

How to verify if XML files comply with the IPC 1752A Standard

This text was provided by James Kandler, Managing Director, RoHS Ready LLC with comments and additions from the IPC 1752A standard committee.

The IPC 1752A standard is designed to enable computer-to-computer data exchange. However, some XML files that suppliers generate for their customers have been found not to comply with formatting requirements in the standard and this prevents the customer from loading the XML files into their IT system.

This step-by-step check of XML files helps companies to verify if the XML files comply with the IPC 1752A Standard for Materials Declaration Management. The tools below will help you identify formatting errors in the XML file which are preventing loading into your IT system so that you can explain these errors to your suppliers and ask for them to be corrected. These checks will be very helpful if you are setting up a new system to generate IPC 1752A XML files, or trouble shooting an existing system. The results of these checks will quickly point you to potential issues with the XML files.

Please note that the tools below will not identify errors in the data provided by the supplier (examples include incorrect part weights, wrong compliance statuses, wrong substances declared, etc). The supplier's data should be reviewed by the receiver for consistency, for example by applying known technical information about the part (plasticizers are not expected to be present in metal parts), comparing against declarations for similar parts from other suppliers, comparing against test reports, etc.

Background

The IPC 1752A standard is the most widely used format for communicating compliance information through the supply chain for electrical and electronic products. The standard is maintained and regularly updated by industry experts to meet changing legislation and industry requirements. The standard improves data quality and reduces cost by providing a standardized format for reporting material declaration data throughout the supply chain.

IPC 1752A materials declarations are provided in XML format (eXtensible Markup Language), a widely used data exchange language which is used to communicate business information through the internet. The old version 1752 standard launched in 2006 was previously supported by two Adobe PDF forms which suppliers could use to generate their XML declarations. However, these old PDF forms had many inherent problems and were not able to support the current industry needs. Instead, the use of the current IPC 1752A standard, launched in 2010, relies on third party solution providers to develop tools for suppliers to use to generate their XML declarations.

Starting 2014, IPC introduced an annual review process to determine a list of verified solution providers for the IPC 1752A standard. Recognition by IPC as a verified IPC 1752A solution provider is a valuable marketing benefit. Companies who receive this recognition have submitted sample files that have been verified to the current IPC 1752A requirements. You can access the latest list of verified IPC 1752A solution providers at <http://www.ipc.org/ContentPage.aspx?pageid=Materials-Declaration>.

The 5 checks are detailed below.

Checking that the XML file complies with the IPC 1752A schema

The IPC 1752A standard includes an IPC 1751A XML Schema which provides the structure and rules that must be followed in the IPC 1752A XML declaration files. The IPC 1751A XML Schema specifies the types of data elements which must be included and the order in which the data elements must be reported.

There are several free as well as not too expensive tools that interested people can use to check whether the XML files follow the correct format specified in the XML Schema. Some of the free online tools include:

<http://www.corefiling.com/opensource/schemaValidate.html>

<http://www.freeformatter.com/xml-validator-xsd.html>

<http://www.utilities-online.info/xsdvalidation>

The following step-by-step approach explains how to use the tool provided by Corefiling Inc.

1. Go to <http://www.ipc.org/ContentPage.aspx?pageid=Materials-Declaration> and download the latest version of the IPC 1751A XML Schema to your computer
2. Next go to <http://www.corefiling.com/opensource/schemaValidate.html>
3. Select XML schema and browse your computer to find the IPC 1751A Schema file.
4. Select XML instance and browse your computer to find the XML file that you want to check against the Schema
5. Select "Validate"
6. "Click here" to view the results.
7. An example report is provided below. The report may be very technical, but what is most important is that you know if there is a violation and you can tell someone where it is.

```
CoreFiling XML Schema Validator
Version: 1.2.0.r278285
Well Formed: VALID
Schema Validation: INVALID
The following errors were found:
```

TYPE	LOC	MESSAGE
Validation	24, 12	cvc-complex-type.4: Attribute 'unitType' must appear on element 'Product'.

Checking that mandatory fields in the Standard are not left blank

It is possible to pass the above validation check against the Schema by including the required fields in the XML file but not providing any data in these fields. For example, the XML file may pass the validation check by including a field called 'Amount' but the value for this field has been left blank. All fields, including optional fields, if present, must include a value. Optional fields should not be reported if they do not include data values.

This tool checks that the XML file includes data in each of the mandatory fields for each type of declaration (Class A, Class C, Class D). Any fields which have been left blank are reported. This tool is provided courtesy of Papros Inc.

1. Go to http://www.paprosinc.com/list_mandat_report.htm
2. Select Filename and browse your computer to find the XML file that you want to check

3. Click the rectangle that indicates the declaration class that you want to test
4. An example report is provided below.

```
-----Searching new declaration-----  
ProductID itemName: Electronic component ---- itemNumber: ABC4523  
Request fieldlock is blank: undefined  
CompanyID authority at request or response is blank:  
SupplyCompany name is blank: undefined  
Product unitType is blank: undefined  
End of data
```

Compare Exemption Description used against the IPC 1752A lists

This tool checks that any RoHS exemption descriptions which are included in the XML file follow the correct format for exemption identification as listed in Appendix B of the IPC 1752A standard. Any RoHS exemptions in the XML file which are not listed in the IPC standard are indicated in the report. This tool is provided courtesy of Papros Inc.

1. Go to http://www.paprosinc.com/list_compare_exm_report.htm
2. Select Filename and browse your computer to find the XML file that you want to check
3. In the Box you will need to copy the list of RoHS Exemption Descriptions from the most recent IPC 1752A Standard Appendix B. See the link to “Exemption Description Text” for an already formatted file of the current exemptions.
4. An example report is provided below. "undefined" indicates that there is text in the exemption that is not defined in the text you pasted into the box.

```
-----Searching new declaration-----  
ProductID itemName: Electronic component ---- itemNumber: ABC4523  
SubstanceExemption description: undefined  
SubstanceExemption description: undefined  
End of data
```

Compare Exemption Identification used against the IPC 1752A lists

This tool checks that any RoHS exemption IDs which are included in the XML file follow the correct format for exemption identification as listed in Appendix B of the IPC 1752A standard. Any RoHS exemptions in the XML file which are not listed in the IPC standard are indicated in the report. This tool is provided courtesy of Papros Inc.

1. Go to http://www.paprosinc.com/list_compare_exid_report.htm
2. Select Filename and browse your computer to find the XML file that you want to check
3. In the Box you will need to copy the list of RoHS exemption IDs from the most recent IPC 1752A Standard Appendix B. See the link to “Exemption Identification Text” for an already formatted file of the current exemptions.
4. An example report is provided below. "undefined" indicates that there is text in the exemption that is not defined in the text you pasted into the box.

```
-----Searching new declaration-----  
ProductID itemName: Electronic component ---- itemNumber: ABC4523  
  
End of data
```

Compare substance categories used against the IPC 1752A lists

This tool checks that any substance categories which are included in the XML file follow the correct format for the substance category names provided in the Appendices of the IPC 1752A standard. Any category names that are not listed on the IPC standard are indicated in the report. This tool provided courtesy of Papros Inc.

1. Go to http://www.paprosinc.com/list_compare_sbc_report.htm
2. Select Filename and browse your computer to find the XML file that you want to check
3. In the Box you will need to copy the substance category names from the most recent IPC 1752A Standard Appendices B, C, and D. See the link to "Substance Categories Text" for an already formatted file of the current exemptions.
4. An example report is provided below.

```
-----Searching new declaration-----  
ProductID itemName: Electronic component ---- itemNumber: ABC4523  
Substance Category name here not on reference list(s): Lead and lead Compounds  
Substance Category name here not on reference list(s): REACH- SVHC  
End of data
```