IPC-1752A
with Amendments 1 and 2
2014 - February

Materials Declaration Management

Supersedes IPC-1752A with Amendment 1
November 2012

A standard developed by IPC

Association Connecting Electronics Industries

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- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

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IPC-1752A with Amendments 1 and 2

Materials Declaration Management

Developed by the Materials Declaration Task Group (2-18b) of the Supplier Declaration Subcommittee (2-18) of IPC

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Foreword

While IPC-1751 defines the generic requirements for declaration process management, IPC-1752 establishes a standard reporting format for material declaration data exchange between supply chain participants and supports reporting of bulk materials, components, printed circuit boards (PCBs), sub-assemblies, and products. This standard defines the content and requirements for four distinct classes of declarations that can be used between members of a supply chain relationship.

1752 - Class A: Declaration Query/Reply
1752 - Class B: Material Group Declaration
1752 - Class C: Material Composition Summary Declaration - Product Level
1752 - Class D: Material Composition Declaration - Homogeneous Material Level, with JIG-101 (latest revision) list

The initial focus of material reporting is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003, on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS). In April, 2005 the Electronic Industries Alliance, Japan Green Procurement Survey Standardization Initiative and the Joint Electronic Device Engineering Council (JEDEC) published the Joint Industry Guide Material Composition Declaration for Electronic Products (JIG-101), which established the materials and substances to be disclosed by suppliers when those materials and substances are present in products and subproducts that are incorporated into electrical and electronic equipment. The IPC-1752 standard supports the substance disclosure requirements outlined by the latest version of JIG-101 and accommodates disclosure of additional substance information.

There are several appendices to the 1752 which represent various lists taken from legal directives and other standard bodies. These lists are subject to change; therefore, corresponding appendices in this standard will be amended to reflect those changes at regular intervals. In addition, some substances/materials may exist on more than one list, and since a requester may require meeting more than one material reporting convention described in the appendices, users should be aware that duplicate reporting of a single substance in a material could result from adhering to the reporting conventions of more than one appendix. Tool designers for 1752 implementation are cautioned to consider screening to remove duplication prior to summing the mass or calculating mass percentages.

This standard will be updated to reflect changes affecting the global market. The methodology for update is described in the section on standard maintenance.

Version 1.1 of this standard was supported by two Portable Document Format (PDF) forms (1752-1 and 1752-2) and the Users Guide (1752-3). However, starting with version 2.0, this standard will not be supported directly with a PDF form. Third party software developers are invited to supply the implementation tool, and one organization has already made a free download implementation tool available. In version 2.0 the data exchange format is specified as Extensible Markup Language (XML).

Using a software tool of the user's choice, relevant data can be saved locally and submitted electronically back to the requester. The data structure is based on an underlying Unified Modeling Language (UML) model, which in turn is represented by an XML schema which is used to validate the XML data files. The schema and model are included in Figure 4-1 and Appendix E.

End product producers and customers throughout the supply chain are requesting that suppliers provide material declarations so that the recipient is aware of the presence and amount of certain chemicals in the products it procures. This standard defines the creation of a document or electronic record that will serve as a standard way for reporting and collecting this type of data.

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Acknowledgment

Any document involving a complex technology draws material from a vast number of sources. While the principal members of the Materials Declaration Task Group (2-18b) of the Supplier Declaration Subcommittee (2-18) are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of the IPC extend their gratitude.

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Materials Declaration Management

1 SCOPE

This standard establishes the requirements for exchanging material and substance data between suppliers and their customers for electrical and electronic product. This standard applies to products, components, subproducts and materials that are supplied to producers of electrical and electronic products for incorporation into their products. It covers materials and substances that may be present in the supplied product or subproduct. It does not apply to process chemicals, unless those process chemicals constitute part of the finished product or subproduct.

This standard applies to business-to-business transactions. It is not intended to be used by the general public when making purchasing decisions. The standard is not a compliance guide. As revisions to the European Union's Restriction of Hazardous Substances (RoHS) Directive and the European Union's REACH Regulation are released, this standard will be updated. Exemptions are for specific applications as defined, and management of usage and expirations are between the requester and the supplier.

1.1 Purpose This standard is intended to benefit suppliers and their customers by providing consistency and efficiency to the material declaration process. It establishes standard electronic data exchange formats that will facilitate and improve data transfer along the entire global supply chain.

1.2 Classes This standard establishes four classes for declaration of materials. Classes may be combined as desired.

Table 1-1 Material Declaration Classification

Class	Description	Declaration Type	Detailed Requirements
A	– Reporting in Query/Reply format	Query/Reply	– Supplier provides responses to standard queries and/or optional custom queries as shown in Figure 6-1.
B	– Material class reporting	Material Class	– Supplier states the amount of different classes of materials within a product.
C	– JIG-101 substance category reporting for the product – Additional substance categories reporting at the product level	Substance summary groups	– Supplier provides mass and/or concentration of JIG-101 substance category at the product level if above thresholds. – Additional substance categories can be added and reported at the product level.
D	– Substances reporting at the homogeneous material level – JIG-101 substances and additional substances are accommodated	Full substances	– Supplier provides location, mass, substances at homogeneous material level.

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2 APPLICABLE DOCUMENTS

The following documents form a part of this standard to the extent specified herein. The revision of the document in effect at the time of solicitation **shall** take precedence.

The requirements of the generic standard, IPC-1751, are a ***mandatory*** part of this standard.

2.1 IPC[1]

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

Version 2.0:

IPC-1751 Generic Requirements for Declaration Process Management

IPC-1752 Materials Declaration Management

See Appendix G for previous versions of IPC-175X.

2.2 European Union (EU) Restrictions on Hazardous Substances (RoHS) Directive[2]

Directive 2011/65/EC of the European Parliament and of the Council of 8 June 2011 on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

2.3 International Electrotechnical Commission (IEC) Standards[3]

IEC 60194 Printed board design, manufacture and assembly - Terms and definitions

IEC 62474 Material declaration for products of and for the electrotechnical industry

2.4 Joint Industry Guide-101 (JIG-101)[4]

Material Composition Declaration for Electronic Products JIG-101 4.1 or its most current version is a product of Electronics Industries Alliance (EIA), JEDEC Solid State Technology Association, and the Japanese Green Procurement Survey Standardization Initiative (JGPSSI). The current JIG is available for download at **www.ce.org/jig**.

2.5 REACH (Registration, Evaluation, Authorization and Restriction of Chemicals)

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC, and 2000/21/EC.

Available at **http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm**

2.6 RosettaNet[5]

RosettaNet - Partner Interface Processes (PIP):

2A13 *Distribute Material Composition Information*

2A15 *Request Material Composition Information*

1. www.ipc.org
2. europa.eu
3. www.iec.ch
4. www.ce.org/jig
5. www.rosettanet.org

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3 REQUIREMENTS

The following requirements are applicable to all the IPC-1752 material declaration processes. In addition, the requirements of IPC-1751 are a ***mandatory*** part of this standard.

3.1 Terms and Definitions All terms are in accordance with IPC-T-50 or IEC 60194 and have been listed below to assist in interpretation of this standard. Additional terms defined by this standard are included below.

3.1.1 Homogeneous Material One material of uniform composition throughout or a material, consisting of a combination of materials, that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes.

3.1.2 Intentionally Added Deliberate use in the formulation of a product where continued presence is desired to provide a specific characteristic, appearance or quality.

3.1.3 Material Matter that is made up of one or more substances.

3.1.4 Product Any substance, material, sub-part, part, sub-assembly, or assembly up to a completed original manufacturer's assembly that is the subject of a declaration.

3.1.5 Requester The party initiating the 175x communication when using the request/response communication mode. The requester is the recipient of the supplier's response.

3.1.6 Subproduct A sub-unit of a product.

3.1.7 Substances Chemical elements and their compounds.

3.1.8 Supplier The organization or company responsible for providing the goods and/or services required to produce an electrical or electronic product.

3.1.9 Threshold Level The level of concentration which defines the value from which the presence of a substance in a product **shall** be reported; often referred to as the Maximum Concentration Value (MCV). Depending upon the regulation, a threshold is most commonly defined either as 'above' or 'equal to or above.'

Note: Numerical threshold levels **shall** be provided in mass %. For calculating parts per million (ppm), the conversion from mass % to ppm is 0.1% = 1000 ppm.

4 DATA MODEL

This standard defines the detailed information elements which should be included in declarations by suppliers to their customers for the materials and substances that may be present in the supplied product or subproduct. Figure 4-1 provides the data model which shows the relationships and linkages between these detailed information elements.

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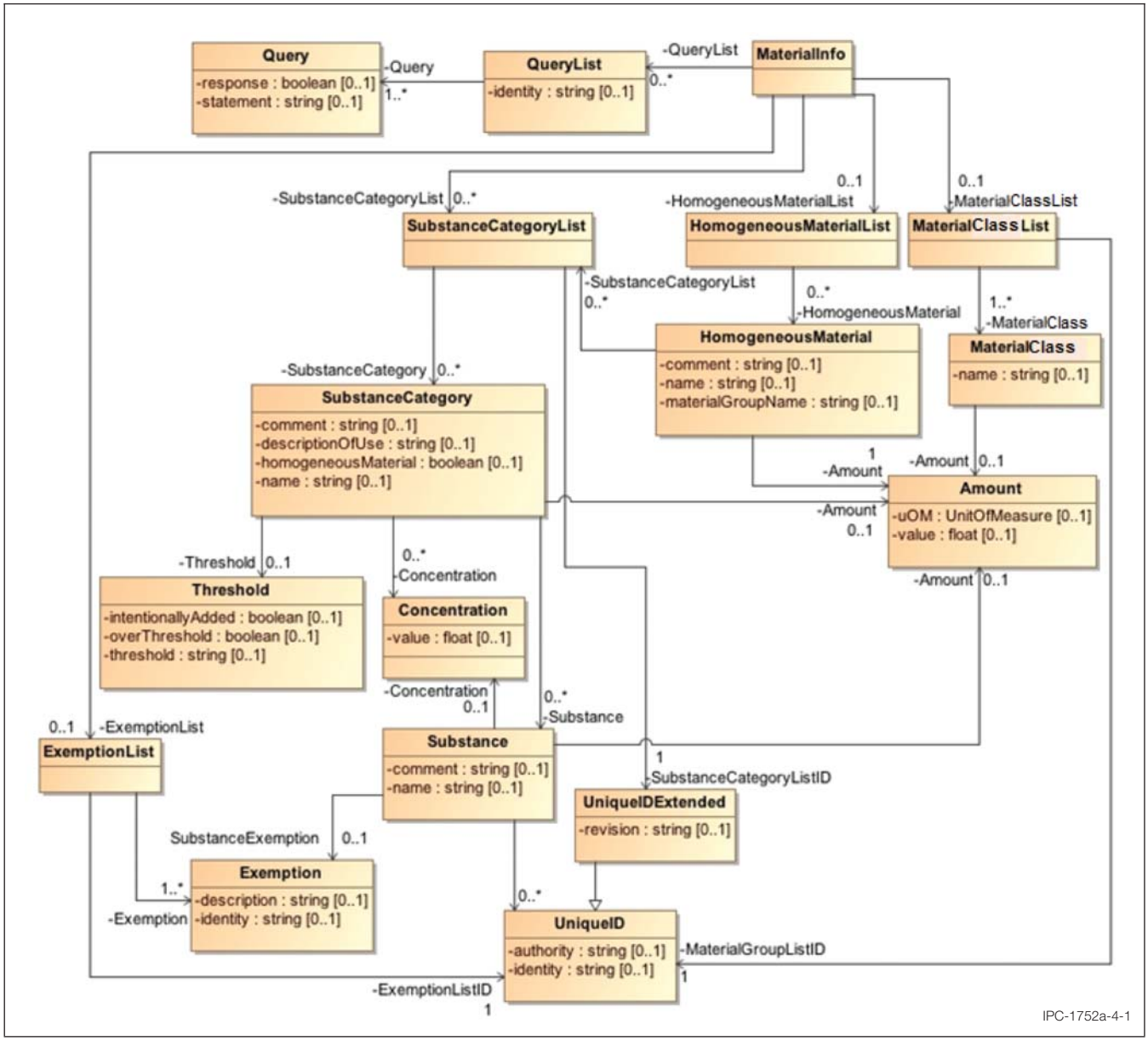

Figure 4-1 Design Data Model for IPC-1752 Material Declaration Requirements

5 MULTIPLE PRODUCT SUPPORT

IPC-1751 enables identification of multiple products to which associated sectional declarations apply.

If the 1752 declaration is to pertain to multiple products as identified in the 1751 sectional, one of the following use cases **shall** apply to the group of identified products, and any restrictions stated under each use case **shall** be observed, such that the declaration remains true and representative of all included products.

Multiple Product Use Cases

For the purposes of this standard, multiple product declarations may consist of one of the following four use cases:

1) Included products have same mass and material content;
2) Included products have different mass with the same material content;
3) Included products have same mass with different material content; and
4) Included products have different mass and different material content.

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Case #1 – Same Mass & Same Material Content

Use Case 1 considers a grouping of reported products where all of the products are identical in body mass and material content. Most often this scenario is associated with a family grouping of products. Class A, B, C and D are fully supported in this case.

Case #2 – Different Mass & Same Material Content

Use Case 2 considers a grouping of reported products where all of the products have different masses but are identical in material content. Most often this scenario is associated with a family grouping of products that are composed of the same materials, but vary in body size or number of repeatable products. This case supports a Class A declaration for multiple parts. When different masses are assigned to different product IDs and all material content, mass values are reported in mass percent, Class B, Class C, and Class D may be used.

Examples:

- A family of hardware products (screw, nut, bolt, etc.) with identical material content but different diameters, length, or other size variables that cause mass variations
- Chassis of different sizes made of same materials
- Uncoated wire: single strand, double strand, n strand

Case #3 – Same Mass & Different Material Content

Use Case 3 considers a grouping of reported products where all the products have the same mass value, but for each product the material content is different. This scenario is possible if the products are produced in different manufacturing facilities with different raw or processed material sources. This case supports a single response using a Class A declaration for multiple parts. Class B, Class C and Class D responses **shall** require unique material declarations for each product of different material content.

Examples:

- A group of 0402 surface mounted ceramic capacitors manufactured at various locations where each location has differing content material sources of the same mass
- An 8-pin SOIC with multiple assembly locations where the components are purchased from a variety of locations where each location has differing content material sources of the same mass
- An 0402 NPO capacitor vs. an 0402 X7R capacitor of the same mass

Case #4 – Different Mass & Different Material Content

Use Case 4 considers a grouping of reported products where all the products have different masses and different material content. Most often this scenario will not involve families of products, but involve a set of products with no real commonality between them. This case supports a single response using a Class A declaration for multiple parts. Class B, Class C and Class D responses **shall** require unique material declarations for each product of different material content.

Examples:

- A list of components used to assemble a power module
- A list of components used to create a wiring harness
- A list of products purchased from a supplier with a wide range of product offerings (capacitors, resistors, connectors, etc.)
- A family of resistors manufactured at various locations where each location has differing raw material sources
- A list of wires with different UL descriptions
- A family of connectors with different contact material options: gold, phosphorus bronze, etc.
- A family of products (comprised of multiple parts and components): servers with different memory capacity, memory modules with different capacity

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6 DESCRIPTION OF THE DATA FIELDS

The 1752 standard is supported by an XML schema and a data model. The materials declaration standard supports various levels of materials disclosure, consistent with the four material declaration classes.

The sections below describe the data fields that will be seen by a user, organized sequentially based on the sectional structure. Software developers **shall** use the XML schema and detailed attribute tables to build a 175x compliant software tool.

6.1 Declaration Query/Reply (Class A) IPC-1752A provides the user with the ability to respond to queries which are either defined as standard queries in this standard, or optionally may be added by the requester or supplier for information not covered by the standard declaration queries. Presently there are four query lists provided:

1. EU RoHS;
2. JIG-101;
3. REACH Candidate List Substances; and
4. REACH Substance Restrictions.

Query lists may change as described in Appendix G. When legislation is updated, IPC will amend query lists accordingly. Each query is a statement, and the response is a true or false answer. More than one query list may be chosen if needed.

Although the query list fields are *optional*, they become ***mandatory*** when the requester requires verification of a commitment by the responding authority.

Note: Effective Date is an *optional* field in IPC-1751. If no effective date is provided, the response date becomes the default effective date of the 1752 response.

Following are the standard query lists.

6.1.1 EU RoHS This section provides the details of the EU RoHS declaration. It also provides an opportunity for the provider of the data to identify any of the exemptions that are known to be applicable to the product identified in the declaration. Exemptions are established by the EU RoHS Directive and are as defined in the declaration. There are five EU RoHS declaration statements, as described in sections 6.1.1.1 to 6.1.1.5 below.

6.1.1.1 Product Meets EU RoHS Requirements Without Any Exemptions This is a declaration that the product(s) described in the declaration contains no RoHS restricted substances above the homogeneous material concentration threshold level per the RoHS Directive. This selection is only appropriate if no exemptions apply and the product conforms to the RoHS Directive.

6.1.1.2 Product Meets EU RoHS Requirements Except Lead in Solder and This Usage May Qualify Under the Lead in Solder "7b" Exemption (other selected exemptions may apply) Suppliers of raw materials, components, sub-assemblies and assemblies may not know if the product(s) being declared will be used as a 7b exemption. By using this declaration, the supplier is indicating that the product(s) contains lead in solder, and the product usage may qualify as a 7b exemption. Other exemptions may also exist but may be so indicated per 6.1.1.3. This declaration statement is for suppliers, not producers of servers, storage and storage array systems.

6.1.1.3 Product Meets EU RoHS Requirements by Application of the Selected Exemption(s) This is a declaration that the product(s) described in the declaration does contain one or more EU RoHS restricted substances above the homogeneous material concentration threshold level per the EU RoHS Directive, but that there is an official exemption which applies to the product. Exemptions which a supplier knows to be available will be disclosed. See Appendix B for a list of exemptions.

6.1.1.3.1 EU RoHS Exemption Lists The RoHS Exemption Lists consist of the complete lists of official exemptions passed into law by the EU. The exemptions lists are based on the EU RoHS Directive exemptions in place at the time of release. Materials declarations are based on the most current exemption lists when the data was provided. See Appendix B for the normative exemptions lists. Updates will be made per Appendix G.

6.1.1.4 Product Fails to Meet EU RoHS Requirements This is a declaration that the product(s) described in the declaration does contain one or more RoHS restricted substances above the homogeneous material concentration limit per the RoHS Directive, and there are no official exemptions known to the supplier which allow such content.

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6.1.1.5 Product is Unknown/Obsolete, No Information is Available This is a declaration that, while the supplier acknowledges the product(s) for which data has been requested, the product is no longer manufactured by the supplier and no information on material content is available. This is sometimes the case for obsolete products, because composition data at the homogeneous material level was not historically measured by suppliers unless it was required for quality purposes.

6.1.2 The Joint Industry Guide (JIG)-101 As stated in the scope of the JIG-101: *"This Guide [JIG-101] represents industry-wide consensus on the relevant materials and substances that shall be disclosed by suppliers when those materials and substances are present in products that are incorporated into electrotechnical products. The Guide [JIG-101] benefits suppliers and their commercial customers by providing consistency and efficiency to the material declaration process and will promote the development of consistent data exchange formats and tools that will facilitate and improve data transfer along the entire global supply chain. It applies to business-to-business transactions. It is not intended to be used by the general public when making purchasing decisions."*

The Joint Industry Guide (JIG)-101 contains REACH Candidate List SVHCs relevant to electrical and electronic products but does not contain the full Candidate list. As stated by the JIG-101: *"As REACH regulates chemical across all industries, not all of the substances publicized on the candidate list occur in products of the electrotechnical industry. Therefore, this Guide [JIG-101] introduces a generic screening methodology. This screening methodology allows identifying only those substances that are relevant for the electrotechnical industry product disclosure."*

6.1.3 REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) The REACH Regulations apply within the European Union and may require a company to:

- communicate with their European Union customers regarding the presence of any Candidate List ''Substances of Very High Concern'' (SVHC) in the company's ''articles'' (as the quoted terms are defined by REACH).
- comply with the substance restrictions which are listed in Annex XVII of REACH

6.1.3.1 REACH Candidate Substances of Very High Concern are Contained/are not Contained in Product Above the Limit per the Definition within REACH The Candidate List of SVHCs is updated periodically by the European Chemicals Agency (ECHA). A list of these substances can be found at the ECHA website (at publication): **http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp**

6.1.3.2 Product Does/Does Not Comply with REACH Substance Restrictions The list of substance restrictions in Annex XVII is updated periodically by the European Chemical Agency (ECHA). Further information is available at the following ECHA website (at publication): **http://echa.europa.eu/web/guest/addressing-chemicals-of-concern/restriction**

6.1.4 Custom Query The standard supports adding custom queries to the standard EU RoHS and REACH queries. If requesters so desire, they may add specific true/false statements to provide additional feedback from the supplier.

6.2 Material Class Declaration (Class B) This section applies to an *optional* Class B, Material Class Reporting. This section is used to report general composition information about a product.

6.2.1 Material Class List This field is for a list of material classes. This list is used to define the set of Material Classes from which to choose for the Material Class field.

6.2.2 Material Class Name A set of materials selected by reason of importance with respect to legislative, economic, environmental, or other management concern and listed together for the purpose of their management. The Class B Material Classes are defined by the IEC 62474 database which is published at **http://std.iec.ch/iec62474**.

6.2.3 Material Class ID The Class B Material Class IDs are defined by the IEC 62474 database which is published at **http://std.iec.ch/iec62474**.

6.2.4 Mass Total mass of the material class contained within the declaration. This field is ***mandatory*** when Material Class is declared.

6.2.5 Unit Measure The information in this field defines the unit of measure for the material class mass as either milligrams (mg), grams (g), or kilograms (kg) or mass percent relative to prodect ID mass for the product (or sub-product for multilevel) which contains the material class being reported.

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6.3 Material Composition Summary Declaration - Product Level (Class C) Class C is used for reporting a summary of types of substances within a product. This section supports the RoHS substance categories (see Appendix B), the JIG-101 substance categories (see Appendix C), the REACH Candidate List SVHC substance categories (see Appendix D), the REACH Substance Restrictions substance categories (see Appendix E) and the IEC 62474 Material Declaration substance categories (Appendix F) as well as allowing custom lists to be added by either the requester (Request/reply) or the supplier (Distribute). If a Class C XML is used for reporting the IEC 62474 Material Declaration substance categories in Appendix F, then the reportableApplication field is ***mandatory***[6]. The reportableApplication field will ***become mandatory*** for all Class C XML files when the IPC-1752A standard is next revised (anticipated in 2015)[7]. All threshold levels **shall** be provided in mass %. Where threshold levels include the words ''intentionally added,'' substances **shall** be declared if they are added intentionally to any part or material of the product, regardless of concentration level.

6.3.1 RoHS Substance Categories For each EU RoHS substance category above the threshold level, the supplier **shall** report the worst case concentration at the homogeneous material level (by using the Concentration element and reporting the mass %) and optionally the total mass of the substance in the product (by using the Amount element and reporting the mass in either milligrams (mg), grams (g), or kilograms (kg)). Multiple lines for a given substance category can be added if a RoHS substance category is contained in more than one homogeneous material. Any instance over the threshold **shall** be reported. If an exemption applies, this **shall** be reported as well by using the SubstanceCategoryExemptionList element.

Suppliers may be requested or choose to provide a description of where, why or how the substance is used in the product.

Homogeneous Example #1: EU RoHS Homogeneous requirement for Lead (Pb)

Homogenous Material 1: Use of lead is covered by RoHS exemption 7(a)
Mass of Lead (Pb) = 0.01 g,
Mass of Homogeneous material = 1 g
Concentration of Lead (Pb) = 0.01 g / 1 g = 1.0%

Homogenous Material 2:
Mass of Lead (Pb) = 0.001 g,
Mass of Homogeneous material = 10 g
Concentration of Lead (Pb) = 0.001 g / 10 g = 0.01%

Total mass of component: 1g + 10 g = 11 g
Total mass of Lead (Pb) = 0.01 g + 0.001 g = 0.011 g

Answer: Total mass of Lead (Pb) = 0.011 g
Worst Case Concentration of Lead (Pb) = 1.0%

```
<SubstanceCategoryList>
    <SubstanceCategoryListID authority="IPC" identity="EUROHS-0508" />
    <SubstanceCategory name="Lead/lead compounds">
        <Threshold threshold="0.1% by weight (1 000 ppm) of homogenous materials" overThreshold="true" />
    <SubstanceCatExemptionList>
        <ExemptionListID authority="IPC" identity="EL2011/534/EU" />
        <Exemption description="Lead in high melting temperature type solders (i.e., lead based solder alloys
          containing 85% by weight or more lead)" identity="7(a)" />
    </SubstanceCatExemptionList>
    <Concentration value="1.0" />
</SubstanceCategory>
```

6.3.2 Non-RoHS Substance Categories For each non-RoHS substance category above the threshold level, the total mass of the substance category in a Class C declaration is ***mandatory*** and is reported by using the Amount element in milligrams, grams, kilograms, or mass percent relative to product ID mass representing the total of that substance in all materials in the product. Suppliers may be requested or choose to provide a description of where, why or how the substance is used in the product.

6. The reportableApplication field is not relevant if a Class C XML is reporting against the substance categories in the current Appendix B, Appendix C, Appendix D and Appendix E.
7. At the next revision Appendix C will be removed (because the JIG sunset in 2013 and was replaced by the IEC 62474 Material Declaration substance categories in Appendix F) and reportableApplication fields will be included in Appendix B, Appendix D and Appendix E.

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Component Example #2: EU REACH Candidate List SVHC component requirement for DEHP

Mass of DEHP in material 1 = 0.02 g
Mass of DEHP in material 2 = 0.002 g

Total mass of component = 20 g
Total mass of DEHP in component = 0.02 g + 0.002 g = 0.022 g
Concentration of DEHP = 0.022 g / 20 g = 0.11%

Answer: Mass of DEHP in component = 0.022 g
Concentration in component = 0.11%

```
<SubstanceCategoryList>
    <SubstanceCategoryListID authority="IPC" identity="EUREACH-0611" />
    <SubstanceCategory name="Bis (2-ethylhexyl) phthalate (DEHP)">
        <Amount UOM="massPercent" value="0.11" />
        <Threshold threshold="0.1% by weight (1 000 ppm) of the product" overThreshold="true" />
</SubstanceCategory>
```

6.4 Material Composition Declaration - Homogeneous Material Level (Class D) Class D provides capabilities to report substances at the homogeneous material level. For consistency in reporting JIG-101 substances, any software tools developed **shall** include the JIG-101 substances categories, substance lists, and associated CAS numbers per the JIG-101.

The supplier indicates the homogeneous material in which he wants to identify the presence of a substance. An example is an integrated circuit, where the homogeneous materials include the bond wire, die attach, lead frame, lead finish, and molding compound.

6.4.1 Homogeneous Material Name The homogeneous materials in each of the products and/or subproducts are identified in this field. In the integrated circuit example they are bond wire, die attach, lead frame, lead finish, and molding compound. This field is ***mandatory***.

6.4.1.1 Homogeneous Material - Mass The information in this field pertains to the total mass of the homogeneous material in that product or subproduct. This field is ***mandatory***.

6.4.1.2 Homogeneous Material - Unit of Measure The information in this field pertains to the unit of measure for the homogeneous material mass; it **shall** be milligrams (mg), grams (g), or kilograms (kg) or mass percent relative to product ID mass for the product (or sub-product for multilevel) which contains the material class being reported. This field is ***mandatory***.

6.4.2 Material Group Name The Material Group Name field is provided to identify a family or group of materials to which the related homogeneous material substances belongs. Examples of Material Group Names might include ''halogens'' or ''phthalates.'' This field is alpha-numeric and *optional*.

6.4.3 Substance Category This field identifies the substance category of the substance in the homogenous material to be declared from the RoHS substance categories (see Appendix B), JIG-101 substance categories (see Appendix C), REACH Candidate List SVHC substance categories (see Appendix D) or the REACH Substance Restrictions substance categories (see Appendix E) or others added by the requester or supplier. If other substance categories are added, they **shall** be clearly defined by either the requester or supplier. This field is ***mandatory*** as required for accurate reporting of the subject product.

6.4.4 Substance This field identifies the name of the substance being declared. This field is ***mandatory*** as required for accurate reporting of the subject product.

6.4.4.1 Issuing Authority This field identifies the authority issuing the substance identity such as CAS (Chemical Abstract Service), EC (European Commission), or IUPAC (International Union of Pure and Applied Chemistry). This field is ***mandatory*** as required for accurate reporting of the subject product. If no issuing authority exists or if chemical identity is confidential, the field becomes *optional* and may be used per convention established between the requester and supplier.

6.4.4.2 Substance Identity This field identifies the issuing authority's registry number of the chemical compound comprising the substance being reported. This field is ***mandatory*** as required for accurate reporting of the subject product. If no

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issuing authority number exists or if chemical identity is confidential, the field becomes *optional* and may be used per convention established between the requester and supplier.

6.4.4.3 Exemption The SubstanceCatExemptionList field and the SubstanceExemption fields identify an EU RoHS exemption that the product supplier knows applies to the product. If the producer reports an exemption for a substance which is present above an EU RoHS threshold, then both these fields are ***mandatory*** as required for accurate reporting of the subject product. These fields are *optional* if below the EU RoHS threshold.

6.4.4.4 Substance - Mass This field identifies the mass of the substance in the homogeneous material. This field is ***mandatory*** as required for accurate reporting of the subject product.

6.4.4.5 Substance - Mass Unit of Measure This field identifies the unit of measure for the substance mass - milligrams (mg), grams (g), kilograms (kg) or mass percent relative to product ID mass for the product (or sub-product for multilevel) which contains the material class being reported. This field is ***mandatory***.

Material Composition Declaration Example #3

```
<HomogeneousMaterialList>
    <HomogeneousMaterial name="Chemical conversion treatment" materialGroupName="Corrosion protection of
      aluminium alloys" >
        <Amount UOM="mg" value="0.04" />
        <SubstanceCategoryList>
            <SubstanceCategoryListID identity="EUREACH-0611" authority="IPC"/>
            <SubstanceCategory name="Cobalt(II) Diacetate">
                <Substance name="COBALT DIACETATE">
                    <SubstanceID authority="CAS" identity="71-48-7" />
                    <Amount UOM="mg" value="0.004" />
                </Substance>
            </SubstanceCategory>
        </SubstanceCategoryList>
        <SubstanceCategoryList>
            <SubstanceCategoryListID identity="Supplier" />
            <SubstanceCategory name="AMMONIUM FLUORIDE">
                <Substance name="AMMONIUM FLUORIDE">
                    <SubstanceID authority="CAS" identity="12125-01-8" />
                    <Amount UOM="mg" value="0.004" />
                </Substance>
            </SubstanceCategory>
        </SubstanceCategoryList>
        <SubstanceCategoryList>
            <SubstanceCategoryListID identity="EUREACH-ARTICLE67-207/2011" authority="IPC" />
            <SubstanceCategory name="Nickel, where prolonged skin contact is expected">
                <Substance name="NICKEL FLUORIDE">
                    <SubstanceID authority="CAS" identity="10028-18-9" />
                    <Amount UOM="mg" value="0.0032" />
                </Substance>
            </SubstanceCategory>
        </SubstanceCategoryList>
    </HomogeneousMaterial>
```

6.4.4.6 Subproducts A Subproduct **shall** be declared if a substance category in Appendices C, E or F refers to this Subproduct in the reporting threshold level for the substance category and the reporting threshold is exceeded. Examples of such Subproducts are when batteries are incorporated into a printed circuit assembly.

If such Subproducts need to be declared, the following **shall** apply:

- A Subproduct **shall** be assigned to another Subproduct (if a higher level Subproduct is declared) or otherwise **shall** be assigned to the Product

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