Document Title	**ARRIS Controlled and Reportable Materials Disclosure Specification**
Number	**595329-001**
Revision	**D**
Revision Date	**11/23/2016**
Revision Author(s)	**J. Baumeister, J. Villarreal**

ARRIS Internal

Revision History – see Workflow History for approvers and approval dates, and Notice for release dates

Rev	Notice #	Description	Author	Revision Date
A	C461822	Initial release	A. Alvarado, J. Baumeister, C. Frias, B. Kierl, J. Villarreal, A. Wang	5/20/2014
B	C469147	Update RoHS exemption status, add notice for non-use of ex 7(b) for NPI, add PAH to controlled list for surface (GS Mark requirement), add exemption for PAH not used in surface part.	A. Alvarado, J. Baumeister, C. Frias, A. Calderon	7/09/2015
C	C474637	Update to align PACE and ARRIS material restrictions. Added as Banned: EPS in packaging, Formaldehyde in wood (changed from reportable) and Polychlorinated Naphalenes. Added as Controlled: Azo dyes (changed from reportable), Red Phosphorus as flame retardant in connectors, Nonylphenol and Nonylphenol ethoxylates, Perchlorates (changed from reportable), Phthalates (changed from reportable), Hexabromocyclododecane (HBCDD), Bisphenol A (BPA) (changed from reportable), Pentachlorophenol (PCP). Added Exemptions: Red phosphorus not used as flame retardant in power carrying plastic connectors, Polystyrene not used in EPS packaging, Formaldehyde not in wood products, BPA not in surface parts, legacy part exemption for Perchlorates and Phthalates, non-RoHS restricted Phthalates in components and Nonylphenol and Nonylphenol ethoxylates not in substance or preparation.	A. Alvarado, J. Baumeister, C. Frias, A. Calderon	8/03/2016
D	C475272	Change Red-Phosphorus and Red-Phosphorus resins to Banned substance and redefine usage restrictions Add link to DfR Solutions white-paper regarding Red-Phosphorus Add note to disallow the use of Red-Phosphorus in known reliability risk components	J. Baumeister, J. Villarreal	11/23/2016

Rev	Notice #	Description	Author	Revision Date

1. SCOPE

This specification sets forth ARRIS Group, Inc. ("ARRIS") materials disclosure requirements for items and materials used in the manufacture and delivery of products to ARRIS customers. The list of substances that ARRIS has targeted for exclusion, reduction or reporting is contained in Appendix A. Reporting requirements and compliance for items and materials used exclusively by contract manufacturers must follow this specification unless managed under a separate agreement with ARRIS.

2. ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

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 in any ARRIS products or ARRIS branded products 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 A.

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."

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.
- 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.

IPC – Association Connecting Electronics Industries. A global trade association dedicated to the competitive excellence and financial success of its member companies, IPC represents all facets of the industry including design, printed circuit board manufacturing and electronics assembly.

IPC1752 – 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. The number or letter following 1752 represents a specific form number developed under this standard

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 ARRIS. 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 – 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).

ARRIS IPC Creator – A Microsoft Excel Based Tool used to generate IPC 1752 A Class D XML Material Disclosures. ARRIS IPC Creator can be downloaded from the ARRIS Corporate Responsibility website under the Material Disclosure Process and Tools section at: http://corporateresponsibility.arrisi.com

Part – A Part is any item or assembly that a supplier sells to ARRIS that is incorporated into ARRIS's products.

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.

ARRIS Scriba Tool – An Industry IPC 1752A XML tool modified by ARRIS to allow full compatibility with ARRIS Environmental Data Management Systems. This tool is recommended for preparing Class A non-homogeneous declarations which may be used in unique circumstances only if pre-approved by ARRIS. ARRIS Scriba Tool can be downloaded from the ARRIS Corporate Responsibility website under the Material Disclosure Process and Tools section at: http://corporateresponsibility.arrisi.com

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 (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 – Concentration shall be expressed in parts per million (ppm) The formula for parts per million (ppm) is 1,000,000 * mass substance / 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 ARRIS products but is not directly sold to ARRIS.

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

3. RESPONSIBILITIES

3.1. ARRIS:

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

3.1.1. Ensure the appropriate reference to this specification on all prints for ARRIS Items as follows:

3.1.1.1. All prints, specifications for ARRIS parts must include a reference to the ARRIS Environmental Requirements**.**

3.1.1.2. Recommended language for use in prints and specifications:

"Prior to part qualification, Supplier must provide all required information to meet the appropriate acceptance criteria in accordance with environmental regulations for banned and controlled substances as outlined in ARRIS Corporate Responsibility webpage and referred in Corporate Supply Agreement and Purchase Order terms and conditions."

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

3.2. SUPPLIER:

It is the responsibility of all suppliers to:

3.2.1. Comply with the reporting requirements detailed in section 4 of this specification for all parts and assemblies. Note that the specific acceptance criteria are defined by Appendix A as dictated by the specific ARRIS Business.

3.2.2. Report Controlled and Reportable substances using the IPC 1752A Class D (Homogeneous Material) format hereafter referred to as the IPC 1752A. The ARRIS IPC Creator tool is recommended to generate the required files. The latest revision of the tool must always be used and can be found at the ARRIS Corporate Responsibility website under the Material Disclosure Process and Tools section at: http://corporateresponsibility.arrisi.com. Instructions on how to complete this form are available at this same website. Any valid IPC 1752A Class D (homogeneous material) declaration generated from another tool is also acceptable. The ARRIS Scriba Tool may also be used.

3.2.3. Material content data reported should be the worst case if more than one bill of material or production operation exists.

3.2.4. 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.

3.2.5. Report any change to the material content of an approved part or assembly by re-submitting an updated report using the IPC 1752A and complying with all other applicable ARRIS change control requirements.

3.2.6. ARRIS may allow the use of IPC1752A Class A Declaration (non-homogeneous material), in specific limited applications. The supplier must receive prior authorization from the in-business product compliance organization to report using any format other than the IPC1752A Declaration Class D (homogeneous material). Examples of allowable products include 3rd party standalone products and complex assemblies (excluding residential/consumer external power supplies).

3.2.7. Completion of this report and submission to ARRIS constitutes a testament that all the information is true and correct to the best of the supplier's knowledge.

3.2.8. Supplier agrees to notify ARRIS of any changes to the product that could affect compliance and or material or substance make up of the part as required in Corporate Supply Agreement and Purchase Order terms and conditions under Product Change section.

4. REPORTING

Material content data reported by suppliers is not shared outside of ARRIS at the part level (unless required for compliance or certification). ARRIS 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 those currently under development by the IEC. Note: Material assay is not intended to fulfill all requirements of this specification.

4.1. Reporting instructions are as follows:

4.1.1. Report 100% of all homogeneous materials that are in the part or assembly.

Note: ARRIS requires the reporting of all inks, adhesives, platings, and paints as homogeneous materials; regardless of the medium onto which they are printed this includes adhesives on labels and tapes.

4.1.2. Report all Controlled and Reportable Substances with concentrations in excess of the reporting thresholds noted in Appendix A 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 of the homogeneous material (in this case Sn/Pb) would have to be known to calculate the concentration.

4.1.3. Apply appropriate exemptions from Appendix B if a compliance threshold is exceeded. This may require the application of multiple exemptions to a single substance if the substance category has overlapping restrictions in different Compliance sections outlined in Appendix A. (e.g. RoHS, General and Surface). Exemptions must be appropriate to the use of the substance in a material. (e.g. Lead solder exemption must not be used for lead in the ceramic of electronic components)

4.1.4. When reporting the composition of homogenous materials, the use of "MISC" (Miscellaneous) may be used for a substance when none of the Banned, Controlled, and Reportable substances per Appendix A of this specification are present in the material above the reporting thresholds. Reporting "MISC" at a material level is not acceptable and can only exceed 10% by weight in a single homogeneous material under the following circumstances:

4.1.4.1. The actual CAS# or Name is known, but cannot be reported due to Intellectual Property (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.

4.1.4.2. In all cases, ARRIS reserves the right to reject a submission without sufficient supplier evidence to demonstrate compliance.

4.1.4.3. Misc substances must be reported as CAS# = "SYSTEM" and substance name = "MISC., NOT TO DECLARE". Any deviation from this exact text will result in an unknown CAS# error upon submission.

4.1.5. 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 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.

5. PART ACCEPTANCE CRITERIA

ARRIS will assign a compliance status for parts based on the acceptance criteria of the various sections of Appendix A. This status will determine the acceptability of parts for use. ARRIS requires all parts to meet the acceptance criteria as outlined in Appendix A unless granted a formal waiver as 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. **The exemption that allows the use of lead in solder and platings in infrastructure equipments expired July 21, 2016, the use of new parts and products containing lead in solder and platings require authorization by product compliance organization.**

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

6. APPROVALS

Title	Approver Name
Compliance Officer	Livia Nascimento

Supply Chain Operations – CPE	Keith Jones
Supply Chain Operations – NCGS	Jerry Cederlund
SVP Supply Chain, Quality & Operations	Jim Brennan

7. REFERENCE DOCUMENTS

Document Description
ARRIS Supplier Code of Conduct
Environmental Marking Requirements for Global Packaging

8. APPENDICES

Appendix A: Banned, Controlled and Reportable Substances

Appendix B: Exemptions to ARRIS Compliance Acceptance Criteria

- EU RoHS Exemptions
- ARRIS General Exemptions
- ARRIS Exemptions for Parts used on the Surface of a Product

Appendix A: Banned, Controlled and Reportable Substances

ARRIS defines the following minimum Reporting and Acceptance Thresholds for the following Banned, Controlled or Reportable Substance families. Substances that are listed as Banned or Controlled cannot exceed the specified limit except where exemptions are noted. Please reference Appendix B for exemptions to thresholds if noted.

Substances	ARRIS 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	0	0	EU Directive 76/769/EEC
Chlorofluorocarbons and halons (Class I and II ozone depleting Chemicals). Must also be reported used in any processing of a part	Banned	0	0	EU Directive 76/769/EEC
Dimethylfumerate or dimethylformamide (DMF)	Banned	0	0	EU Directive 2009/251/EC
Expanded polystyrene (EPS) in packaging	Banned	0	0*	ARRIS Initiative
Formaldehyde in wood products	Banned	0	0*	EU REACH EC 1907/2006, US TSCA, Various others
Halogenated dioxins and furans	Banned	0	0	German Regulation
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF6)	Banned	0	0	EU Directive 842/2006/EC Austrian Regulation BGBl. II No 447/2002
Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-imethylethyl)-	Banned	0	0	Japanese law – Article 13 of the Law concerning the Evaluation of Chemical Substances and Regulation of their Manufacture, etc.
Polychlorobiphenyls and derivatives (PCBs)	Banned	0	0	EU Directive 76/769/EEC
Polychloroterphenyls and derivatives (PCTs)	Banned	0	0	EU Directive 76/769/EEC
Polychlorinated Naphalenes (PCNs)	Banned	0	0	Switzerland: StoV Anh. 3.1

Substances	ARRIS Category	Reporting Threshold (ppm at a homogenous level unless otherwise indicated)	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Red-Phosphorus and Red-Phosphorus resins that come in contact with metals or other conductors carrying voltage	Banned	0	0*	ARRIS Initiative http://www.dfrsolutions.com/white-papers/red-phosphorus-induced-failures-in-encapsulated-circuits/ ARRIS disallows the use of Red-Phosphorus and Red-Phosphorus resins that come in contact with metals or other conductors carrying voltage (e.g. cables, connectors, power supplies, switches and semiconductor encapsulation materials)
Azocolourants and azodyes in leather and textiles	Controlled	3	30*	EU REACH EC 1907/2006
Bisphenol A (4,4' Isopropylidendiphenol)	Controlled	100	1000*	California Safe Drinking Water and Toxic Enforcement Act (Prop 65)
Cadmium and cadmium compounds	Controlled	10	100*	EU Directive 2011/65/EC (RoHS)
Cadmium, Chromium (VI), Lead and Mercury metals and compounds in packaging	Controlled	10	sum of metals not to exceed 100 ppm based on total package weight	EU Regulation 94/62/EC; various US states
Cadmium and cadmium compounds in "portable" batteries	Controlled	10	20 ppm of the total battery cell weight.	EU Regulation 2006/66/EC
Chromium (VI) compounds	Controlled	100	1000*	EU Directive 2011/65/EC (RoHS)
Cobalt dichloride	Controlled	10	100*	EU REACH EC 1907/2006
Ethylene Glycol Monomethyl Ether and its acetate	Controlled	1	5	California Safe Drinking Water and Toxic Enforcement Act (Prop 65)
Ethylene Glycol Monoethyl Ether and its acetate	Controlled	1	5	California Safe Drinking Water and Toxic Enforcement Act (Prop 65)

Substances	ARRIS Category	Reporting Threshold (ppm at a homogenous level unless otherwise indicated)	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Hexabromocyclododecane (HBCDD) and all major diastereoisomers	Controlled	100	1000	EU REACH
Latex and latex compounds	Controlled	100	1000*	ARRIS Initiative
Lead and lead compounds	Controlled	100	1000*	EU Directive 2011/65/EC (RoHS)
Lead in cable jackets	Controlled	100	300	California Safe Drinking Water and Toxic Enforcement Act (Prop 65)
Mercury and mercury compounds that are intentionally added	Controlled	1	1000*	EU Directive 2011/65/EC (RoHS), Swiss Ordinance on Reduction of Risk from Chemical Products, Various US states
Nickel and nickel compounds	Controlled	10	100*	EU Regulation 2006/66/EC
Nonylphenol and Nonylphenol ethoxylates	Controlled	100	1000*	EU REACH EC 1907/2006
Pentachlorophenol (PCP)	Controlled	100	1000	EU REACH EC 1907/2006, German Legislation
Perchlorates	Controlled	6 ppb	6 ppb	CA Perchorate Act
Perfluoro alkyl sulfonates (PFAS), and derivatives (including PFOS)	Controlled	10	100	EU Directive 2006/122/EC
Phthalates (after 06/01/2017)	Controlled	100	1000	EU Directive 2011/65/EC (RoHS), CA Prop 65, EU REACH EC 1907/2006
Polybrominated biphenyls (PBBs)	Controlled	100	1000	Canada Regulation, EU Directive 2011/65/EC (RoHS)
Polybrominated diphenyl ethers (PBDEs) (including Nonabromodiphenyl ether)	Controlled	100	1000	EU Directive 2011/65/EC (RoHS), Various US state
Polycyclic Aromatic Hydrocarbons (PAH)	Controlled	0	0.5*	German Product Safety (GS Mark)-
Short-chain chloroparaffins - chlorinated alkanes with 10–13 carbon atoms in the chain and a minimum of 48 percent chlorine by weight	Controlled	100	1000	Norway Product Regulations FOR-2004-06-01-922/ Swiss Ordinance on Reduction of Risk from Chemical Products

Substances	ARRIS Category	Reporting Threshold (ppm at a homogenous level unless otherwise indicated)	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Tin compounds:Tributyl Tin Oxide (TBTO),Tributyl Tin (TBT), Triphenyl Tin (TPT), Dibutyl Tin (DBT), Dioctyl Tin (DOT)	Controlled	100	1000	EU REACH EC 1907/2006
Aluminum and aluminum compounds	Reportable	100	-	-
Amines, aliphatic	Reportable	100	-	-
4-Aminobiphenyl	Reportable	100	-	-
Aniline salts	Reportable	100	-	-
Arsenic and arsenic compounds	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	-	-
Barium and barium compounds	Reportable	100	-	-
Beryllium and beryllium compounds	Reportable	100	-	-
Bismuth and bismuth compounds	Reportable	100	-	-
Brominated Flame Retardants (other than PBBs or PBDEs) (e.g. Tetrabromobisphenol-A)	Reportable	100	-	-
Certain short and medium chained chlorinated paraffins	Reportable	100	-	-
Chromium and chromium compounds	Reportable	100	-	-
Chlorinated flame retardants	Reportable	100	-	-
Cobalt and cobalt compounds except cobalt dichloride	Reportable	100	-	-
Copper and copper compounds	Reportable	100	-	-

Substances	ARRIS Category	Reporting Threshold (ppm at a homogenous level unless otherwise indicated)	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Ferrosilicon and alloys	Reportable	100	-	-
Gold and gold compounds	Reportable	100	-	-
Halogenated aromatic compounds as monomers (including Polychlorinated Naphthalenes)	Reportable	100	-	-
Halogenates that produce acidic vapor with water	Reportable	100	-	-
Iron and iron compounds	Reportable	100	-	-
Magnesium and magnesium compounds	Reportable	100	-	-
Organic azo and azo-oxy compounds	Reportable	100	-	-
Organic halogen compounds (except where listed separately)	Reportable	100	-	-
Organic phosphorus compounds	Reportable	100	-	-
Organic silicon compounds	Reportable	100	-	-
Palladium and palladium compounds	Reportable	100	-	-
Polybrominated Terphenyls	Reportable	100	-	-
PVC and vinyl chloride monomer	Reportable	100	-	-
Selenium and selenium compounds	Reportable	100	-	-
Radioactive substances	Reportable	100	-	-
Rubidium and rubidium compounds	Reportable	100	-	-
Silver and silver compounds	Reportable	100	-	-
Small Fibers - All parts containing fibers or fibrils 5um (microns), or less, in diameter with a length: diameter ratio equal to or greater than 3:1	Reportable	100	-	-
Tantalum and tantalum compounds	Reportable	100	-	-
Tellurium and tellurium compounds	Reportable	100	-	-

Substances	**ARRIS Category**	**Reporting Threshold** (ppm at a homogenous level unless otherwise indicated)	**Acceptance Threshold** (ppm at a homogenous level unless otherwise indicated)	**Reference**
Tetramethylthiuram disulfide (Thiram)	Reportable	100	-	-
Thallium and thallium compounds	Reportable	100	-	-
Tin and tin compounds	Reportable	100	-	-
Tungsten and tungsten compounds	Reportable	100	-	-
Zinc and zinc compounds	Reportable	100	-	-

* Exemptions may apply for specific usages above the given threshold. Please refer to Appendix B for a comprehensive list of available exemptions.

Appendix B: Exemptions to ARRIS Compliance Acceptance Criteria

The following provides Exemptions to the Compliance Criteria found in Appendix A. These exemptions are to be applied by a Supplier in the IPC1752A file submitted to ARRIS and will be reviewed by the ARRIS Environmental Data Management team prior to file acceptance. Please note for overlapping Substance categories, the suppliers must apply applicable exemptions in each exemption class. (e.g. RoHS, General and Surface).

EU RoHS Exemptions

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
CADMIUM AND CADMIUM COMPOUNDS	100	8(b)	7/21/2016[1]	Cadmium and its compounds in electrical contacts
CADMIUM AND CADMIUM COMPOUNDS	100	13(b)	7/21/2016[1]	Cadmium (and lead) in filter glasses and glasses used for reflectance standards
CADMIUM AND CADMIUM COMPOUNDS	100	21	7/21/2016[1]	Lead and cadmium in printing inks for the application of enamels on borosilicate glass
CADMIUM AND CADMIUM COMPOUNDS	100	30	7/21/2016[2]	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB and more
CADMIUM AND CADMIUM COMPOUNDS	100	38	7/21/2016[2]	Cadmium and Cadmium oxide in thick film pasts used on aluminum bonded beryllium oxide
HEXAVALENT CHROMIUM	1000	9	7/21/2016[1]	Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators
LEAD AND LEAD COMPOUNDS	1000	5(a)	7/21/2016[2]	Lead in glass of cathode ray tubes
LEAD AND LEAD COMPOUNDS	1000	5(b)	7/21/2016[1]	Lead in glass of fluorescent tubes not exceeding 0.2% by weight
LEAD AND LEAD COMPOUNDS	1000	7(c)-I	7/21/2016[1]	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
LEAD AND LEAD COMPOUNDS	1000	7(c)-II	7/21/2016[1]	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher
LEAD AND LEAD COMPOUNDS	1000	7(c)-IV	7/21/2016[1]	Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
LEAD AND LEAD COMPOUNDS	1000	7(b)	7/21/2016[2]	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications
LEAD AND LEAD COMPOUNDS	1000	7(a)	7/21/2016[1]	Lead in high melting temperature type solders (i.e. lead based solder alloys containing 85% by weight or more lead)
LEAD AND LEAD COMPOUNDS	1000	6(c)	7/21/2016[1]	Lead as an alloying element in copper containing up to 4% lead by weight
LEAD AND LEAD COMPOUNDS	1000	6(a)	7/21/2016[1]	Lead as an alloying element in steel containing up to 0.35% lead by weight
LEAD AND LEAD COMPOUNDS	1000	6(b)	7/21/2016[1]	Lead as an alloying element in aluminum containing up to 0.4% lead by weight
LEAD AND LEAD COMPOUNDS	1000	13(a)	7/21/2016[1]	Lead in white glasses used for optical applications
LEAD AND LEAD COMPOUNDS	1000	13(b)	7/21/2016[1]	Lead (and Cadmium) in filter glasses and glasses used for reflectance standards
LEAD AND LEAD COMPOUNDS	1000	15	7/21/2016[1]	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
LEAD AND LEAD COMPOUNDS	1000	9(b)	7/21/2016[1]	Lead in lead/bronze bearing shells and bushes
LEAD AND LEAD COMPOUNDS	1000	17	7/21/2016[2]	Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications
LEAD AND LEAD COMPOUNDS	1000	18(b)	7/21/2016[1]	Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb)
LEAD AND LEAD COMPOUNDS	1000	21	7/21/2016[1]	Lead and cadmium in printing inks for the application of enamels on borosilicate glass
LEAD AND LEAD COMPOUNDS	1000	24	7/21/2016[1]	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors
LEAD AND LEAD COMPOUNDS	1000	25	7/21/2016[2]	Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
LEAD AND LEAD COMPOUNDS	1000	26	7/21/2016[2]	Lead oxide in the glass envelope of Black Light Blue (BLB) lamps
LEAD AND LEAD COMPOUNDS	1000	29	7/21/2016[1]	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (*)
LEAD AND LEAD COMPOUNDS	1000	31	7/21/2016[2]	Lead in soldering materials in mercury free flat fluorescent lamps
LEAD AND LEAD COMPOUNDS	1000	32	7/21/2016[2]	Lead Oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes.
LEAD AND LEAD COMPOUNDS	1000	33	7/21/2016[2]	Lead in solders for the soldering of thin copper wires of 100 um diameter and less in power transformers
LEAD AND LEAD COMPOUNDS	1000	34	7/21/2016[1]	Lead in cermet based trimmer potentiometer elements
LEAD AND LEAD COMPOUNDS	1000	37	7/21/2016[1]	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body
MERCURY AND MERCURY COMPOUNDS	1000	1(a)	7/21/2016[1]	Mercury in compact fluorescent lamps < 30 W not exceeding 5 mg per lamp (in 2012: 3.5 mg, > 2012: 2.5 mg)
MERCURY AND MERCURY COMPOUNDS	1000	1(b)	7/21/2016[1]	Mercury in compact fluorescent lamps < 50 W and > 30 W not exceeding 5 mg per lamp (> 2011: 3.5 mg)
MERCURY AND MERCURY COMPOUNDS	1000	1(c)	7/21/2016[1]	Mercury in compact fluorescent lamps < 150 W and > 50 W not exceeding 5 mg per lamp
MERCURY AND MERCURY COMPOUNDS	1000	1(d)	7/21/2016[1]	Mercury in compact fluorescent lamps > 150 W not exceeding 15 mg per lamp
MERCURY AND MERCURY COMPOUNDS	1000	1(e)	7/21/2016[1]	Mercury in compact fluorescent lamps with circular or square structural shape and tube diameter < 17 mm (not exceeding 7 mg per lamp > 2011)
MERCURY AND MERCURY COMPOUNDS	1000	1(f)	7/21/2016[1]	Mercury in compact fluorescent lamps for special purposes not exceeding 5 mg per lamp
MERCURY AND MERCURY COMPOUNDS	1000	1(g)	12/31/2017	For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(1)	7/21/2016[1]	Mercury in straight fluorescent lamps with tri-band phosphor for general purposes with normal lifetime and a tube diameter < 9 mm (e.g. T2) not exceeding 5 mg per lamp (> 2011: 4 mg)

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(2)	7/21/2016[1]	Mercury in straight fluorescent lamps with tri-band phosphor for general purposes with normal lifetime and a tube diameter < 17 mm and > 9 mm (e.g. T5) not exceeding 5 mg per lamp (> 2011: 3 mg)
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(3)	7/21/2016[1]	Mercury in straight fluorescent lamps with tri-band phosphor for general purposes with normal lifetime and a tube diameter < 28 mm and > 17 mm (e.g. T8) not exceeding 5 mg per lamp (> 2011: 3.5 mg)
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(4)	7/21/2016[1]	Mercury in straight fluorescent lamps with tri-band phosphor for general purposes with normal lifetime and a tube diameter > 28 mm (e.g. T12) not exceeding 5 mg per lamp (> 2012: 3.5 mg)
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(5)	7/21/2016[1]	Mercury in straight fluorescent lamps with tri-band phosphor for general purposes with long lifetime (> 25000h) not exceeding 8 mg per lamp (> 2011: 5 mg)
MERCURY AND MERCURY COMPOUNDS	1000	2(b)(2)	04/13/2016	Mercury in non-linear halophosphate lamps (all diameters) not exceeding 15 mg in halophosphate lamps
MERCURY AND MERCURY COMPOUNDS	1000	2(b)(3)	7/21/2016[1]	Mercury in non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9) (> 2011: not exceeding 15 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	2(b)(4)	7/21/2016[1]	Mercury in lamps for other general lighting and special purposes (e.g. induction lamps) (> 2011: not exceeding 15 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	3(a)	7/21/2016[1]	Mercury in short length (< 500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes (> 2011: not exceeding 3.5 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	3(b)	7/21/2016[1]	Mercury in medium length (greater than 500 mm and < 1,500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes (> 2011: not exceeding 5 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	3(c)	7/21/2016[1]	Mercury in long length (> 1,500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes (> 2011: not exceeding 13 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(a)	7/21/2016[1]	Mercury in other low pressure discharge lamps (> 2011: not exceeding 15 mg per lamp)

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
MERCURY AND MERCURY COMPOUNDS	1000	4(b)-I	7/21/2016[1]	Mercury in high Pressure Sodium (vapour) lamps for general lighting purposes < 155 W with improved colour rendering index Ra > 60 (> 2011: not exceeding 30 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(b)-II	7/21/2016[1]	Mercury in high Pressure Sodium (vapour) lamps for general lighting purposes < 405 W and > 155 W with improved colour rendering index Ra > 60 (> 2011: not exceeding 40 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(b)-III	7/21/2016[1]	Mercury in high Pressure Sodium (vapour) lamps for general lighting purposes > 405 W with improved colour rendering index Ra > 60 (> 2011: not exceeding 40 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(c)-I	7/21/2016[1]	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes < 155W (> 2011: not exceeding 25 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(c)-II	7/21/2016[1]	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes < 405 W and > 155 W (> 2011: not exceeding 30 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(c)-III	7/21/2016[1]	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes > 405 W (> 2011: not exceeding 40 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(e)	7/21/2016[1]	Mercury in metal halide lamps (MH)
MERCURY AND MERCURY COMPOUNDS	1000	4(f)	7/21/2016[1]	Mercury in other discharge lamps not specifically mentioned in this list

Notes:

[1] RoHS exemption expires 7/21/2016 however application for extension has been filed with the EU Commission

[2] RoHS exemption expires 7/21/2016 and no application for extension has been filed. These exemptions will not be permitted for new parts and products without specific authorization by the in-business product compliance organization

ARRIS General Exemptions

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
CADMIUM AND CADMIUM COMPOUNDS	20	500		Cadmium not in batteries or packaging covered by EU RoHS
COBALT DICHLORIDE	100	537		Part contains Cobalt Dichloride but is not in the form of a substance or preparation (eg silica gel)
HEXAVALENT CHROMIUM	3	509		In packaging, the sum of Cd, Hg, Pb and CrVI does not exceed 100 ppm based on total package mass per 94/62/EC
LEAD AND LEAD COMPOUNDS	70	510		In packaging, the sum of Cd, Hg, Pb and CrVI does not exceed 100 ppm based on total package mass per 94/62/EC
LEAD AND LEAD COMPOUNDS	70	513		Lead in Cable Jackets only, up to 300 ppm per California Prop 65
LEAD AND LEAD COMPOUNDS	70	518		Lead NOT in cable jackets or packaging; covered by RoHS
MERCURY AND MERCURY COMPOUNDS	5	511		In packaging, the sum of Cd, Hg, Pb and CrVI does not exceed 100 ppm based on total package mass per 94/62/EC
MERCURY AND MERCURY COMPOUNDS	5	515		Mercury in batteries per EU Directive 98/101/EC not to exceed 5 ppm of total battery cell weight
MERCURY AND MERCURY COMPOUNDS	5	520		Mercury NOT in batteries covered by EU ROHS 2011/65/EC
RED-PHOSPHORUS AND RED-PHOSPHORUS RESINS	0	542		Part contains Red-Phosphorus or Red-Phosphorus resins but is not used in any material that comes in contact with metals or other carrying voltage
EXPANDED POLYSTYRENE (EPS)	0	543		Polystyrene not used in EPS packaging
FORMALDEHYDE	0	544		Formaldehyde not in wood products
BISPHENOL A (4,4' ISOPROPYLIDENDIPHENOL)	1000	545		Part contains BPA but will not have contact with skin (i.e. surface mount parts)
PERCHLORATES	6 ppb	546		Legacy part contains Perchlorates but is qualified prior to 06/01/2017
NONYPHENOL AND NONYPHENOL EXOLATES	1000	547		Part contains Nonyphenol but is not in the form of a substance or preparation
PHTHALATES	1000	548	07/21/2019	Legacy part contains Phthalates but is qualified prior to 06/01/2017

ARRIS General Exemptions (cont)

PHTHALATES	1000	549		Part contains Phthalates used in electronic components (e.g. capacitors, resistors, etc) and is not a RoHS restricted Phthalate (DEHP, BBP, DBP and DIBP)

ARRIS Exemptions for Parts used on the Surface of a Product

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
LATEX	0	534		Part contains Latex but will not have prolonged contact with skin (i.e. surface mount parts)
LEAD AND LEAD COMPOUNDS	0	538		Part contains Lead but will not have prolonged contact with skin (i.e. surface mount parts)
LEAD AND LEAD COMPOUNDS	0	539		Part contains Lead but the manufacturer certifies it meets ASTM F963-03
NICKEL AND NICKEL COMPOUNDS	0	501		Part contains Nickel, but will not have prolonged contact with skin
NICKEL AND NICKEL COMPOUNDS	0	506		Part contains Nickel and could have prolonged contact with skin but the manufacturer certifies it meets EN1811, per 76/769/EEC and 94/27/EC **Note: All Ni used in stainless steel and amorphous metals is compliant with EN1811 unless sulfur content of metal is >.03%.**
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)	0	541		Part contains PAH's but will not have contact with skin (i.e. surface mount parts)