



Guideline
**Material Declarations
Within The Supply Chain**

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Foreword

Differing regulations within and outside Europe and product- and industry-specific requirements make sustainable and standardised information management within value-chains more important than ever. Above all, the need to comply with the specific requirements of chemicals legislation relating to the electro and digital industry products poses major challenges for the market players involved. For example, companies in the European Union are obliged by EU regulations such as the REACH Regulation and the Waste Framework Directive to pass on certain information within the supply chain and to submit it to the European Chemicals Agency (ECHA). If appropriate, they must also ensure that the composition of materials, components and assemblies in the upstream supply chain does not breach specified concentration limits. In particular, the dynamics of the general European legal requirements through the REACH Regulation and the product-specific substance restrictions of the RoHS Directive, the individual company specifications based on these, as well as the globally branched value chains are reasons why only effective information management within the value chains can lead to compliance with product requirements.

This updated guide aims to provide specific information on aspects of 'material declarations within the supply chain' in relation to the exchange of product-specific material and substance information to ensure 'product compliance'. In particular, the international standard IEC 62474 4 relating to material declarations for products from and for the electrical engineering industry is explained and an outlook on the planned cross-industry standard on material declaration IEC/ISO 82474-1 is given.

It is ultimately up to each individual player in the supply chain to decide whether the communication of product-specific information on materials and substances within the supply chain can be improved. We hope you will find this guideline helpful in this respect.

1 Background – sense and purpose of material declarations

1.1 Introduction

Within the electrical engineering and electronics industry as well as in other sectors, additional product-specific material and substance information has come into focus compared to the first edition of the guide. This includes information on the ingredients used at material, component and assembly level or information on the substances used in the manufacturing process. Various reasons (e.g., legal regulations) can be cited for the necessity of exchanging these material declarations within the supply chain.

The provision of material declarations in the supply chain is interpreted and practiced very differently by the actors involved. The use of a standard is becoming more important than ever due to the increasing global regulations for electrical and electronic products, to keep track of the multitude of requirements and to limit the associated time and financial expenditure to an acceptable level. In general, it can be assumed that company-specific substance lists will increase the effort required to prepare material declarations. With the requirements for the SCIP database and the development of international standards, more and more framework conditions must be observed.

1.2 Global Supply Chain Complexity

Global supply chains are a complex web of commercial relationships. One point to bear in mind in this context is that neither the electrical engineering and electronics industry nor other branches of industry have isolated supply chains. Companies often form part of multitiered, global supply chains and normally have limited knowledge of the full chemical composition of their upstream suppliers' products.

For many years, the electro and digital industry has been committed to improving material declarations between the relevant players in supply chains. Above all, it was recognised that a lack of harmonization due to the absence of defined standards relating to material declaration requirements in industry-specific supply chains leads to shortfalls in the communication between all stakeholders involved. However, the associated findings have so far only resulted in minor improvements in terms of minimising companies' related outlay. Consequently, there are growing calls from numerous businesses for an efficient approach to material declarations. This raises the question of how to establish good declaration practice.

The ZVEI was quick to play an active role in national and international standardisation committees in the electrical engineering and electronics industry. At the international standardisation level of the IEC in particular, Technical Committee 111 (IEC/TC111) has addressed the issue of material declarations. In 2012, the international standard IEC 62474 was published. As described in the first two paragraphs, further developments are required to standardise the material declaration. Consequently, the electrical engineering and electronics industry is also involved in the development of the cross-industry international standard IEC/ISO 82474-1 "Material Declaration - Part 1: General Requirements". Background information and further details on the international standard IEC 62474 as well as a short outlook on the activities for IEC/ISO 82474-1 are listed in chapter 4 of this guide.

2 Legal regulations relating to chemicals in the electro and digital industries

Companies operating in all branches of the electrical engineering and electronics industry – from components to consumer and capital goods – are required to observe a variety of European and non-European regulations relating to chemicals. What's more, these regulations are changing all the time. Key regulations within the European Union are the REACH Regulation on chemicals, the RoHS Directive and the ELV Directive. Other product-specific and sector-specific regulations relating to chemicals also need to be observed within the electrical engineering and electronics industry.

The following chapters deal with important contents of the RoHS directive, the REACH regulation, the SCIP database and the POP regulation. These legal texts, which are important for the electrical industry, apply independently of each other. In case of doubt, the most stringent requirement applies. Further legal regulations relating to chemicals in the electrical engineering and electronics industry can be found in the database of the international standard IEC 62474¹, among others.

2.1 RoHS Directive 2011/65/EU

Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment applies to equipment that requires electric currents or electromagnetic fields to work properly, and to equipment that is used to generate, transfer and measure such currents and fields and is designed to operate with a voltage rating not exceeding 1,000 volts for alternating current and 1,500 volts for direct current. Annex I list product categories covered by the Directive. The scope has gradually been extended to all electrical products, provided no explicit exemption applies.

Materials, components and assemblies that are not themselves electrical or electronic equipment as defined by the RoHS Directive but are associated with a product that is deemed to be electrical or electronic equipment as defined by the RoHS Directive must comply indirectly with the substance restrictions of the RoHS Directive if they form part of electrical and electronic equipment as defined by the RoHS Directive. Within the supply chain, this indirect application of the RoHS Directive to materials, components and assemblies is normally only ensured under private law by means of contractual safeguards, confirmations or manufacturer declarations.

The technical documentation required to establish conformity is described in the harmonised standard EN IEC 63000:2018 – 'Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances' (German version: DIN EN IEC 63000:2019-05 (VDE 0042-12:2019-05)).

The Directive allows for application- and material-related exemptions from substance restrictions:

- An application-related exemption is, for example, the exemption with number 4(a) ('Mercury in other low pressure discharge lamps' or 4(a)-I ('Mercury in non-phosphor-coated low pressure discharge lamps').
- A material-related exemption is number 6c ('Copper alloy with a lead content of up to four percent by mass').

Information on applied exemptions within the RoHS Directive should be provided within the supply chain according to the harmonised standard EN IEC 63000:2018. In general, it is also helpful to provide information on applied exemptions in consultation with the involved actors.

Further information on the RoHS Directive can be found on the websites of the EU Commission, which has also published a (non-legally binding) FAQ document t².

1 see <http://std.iec.ch/iec62474>

2 see https://ec.europa.eu/environment/topics/waste-and-recycling/rohs-directive_en

2.2 REACH Regulation (EC) No. 1907/2006

Regulation (EC) No. 1907/2006 harmonised European chemicals legislation and created some new structures and procedures. The REACH Regulation sets out basic obligations for virtually all market players. These obligations are based on each player's role within the supply chain (substance manufacturers, importers, etc.). Under this Regulation, the electrical engineering and electronics industry largely acts as a downstream user, utilising substances and mixtures or manufacturing articles containing 'substances'.

Particularly important parts of the Regulation are Annex XVII (restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles), Annex XIV (continuously updated list of substances subject to authorisation obligations under REACH) and the SVHC list, meaning the REACH Candidate List for Substances of Very High Concern that may become subject to authorisation obligations, which is continuously growing. Article 33 also stipulates that downstream users are obliged to pass on information about SVHCs contained in articles (products). It states that the supplier of an article that contains an SVHC in a concentration above 0.1 % weight by weight (w/w) must provide the recipient of the article with the information in his possession that is sufficient to allow safe use of the article. As a minimum, however, the recipient must be told the name of the relevant SVHC.

The BDI's 'Guidance for complying with the requirements of the REACH and CLP Regulation' provides a compilation of REACH information that has been put together and approved by a large part of German industry, e. g. useful sample texts/formulations for communication within the supply chain³. Further information on REACH can be found at the German REACH-CLP-Biozid Helpdesk⁴.

2.3 Waste Framework Directive 2008/98/EG (SCIP database)

As a result of the adaptation of the Waste Framework Directive 2008/98/EC by (EU) 2018/851, Articles 9(1) and 9(2) have been added requiring suppliers to provide certain information to ECHA. For this purpose, ECHA has created the SCIP database. The name 'SCIP' stands for 'Substances of Concern In articles as such or in complex objects (Products)'. Access is via internet links at echa.europa.eu/en/SCIP⁵. The implementation of this requirement by the EU Member States has varied. Germany has implemented the requirements of the Waste Framework Directive in the Chemicals Act §16f. Reporting articles to the SCIP database is free of charge.

Every European manufacturer, supplier or importer of an article is obliged to register in the database if the articles supplied contain at least one candidate substance (SVHC) in a concentration greater than 0.1 mass percent and the article is supplied to professional customers. The obligations to notify the SCIP database are in addition to the obligatory information duties according to REACH Article 33(1). Mixtures and substances do not have to be reported to the SCIP database. Direct supply to private consumers or to recipients outside the European Union (27 states) are also not subject to the SCIP reporting obligation.

As confirmation of the notification, ECHA sends a unique SCIP number, which is derived from the notifying company and the article number. ECHA has published a data output option on the SCIP homepage in which notified data records can be displayed by means of a selective search. Details can be found in ECHA's guidance document⁶ and the joint association information prepared by the ZVEI in cooperation with other trade associations⁷, as well as in the FAQ on the SCIP database⁸. Information can also be found in the ZVEI's guide for members on the occasion of the inclusion of lead on the REACH candidate list⁹.

³ see <http://www.bdi.eu/stoffpolitik.htm>

⁴ see <http://www.reach-clp-biozid-helpdesk.de> under 'REACH'

⁵ see [SCIP - ECHA \(europa.eu\)](http://echa.europa.eu)

⁶ see [Requirements for SCIP Notifications](#)

⁷ see [SCIP – Update der Verbändeinformation zu Informationspflichten zu Stoffen in Erzeugnissen aus der EU-AbfRR er-schienen - zvei.org](#)

⁸ see <https://echa.europa.eu/de/scip-support>

⁹ see [ZVEIconnects \(ZVEI members area\)](#)

2.4 Regulation on POPs (EU) 2019/1021

Regulation (EU) 2019/1021 on persistent organic pollutants regulates the production, placing on the market and use of POPs to protect human health and the environment. The Regulation transposes the POP Convention (Stockholm Convention on Persistent Organic Pollutants) and the Aarhus Protocol (Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants) into European law. The POP Regulation prohibits the production, placing on the market and use of substances listed in Annex I or Annex II on their own, in mixtures or in articles. For individual substances, the same annexes set limits below which they may be present as unintentional trace contaminants. In some cases, there are also exemptions, which are also specified in Annexes I and II.

Furthermore, the regulation contains provisions on the handling of waste consisting of, containing or contaminated by substances listed in Annex IV.

Examples of substances regulated in the POPs Regulation are HBCD, DecaBDE, PFOS, SCCP, PFOA and polychlorinated biphenyls (PCBs). The list of substances that fall under the scope of the regulation is expanded at regular intervals.

3 Types of declarations and declaration strategies

Good information management is based on the reliable and trustworthy communication of mandatory and, if necessary, other relevant information throughout the supply chain. This requires companies to reach prior agreement on appropriate tools and procedures. In this context, the sections below set out selected types of declaration and declaration strategies that can be supported with international standard IEC 62474 (see Section 4 of this Guideline).

3.1 Types of declarations and the relevant requirements

Generally, declarations serve a specific aim and purpose. Their scope and content must ensure a balance between complexity and benefit. The declaration's precision (level of detail) must be geared to the relevant purpose and the requirements of legislation, suppliers and customers. Applying the basic principle 'as much as necessary, as little as possible' results in more efficient communication along the entire supply chain.

It is important to bear in mind that the current legislation relates to a list of specific restricted or banned substances and therefore does not require all parts of a product to be disclosed.

The following table (Table 1) provides an overview of key types of declaration and focuses on the relevant requirements.

Table 1: Types of declaration

	Supplier declaration and/or contractual agreement	Material declaration based on a list of substances	Full Material Declaration (FMD)
Description/notes	<p>A supplier declaration and/or contractual agreement confirms that the concentrations of the defined substances in the material, component or assembly do not exceed the permissible maximum values. If required, all exemptions that have been applied can also be listed.</p> <p>The requirement for the manufacturer to comply with the maximum values of the defined substances in the material, component or assembly is confirmed by means of a signed contract.</p> <p>It is important to bear in mind that supplier declarations or contractual agreements must be aimed at a specific material, component or assembly or cover a specific range of materials, components and/or assemblies.</p> <p>Notes: Here, compliance with one or more statutory or proprietary requirements is confirmed by the supplier and/or agreed between supplier and customer.</p>	<p>Material declaration based on a list of substances provide information on the concentration of the substances defined in the lists. If required, all exemptions that have been applied can also be listed.</p> <p>Standard EN IEC 63000:2018 (VDE 0042-12):2019-05 refers to standard IEC 62474, which is explained in section 4 of this document.</p> <p>Notes: The material declaration based on a list of substances (e. g. in the IEC 62474 database of declarable substances and groups of substances) identifies all substances in the list and indicates the proportion contained in the product if present.</p> <p>Rather than guaranteeing compliance with the prescribed specifications (supplier declaration and/or contractual agreement), the material declaration identifies all substances that are of particular interest to the customer, together with the relevant proportions.</p>	<p>There is no standard definition of which substances must be listed in a FMD and in what format. Both the substances in question and the declaration's level of detail vary from company to company and no generalisation is possible.</p> <p>Notes: Companies use FMDs for many different reasons. All legal and proprietary requirements can, in principle, be covered if there is an appropriate definition of how the FMD is to be drawn up.</p>
DIN EN IEC 63000 (VDE 0042-12):2019-	Supplier declaration and/or contractual agreement	Material declaration	
	<p>Harmonised standard EN IEC 63000:2018 (German version: DIN EN IEC 63000 (VDE 0042-12):2019-05) specifies the technical documentation that a manufacturer needs to prepare to confirm conformity with substance restrictions. In addition to this, it explains that the standard can also be used for other global substance-related regulations. The standard refers to the 'supplier declaration and/or contractual agreement' and the 'material declaration' or analytical test results as means of collecting information.</p>		

3.2 Declaration strategies

The need to assess legal requirements as well as other company-specific requirements usually necessitate the introduction and implementation of declaration strategies. The declaration tool can range from a paper filing system to a fully integrated IT system.

Table 2 explains the advantages and disadvantages of the different strategies as well as some selected criteria for evaluating declaration types. However, there is no prioritisation of the strategies. Rather, the selection of the appropriate strategy must be aligned by all involved actors within the respective value chain.

Supplier declarations and/or material declarations based on a substance list (see chapter 3.1) can provide a company with information on the potential presence of relevant substances with a legal or customer-related background.

In most cases, the purpose of an FMD-based declaration strategy is to enable the evaluation of one's own product range against the currently valid substance restrictions and bans and, if necessary, to prepare for future substance requirements. If possible, customer requirements related to individual substances or substance lists can be compared with the existing data.

The decision to implement one of the two types of strategy is based on the requirements of one's own company and the industry sector concerned.

Declaration strategies can only reflect future substance restrictions and bans to a limited extent. No strategy can completely remove the need to monitor legal requirements and communication in the supply chain. Possibilities for obtaining information should be used as appropriate. For example, the members of the ZVEI working group on chemicals policy are regularly informed of changes in this area.

It is to be expected that the need for information will increase, amongst other things due to legal requirements. Therefore, a structured approach for the communication of product-specific material and substance information in the supply chain is desirable.

Tabelle 2: Declaration strategies

	Supplier declaration and/or contractual agreement	Material declaration based on a list of substances	Full Material Declaration (FMD)
Know-how protection	<p>Apart from the supplier or material declaration, which is based on a list of substances, there is no declaration relating to the alloy composition or substance formulation. This guarantees the protection of know-how.</p>		<p>Relevant substances can be anonymised with a relevant note in the declaration to ensure that know-how is protected. Legally restricted/banned and declarable substances cannot be anonymised.</p> <p>The extent of anonymised details is usually limited.</p>
Declaration effort	<p>Preparing the declaration requires only minor effort.</p>	<p>Ideally, the declaration is prepared based on a list of substances, e. g. in line with international standard IEC 62474, to minimise the amount of work required in the supply chain.</p>	<p>A large amount of work is involved in preparing the declaration, especially in the case of complex components and/or assemblies.</p>
	<p>Any new legal requirements and/or changes to the relevant exemptions require an evaluation of the existing supplier declarations and, if appropriate, additions or a new version. The relevant supply chain will need to be involved in this process.</p>	<p>In the case of customised substance lists, it needs to be checked, for example, whether these are already covered by international standard IEC 62474. If additional substances need to be included due to new customer requirements, the existing declarations may need to be re-evaluated. The supply chain will need to be involved in this process.</p>	<p>PDF/HTML-based FMDs have proved suitable in the case of less complex components and/or assemblies such as electrical components. This form of declaration also includes the so-called family declarations, with which the composition of a largely identically structured product family is created (e.g., the different capacitance values of a capacitor series). In this case, the creation and modification efforts are to be classified as low. If required, the data can be transferred manually or system-supported into other declaration systems.</p>
	<p>For many legal or sector-specific requirements, the need for additions/a new version can be avoided using contractual agreements.</p>	<p>Due to the large number of customized substance lists and the associated internal checking work, this type of declaration can generate additional work.</p>	
Availability of data	<p>Within the value-added chain, the need for data to be available is more widely accepted in the case of legally regulated substances than in the case of non-regulated substances.</p>		<p>The manufacturer of a complex component and/ or assembly does not normally have sufficient knowledge to provide a complete FMD independently. In principle, FMDs are therefore normally created in such a way that the relevant supply stage also prepares the declaration for its area of expertise:</p> <p>> materials > components > assemblies > end products</p> <p>Applying this idealised procedure produces extremely accurate FMD data.</p>

Tabelle 2: Declaration strategies			
	Supplier declaration and/or contractual agreement	Material declaration based on a list of substances	Full Material Declaration (FMD)
Evaluation of new substance requirements	<p>In line with DIN EN IEC 63000 (VDE 0042-12):2019-05, manufacturers must ensure that</p> <p>a) the technical documentation provided and the individual documents it refers to are subjected to regular checks and are thus valid</p> <p>b) the technical documentation also includes any changes to materials, components or assemblies.</p>		<p>Evaluation is possible depending on how the FMD has been defined and designed.</p> <p>For specific sectors, the FMD includes a list of substances. Direct evaluation is possible if the substance is included in the list of substances or has been declared.</p> <p>Depending on the regulations relating to implementation of the FMD, the declaration may need to be revised after updating the list of substances, in particular in the case of anonymized substances. This ensures that the database is updated, and evaluation is possible, albeit with a delay.</p>

4 IEC 62474: Material Declaration for Products of and for the Electrotechnical Industry

The development of the international standard IEC 62474 on material declarations for products from and for the electrical engineering industry began in 2006. The Technical Committee 111 of the IEC (IEC/TC111), which was newly established at international standardisation level at that time, was entrusted with the task of developing a material declaration standard for the electrical engineering and electronics industry. The standard should cover the following aspects:

- Process of material declaration,
- Declarable substances,
- Data exchange.

Standardisation work was based on existing documents/procedures, in particular IEC PAS 61906 (material declaration process), which was developed in Germany, the Joint Industry Guide – JIG (substance lists/declarable substances with the relevant criteria) and IPC1752 (data exchange).

The decision to include regulations relating to chemicals on a global scale led to the parallel development of a database that is separable from the standard in process engineering terms and makes it far easier to update the relevant contents, the material categories and the data elements for exchanging information.

The standard and database were accepted by a clear majority, published in 2012 and updated in 2018. Since then, the database has also been available free of charge at: <http://std.iec.ch/iec62474>.

With the publication of the international standard IEC 62474 and the establishment of a team to update the database, other material declaration initiatives (e.g., the Joint Industry Guide - JIG) have ceased their activities in this respect, together with the recommendation to apply the international standard IEC 62474 from this point on.

The Technical Report (TR – IEC TR 62474-1:2015) ‘Guidance on implementing IEC 62474’ has been prepared by IEC/TC111 working group 1. This supplementary document is aimed at companies that develop software for exchanging material declarations and companies that prepare material declarations in line with international standard IEC 62474 or request and receive such declarations from their suppliers.

4.1 Key elements of international standard IEC 62474

The international standard IEC 62474 specifies the procedure, content and format for preparing material declarations for products of companies that operate in or supply the electrical engineering and electronics industry. It thus sets out the requirements, content and format of the data exchange for material declarations within the supply chain. The data exchange requirements and format are also applicable to other industries.

The purpose of international standard IEC 62474 is to provide data that

- should make it possible to evaluate product compliance with statutory regulations relating to chemicals (see Chapter 2) or, if appropriate, to answer market enquiries (from the trade/consumers/disposal companies) about the material composition of products.
- can serve as a basis for providing information during the green product design process and throughout the product life cycle.

In this context, it should be noted that process chemicals and emissions from the use of the products do not fall within the scope of the international standard.

Although the international standard initially specifies basic requirements, it offers manufacturers and suppliers of products flexibility in the selection of further company-specific requirements. If requirements that go beyond these basic requirements are set or agreed between the partners in the supply chain, further requirements for the material declaration take effect. To ensure the correct exchange of data in these cases, these specific requirements are described in the standard.

The underlying data model thus enables the entire range from declaration against a list to FMD without prescribing a specific strategy and leaves this choice to the companies.

Declarable substances or groups of substances

A key part of the standard is the definition of criteria for declarable substances or groups of substances. Substances and groups of substances that meet these criteria are already listed in the IEC 62474 database or will be added to it after a review.

Since this standard applies to the electrical engineering and electronics industry, only substances or groups of substances that may be present in products of this industry and in supplier products of the electro and digital industry are included.

The IEC 62474 database generally distinguishes between three criteria for declarable substances or groups of substances:

- Criterion 1: substances respectively groups of substances from applicable legal provisions relating to chemicals.
- Criterion 2: substances respectively groups of substances from legal provisions relating to chemicals without a defined reference date.
- Criterion 3: substances respectively groups of substances from non-statutory, sector-specific requirements.

The criteria themselves are not simply aimed at legally restricted and/or banned substances but also cover substances subject to information obligations such as reporting or labelling. As an international IEC standard, IEC 62474 is consequently based on the laws of the IEC member states when it comes to identifying declarable substances or groups of substances according to the previously mentioned criteria 1 and 2.

It is mandatory to declare substances respectively groups of substances in the product that are listed under criterion 1 or 2 in the IEC 62474 database, whereas the declaration of substances listed under criterion 3 is optional.

Basic requirements for a material declaration in line with IEC 62474

If the product application is subject to declaration, it is compulsory to declare substances respectively groups of substances that fall under criteria 1 and 2 and are present in quantities above the limit specified in the IEC 62474 database.

In this context it must be noted that the presence of a restricted and/or banned substance does not necessarily mean a ban on placing the product on the market. For example, often substance restrictions and bans do not apply worldwide and, often, only specific applications are restricted and/or banned, or there are exemptions to the substance restrictions and bans. The material declaration in line with international standard IEC 62474 must be seen as an aid enabling the recipient to assess compliance with the requirements applying to substances respectively groups of substances. However, this by no means corresponds to a declaration of conformity. The assessment of conformity is generally the responsibility of the recipient of the information.

Further requirements

Beyond the basic requirements set out above, the standard enables additional details to be declared up to the level of an FMD. However, this entails additional requirements that need to be met.

One example of such further requirements is indicating exemptions from the substance restrictions under the RoHS Directive 2011/65/EU. The declaration of such exemptions does not fall under the basic requirements set out above and is therefore optional. However, if the declaration of exemptions is applied, further details must be provided to ensure unambiguous data exchange. Today, the international standard IEC 62474 contains a separate list of exemptions under EU-RoHS and China-RoHS, which is updated regularly.

If the recipient of the material declaration requests the mandatory declaration of RoHS exemptions from its supplier, this declaration and the information on the presence of the declarable substance enables the recipient to evaluate RoHS conformity.

The IEC 62474 database

Given the different and frequently changing European and non-European legislation relating to chemicals, it is extremely important that regulations are kept up to date to ensure product compliance. Consequently, the international standard IEC 62474 has been linked to a database and a validation team has been set up within IEC Technical Committee 111 (IEC/ TC111), which ensures regular updating of the contents to reflect new legally regulated substances as promptly as possible. In this way, changes to the database can be implemented in less than half a year. Details and further information about the validation team can be found in Annexes I and II. There, the updating work is explained and the working method of the validation team for database updates is specifically presented using the example of the REACH candidate list.

In basic terms, the IEC 62474 database is a collection of data elements that are available to download free of charge at

<http://std.iec.ch/iec62474>.

The database contains the following entries in table form:

- list of declarable substances and groups of substances,
- list of reference substances for declarable groups of substances,
- list of material classes,
- lists of exemptions,
- lists with additional information,
- XML material declaration scheme,
- list of data elements.

4.2 Preview on the planned cross-industry standard for material declaration IEC/ISO 82474-1

Due to the increasing number and complexity of material regulations affecting various industries, the international standardisation project "PNW 111-604 Ed.1.0 (IEC 82474-1 ED1) - Material declaration - Part 1: General requirements" was initiated. Within the framework of this standardisation project, an ISO-IEC dual logo standard is to be developed in which the requirements for material declarations from the previous IEC 62474 will be transferred and standardised for other industries. The aim is to develop a data format that allows information to be exchanged within the entire supply chain. This should enable organisations to evaluate materials regarding material requirements and, if necessary, to fulfil specific sectoral requirements.

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Datum: 12.07.2022

List of acronyms and glossary

Acronym	Description /Explanation
BDI	Bundesverband der Deutschen Industrie e.V. /Federation of German Industries) http://www.bdi.eu/
Deca-BDE	Deca-Bromdiphenylether, Bis(pentabromophenyl) ether
DKE	German Commission for Electrical, Electronic & Information Technologies of the DIN and VDE. The DKE prepares national standards and safety regulations for electrical engineering, electronics and information technology and telecommunication standards. The focus is on harmonisation with European and global standards. https://www.dke.de/en
DKE/K 135	DKE committee for recording substances in electrical engineering products. DKE/K 135 prepares stipulations for the recording and declaration of chemical substances in products used in the electrical and electronics industry. The committee is responsible for IEC 62321 standards, which provide test methods for defining the concentration of specific substances of concern. A further key task of DKE/K 135 is maintaining IEC 62474, which defines the data exchange requirements, content and format for material declarations within the supply chain (can also be applied to other branches of industry). https://www.dke.de/de/ueber-uns/dke-organisation-auftrag/dke-fachbereiche/dke-gremium?id=2000403&type=dke%7Cgremium
ELV	End of Life Vehicles – Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of-life vehicles. See Official Journal of the European Union: http://eur-lex.europa.eu/
IEC 63:2016 German version: EN IEC 63000:2018 DIN EN 63000 (VDE 0042- 12):2019-05	Standard EN 50581:2012 'Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances' was published in the Official Journal of the European Union (2020/L 155/12). It is thus considered a harmonised standard in the sense of RoHS 2 and triggers the presumption of conformity (cf. Article 16 of RoHS 2). The standard describes the procedure for preparing the technical documentation required to establish RoHS conformity, see Official Journal 2020/L 155 /12 of the European Union: http://eur-lex.europa.eu/ . EN IEC 63000:2018 replaces EN 50581:2012, which could be used as a harmonised standard for the presumption of conformity with a transitional period until November 2021. The standard can be obtained from Beuth-Verlag: https://www.beuth.de/de/norm/din-en-iec-63000/302205544 .
EU	European Union https://european-union.europa.eu/index_en
FMD	Kurzform für ‚Full Material Declaration‘ (Materialvolldeklaration)
GADSL	Global Automotive Declarable Substance List: http://www.gadsl.org/
HBCD	Hexabromocyclododecan

Acronym	Description /Explanation
IEC	International Electrotechnical Commission. The IEC is the international standardisation organisation for electrical engineering and electronics standards. http://www.iec.ch/
IEC 62474	International standard on Material Declaration for Products of and for the Electrotechnical Industry. This standard sets out the data exchange requirements, content and format for material declarations within the supply chain. Even though this international standard was developed for the electrical engineering industry, the data exchange requirements and format can also be used for other branches of industry. http://std.iec.ch/iec62474 The German standard DIN EN IEC 62474:2019-09 (VDE 0042-4:2019-09) is available from https://www.beuth.de/norm/din-en-iec-62474/307528651
IEC/PAS 61906	The standard entitled 'Procedure for the declaration of materials in products of the electrotechnical and electronic industry' specifies the form and procedure for preparing material declarations in the electrical and electronics industry. It was used as a basis for the work on international standard IEC 62474. The standard was withdrawn in May 2013 with a transition period running to 26 April 2015.
IPC	Association Connecting Electronics Industries. This global trade association represents the printed circuit board and electronics industries, their customers and their suppliers. https://www.ipc.org/
IPC 1752A	This standard provides a defined XML schema for exchanging material declarations within the supply chain. It was used as a basis for the work on international standard IEC 62474.
ISO	International Organization for Standardization http://www.iso.org/iso/home.html
JIG-101	The Joint Industry Guide (JIG-101 Ed. 4.1) includes substance lists and statutory requirements stating substance limits. A selection of specified data fields provides support in exchanging information on materials and substances in the supply chain. Version 4.1 of JIG-101 was considered during the work on international standard IEC 62474. The updating of JIG-101 stopped with the publication of Version 4.1 and the regularly updated international standard IEC 62474 is recommended instead.
Materialdeklaration	Indication of constituent elements used at material, component and assembly levels in varying forms and degrees of detail. In this guide, 'material declaration' is used as a generic term covering supplier declarations and/or material declarations based on a substance list and FMDs.
MD	Material declaration
PCB	Polychlorinated biphenyls
PFOA	Perfluorooctanoic acid ,
PFOS	Perfluorooctansulfonic acid

Acronym	Description /Explanation
POP	Persistent Organic Pollutants are mostly regulated in the POP Regulation, Regulation (EU) 2019/1021 on Persistent Organic Pollutants, which implements the provisions the provision of the Stockholm Conventions throughout Europe.
Product-Compliance	Product compliance refers to the requirements that a product must meet before it is placed on the market. In general, this means compliance with rules (e.g., legal regulations and guidelines or customer-specific requirements), whereby the requirements within product compliance can be very complex.
RISL	‚Railway Industry Substance List‘. http://www.unife-database.org/
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), 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. See Official Journal of the European Union: http://eur-lex.europa.eu/ ; http://eur-lex.europa.eu/
RoHS	Directive 2011/65/EU (‘RoHS 2’) 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. Follow-up to Directive 2002/95/EC (‘RoHS 1’). See Official Journal of the European Union: http://eur-lex.europa.eu/http://eur-lex.europa.eu/
SCCP	<u>Short chained chlorinated paraffins</u>
Substance list	Listing of substances that are restricted, banned or subject to specific declaration requirements based on statutory provisions.
SVHC	Substances of Very High Concern in line with the REACH Regulation. The Candidate List of Substances of Very High Concern for authorisation is available at: http://echa.europa.eu/de/candidate-list-table Version of German authorities http://www.reach-clp-biozid-helpdesk.de/de/REACH/REACH.html
TC111	IEC Technical Committee 111 entitled ‘Environmental standardization for electrical and electronic products and systems’
VDE e.V:	VDE Association for Electrical, Electronic & Information Technologies https://www.vde.com/en .
ZVEI	ZVEI e. V. • Electro and Digital Industry Association http://www.zvei.org

APPENDIX

Annex I: International standard IEC 62474: How is the database kept up to date?

The procedure for updating the IEC 62474 database by the validation team is explicitly provided for and described in the IEC/ISO guidelines. This allows data elements to be kept up to date by a validation team without changing the standard itself. The validation team (VT) is composed of representatives of the national standards committees (NCs). In consultation with the NCs, they decide on the inclusion/ non-inclusion of new substances/substance groups or material classes. The update cycles are kept short, so that changes to the database can be implemented in less than half a year, which has already been demonstrated several times in practice.

To keep the database up to date, a two-step process is applied following the IEC/ISO guidelines. National standards committees submit amendments to the IEC 62474 database. In a first step, the validation team verifies whether the submitted amendment requests meet the criteria of the standard and modifies the requests if necessary. In a second step, they are submitted for voting by the NCs. In this second step, no comments are possible, but amendments based on comments can be withdrawn and amended accordingly and resubmitted in the next cycle. If the vote is positive, the changes are implemented in the database.

In Germany, the members of the validation team are appointed by DKE/K 135.

All new proposals or amendments to the database that are put to the vote are distributed via the DKE and the corresponding German committees (including ZVEI) and evaluated in a six-week voting procedure.

In addition, it is possible to submit proposals for changes to entries in the database as well as substances or substance groups and material classes for new inclusion to the validation team via DKE/K 135. The criteria 1 to 3 explained in chapter 4.1 must be observed and the official 'Change Request Format' (available from DKE) must be used.

Annex II: International standard IEC 62474: Work of validation team based on example of REACH Candidate List

Basically, according to the sense of the standard, substances on the REACH candidate list, as far as they are relevant for the E&E industry, must be declared. Since they are regulated via the REACH regulation and entail an information obligation within the supply chain if the criteria of Article 33 of the REACH Regulation (see chapter 2.1) are met, they must be included in the IEC 62474 database under criterion 1. However, a prerequisite is that applications of the substance exist in the electrical engineering and electronics industry. In the meantime, a half-yearly cycle has been established for updating the candidate list and the validation team (VT) has also adjusted its work to this rhythm and consistently carries out a half-yearly update of the IEC 62474 database to provide the supply chain with up-to-date information as promptly as possible.

In addition, the validation team reminds the national standardisation committees of the possibility to submit new and/or amendment requests. The validation team collects information on whether the new substances on the REACH candidate list under discussion are used in the electrical and electronics industry. If this is confirmed, representatives of the various NCs submit substance-specific new and/or amendment requests. First these are checked for relevance by the VT. In this context, it is desirable to report any information on known applications to the national representatives in the VT, as these applications are deliberately listed in the database to provide targeted information. For the optimal further development of the database, it is therefore helpful to feed examples of applications directly into the process. The ZVEI's working group on substance policy can be used as a contact point for this purpose.

Subsequently, all applications are submitted for voting by the NCs. After a positive vote, the database is adapted. The IEC 62474 database is usually updated shortly after the publication of new substances on the REACH candidate list.

Annex III: Practical Example Material Declaration

See following pages

Practical Example Material Declaration

With the publication of the ZVEI guideline on "Material declarations within the supply chain", it was quickly recognised by the ZVEI working groups that examples would be very helpful as a visualisation for understanding.

The need was taken up and implemented by the Core Group Material Declaration, formerly known as the 'Expert Group Communication'. The practical examples are deliberately not referred to as "best practice", as the latter is defined by sector-, company- and supplier-specific framework conditions, i.e. the existing or common data structure, and the extent to which consumers or major customers require information.

In the following examples, a component is described by the different declaration types from the guideline. It may be of interest to the reader, how in which way the different information content is presented in the different declaration types.

Core Group Material Declaration within the ZVEI Working Group on Chemicals Policy | 12. July 2022

Practical example material declaration – plug-in connector




A connector is used to illustrate the different levels of detail and the respective depth of information of the declaration methods:

- Supplier Declaration
- Material Declaration (MD)
- Full Material Declaration (FMD)

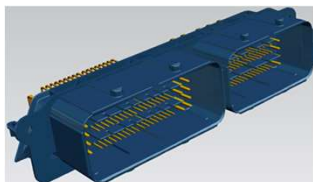
For the example, the following substances were included in the declaration for a plug-in connector.

- Lead (RoHS, ELV, ...)
 - 1** In the connector pins' tinning material (Pin 1.50 x 56.44)
 - 1*** In the CuZn39Pb3 material of the connector pin (Pin 0,64 x 48,38)
- Beryllium (REACH – RMOA substance evaluation process, CoRAP,.....)
 - 2** In the connector pins' tinning material (1.50 x 23.80 pin)
- Alpha-hexabromocyclododecane (HBCDD) (REACH Annex XIV, etc.)
 - 3** In the alignment plate 2 material

Practical example – material declaration – Explanation of terminology used below

- **Structural elements in material database**
 -  „Part“ (Housing, Connector pin, ...)
 -  „Material“ (PA66-GF50, ...)
 -  „Basic substance“ (lead, tin, copper, ...)
- **Details**
 - Evaluation system
 - X → Full description with all details
 - O → Reduced description, e. g., the connector pin is listed as a part but there is no distinction between model types (pin cross-sections, lengths)
 - - → No information
 - Structure
 - Mapping of the individual parts and materials listed in the product parts lists based on the structural elements of the material database used
- **Type (sub-component)**
 - list of sub-components such as pin form, housing, etc. and the quantity shown in the relevant declaration stage. In the example used, for instance, there are 12 different pin forms based on their geometrical dimensions (cross-section, length)
- **Database**
 - Number of structural elements shown (part, material, basic substance) in the database for the relevant declaration method
 - MD elements: All structural elements

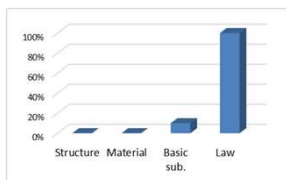
Supplier declaration (RoHS)



- RoHS supplier declaration
- Only includes information about substances in the legislation referred to

2 und **3** are not regulated under RoHS.

		Material declaration based on a substance list
Details	Type (sub-component)	-
	Quantity	-
	Structure	-
	Material	-
	Basic substance	0
Type (sub-component)	Pin forms	-
	Housing	-
	Applicator	-
	Sealing	-
	MD elements	-
Database	Parts	-
	Material	-
	Basic substance	1



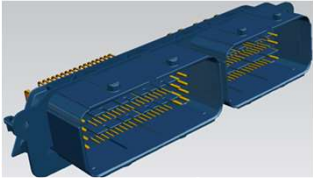
RoHS declaration (2011/65/EU)

RoHS declaration (2011/65/EU)*

Part- / Article-Number *	234 xyz				
Part- / Article-Name *	ZVEI-Muster				
Revision number of the product / article	00				
Total weight (g)	193,3				
Release of Report *	28.02.2022				
RoHS evaluation *	Does not fulfill the substance requirements				
Contained regulated substances *	CAS number	Concentration	Unit	Homogeneous Material	Exemption *
Lead/Lead Compounds		10	%	SnPb10	-
Lead/Lead Compounds		3,5	%	CuZn39Pb3	6c
RoHS Exemption(s)					
-					
6c: Kupferlegierung mit einem Massenanteil von bis zu 4 % Blei					
* Necessary information					

1
1*

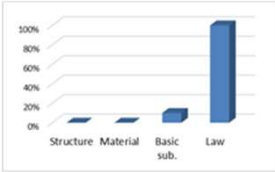
Supplier declaration (ELV)



- ELV supplier declaration
- Only includes information about substances in the legislation referred to
- **2** and **3** are not regulated under ELV.

Material declaration based on a substance list

Details	Type (sub-component)	-
	Quantity	-
	Structure	-
	Material	-
	Basic substance	0
Type (sub-component)	Pin forms	-
	Housing	-
	Applicator	-
	Sealing	-
Database	MD elements	-
	Parts	-
	Material	-
	Basic substance	1



ELV declaration (2000/53/EU)

ELV declaration (2000/53/EU) *	
Part- / Article-Number *	234 xyz
Part- / Article-Name	ZVEI-Muster
Revision number of the product / article	00
Total weight (g)	193,3
Release of Report *	28.02.2022
ELV evaluation *	Fulfill the substance requirements using the ELV-exemption 8a

1 →

1* →

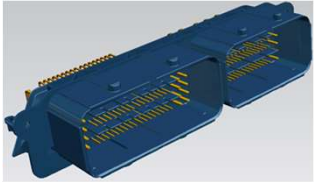
Contained regulated substances *	CAS number	Concentration	Unit	Homogeneous Material	Exemption *
Lead/Lead Compounds		10	%	SnPb10	8a
Lead/Lead Compounds		3,5	%	CuZn39Pb3	3

This product fulfill the substance requirements of the ELV with reference to the following exemptions:

ELV Exemption
8a: Lead in solders to attach electrical and electronic components to electronic circuit boards and lead in finishes on terminations of components other than electrolyte aluminum capacitors, on component pins and on electronic circuit boards
• Copper alloy with up to 4 % lead

*Necessary information

Supplier declaration (REACH)



- REACH supplier declaration
- Only includes information about substances in the legislation referred to
- **2** is not listed in the REACH candidate list for Annex XIV

		Material declaration based on a substance list
Details	Type (sub-component)	-
	Quantity	-
	Structure	-
	Material	-
	Basic substance	0
Type (sub-component)	Pin forms	-
	Housing	-
	Applicator	-
	Sealing	-
Database	MD elements	-
	Parts	-
	Material	-
	Basic substance	2



REACH declaration (Regulation (EU) No. 1907/2006)

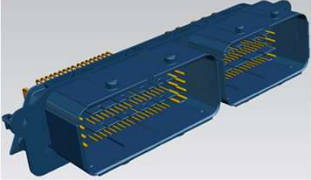
REACH declaration (Regulation (EU) No. 1907/2006)*		
Part- / Article-Number *	234 xyz	
Part- / Article-Name	ZVEI-Muster	
Revision number of the product / article	00	
Total weight (g)	193,3	
Date of Report *	28.02.2022	
SVHC-Information according to REACH Article 33 (Substances of very high concern) http://echa.europa.eu/candidate-list-table		
Substance name *	CAS / EC number	Information on safe use, if applicable
Cyclododecane, 1,2,5,6,9,10-hexabromo-, (1R,2S,5R,6R,9R,10S)-rel-	134237-51-7	
Lead / Lead compound	7439-92-1	
*Mandatory information		

3

1

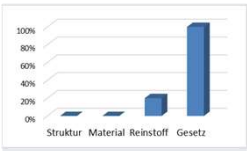
1*

Material declaration (MD) based on substance list



- Material declaration based on a substance list taking into account the relevant thresholds
 - IEC 62474
 - e.g. Global Automotive Declarable Substance List (GADSL)
- Only includes information about substances in the relevant substance list
- Additional information may be required, e. g., weight percentage, part/article number, etc.

		Material declaration based on a substance list
Details	Type (subcomponent)	-
	Quantity	-
	Structure	-
	Material	-
	Basic substance	0
Type (sub-component)	Pin forms	-
	Housing	-
	Applicator	-
	Sealing	-
	MD elements	-
Database	Parts	-
	Material	-
	Basic substance	3 / 7



A) Basic substances classified based on IEC 62474
 2 is not part of the substance list

Info on legal exceptions?

Description	CAS No.	GADSL SVHC	Percent [%]	Weight [g]
Nickel	7440-02-0	D	0,2805	0,3905
Cyclododecane, 1,2,5,6,9,10-hexabromo-, (1R,2S,5S)	134237-51-7	DP / SVHC	0,0129	0,0180
Lead	7439-92-1	DP	0,0051	0,0070

3

1

1*

Info on legal exceptions?

B) Basic substances classified based on GADSL/REACH

Description	CAS No.	GADSL SVHC	Percent [%]	Weight [g]
Copper	7440-50-8	D	36,7716	51,1810
Nickel	7440-02-0	D	0,2805	0,3905
Silver	7440-22-4	D	0,1430	0,1990
Beryllium	7440-41-7	D	0,0483	0,0672
Cyclododecane, 1,2,5,6,9,10-hexabromo-, (1R,2S,5S)	134237-51-7	DP / SVHC	0,0129	0,0180
Lead	7439-92-1	DP	0,0051	0,0070
Cobalt	7440-48-4	D	0,0037	0,0052

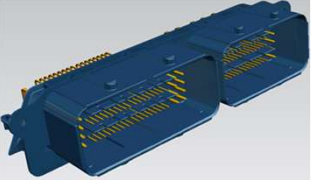
2

3

1

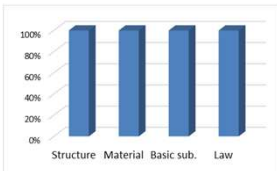
1*

FMD – Full Material Declaration



- Inclusion of all sub-components according to parts list
- Details of material and composition
- Evaluation and labeling of legally relevant substances in line with the database and parts list used, e.g. automotive sector or consumer

		FMD Full Material Declaration
Details	Type (sub-component)	X
	Quantity	X
	Structure	X
	Material	X
	Basic substance	X
Type (sub-component)	Pin forms	12
	Housing	1
	Applicator	2
	Sealing	1
Databases	MD elements	291
	Parts	20
	Material	59
	Basic substance	212



Material data

ZVEI-Muster-1

- 4* Pin 1.50 X 56.44
 - 0,0016g e-plate Ag (electrodeposited Silver Coatings)
 - 0,0028g Ep-Ni
 - 0,000631g e-plate SnPb10 (electrodeposited Tin-Lead Coatings)
 - 0,01 - 0,2% Kohlenstoff
 - 0,0 - 0,04% Schwefel
 - 5,0 - 15,0% Blei
 - Rest: 89,875% Zinn
 - 0,491g High Copper Alloy
 - 31* Pin 0.64 X 48.38
 - 0,000632g e-plate Sn (electrodeposited Tin Coatings, bright and matt)
 - 0,0016g Ep-Ni
 - 0,000778g e-plate Ag (electrodeposited Silver Coatings)
 - 0,221g CuZn39Pb3
 - 57,0 - 59,0% Kupfer
 - 0,0 - 0,05% Aluminium (Metall)
 - 0,0 - 0,3% Eisen
 - 0,0 - 0,3% Nickel
 - 2,5 - 3,5% Blei
 - 0,0 - 0,3% Zinn
 - 0,0 - 0,2% Sonstiges, nicht zu deklarieren
 - Rest: 38,425% Zink (metall)
 - 4* Pin 2.80 X 63.93
 - 2* Pin 2.80 X 65.33
 - 4* Pin 1.50 X 23.80
 - 0,0049g Ep-Ni
 - 0,861g CuBe2
 - Rest: 97,4% Kupfer
 - 1,8 - 2,1% Beryllium
 - 0,0 - 0,3% Cobalt
 - 0,0 - 0,2% Eisen
 - 0,0 - 0,3% Nickel
 - 0,0 - 0,5% Sonstiges, nicht zu deklarieren
- 0,0031g e-plate Ag (electrodeposited Silver Coatings)
 - 1* Pin 2.80 X 22.65
 - 31* Pin 0.64 X 41.48
 - 4* Pin 1.50 X 48.24
 - 4* Pin 1.50 X 41.34
 - 4* Pin 1.50 X 34.94
 - 31* Pin 0.64 X 54.78
 - 31* Pin 0.64 X 35.08
 - 1* Housing
 - 17* Pin 0.64 X 68.12
 - 17* Pin 0.64 X 61.18
 - 1* ALIGNMENT PLATE 1
 - 1* ALIGNMENT PLATE 2
 - 3,591g PA66 GF BLACK-ZVEI
 - 1,0% RuB
 - Rest: 49,5% GF-Faser
 - 1,0% Weitere Additive, nicht zu deklarieren
 - 0,5% Cyclohexan, 1,2,5,6,9,10-hexabrom-... (18,25,58,68,98,108)-ml
 - 48,0% PA66

- 1* Surface Finish
- 1* Sealing

Detailed info on substance evaluation (e.g. ELV, REACH, GADSL)

ELV exception used – here 8a, 3

Basic Substance	% (MAX)	Application [ID]
1 Lead	15	Lead in solder used in electronic circuit board applications - 8a...

Reinstoff	% (MIN)	% (MAX)	Anwendung [ID]
Nickel	0	0.3	Not applicable [34]
Blei	2.5	3.5	3 - Alloying element in copper [3]

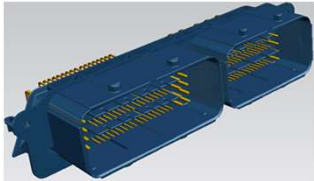
CAS No.: 7440-41-7
GADSL category: D- REACH-SVHC

Ref. substance list classification – GADSL

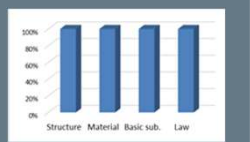
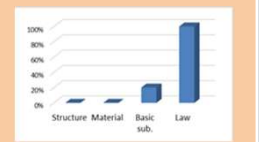
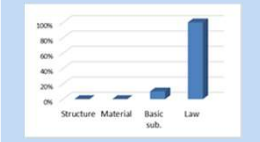
Ref. substance list classification – here GADSL and REACH

CAS No.: 134237-51-7
GADSL category: DP REACH-SVHC



Material declaration - overview



		Supplier declaration	Material declaration based on a substance list	FMD Every item in parts list recorded
Details	Type (sub-component)	-	-	x
	Quantity	-	-	x
	Structure	-	-	x
	Material	-	-	x
	Basic substance	0	0	x
Type (sub-component)	Pin form	-	-	12
	Housing	-	-	1
	Applicator	-	-	2
	Sealing	-	-	1
Database	MD elements	-	-	291
	Parts	-	-	20
	Substances	-	-	59
	Basic substances	2 / 1	3 / 7	212



Glossary

RoHS	R estriction of H azardous S ubstances	EU Directive on restricting the use of certain hazardous substances in electrical and electronic equipment
ELV	E nd of L ive of V ehicle (Altfahrzeug-RL / 2000/53/EG)	EU Directive on recycling end-of-life vehicles and definition of banned substances (Pb, Hg, Cr6+, Cd)
REACH	R egistration E valuation A uthorization of C hemical	EU regulation on the registration, evaluation, authorization, and restriction of chemicals
SVHC	S ubstance of V ery H igh C oncern	Designation for environmentally relevant substances as defined in REACH Annex XIV. Being classified as an SVHC can make the availability of preparations or materials based on such substances more difficult or interrupt it □ supply chain (supplier halts e.g. production of substance)
GADSL	G lobal A utomotive D eclarable S ubstance L ist	GADSL is a list of substances that may be used in the automotive industry Possible classifications: <ul style="list-style-type: none"> • D Declaration required • P Banned taking into account additional criteria • D / P Declaration required / banned with use of exceptions, e.g. ELV 8a
IEC 62474	Material declaration for products from and for the electrical engineering industry	Specifies the process, content, and form when preparing material declarations for products of companies that operate in or supply the electrical engineering and electronics industry..
	Declaration obligation	Legally regulated substance, e. g. ELV, RoHS, etc.
	Declaration interest	The substance is, for example, currently being examined with a view to changing the legal classification
CoRAP	Community Rolling Action Plan	REACH method for evaluating substances

Contact

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electrifying
ideas

