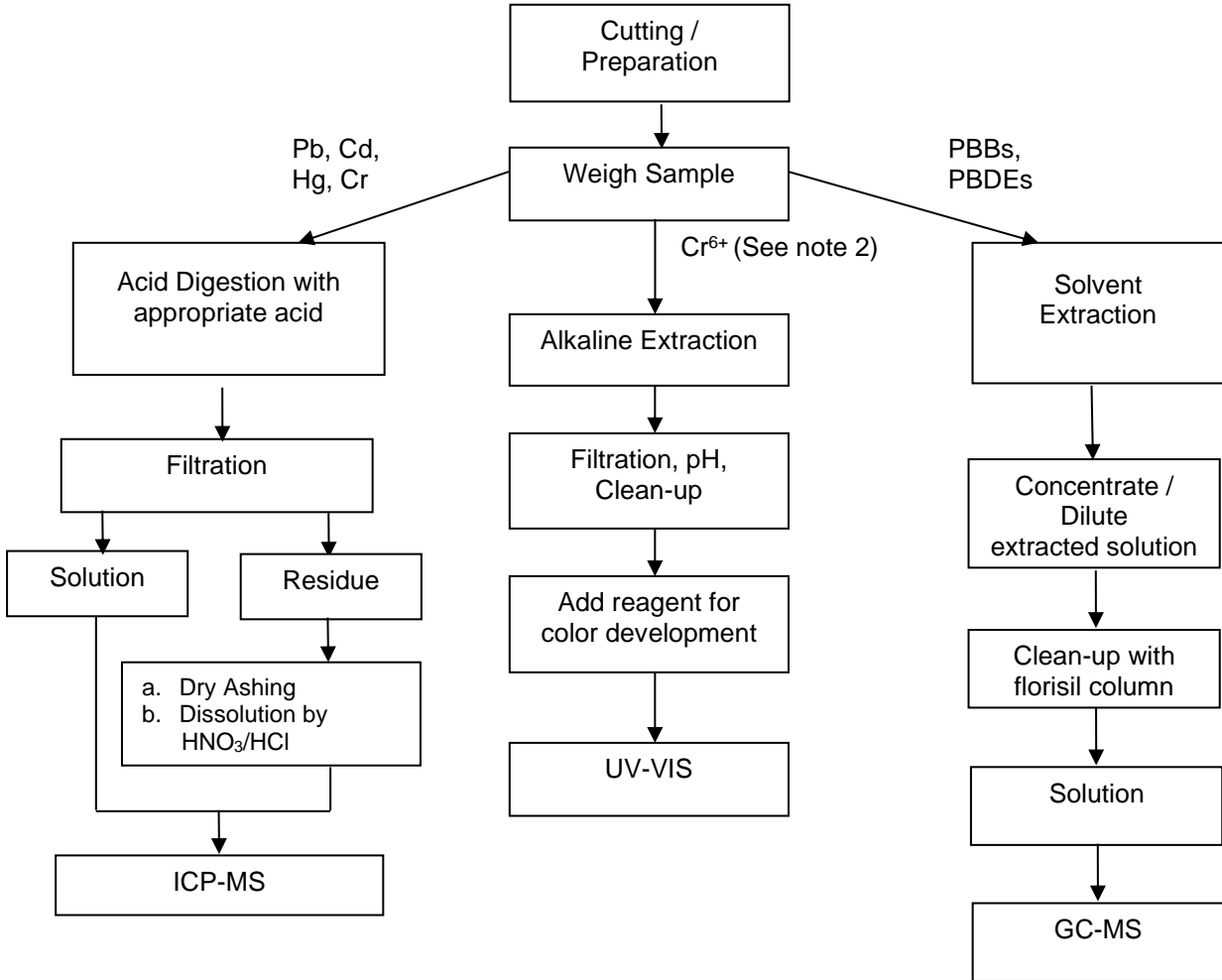
### Sample Description:

1. Bag 21 – Green FEP Dielectric Insulation

- Note:
1. ppm = parts per million
  2. mg/kg = ppm
  3. 1% = 10000 ppm (mg/kg)
  4. ND = Not Detected, reported when the reading is less than the reporting limit value.

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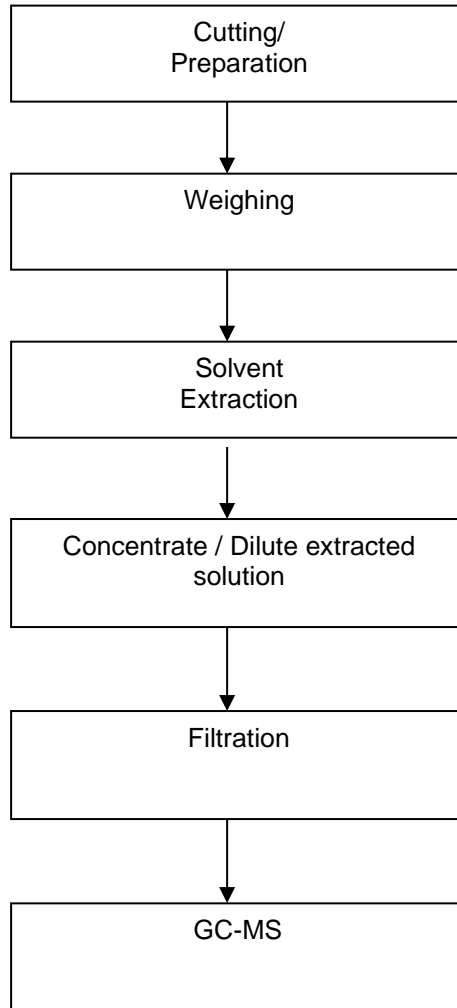
**Flowchart for RoHS:**



- Note : 1. The Cr, Cd, Pb and Hg contents test on polymeric samples were dissolved totally by pre-conditioning method according to above flow chart.  
 2. Cr<sup>6+</sup> is performed only when total Cr is detected

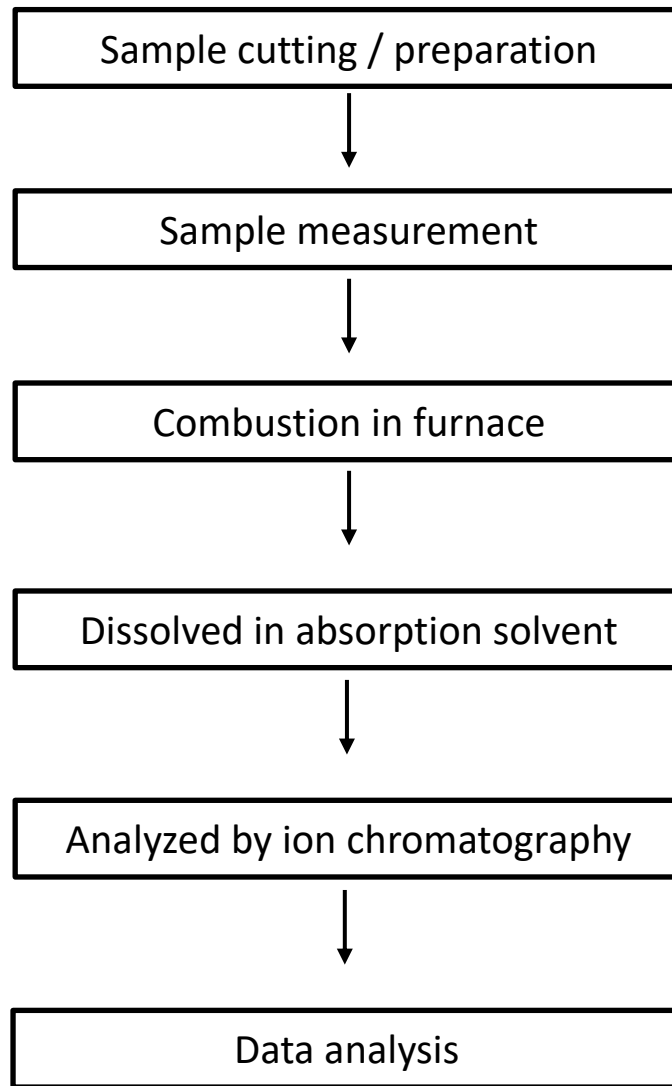
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Flowchart for Phthalates:



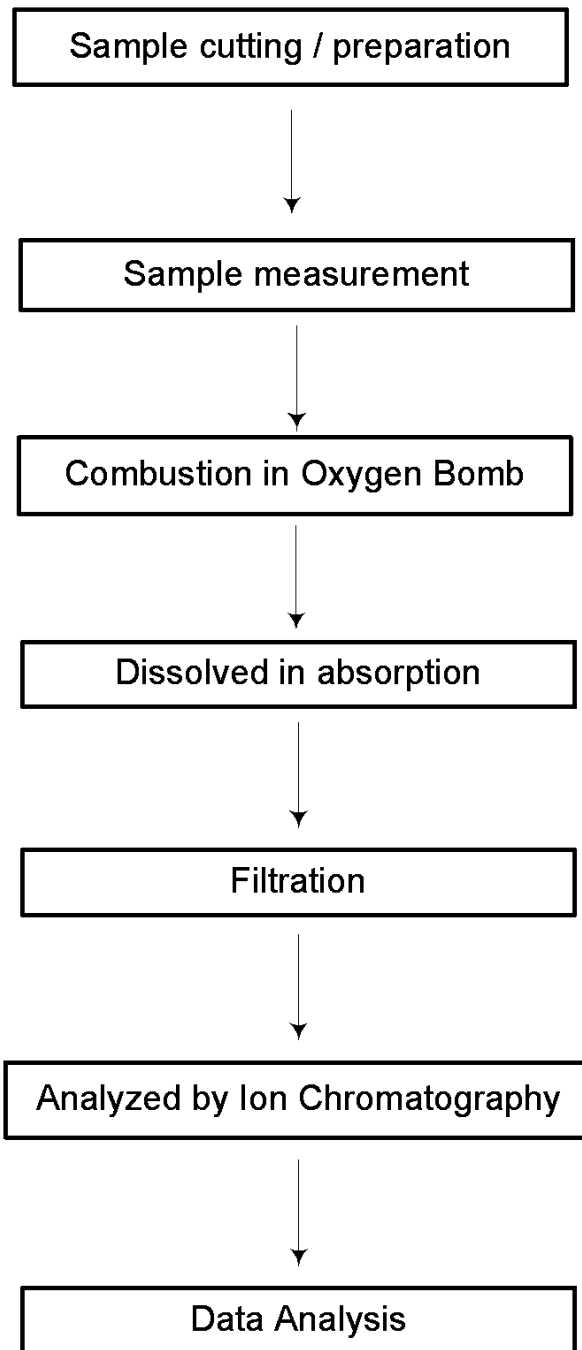
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**Flow Chart of Halogen Test by Combustion Ion Chromatography:**



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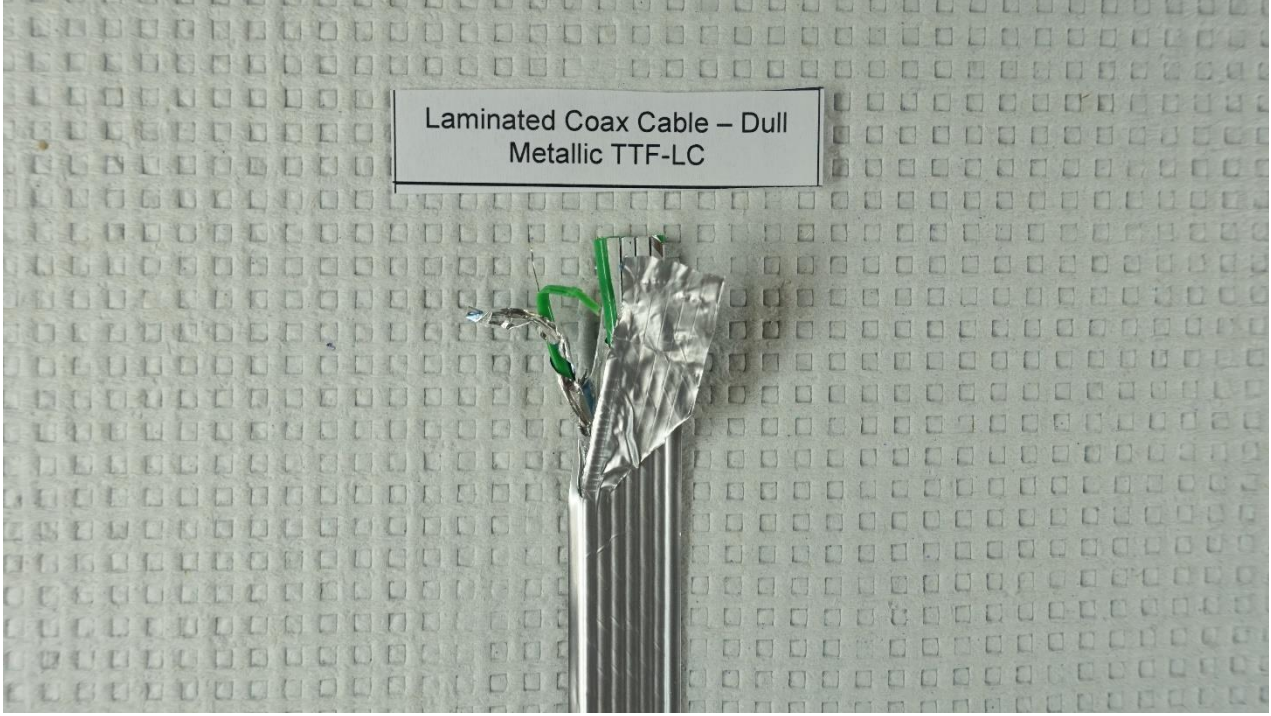
Halogen Testing Flow Chart (EN 14582):



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Sample Photo(s):



SGS authenticates the photo(s) on the original report only

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

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