

IPC-1754 WAM 1

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Materials and Substances Declaration for Aerospace and Defense and Other Industries

An international standard developed by IPC

Association Connecting Electronics Industries



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Materials and Substances Declaration for Aerospace and Defense and Other Industries

Developed by the Materials and Substances Declaration for the
Aerospace, Defense, HE and Other Industries Task Group (2-18k)
of the Supplier Declaration Subcommittee (2-18) of IPC

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Materials and Substances Declaration for Aerospace and Defense and Other Industries

1 SCOPE

This standard establishes the requirements for exchanging material and substance data for Products between suppliers and their customers for Aerospace and Defence (AD), Heavy Equipment (HE) and other industries.

This standard covers the process for exchanging data on chemical substances ("Substances") that may be present in materials, used in production, operations, maintenance, repair or overhaul/refurbishment of the supplied 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. This standard is not a compliance guide.

Multiple Declarable Substance Lists (DSL) designated by various industries may be applicable to this standard for reporting purposes. One example of an industry designated DSL is the International Aerospace Environmental Group (IAEG®) Aerospace and Defence Declarable Substances List (AD-DSL).

1.1 Purpose This standard covers specific requirements for data as described in the Scope to be exchanged between a supplier and a requester.

2 APPLICABLE DOCUMENTS

The following documents may be used as references to the extent specified herein. Unless otherwise specified, documents below that are in effect at the time of supplier declaration **shall** take precedence.

2.1 IPC¹

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

IPC-1751A Generic Requirements for Declaration Process Management

2.2 Other References This standard is not limited to the regulatory requirements referenced below. Any requester may add additional requirements as needed.

The following references are related to the standard but are not required for usage of the standard.

2.2.1 IPC¹

IPC-1752A Materials Declaration Management

2.2.2 REACH *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)*. <http://echa.europa.eu/>. REACH imposes market and use constraints and reporting requirements for substances, including those present in articles. An article is defined later in Section 3.1.2.

2.2.3 EU RoHS *Directive 2011/65/EU 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 (recast)*.

3 TERMS AND DEFINITIONS

The following definitions are aligned with IPC-1751A, IPC-1752A, and IPC T-50. An asterisk (*) by the end of the term indicates that the definition is unique to IPC-1754.

3.1 Article* An object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition.

Source: EU REACH 1907/2006 legislation, *Article 3(3)*.

3.2 Bill of Material (BOM)* A list of the raw materials, sub-assemblies, intermediate assemblies, sub-components, parts and the quantities needed for a product structure.

1. www.ipc.org

3.3 CAGE Code* The Commercial and Government Entity (CAGE) Code is a five character code that uniquely identifies contractors doing business with the United States federal government, North Atlantic Treaty Organization (NATO) member nations, and national foreign governments. The CAGE Code provides a standardized method of identifying a given facility at a specific location.

Source: Department of Defense – Contractors Guide to Submitting a Disclosure, Published by Office of the Inspector General, February 2009.

3.4 Declarable Substance List (DSL)* A list of substance(s) and/or group(s) of substances against which supply chain substance reporting is required.

Note: The AD-DSL is an example of a DSL provided by the IAEG® authority for the AD industry (see Appendix D). Other authorities may specify their own DSL.

3.5 Due Diligence Actions exercised and reasonable steps taken to avoid misrepresentation.

Source: Modified from IPC-1751A

3.6 DUNS® Number Data Universal Numerical System (DUNS®), 9 digit number as assigned by Dun & Bradstreet. It is a unique identifier that stays with a company and is used by businesses, banks and governments. Also referred to as a D-U-N-S® Number, or DUNS® Number.

The uniqueness of the DUNS® Number may enable identification of IPC-1754 substance declarations to a specific supplier's location/manufacturing sites.

3.7 Full Substance Declaration (FSD)* All substances in the product and their masses at the material, subproduct or product level.

Note: Requirements for FSD are specified in Section 5

3.8 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.

Source: Directive 2011/65/EU, known as “RoHS2”.

3.9 Maintenance* Activities required for maintaining the product.

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

Source: IPC-1752A

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

Source: Modified from IPC-1751A

3.12 Overhaul/Refurbishment* Activities required to overhaul or refurbish the product.

3.13 Product Group One or more products grouped together (usually based on shared substance composition attributes) for the purpose of associating the same declaration to the grouping, such that the provided information applies equally to each member of the grouping (possibly exhibiting differing physical characteristics - shape, size, etc.), thus alleviating the necessity for the supplier to provide the same information multiple times.

3.14 Product Operations* Activities required for operating the product.

3.15 Production Process* Activities required for manufacturing the product.

Note: Intermediate substances and substances used for facility operations or facility maintenance are not included in this definition, unless they are contained in the final product.

3.16 Query List* A list of query statements without responses about the supplier's products being declared.

Note: The AD Query List is an example of a Query List provided by the IAEG® authority for the AD industry (see Appendix D). Other authorities may specify their own Query List.

3.17 Repair* Activities required for repairing the product.

3.18 Requester The company or other entity initiating the IPC-175x communication when using the request/reply communication mode. The requester is the default recipient of the supplier's response.

Source: Modified from IPC-1752A

3.19 Subproduct An entry applied to a Product object for the purpose of defining a portion of that product per the supplier's bill of materials, engineering documentation, or other logical structure. A Subproduct may have additional levels of subproducts; the number of subproduct levels is limited by logic and not the IPC-175x schema. The supplier provides all subproduct information.

3.20 Substances Chemical elements and their compounds.

Source: IPC-1752A

3.21 Supplier The organization or company responsible for providing the finished goods and/or services required to produce a product.

Source: Modified from IPC-1751A

3.22 Threshold Level The level above which a substance contained in a product is to be reported.

Source: Modified from IPC-1752A

3.23 Use Descriptor List* A reference list of common uses of substances, materials or processes.

Note: The European Chemicals Agency (ECHA) Use Descriptor list is an example of a Use Descriptor List with a specific ID and "ECHA" as the Authority (see Appendix D).

4 OVERVIEW OF MATERIALS AND SUBSTANCES DECLARATION

4.1 IPC-175x Family of Standards A detailed description of the IPC-175x family of standards is provided in IPC-1751A. A list of the standards is provided below:

- Generic Requirements for Declaration Process Management (IPC-1751A)
- Materials Declaration Management (IPC-1752A)
- Chemical Analysis Lab Report Standard (IPC-1753)
- Conflict Minerals Data Exchange Standard (IPC-1755)
- Manufacturing Declaration Management (IPC-1756)
- Declaration of Shipping, Packing and Packaging Materials (IPC-1758)

4.2 Overview of Declaration Classes This standard establishes three classes for materials and substances declarations: Class E is *mandatory* and may be combined with either Class F or Class G. See Table 4-1.

Note 1: "materials and substances declaration" is referred to as "declaration" in this standard.

Note 2: Classes A, B, C and D used in IPC-1752A are not used in this standard.

Table 4-1 Declaration Classifications

Class ID	Class Name	Class Description
E	Product Statement Declaration	Supplier provides product information and responds to statements about their products with true / false / unknown answers.
F	Declarable Substances Declaration	Only DSL Substances contained in the product at or above the applicable threshold specified in the DSL shall be reported. DSL substances in processes required for production, operations, maintenance, repair or overhaul/refurbishment of the product may be reported.
G	Extended Substances Declaration	Substance information that is required for a Class F declaration plus any additional substance information may be declared. The additional substance information may be substances that are constituents of the product(s) or substances in the process(s).

4.3 Visual Representation of Materials and Substances Declarations The standard specifies the data exchange format for a declaration.

The declaration may use information from three data lists (shown as A, B, and C in Figure 4-1):

- A. Query List
- B. Declarable Substance List
- C. Use Descriptor List

The declaration may be composed of six data groups (shown as 1 through 6 in Figure 4-1):

- 1. Requester data
- 2. Supplier data
- 3. Product data
- 4. Product Statement
- 5. Substances in Product
- 6. Substances in Process

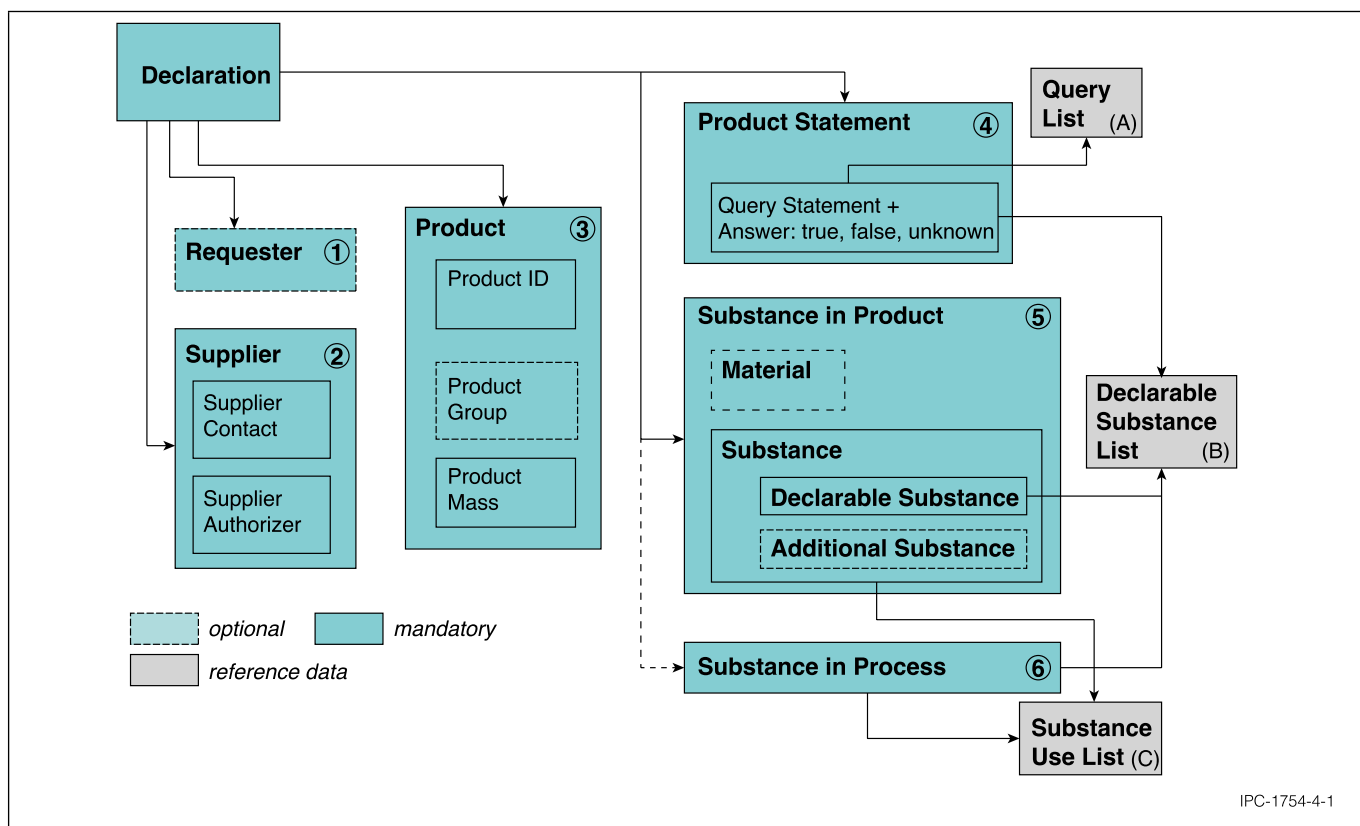


Figure 4-1 Data Structure of the Declaration

5 REQUIREMENTS

This section explains the requirements for substances and material data exchange between data requester and data supplier. The following requirements are applicable to all IPC-1754 declarations.

Data groups are collections of data elements grouped per their use in the standard.

Data groups in IPC-1754 are very similar to those used in other IPC-175x standards:

- IPC-1751A for Request Management Process: Requester data, Supplier data, Authorizer data, Product Information data;
- IPC-1752A for Material Declaration Management: Product Statement, Material Data, Substance Data, Attachments.

Some data groups are specific to IPC-1754: Substance in Process, Substance in Product are IPC-1754 data groups that group Product Data, Material Data, Process Data and Substance Data.

Some data groups have similar content:

- “Product Group” is similar to multiple Product ID in a Product declaration;
- “BOM Level” in product data may identify where the subproduct is located in the declared product structure.

5.1 Declaration Classes Three classes (E, F, and G) were introduced in Section 4.2, Table 1.

The usage of the classes is shown in Figure 5-1 along with the applicable data groups:

Requester data

Supplier data

Product Group

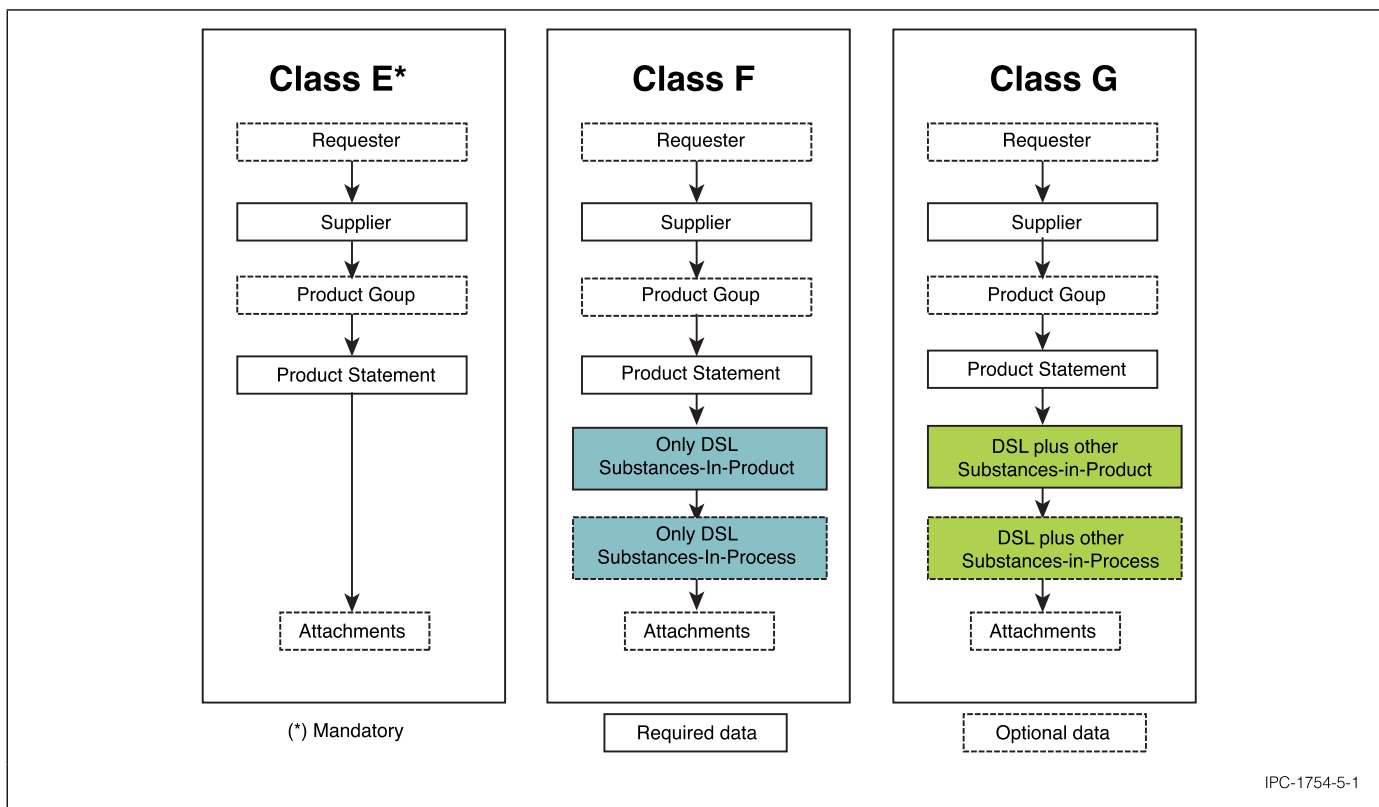
Product Data

Product Statement

Substance in Product data

Substance in Process data

Attachments



IPC-1754-5-1

Figure 5-1 Usage of Classes in the Standard

5.1.1 Product Statement Declaration (Class E) A Class E product statement declaration provides supplier responses to a set of query statements (query list) that are relevant to the industry. For example, a query statement may refer to whether or not a certain type of substance is contained in the product. More than one query list may be included if the declaration is applicable to multiple industries.

A Class E product statement declaration **shall** be declared in all declarations that conform to this Standard.

The following requirements apply to the Class E Product Statement Declaration:

- The authority and the identity of the product statement list **shall** be declared.
- Each query statement **shall** have a unique identity.

- The supplier response to each query statement **shall** be either: true, false or unknown.
- The supplier **shall** provide a response to each query statement included in the query list(s) that have been included in the declaration.

A Class E declaration contains the following data groups:

- Requester Data if declaration mode is “Request/Reply”;
- Supplier Data;
- Product Data if it’s a single product declaration;
- Product Group including Product Data (if multiple Products are included within the same declaration);
- Product Statement as a Query List, with its ID and the answers: true, false, unknown;
- Attachments (attached files as proof of evidence of the declaration, basis of estimate, assumptions, etc.)

5.1.2 Declarable Substance Declaration (Class F) For a Class F declaration, all substances identified in the DSL and contained in the Product(s) at or above any applicable threshold specified in the DSL **shall** be reported.

All substances identified in the DSL and required for production, operations, maintenance, repair or overhaul/refurbishment processes for the Product(s) may be reported.

When a DSL substance in product is reported, its mass information **shall** be provided.

5.1.3 Extended Substance Declaration (Class G) Class G declaration is a Class F declaration plus any additional substance information up to and including a Full Substance Declaration (FSD).

Note: Some industries may refer to a FSD as a Full Material Declaration (FMD).

The following requirements apply to a Class G FSD.

- A FSD requires 100% of all product substances to be reported including respective masses; if “unknown” mass is declared, the FSD flag **shall not** be set as true.
- A FSD includes Confidential Business Information (CBI) allowances.
- Specific FSD and CBI reporting requirements **shall** be specified by the Authority responsible for assigning the applicable Declarable Substances List (DSL).

Class G FSD **shall** include a flag denoting full substance declaration.

Note: Class G declaration facilitates converting IPC-1752A Class D, or other Full Material/Substance formats, to an IPC-1754 to avoid reentering of data valid to the IPC-1754 requirements.

5.2 Data Requirements for Lists The contents of the data lists are not included in the Standard but the data requirements and formats are specified by the Standard. These are industry specific Declarable Substance List (DSL), Query List, Use Descriptor List.

5.2.1 Declarable Substance List The DSL is used to identify substances with declaration requirements that are constituents of the product or used in production, product operations, maintenance, repair or overhaul/refurbishment processes.

The DSL **shall** be identified by an authority, an ID, and a version. A release date may be provided.

A unique ID **shall** be specified for each substance on the DSL, and is assigned by the authority. DSL IDs may also be assigned to groups of substances. Each substance or group of substances **shall** have a substance name.

Each substance on the DSL may include dates to represent their: entry into the list, modification, and removal date as applicable.

Individual substances and substance families may have identified thresholds for de minimus levels within the DSL.

Note 1: A threshold of “zero” may be used for a substance on a DSL when a threshold is not specified.

Note 2: See in Appendix D for examples of Declarable Substance Lists.

5.2.2 Query List A query list is identified by an ID and an Authority for the corresponding industry.

Each query statement in the query list **shall** be identified by an ID and may be identified by an Authority.

A query list may include a query statement related to presence of DSL substances.

Note: See Appendix D examples of query list.

5.2.3 Use Descriptor List A Use Descriptor List provides a reference list of common uses of substances, materials or processes. Each Use Descriptor list **shall** be identified by an Authority and be assigned a unique ID.

Each Substance Use in a Use Descriptor List **shall** be identified by an ID.

Note: See Appendix D for the ECHA Use Descriptor list which is an example of a Use Descriptor List with a specific ID and “ECHA” as the Authority.

5.3 Data Requirements for Declaration

5.3.1 Requester Requester Company data may be identified by either a company name, or a CAGE Code or a DUNS® Number.

5.3.2 Supplier Supplier Data includes:

- Supplier Company;
- Supplier Contact: the point of contact at the supplier company that the requestor may contact for additional information or clarification;
- Supplier Authorizer: the person at the supplier company responsible for approving the declaration.

5.3.2.1 Supplier Company Supplier Company may be identified by either a CAGE Code, a DUNS® Number, or any Custom Requester ID assigned by the Requester.

Supplier Contact company and Supplier Authorizer company may be different.

Note: For example, the contact may be associated with a company subsidiary whereas the authorizer could be associated with the corporate parent company.

5.3.2.2 Supplier Contact Supplier Contact data includes:

- Name
- Title
- Phone
- Email

5.3.2.3 Supplier Authorizer Supplier Authorizer data includes:

- Contact Name
- Title
- Phone
- Email

5.3.3 Product Product data includes:

- Product Identification data
- Product Mass data
- Additional information:
 - A flag “isArticle” (true / false) for all products, subproducts or material
 - A flag “allMaterialsDeclared” (true / false) for all products and subproducts
 - Country of Manufacture
 - Quantity of Product, or “Number of Instances”, as a Subproduct in a parent Product

5.3.4 Material Material data includes:

- Material Identification data
- Material Mass data
- Additional information:
 - A flag “isArticle” (true / false) for all Materials
 - A flag “isHomogeneous” (true / false) that may be used to indicate that the material is or is not a homogeneous material
 - Manufacturer of the Material
 - Material Use Description, as informative data
 - Material Specification ID (e.g. company proprietary specification or industry standard administered by a Standards Development Organization or trade association)

5.3.5 Substance Substance data includes:

- Substance Identification data
- Substance Mass data
- Additional information:
 - Substance Use Description

5.3.6 Product Group Product Group data includes:

- Group Identification data
- List of Products in the Group

5.3.7 Substances in Product Substances in Product data for one Product or a Product Group includes:

- Product Identification data or Group Identification data (*optional*)
- Material data
- Substance data

5.3.8 Process Process data includes:

- Process Identification: a Process Name used as an ID
- Process Classification: informative data
- Process Stage: informative data

5.3.9 Substances in Process Substances in Process data, if provided, **shall** include at a minimum:

- Product identification data or Group Identification data (*optional*)
- Process Stage data
- Substance identification data

Substances in Process data may also include:

- Additional Product data
- Additional Process data
- Material data
- Additional Substance data

5.3.10 Character set The character set for all data fields in the Standard is UTF-8² that supports non-ASCII characters.**5.3.11 Date Format** Dates **shall** be provided in the eXtensible Markup Language (XML) date format: YYYY-MM-DD.**5.4 Use Cases****5.4.1 Declaration Modes**

5.4.1.1 Request/Reply Mode The Request/Reply mode is used in a business-to-business interaction: the Supplier provides their product declaration in response to a request from the Requester.

5.4.1.2 Distribute Mode The Distribute mode is used by the Supplier when they make a product declaration available independent of any request; in that case, no Requester is identified in the declaration.

5.4.2 Single Product Use Case Class E, F or G declaration may be used for collecting information about one product from one supplier.

5.4.3 Multiple Product Use Cases IPC-1754 enables identification of multiple products to which associated declarations apply.

5.4.3.1 Multiple Products – Same Mass and Same Substance This use case considers a product group where all of the products are identical in body mass and substance content. Most often, this scenario is associated with a family grouping of products. Class E, F and G are available declaration options.

2. UTF-8 is a character encoding capable of encoding all possible characters, or *code points*, defined by Unicode (Universal Coded Character Set); it stands for Unicode Transformation Format – 8-bit.