IEC TS 62474-1

Edition 1.0 2022-11

TECHNICAL SPECIFICATION

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Material declaration for products of and for the electrotechnical industry – Part 1: Guidance on the implementation of IEC 62474

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MATERIAL DECLARATION FOR PRODUCTS OF AND FOR THE ELECTROTECHNICAL INDUSTRY –

Part 1: Guidance on the implementation of IEC 62474

FOREWORD

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IEC TS 62474-1 has been prepared by IEC technical committee 111: Environmental standardization for electrical and electronic products and systems. It is a Technical Specification.

This first edition of IEC TS 62474-1 cancels and replaces IEC TR 62474-1:2015.

This edition includes the following significant technical changes with respect to IEC TR 62474-1:2015:

a) IEC TR 62474-1:2015 was revised and converted to a Technical Specification in accordance with the requirements of the ISO/IEC Directives;
b) the introduction and scope have been updated to better align with the requirements of IEC 62474:2018;
c) by defining an authority, list identity and list version, the standard data exchange format can be used for lists other than the IEC 62474 database;
d) two types of material declarations, declaration for compliance and composition declaration, and their requirements are defined;

e) the material classes and exemption list capabilities have been improved;

f) guidance is provided on how to use data fields in the declaration of compliance and composition declaration to collect the information required for the European Chemical Agency (ECHA) Substances of Concern In articles, as such or in complex objects (Products) (SCIP) database;

g) six examples of material declaration are given to show how IEC 62474 meets various industry needs.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
111/654/DTS	111/671/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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A list of all parts in the IEC 62474 series, published under the general title *Material declaration for products of and for the electrotechnical industry*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

There are ever increasing legal regulations around the world along with supply chain requirements that either restrict or require reporting or labeling the use of certain substances in products. To determine a product compliance status, manufacturers need information about the substances in the product that can be passed down the supply chain. This can include data about materials as well as product parts used in products. This information can also be used as one of the inputs in an environmentally conscious design process throughout the product life cycles.

To make material declaration data readily available, the supply chain (including organizations providing products to the electrotechnical industry) needs a standardized method to exchange this type of data. The IEC 62474 standard is flexible for, not only identifying base requirements, but also allowing all levels of additional reporting under defined rules, so that the data is properly exchanged through the supply chain. The IEC 62474 standard uses a single format for data exchange rather than relying on each customer's own format.

Broad implementation by electrotechnical industry and organizations can result in:

- material declaration data being available as part of the contract sales of products in the electrotechnical industry,
- availability of material declaration data that is not dependent on an organization's size or purchase volume,
- improvement of data quality, reduction of compliance costs and reduction of inefficiencies, and
- faster assessments of products and materials compliance status.

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Material declarations meeting the IEC 62474 standard provide data needed to make a substance compliance assessment. They can also be used as part of the technical documentation required to place products on the market in different regions. Examples are:

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- the EU Restriction of Hazardous Substances (RoHS) Directive;
- the EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH);
- the EU Eco-design Directive;
- the Administrative Measures for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products (China RoHS 2).

Government authorities that issue substance restriction regulations need to have economic methods to obtain substance data to conform to these requirements that allow for international trade. IEC standards such as IEC 62474 are recognized by the World Trade Organization (WTO). This means that government authorities can adopt IEC 62474 to provide an economically feasible standard to its resident companies to get needed data from a supply chain in order to achieve the substance restrictions and be assured that such rules facilitate international trade and are in conformance with WTO standards.

Also, restricted substance regulations usually include exemptions for certain products based on available technology or other issues. Exemptions are dynamic and often based on changes to technology and products. This requires government resources to evaluate exemptions from product suppliers and exemptions issued by other government authorities to determine suitability. It is possible governments are not able to update exemptions based on a direct referral to exemptions issued by other governments. This results in significant costs and time lags to do analyses and grant updated exemptions, especially if government authorities lack expertise or adequate funding to perform these tasks. If an exemption approved by a government authority is not adopted in a timely manner, this can put the local economy at a disadvantage because certain products cannot then be placed on the local market. In the case of some product sectors, such as medical devices, this also can prevent access to life-saving technologies.

IEC 62474 now allows government authorities to adopt exemptions from other government authorities by referencing the international IEC 62474 database. Since the IEC 62474 database maintains current exemption lists, governments may rely on this database without additional resources or time.

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MATERIAL DECLARATION FOR PRODUCTS OF AND FOR THE ELECTROTECHNICAL INDUSTRY –

Part 1: Guidance on the implementation of IEC 62474

1 Scope

This part of IEC 62474 is a guidance document to help organizations properly implement IEC 62474. These organizations can be the ones creating tools for material data exchange and those who submit and receive material declarations.

This document supports consistent implementation of IEC 62474, including how the procedures, content, and form relating to material declarations for products can be further specified. It also illustrates how to apply IEC 62474 to non-electrotechnical industries.

This document:

- illustrates the flexibility and functionality of the IEC 62474 standard including examples,
- illustrates how to achieve conformity with IEC 62474, including guidance on preparing a declaration for compliance and a composition declaration, including mandatory and optional declaration requirements,
- illustrates how IEC 62474 can be applied to non-electrotechnical industries by preparing material declarations using an alternate declarable substance list (DSL),
- supports organizations that create software to exchange substance and material data to implement IEC 62474 in their tools, and
- supports users that submit and receive material declarations.

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Following the IEC 62474 standard scope, process chemicals, emissions during product use and product packaging material are not in the scope of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62474:2018, *Material declaration for products of and for the electrotechnical industry*
IEC 62474:2018/AMD1:2020

NOTE The requirements of IEC 62474:2018 were not changed substantially by IEC 62474:2018/AMD1:2020. IEC 62474:2018/AMD1:2020 mainly explains certain requirements of IEC 62474:2018 more clearly and corrects some editorial errors.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62474 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
declarable article
article into which an instance of the substance of very high concern (SVHC) above 0,1 mass percent was first incorporated

Note 1 to entry: The EU REACH regulation imposes requirements on product suppliers to identify SVHCs that are present in their products above threshold. Following a European Court of Justice ruling, the European Chemical Agency (ECHA) published a guidance document clarifying that the threshold level for reporting the SVHC is 0,1 % of the first article in a product.

Note 2 to entry: The declarable article is sometimes referred to as the first article in the context of the EU REACH regulation.

4 Guidance on functionality of IEC 62474 material declaration

4.1 General information

As shown in Figure 1, the IEC 62474 standard defines two types of material declarations and their requirements:

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1) The declaration for compliance provides the declaration at a product level in reference to the list of declarable substances (DSs) and declarable substance groups (DSGs) within the IEC 62474 DSL.
2) The composition declaration provides more detailed reporting of individual substances contained within the IEC 62474 DSL. Reporting can be at material, product part or product level as determined by regulatory requirements and contain very specific mass or mass percent type of information.

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IEC 62474 also provides the capability to declare a material class (such as stainless steel, copper, gold, types of plastic), allow a higher level query to a set of questions (such as EU REACH or EU RoHS compliance (true/false)), support exemptions used by a given product, and include attachments for supporting documentation to a declaration or group of declarations.

At minimum either a declaration for compliance or a composition declaration shall be provided. Both can be provided along with a material class declaration, a query list, an exemption list and attachments. It is common for a query list to accompany a declaration for compliance or a composition declaration. If exemptions are needed, they are used in conjunction with the declaration for compliance and composition declaration. Both declarations can be communicated either in the requester/responder mode or the distribution mode.

IEC 62474 specifies the use of a dedicated database (the IEC 62474 database) that lists substances and substance groups requiring declaration. This provides certainty to suppliers regarding what minimum data is required to report, regardless of a manufacturer's product or customer location. The IEC 62474 database also includes a developer's table and XML schema that specify data exchange format (hereinafter referred to as "IEC 62474 DXF") requirements, material classes that may be used as an input to environmentally conscious design and exemption lists that are specific to a single law or regulation. The IEC 62474 database is maintained and regularly updated by global experts to meet changing legislation and broad customer requirements. The database can be found at: http://std.iec.ch/IEC 62474.

Another important feature of IEC 62474 is the flexibility to use other lists than the IEC 62474 DSL. The same declaration format can now use lists from other industries.

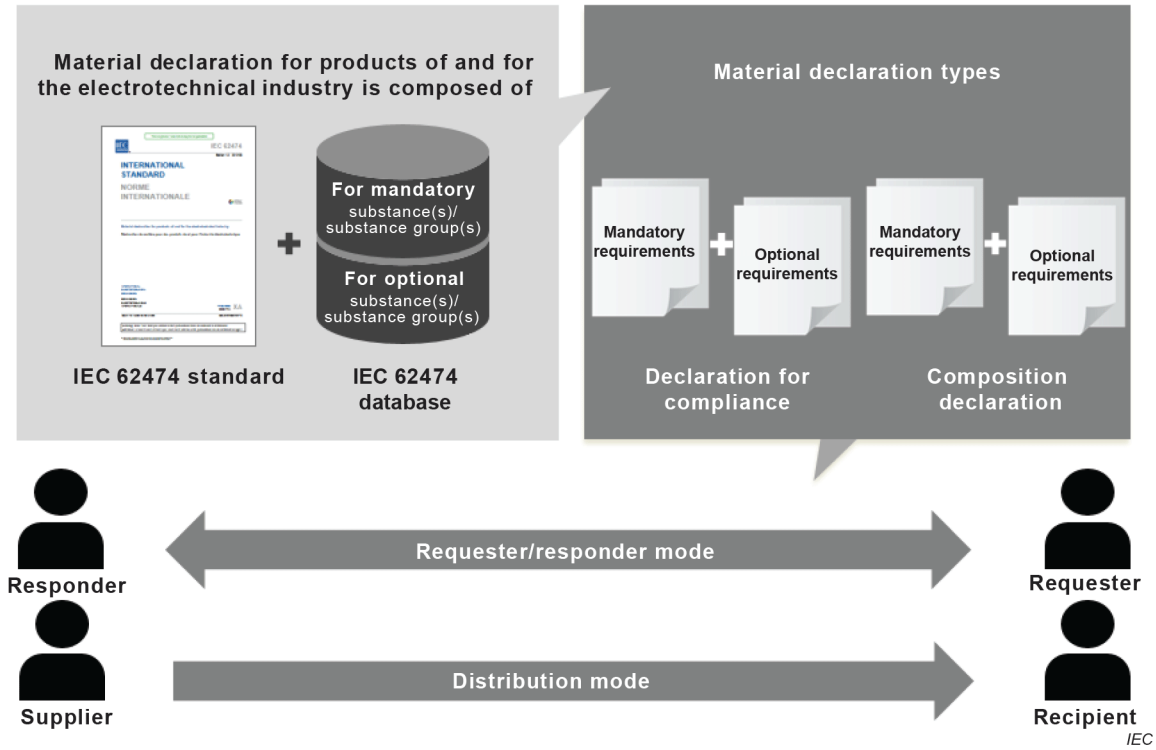

Figure 1 – IEC 62474 principles

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4.2 Conformity to the IEC 62474 standard

The IEC 62474 standard consists of several parts, including DXF, DSL, material class list (MCL) and exemption lists (EL). A material declaration may utilize any or all of these parts. IEC 62474 states that a material declaration that is in full conformance with IEC 62474 would utilize, at a minimum, the IEC 62474 DXL and the DSL. It also states that a material declaration may be in conformance only with the IEC 62474 DXF or only with the IEC 62474 DSL, but if so, the declaration can only declare conformance to the specific parts of the standard that is used. Acceptable statements for declaring conformance are provided in IEC 62474.

The opportunity to declare conformance to just the IEC 62474 DXF enables the declaration against other lists. If the material declaration meets the requirements of the IEC 62474 DXF but utilizes an alternate DSL, the material declaration can be claimed to conform to the IEC 62474 DXF.

For a declaration to conform to the IEC 62474 DXF, it shall meet the declaration requirements specified in IEC 62474:2018, Clause 4 and IEC 62474:2018/AMD1:2020, Clause 4, the format requirements in the IEC 62474 XML schema and the additional requirements in the developer's table.

IEC 62474 specifies that only substances that remain in the product are declared in the material declaration. IEC 62474 also requires that process chemicals that react, form other chemicals, or otherwise do not remain in the product shall not be included. For example, for a resin and a hardener that are used to form epoxy in a product, the final epoxy substance should be declared if it is a DS or as a voluntary declaration. The individual resin and hardener chemical can be declared only if a residual amount of these chemicals remain in the product.

4.3 Material declaration using alternate DSL(s)

4.3.1 General information

Today only a few sectors, such as automotive, aerospace and defence, electronics, have developed a material declaration standard similar to IEC 62474. Owing to, on the one hand, the increasing number of sectors being affected by specific or multi-sectoral policies and legislations such as REACH and critical raw materials (CRMs), and on the other hand, suppliers delivering the same goods to multiple sectors, the need for a generic DXF able to handle any type of substance lists has never been greater.

IEC 62474:2018 has anticipated such need and included this requirement clearly in IEC 62474:2018/AMD1:2020. IEC 62474:2018 allows for the handling of different substance lists compared with the IEC 62474 DSL, provided that such lists have been prepared in accordance with the IEC 62474 DSL format.

4.3.2 Creating an alternate DSL

When preparing an alternate DSL, an identifier (list authority, list identity, and list version) for the DSL shall be available. Several fields in the list are mandatory, as follows:

- substance group;
- specific substance;
- CAS number;
- reportable application(s);
- reporting threshold level in product (unless otherwise specified);
- reporting level;
- reporting requirement.

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Additionally, several fields in the list below should be populated, if applicable:

- common synonyms;
- substance clarification;
- typical applications or uses;
- basis for including;
- description of basis (specific regulatory citation or specific market demand);
- mass information requirements;
- first added;
- last revised;
- comments or footnotes.

Here below is a "hypothetical" example of an alternate DSL including authority, identity and version information:

- authority: "CEN-CLC JTC10";
- identity: "CRM_DeclarableSubstances";
- version: "vD1.01;01-mar-2020".

4.4 Business information

Business information describes information of the enterprises that request and provide the material declaration.

IEC 62474 allows the material declaration in local language as an option. In non-English-speaking countries, when enterprises provide business information, the local language notation can more accurately identify the names of the company and the person in charge. Therefore, in addition to English, it is convenient to exchange business information in the local language.

4.5 Product information

Product information discloses specific details of the product(s) subject to the declaration, including the product identification (e.g. model number, stock-keeping unit (SKU), part number) and product mass.

To make a declaration for a product, one shall specify the unitType (for example, each, g, kg, cm, m, cm^2, m^2, cm^3, l, m^3) and provide the mass of 1 unitType of the product. For example, the mass of 1 m of copper wire, the mass of 1 m^2 of steel sheet, the mass of 1 litre of paint. For discrete parts (e.g. resistors, capacitors, screws, housings), one should set the unitType to 'each'.

To make a declaration for a product family, one shall specify the identification and mass of each product within the product family. If all products within the declaration have the same mass, one mass entry for all products is sufficient.

Each product disclosed in the declaration shall be identified as an article (with the use of the isArticle flag) if the product contains a DS or DSG substance(s) exceeding a reporting threshold based on 'article'.

4.6 Conversion between ppm and mass percent

In the material declaration, either mass or mass percent for the substance, substance group, material or product part can be used.

Many laboratories report concentrations in ppm. One ppm means 1 part in 1 000 000 like parts, such as grams to gram basis. ppm is converted to mass percent for such cases by the formula Mass percent = *X* ppm/10 000.

See Table 1 for conversion from ppm to mass percent.

Table 1 – Conversion table from ppm to mass percent

Mass percent %	**ppm** mg/kg
0,000 1 %	1
0,001 %	10
0,01 %	100
0,1 %	1 000
1,0 %	10 000
10,0 %	100 000
100,0 %	1 000 000

To convert from mass to mass percent, one divides the mass of DS or DSG by the mass of the product, product part or material and then converts to percent.

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