General Specifications on Environmental Compliance for Suppliers

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1.0 BACKGROUND/INTRODUCTION

This specification serves as a Flex environmental compliance expectations and requirements activities and procedures used for Flex suppliers to comply with identified environmental legal, regulatory, industry, or customer requirements for components and production materials sold to Flex.

2.0 PURPOSE

This document establishes requirements for Flex suppliers to specifically comply in determining and maintaining the environmental compliance status of the identified materials and or products to identified environmental legal, regulatory, industry or customer requirements.

The following list shows some key Regulations:

a.	Directive 2011/65/EU	EU RoHS (Recast) NOTE: RoHS (recast) was published on 8 June 2011 and repealed Directive 2002/95/EC (RoHS) starting 3 January 2013. EEE product scope under RoHS recast will include 3 new categories that will progressively come into implementation towards 21 July 2019. RoHS (recast) continues to restrict the same hazardous substances with the same thresholds as RoHS, but have identified DEHP, DBP, BBP, and HBCDD as priority substances to be reviewed for possible inclusion in the near future into the directive. RoHS (recast) requires finished EEE manufactured in and shipped into the EU to bear the CE mark and requires manufacturers to keep a Declaration of Conformity and technical files to document conformity to the directive. All these new requirements may trigger more demands for test reports and systematic management in the supply chain.
b.	Directive 2015/863	Amending Annex II to Directive 2011/65/EU
c.	Regulation EC No 1907/2006	REACH (Restriction, Evaluation, Authorization and Restriction of Chemicals)
d.	China RoHS	Administrative measures on the control of pollution caused by Electronic Information Products
e.	California Proposition 65	The Safe Drinking Water and Toxic Enforcement Act of 1986
f.	Directive 2006/66/EC	Batteries and Accumulators and Waste Batteries and Accumulators
g.	Directive 94/62/EC	Packaging and Packaging Waste
h.	Directive 2012/19/EU	Waste Electrical and Electronic Equipment
i.	Conflict Minerals	“Dodd-Frank Act” means the Dodd-Frank Wall Street Reform and Consumer Protection Act’s provision and corresponding enabling regulations regarding conflict minerals, including regulations passed by the Securities and Exchange Commission and other applicable laws. Whether or not Supplier is subject to the Dodd-Frank Act, requires that US publicly traded companies must conduct due diligence on the 3TG on their supply chains and file reports with the US Securities and Exchange Commission

3.0 SCOPE

This general specification applies to all materials, components, parts, assemblies and/or products supplied to Flex for the manufacture of electrical & electronic equipment applicable under the specific legal regulations, and also where this specification is cited on respective Flex part number drawings, part or product specifications, procurement agreements, purchase contracts, purchase orders or other procurement documentation. The supplier is responsible for compliance with this specification as well as for any subcontracted operations and procured materials, components, parts, assemblies or products used in the manufacture of materials, components, parts, assemblies and products for applications by Flex and its customers. Suppliers are required to have processes in place to monitor changes in applicable environmental legal, regulatory, industry, or customer requirements to determine the impact of the changes to their operations and products that are supplied to flex and take appropriate actions to ensure continuing conformance.

4.0 DEFINITIONS and ABBREVIATIONS

4.1.	**Product**	A product is a conglomeration of assembled parts as finished goods and a whole entity ready for end-user application & usage.
4.2.	**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.
4.3.	**Part**	A part is any item or assembly that a supplier sells to Flex that is incorporated into Flex products.
4.4.	**Component**	A component is a combination of homogeneous materials that have been formed into a single manufactured part.
4.5.	**Material**	Materials are items used to construct parts. A material is always made up of one or more substances.
4.6.	**Substance**	A substance is a chemical element, compound, or polymer (if it has a CAS number). All substances are materials, but all materials are not necessarily substances. For example: brass is a material that is made up of copper and zinc substances. Zinc metal is a material and a substance. Polycarbonate is a material and 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 can include other constituents besides the polycarbonate substance and because it does not have a CAS number.
4.7.	**Full Material Declaration (FMD)**	A full material declaration discloses 100% of the homogenous materials that are found in the supplied materials/parts and a 100% of all the substances that are contained in those materials. Materials or substances (whether “Intentionally Added” or not) contained in materials/parts purchased (and in turn incorporated into supplier’s products) must be disclosed. It is recognized that in certain situations, 100% disclosure by CAS Registry Number may not be feasible due to the confidentiality or proprietary nature of the information.
4.8.	**Homogenous material**	A unit that cannot be mechanically disjointed in single materials or any material that is not mechanically divisible (disassembled, cut or ground) into separate material constituents. The term “homogeneous” is understood as "of uniform composition throughout". Examples of homogeneous materials are individual types of: plastics, ceramics, glass, metals, alloys, paper, board, resins, and coatings. The term “mechanically disjointed” means that the materials can be, in principle, separated by mechanical actions such as for example: unscrewing, cutting, crushing, grinding and abrasive processes.

4.9.	**RoHS**	Acronym for European Union Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
4.10.	**RoHS Compliant**	Material, part, component, assembly or product that complies with the European Union Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment including any applicable exemptions.
4.11.	**Supplier Certificate of Compliance (SCOC)**	A declaration by suppliers that certifies the compliance of the parts or products indicated in the declaration with the environmental legislations, standards, or substance restrictions the declaration references.
4.12.	**REACH**	Acronym for European Union regulation on the Restriction, Evaluation, Authorization and Reduction of Chemicals. This regulation requires all substances, chemicals and materials to be registered to appropriate authorities and communicated, including all uses, bi-directionally along the supply chain.
4.13.	**IMDS**	International Material Data System. The IMDS (International Material Data System) is the automobile industry's material data system. Initially, it was a joint development of Audi, BMW, Daimler, DXC, Ford, Opel, Porsche, VW and Volvo. Further manufacturers have meanwhile joined the community and IMDS has become a global standard used by almost all of the global OEMs. Talks are being held with further manufacturers regarding their participation in IMDS. In IMDS, all materials used for automobile manufacturing are collected, maintained, analyzed and archived. Using the IMDS, it is possible to meet the obligations placed on automobile manufacturers, and thus on their suppliers, by national and international standards, laws and regulations.
4.14.	**ELV:**	End of Life Vehicle. Legal and industry requirements that set clear quantified targets for reuse, recycling and recovery of the ELVs and their components. It also pushes producers to manufacture new vehicles without hazardous substances (in particular lead, mercury, cadmium and hexavalent chromium), thus promoting the reuse, recyclability and recovery of waste vehicles.
4.15.	**GBS/PEC Team**	This team is responsible for performing material compliance analysis and interfacing with the sites and suppliers to achieve the analysis once a service request has been received.

5.0 TABLE OF REFERENCES

Document Title	Document Number	Link to Document
EU Directive 2011/65/EC Restriction of Hazardous Substances (RoHS). Recast	RoHS 2 directive (2011/65/EU)	EU Commission Guidance http://ec.europa.eu/environment/waste/rohs_eee/legis_en.htm Legislation http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011L0065 Amendment - DIRECTIVE (EU) 2017/2102 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 November 2017 amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1512061986553&uri=CELEX:32017L2102
RoHS 3 (EU 2015/863)	RoHS 3 directive (2015/863/EU)	Amending Annex II to Directive 2011/65/EU http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2015.137.01.0010.01.ENG
EU Directive 1907/2006 Registration, Evaluation, Authorization and Restriction of Chemicals	Regulation (EC) 1907/2006	https://echa.europa.eu/regulations/reach/legislation
REACH SVHC	REACH Regulation EC 1907/2006 – SVHC Candidate list	https://echa.europa.eu/candidate-list-table
REACH AUTHORIZATION	REACH Regulation EC 1907/2006 – Authorization list	https://echa.europa.eu/addressing-chemicals-of-concern/authorisation/recommendation-for-inclusion-in-the-authorisation-list/authorisation-list

REACH RESTRICTION	REACH Regulation EC 1907/2006 – Restricted list	https://echa.europa.eu/addressing-chemicals-of-concern/restrictions/substances-restricted-under-reach
EU Directive 2009/125/EC Ecodesign requirements for energy-related products (ErP)	Directive 2009/125/EC	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0125
Global Automotive Declarable Substance List (GADSL)	GADSL	http://www.gadsl.org/
Flex Supplier Manual and Environmental Procurement Guidelines	CES-MAT-4-001-00	https://flex.com/other/supplier-information-supplier-quality
Flex Specification for Procurement of Lead (Pb)-Free Electronic and Electromechanical Components and Assemblies	CES-MAT-2-003-00	https://flex.com/other/supplier-information-supplier-quality
Specification of banned and restricted substances for use	CES-REG-1-001-00	https://flex.com/other/supplier-information-supplier-quality
Supplier Quality General Requirements	FMS-QMS-3-005-00	https://flex.com/other/supplier-information-supplier-quality
Anthesis IPC1-752A material declaration user guide	Anthesis IPC 1752A Guide	https://flex.com/other/supplier-information-supplier-quality
Global barcode marking standard for EDM material (chemicals)	MAT-MAT-1-006-00	https://flex.com/other/supplier-information-supplier-quality
Global barcode marking standards for purchased parts and supplier hubbed parts	MAT-MAT-1-004-00	https://flex.com/other/supplier-information-supplier-quality

6.0 PROCEDURE

6.1 Flex Expectations on Suppliers Compliance

6.1.1 Flex expects all its materials, components, parts, assemblies and other product suppliers to be actively managing environmental compliance to all legal regulations and any specific Flex requirements. Suppliers must present to Flex how the requirements outlined in this specification are incorporated into their processes and how the requirements of this specification will be met. Progress tracking will be an integral part of supplier business reviews. Flex expects suppliers to align their environmental compliance roadmaps with Flex requirements. In addition, Flex customers may require environmental compliancy above Flex or Legal requirements and suppliers shall be expected to comply. As most industry components are environmental compliant, suppliers are expected to support any non-environmental compliant component requirements through direct or alternative source arrangements.

6.1.2 Flex expects its suppliers to inform Flex of any anticipated technology or cost issues that may affect the supplier's ability to support Flex's environmental compliant and non-compliant requirements. There should be minimal cost impact to Flex for environmentally compliant materials, components, parts, assemblies, products or services. In any event, suppliers are required to provide a mitigation plan for cost structure impacted, and to update Flex on the cost reduction plan or roadmap at least on a quarterly basis. Flex reserves the right to endorse the approval under general contract review with suppliers.

6.1.3 Flex expects its suppliers to identify issues that may impact the quality, yield or long-term reliability of parts, assemblies or products. Flex expects environmentally compliant materials, components, parts, assemblies or products supplied to Flex to be of equal or greater quality than non-compliant materials, components, parts, assemblies or products.

6.1.4 Suppliers are responsible to notify Flex if any banned or environmentally reportable substances are used in materials, components, parts, assemblies or products provided to Flex.

6.1.5 Suppliers are expected to provide a unique manufacturer Part Number for any part that is compliant, and suppliers are expected to have an effective management system to prevent the mixing of compliant and non-compliant parts. This should include an effective marking/labeling strategy for packaging, parts, and documentation. Suppliers are required to endorse standardized or internal part re-numbering system of their own choice. For those parts that are already available as compliant, the same part numbers may be retained, but the suppliers must ensure that old non-compliant parts are no longer available on shelves or purchasable through third parties.

6.1.6 Flex may, at its discretion, request a self-assessment or on-site audit of a supplier's environmental capability. Supplier shall be expected to fully comply with such requests and submit all materials requested, in the time frame defined, to validate such environmental capabilities. Corrective actions resulting from deficiencies identified in these assessments shall be resolved by supplier within the time frame defined in the issued corrective action. Supplier may be required to provide documented evidence of such corrective actions to meet Flex requirements

6.1.7 Suppliers are expected to provide the Requested Compliance Information to Flex within 5 Business days.

6.2 General Compliance Requirements

6.2.1 Flex fully endorses all legal regulations regarding environmental compliance. Suppliers must assist Flex in achieving compliance with the respective legislation, and work with Flex and its customers well in advance and before the requirements come into effect to allow any potential product re-qualifications, new product introductions, etc.

6.2.2 Suppliers must ensure and guarantee that materials, components, parts, assemblies and/or products provided to Flex do not contain restricted substances above prescribed allowable amounts. This restriction applies to all substances and compounds containing these substances defined in the relevant Legal, Flex or Customer requirements. These substances and compounds must not be in or on any materials, components, parts, sub-assemblies or products, except for the exemptions listed under environmental legal, regulatory, industry or customer requirements. Flex team will be periodically checking which part compliance status has changed due to new regulations or expiring exemptions. Supplier must perform impact analysis on the affected part list and send to Flex for feedback and take necessary precautions to ensure compliance.

6.2.3 The maximum concentrations of banned substances shall be in accordance with the applicable environmental Directives or as directed by Flex for its customers. The maximum allowable level found in a homogeneous material (e.g. metal, adhesive, paint, plastic, plating, etc.), cannot exceed the maximum concentration levels stipulated by the relevant Directive(s).

6.2.4 Suppliers of components used in products (direct materials) are required to confirm their compliance with all applicable global government environmental regulations or customer specific requirements as advised by Flex.

6.2.5 Suppliers of production materials used to manufacture products (indirect materials) are required to confirm their compliance with all applicable governmental regulations and Flex Specification of Banned and Restricted Substances.

6.2.6

6.2.7 Flex team will be periodically checking which part compliance status has changed due to new regulations or expiring exemptions. Supplier must perform impact analysis on the affected part list and send to Flex for feedback and take necessary precautions to ensure compliance.

6.2.8 Suppliers shall provide confirmation of compliance on request from Flex using IPC1752A format delivered in XML format (Ref 5.09). Suppliers may use their own tools to create IPC1752A XML files. Alternatively, suppliers who do not have their own tools are directed to use the Anthesis IPC1-752A material declaration template to create IPC1752A XML declarations.

At Flex discretion dependent on compliance requirements, declaration requests may be made by IPC1752A class per the table below:

Class	Description	Declaration Type	Detail Requirements
A	Reporting in Query/Reply format	Query/Reply	Supplier provides responses to standard queries and/or optional custom queries
B	Material group reporting	Material Group	Supplier states the amount of different groupings of materials within a product.
C	JIG-101 substance category reporting for the product Additional substance categories reporting at the product level	Substance summary groups	Supplier provides mass and/or concentration of JIG-101 substance category at the product level if above thresholds. Additional substance categories can be added and reported at the product level.
D	Substances reporting at the homogeneous material level. JIG-101 substances and additional substances are accommodated	Full substances	Supplier provides location, mass, substances at homogeneous material level

Completed declarations must be returned to the Flex individual making such request or may be emailed to GBS team at: in.gbsengecmgatekeeper@flex.com

6.2.9 Irrespective of the IPC1752A declaration class submitted, all suppliers MUST provide a signed “Supplier Certificate of Compliance”. These SCoC’s are integral to the declaration forms but suppliers may attach their own documents if preferred.

6.2.10 Supplier shall be required to ensure familiarity and understanding of the documentation necessary to submit correct environmental IPC1752A declarations to Flex. The “Anthesis IPC1-752A material declaration template” is available at the Supplier Quality Web page:

https://flex.com/other/supplier-information-supplier-quality

In addition, for those suppliers who use the Anthesis IPC-1752, suppliers shall read and understand the “Anthesis IPC1-752A material declaration user guide” published on the Support page of that web site.

Alternatively, at Flex discretion, supplier may be required to take specific training programs from Flex to properly understand environmental compliance requirements and to submit correct environmental declarations.

6.2.11 All suppliers to Flex are required to comply with Flex Lead Free requirements as specified in Flex “Specification for Procurement of Lead (Pb) Free Electronic and Electromechanical Components and Assemblies”. Evidence of compliance shall be required on request from Flex.

6.2.12 Device datasheets should clearly indicate the termination solder composition, maximum component temperature rating, recommended & absolute reflow profile limits, and the moisture sensitivity rating. If this information is not present on the datasheet, suppliers shall provide a clear reference where such information can be located.

6.3 Customer Specific Requirements

Frequently, unique environmental requirements are needed to fulfill Flex's customer product environmental specifications. Such requirements may entail differences from the legal limits of various environmental requirements, additions to existing banned substance requirements, reduction or bans on all halogen substances or any activity necessary to comply with a customer "Green" requirement. Suppliers are required to consult with Flex and its customer on a case by case basis.

6.3.1 Customer unique requirements will be specifically identified by the Flex Global Environmental Management team or defined in a Product Environmental Specification for a product

6.3.2 As required, substance data at a full homogeneous level may be required. Suppliers shall provide such data at Flex request via the IPC1752A Class D format.

6.3.3 A 3rd party laboratory report shall accompany all material content declarations. This will provide validation of the material content declaration data submitted.

6.3.4 On flex approval, lab reports may be provided from the suppliers' own laboratory. Recommend the use test lab: SGS, INTERTEK, TUV, CTI

6.4 Conflict Minerals

Supplier must have a policy to reasonably assure that the 3TG (tantalum, tin, tungsten, and gold) in Product does not directly or indirectly finance or benefit armed groups that are offenders of serious human rights abuses in the Democratic Republic of the Congo or an adjoining country. Supplier will exercise due diligence to comply with and demonstrate compliance with the "Dodd Frank Act Section 1502".

Flex is an active member of the Conflict Free Sourcing Initiative and the Due Diligence sub-team. Flex has adopted the tools and programs released by these organizations as part of our corporate Conflict Minerals Due Diligence activities.

Supplier will:
(a) exercise due diligence on the source and chain of custody of 3TG used in product;
(b) provide Flex with a complete and accurate conflict mineral report detailing the source and chain of custody of conflict minerals (Conflict Minerals Reporting Template (CMRT)) for all materials, components, and subcomponents used in the Product

6.5 RoHS Compliant & Lead-Free Marking/Identification

Flex endorses IPC/JEDEC J-STD-609B-2016, Marking and Labeling of Components, PCBs and PCBAs to Identify Lead (Pb), Lead-Free (Pb-Free) and Other Attributes

6.5.1 All components or parts should have the outer packaging boxes and inner package material (tray, tube, reel, etc.) marked with some form of traceable information indicating that the components or parts are lead-free/RoHS compliant per JESD97 classification. This marking should also appear on the component or part package where there is room for such a marking.

6.5.2 All RoHS/ environmentally compliant components or parts should have a new Manufacturer P/N's assigned. Suffix or prefix additions to existing P/N structures are acceptable.

6.5.3 Suppliers shall provide any additional markings to components, inner packaging or outer packaging as required and specified by Flex.

6.6 Requirements on Product Change Notification (PCN)

Supplier shall manage all Product Change Notifications (PCN) per Flex requirements defined in Supplier General Quality Requirements (ref 5.14).

Sample devices and qualification data shall be made available to Flex prior to the release of the PCN or introduction of the new product.

In case of any materials changes to parts (exemptions/changes to regulations), supplier needs to share updated IPC 1752A files for parts affected flex immediately.

6.7 Verification of Compliance

At Flex request, suppliers shall provide Flex with, analytical test data that demonstrates the compliance of parts, components or products sold to Flex with any applicable provision of this specification. Any additional documentation and/or test data, including documentation and data from the supplier's supply chain, which demonstrates specific supplier actions to verify compliance must be kept on file for a minimum of 10 years and be made available on request within 5 business days.

6.7.1 Analytical Testing

When the measurement of materials content is required to verify compliance, or specifically requested by Flex, the supplier shall use a qualified 3rd party lab to perform any required testing.

Supplier internal labs may be used subject to Flex approval.

For testing, the material must be a homogeneous material, or a component processed into a homogeneous state. A homogenous material is a substance or a mixture of substances with a uniform composition (such as solders, resins, coatings, etc.), and a component is a combination of homogeneous materials that have been formed into a single manufactured part.

7.0 RESPONSIBILITY

7.1. Engineering Quality Excellence - It shall be this team responsibility to maintain this document, provide periodic updates as industry conditions dictate, and ensure that all Flex sites are made aware of this document and changes thereof. This team also has the responsibility to update any contracts or other suppliers legal documentation that may reference this document.

7.2. Corporate Supplier Quality Team – It shall be the responsibility of this team to ensure that this document is available on Flex web pages for external access by all suppliers and to ensure that all Preferred Suppliers are made aware of this document and have access to it.

7.3. Site Environmental Personnel – It shall be the responsibility of site environmental compliance personnel to ensure that this document is made available to all suppliers controlled by the site.

8.0 RECORD RETENTION REQUIREMENT

8.1.

No	Record	Retention Period	Storage Location	Protection	Retrieval	Disposition
1.	Environmental Compliance Records	10 Years	Electronic / Hard Copies As Applicable	As Per Internal Applicable Procedures	As Per Internal Applicable Procedures	As Per Internal Applicable Procedures

(Note: This section is Mandatory if this Policy/Process/or Procedure is related to or leads to the generation of records.)