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ISSUE	ORIGINATOR	DETAILS OF CHANGE	DATE
O	P. Morgan	Initial Release	09-Apr-96
A	J. Prichard	Updated notes	17-Sep-96
B	R. Franz	Added response sheet	7-Aug-98
C	W. Scheffrahn	Updated supplier response sheet	21-Aug-98
D	J. Plyler	Updated all sections to reflect changes in terminology and the list of materials. Replaced list of Banned and Reportable Materials with the Eco-Design list of Controlled, Restricted and Reportable Substances. Revised reporting form.	18-Apr-01
E	S. Scheifers R. Franz M. Loch	Complete rewrite of all sections to simplify document for suppliers. Revised structure and appendices. Also revised to be consistent with Eco-Design List and Eco-Design to be consistent with Eco-Design List and Eco-Design. Added section to report on recycled content, new group reporting format, and web links to aid in supplier disclosure. Added law dept. recommended terminology.	14-Jun-02
F	S. Scheifers B. Kierl G. Avila	Controlled substances list updated with Proposition 65 settlement, azo dyes, specific glycol ethers, and new thresholds. Legal clause was removed and inserted into vendor compliance certification specification. An official electronic reporting form is incorporated by reference with this specification. The document has been reformatted for better clarity.	31-Mar-03
G	S. Scheifers G. Avila	This minor revision adds a new Acceptance Criteria to Appendix C as Section 4 – End-Of-Life Vehicle Directive (ELV) and adds a part description field to Section 1 in the Supplier Disclosure Form in Appendix D.	25-Sep-03
H	W18 Team M. Murdock	This major revision: provides guidance for embedded batteries; consolidates definitions; introduces new definitions/processes such as Banned Substances, Compliance Connect and EEE; discontinues use of the Supplier Disclosure Form and requires homogeneous material reporting via Compliance Connect; removes legal references; streamlines reporting requirements and consolidates Banned, Controlled and Reportable Substance reporting thresholds in Appendix A; revised most acceptance criteria thresholds to align with regulatory requirements and referenced these requirements; updated Global Acceptance Criteria exemptions to include EU Directive 98/101/EC requirements for batteries.	21-Feb-05
J	PRSS Environmental COP	This minor revision includes: simplification of scope; the addition/or minor modification of definitions for better clarity; introduction of the IPC1752-1 reporting form for use on an exception basis; addition of recommended print reference language; changes to the reporting of "Misc."; minor changes to the Appendix A list; synchronization of exemptions to those in the EU RoHS and ELV Directives. Inclusion of requirements for global battery and packaging regulations.	03-Apr-06



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		Note: All acceptance criteria for this revision ("J") are considered equal to or less stringent than the prior revision "H". Parts qualified to revision "H" will meet this revision's requirements.	
K	W18 Team J. Plyler	This revision includes: revision of referenced documents; clarification of supplier responsibilities; addition of Perchlorates and Radioactive substances to the Reportable List; transfer of "Arsenic and arsenic compounds", "Brominated Flame Retardants", and "PVC and vinyl chloride monomer" from Reportable to Controlled status; addition of Product Acceptance Criteria for ECOMOTO products (new Appendix C Section 1); and, updates to Appendix C Section 2, 3 and 4 criteria and exemptions. The changes in this version will have the greatest impact on batteries, wood packaging, and parts used by the Mobile Devices business.	06-Aug-07
L	W18 Team W. Janisch	This revision includes: the addition of Section 5 to document unique compliance criteria for the Mobile Devices business (MDb). MDb is no longer governed by Section 2. Phthalates, PFAS, PFOS, and Nickel are moved from Reportable to Controlled status. The Motorola 1202897W19 has been added as a reference document.	01-April-08
M	W18 Team Matt Norton	Removed DecaBDE exemption language per EC ruling; Deleted Exemptions not applicable or observed for clarity and EDM processing including exemption 16 in Section 2 and 13 in Section 5 (unused).; Removed Section 3 US Requirements per Product Stewardship Team Direction; Removed Section 4 for Automotive (basically harmonized with RoHS in 2008 and limited use); Added Formaldehyde to reporting; Added specific substances, PAH/PCAH and Polychlorinated Naphthalenes as notes to specific categories; Revised Section 8 document maintenance responsibility to EHS; Added Phthalates to Ecomoto Appendix C section 1; Eliminated Appendix C note on part qualification; Editorial revision to Section 6 regarding acceptance criteria revised to reflect current practices. Removed "in EEE" after Chromium and Lead in Appendix A reporting section.	01-May-08



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N	W18 Team Theresa Jordan	<p>Appendix A changes: Added bans on Dimethyl Formamide or Fumerate, Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl), and HFCs, PFCs and SF6; Added Short-chained chloroparaffins and latex as controlled; Changed tin/tin compounds, cobalt/cobalt compounds, antimony/antimony compounds, barium compounds, chromium(III)/chromium compounds, selenium/selenium compounds to controlled. Added rubidium, chlorinated flame retardants as reportable.</p> <p>Section 2 Definitions: Added mandatory reporting of Inks in printed materials regardless of homogenous material.</p> <p>Modified section 3.1.3 to remove requirement to include the revision letter in prints and specs.</p> <p>Section 5.0 Added note on confidentiality of data.</p> <p>Section 5.1.4 Added requirements for MISC-IP reporting that exceeds 10%, incl. link to form.</p> <p>7.0 References section -Changed all references to A3025 to new 1213933T43 spec. Removed reference to A3019.</p> <p>App C Section 1: changed limits on BFR's and PVC to 900 ppm</p> <p>App C Section 2: added banned substances as noted in changes to App A; added 1000ppm acceptance limit for cobalt; added 1000ppm acceptance limit for short-chained chloroparaffins; added 100 ppm limit for tin compounds listed in App C; added requirement to footnote 5 to include comment for Nickel content if Nickel will not come in direct or prolonged contact with the skin.</p> <p>App C Section 5: added banned substances as noted in changes to App A; changed PVC limit to 1000ppm from 100 ppm; added 1000ppm acceptance limit for cobalt; added 1000ppm acceptance limit for short-chained chloroparaffins; added 100 ppm limit for tin compounds listed in App C; removed footnotes [5] and [6] because they were obsolete; added new footnote [5], modified footnote [6] (formerly [7] ) to include comment for Nickel content if Nickel will not come in direct or prolonged contact with the skin. Added 100ppm acceptance limits for antimony, barium, chromium III, latex, selenium in surface preparations.</p>	31-March-2010
P	W18 Team Theresa Jordan	<p>Changed Scope from "Motorola, Inc." to Motorola Solutions, Inc. Changed all references to "Motorola Solutions, Inc." instead of "Motorola, Inc."</p> <p>Added definition of "Article" in Section 2.0. Added clarification in definition of "Homogeneous Material" to require reporting of additives in polymers.</p> <p>Added reference to IEC 62321:2008 in section 5.0.</p> <p>Appendix A: changes: changed latex/latex compounds, antimony/antimony compounds, barium/barium compounds, chromium(III)/chromium compounds, selenium/selenium compounds to Reportable from Controlled, Added Rare Earth Metals and</p>	01-July-11



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		<p>tungsten/tungsten compounds as reportable; changed reportable limit on cobalt/cobalt compounds to 10ppm;</p> <p>Appendix C Section 2: Changed acceptance threshold for cadmium/cadmium compounds to 99ppm from 100ppm per REACH; changed acceptance threshold for cobalt/cobalt substances at 1000ppm to Cobalt Dichloride only at 100ppm; changed acceptance threshold for organic tin substances to 1000ppm. Changed PVC to Controlled for all parts qualified after January 1, 2012..</p> <p>Eliminated Appendix C Section 5 (acceptance criteria for Mobile Devices business). Removed section 7.0 reference to 1202897W19 specification for Mobile Devices.</p> <p>Appendix C exemptions: updated to reflect recent changes in ROHS exemptions</p>	
R	W18 Team Theresa Jordan	<p>Updates throughout to reflect implementation of “Intelligent Compliance Connect” form for material content data collection.</p> <p>Appendix A: added Nanomaterials as Reportable; added musk xylene and MDA as Controlled.</p> <p>Appendix C section 1: added REACH Substances which will be banned in 2015 as “Controlled” with an acceptance threshold of 1000ppm</p> <p>Appendix C section 2: Added musk xylene and MDA as Controlled with an acceptance threshold of 1000ppm; removed exemptions for “Lead in dielectric ceramic in capacitors for a rated voltage of less than 125V AC or 250V DC” (ROHS 7c-III) and “Lead used in other than C-press compliant pin connector systems” (ROHS 11b)</p>	01-Nov-2012
T	W18 Team Theresa Jordan	<p>Appendix A: added CI Pigment Red 104, CI Pigment yellow 34, Diarsenic Trioxide, Diarsenic Pentaoxide, Diisobutyl Phthalate (DIBP), Dibutyl Phthalate (DBP), Benzyl Butyl Phthalate (BBP), Bis(2-ethylhexyl) Phthalate (DEHP), Lead Chromate, Perfluorooctanoic Acids as Controlled with Reporting Threshold of 100ppm. Changed Formaldehyde from Reportable to Controlled. Combined “Certain short and medium chained chlorinated paraffins” and “Short-chain chloroparaffins - chlorinated alkanes with 10–13 carbon atoms in the chain and a minimum of 48 percent chlorine by weight.” Revised footnote [1] to include all substances. Added footnote [1] to Ethylene Glycol Monomethyl Ether and its acetate and Ethylene Glycol Monoethyl Ether and its acetate.</p> <p>Appendix C section 1: added CFR’s as Controlled at 900ppm, changed “REACH SVHC’s to be banned in 2015” to “REACH SVHC’s”</p> <p>Appendix C Section 2: added CI Pigment Red 104, CI Pigment yellow 34, Diarsenic Trioxide, Diarsenic Pentaoxide, Diisobutyl Phthalate (DIBP), Dibutyl Phthalate (DBP), Benzyl Butyl Phthalate (BBP), Bis(2-ethylhexyl) Phthalate (DEHP), Lead Chromate, Perfluorooctanoic Acids, Formaldehyde as Controlled with Acceptance Threshold of 1000ppm. Clarified PVC restriction is for External Cables. Revised</p>	03-July-2014



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		footnote [1] to include all substances. Added footnote [1] to Ethylene Glycol Monomethyl Ether and its acetate and Ethylene Glycol Monoethyl Ether and its acetate. Added footnote [7].	
U	W18 Team Theresa Jordan	Appendix A: changed 4 REACH SVHC's to Controlled from Reportable: Trichloroethylene, 2,4-Dinitrotoluene, Hexabromocyclododecane, Tris(2-chloroethyl)phosphate; Changed Perchlorates to Controlled from Reportable  Appendix C Section 1: removed REACH SVHC's as Controlled; Appendix C Section 2: Changed Perchlorates to Controlled from Reportable with threshold of 6ppb; added exemption 9 for Lithium Perchlorate in Coin Cells above 10mAh; changed Trichloroethylene, 2,4-Dinitrotoluene, Hexabromocyclododecane, Tris(2-chloroethyl)phosphate to Controlled with threshold of 1000ppm;	02-FEB-2015
UA	W18 Team Theresa Jordan	Appendix A: Added Prop 65 substances DINP and Bisphenol-A (in surface finishes) as "Controlled." Removed Exemptions in Appendix C Section 2 corresponding to expiring ROHS exemptions 5a, 5b, 7b. Modified Footnote 5 to apply to all substances in surface finishes.	16-APR-2016
UB	W18 Team Theresa Jordan	Appendix A: Changed Reporting Threshold of Radioactive Substances to 1ppm; changed Mercury and Mercury Compounds to "Banned" from "Controlled"; added BNST as "Banned"; added TDCPP as "Controlled"; added Creosotes as "Controlled"; added Nonylphenols as "Controlled"; added REACH Restricted Substances and REACH Authorised substances not otherwise listed as "Controlled;"  Appendix C: Removed exemptions for Mercury	18-NOV-2016
UC	W18 Team Theresa Jordan	Appendix C: added "REACH Authorised and Restricted Substances not otherwise listed" as controlled at 1000ppm; added Indium Phosphide and "MCCP not otherwise listed" as Reportable due to ROHS Pack 15; removed expired ROHS exemptions 13a and 13b	1-MAY-2019
UD	W18 Team Theresa Jordan	5.1.4 – Added requirement to provide CAS number not found in Materials tab of submission, removed requirement to provide "Remark" regarding MISC-IP content.  App A and App C: Removed 2,4-Dinitrotoluene, CI Pigment Red 104, CI Pigment yellow 34, Diarsenic Trioxide, Diarsenic Pentaoxide, Lead Chromate, MDA (4,4'-Diaminodiphenylmethane), Musk xylene, Trichloroethylene, Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified: Alpha-hexabromocyclododecane, Beta-hexabromocyclododecane, Gamma-hexabromocyclododecane, as they are included in REACH Authorized. Removed 4-Aminobiphenyl, Dimethyl fumarate (DMF), Organic Tin compounds:Tributyl Tin Oxide (TBTO),Tributyl Tin (TBT), Triphenyl Tin (TPT), Dibutyl Tin (DBT), Dioctyl Tin (DOT) as they are included in REACH Restricted. Removed Thiram from Reportable List and removed Ethylene Glycol	



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Monomethyl Ether and its acetate and Ethylene Glycol Monoethyl Ether and its acetate from Controlled List, due to no expectation they will be present in MSI products. Added "REACH Candidate List Substances not otherwise listed" as Reportable.

Combined Appendix A Reporting Thresholds into Appendix C; Appendix C, Section 2: deleted footnote related to deleted Glycol Ethers; deleted footnote related to Organic Tin compounds; removed exemption for "Lead in white glasses used for optical applications."

1. SCOPE:

This specification sets forth Motorola Solutions, Inc.'s materials disclosure requirements for items and materials used in the manufacture and delivery of products to Motorola Solutions, Inc. customers. The list of substances that Motorola Solutions, Inc. has targeted for exclusion, reduction or reporting is contained in Appendix C.

2. DEFINITIONS:

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

Assembly - An Assembly is a collection of components and materials that are not intended to be disassembled, or cannot reasonably be disassembled without the use of a specialized tool, by the end user. Products are considered to be assemblies.

Banned Substances - These substances are not allowed for use at any level unless noted as an exemption in the acceptance criteria.

CAS Number – or CAS (Chemical Abstract Service) Registry Number (CASRN) is a unique number identifying chemical substances. CASRNs, assigned by the CAS Registry, a division of the American Chemical Society, are the only method in existence for identifying discrete substances. CASRNs may be obtained from raw material suppliers or directly from the CAS Registry.

Controlled Substances - These substances are limited for use in the manufacturing process or in certain applications at the levels specified in Appendix C.

EEE – Electrical and Electronic Equipment

Homogeneous Material - A material, as defined by the European Union Technical Adaptation Committee, that cannot be mechanically disjointed into different materials; homogenous materials are materials "of uniform composition throughout." Ceramics, glass, metals, alloys, paper, board, resins, coatings are provided as examples. The term "mechanically disjointed" would mean "that the materials can be, in principle, separated by mechanical actions such as for example: unscrewing, cutting, crushing, grinding and abrasive processes." Exception to this: substances in polymers which cannot be mechanically disjointed must still be reported (e.g. phthalates in PVC) However, additives used in a polymerization process must be reported if they are identified in Appendix A. Note: Motorola Solutions, Inc. requires the reporting of all inks as homogeneous materials, regardless of the medium onto which they are printed.

The following examples are provided:

- A plated lead frame has two materials, the plating material and the lead frame, that must be independently evaluated for controlled materials.

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- A plastic cover is a "homogeneous material" if it consists of one type of plastic that is not coated with, or has attached to it or inside it, any other kinds of materials. In this case, the Maximum Concentration Values (MCV) of the RoHS directive would apply to the plastic.
- An electric cable that consists of metal wires surrounded by non-metallic insulation materials is an example of a "non-homogeneous material," because the different materials could be separated by mechanical processes. In this case the MCVs would apply to each of the separated materials individually.
- A semiconductor package contains many homogeneous materials, including plastic molding material, tin-electroplating coatings on the lead frame, the lead frame alloy and gold-bonding wires.

Intelligent Compliance Connect - Intelligent Compliance Connect is an Excel-based collection tool adopted by Motorola Solutions, Inc. that follows the IPC1752A Class D format. Additional information is available [here](#).

IPC1752A - IPC1752A is a standard for electronic data exchange for Environmental Data developed by IPC with participation from major OEMs, Contract Manufacturers, Component Manufacturers and Material suppliers.

Intentionally Added - "Intentionally Added" shall mean "deliberately utilized in the formulation of a material or part where its continued presence is desired in the final product to provide a specific characteristic, appearance or quality". Intentionally Added substances and materials can occur at any point in the supply chain, i.e. a sub-tier supplier may add a material or substance that a tier 1 supplier must report to Motorola Solutions, Inc. Further, catalysts introduced during processing are always considered to be intentionally added materials. The use of recycled materials as feedstock for the manufacture of new products, where some portion of the recycled materials may contain amounts of regulated metals, is not to be considered as intentionally added.

Material - Materials are items used to construct parts. A "Material" is made up of one or more "Substances". Note: Very few materials are composed of only one substance (e.g., all metals contain other substances at low concentrations either as unintentional contaminants or purposely introduced alloying agents).

Part - A Part is any item or assembly that a supplier sells to Motorola Solutions, Inc. that is incorporated into Motorola Solutions, Inc.'s products.

Post-Consumer Recycled Content – Recycled content in products or parts which have been assembled using material that has completed its original life cycle and has been recycled into another part rather than having been disposed of as solid waste.

Post-Industrial Recycled Content – Recycled content in product parts or materials which have been diverted from the production stream and are industrial waste or by-products (sometimes referred to as factory scrap). Post-industrial scrap can be used to produce materials or parts in the same or a different process than the original.

Reportable Substances - These substances are not currently banned or controlled for use but a ban or voluntary phase-out is likely or they have an impact on the end-of-life management of the finished product.

Reporting Threshold – Concentration level which defines the limit equal to or above which the presence of a substance or material must be reported.

Substance - A "Substance" is a chemical element, compound, or polymer and has a CAS number. For example: stainless steel is a material typically composed of the following substances: Iron; Carbon; Manganese; Silicon; Chromium; Nickel; and others. The polymer Polycarbonate is a "Substance" because there is a CAS number



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(25037-45-0) for it. Lexan is the brand name for a Material. Lexan is not a “Substance” because it includes other constituents in addition to the Polycarbonate Substance and because it does not have a CAS number.

Substance Concentration - Motorola Solutions, Inc. uses parts per million (ppm) to express the concentration of substances. The formula for parts per million (ppm) is  $1,000,000 * \text{mass substance} / \text{mass of the homogeneous material}$ . Concentrations are unit-less, for example 100 ppm = 0.01% = 100 mg/kg.

Sub-Tier Supplier - Any company selling or providing a material or part that is incorporated into Motorola Solutions, Inc. products but is not directly sold to Motorola Solutions, Inc.

Supplier - The Company selling or providing a material part, or assembly to Motorola Solutions, Inc. that Motorola Solutions, Inc. intends to use in its products. Supplier, tier 1 supplier, and vendor are used interchangeably.

W18 Webform: The W18 Webform is an online tool that Suppliers should use to submit their Full Material Content Data to MSI.

### 3. MOTOROLA SOLUTIONS, INC.'S RESPONSIBILITIES:

It is the responsibility of Engineering and personnel who prepare component specifications to:

3.1. Ensure the appropriate reference to this specification on all prints for Motorola Solutions, Inc. items as follows:

3.1.1. All prints for Motorola Solutions, Inc. items must include a reference to the 1202897W18.

3.1.2. Print notes must include a reference to the appropriate section in Appendix C applicable to the Motorola Solutions, Inc. item, and should detail any exemptions which will be permitted.

3.1.3. Print notes shall include the 1202897W18 reference without revision.

3.1.4. Recommended language for use in prints:

“Supplier must provide all required information and comply with Motorola Solutions, Inc.'s Controlled and Reportable Materials Disclosure 1202897W18 requirements. MOTOROLA SOLUTIONS, INC. WILL NOT QUALIFY PARTS THAT DO NOT MEET THE ACCEPTANCE CRITERIA AS OUTLINED IN APPENDIX C, SECTION [*insert “1” or “2”,*] OF THIS SPECIFICATION. [*If applicable* – The following exemptions may not be applied...] “

3.2. Ensure that materials and parts specified for designs comply with this specification, including OEM materials and parts.



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It is the responsibility of all suppliers to:

- 4.1. Comply with the reporting requirements listed in Section 5 of this specification for all parts and assemblies sold to Motorola Solutions, Inc.
- 4.2. Report Controlled and Reportable substances using the W18 Webform (or Intelligent Compliance Connect tool), also known as the eW18 (hereafter referred to as the eW18). Instructions and training on how to use these tools are available [online](#).
- 4.3. Material content data reported should be the worst case if more than one bill of material or production operation exists.
- 4.4. Cascade the requirements in this specification to their sub-tier suppliers. Sub-tier supplier data input is a must for complete material and substance data determination.
- 4.5. Report any change to the material content of an approved part or assembly by re-submitting an updated report using the eW18 and complying with all other applicable Motorola Solutions, Inc. change control requirements.
- 4.6. Motorola Solutions, Inc. may allow the use of alternate declarations in specific limited applications. The supplier must receive prior authorization from the in-business product compliance organization, with the concurrence of Environmental Health and Safety (EHS), to report using any format other than the eW18. Completion of this report and submission to Motorola Solutions, Inc. constitutes a testament that all the information is true and correct to the best of the supplier's knowledge.
- 4.7. Supplier agrees to notify Motorola Solutions, Inc. of any changes to the product that could affect compliance and or material or substance makeup of the part as required under Motorola Solutions, Inc. PCN process.

**5. REPORTING:**

Material content data reported by suppliers is not shared outside of Motorola Solutions, Inc. at the part level without express written consent from the supplier. Motorola Solutions, Inc. reserves the right to use supplier material content data to report the material content of our products to our customers or regulatory agencies, without revealing supplier information unless required by law.

When a lab analysis is used to determine the composition of a homogeneous material, it should be performed per international standards, such as IEC 62321. Note: Material assay is not intended to fulfill all requirements of this specification.

**5.1. Reporting instructions are as follows:**

- 5.1.1. Report 100% of all homogeneous materials that are in the part or assembly.
- 5.1.2. Report all Controlled and Reportable Substances with concentrations in excess of the reporting thresholds noted in Appendix C as contained within each homogenous material.
  - Example: A eutectic Sn/Pb solder coating is used as a finish on a capacitor. This would require reporting the Pb concentration based on the weight of that coating. Because this is a eutectic solder, the concentration of Pb is well known at 37%. In other cases, the weight



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of the homogeneous material (in this case Sn/Pb) would have to be known to calculate the concentration.

5.1.3. Report Recycled Content. Determine the percentage by weight of Recycled Content in the part as shipped to Motorola Solutions, Inc. Recycled Content should be expressed as Post-Industrial Recycled Content and Post-Consumer Recycled Content.

5.1.4. When reporting the composition of homogenous materials, the use of "MISC" (Miscellaneous) may be used for a substance only when appropriate. Reporting "MISC" at a material level is not acceptable. "MISC" for a substance can only exceed 10% (by weight) of the homogeneous material in one of two situations:

5.1.4.1. There is no suitable CAS number / name found for the substance in the Intelligent Compliance Connect pull-down menu.

In this case, the supplier must provide the actual CAS number separately, in the "Tradename(Column B) field for that material on the "Materials" tab of the eW18 submission/Intelligent Compliance Connect file. An example of an acceptable remark is: "CAS number not available in this file, substance name is "xxxxxxx", CAS number is: xxx-xx-x"

5.1.4.2. The actual CAS number / name is known but can not be reported for Intellectual Property reasons.

In this case, the supplier must provide a certification from the original manufacturer of the material in question that the actual CAS number(s)/name(s) of the substance(s) is known but cannot be reported for IP reasons, and that none of the Banned, Controlled, and Reportable substances per Appendix A of this specification are present in the material above the reporting thresholds. Motorola Solutions, Inc.'s MISC IP form should be used for this purpose (available [here](#)).

It is not appropriate to claim an IP issue when the actual substance is not known. Non-IP substances within a material must still be reported; as noted above, the use of MISC at the material level is not allowed.

In all cases Motorola Solutions, Inc. reserves the right to reject the submission without sufficient supplier evidence to demonstrate compliance.

5.1.5. A battery in an assembly (e.g. button cell on a PWB) must be reported on the Part Tree tab as a sub-part in the eW18 submission. Materials and substances in the battery must be reported on the Part Detail tab. Further, the word "battery" must be used in the part name field.

5.1.6. The supplier is responsible to ensure that any units used are consistent and provide an accurate accounting of the substance concentration.

Finally, do not confuse Part Acceptance Criteria and the related exemptions with reporting requirements. Reporting a substance or material is always required even if it is exempt or meets the Part Acceptance Criteria. For example, lead in ceramics must be reported.

## 6. PART ACCEPTANCE CRITERIA:

Motorola Solutions, Inc. will assign a compliance status for parts based on the acceptance criteria of the various sections of Appendix C. This status will determine the acceptability of parts for use. Motorola Solutions, Inc. requires all parts to meet the acceptance criteria as outlined in Appendix C unless granted a formal waiver as



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defined in the internal exception policies (e.g. - for some spare and replacement parts, customer specification required parts, specific markets, etc). This applies to parts that reference this specification and the corresponding acceptance criteria of this specification.

Note that reporting per this specification is always required, whether or not the acceptance criteria is met.

7. REFERENCE DOCUMENTS:

**1210601A Packaging Requirements for Inbound Shipments to Motorola** – a global Motorola Solutions, Inc. specification

**1213933E15 Motorola Global Packaging, Environmental Requirements Document** – a global Motorola Solutions, Inc. specification

Additional information is available at: <http://responsibility.motorolasolutions.com/index.php/downloads/dow02-downloads-materialdisclose/> . For a copy of the above specifications refer to your Motorola Solutions, Inc. contact .

8. REVISIONS:

The Motorola Solutions, Inc. EHS Department manages this document.



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9. APPROVALS:

<b>Business</b>	<b>Approver Name</b>	<b>Approver Signature</b>	<b>Date</b>
Product Regulatory Compliance	Amy Herrmann	email	JULY 17, 2020
Manager EDM	KayWei Lim	email	JULY 19, 2020
EHS	Theresa Jordan	<i>Theresa Jordan</i>	JULY 8, 2020
IT	LayBeng Toh	email	JULY 16, 2020
Engineering	Hasniza Idris	email	JULY 10, 2020



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10. APPENDICES:

**Appendix A: Reserved** This space left blank intentionally for future revisions.

**Appendix B: Reserved** This space left blank intentionally for future revisions.



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**Appendix C: Reporting Thresholds and Acceptance Criteria**

Note: Specific Motorola Solutions, Inc. customer requirements may be more restrictive than the criteria set forth in Appendix C. Acceptance Thresholds are applied at the homogenous material level unless specified otherwise. See the "[Supplemental List of Substances for W18](#)" on the MSI website for a list of CAS numbers which fall into each substance category.

**Section 1: Environmentally Preferred Product (EPP) Acceptance Criteria**

In addition to Appendix C section 2, the following substances that are listed cannot exceed the specified limit except where exemptions are noted:

Substances	Motorola Solutions, Inc. Category	Reporting Threshold (ppm at a homogenous level unless otherwise indicated)	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)
Brominated Flame Retardants (other than PBBs or PBDEs) (e.g. Tetrabromobisphenol-A)	Controlled	100	900
Chlorinated Flame Retardants	Controlled	100	900
<u>PVC</u> and vinyl chloride monomer	Controlled	100	900
<u>Phthalates</u>	Controlled	10	100



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**Section 2: Global Compliance Acceptance Criteria**

All substances in this appendix must be reported per Section 5. Thresholds apply to naturally occurring contaminants within each homogeneous material. See the [“Supplemental List of Substances for W18”](#) on the MSI website for a list of CAS numbers which fall into each substance category.

The following substances that are listed cannot exceed the specified limit except where exemptions are noted:

Substances	Motorola Solutions, Inc. Category	Reporting Threshold (ppm at a homogenous level unless otherwise indicated)	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Asbestos, asbestos compounds	Banned	-	-	<a href="#">EU regulation 2006/1907/EU (REACH) and others</a>
Benzenamine, N-phenyl-, Reaction Products with Styrene and 2,4,4-Trimethylpentene (“BNST”)	Banned	-	-	<a href="#">Canadian Environmental Protection Act</a>
Chlorofluorocarbons and halons (Class I and II Ozone Depleting Chemicals) [1]	Banned	-	-	<a href="#">The Montreal Protocol on Substances that Deplete the Ozone Layer</a>  And others
Halogenated dioxins and furans	Banned	-	-	<a href="#">German Regulation</a>
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF6)	Banned	-	-	<a href="#">EU Directive 842/2006/EC</a> <a href="#">Austrian Regulation BGBl. II No 447/2002</a>
Mercury and Mercury Compounds	Banned	-	-	Japanese Law – <a href="#">Act on Preventing Environmental Pollution of Mercury</a> <a href="#">Swiss Ordinance on Reduction of Risk from Chemical Products</a> , Various US States

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Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-imethylethyl)-	Banned	-	-	<a href="#">Japanese law - Article 13 of the Law concerning the Evaluation of Chemical Substances and Regulation of their Manufacture, etc.</a>
Polychlorobiphenyls and derivatives (PCBs)	Banned	-	-	<a href="#">EU regulation 2006/1907/EU (REACH)</a> <a href="#">Canadian regulation SOR/2008-273</a>  And others
Polychloroterphenyls and derivatives (PCTs)	Banned	-	-	<a href="#">EU regulation 2006/1907/EU (REACH)</a>
Azo Dyes in leathers and textiles	Controlled	1	30	<a href="#">EU regulation 2006/1907/EU (REACH)</a>
Arsenic and arsenic compounds in wood products as a preservative	Controlled	100	[see footnote 3]	<a href="#">EU Directive [2003/2/EC]</a>
Bisphenol-A [4]	Controlled	100	1000	<a href="#">California Safe Drinking Water and Toxic Enforcement Act (Prop 65)</a>
Cadmium and cadmium compounds	Controlled	10	99	<a href="#">2011/65/EU (ROHS)</a> <a href="#">EU regulation 2006/1907/EU (REACH)</a>
Cadmium, Chromium (VI), Lead and Mercury metals and compounds in packaging	Controlled	100	sum of listed metals not to exceed 100 ppm based on total package weight	<a href="#">EU Regulation 94/62/EC</a> ; various US states
Cadmium and cadmium compounds in "portable" batteries	Controlled	100	20 ppm of the total battery cell weight.	<a href="#">EU Regulation 2006/66/EC</a>
Chromium (VI) compounds	Controlled	100	1000	<a href="#">2011/65/EU (ROHS)</a>



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Chromium (VI) compounds in leather and textiles	Controlled	1	3	<a href="#">Germany - § 30 of the Food and Commodities Law (LMBG)</a>
Cobalt Dichloride	Controlled	100	100	<a href="#">EU Regulation 1272/2008/EC</a>
Creosotes	Controlled	100	1000	<a href="#">California Safe Drinking Water and Toxic Enforcement Act (Prop 65)</a>
Diisobutyl Phthalate (DIBP), Dibutyl Phthalate (DBP), Benzyl Butyl Phthalate (BBP), Bis(2-ethylhexyl) Phthalate	Controlled	100	1000	<a href="#">2011/65/EU (ROHS)</a> 2015/863/EU
Diisononyl Phthalate (DINP)	Controlled	100	1000	<a href="#">California Safe Drinking Water and Toxic Enforcement Act (Prop 65)</a> REACH
Formaldehyde	Controlled	100	1000	Lithuanian Hygiene Norm HN 96:2000; Austria - BGB I 1990/194: Formaldehydve rordnung, §2, 12/2/1990; Title 17 California Code of Regulations §§ 93120-93120.12; etc
Lead and lead compounds	Controlled	100	1000	<a href="#">2011/65/EU (ROHS)</a>
Lead in cable jackets [1, 2]	Controlled	100	300	<a href="#">California Safe Drinking Water and Toxic Enforcement Act (Prop 65)</a>
Nickel and nickel compounds [4]	Controlled	10	100	<a href="#">EU regulation 2006/1907/EU (REACH)</a>
Nonylphenol ethoxylate	Controlled	100	1000	Turkey - Hazardous Chemical Content of some Consumer Products
Nonylphenol and its isomer mixtures	Controlled	100	1000	Turkey - Hazardous Chemical Content of some Consumer Products

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Polybrominated biphenyls (PBBs)	Controlled	100	1000	<a href="#">Canada Regulation, 2011/65/EU (ROHS)</a>
Polybrominated diphenyl ethers (PBDEs)	Controlled	100	1000	<a href="#">2011/65/EU (ROHS)</a> Illinois, USA
Perchlorates-Lithium Perchlorate, Magnesium Perchlorate, Zinc Perchlorate [6]	Controlled	-	6ppb	<a href="#">California Perchlorate Contamination Prevention Act</a>
Perfluoro alkyl sulfonates (PFAS), and derivatives (including PFOS)	Controlled	1	100	<a href="#">EU Directive 2006/122/EC</a>
Perfluorooctanoic Acids	Controlled	100	1000	<a href="#">Law on the Control of Products and Consumer Services (Norway)</a>
Persistent Organic Pollutants (POP)	Controlled	100	1000	<a href="#">EU Directive 2019/1021/EC</a>
Poly Vinyl Chloride (PVC) vinyl chloride monomer in External Cables	Controlled	100	1000	Motorola Solutions, Inc. Initiative
Certain short and medium chained chlorinated paraffins	Controlled	100	1000	<a href="#">Norway Product Regulations FOR-2004-06-01-922/ Swiss Ordinance on Reduction of Risk from Chemical Products</a> <a href="#">EU Directive 2013/126/EC</a>
REACH Authorised and Restricted Substances not otherwise listed	Controlled	100	1000	<a href="#">EU regulation 2006/1907/EU (REACH)</a>

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Tris(2-chloroethyl)phosphate ("TCEP")	Controlled	100	1000	<a href="#">EU regulation 2006/1907/EU (REACH)</a> <a href="#">Human and Environmental Health Protection Act</a> <a href="#">Washington DC</a>
Tris(1,3-dichloro-2-propyl) phosphate ("TDCPP")	Controlled	100	1000	<a href="#">Human and Environmental Health Protection Act</a> <a href="#">Washington DC</a>
Aluminum and aluminum compounds	Reportable	100	-	-
Amines, aliphatic	Reportable	100	-	-
Aniline salts	Reportable	100	-	-
Anthracene	Reportable	100	-	-
Antimony and antimony compounds	Reportable	100	-	-
Aromatic amines and dyes	Reportable	100	-	-
Aromatic compounds as monomers (except where listed separately)	Reportable	100	-	-
Poly Aromatic Hydrocarbons (PAH and PCAH)	Reportable	100	-	-
Barium and barium compounds	Reportable	100	-	-
Beryllium and beryllium compounds	Reportable	100	-	-
Bismuth and bismuth compounds	Reportable	100	-	-
Chromium(III) and chromium compounds	Reportable	100	-	-

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Cobalt and cobalt compounds	Reportable	10	-	-
Copper and copper compounds	Reportable	100	-	-
Ferrosilicon and alloys	Reportable	100	-	-
Gold and compounds	Reportable	100	-	-
Halogenated aromatic compounds as monomers (Including Polychlorinated Naphthalenes)	Reportable	100	-	-
Halogenates that produce acidic vapor with water	Reportable	100	-	-
Indium Phosphide	Reportable	100	-	-
Iron and iron compounds	Reportable	100	-	-
Latex and latex compounds	Reportable	100	-	-
Magnesium and magnesium compounds	Reportable	100	-	-
Medium-Chained Chlorinated Paraffins (MCCP) not otherwise listed	Reportable	100	-	ROHS Pack 15
Nanomaterials	Reportable	Intentionally added	-	-
Organic azo and azo-oxy compounds	Reportable	100	-	-
Organic halogen compounds (except where listed separately)	Reportable	100	-	-
Organic phosphorous compounds	Reportable	100	-	-
Organic silicon compounds	Reportable	100	-	-

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Palladium and palladium compounds	Reportable	100	-	-
Perfluorocarbons	Reportable	100	-	-
Polybrominated Terphenyls	Reportable	100	-	-
REACH Candidate List Substances not otherwise listed	Reportable	100	-	-
Radioactive substances	Reportable	1	-	-
Rubidium and rubidium compounds	Reportable	100	-	-
Rare Earth Metals	Reportable	100	-	-
Selenium and selenium compounds	Reportable	100	-	-
Silver and silver compounds	Reportable	100	-	-
Small Fibers - All products containing fibers or fibrils 5um (microns), or less, in diameter with a length: diameter ratio equal to or greater than 3:1	Reportable	100	-	-
TBBPA	Reportable	100	-	ROHS Pack 15
Tantalum and tantalum compounds	Reportable	100	-	-
Tellurium and tellurium compounds	Reportable	100	-	-
Thallium and thallium compounds	Reportable	100	-	-
Tungsten and tungsten compounds	Reportable	100	-	-
Zinc and zinc compounds	Reportable	100	-	-

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1. Substance may not be intentionally added.
2. The concentration basis is based on the weight of the external cable jacket not including any conductors, sheathed conductors or ground jackets.
3. Banned in packaging and as a fumigation technique for wood pallets and other wood packaging (includes methyl bromide).
4. Controlled in surface preparations of products and parts intended to come into direct and prolonged contact with the skin. For Nickel, such products and parts must be evaluated by a materials testing laboratory in accordance with EN1811:1999 to validate that the Nickel ion release rate is  $< 0.5 \mu\text{g}/\text{cm}^2/\text{week}$ . A supplier must provide a declaration of compliance with this standard along with their material disclosure for affected products and parts. If the Nickel reported will not come into direct and prolonged contact with the skin, the supplier must add the following comment to the Remarks column: "Nickel will not come into direct or prolonged contact with the skin."

**Exemptions to Global Compliance Acceptance Criteria:**

1. Lead as an alloying element in steel containing up to 0.35 % lead by weight, aluminum containing up to 0.4 % lead by weight, and copper containing up to 4 % lead by weight. (ROHS 6a, 6b, 6c)
2. Lead in:
  - a. High melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead). (ROHS 7a)
  - b. Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound (ROHS 7cI)
  - c. Lead in dielectric ceramic in capacitors for a rated voltage of 125V AC or 250V DC or higher (ROHS 7cII)
  - d. Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors (ROHS 7cIV)
3. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages. (ROHS 15a)
4. Lead in all batteries and cadmium in industrial, professional and automotive batteries
5. Cadmium and its compounds in electrical contacts (ROHS 8b)
6. Lithium perchlorate in coin cell batteries rated over 10mAh is allowed; this regulation also requires labeling of the end product