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| Date | Document | Project Nr. |
|  | 111/461/CD |  |

| **MB/NC** | **Line number**(e.g. 17) | **Clause/ Subclause**(e.g. 3.1) | **Paragraph/ Figure/ Table/**(e.g. Table 1) | **Type of comment** | **Comments** | **Proposed change** | **Observations of the secretariat** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| BE-01 |  |  |  | Ge | Despite some improvements, the Belgian NC cannot yet support the document as presented. Areas of concern are detailed below |  |  |
| DE-01 |  | General document |  | ge | Due to the high relevance to plastics as a material as well as certain substances used for plastics, this project will need to be liaised with the corresponding TC 61 of ISO. | Establish liaison with ISO TC 61 plastics committee. |  |
| DE-02 |  | General document |  | ge | PT63031 collected plenty of information on the different interpretations of this term. PT63031 now possesses a wide overview of the different opinions as well as of the background on “Low Halogen” materials.This overview and information that was collected shows, in the opinion of the German NC, that a horizontal definition of “Low Halogen” materials, that is valid for the whole electric and electronic, is not possible at the moment. Different parts of the electric and electronic industries have different understanding of the term “Low Halogen” materials. These different understandings cannot be combined at the moment. | We suggest that PT63031 uses the many information collected to issue a TR that shows the different options to understand the term “Low Halogen” materials instead of an IS.  |  |
| DE-03 |  | General document |  | ge | A standard for the definition of “Low Halogen” materials has to give a clear and unambiguous definition. This is not given in the provided CD2. Threshold values in clause 4 refer to a material. The word material is defined in clause 3.1. as “substance or mixture within a product or product part”. (e.g. addressed range of materials in introduction and in scope are not in line)From this, it is not clear how the specification can be applied to electrical equipment. The threshold values could be referred to the weight of a component of electrical equipment or to the weight of the complete equipment. Both would be possible with the current CD2 but with completely different result.A possible definition that would be clear and unambiguous could refer to the homogenous material as defined in IEC 62474. However, this would mean that for complex equipment several hundreds or thousands of parts had to be considered. This would require enormous efforts especially when total elemental halogen is considered. Thus, we do not agree that it is possible to check a clearly defined “Low Halogen” specification that covers total elemental halogen without requiring disproportionate efforts.  | Clarify scope of materials and ‘low halogen’ definition in respect to materials and aggregation level addressed. Clarify operational process and efforts.  |  |
| ES |  | General document |  | Ge (general) | Due to the high relevance to plastics as a material as well as certain substances used for plastics, this project will need to be liaised with the corresponding TC 61 of ISO. | Establish liaison with ISO TC 61 plastics committee. |  |
| ES |  | General document |  | ge | PT63031 collected plenty of information on the different interpretations of this term. PT63031 now possesses a wide overview of the different opinions as well as of the background on “Low Halogen” materials.This overview and information that was collected shows, , that a horizontal definition of “Low Halogen” materials, that is valid for the whole electric and electronic, is not possible at the moment. Different parts of the electric and electronic industries have different understanding of the term “Low Halogen” materials. These different understandings cannot be combined at the moment.We therefore suggest that PT63031 uses the many information collected to issue a TR that shows the different options to understand the term “Low Halogen” materials.   | PT63031 should issue a TR (Technical Report) instead of an IS. |  |
| GB 1 |  | Whole document |  | General | The scope of TC111 is very clearly limited to environmental matters, not safety matters. While there are substance restrictions placed on halogens because undesirable environmental environmental impacts, other restrictions are placed on the use of halogens due to undesirable consequences for human health and/or safety. As safety is not within the scope of TC111, any standard produced by TC111 should not deal with safety matters. | Ensure, in the title, scope and content of the document that it is made clear that this document is concerned only with the environmental consequences of the use of halogens and their compounds.Any restriction on a halogenated substance should be based on a knowledge that the substance is environmentally hazardous and not simply because it contains a halogen.If the above is not agreed then TC111 should request a change in its scope to the IEC SMB. |  |
| GB 2 |  | Whole document |  | General | It is not clear if this standard applies only to individual parts used to consrruct electrical or electronic equipment (EEE), or the end EEE (which may in turn include non-elctrical accessories). Even if the provisions only apply to parts used in EEE, does the term “low halogen material” apply to the whole of that part or to each indivisible substance used to form that part/ | Clarify |  |
| GB 3 |  | Whole document |  | ed | “Low Halogen” should be “low halogen”.There is no need for the use of upper case. | Change to “low halogen” throughout. |  |
| JP1 |  | Complete document |  | ge | **[Comments from chemicals and materials suppliers point of view]**According to the Strategic business plan (SBP) of IEC TC111, the standards have the potential to positively influence the harmonisation of requirements specified in legislation and with it conformity assessment worldwide. The SBP also mentions that TC 111 provides TCs/SCs with basic and horizontal standards, including guidelines and technical reports in the environmental area.Although IEC TC 111 has worked proactively regarding the standardization needs on environmental topics by publishing standards on hazardous substances etc, care shall be taken those standardization is to be discussed under scientific justification point of view and scope of the standard should focus on regulated substances of environmental concern only. Existing standards including component or material definitions with halogen content in specific TCs/SCs or industry associations can be referenced as information only. However, they should not be used normatively as the definition of IEC 63031 to be influenced on unspecified TCs, SCs or industries in electrical and electronic products, without scientific justification of substances and thresholds in scope and their appropriate analytical methods. | **[Proposals from chemicals and materials suppliers point of view]**Please indicate the following items in this standard. In case they could not be described, it should be TR, not IS or TS.1. Purpose, necessity and reasons relating to environment / human health safety of this definition should be specified.2. Specific description of the method for identifying and analysing content of the halogen-containing substance in the product should be described.3. Material declaration should be Criteria 1 (regulated substance) of IEC 62474 database.When including Criteria 2 & 3, describe not only hazard assessment, but also evaluation of halogen-containing product chemical risk.  |  |
| NL 01 |  | General |  | ed/te | From the whole document it is not really clear **why** one needs to have this “Low halogen material” definition, and **who** needs it. If we are not able to give a good explanation why we need this standard, then we might not need it… | Add explanation of the reason **why**, and **who** is waiting for this standardIf no realistic and scientifically founded explanation can be given, propose to STOP itInstead, a study on its need could be an alternative |  |
| US1 |  |  |  | Ge | The USNC wishes to thank PT 63031 for its work on this draft international standard, given the complexity of stakeholder wishes. We include the following comments to improve the value of this standard within the electrotechnical industry.  |  |  |
| ES | 001 | Title |  | ge | Due to the fact that not “all” halogens can be covered by the standard we propose to change the title. | Change the title to: “Definition of low halogen materials used for electrical and electronic products **based on certain halogenated compounds**.” |  |
| JP2 | 001 |  | Title | Ge, Ed | **[Comments from chemicals and materials suppliers point of view]**Existing standards in IEC TCs/SCs or industry associations which provide material or component definitions with specific halogen content, aim at differentiating materials with scope of halogens and the threshold with no environmental justification, but according to specific market circumstances in various.A standard developed by IEC/TC111 should focus on environmental issues for the definition of such terminology and contribute to avoid inconsistency between standards on environmental specifications and guidelines.Terminology of “low halogen” does neither address nor imply to solve environmental issues scientifically. But terminology of “low concern” directly implies a need of industries to solve them.This change of title will also solve another issue for specific industry (JEDEC) who already has a standard of **low halogen** definition.  | **[Proposals from chemicals and materials suppliers point of view]**Modify the title as follows:“DEFINITION AND GUIDANCE OF ~~LOW~~ HALOGEN MATERIALS OF **LOW CONCERN** FOR ELECTRICAL AND ELECTRONIC PRODUCTS”If this is accepted, “low halogen materials” or “material defined as low halogen” is to be changed to “halogen materials of low concern” in the whole document.  |  |
| NL 02 | 001 | Front page |  | ed | Title: “Definition of Low Halogen Materials used in Electronic and Electrical Products” 🡪 should consistently use combination “electrical and electronic” throughout the document | Title: “Definition of Low Halogen Materials used in Electrical and Electronic ~~and Electrical~~ Products” |  |
| US2 | 001 | Title |  | Ed | Change title to reflect the actual “materials of concern” for low halogenated additives | Change title to: “Definition of Low Halogenated Materials of Concern for Electrical and Electronic Products” |  |
| JP3 | 005-28 | Title |  | ge | **[Comments from electronic/electrical product manufacturers and fluoropolymer suppliers point of view]**Not all of the elemental halogen or halogenated compounds are harmful to humans or the environment, then we should not have unwarranted and unscientifically defensible definition of low halogen. We have concern that once the definition of low halogen materials is established, it will be used to restrict some elemental halogens or halogenated compounds. Therefore, we should only focus on hazardous halogens. | **[Proposal from electronic/electrical product manufacturers and fluoropolymer suppliers point of view]**Change of title into:DEFINITION OF LOW HALOGEN MATERIALS OF **CONCERN** FOR ELECTRICAL AND ELECTRONIC PRODUCTS |  |
| SE 01 | 006 | Introduction |  | te | Suggested to delete: “other organic” in order to align with the scope. | To change text to: “Polymers and non-metallic and non-ceramic materials and their additives containing halogenated compounds are utilized in various electrical and electronic equipment (EEE) applications, including those where flammability resistance is an important characteristic.” |  |
| US3 | 006 | Introduction |  | Ed | The word “organic” should be removed. There is no additive reason to include this description here. | Polymers, non-polymeric, non-metallic and non-ceramic materials and their additives containing.  |  |
| DE-04 | 006-17, 28 | Introduction |  | te | We understand that the secretariat wants the standard not to be related to substance regulations. Corrosiveness and toxicity of certain fire effluents in case of accidental burning is not the aim of a horizontal standard. It should be covered by specific fire protection standards; which are well considered at ISO TC 92.Export of waste electric and electronic equipment to countries where open burning happens intentionally is an illegal process. It can therefore not be the aim of a standard.We therefore see as only possible justification for this standard the fact that no common definition of “Low Halogen” materials exists yet. This would not outweigh the drawbacks this standard would bring due to the impossibility to find a workable and reliable definition. | Clarify purpose and benefit for application of this intended specification.  |  |
| NL 05 | 011-17 | Introduction |  | ed | This paragraph makes the standard appear biased; it brings generic negative context to halogenated substancesBesides, this paragraph brings no real value to the Introduction part of the standard | Remove text in lines 11-17 |  |
| US4 | 011-17 | Introduction |  | Ge | Remove this paragraph and three bullet items. Qualitative / anecdotal comments such as these are controversial, inaccurate and inflammatory to many stakeholders in the Electrical and Electronic Products Supply Chain. These kinds of statements do NOT belong in an introduction as they could be misleading to the reader as to the intent to use this standard to deselect all halogenated products. To reach consensus, both within each National Committee as well as within TC 111, this kind of rhetoric should be removed in favour of simply the mission and definition of “low halogen” in this Standard. | Strike Lines 11 - 17 |  |
| BE-02 | 019 | introduction |  | Te | “The term low halogen is currently not well defined…” is not fully true; there are several definitions from recognized bodies, but they are not identical and do not cover all EEE.  | Change to something like: “***The tem ‘low halogen’ has been defined for specific industries, but there is currently no definition that could be adopted by EEE industry as a whole. Therefore, IEC TC111 believes it is necessary to provide a definition that could be supported internationally for materials used in all EEE***” |  |
| NL 06 | 019 | Introduction |  | ed | No added value to include the words “all” and “consensus” | Remove “all” and “consensus”:“The term “low halogen” is currently not well defined for ~~all~~ EEE in any international ~~consensus~~ standard” |  |
| US5 | 019 - 24 | Introduction | Par 3 | Te | Contrary to the line 19, low halogen is defined for EEE in at least three different international standards and consortium bodies, JEDEC, EIA, IPC, iNEMI, JEITA and IEC. Limit the scope of this new “low-halogen” standard and the respective definition to halogenated materials of concern which are present in the IEC 62474 database.  | Eliminate “The term “low halogen” is currently not well defined for all EEE many non-metallic and non-ceramic materials in any international consensus standard.” and replace with;“The term “low halogen” is currently defined by international electronics standards organizations although there is no unanimous consensus on the qualitative or quantitative definitions. However there is some discrepancy between the standards as to which term is used and how the terms are defined. To ensure a uniform and consistent understanding of the meaning of “low halogen” throughout the industry, this term needs to be harmonized, and to the extent possible in a horizontal standard, clearly defined as it pertains to many different materials within EEE products. The periodic table identifies the halogen group as containing fluorine, chlorine, bromine, iodine, and astatine; however, this document defines the term “low halogen” as it specifically concerns EEE, halogen compounds and their applications listed within the IEC 62474 Database are the only halogens being considered .” |  |
| IT03 | 022-25 | INTRODUCTION |  | te | Not only astatine, but also fluorine and iodine should not be considered among the halogens of concern | Amend the sentence as follows:The periodic table identifies the halogen group as containing fluorine, chlorine, bromine, iodine and astatine; however, since this document defines the term “low halogen of concern”, as it specifically concerns EEE, astatine is not being considered, likewise fluorine and iodine are not considered: these halogens (particularly fluorine) are widely used in electrotechnology (see Annex A) and with the current status of knowledge they are not of concern for the health and the environment.  |  |
| US6 | 024 – 26, 28 | Introduction | Par 3 | Te | This standard should educate users and permit them to make an informed decision about halogenated materials of concern that does not place unjustified limitations on materials of composition. | When ~~implementing~~ determining if a “low halogen” technology is appropriate, this standard ~~shall~~ may be utilized to identify the industry accepted definition within the electrical and electronic industry to help address halogenated materials of concern.Note: Criteria 3 reporting requirements in the 62474 database are optional, should one choose to define materials or products as Low-Halogen, the requirements including Criteria 3 are considered mandatory. |  |
| JP5 | 025 |  | INTRODUCTION | ed | POPs regulation is included by the Line 15 | Delete Line 16 |  |
| JP6 | 026 |  | INTRODUCTION | ge | The term “technology” cannot be used here, since it is not an issue. | Use “term” instead of “technology”. |  |
| BE-03 | 028 | introduction |  | Te | “compliance with any legislation” is not the adequate term; it should be “conformity” (in the same meaning as “declaration of conformity”); on the other hand, “conformance” is not used anywhere in the document. | Change the full sentence” into: “***Compliance with this standard does not imply conformity with any legislation***”. By consistency with section 5.2, “conformity” could also be used at both places, to give the alternate proposal: “***Conformitywith this standard does not imply conformity with any legislation***”. |  |
| JP7 | 028 |  | INTRODUCTION | ge | The definition needs to be limited only to products in E&E field. | Within ONLY the electrical and electronic industry. |  |
| JP8 | 029-34 | Introduction |  | Ge | Need to explain the background of the standard and the current situation of existing various standards related to halogen content from the point of view of fire safety, reliability, etc. and to clarify the standard does not intrude and unify existing standards and intend to enforce the application of a product/industry standard listed in criteria 3 to other products and product groups  | Add the following sentences.Various words and definitions related to halogen content such as low halogen, halogen free, and non-halogenated have been specified by product standards or industry standards individually, from the point of view of fire safety, reliability or market requirement.This standard doesn’t intrude or unify the definitions of those existing standards.This standard intends to specify the definition low halogen material of concern in order to reduce negative environmental impact and its risk in product life cycle of electric and electronic products, based on IEC62474 database.There is no intention to enforce the application of a product or industrial standard listed in the IEC62474 database to other products or product groups. |  |
| BE-04 | 030 | 1 |  | Te | Is it not useful to specify that only solid materials are in scope  | Consider adding “***solid***” before “polymeric, non-metallic and non-ceramic materials…” |  |
| IT04 | 030 - 31 | 1 |  | te | Previously published standards should not be encompassed by this new standard as the definitions and requirements are well known and adopted across the electronics industry. | Amend text as follows: “This International Standard defines Low halogen of concern content in polymeric …” instead of “… low halogen content …”. |  |
| US7 | 030 - 31 | Scope | Par 1 | Te | The scope of this standard should be limited to halogenated materials of concern. | This International Standard defines low halogen content in polymers, non-polymeric, non-metallic and non-ceramic materials of concern and their additives for use in electrical and electronic products. |  |
| JP10 | 030-34 | Scope |  | T | **[Comments from electronic/electrical product manufacturers point of view]**The scope as written does not ensure exclusion of liquids and/or gases enclosed within products (batteries etc), except where listed in the IEC 62474 database | **[Proposal from electronic/electrical product manufacturers point of view]**Change of scope to “definition of low halogen materials of concern used in electrical and electronics”The new scope should read as follows (addition is bold and underlined below):This International Standard defines low halogen **materials of concern** content in non-metallic and non-ceramic materials for use in electrical and electronic products.Materials that are used during processing, in product delivery systems, or in product packaging (i.e. shipping materials), which may contain any form of halogens, but do not remain within the product are not in the scope of this document. **Substances or substance mixtures within the product as liquid state (e.g. electrolyte, coolant)**  **and/or gases enclosed within products (batteries etc), except where listed in the IEC 62474 database are also not in the scope of this document.** |  |
| JP9 | 030-34 | 1 |  | Ge/Te | **[Comments from chemicals and materials suppliers point of view]**Definition of low halogen materials developed in IEC/TC111 should not aim at lowering halogen content in materials with no environmental hazard or risk assessment. Instead, the definition should be standardised to minimize risk of halogens at necessary level of environmentally safety aspect, and maximize the benefits of halogens in consideration of the individual market circumstances. Chlorine is the substance to help to digest nutrition from food as salt which exists at 5 % in human body, whereas it also has disadvantage to increase risk of high blood pressure or heart disease. Similarly, PVCs are used in various electrical and electronic products where they contribute to fire prevention as well as long term thermal aging residence and softness, and Bromine is used in the products as flame retardant which have fire prevention against short-circuit and overcurrent. Then safety of those halogens should be quantitatively evaluated with both hazard and exposure (or intake) of the substances.It will be likely to cause increase of other risks, if use of halogenated substances is restricted without the above evaluation properly.  | **[Proposals from chemicals and materials suppliers point of view]**Scope should be changed not directly to aim at setting low halogen content, and more focus on how to use definitions of low halogen contents in supply-chain, as follows:“This International Standard defines environmental communication guidance of low halogen content in polymeric, non-metallic and non-ceramic materials and their additives for use in electrical and electronic products. Materials that are used during processing, in product delivery systems, or in product packaging (i.e. shipping materials), which may contain any form of halogens but do not remain within the product are not in the scope of this document.” |  |
| FR 3 | 031 | 1 |  | te | The dashed item in line 16 and the second part of the specification in clause 4 line 91 “….thresholds of all halogenated substances in IEC 62474 database” clearly illustrate that, from an environmental point of view, only substances are relevant and elements are not relevant. A low halogen content is only a simple/simplistic way to ensure that a possible release of potentially hazardous halogenated substances remains low. This basic idea shall be made clear in this standard | Add in the scope after line 31, the following new paragraph:“From an environmental point of view, the hazard is only relevant at substance level and a low halogen content is a simple mean to ensure that a possible release of potentially hazardous halogenated substances remains low.” |  |
| FR 4 | 031 | 1 | 1 | ed | The possible additives are included in the polymeric materials. | Replace “and” with “including” to read “…materials including their additives … “ |  |
| IT05 | 040 | 2 |  | ed | “(all parts) is no more allowed by ISO/IEC most recent edition: only those parts really referenced must be listed in the normative references | Check if it is really necessary to consider all parts, if so add the whole list of titles |  |
| NO | 040 | 2 |  | Te | Reference to IEC 62474 is dated but the database is going to evolve regularly and the IEC 63031 will be then out-of -date | Remove the date when referring to IEC 62474; or differentiate the standard (dated) from the database (undated) |  |
| SE 02 | 040 | 2 |  | te | Reference to IEC 62474 is dated but the database is going to evolve regularly and the IEC 63031 will be then out-of -date |  Remove the date when referring to IEC 62474 or differentiate the standard from the database (undated.) |  |
| CN-3 | 040~43 | 2 | 2~4 | technical | lack of critical normative references, such as IEC 60754-3, EN 14582 and EN 45545-2, important for the determination of the content of halogen, which are mentioned in this standard | add normative references such as IEC 60754-3, EN 14582 and EN 45545-2 |  |
| BE-06 | 041 | 2 |  | Te | A new version of IEC 62474 has reached CDV stage and is likely to be published before IEC 63031 | Consider referencing the future IEC 62474 (111/459/CDV), as there are significant differences between both versions |  |
| US9 | 041 | 2.0 | 3rd para | Ge | It is anticipated that the IEC 62474 Ed 2.0 CDV or FDIS will be issued by the time that the IEC 63031 CDV or FDIS is prepared. | Change the reference to IEC 62474 Ed 2.0 CDV, FDIS or as issued, depending on status at the time of issue of IEC 63031. |  |
| GB 4 | 042 - 43 | 2 |  | ed | Text formatting for IEC 63000 is not consistent.  | Use the same format as for the other two normative references.  |  |
| NL 07 | 042-43 | 2 |  | ed | Different letter type/size/color used | Align letter type/size/color with the other references |  |
| JP13 | 044-67 | 3 |  | Te | JEDEC JS709B standard provides the definition of low halogen materials for electronic products only and electrical products are not intended within the scope. However, terminology of electronic products in the JEDEC standard may look very broad and seem to include electrical products when their definition is extended to all IEC electrotechnical product because there is not clear definition of electronic product and electric product.If criteria 3 of IEC 62474 or the JEDEC standard is used for the low halogen material definition as normative and some part of the definition only covers either of electrical and electronic products, both of two product categories shall be defined in IEC 63031 clearly and separately. | Definition of electrical product added to Clause 3 as follows:“3.1.y electrical product A product operated by energy of electrical current and voltage and transform electrical energy in simple ways into some other form of energy or provide it to other product, regardless of containing electronic devices or not“ |  |
| JP14 | 044-67 | Terms, definitions and abbreviations | Terms and definitions | te | About definition of material, specify that metal and ceramic are excluded in order to clarify the object in Specifications.  | Rewrite definition of material as following.(add the sentence “metallic and ceramic materials excluded”.)**material**substance or mixture within a product or product part, metallic and ceramic materials excluded. |  |
| JP15 | 044-67 | Terms, definitions and abbreviations | Terms and definitions | ge | Add the following definition of reporting threshold level, in order to clarify the Specifications proposed below. | Add definition of reporting threshold level as following.**reporting threshold level**concentration limit at or above which the presence of a declarable substance in a material or product is declared if declaration of the declarable substance is mandatory according to the IEC 62474 Database, or if it is agreed on to be declared[SOURCE: IEC62474:2012, Terms and definition 3.12] |  |
| JP11 | 044-88 | Scope |  | Ge | **[Comments from TC91 electronic product manufacturers point of view]**The definition of Low Halogen is widely accepted in the industry based on IEC 61249-2-21 and JS-709A (Joint JEDEC / ECA Standard) which are existing standards concerning "Low Halogen Materials" and specifically target Br and Cl only. There is no scientific reason to include F and I simply because they are halogens.IEC 61249-2-21 came out in November 2003, and it immediately became the worldwide standard to define “low-halogen” in CCL. This has been a standard for a long time and is well known worldwide. Many other standards organizations have based their bromine and chlorine limits based on IEC 61249-2-21.The requirements from the IEC PAS 63015: 2016 standard defines low halogen as Br and Cl only. | **[Proposal from TC91 electronic product manufacturers point of view]**While material shall meet the threshold of the halogenated substances listed IEC62474 criteria 1,2 and 3, align IEC 63031 with these globally accepted industry definitions (PAS) and remove the F and I requirements. |  |
| JP12 | 044-88 | 3 |  | Te | JEDEC JS709B standard provides the definition of low halogen materials for electronic products only and electrical products are not intended within the scope. However, terminology of electronic products in the JEDEC standard may look very broad and seem to include electrical products, when their definition is extended to all IEC electrotechnical product because there is not clear definition of electronic product and electric product.If criteria 3 of IEC 62474 or the JEDEC standard is used for the low halogen material definition as normative and some part of the definition only covers either of electrical and electronic products, both of two product categories shall be defined in IEC 63031 clearly and separately. | Definition of electronic product added to Clause 3 as follows:“3.1.x electronic product A product containing one or more electronic devices performing major functions of the product. It can be used interchangeably with electronic component.Note: electronic device is a device the function of which is based on charge carriers moving through a semiconductor, a high vacuum or a gas discharge. Examples of electronic devices include transistors, integrated circuits, hybrid integrated circuits, and modules containing active electronic components.” |  |
| BE-05 | 045-68 | 3.1 |  | Te | Since IEC 63031 refers to IEC 62474, it should be useful to add some definitions, taken from IEC 62474 (111/459/CDV).As a general remark, the whole document should be checked for wording consistency with the upcoming version of IEC 61474 (after application of the changes resulting from the comments on the CDV) | **3.1.x****declarable substance**substance that meets specified criteria for reporting according to IEC 62474**3.1.xreporting threshold level**concentration limit at or above which the presence of a declarable substance in a material or product is declared if declaration of the declarable substance is mandatory according to the IEC 62474 Database, or if it is agreed on to be declared |  |
| NL 08 | 046-47 | 3.1 |  | ed | It is not realistic to expect that users of this standard will acquire (buy) the ever growing 62321 series (now already 12+ standards) to access definitions | Remove the sentence“~~For the purposes of this document, the terms and definitions given in IEC 62321 (all parts), as well as the following, apply~~”Instead, add the definitions of the specific parts of the IEC 62321 series that are relevant to this standard |  |
| US10 | 053-sq | Terms,definitions and abbreviations | New | Te | Need a new definition for fluoropolymer to help users understand the exclusion as not being halogenated materials of concern. | Add-Fluoropolymer – carbon only polymer backbone with direct attachment of fluorines. See Buck et al., 2011. |  |
| GB 5 | 056 | 3.1.2 |  | ed | The asterisk is unnecessary. | Delete the asterisk. |  |
| NL 09 | 056 | 3.1.2 |  | ed | What is the meaning of the asterix behind the word iodine? | Remove the asterix |  |
| GB 6 | 057 | 3.1.2 |  | ed | The format of the ‘NOTE’ is not in line with the IEC drafting rules.  | Replace NOTE: with ‘Note 1 to entry:’  |  |
| IT06 | 057 | 3.1.2 |  | ed | Hanging asterisk to be deletedNOTE should become “NOTE to entry” per last IEC template | Amend accordingly |  |
| US11 | 058-sq | Terms,definitions and abbreviations | New | Te | A new NOTE (as compared to the NOTE for Astatine) should be added to help explain why fluorine from fluoropolymers is not included. Please see detailed remarks in (PT63031\_0075\_INF) for further explanation. | If the halogens are defined as only those present in the IEC 62474 Database, this proposed change is not relevant.If the halogens are defined as all elemental F,Cl, Br and I (e.g. 0.9% threshold), this following change is proposed. “NOTE Fluorine from fluoropolymers (E.g., PTFE) has no practical significance within the context of this standard. Fluoropolymers (carbon only polymer back-bone with direct attachment of fluorines) are a well-defined, safe, and uniquely respected class of materials that exhibit high durability and long functional life. Therefore fluoropolymers are not halogenated materials of concern. “  |  |
| US12 | 058-sq | Terms,definitions and abbreviations | New | Te | Need a new definition of halogenated material of concern to help users understand the scope of this standard. Any inclusion of toxicity/corrosivity should be in the context of all fire effluents (e.g., CO, HCN, smoke particulates, etc.), mass of material to volume of fire effluent and time to reach temperatures at which fire effluent is generated. See Alarie, 1985. | “Halogenated material of concern – those materials that are restricted, and/or are persistent organic pollutants (PBTs or POPs), and produce corrosive/toxic fumes upon combustion.” |  |
| GB 7 | 060 | 3.1.3 |  | ed | “Material” should be “material” | Change to lower case. |  |
| BE-09 | 062 | 4 |  | Te | In order to give some level of certainty, and avoid the need for overnight changes, there must be a way to identify which version of the DB has to be used at a given time | Specify a cut-off date for the DB (e.g. the publication date of IEC 63031) a transition period after each change to the DB (in the spirit of the RoHS substance list) |  |
| GB 8 | 062 | 3.1.3 |  | ed | “IEC62474” should be “IEC 62474” | Insert a space. |  |
| GB 9 | 062 | 3.1.3 |  | ed | ISO 62474:2012 is referenced. | Add this reference to the Bibliography. |  |
| NO | 064 | 3.1.4 |  | Te | The word “plastic” is only used in the informative annex. No real reason to keep it in the paragraph 3 on terms and definitions | Remover definition of plastics |  |
| NO | 064 | 3.1.4 |  | Te | The definition of plastic is issued from ISO 21070 “Ships and marine technology -- Marine environment protection -- Management and handling of shipboard garbage” which is not the most appropriate choice for plastics definition reference.Use a “more official” definition from ISO 472 standard on Plastics Vocabulary | Use the ISO 472 definition of plastics : “material which contains as an essential ingredient a high polymer and which, at some stage in its processing into finished products, can be shaped by flow” |  |
| SE 03 | 064 | 3.1.4 |  | te | The definition of plastic is issued from ISO 21070 “Ships and marine technology -- Marine environment protection -- Management and handling of shipboard garbage” which is not the most appropriate choice for plastics definition reference.Use a “more official” definition from ISO 472 standard on Plastics Vocabulary | Use the ISO 472 definition of plastics : “plastic,nounmaterial which contains as an essential ingredient a high polymer and which, at some stage in its processing into finished products, can be shaped by flow” |  |
| FR 5 | 065 | 3.1.4 |  | ed | There is likely a better source to define “plastic” than ISO 21070:2011Ships and marine technology — Marine environment protection — Management and handling of shipboard garbage | Replace with the following definition 2.702 taken from ISO 472 Plastics – Vocabulary:“**plastic**, nounmaterial which contains as an essential ingredient a high polymer and which, at some stage in its processing into finished products, can be shaped by flowNote 1 to entry: Elastomeric materials, which are also shaped by flow, are not considered to be plastics.Note 2 to entry: In some countries, particularly the United Kingdom, the term “plastics” is used as the singular form as well as the plural form.” |  |
| NL 10 | 065 | 3.1.4 |  | ed | What is the meaning of the word ‘high’ in “organic high polymers”? | Remove the word ‘high’ in line 65 |  |
| GB 11 | 065 - 66 | 3.1.4 |  | ed | Text formatting is not consistent.  | Correct the text formatting |  |
| US13 | 065-67 | 3.1.4 |  | Ed | Not all plastics are formed into a finished product using heat and pressure. As an example, extruded rod stock can be considered as an intermediate product, and once machined or cut, then becomes a final product. Another example are reaction injection molding compounds that are simply pumped into a mold where they react and harden. | Delete words “. . . by heat and/or pressure”Replace by: “by flow or other means” |  |
| GB 10 | 068 | 3.1.4 |  | ed | ISO 21070:2011 is referenced. | Add this reference to the Bibliography. |  |
| SE 04 | 082 | 3.2 |  | te | In accordance with comments SE17, SE19 and SE20, PFAS to be included in Annex A | Add to the abbreviations:PFASPerfluorinated Alkylated Substances |  |
| NL 11 | 086 | 3.2 |  | ed  | What is the correct scientific abbreviation of Polyvinylidenefluoride? PVDF or PVdF? | Correct abbreviation ‘PVdF’ if relevant |  |
| SE05 | 088 | 3.2 |  | te | Change wording, singular “paraffin” to plural “paraffins” | SCCP Short Chain Chlorinated Paraffins |  |
| JP16 | 089 | Terms, definitions and abbreviations | Terms and definitions | ge | Add the following definition of reportable application, in order to clarify the Specifications proposed below. | Add definition of reportable application as following.**reportable application**intended use of a declarable substance or declarable substance group which determines its relevance to a given scope and the reporting threshold level for disclosure[SOURCE: IEC62474:2012, Terms and definition 3.11] |  |
| JP22 | 089 | Section 4 |  | Te | Need to clarify there is no intention to apply criteria 3 to material used in another product or industry which doesn’t use the product or industry standard.  | Add the following sentence.Criteria 3 is adopted to material used in a product subjected to the product or industry standard.  |  |
| JP25 | 089 | 4 |  | Ge/Te | **[Comments from chemicals and materials suppliers point of view]**IEC 63031 shall clarify significance that requires definition to differentiate low halogen materials from other high halogen materials.Such differentiation between high and low definition needs an indicator by certain halogen content with no exception of all halogenated substances. If the indicator is not used, it has inconsistency with the title of ‘low halogen’. | **[Proposals from chemicals and materials suppliers point of view]**If the existing title of “low halogen material” will have to be retained, definition of the “low” shall be defined with content (quantity), to differentiate high and low of all halogenated substances regardless of environmental hazard or concern levels of individual substances. If halogenated materials of low concern are major purpose for the definition, then specification shall focus on the hazard level of individual substances, not by content.  |  |
| GB 12 | 089 - 93 | 4 |  | te | Unless there is scientific evidence that a total mass of halogens greater than a particular value (e.g. 0.9%) is environmentally hazardous then there should not be such a limit contained in this document. For example, common table salt sodium chloride is not known to be environmentally hazardous and yet would need to be declared according to this standard as written.Typically, environmental restrictions are based on the properties of a compound / substance rather than the elements forming that compound. Consequently we do not see, unless there is evidence to the contrary, why a limit on elemental halogens is valid. | Remove the 0.9% for total halogen content, leaving the limit values to be based upon the concentrations of substances contained in the IEC 62474 database.  |  |
| JP17 | 089 to 93 | New clause before Clause 4 |  | Te | **[Comments from chemicals and materials suppliers point of view]**Conventionally in IEC, specific TCs provided definitions related to halogens content for specific components only (e.g. IEC 61249-2-21). However in market, the definitions have been misused horizontally to unspecified components and materials in various, that becomes a cause of confusion to misunderstand environmental issues, or for material suppliers to experience a reputational damage as if containment of halogens itself is evil against environmental safety. The definitions related to halogen content in IEC are now very sensitive because of the above, and the definitions originally have tight relation to marketing of those specific components and materials. Therefore, a guidance to prevent from miscommunication of environmental safety aspect concerning halogen content should be added in normative texts of IEC 63031, which is very supportive for TCs/SCs and market as a basic publication internationally. | **[Proposals from chemicals and materials suppliers point of view]**Add a new clause titled “Guidance to use definitions of materials containing halogen content” which provide a guide to clarify justification in which purpose the definition is used, especially either of:1. Environmental reasons
2. Safety reasons, or
3. Other technical or marketing reasons

(Proper texts should be discussed and provided in PT which should form a task group with relevant TCs/SCs)  |  |
| JP18 | 089 to 93 | 4. specifications |  | te | **[Comments from electronic/electrical product manufacturers and fluoropolymer suppliers point of view]**IEC 61249-2-21:2003 and JS-709B(Joint JEDEC / ECA Standard) are since long time existing standards concerning “Low Halogen Materials" which scope focus on the restrict of halogenated flame retardants and have been accepted within the industry. They were established after a lot of discussions.2nd CD of IEC 63031 also focuses on “halogenated flame retardants” as described in “INTRODUCTION”. IEC 63031 should be based on existing standards and not introduce arbitrary new definitions and threshold values. Furthermore, we have the following reasons.[Reasons]1. Investigation is possible.

It is difficult to investigate conformity of less than 0.9% of 4 halogen elements in unit parts and final products according to the current definition.Therefore, EEE manufacturers cannot name low-halogen for their products.* 1. About the condition of 4 halogen elements less than 0.9%, there is no investigation method at present, and EEE manufacturers cannot get evidences for their parts.

Also, it is difficult to analyze all materials for composite parts.* 1. About investigation based on the IEC 62474 database, EEE manufacturers can investigate and get evidences, because there are methods. (for example, chemSHERPA)
1. It can coexist with other standards.

There are other standards concerning low-halogen, but IEC62474 database does not infringe, because the database describes each object and the threshold. (IEC 61249-2 and JEDEC standards are already included.)Conversely, it is possible to meet another new standards by including into the IEC 62474 database as criteria 3.3. It matches NWIP based on the PAS (111/382/PAS).In addition, it is necessary to clarify which material should meet the new substances/requirements after publishing the standard and the timing to meet these new contents of IEC 62474 in the Note. | **[Proposals from electronic/electrical product manufacturers and fluoropolymer suppliers point of view]**We would propose the following specification:Materials for use in electrical and electronic products defined as “Low Halogen materials of concern” shall be below reporting threshold limits of all halogenated substances for reportable applications in the IEC 62474 database, including criteria 1, 2 & 3. Currently existing IEC / ANSI standards which define low-halogen applications will continue to be enforced for those particular materials (E.g. IEC 61249-2-21 for PCB Laminates) These Notes would need follow-up based on the above scope.Note 1: Would need to add PVC to the IEC 62474 Database – VT Decision. (PVC was originally in the JIG but removed from IEC 62474) Note 2: All existing standard references would need added to the IEC 62474 DSL since reportable applications are different as well as thresholdsNote 3:Currently existing IEC / ANSI / JEDEC / IPC standards which normatively define low-halogen, halogen-free or non-halogenated definition will continue to be enforced for those particular materials .(E.g. IEC 61249-2-21 for PCB Laminates, JEDEC 709B)Note 4:All products listed as low-Halogen from the initial publication date of IEC 63031 through the next revision date will be grandfathered as Low Halogen products. All new products introduced after that revision date shall meet any new requirements added to the database during that timeframe. |  |
| CA-01 | 089-92 | 4 |  | TE | There is no scientific basis for the selection of 0.9% by mass as a cut-off point for low halogen materials. As currently specified, many halogens for which there are no known or anticipated human health or environmental concerns will not qualify as low halogen. This fact is even stated in the document in line 184 “Halogenated substances are not as a group generally hazardous to the environment” | The 0.9% by mass criteria requirement should be deleted. The criteria should only exclude those halogenated materials containing amounts of halogen that equal or exceed the threshold amounts on the IEC 62474 database. |  |
| ES | 089-92 |  | Specifications | Te (technical) | A total halogen requirement that covers all halogenated substances is not practicable.The specification must not conflict with the scope. The latter relates to substances within a material. Thus, clause 4 must also refer to substances within a material.The proposed definition is not exact enough as the point of reference is not clearly defined (e.g., homogenous material or article?). It is not possible to give an exact definition without defining further terms. These further definitions are not necessary as they are already given in IEC 62474 database  | Change lines 90 – 92 to:“Low Halogen” is related to the content of an intentionally added ingredient in a material. This relates to chlorinated and brominated flame retardants which are listed in the IEC 62474 and not regulated by any legislation yet, which are used in the EE sector. In order to define a material as “Low Halogen”, it should contain less than 0,9 % (by mass) total element halogen.  |  |
| JP 23 | 089-93 | 4 |  | te | **[Comments from article supplier point of view who has concern of Fluorine and Iodine as well as Chlorine and Bromine]**The voluntary restraints about the usage of halogenated compounds have been proceeded among supply chain in the field of electric and electronic products.The thresholds of halogenated compounds are based on IEC61249-2-21 (halogen free) or JEDEC JB709B (low-halogen) in many cases.On the other hand, like as JEITA-ET7304A, there are voluntary restraints that the target elements are expanded to fluorine and iodine in some Industry. It seems to be important to expand the target to fluorine compounds and iodine compounds, for example, fluoropolymer is especially concerned about the difficulty of recycling and generation of corrosive gas when incinerated.From the point of view described above, that is market experience and environmentally conscious design, we propose 2 requirements for the voluntary restraints. | **[Proposals from article supplier point of view who has concern of Fluorine or Iodine as well as Chlorine and Bromine]**Proposed change of specificationsLow-Halogen Basic:Materials defined as “Low-Halogen Basic” shall meet the thresholds of all halogenated substances in IEC62474 database.Low-Halogen Advance:Materials defined as “Low-Halogen Advance” shall meet the thresholds of all halogenated substances in IEC62474 database and shall contain less than 0.9%(by mass) total elemental halogen content (F+Cl+Br+I). |  |
| JP24 | 089-93 | 4 |  | Te | **[Comments from chemicals and materials suppliers point of view]**The threshold of 0,9 % in the CD is based on evaluation under the following worst case scenario:The value assumes that a material containing halogens generates hydrogen halides (HF, HCl, HBr, and HI) from all halogenated sources in the material under combustion, but keep human health against exposure of the hazardous gases as well as other hazardous gases like CO and CO2, by calculation with amounts of the gases and each toxicity factor of ‘the immediately dangerous to life or health values (IDLHs) by NOSH in US’ then finally assessed under fire safety engineering methodology of EN 45545.Therefore, the 0,9% threshold should be used for materials if halogen sources are derived from either of additives, impurities, or reaction residues in a non-halogenated polymer matrix. Because, downstream users of the material are hard to know which substances of the halogens come from if they are non-reporting substances in the material declaration system. It may be also hard for suppliers to disclose those non-reporting substances or to provide information to identify environmentally safety information, in any conditions of electrical and electronic products between production and end-of-life. On the other hand, halogenated polymer matrix (PVCs, PTFE, Br-epoxy for potting, PVA-I complex etc.) obviously contain halogens exceeding 0,9 % and information to identify the chemical names and environmental safety should be supplied to downstream users appropriately to reduce their environmental concern.Therefore, threshold is not necessary to be set to those halogenated polymers, but instead, environmental safety information with identification on the chemicals should be required for appropriate communication in supply-chain, in the environmental standard point of view. Again, threshold setting at 0.1% etc with no hazard risk assessment to support the value causes harmful reputation of halogens for environmental point of view, which shall be eliminated in standardization process in IEC/TC111. | **[Proposals from chemicals and materials suppliers point of view]**Replace the first half of the current definition with;“Materials defined as “Low Halogen” shall consist of non-halogenated polymer matrix itself, or with additives, impurities, and reaction residues in the matrix which contain less than 0,9% (by mass) total elemental halogen content (F+Cl+Br+I), and meet…”.And add the following texts after the definition. Halogenated polymer matrix (e.g. PVC, Brominated epoxy resin, PTFE, and PVA-iodine complex for polarizing flm etc) shall be declared with identification information (e.g. chemical name, CAS No.) for environmental communication to supply chain if the definition is used for declaration. Any environmental safety information may be supplied together if that is useful for environmental communication purpose with supply chain. |  |
| JP26 | 089-93 | 4 |  | Te | **[Comments from chemicals and materials suppliers point of view]**Environmental safety of chemical substances should be determined and communicated individually per individual unique substance (CAS No.) as long as that can be identified and hazard is different in such specific chemical structures (if hazard is same, grouping of specific substances can be used). In terms of that, the Criteria 1 of IEC 62474 follows the principle and reference to the Criteria 1 is appropriate for definition of the low-halogen.However, the Criteria 3 of IEC 62474 includes voluntary material declaration based on specific market circumstances of specific components and products. Review is required if those specific definition may be directly used for all EEEs in IEC, because of responsibility of basic publication in IEC/TC111 for environmental standard development. In fact, new work of IEC 63031 was approved and started since JEDEC/JS709 (currently listed in Criteria 3 of IEC 62474) had a problem to apply the definition extended to all EEEs in IEC. At this point, Criteria 3 should be removed out from the definition of the low halogen material under IEC 63031, in order that the same problem will not be repeated. As IEC 63031 will become a broad sense of the low halogen definition in all EEEs as environmental point of view, JEDEC/JS709 can be used In the narrow sense of the definition to specific products applicable in JEDEC industry.  | **[Proposals from chemicals and materials suppliers point of view]**Change the latter half of the definition to;“… and meet the thresholds of all halogenated substances in Criteria 1 of IEC 62474 database”If Criteria 3 should be included in the IEC 63031 specification in future, PT63031 should develop texts of a guidance not to use the definition of specific components and industry listed in Criteria 3 as is, and how the user of IEC 63031 should assess if the definition can be used properly for other components and industry. For development of the texts, PT 63031 and relevant TCs/SCs should form a joint working group to start mutual understanding how differently specifications of halogen content are defined separately among the TCs/SCs at first. |  |
| FR 6 | 090 | 4 |  | Te | The specification include thresholds for all halogenated materials listed in IEC 62474 database; the specification should only be limited to substances ranked in criteria 1 (mandatory reporting) and not to those of criteria 2 or 3 | Limit  thresholds only to halogenated materials classified by “criteria 1”  and replace the end of the sentence by :“...and meet the thresholds of all halogenated materials listed as Criteria 1 in IEC 62474 database” |  |
| NO | 090 | 4 |  | Te | The specification include thresholds for all halogenated materials listed in IEC 62474 database; the specification should only be limited to substances ranked in criteria 1 (mandatory reporting) and not to those of criteria 2 or 3 | Limit thresholds only to halogenated materials classified by “criteria 1” : “...and meet the thresholds of all halogenated materials listed as Criteria 1 in IEC 62474 database” |  |
| US14 | 090 - 93 | 4 Specifications |  | Te | Change the low halogen specification to include only those halogenated materials of concern. As discussed during the PT63031 meeting in Wilmington, DE, there is a very real concern that the new "low-halogen" definition will be used inappropriately to sell/market against products which do not meet the new definition as being "bad" and promote products which do meet the new definition as being "good", even while recognizing that the rationale and justification for the proposed new definition is not scientifically defensible. In addition, the proposed new definition for "low-halogen" contains a combined threshold (> 9,000 ppm) that is not scientifically justified in terms of toxicological or environmental impact but instead is based on a reasonable limit for existing manufacturing capability on a subset of electrical and electronic products, as well as including the materials / substances listed in the IEC 62474 database, including Criteria’s 2 & 3. | Materials defined as “Low Halogen” shall ~~be evaluated for materials of concern and contain less than 0,9% (by mass) total elemental halogen content (F+Cl+Br+I) and meet the thresholds of all halogenated substances in IEC 62474 database~~ meet the threshold limits and reportable applications of halogenated substances listed in the IEC 62474 database, including criteria 1, 2 & 3 as of the latest date of publication for IEC 63031. ~~NOTE: See Annex A for a list of likely uses of halogenated substances within electrical and electronic products.~~* Currently existing IEC / ANSI/ JEDEC / IPC standards which normatively define low-halogen, halogen-free or non-halogenated definition will continue to be the requirements for those particular materials .(E.g. IEC 61249-2-21 for PCB Laminates, JEDEC/ECA JS-709B)
* All products listed as Low-Halogen from the initial publication date of IEC 63031 through the next revision date will be grandfathered as Low Halogen products. All new products introduced after that revision date should meet any new requirements added to the database during that timeframe.
 |  |
| IT10 | 090 to 92 | 4 |  | te | Scope of TC 111 is to create a scientifically accurate standard but not deal with environmental aspects relevant to EEE products. IEC 62474 contains declarable halogenated compounds that are identified to cause concerns to human health and the environment. It makes more sense to use the IEC 62474 database as the only source of halogens that are under this low halogen definition. | Refer only to the materials in IEC 62474 database when referencing the definition to specific halogen containing substances of concern. Fluoropolymers should not be the target of this standard. |  |
| BE-11 | 090, 141, 143, 145, 147 | 4 (and others) |  | Ge/Te | Remove the 0.9% for total halogen content. Limit values should be based on the IEC 62474 database.  | Remove 0.9% limit. Base limit values on IEC 62474 database, “Criteria 1” only. |  |
| BE-07 | 090-92 | 4 |  | Te | Limiting elemental halogen would be relevant to “halogen free”. “Low halogen” should look at halogenated substances, and limit the ones which have been recognized as detrimental for the human health or the environment. | Delete the condition “contain less than 0,9% (by mass) total elemental halogen content (F+Cl+Br+I)” |  |
| GB 13 | 090-92 | 4 |  | Te | IEC 62474 contains declarable halogenated compounds that are identified to cause concerns to human health and the environment. It makes sense to use the IEC 62474 database as the single source of halogens that are under this low halogen definition. However, IEC 62474 database is updated twice per year. It is difficult to design a product to meet a requirement which is changing frequently over time. This could cause a product designed to be low halogen to be subsequently considered as no longer low halogen at the time of product launch. Therefore, a cut-off date must be included if referring to IEC 62474 database.The requirement of some halogen compounds in IEC 62474 database is only applicable to certain applications or certain products. It needs to be clearly stated in the definition | The declaration shall be consistent to the version of the database that you are making the decleration to. |   |
| IE | 090-92 | 4 |  | Te | To create a standard not considering environmental impact and benefit relevant to EEE products is not in scope of TC 111. The standard has not provided sufficient scientific evidence to justify the inclusion of 4 elemental halogens from the environmental and human health perspective. The proposed definition will limit the use of all halogen compounds and consequently impact the innovation in EEE products without getting much environmental benefit. The standard should focus on the halogen compounds that have been identified with environmental concerns rather than target on the 4 halogens at elemental level.  | Delete 0.9% (by mass) total elemental halogen content (F+Cl+Br+I) from the definition.  |  |
| IE | 090-92 | 4 |  | Te | IEC 62474 contains declarable halogenated compounds that are identified to cause concerns to human health and the environment. It makes sense to use the IEC 62474 database as the single source of halogens that are under this low halogen definition. However, IEC 62474 database is updated twice per year. It is difficult to design a product to meet a requirement which is changing frequently over time. This could cause a product designed to be low halogen no long low halogen at the time of product launch. Therefore, a cut-off date must be included if referring to IEC 62474 database.The requirement of some halogen compounds in IEC 62474 database is only applicable to certain applications or certain products. It needs to be clearly stated in the definition | Set a cut-off date (e.g. the date / revision when this standard is published) for the IEC 62474 database. Any halogen compounds included in the database after the publication of this standard are not considered in the definition until the next revision of this standard. The reportable application must also be included in the definition if IEC 62474 database is referenced.This is the suggested definition: Materials defined as “Low Halogen” shall meet the threshold limits and reportable applications of halogenated substances listed in the IEC 62474 database (Version XYZ), including criteria 1, 2 & 3 as of the latest date of publication for IEC 63031. • Currently existing IEC / ANSI / JEDEC / IPC standards which normatively define low-halogen, halogen-free or non-halogenated materials / products shall continue to be the requirements for those specific materials / products (e.g. IEC 61249-2-21 for PCB Laminates, JEDEC/ECA JS-709B)• All materials / products listed as Low-Halogen from the initial publication date of IEC 63031 through the next revision date shall continue to be considered Low Halogen materials / products. All new materials / products introduced after the revision date of IEC 63031 (typically every 5 years from initial publication) must meet any new requirements added to the database during that timeframe. |  |
| IT07 | 090-92 | 4 |  | te | The definition of Low Halogen is widely accepted in the industry based on IEC 61249-2-21 and JS-709B(Joint JEDEC / ECA Standard) which are existing standards concerning “Low Halogen Materials" and specifically target Br and Cl only. There is no scientific reason to include F and I simply because they are halogens. | Remove general reference to Fluorine (and Iodine) from the definition.In other words, only 0,9% (by mass) total elemental halogen of concern (Cl+Br) shall be considered |  |
| IT08 | 090-92 | 4 |  | te | The requirements from the IEC PAS 63015: 2016 standard defines low halogen as Br and Cl only. | Remove general reference to Fluorine (and Iodine) from the definition. See IT07 |  |
| IT09 | 090-92 | 4 |  | te | Halogens are not as a group generally hazardous to the environment and the inclusion of all halogens in the definition would create unnecessary concern. | Remove general reference to Fluorine (and Iodine) from the definition. See IT07 |  |
| JP19 | 090-92 | 4. specifications |  | Te | TC91 objects to 0.9% threshold limit for F+Cl+Br+I.•An IEC standard should not support abuse of definitions for marketing purposes, like “low halogen”• There is a scientific justification of that value from the point of view of fire-safety, EN45542-2, but it is based on a specific situation, “fire protection on railway vehicles”, which cannot be spread over total electric and electronic industry as a general definitionSpecific concerns about EEE combustion in certain confined spaces should not be used to justify broad concerns about EEE combustion in all spaces.  | TC91 proposes the definition of low halogen as bellows based on JS-709B and IEC 61249-2-21. “The halogens fluorine (F), iodine (I), and astatine (At) are not covered by this document. Bromine (Br) and chlorine (Cl) refer to all oxidation states of these elements. Bromine (Br) and chlorine (Cl) in materials that may be used during processing but do not remain within the final product are not included in this definition.For an electronic product to be defined as “low-halogen”, each material within the product shall meet all of the following specifications.1)Each material within an electronic product, (excluding printed board laminates) shall contain <1000 ppm (0.1%) by weight of bromine if the bromine source is from BFRs and <1000 ppm (0.1%) by weight of chlorine if the chlorine source is from CFRs, PVC, PVC congeners, PVC block polymers, PVC copolymers, or polymer alloys containing PVC. Higher concentrations of bromine and chlorine are allowed in plastics contained within electronic products (other than printed board laminates contained within those devices) as long as their sources are not flame retardants, PVC, PVC congeners, PVC block polymers, PVC copolymers, or polymer alloys containing PVC.2) All printed board laminates contained within electronic and electrical products, including those within a passive or solid-state device shall meet the requirement for Br and Cl, or the maximum total halogens contained is 1500 ppm with a maximum Cl of 900 ppm and maximum Br being 900 ppm as defined in the most current version of one of the following specifications: IEC 61249-2, IPC-4101, JPCA-ES-01.NOTE. See Annex A for a list of likely uses of flame retardants, PVC, PVC congeners, PVC block polymers, PVC copolymers, or polymer alloys containing PVC within electronic products. |  |
| JP20 | 090-92 | Section 4 |  | Ge | **[Comments from TC91 electronic product manufacturers point of view]**Fluoropolymers should not be the target of this standard. Fluoropolymers possess low inherent hazard and unique functionality to multiple industries, including health care, food contact applications, aerospace, chemical processing, building construction, automotive, electronics, energy, environmental protection, and outdoor and technical apparel.Substance restrictions around the world have not identified the use of all fluoropolymers (e.g., PTFE, FEP, PFA) as an area of concern. Halogens are not as a group generally hazardous to the environment, so the inclusion of all halogens in the definition would create unnecessary problems for the electronics industry.Creating a scientifically accurate standard but not dealing with environmental aspects relevant to EEE products is not in the scope of TC 111. | **[Proposal from TC91 electronic product manufacturers point of view]**Exclude fluoropolymers. There is no scientific evidence presented to include these elements/materials |  |
| NL 12 | 090-92 | 4 |  | **te** | It does **not** make sense to also include Criteria 3 (for information only) substances in the definition of “Low halogen materials”, since the objective of this definition is to include **regulated** substances that have already been accessed and were demonstrated to pose issues to health and environment when used in EEE*Please also note the voting round held during the PT63031 meeting in Wilmington on May 18, 2017* | Change second part of the definition to “…and meet the thresholds of all hazardous halogenated Criteria 1+2 substances in the IEC 62474 database” |  |
| NL 13 | 090-92 | 4 |  | **te** | Any limit referred to in this definition shall be based entirely on **scientific evidence** of an adverse environmental impact in the case such limit is exceeded. The limit of 0,9% lacks scientific evidence of adverse environmental impact, and therefore must not be used in a standard  -- or otherwise we will be making legislation instead of a standard.The link with IEC 62474 Criteria 1+2 can be accepted as the substances in these categories are already accessed for their harmful behaviour to environment (or health)Note that IEC 62474 Criteria 3 substances are not determined as concern materials and shall therefore be excluded from the definition | Change the definition to:“Materials defined as “Low Halogenated Materials of Concern” shall ~~contain less than 0,9% (by mass) total elemental halogen content (F+Cl+Br+I) and~~ meet the thresholds of all hazardous halogenated Criteria 1+2 substances in the IEC 62474 database”AND add the following sentence :🡪 The above definition excludes non-hazardous halogenated substances included in the IEC 62474 database for reporting purposes |  |
| CN-1 | 090-93 | 4 |  | technical |  There is no scientific basis to to restrict all halogen materials by 0,9% (by mass) total elemental halogen content (F+Cl+Br+I).IEC 62474 lists the declarable substances, among which the halogen substances shall be the focus of concern for low halogen. | Delete “contain less than 0,9% (by mass) total elemental halogen content (F+Cl+Br+I)”Change this paragraph to: Materials defined as “Low Halogen” shall meet the thresholds of all halogen substances in IEC 62474 database. |  |
| BE-08 | 091 | 4 |  | Te | “threshold of all halogenated substances” should be clarified | Replace by ***“the reporting threshold level of all halogenated declarable substances***” See also BE-05 for the definition of “reporting threshold level” and “declarable substance” |  |
| GB 14 | 091 | 4 |  | Ge | It is helpful for users to know exactly which substances in the 62474 database are halogenated.  | Create an Annex in this standard to include a list of all halogenated substances in IEC 62474 Database as of the date when this standard is published  |  |
| GB 15 | 091 | 4 |  | Te | It is not clear that the definition applies to restricted substances, reportable substances, or both, in IEC 62474 database?  | Specify which criteria (e.g. 1, 2 or 3) substances or all are included in the definition. |  |
| IE | 091 | 4 |  | Te | It is not clear that the definition applies to restricted substances, reportable substances, or both, in IEC 62474 database | Specify all criteria 1, 2 and 3 substances are included in the definition. |  |
| SE06 | 091 | 4 |  | te | The reference to “all halogenated substances in IEC 62474 database” is unclear, whether this standard for materials shall consider substances related to products, parts and articles as well. |  New text: Materials defined as “Low Halogen” shall contain less than 0,9 % (by mass) total elemental halogen content (F + Cl + Br + I) and contain less than Reporting Threshold of each halogenated substance in normative Annex B. Annex B contains the halogenated substances listed in the IEC 62474 database on September 2017. |  |
| SE07 | 091 | 4 |  | te | It is unclear which revision of the IEC 62474 database that shall be used | Include the latest database substance list in a new Annex B, see proposed table in the end of this document. |  |
|  US15 | 091 | 4 |  | Ge | It is helpful for users to know exactly which substances in the 62474 database are halogenated.  | Create an Annex in this standard to include a list of all halogenated substances in IEC 62474 Database as of the date when this standard is published  |  |
| BE-10 | 091, 140, 144, 150, 168, 196, 204, 212, 308, 314, 317 etc. | 4 (and others) |  | Ge/Te | Any restriction on a substance should be based on clear evidence that the substance poses a risk to the environment or to human health at the proposed restriction level.  | Replace par. 4. “Specifications” by : Materials defined as “Low Halogen” should be limited to those containing substances with clear scientific evidence that the substance poses a risk to the environment or to human health at the proposed restriction level. Each substance needs to be assessed individually for the environmental or human health impacts that can result from its use. |  |
| CA-02 | 091-92 | 4 |  | TE | The phrase "meet the thresholds" is ambiguous and may cause confusion.  | Replace "meet the thresholds of all halogenated substances in IEC 62474 database" with "not contain (at or above the applicable threshold level) any halogenated substance that is a declarable substance or included in a declarable substance group on the IEC 62474 declarable substances list (DSL). The applicable threshold for each entry in the IEC 62474 DSL is specified in the ReportingThreshold field. " |  |
| GB 16 | 092 | 4 |  | ed | Full stop missing at the end of the sentence. | Add the full stop.  |  |
| JP21 | 092 | Section 4 |  | Te | **[Comments from electronic/electrical product manufacturers and fluoropolymer suppliers point of view]**IEC 62474 contains declarable halogenated compounds that are identified to cause concerns to human health and the environment. Use IEC 62474 database as the only source of halogens that are under this low halogen definition. | **[Proposal from electronic/electrical product manufacturers and fluoropolymer suppliers point of view]**Add “, including criteria 1, 2 & 3” after the IEC62474 database.  |  |
| SE08 | 092 | 4 |  | ed | Full stop is missing | Correct it. |  |
| JP27 | 094-164 | 4 |  | Te | **[Comments from chemicals and materials suppliers point of view]**Concern of halogenated materials can be summarized, if 1. a material may contain regulated restriction substances, or
2. a material may generate hazardous substances in burning behavior.

For 1), declaration of halogenated substances regulated can reduce the concern.For 2), there are two ways to reduce the concern. One is to identify the hazards of decomposed substances and give user of materials measure to prevent from the hazards. But in some cases it may not be available to provide any information on hazards of decomposed substances from materials containing any halogens. If environmental hazard information of decomposed gases or measure to prevent from the hazards are not available or infeasible, screening methodology can reduce concern of halogenated materials, if the screening approach has justification scientifically.In any case, the proposed change will not affect JEDEC standard or standard in TC91.  | **[Proposals from chemicals and materials suppliers point of view]**Change the specifications as follows:“Materials defined as “halogenated materials of low concern” shall meet the thresholds of all halogenated substances in Criteria 1 of IEC 62474 database, and report as follows:1. Information on environmental hazards of decomposed substances in burning treatment process of the material used in electrical and electronic products, and measures to prevent from the hazards, or
2. Information on the material which contain less than 0,9 % (by mass) total elemental halogen content (F + C l+ Br + I) of the material used in electrical and electronic products, if information or the measures of a) is not available or infeasible.

Note 1. Criteria 3 of IEC 62474 include declarable substance groups of specific halogens as “optional” for information only. They are not considered halogen materials of low concern in this standard, but can be reported with IEC 62474 database as low halogen materials or non-halogenated materials defined separately in TCs/SCs or industry associations. Note 2. 0,9% (by mass) total elemental halogen content is based on calculation with amounts of decomposed hazardous gases including CO, CO2, SO2, HCN, HF, HCl, HBr, and I2 (HI is not stable and can be transformed to I2) and each toxicity factor of ‘the immediately dangerous to life or health values (IDLHs) by NOSH in US’. The value of 0,9 % assumes that a material containing halogens generates hydrogen halides (HF, HCl, HBr, and HI) in the material under combustion, and reach upper limitation to keep human health against exposure of all the hazardous gases considered above, in the worst case scenario of no evacuation possible. “ |  |
| BE-12 | 096-103 | 5.1 |  | Te | If IEC 63000 is normatively referenced, wording should be similar to the one in IEC 63000 section 4.3.3, taking into account the difference of structure between the two documents (IEC 63000 explains the options in the enumeration, while IEC 63031 uses dedicated subsection to explain each option).  | Replace the whole text by:“***Materials used in EEE shall be assessed using the same principles as outlined in section 4.3 of IEC 63000.*** ***The following documents on relevant materials shall be collected:******a) Supplier declarations and/or contractual agreements, or******b) Material Declarations, or******c) Analytical test results***” |  |
| GB 17 | 096-103 | 5.1 |  | ed | Since Subclause 5.1 refers to EN50581 and IEC 63000, the content should be consistent with the references | Change “tools” to “documents” and “analytical testing” to “analytical test results” |  |
| US16 | 096-103 | 5.1 |  | Ge | Since Subclause 5.1 refers to EN50581 and IEC 63000, the content should be consistent with the references | Change “tools” to “documents” and “analytical testing” to “analytical test results” |  |
| FR 7 | 097 | 5.1 | 1 | ed | The reference to IEC 63000 is sufficient and there is no reason to refer to EN 50081. | Delete “EN 50081 and” |  |
| US17 | 097 | 5.1 | 1st para | Ed | This is an IEC and not a regional (i.e., European) standard. IEC 63000 covers what EN 50581 covers. When there is both an IEC and a regional standard, the reference to the IEC standard is enough. | Change to: “As indicated in ~~EN 50581 and~~ IEC 63000, the following “ |  |
| GB 18 | 097 - 98 | 5.1 |  | ed | It is not clear to what conformity is demonstrated.  | Please clarify  |  |
| NL 14 | 097-98 | 5.1 |  | ed | “… the following common tools are used for demonstrating conformity:” 🡪 it is not clear for what conformity is demonstrated | “… the following common tools are used for demonstrating conformity with the specifications listed in Clause 4:” |  |
| US18 | 100 | 5.1 – 5.5 |  | Te/Ed | Each of subclauses 5.2-5.5 is about methods that may be used to demonstrate conformity. It does not need to repeat this concept. They also offer little new information in addition to the bullets. | Delete subclauses 5.2-5.5 and change 5.1 bullets to * “supplier declarations, and/or
* contractual agreements, and/or
* material declarations *meeting the**current version of IEC 62474*, and/or
* analytical testing *meeting IEC 62321 series standards or other recognized standard.*
 |  |
| US19 | 100-103 | 5.1 | Bullets | Te | The methods above do not include all common methods. An organization may be able to internally determine the content of halogens based on engineering knowledge and product or material specifications. The methods now included all assume that this knowledge is not available internally. | Add a Note indicating: *“internal engineering assessments and specifications”* |  |
| FR 8 | 104 | 5.2 |  | Te | The database evolves regularly. It is necessary to refer to the version number of the database in the declaration. | Add the sentence :“The supplier declaration shall contain the version number of the database” |  |
| FR 10 | 105 | 5.2 | 1 | te | All the specifications of clause 4 shall be taken into account.Editorial simplification  | Replace the text after the coma to read“Declaration from the supplier stating that the material under evaluation conforms with the specifications in clause 4.” |  |
| FR 9 | 105 | 5.2 | 1 | ed | For better homogeneity with 5.3 and 5.4, which do not include a verb | Replace the beginning of the sentence with“Declaration from the supplier....” |  |
| GB 19 | 106125139 | 5.25.55.6.1 |  | ed | When reference is made to another clause the drafting rules require the use of capital C i.e. Clause | Replace ‘clause’ with ‘Clause’ |  |
| GB 20 | 107 | 5.3 |  | ed | Incorrect grammar.  | Change to:“Conformity can be demonstrated using contractual agreements, confirming that the content of all the halogenated substances in the material under evaluation are within the specifications in Clause 4.” |  |
| FR 11 | 108 | 5.3 | 1 | te | All the specifications of clause 4 shall be taken into account.Editorial simplification and better homogeneity with 5.2. | Replace the sentence to read“Contract with the manufacturer stating that the material under evaluation conforms with the specifications in clause 4.” |  |
| BE-13 | 108-109 | 5.3 |  | Ed | This is not a full sentence; to avoid confusion with a definition, consider adding a verb or taking the enclosed suggestion. Additionally, it should be emphasized that valid contracts are signed (IEC 63000 specifies it, but this CD does not) | Suggested text (inspired from IEC 63000):“***Such agreements are signed contracts confirming that the manufacturer’s specifications for the maximum content of halogenated substances in the material under evaluation are fulfilled*.”** |  |
| NL 15 | 108-109 | 5.3 |  | ed | Not fulfilled yet, but should be… | Include “to be”:“Contracts confirming that the manufacturer’s specification for the maximum content of halogenated substances in the material under evaluation are to be fulfilled”  |  |
| GB 21 | 110 | 5.4 |  | ed | Incorrect grammar. | Change to:“Conformity can be demonstrated using material declarations, confirming that the content of all the halogenated substances in the material under evaluation are within the specifications in Clause 4.” |  |
| JP28 | 110-116 | 5 |  | Te | **[Comments from chemicals and materials suppliers point of view]**It’s most useful to develop and prepare a declaration format of halogenated materials in IEC 63031, in order to assist environmental safety communication among various TCs/SCs and supply-chain where they manage different halogenated chemicals or elements with different thresholds in their standards currently. | **[Proposals from chemicals and materials suppliers point of view]**Add a new sub clause in Clause 5 to provide a guidance how to manage a declaration sheet for halogenated materials. Example of the declaration format outline is as follows;1. A column to declare use of halogenated polymer matrix, and if used, an additional column to declare CAS No. of the chemicals. For remarks, another column can be put to attach information to help environmental safety between production and end-of –life of electrical and electronic products.
2. A column to declare use of non-halogenated polymer matrix. If used, an additional column to declare containment or non-containment either of additives, impurities, or reaction residues of halogens. Then one more column to declare in case of containment of the above halogens, to meet the 0,9 % threshold. For remarks, another column to attach supplements of test reports to confirm halogen contents not exceeding 0.9%.
3. To be linked with both 1) and 2), the final column to declare the materials contain no substance listed in Criteria 1 of IEC 62474.
 |  |
| FR 12 | 111 | 5.4 | 1 | te | All the specifications of clause 4 shall be taken into account.Editorial simplification and better homogeneity with 5.2. | Replace the sentence to read“Material declarations providing information on the specifications in clause 4.” |  |
| BE-14 | 111-112 | 5.4 |  | Ed/Te | This is not a full sentence; to avoid confusion with a definition, consider adding a verb or taking the enclosed suggestion  | Suggested text (inspired from IEC 63000):“***Material declarations provide information on halogenated substance content substances in the material under evaluation. The material declaration content should meet the requirements specified in IEC 62474, subclause 4.2.3 for the halogenated substances***.” |  |
| GB 22 | 117 | 5.5 |  | te | This clause needs extensive re-writing if it is to be retained. It could be used as a method for determining whether there are halogens present and consequently whether determination of particular substances is necessary. The UK stresses that it does not agree with a total halogen concentration of 0.9% or any other value.Combustion followed by ion chromatography does not necessarily determine the halogen content of the sample, but is often used to determine the halogen content of the combustion effluent (e.g IEC 62321-3-2 [for bromine]). Elemental analysis of the combustion residue would also be needed in order to determine the halogen content of the sample.Alternatively closed oxygen bomb combustion can be used followed by analysis of the total residue.prEN 50642 uses this latter method, but will only measure soluble halides. Other analytical methods would be needed to quantify any insoluble halide residue.IEC 60754-3 is still under development. It is not appropriate to reference a standard that is not published. | Change the text to make it clear that analysis of combustion effluent is not, on its own, a valid method for the purposes of this standard.It needs to be made clear that after combustion, all products (solid, liquid and gaseous) need to be analysed in order to determine the halide content of the sample.Also make it clear that for a total halide determination, both soluble and insoluble halide residues need to be quantified.Delete reference to IEC 60754-3 if it has not been published prior to the publication of this standard |  |
| NL 16 | 117-122 | 5.5 |  | Te | 1. Align title with line 103: “test results” vs. ”testing”2. Several test standards are still under development and not yet available for all Halogens, all Halogenated compounds nor for all materials in electronic components3. No need to provide “opinion” statement. Replace “is a suitable screening technique to assess” by “can be used to assess” for certain halogens and certain materials4. Last part of the sentence is not relevant here (too much detail) and should be removed. | Title: Analytical ~~test results~~ testing When needed, analytical testing based on test standards can be used, available or under development for certain halogens and certain materials. As example, combustion of the material under evaluation followed by ion chromatography quantification ~~is a suitable screening technique~~ can be used to assess the content of ~~individual and total~~ certain halogens for certain combustible materials within the scope of this standard.  ~~The combustion ion-chromatography testing technique can detect and identify individual halogen elements as “halide ions” at or below 0.01% by mass.~~ |  |
| JP29 | 117-134 | 5.4 |  | ge | **[Comments from chemicals and materials suppliers point of view]**This declaration should be limited for IEC 62474 (Criteria 1, Currently regulated and regulated in future risk assessment) . | **[Proposals from chemicals and materials suppliers point of view]**Material declaration providing information on the content of halogenated substance based on IEC 62474 Criteria 1 and future nominated substance by its discussion of risk assessment. |  |
| BE-15 | 118-134 | 5.5 |  | Te | In section 2, IEC 62321 (all parts) appears to be a normative reference. In section 5.5, IEC 62321-3-1 and -3-2 appear in a note and are presented as “examples” | Clarify the normative level of the methods described in IEC 62321; by consistency with IEC 63000, they should be referred to in the main text (not in a note) and be more than just examples |  |
| NL 03 | 12 | Introduction |  | ed | Repeated sentence w.r.t. first paragraph | “Implementation of substance restrictions around the world have identified the use of ~~halogenated materials including polymers, their flame retardants and other additives~~ some of these materials as an area of concern for the EEE industry at least in part due to the following:” |  |
| IT01 | 1-2 | Title |  | ed/te | Not all halogens are of concern, as clearly acknowledged also in Annex A: fluoropolymers are largely used without scientific evidence of concern for health and the environment  | Change the title of this standard to “Low halogen materials of concern for electrical and electronic equipment” instead of “Low halogen materials”. |  |
| FR 13 | 122 | 5.5 |  | Ed | A point is missing before “however” and a coma after: | Replace by :”... for halogen element screening. However, many...” |  |
| NO | 122 | 5.5 |  | Ed | A point is missing before “however” and a coma after: | Replace by :”... for halogen element screening**.** However**,** many...” |  |
| SE 09 | 122 | 5.5 |  | ed | A point is missing before “however” and a coma after: | Replace by:” ... for halogen element screening**.** However**,** many...” |  |
| FR 14 | 126 | 5.5 | 1 | te | Equivalence is unnecessary as soon as adequacy / sufficiency can be demonstrated. | Replace “equivalence” with “adequacy” or “sufficiency”. |  |
| NL 17 | 128-129 | 5.5 |  | ed | “Analytical testing based on combustion and ion chromatography or x-ray fluorescence (XRF) spectroscopy” 🡪 no need to spell out the meaning of XRF, since it has already been explained in line 122 | “Analytical testing based on combustion and ion chromatography or ~~x-ray fluorescence (XRF)~~ XRF spectroscopy” |  |
| FR 15 | 132 | 5.5 |  | Ed | The note should make reference to the prIEC60754-3 instead IEC60754-3 | Modify IEC60754-3 by prIEC60754-3 |  |
| NO | 132 | 5.5 |  | Ed | The note should make reference to the prIEC60754-3 instead IEC60754-3 | Modify IEC60754-3 by prIEC60754-3 |  |
| SE 10 | 132 | 5.5 |  | ed | The note should make reference to the prIEC60754-3 instead IEC60754-3 | Modify IEC60754-3 by prIEC60754-3 |  |
| FR 16 | 133 | 5.5 | Note | te | Referring to the draft European standard prEN 50642 is inappropriate in an IEC standard. | Replace the beginning of the note with“IEC 62321-3-2, IEC 60754-3 are examples of…” |  |
| US20 | 135 | 5.6 |  | Te/Ed | The information included here is informative and is great support information that belongs in an informative annex.  | If the proposal to remove the 0.9% threshold requirement in US15 is accepted, then this section needs to be completely re-written and moved to an informative annex.If the proposal to remove the 0.9% threshold requirement in US15 is not accepted, then move subclause 5.6 to an informative annex. |  |
| GB 23 | 135 - 164 | 5.6 |  | Te | In line with GB 12, the limit of 0,9% for total halogen should be deleted until such a time that such a limit (and any associated test method) is substantiated. | Delete clause 5.6 |  |
| ES | 135-164 |  | 5.6 Interpretation of test results | te | Analytical testing would check for substances in IEC 62474 database. These tests follow analytical methods as given in standards, usually IEC 62321 series. A chapter on the interpretation of test results is not necessary as this is already given in the respective standards. | Delete clause 5.6 |  |
| NL 18 | 135-164 | 5.6 |  | ed/te | This section may not be relevant anymore in case justification of the upper limit (0.9%) cannot be found, and the limit is removed from the definition | In that case, remove Clause 5.6 plus its sub-clauses |  |
| IE | 136-157 | 5.6 |  | Te | Update Sub-clause 5.6 accordingly based on the new low halogen definition proposal (see comment related to Clause 4).  | Delete Sub-clause 5.6.2 and modify Sub-clause 5.6.3 by removing any wording related to 0.9% and / or total elemental halogen (F+Cl+Br+I) |  |
| US22 | 136-157 | 5.6 |  | Te | Update Subclause 5.6 accordingly based on the new low halogen definition proposal (see comment related to Clause 4).  | (See US21) Delete Subclause 5.6.2 and modify Subclause 5.6.3 by removing any wording related to 0.9% and / or total elemental halogen (F+Cl+Br+I) |  |
| US21 | 137 - 140 | 5.6 Interpretation of test results | 5.6.1 Halogens not detected | Te | Test results should be limited to ions from halogenated materials of concern as defined in the IEC 62474 database. | (See US21) Results indicating no detectable chloride (chlorine), bromide (bromine), fluoride (fluorine) and/or iodide (iodine) ions from halogenated materials of concern demonstrate that the tested material is in conformance with the “Low Halogen” definition described in clause 4 providing that the method detection limit is below the lowest halogenated substance reporting level threshold in the IEC 62474 database. |  |
| IT11 | 137-138 | 5.6.1 |  | te | Halogens are not as a group generally hazardous to the environment and the inclusion of all halogens in the definition would create unnecessary concern. | Remove general reference to Fluorine (and Iodine) from the definition. See IT07 |  |
| NL 19 | 139 | 5.6.1 |  | ed | “…definition described in clause 4 …” 🡪 the word ‘clause’ is typically always written with capital C | “…definition described in Clause 4 …” |  |
| US23 | 141 - 151 | 5.6 Interpretation of test results | 5.6.2 Total detected halogens ≥ 0.9% | Te | Test results should be limited to ions from halogenated materials of concern as defined in the IEC 62474 database.Further investigation for fluoride (fluorine) ions resulting from halogenated materials of concern can be done by conducting an extraction procedure with methanol followed by LCMS/MS. Details can be provided upon request (W. L. Gore & Associates, Inc.) | (See US21) If the proposal to remove the 0.9% threshold requirement in US15 is accepted, then this 5.6.2 needs to be completely re-written to read as below.Title “*Detected halogens greater than or equal to threshold(s) and application(s) defined in IEC 62474 Database**Results indicating ion content from halogenated materials of concern which exceed the threshold(s) and application(s) specified in the IEC 62474 Database demonstrate that the tested material is not in conformance with the “Low Halogen” definition described in Part 4 Specifications.* *NOTE  Depending on the composition of the material being tested, it may be possible to demonstrate that the ICPMS test results do not represent a halogenated material of concern.  As an example, results indicating total fluoride (fluorine) ion content >/= the threshold require further investigation in order to determine the source.  Fluoride (fluorine) ions originating from fluoropolymers should not be taken into account or impact compliance with the “Low Halogen” definition as fluoropolymers are not halogenated materials of concern. Fluoride (fluorine) ions cannot be extracted from fluoropolymers so extractible F ions could be coming from a halogenated material of concern.  If the extraction analysis shows no detectable fluoride (fluorine) then the original ICPMS result should be classified as “Fluoride (fluorine) not resulting from a halogenated material of concern”.”* |  |
| US24 | 141 - 151 | 5.6 Interpretation of test results | 5.6.3 Halogens detected with total < 0.9% | Te | Test results should be limited to ions from halogenated materials of concern as defined in the IEC 62474 database. | (See US21) If the proposal to remove the 0.9% threshold requirement in US15 is accepted, then this 5.6.3 needs to be completely re-written to read as below.Title “*Detected halogens less than threshold(s) and application(s) defined in IEC 62474 Database**Results indicating the presence of the halogen ion content from halogenated materials of concern less than the threshold(s) and application(s) specified in IEC 62474 Database demonstrate that the tested material is in conformance with the “Low Halogen” definition described in Part 4 Specifications.*Remove rest of information, starting with “Further…” on 149 to the end of line 151. |  |
| FI | 141, 143, 145, 147, 155, 156,157, 162, 163, 259 |  |  | ed | Use decimal comma instead of decimal point to comply with ISO/IEC Directives Part 2 Ed 7.0 subclause 9.1. | Replace decimal point with decimal comma throughout the document. |  |
| BE-16 | 141-144 | 5.6.2 |  | Te | We do not support this condition | Delete this clause and renumber the remaining text accordingly. |  |
| CA-03 | 141-144 | 5.6.2 |  | TE | There is no scientific basis for the selection of 0.9% by mass as a cut-off point for low halogen materials. As currently specified, many halogens for which there are no known or anticipated human health or environmental concerns will not qualify as low halogen. This fact is even stated in the document in line 184 “Halogenated substances are not as a group generally hazardous to the environment” | Delete 5.6.2 lines 141-144 |  |
| CN-2 | 141-164 | 5.6.25.6.3 |  | technical | Same as above | Delete 5.6.2 and 5.6.3 |  |
| IT12 | 142-143 | 5.6.2 |  | te | Halogens are not as a group generally hazardous to the environment and the inclusion of all halogens in the definition would create unnecessary concern. | Remove general reference to Fluorine (and Iodine) from the definition. See IT07 |  |
| NL 20 | 144 | 5.6.2 |  | ed | Be consistent in referencing the definition described in Clause 4 | “…the “Low Halogen” definition described in ~~Part 4 Specifications~~ Clause 4” |  |
| BE-17 | 145 | 5.6.3 |  | Ed/Te |  | Renumber clause as 5.6.2 and call it simply “Halogens detected” |  |
| FR 17 | 145 | 5.6.3 |  | Te | The methodology proposed for the assessment of the halogen content is based on a combustion that is unfortunately not 100% efficient. Therefore, all the different elements are not found in the smoke or not 100% under halid ions so not quantify. Finally, this technique can be used to determine whether HBCDD content fulfil the requirement of content less than 0.1%. | Delete the example line 153 |  |
| NO | 145 | 5.6.3 |  | Te | The methodology proposed for the assessment of the halogen content is based on a combustion that is unfortunately not 100% efficient. Therefore, all the different elements are not found in the smoke or not 100% under halid ions so not quantify. Finally, this technique can be used to determine whether HBCDD content fulfil the requirement of content less than 0.1%. | Delete this example |  |
| CA-04 | 145-147 | 5.6.3 |  | TE | There is no scientific basis for the selection of 0.9% by mass as a cut-off point for low halogen materials. As currently specified, many halogens for which there are no known or anticipated human health or environmental concerns will not qualify as low halogen. This fact is even stated in the document in line 184 “Halogenated substances are not as a group generally hazardous to the environment” | Replace line 145**“5.6.3 Halogens detected with total < 0.9%”**with**“5.6.3 Halogens detected”**Replace line 147 “and iodide (iodine) with total halogen ion content ≤0.9% require further investigation to”with“and iodide (iodine) require further investigation to” |  |
| NL 21 | 145-147 | 5.6.3 |  | te | Inconsistent use of “≤” symbol:“…with total halogen ion content ≤0.9% …” | Change to “<” symbol:“…with total halogen ion content **<** 0.9% …”  |  |
| IT13 | 146-147156-157 | 5.6.3 |  | te | Halogens are not as a group generally hazardous to the environment and the inclusion of all halogens in the definition would create unnecessary concern. | Remove general reference to Fluorine (and Iodine) from the definition. See IT07 |  |
| BE-18 | 147 | 5.6.3 |  | Te |  | Delete “with a total halogen ion content ≤0.9%” |  |
| SE11 | 147 | 5.6.3 |  | te | It is stated (less than or equal to) “≤0.9%”, which is wrong. | Change to (less than): “< 0,9%” |  |
| NL 22 | 148-149 | 5.6.3 |  | ed | Be consistent in referencing the definition described in Clause 4 | “…the “Low Halogen” definition described in ~~Part 4 Specifications~~ Clause 4” |  |
| FR 18 | 149 | 5.6.3 | 1 | ed |  | Replace “Part 4” with “clause 4”. |  |
| FR 1 | 15 | Introduction |  | te | This first dashed item is meaningless as the sentence starts in line 11 with “Implementation of substance restrictions around the world have identified…” | Delete this first dashed item. |  |
| JP4 | 15,16 | INTRODUCTION |   | ge | Revision of Introduction is necessary. However, at the present time it is better to assumed to be TBD, because it is necessary to rewrite it to the contents conforming to the definition of halogen and Specifications. | It is better to assumed to be TBD at the present time, because it is necessary to rewrite it to the contents conforming to the definition of halogen and Specifications. |  |
| US25 | 153 - 157 | 5.6 Interpretation of test results | 5.6.3 Par 2 | Te | Test results should be limited to ions from halogenated materials of concern as defined in the IEC 62474 database. | (See US21) If the proposal to remove the 0.9% threshold requirement in US15 is accepted, then this 5.6.3 needs to be re-written to read as below.“For example, in the IEC 62474 database, HBCDD (hexabromocyclododecane, a brominated flame retardant) is a mandatory reporting requirement substance with “intentionally added or 0.1% by mass” on an “article” basis as the reporting threshold level. ~~Any article containing unintentionally added HBCDD with less than 0.9% total elemental halogen (F+Cl+Br+I) must also have <0.1 mass % HBCDD to be identified as “low halogen”.”~~ |  |
| FR 19 | 155 | 5.6.3 | 2 | te | Clarification | Replace the sentence with:“Any article containing less than 0.9% total elemental halogen (F+Cl+Br+I) must also have <0.1 mass % HBCDD to be identified as “low halogen”. |  |
| CA-05 | 156 | 5.6.3 |  | TE | There is no scientific basis for the selection of 0.9% by mass as a cut-off point for low halogen materials. As currently specified, many halogens for which there are no known or anticipated human health or environmental concerns will not qualify as low halogen. This fact is even stated in the document in line 184 “Halogenated substances are not as a group generally hazardous to the environment” | Replace line 156“unintentionally added HBCDD with less than 0.9% total elemental halogen (F+Cl+Br+I) must”with“unintentionally added HBCDD must” |  |
| FR 20 | 157 | 5.6.3 | 2 | ed | “%” must be after “0.1” | Replace “0.1 mass %” with “0.1 % by mass” |  |
| NL 23 | 163-164 | 5.6.3 |  | ed | Be consistent in referencing the definition described in Clause 4 | “…the “Low Halogen” definition described in ~~Part 4 Specifications~~ Clause 4” |  |
| FR 2 | 17 | Introduction |  | te | TC 111 “Environmental standardization for electrical and electronic products and systems” can and shall deal only with Environmental issues. | Replace this third dashed item with“- Toxicity of certain fire effluents.” |  |
| IT02 | 17 | INTRODUCTION |  | te | Specific concerns about EEE combustion in certain confined spaces should not be used to justify broad concerns about EEE combustion in all spaces. | Remove line 17. |  |
| NL 04 | 17 | Introduction |  | ed | Focus of this standard must be on environmental aspects“Corrosivity / toxicity of certain fire effluents” is not directly linked to environment but rather to property damage (corrosivity), health (toxicity) and fire hazard | Remove third bullet  |  |
| Unex | 17 | Introductionm |  | Technical | The reference to corrosivity is incorrect.Although halogenated polymers produce acid gases in case of burning, there are other polymers that also produce corrosivity in case of burning.IEC-TC89 indicated there is no direct relationship between acidity and halogen content | Delete the line |  |
| GB 24 | 170 | A.1 |  | te | Some general text describing why halogenated substances are used in electrotechnical products should be included. | Some suggested initial text for this clause is as follows:“Halogen-containing materials are primarily used in electrical and electronic products either because of useful properties of the base material or as flame retardants to achieve a desired ignition resistance and/or to reduce the flame spread after ignition.Some halogen-containing materials are used for other purposes, e.g. as surfactants, plasticizers, or as pigments. Some fillers may also contain halogenated substances.A number of halogen containing materials have been identified as having a detrimental environmental impact. These are listed in the IEC 62474 database, which is kept under periodic review. Some halogenated substances are restricted for reasons other than environmental ones, e.g. because they emit decomposition products that are hazardous to health when subject to high temperatures. These restrictions are not dealt with in this standard. |  |
| JP31 | 170 | Annex A | A.1 General | Ed | This wording is redundant and unnecessary. Annex A originally aims at providing fact basis information. | Delete “In fact”. |  |
| GB 25 | 171 - 183  | A.1 |  | T | This listing is totally unecessacary. It is incomplete (no list of components ‘commonly found in EEE’ could ever be complete) and yet line 183 says “This standard applies to the materials used in these components.” So if the material is not contained in a component which is not in this incomplete list this standard doesn’t apply? | Manufacturers of EEE know the components they use, so an incomplete or indicative list is useless and should be deleted. A statement along the lines of “This standard applies to all materials…” belongs in the scope or normative text, not an informative annex. |  |
| US26 | 183 | A.1 | 2nd para | Te | With the definition of low halogens being tied to the IEC 62474 standard, it needs to be consistent with that standard. This statement is inconsistent with IEC 62474. | Eliminate line 183. |  |
| US27 | 184 | A.1 | 3rd para | Te | This paragraph supports the rationale to eliminate the 0.9 mass percent of total halogens from the definition of low halogen. | Maintain and change the definition of low halogens, see comment above and US15. |  |
| GB 26 | 184-186 | A.1 |  | ed/te | This paragraph is confusing. This standard DOES include all halogens, so what does this text mean? | Delete “so to include all halogens would create demands for verifications that are not needed.” |  |
| BE-19 | 185 | A.1 |  | Ed |  | Consider deleting “in” after the comma |  |
| SE12 | 186 | A.1 |  | te | Replace wording: “halogens” with “halogenated substances”. | Change to: “halogenated substances” |  |
| US28 | 187 | A.1 | 4th para | Te | This paragraph provides no guidance or interpretation. It is an introduction-type statement, and one for which there may not be universal agreement. | If deleting paragraph (US29) is not accepted; please delete this line. |  |
| GB 27 | 187 - 203 |  |  | Te | It is not only “Stakeholders of e-waste” who have been diacussing this matter. The word “informal” is inappropriate, since the converse is “formal”. IEC standards should present information in as consise a manner as possible, which the current text does not. Remarks such as “Open-Burning of all plastics yields toxic and corrosive by-products and this practice should be discontinued.” Is why many countries forbit this practice, but this standard is about defining limits for “low halogen” and should restrict itself to this matter. It should also restrict itself to environmental matters, in particular substances contained in the IEC 62474 database.Lines 109 to 203 are simply a repetition of the introduction giving the reason for creating this standard, so need not be repeated again.As stated previously, TC111 should be concerned solely with environmental aspects and not safety considerations such as the emissions of substances hazardous to health (e.g. causing inhalation damage to those involved in the open burning of plastics.) | Delete lines 187 to 203. |  |
| NL 24 | 187-194 | A.1 |  | ed | The unacceptable aspects of ‘Open-burning’ are mostly health related, and are therefore not covered by the standard | Remove lines 187-194 |  |
| US29 | 187-194 | A.1 | General | Ed | Many stakeholders would disagree with the comments found in this paragraph, based on the methodology of e-waste recycling. While much have this description is part of the “debate”, it would be more appropriate to imply that this is just one perspective. | If deleting paragraph (US29) is not accepted; change the first sentence on Line 187 to read: “**Some** stakeholders of waste electrical and electronic equipment (e-waste, hereafter) have **suggested**, however, that informal activities in the e-waste recycling chain . . . .” |  |
| SE13 | 188 | A.1 |  | te | At line it is stated: “that informal activities in the e-waste recycling chain including manual dismantling,” – manual dismantling is common practice. | Change to: “that informal activities in the e-waste recycling chain such as …” |  |
| CA-06 | 190-192 | A.1 |  | TE | The open burning of e-waste is hazardous from both an environmental and human health perspective. There is no data to suggest that decomposed gasses from halogens are worse than other by-products of e-waste burning and is inflammatory. | Delete the language “in particular by decomposed gases such as hydrogen halides (HF, HCl, HBr, and HI) from open burning of cables and plastics 1 parts which can contain a high content of halogens depending on the initial product designs.” From the second to last sentence. |  |
| US30 | 193 - 194 | Annex A | A.1 Par 4 | Te | Users should understand that compliance with this standard does not prohibit or prevent open burning. The text should be strengthened from “should be discontinued” to “should be illegal”, otherwise, compliance with this standard will place the burden on countries and manufacturers intent on compliance with appropriate standards, recycling and disposal practices without impacting the open-burning, which is the primary source of concern regarding fire effluents of halogenated materials used in EEE applications. | If deleting paragraph (US29) is not accepted, revise this passage to read, Open-Burning of all plastics yields toxic and corrosive by-products and this practice should be ~~discontinued~~ illegal. Compliance with this standard in conjunction with responsible recycling/waste disposal is necessary to achieve the desired environmental and societal outcomes. |  |
| JP30 | 195 | 5.5 |  | Te | **[Comments from chemicals and materials suppliers point of view]**Quantitative analysis results are different in the test standards in examples. If 5.5 should keep in IEC 63031, WG3 shall finish IIS to confirm repeatability and reproducibility, as well as interoperability of test results between different test methods available before publication of IEC 63031.  | **[Proposals from chemicals and materials suppliers point of view]**IEC 63031 shall not be published unless IIS of test methods has been finalized to make conclusion of repeatability, reproducibility and interoperability between the test methods of halogen contents, if IEC 63031 keeps 5.5. |  |
| NL 25 | 195-201 | A.1 |  | ed | prEN 50642 is currently a draft standard, and is not supposed to be referred to in the body of this standard if not publishedIf this standard is to be published before the 50642, its reference will need to be removed anyway | Replace the reference to prEN 50642 by another reference, preferably from IEC source … there are many to choose from |  |
| US31 | 195-203 | A.1 | General | Ed | This is a proposed Standard for the Definition of a Low Halogen product. It is NOT a position / white paper on certain biased perspectives on halogenated products. It is these kinds of comments that is making it very difficult to achieve consensus on this proposed standard. Referencing “some” undefined industries and individual companies is extremely inappropriate for an IEC standard on product definition. | Strike the entire paragraph in Lines 195 – 203. |  |
| US32 | 195-203 | A.1 | 4 | Te | The sentence regarding a singular association is not precise and the implied meaning to the reader of the standard is inaccurate. A number of international semiconductor companies, materials companies and end user integrator companies worked on the definition up to 10 yrs. ago in response to hazard and safety concerns raised by certain non-governmental organizations that represented end users.Refer to:

|  |
| --- |
| New York State/NEMA Toxicity database that indicates no significant difference in toxicity between the fluoropolymer category of materials versus PVC and Polyolefin based materials when burned.  |

The motivation for the definition cannot be supported by the statement. | If deleting paragraph 5 (US32) is not accepted, replace this paragraph to read; ~~For example independent semiconductor producers, materials companies and end product manufactures aligned on definitions acceptable to end users, that balance (intended and unintended event) versus cost and availability.~~~~In fact,~~ Some industries and companies have independently introduced a reduction of halogenated substances based on their own definition of scope and thresholds or criteria to lower the halogen content~~. For example, an independent semiconductor association provides 197 their low-halogen definition which is limited to bromine and chlorine derived from CFRs, BFRs, 198 and PVCs only [1], whereas prEN 50642[9] provides a method for the determination of the 199 content of halogenated substances in cable management systems that can be converted to 200 fluoride, chloride, bromide and iodide by combustion[2].~~ Thus, these activities generate a need for an IEC definition of “low halogen” as applied to various electrical and electronic products. |  |
| NL 26 | 201 | A.1 |  | ed | Reference [2] has nothing to do with the mentioned prEN 50642 providing “a method for the determination of the content of halogenated substances in cable management systems …” | Remove reference [2] in line 201 |  |
| NL 27 | 201-203 | A.1 |  | ed | It is not correct to justify the need for an IEC “Low halogen” definition based on two other, different definitions: one defining “**Low** halogen” (JEDEC), the other defining “Halogen **free**” (prEN 50642) In fact, there is no need for yet another (non-harmonized) definition on halogen content anyway…!  | Remove the sentence“~~Thus, these activities generate a need for an IEC definition of “low halogen” as applied to various electrical and electronic products.~~” |  |
| JP32 | 203 |  | A.1 General | Ge | **[Comments from chemicals and materials suppliers point of view]**Halogen gas generated by field burning is regarded as environmental impact information, but there is no big impact report even with a big fire like a forest fire. If the burning field is assumed to be environmental and human health risks, please describe the ban on burning in Japan and information on incineration technology.(It is well known that the generation of harmful gas can be greatly reduced by completely burning these gases with suitable treatment equipment.)The description of informal activities Is not necessary.  | **[Proposals from chemicals and materials suppliers point of view]**Replace texts from line 187-194 with the correct fact and add the right method to reduce the risk of combustion as follows:“CO, CO2, SO2, NO2 and halogen gases (HF, HCl, HBr, and HI) generate from open burning. However, it is well known that these gases can be greatly reduced in generation of harmful gas by completely burning with appropriate treatment equipment.”If this is accepted, add “ CO, CO2, SO2, NO2 and” in front of “ hydrogen halides” in line 223 of Annex A.3.1. |  |
| BE-20 | 204 | A.2 |  | Ed | Why not to call it “Halogenated substances in IEC 62474 database”? The title is misleading, as no material is expected to contain “all” halogenated substance in the DB at the same time … | Delete “Materials containing all” |  |
| SE14 | 204 | A.2 |  | te | Headline wording < all > is confusing | Remove the word < all > |  |
| BE-21 | 205 | A.2.1 |  | Ed | Header is useless, since there is no other subsection in A.2  | Delete this header |  |
| NL 28 | 210-211 | A.2.1 |  | ed | Sentence does not ‘run’ smoothly | Remove “substance groups” from line 210 or add it after non-halogenated substances in line 211 as follows:“The database contains both halogenated substances ~~or substance groups~~ and non-halogenated substances”**or**“The database contains both halogenated substances ~~or substance groups~~ and non-halogenated substances or substance groups” |  |
| NL 29 | 212-214 | A.2.1 |  | ed | Explanation of Criteria 3 substances is not in place to be added here since similar explanations for Criteria 1 and Criteria 2 are not providedBesides, the message around threshold is not relevant here | “[…] which are categorized into Criteria 1 (currently regulated), Criteria 2 (for assessment), and Criteria 3 (for information only) ~~where the reporting threshold value is given based on the lowest applicable regulatory limit or stakeholder requirements in the market of specific applications~~. Criteria 1 and 2 substances are based on regulatory requirements, and therefore have mandatory declaration, while Criteria 3 substances have non-mandatory declaration as they are based on market specific requirements.” |  |
| GB 28 | 215-217 | A.2 |  | te | “give the foundation for inclusion/exclusion of the halogen in the low halogen definition”is not correct.Also how can categories provide the motivation of limits?Furthemore, TC111 (and therefore this standard) only cover environmental matters. Hence the text “health and” is incorrect as it implies that this standard goes beyond the scope of TC111. | Delete lines 215 - 217 |  |
| NL 30 | 217 | A.2.1 |  | ed | No clear to state “based on the health and environmental aspects” | “[…]and the motivation of the limits, based on ~~the health and environmental aspects~~ legislation or market requirements.” |  |
| NL 31 | 218 | A.3 - Title |  | ed | What are the additional halogenated substances? | Remove the word “additional” from the title:“Materials containing ~~additional~~ halogenated substances to consider environmental aspects” |  |
| SE15 | 218 | A.3 |  | te | At line “additional” is stated. This is confusing. | Delete word: “additional” |  |
| GB 29 | 218 - 246 |  |  |  | A.3.1 and A.3.2 seem to be about safety and so are not within the scope of TC111. See GB1.Moreover, A.3.2 attempts to explain why this standard contains a limit of 0,9% for totalogen content in all substance contained within a product, based on the toxicity of combustion products. GB is not aware of any scientifically validated evidence for introducing environmental limits on this basis, see GB 12.Hence A.3 reduces to just the current A.3.3.  | Delete A.3.1 and A.3.2 and re-name clause Emissions of halogenated substances into the environment |  |
| US33 | 218 - 246 | Annex A | A.3.1 Corrosivity of the combustion products | Te | Remove clause A.3 in its entirety to align with the proposals in US4 and US25. | Eliminate clause A.3. |  |
| ES | 218-246 |  | A.3 | te | This new chapter is fully unsuitable due to:* A 3.1 is out of scope of this standard, and therefore not helpful for a “low halogen” definition.
* A 3.2 is in the same way out of scope as standards already exist.

A 3.3 is neither useful as the named substances are legally well regulated. | Delete A.3 completely |  |
| NO | 219 | A.3.1 |  | Ed | Paragraph is not justified. | Justify the paragraph to both right and left |  |
| FR 21 | 220 | A.3.1 |  | te | “Corrosivity” is no the appropriate term | Replace the title with “Irritating properties of the combustion products” |  |
| IT14 | 220-230 | A.3.1 |  | te | Specific concerns about EEE combustion in certain confined spaces should not be used to justify broad concerns about EEE combustion in all spaces. | Remove paragraph A.3.1. |  |
| US34 | 220-230 | A3.1 |  | Te | Remove clause A.3 in its entirety to align with the proposals in US4. | If deleting paragraph A.3 (US35) is not accepted, eliminate paragraph A.3.1 in total. |  |
| NL 32 | 220-237 | A.3.1. and A.3.2 |  |  | These sub-clauses are **not** relevant for this standard … only Clause A.3.3 is relevant:- Corrosion effect (line 229) is resulting in property damage, and has nothing to do with environmental aspects- Toxicity of combustion gases (line 231) is about health safety, and has nothing to do with environmental aspects | Remove complete sub-clauses A.3.1.and A.3.2 |  |
| JP33 | 221 | Annex A1. |  | General | **[Comments from chemicals and materials suppliers point of view]**Benefit of halogenated compounds should also be described as well as concern. In particular halogenated materials which improve flame retardant properties can control and reduce spread of fire including decomposed gases. | **[Proposals from chemicals and materials suppliers point of view]**Add after line 203 as follows:However, using halogen materials to polymer compounds as additive upgrades the various characteristic features. In particular, by using the halogenated frame retardant, in case of fire, burning expansion can be controlled effectively. That can also indirectly contribute the decreasing decomposed gases. |  |
| SE16 | 229-230 | A.3.1 |  | te | It is here stated: “The main reason for such assessment is the corrosion effect, since HBr and HCl are not classified as “toxic” but as “irritant”.”  | Change wording to:“The main reason for such assessment is the corrosion effect, since the adverse health effects of HBr and HCl depend on the concentration in the air.”  |  |
| FR 22 | 231 | A.3.2 |  | te | A indicated in the scope of Part 1 “General” of EN 45545 series “Railway applications - Fire protection on railway vehicles”, “The measures and requirements specified in EN 45545 are intended to protect passengers and staff in railway vehicles in the event of a fire on board.”The toxicity dealt with in EN 45545-2 is not toxicity for environment and EN 45545-2 should not be referred to in IEC 63031. | Delete the whole current paragraph and possibly replace it with an appropriate more general text as in A.3.1. |  |
| BE-22 | 231-237 | A.3.2 |  | Ge/Te | A.3.2 attempts to explain why this standard contains a limit of 0,9% for total halogen content in all substance contained within a product, based on the toxicity of combustion products. We are not aware of any scientifically validated evidence for introducing environmental limits on this basis. It is commonly accepted that CO (carbon monoxide) is the big killer in fires (e.g. <http://www.nfpa.org/news-and-research/news-and-media/press-room/reporters-guide-to-fire-and-nfpa/consequences-of-fire>); CO has the additional disadvantage that it odourless and tasteless, which (unlike most other fire gases) prevents you from waking up when asleep. | Remove A.3.2. |  |
| IT15 | 231-237 | A.3.2 |  | te | Specific concerns about EEE combustion in certain confined spaces should not be used to justify broad concerns about EEE combustion in all spaces. | Remove paragraph A.3.2. |  |
| US35 | 231-237 | A.3.2 | Toxicity | Ed | This standard should not be citing very certain applications or considerations unique to that product and make “general” suppositions to ALL products and applications. This is dangerous, misleading and, again, is inhibiting consensus on this proposed standard. Also, gases / substances such as HCl and HBr are NOT classified as “toxic”, but only as an “irritant” (as stated in the previous paragraph). Inferences on “Toxicity” should not be a part of this Informative Annex. | If deleting paragraph A.3 (US35) is not accepted, eliminate paragraph A.3.2 in total. |  |
| US36 | 232 | A.3.2 | Last sentence | Te | Given the recommendation to remove the reference to 0.9 mass percent in the low halogen definition, this sentence is not needed and in fact can be confusing. | If deleting paragraph A.3 (US35) is not accepted and eliminating A3.2 (US36) is not accepted, eliminate the last sentence in A3.2. |  |
| US37 | 238-246 | A.3.3 |  | Te | Scientific studies showing the presence of substances in living organisms does not link the use or presence of these substances in electronics. No evidence of causation is provided. | If deleting paragraph A.3 (US35) is not accepted, eliminate A3.3. |  |
| US38 | 238-246 | A3.3 |  | Te | Scientific studies showing the presence of substances in living organisms does not link the use or presence of these substances in electronics. No evidence of causation is provided. | If deleting paragraph A.3 (US35) is not accepted and eliminating A3.3 (US39) is not accepted, rewrite A3.3 to indicate what is and is not known. |  |
| NL 34 | 239-246 | A.3.3 |  | ed | … | Add sentence: “Many scientific studies have proven that these substances are largely spread in living organisms all over the world which is a considerable environmental concern. This is, amongst others, the reason why these substances are included in the IEC 62474 Criteria 1 and 2 database.” |  |
| NL 33 | 240 | A.3.3 |  | ed | Not **all** brominated and chlorinated flame retardants are found in the environment | Change sentence to:“Some ~~of them (~~brominated and chlorinated flame retardants and some fluorinated substances like PFOAs and PFOSs~~)~~ can be widely distributed in the environment.” |  |
| GB 31 | 247 | A.4 |  | ed | “the typical” is unnecessary. | Change to:“Examples of halogenated materials in electrical and electronic products”. |  |
| GB 30 | 247 - 254 | A.4 |  | Te/GE | It is certainly possible to see the benefit of examples of the typical halogenated materials which may be found in electrical and electronic products. However, the various sub-parts of A.4 are not consistant in the information they provide nor the way they provide it.Furthermore, sometimes a mass fraction of a halogen is provided and other times not. As described in GB 12, this standard should not include a requirement for total halogen concentration and therefore the value of providing mass fraction data is questioned. | Ensure consistency between sub-parts of Annex A.4 and consider the removal of mass fraction data. |  |
| ES | 247-353 |  | A.4 | te | A.4 is fully inappropriate as it contains many substances that are legally regulated, but do not occur in EE products. Therefore the reference in clause 4. specifications to the IEC 62474 DB is fully sufficient. | Delete A.4 completely |  |
| US39 | 247-353 | A.4 |  | Te | Remove clause A.4 in its entirety to align with the proposals in US4 and US25. | Eliminate clause A.4. |  |
| GB 32 | 249 | Annex A | A.4.1 Title | Technical | The use of a non-specific term, “fluorinated substances” describes a universe of organic and inorganic substances. There is a need to use consistent terminology across the scientific community. As fluoropolymers and perfluoroalkyl acids (PFOA/PFOS) are perfluoroalkyl and polyfluoralkyl substances (PFASs). See Buck et al 2011. | Materials containing perfluoroalkyl and polyfluoroalkyl substances (PFASs).Add a reference to the Buck et al 2011 in the bibliography. |  |
| US40 | 249 | Annex A | A.4.1 Title | Te | The use of a non-specific term, “fluorinated substances” describes a universe of organic and inorganic substances. There is a need to use consistent terminology across the scientific community. As fluoropolymers and perfluoroalkyl acids (PFOA/PFOS) are perfluoroalkyl and polyfluoralkyl substances (PFASs). See Buck et al 2011. | If deleting paragraph A.4 (US41) is not accepted, revise the title to read; Materials containing ~~fluorinated~~ PFAS’sAdd the following definitions to Clause 3:**PFAS’s** aliphatic substances containing one or more C atoms on which all the H substituents present in the nonfluorinated analogues from which they arenotionally derived have been replaced by F atoms, in such a manner that PFASs contain the perfluoroalkyl moiety CnF2n+1–.**Perfluoroalkyl substances**aliphatic substances for which all of the H atoms attached to C atoms in the nonfluorinated substance from which they are notionally derived have been replaced by F atoms, except those H atoms whose substitution would modify the nature of any functional groups present.**Polyfluoroalkyl substances**aliphatic substances for which all H atoms attached to at least one (but not all) C atoms have been replaced by F atoms, in such a manner that they contain the perfluoroalkyl moiety CnF2n+1–. |  |
| GB 33 | 249-sq | Annex A | Add NOTE | Technical | The PFASs categories and terminology need to be consistent with Buck et al 2011.PFOA and PFOS are included in the Buck paper as non-polymeric perfluoroalkyl acids (p. 522)  | Add – With respect to fluorinated materials in EEE, perfluoroalkyl and polyfluoralkyl substances, PFASs are described in Buck 2011. |  |
| US41 | 249-sq | Annex A | Add NOTE | Te | The PFASs categories and terminology need to be consistent with Buck et al 2011.PFOA and PFOS are included in the Buck paper as non-polymeric perfluoroalkyl acids (p. 522)  | If deleting paragraph A.4 (US41) is not accepted, add the following as a Note:With respect to fluorinated materials in EEE, perfluoroalkyl and polyfluoralkyl substances, PFASs are described in Buck 2011. Fluorinated polymers to encompass all polymers for which one or more of the monomer units contains the element F, in the backbone and/or in side chains. Fluorinated polymers may or may not be PFASs, depending on whether they contain perfluoroalkyl moieties. Fluoropolymers are a distinct subset of fluorinated polymers made by (co)polymerization of olefinic monomers, at least one of which contains F bound to one or both of the olefinic C atoms, to form a carbon-only polymer backbone with F atoms directly attached.Nonpolymer perfluoroalkyl and polyfluoroalkyl substances include Perfluoroalkyl acids which are also PFASs. This family include PFAAs such as perfluoroalkyl carboxylic, sulfonic, sulfinic, phosphonic, and phosphinic acids.  |  |
| GB 34 | 250 - 252 | Annex A | A.4.1.1 General | Technical | Terminology should be consistent with Buck et al 2011. | Relevant fluorine containing substances can be divided into three groups. These are: fluoropolymers, perfluoroalkyl acids (e.g., PFOS and PFOA), and inorganic fluorinated substances. |  |
| US42 | 250 - 252 | Annex A | A.4.1.1 General | Te | Terminology should be consistent with Buck et al 2011. | If deleting paragraph A.4 (US41) is not accepted, add revise this part as follows; “Relevant fluorine containing substances can be divided into three groups. These are: fluoropolymers, perfluoroalkyl acids (e.g., PFOS and PFOA), and inorganic fluorinated substances.” |  |
| NL 41 | 251-252 |  |  |  | In the sentence “Relevant fluorine containing substances can be divided into three groups. These are: fluoropolymers, PFOS and PFOA, and inorganic substances.” | Three are named but we count four.If PFOS and PFOA are one group, suggest to replace “and” by a slash:“Relevant fluorine containing substances can be divided into three groups. These are: fluoropolymers, PFOS ~~and~~ / PFOAs, and inorganic substances.” |  |
| SE17 | 252 | A.4.1.1 |  | te | First sentence mention three groups. Second sentence mention four groups. PFOS and PFOA can belong to the group PFAS. | New second sentence:“These are: fluoropolymers, PFAS (such as PFOS and PFOA) and inorganic substances.” |  |
| IT17 | 253 | A.4.1.2 |  | te | Fluoropolymers possess low inherent hazard and unique functionality to multiple industries, including health care, food contact applications, aerospace, chemical processing, building construction, automotive, electronics, energy, environmental protection, and outdoor & technical apparel. | Refer only to the materials in IEC 62474 database when referencing the definition to specific halogen containing substances of concern. Fluoropolymers should not be the target of this standard. |  |
| IT16 | 253-265 | A.4.1.2 |  | te | Substance restrictions around the world have not identified the use of all fluoropolymers (e.g., PTFE) as an area of concern. | Refer only to the materials in IEC 62474 database when referencing the definition to specific halogen containing substances of concern. |  |
| NL 35 | 254 | A.4.1.2 |  | ed | Should consistently use combination “electrical and electronic” throughout the document | “Fluoropolymers for electrical and electronic ~~and electrical~~ products …” |  |
| US43 | 254 - 255 | Annex A | A.4.1.2 Fluoropolymers | Te | It should be clarified that fluoropolymers are different from the other two classes of fluorinated substances and therefore do not have the same concerns.Note - Fluoropolymers with MW >10,000 Daltons cannot enter the cell. | If deleting paragraph A.4 (US41) is not accepted, revise this passage as follows;“Fluoropolymers for electronic and electrical products have not been identified as bio-accumulative, persistent or toxic substances by any countries or organizations. Fluoropolymers have thermal, chemical, photolytic, hydrolytic, and biological stabililty. Fluoropolymers are high molecular weight and have negligible oligomer content or leachables. They cannot cross cell membranes and are not bioavailable or bioaccumulative. Toxicology studies on PTFE (for example) demonstrate the lack of: acute or subchronic systemic toxicity, irritation, sensitization, local toxicity on implantation, cytotoxicity, in vitro and in vivo genotoxicity, hemolysis, complement activation, or thrombogenicity. These properties which make fluoropolymers so very unique and useful are also those that make them biocompatible and inherently safe. Finally, these data demonstrate that fluoropolymers are distinctly different and separate from other categories of per- and poly-fluoroalkyl substances. Therefore, fluoropolymers are not halogenated materials of concern.  |  |
| CA-07 | 255 | A.4.1.2 |  | TE | Given that open air burning is a key reason for the use of low-halogen status, PT should confirm that the statement is also true for products from combustion of fluoropolymers.  |  |  |
| FR 23 | 257 | A.4.1.2 | Table A-1 | Te | The mass fraction of fluorine may vary in some fluoropolymer, depending on the monomer concentration.  | Provide a range of fluorine mass fraction for fluoropolymer based on fluorinated and non fluorinated monomers |  |
| FR 24 | 257 | A.4.1.2 | Table A-1 | Ed | The values provided are very precise.  | Provide values with only two significant digit |  |
| NO | 257 | A.4.1.2 | Table A-1 | Te | The mass fraction of fluorine may vary in some fluoropolymer, depending on the monomer concentration.  | Provide a range of fluorine mass fraction for fluoropolymer based on fluorinated and non fluorinated monomers |  |
| NO | 257 | A.4.1.2 | Table A-1 | Ed | The values provided are very precise.  | Provide values with only two significant digit |  |
| SE 18 | 257 | A.4.1.2 | Table A-1 | ed | The values provided are very precise. | Provide values with only two significant digit |  |
| JP34 | 259 | Annex A | A.3.1 | Ge | **[Comments from chemicals and materials suppliers point of view]**The description of inappropriate activities is not necessary. | **[Proposals from chemicals and materials suppliers point of view]**Delete “Inappropriate activities in the e-waste recycling chain including“. |  |
| NL 36 | 259 | A.4.1.2 | Table A-1 | ed/te | Do we really need up to 2 decimals for the mass fraction of fluorine?(See also Table A-3 where the mass fraction for chlorine have been rounded off) | Round off the mass fractions of fluorine to integer numbers |  |
| GB 35 | 262 | A.4.1.2 |  | ed | Either list examples in a Table or list them in the text, but not both. | Change:“Typical examples are listed in Table A-2 including insulating films, binding reagents for electrochemical devices such as lithium ion batteries, capacitors, fuel cells, backsheet of photovoltaic panels and functional ingredients of low wear and lubricity for plastics in general.”to“Typical examples are listed in Table A-2.”And add further examples to the table if required, |  |
| NL 37 | 266 | A.4.1.2 | Table A-2 | Ed | There is a disproportionate amount of information on the use of Fluor substances compared to the other halogens, that could make people overreact against its useBesides, there is a lot of repeated information in the table | Delete Table A-2 altogether.Eventually, if felt that some information is of utmost importance, replace the table by a few lines overview |  |
| US44 | 266 | Table A.2 |  | ED | PVDF should be consistently named throughout the document as Polyvinylidene fluoride | If deleting paragraph A.4 (US41) is not accepted, change Poly Vinylidene DiFluoride to Poly(vinylidene fluoride) |  |
| US45 | 266 | Table A.2 |  | ED | For PVDF,cables should be added under the Materials column.  | If deleting paragraph A.4 (US41) is not accepted, add “Cables” in Table A-2 for PVDF under the Materials column. Products column should say “Plenum” and “High heat resistance” should be added under the column Properties. |  |
| GB 36 | 267 | Annex A | A.4.1.3 PFOS and PFOA | Technical | Update terminology in title to be consistent with scientific consensus or delete entire section (see next comment). | Perfluoroalkyl acids (e.g., PFOS and PFOA) |  |
| SE19 | 267 | A.4.1.3 |  | te | In the title and in the text below, change PFOS , PFOA as mentioned in SE NC comment SE17. | Change to: “PFAS (such as PFOS and PFOA)” |  |
| US46 | 267 | Annex A | A.4.1.3 PFOS and PFOA | Te | Update terminology in title to be consistent with scientific consensus or delete entire section (see next comment). | If deleting paragraph A.4 (US41) is not accepted, revise to read “Perfluoroalkyl acids (e.g., PFOS and PFOA)” |  |
| SE20 | 268 | A.4.1.3 |  | te | In the text, starting with “Because of their chemical structure, PFOS and PFOA…” the use of abbreviations PFOS, PFOA, as well as the use of the pronoun “their” in the describing text are confusing. | Change wording to: ” Because of the chemical structure, PFAS…” |  |
| GB 37 | 268 - 274 | Annex A | A.4.1.3 | Technical | Note that existing text acknowledges PFOS/PFOA are no longer used in EEE. Therefore delete the whole section or make this statement more obvious.  | Delete lines 268 – 274. |  |
| US47 | 268 - 274 | Annex A | A.4.1.3 | Te | Note that existing text acknowledges PFOS/PFOA are no longer used in EEE. Therefore delete the whole section or make this statement more obvious.  | If deleting paragraph A.4 (US41) is not accepted, Delete entire section or revise as follows;Perfluorooctanesulfonic acid and its salts (PFOS) and perfluorooctanoic acid and its salts (PFOA) are no longer accepted as surface-active agents in various high temperature applications and consequently no longer recommended for use in electrical and electronic products. However, because of their chemical structure, PFOS and PFOA are chemically and biologically stable in the environment and resist typical environmental degradation processes. As a result, these chemicals are extremely persistent in the environment. They have been found to have several environmental toxic effects. ~~Perfluorooctanesulfonic acid and its salts (PFOS) and perfluorooctanoic acid and its salts (PFOA) are no longer accepted as surface-active agents in various high temperature applications and consequently no longer used in electrical and electronic products.~~  |  |
| GB 38 | 282 | A.4.2 and A.4.2.1 |  | te | There are five groups, not four.Chlorinated flame retardants should be included. | Change the text in A.4.2 to include chlorinated flame retardants.Some suggested text is as follows:“A.4.2.x Chlorinated flame retardants (CFRs)Chlorinated flame retardants (CFRs) are primarily used, like BFRs, to increase ignition resistance and/or to reduce the spread of flame after ignition. Also, as with BFRs, they can act as thermal stabilizers during fabrication, and they can act as plasticizers.There are two main families of CFRs: chlorinated paraffins and chlorinated alkyl phosphates~~. Of the former, short chain chlorinated paraffins (SCCPs) have been found to be toxic to aquatic organisms at low concentrations [1].~~SCCPs are listed as Criteria 1: “Currently regulated”, and other CFRs are listed as Criteria 3: “For information only” in IEC 62474 DB [2]. The substances in both groups are declarable.” |  |
| FR 25 | 287 | A.4.2.2 | Table A-3 | Te | PVC being described as a chlorinated polyethylene (line 290-291), the mass fraction of chlorine for chlorinated polyethylene in the table shall also include the case of PVC for which the mass fraction of chlorine is 56% | Modify mass fraction of chlorine for chlorinated polyethylene to “10 to 56” |  |
| NO | 287 | A.4.2.2 | Table A-3 | Te | PVC being described as a chlorinated polyethylene (line 290-291), the mass fraction of chlorine for chlorinated polyethylene in the table shall also include the case of PVC for which the mass fraction of chlorine is 56% | Modify mass fraction of chlorine for chlorinated polyethylene to “10 to 56” |  |
| US48 | 290-293 | A.4.2.2 | Paragraph | Te | PVC is not chlorinated polyethylene. These are two different materials. PVC is made by the reaction of vinyl chloride monomer. Chlorinated polyethylene is made by the addition of elemental chlorine to polyethylene polymer. The two are NEVER equivalent. Neither Chloropolymers, or PVC are listed in the IEC 62474 database and should NOT be inferred as “declarable” or subject to deselection, as this Annex is suggesting. | If deleting paragraph A.4 (US41) is not accepted, revise as follows;Polyvinylchloride (PVC), which is widely used for insulation material of electric cables inelectrical and electronic equipment, ~~can be regarded as a specific example of a Chlorinated polyethylene~~ is formed from the polymerization of vinyl chloride monomer, and consists of repeat saturated molecular units of 2 carbon atoms, 3 hydrogen atoms, and 1 chlorine atom, and which molecular weight is typically measured with viscosity methods. PVC itself is not listed in the IEC 62474 database, which are declarable substances.***rkrock****2017-06-28 18:53:51*--------------------------------------------This is scientifically inaccurate. PVC is made by the reaction of vinyl chloride monomer. Chlorinated polyethelene is made by the addition of elemental chlorine to polyethylene polymer. The two are never equivalent.  |  |
| FR 26 | 291 | A.4.2.2 |  | Te | It is specified that PVC is not listed in IEC 62474 Database is evolving, such sentence might be not true anymore in some years | Remove 291 to 294 lines |  |
| NO | 291 | A.4.2.2 |  | Te | It is specified that PVC is not listed in IEC 62474 database. Such sentence might not be true anymore in some years | Remove the sentence line 291 |  |
| GB 39 | 293 | A.4.2.2 |  | ed | “which are” should be “which only contains” | Change to: “which only contains” |  |
| GB 40 | 312 | A.4.3.2 |  | te | Some text concerning PBBs, PBDEs and HBCDD should be included. | Add the following text:“Polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs), and hexabromocyclododecane (HBCDD) have been proven to be hazardous to the environment.  |  |
| NL 38 | 317 | A.4.3.2 |  | ed | Add wording before reference to IEC 60695-11-10 | “… desired flame resistance (e.g. as determined according IEC 60695-11-10).” |  |
| GB 41 | 321-325 | A.4.3.3 | 1st sentence | ed | This sentence does not make sense. In addition, the references to specific mass fractions should be removed in the rest of annex A.4.3.3. | Simplify A.4.3.3 to: “Other sources of bromine found in EEE are phthalocyanine green based pigments found in orange coloured plastic materials, paints or coatings.” |  |
| US8 | 32-34 | 1 |  | Te | Since most environmental concern about halogen is from the plastic and other solid materials, it is reasonable to specifically exclude gas and liquid from the scope of this standard.  |  “Materials that are used during processing, in product delivery systems, or in product packaging (i.e. shipping materials), which may contain any form of halogens, but do not remain within the product are not in the scope of this document.  *Materials within the product as gas or liquid state are also not in the scope of this standard*.” |  |
| GB 42 | 328 | A.4.3.4 |  | ed | “as well” is unnecessary. | Delete “as well”. |  |
| GB 43 | 329 | A.4.4 |  | ed | The text could be improved.Note 2 is unnecessary – see 3.1.2.See proposed new text. | Suggested text is as follows:A.4.4 Iodine-containing substancesA.4.4.1 GeneralRelevant iodine-containing substances can be divided into three groups. These are: residual reaction intermediates, polarization films, and heat stabilizers.NOTE One iodine-containing substance, trifluoroiodomethane, is classified as an “Ozone Depleting Substance” and is listed as one of reference substances in the IEC 62474 database. However, it is a gas at ambient temperatures and pressures and has no practical significance within the context of this standard.A.4.4.2 Residual reaction intermediatesSome iodine substances are used as reactants or reaction intermediates in the production of materials used in electrical and electronic products. A.4.4.3 Polarization filmsOne of the most important uses of iodine in electronic products is in the manufacture of polarization films. These films are a key part of LCD panels. The film’s function is to allow pixels to be switched on and off. A.4.4.4 Heat stabilizersA few plastics materials incorporate iodine-containing substances as heat stabilizers, for example, the charging connectors used for smart-phones and tablets.  |  |
| FR 27 | 330 | A.4.4.1 |  | Ed | “Rection” instead of “reaction” | reaction |  |
| NO | 330 | A.4.4.1 |  | Ed | Rection instead of reaction | reaction |  |
| SE 21 | 330 | A.4.4.1 |  | ed | “Rection” instead of “reaction” | reaction |  |
| NL 39 | 332 | A.4.4.1 |  | ed | Wrong spelling of word “reaction” | “These are residual of reaction intermediates, polarization panel and heat stabilizer.” |  |
| BE-23 | 333 | A.4.4.2 |  | Ed | Confusing wording | Change “No iodine substances hazardous to the environment have yet been identified to be used in electrical and electronic products” into “***No iodine containing substances hazardous to the environment have yet been identified ~~to be~~ as being used in electrical and electronic products***” |  |
| NL 40 | 348 | A.4.4.4 |  | ed |  | “~~The iodine~~ Iodine levels of up to 2% by mass can result.” |  |
| NL 42 | 351-353 | A.4.4.4 |  | ed | The explanation given in Note 2 basically is a repeat of the text listed in lines 57-58 | Delete Note 2 altogether |  |
| JP35 | 354 | A.4.1.2 | Table A-1 | Ed | There is a PFA line in Table A-2, so it seems to be natural to have PFA in the table A-1 | Add the following line to the Table A-1“Tetra Fluoro Ethylene Perfluoro Alkyl Vinyl Ether copolymer (PFA), 75.82%” |  |
| JP36 | 354 | New informative annex |  | Te | Some TCs/SCs have provided standards defining “halogen-free” or “nonhalogenated” materials with different scope of elemental halogens and thresholds, which should be informed to users of IEC 63031 in this document in order that IEC 63031 will become a basic publication to provide a guidance of material definition including specific halogens and thresholds in the future.For example, TC20, TC91, and TC100 have those standards which should be listed for notification as informative annex of this standard.  | Add a new Annex B to provide list of standards which have material definitions related to halogen contents and or specific group of halogens and thresholds. |  |
| JP37 | 354 | NewAnnex C |  | Ge | Need to clarify the definition of IEC62474 database criteria 1, 2 and 3 | Add table of declarable substances criteria of IEC62474 as Annex C |  |
| GB 47 | 355 | Bibliography |  | Technical | Add new reference | Buck, Robert C, James Franklin, Urs Berger, Jason M Conder, Ian T Cousins, Pim de Voogt, Allan Astrup Jensen, Kurunthachalam Kannan, Scott A Mabury, and Stefan PJ van Leeuwen. Perfluoroalkyl and Polyfluoroalkyl Substances in the Environment: Terminology, Classification, and Origins. Integrated Environmental Assessment and Management - Volume 7, Number 4—(2011) pp. 513–541 |  |
| US49 | 355 | Bibliography |  | Te | Add a new reference | Buck, Robert C, James Franklin, Urs Berger, Jason M Conder, Ian T Cousins, Pim de Voogt, Allan Astrup Jensen, Kurunthachalam Kannan, Scott A Mabury, and Stefan PJ van Leeuwen. Perfluoroalkyl and Polyfluoroalkyl Substances in the Environment: Terminology, Classification, and Origins. Integrated Environmental Assessment and Management - Volume 7, Number 4—(2011) pp. 513–541 |  |
| US50 | 355 | Bibliography |  | Te | Add new references | If deleting paragraph A.3 (US35) is not accepted, the following bibliography references are recommended;Alarie, Y. Toxicity of Fire Smoke, Critical Reviews in Toxicology, Vol 32, p. 259-289, 2002Alarie, Y. (1985) The toxicity of smoke from polymeric materials during thermal decomposition. Ann. Rev. Toxicol. Pharmacol. 25: 325-347Barrow, Alarie and Stock, Sensory Irritation and Incapacitation Evoked by Thermal Decomposition Products of Polymers and Comparisons with Known Sensory Irritants, Archives of Environmental Health, March/April 1978, pp79-88.Gad SC and HL Kaplan, Combustion Toxicity, CRC Press, Boca Raton, Oct 2, 1990, p93.Hirschler, Marcelo, Flame Retardants and the Associated Toxicity, Fire Protection Engineering, 2015. |  |
| GB 44 | 359 | Bibliography | [2] | ed | “IEC62474” should be “IEC 62474” | Insert a space. |  |
| GB 45 | 360-369 | Bibliography |  | ed | References [3] to [7] do not occur in the text. | Either insert these references in the text where appropriate or delete the references. |  |
| GB 46 | 378-384 | Bibliography |  | ed | References [13] to [16] do not occur in the text. | Either insert these references in the text where appropriate or delete the references. |  |

Annex of JP.doc

Annex C IEC 62474 table of declarable substance criteria





Annex of SE.doc

Proposed Annex B from SE-07

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***ID*** | ***SubstanceGroup or SpecificSubstance*** | ***CAS number*** | ***Basis*** | ***Reportable Applications*** | ***Reporting Threshold*** |
| 00008 | Brominated flame retardants (other than PBBs, PBDEs, or HBCDD) | \*) | Criteria 3: For Information Only | Printed Wiring Board (PWB) Laminates | 0.09 mass% total bromine content in laminatematerial |
| 00009 | Brominated flame retardants (other than PBBs, PBDEs, or HBCDD) | \*) | Criteria 3: For Information Only | Plastic materials except PWB laminates | 0.1 mass% of bromine in plastic materials |
| 00013 | Cobalt dichloride | 7646-79-9 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00018 | Fluorinated Greenhouse Gases (PFC, SF6, HFC) | \*) | Criteria 1: Currently Regulated | All | Intentionally Added in product |
| 00020 | Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified: Alpha-hexabromocyclododecane Beta-hexabromocyclododecane Gamma-hexabromocyclododecane | \*) | Criteria 1: Currently Regulated | All | Intentionally added or 0.1 mass% of article |
| 00032 | Ozone Depleting Substances (CFC, Halon, HBFC, HCFC & others) | \*) | Criteria 1: Currently Regulated | All | Intentionally Added in product |
| 00033 | Perchlorates | \*) | Criteria 1: Currently Regulated | All | 6 x 10 ^-7 mass% of battery or product part |
| 00044 | Polybrominated Biphenyls (PBBs) | \*) | Criteria 1: Currently Regulated | All | 0.1 mass% in homogenous material |
| 00045 | Polybrominated Diphenylethers (PBDEs) | \*) | Criteria 1: Currently Regulated | All | 0.1 mass% in homogenous material |
| 00046 | Polychlorinated Biphenyls (PCBs) and specific substitutes | \*) | Criteria 1: Currently Regulated | All | Intentionally added in product |
| 00047 | Polychlorinated Terphenyls (PCTs) | \*) | Criteria 1: Currently Regulated | All | 0.005 mass% in material |
| 00048 | Polychlorinated Naphthalenes (PCNs) | \*) | Criteria 1: Currently Regulated | All | Intentionally added in product |
| 00052 | Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) | \*) | Criteria 1: Currently Regulated | All | Intentionally added or 0.1 mass% of article |
| 00056 | Tris(2-chloroethyl) phosphate | 115-96-8 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00062 | Chlorinated Flame Retardants (CFR) | \*) | Criteria 3: For Information Only | Plastic materials except PWB laminates | 0.1 mass% chlorine in plastic materials |
| 00063 | Chlorinated Flame Retardants (CFR) | \*) | Criteria 3: For Information Only | Printed Wiring Board (PWB) Laminates | 0.09 mass% total chlorine content in laminatematerial |
| 00064 | Bis(pentabromophenyl) ether (decabromodiphenyl ether) (DecaBDE) | 1163-19-5 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00072 | Pyrochlore, antimony lead yellow | 8012-00-8 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00076 | Dibutyltin dichloride (DBTC) | 683-18-1 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00096 | Pentadecafluorooctanoic acid (PFOA) | 335-67-1 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00097 | Ammonium pentadecafluorooctanoate (APFO) | 3825-26-1 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00103 | Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA | \*) | Criteria 1: Currently Regulated | Textiles, photographic coatings applied to films, paper or printing plates and other coated consumer products. | 1 microgram/m2 (as the sum of PFOA)in material |
| 00104 | Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA | \*) | Criteria 1: Currently Regulated | All except textiles, photographic coatings applied to films, paper or printing plates and other coated consumer products. | 0.1 mass% of the part (as the sum of PFOA)in material |
| 00124 | Perfluorooctane sulfonates (PFOS) | \*) | Criteria 1: Currently Regulated | Textiles or other coated materials. | Intentionally added or 1 microgram/m2 of coated material |
| 00125 | Perfluorooctane sulfonates (PFOS) | \*) | Criteria 1: Currently Regulated | All except textiles or other coated materials. | Intentionally added or 0.1 mass% of the part (as the sum of PFOS) in material |
| 00134 | 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl) phenol (UV-327) | 3864-99-1 | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00140 | Perfluorononan-1-oic-acid and its sodium and ammonium salts | \*) | Criteria 1: Currently Regulated | All | 0.1 mass% of article |
| 00142 | Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts | \*) | Criteria 1: Currently Regulated | All | 0.1 mass% of article |

\*): there are several CAS-numbers.