

## ESAM, Inc Environmental E-QAPP

The following provisions with their terms and conditions shall become an integral part of the purchase order to the extent specified in the purchase order and shall become a supplement to the presently existing terms and conditions of the purchase order. All specifications and standards referenced in this document are the latest issue in effect at the time of Purchase Order placement, unless otherwise stated. These provisions apply to all ESAM facilities and divisions as appropriate.

This specification is not intended to list all product limitations or restrictions that are or may be in the future covered by law or legal restrictions. The Seller has the obligation to comply with all applicable laws and legal/regulatory restrictions. This specification does not diminish or relieve the seller from complying with local applicable laws or legal/regulatory restrictions.

Precedence: If a conflict occurs between this specification and a ESAM individual specification the ESAM specification shall prevail if no legal laws are violated.

This specification is in addition to and does not in anyway limit or supersede any other product specification that may be established by ESAM Inc.

### 1. OZONE DEPLETING SUBSTANCES

Ozone depleting substances (ODS) per EPA Regulations 601-607 of the Clean Air Act and the Montreal Protocol shall not be used in process of manufacturing parts, assemblies, components or raw materials unless a written exemption is granted by ESAM Inc. for military applications (see addendum 1 and 2).

- (a) Supplier shall not introduce Ozone depleting substances into the product during the manufacturing process.
- (b) Supplier's standard Certificate of Conformance (C of C) shall be verification that product has been built in accordance with these requirements for ozone depleting substances and ESAM's Terms and Conditions.

### 2. WEEE AND RoHS COMPLIANCE

- (a) Product must be compliant to European Union (EU) Directives 2011/65/EC and WEEE Directive 2002/96/EC. Marking must be applied as required per item 5 below and material declarations per item 10 below. Other applicable sections of this document apply to EU RoHS and WEEE.
- (b) When specified by ESAM Product Management or ESAM Compliance Management, product must be compliant to China RoHS requirements as specified in SJ/T11363-2006 and SJ/T11364 and provide material declarations per item 10 below and marking per item 13 below.
- (c) Supplier shall certify that RoHS substances were not introduced into the product during the manufacturing process.
- (d) Suppliers shall certify that the product is built to the specifications, prints and/or defined requirements.
- (e) If ESAM Inc. specifies the raw materials, assemblies or component Supplier shall certify via a material declaration that product has been built in accordance with these requirements and specifications.

### 3. REACH COMPLIANCE

Supplier must comply with European Union Regulation 1907/2006 E/C and supply Material Declarations and comply with other subsequent REACH related sections of this document.

- (a) Supplier shall certify that REACH substances were not introduced into the product during the manufacturing process.
- (b) Suppliers shall certify that the product is built to the specifications, prints and/or defined requirements.
- (c) If ESAM Inc. specifies the raw materials, assemblies or component Supplier shall certify via a material declaration that product has been built in accordance with these requirements and specifications.
- (d) Suppliers shall provide ESAM Inc. REACH updates in accordance with item 10 below

#### **4. MARKING PERMANENCY AND LEGIBILITY**

WEEE (Wheelie bin), RoHS, and PRODUCT TAKE BACK (Company logo, Address, ESAM Part number & Country of Origin) marking permanency must be in accordance with CENELEC EN50419:2005.

#### **5. WEEE MARKING**

ESAM Inc. does not hold seller responsible for European Product take back at the end of product life. WEEE marking is required as convenience for electronic & electrical products upon determination of the following items;

- (a) If determined by ESAM that the finished goods product will ship to the European Union in the as received condition from the seller and no fixed site or military EU exemptions apply
- (b) Finished Goods fall under the definition of a covered WEEE item
- (c) Subassemblies or fabricated parts that become part of a ESAM upper level assembly typically are not required to have WEEE marking unless specifically called out on the drawing or specification.

#### **6. SEGREGATION OF ROHS AND NON-ROHS MATERIAL**

The supplier at all times shall maintain a process or system to ensure that RoHS compliant parts and Non-RoHS compliant parts are segregated and properly identified as to the compliance status. The supplier shall maintain appropriate controls and RoHS marking with vendor parts to ensure that received component parts are not mixed on reels or other packaging methods.

#### **7. ESAM IN-PROCESS/SOURCE INSPECTION (ODS/REACH/RoHS)**

ESAM Inc. reserves the right to visit the plant of the seller or seller's sources to survey facilities, systems, and/or product to determine satisfactory conformance to the applicable environmental specifications. ESAM representative(s) may elect to conduct inspection either on a random basis or to the extent of 100% inspection. Seller will be notified if ESAM inspection is to be conducted on specific shipments. No shipments are to be held for ESAM inspection unless notification is received prior to, or at the time of, material being ready for shipment.

#### **8. SHELF LIFE/HAZARDOUS MATERIAL DESTINED FOR EU SHIPMENTS**

The seller shall provide REACH Safety Data Sheet (SDS) in the European Union ECHA format with every shipment for substances, preparations or articles with SVHC's above 0.1% weight/weight beginning with all shipments after June 1, 2011. Disclosure must include all substances on the published SVHC candidate list.

#### **9. RoHS & REACH PRODUCT TESTING**

ESAM, Inc. reserves the right to have any advertised RoHS or REACH compliant product tested for RoHS compliance. If product is determined to be noncompliant it is the responsibility of the supplier to replace or correct all noncompliant material at the seller's expense.

#### **10. MATERIAL DECLARATIONS**

ESAM Inc. requires RoHS & REACH Material Declarations prior to product shipment or with the first article approval (item 11 below). Upon request, seller shall provide a RoHS or REACH Declaration within 5 business days of the request.

**Requirements for EU RoHS Material Declarations are as follows;**

- (a) RoHS Compliance Material Declarations signed or authorized by personnel with appropriate authority is required on Company letterhead/website.
  - (b) Any RoHS technical exemptions that are used must be identified on the Material Declaration, if the product is fully compliant then a statement such as “No RoHS technical exemptions apply” must be included in the Material Declaration.
  - (c) Website declarations are acceptable if the items above in (a) and (b) are covered and product weight is provided.
  - (d) Drawings or Spec sheets of products that just state “RoHS Compliant” is not an acceptable Material Declaration.
  - (e) A RoHS statement of Compliance (a and b above) with supporting test results is acceptable provided any technical exemptions are identified that cause test results to be above acceptable RoHS PPM levels.
  - (f) Product homogenous material reports in PPM, Percentages or weights are acceptable provided product mass (weight) and (a) and (b) are included.
  - (g) IPC1752-2 formats Class1-6 are acceptable provided that all required fields on the form are completed. Suppliers are encouraged to use this format as the data will automatically load into ESAM’s Environmental database.
1. EU RoHS Material Declarations must be provided within 5 business days of the ESAM request.

**China RoHS Material Declaration requirements:**

It is the responsibility of ESAM’s Product Managers to notify ESAM Supply Chain if China RoHS is required. In addition to the requirements stated in items (a)-(f) above under EU RoHS, the following requirements apply for a China RoHS:

- (a) If EU RoHS technical exemptions are identified, then the China Declaration must include the “Environmentally Friendly Use Period” in years as identified by your company per SJ/-T11364-2006.
- (b) EU RoHS and China RoHS declarations may be combined into one Material Declaration.
- (c) In addition to the requirements stated above, additional marking and documentation is required for finished products such as Cable Assemblies, RF equipment, Servers, Computers, monitors, etc. These requirements are covered below under “Environmental Marking Requirements”.

**REACH Material Declarations**

Within the European Union REACH is controlled by European Union’s European Chemical Agency (referred to as ECHA). Unlike RoHS, chemical substances are being added to this ECHA candidate list called Substances of Very High Concern (SVHC’s) on a regular basis. As a supplier to ESAM, you are required to monitor the SVHC candidate list and report any SVHC’s that are in your product supplied to ESAM that exceed an SVHC limit of 0.1% wt/wt. Please note SVHC’s above the limits will not be considered a product nonconformance. However, if seller does not provide regular updates (60-90 days) after the SVHC’s are updated, this may result in a Supplier Corrective Action. These notifications must be sent to ESAM.

Beginning June 1, 2011 seller must provide a Safety Data Sheet format as described in ECHA Regulation 1907/2006 for any SVHC above 0.1% wt/wt with each product shipment. If an SVHC is in seller’s finished product above 0.1% wt/wt and an SDS does not ship with the product, this shall be considered a nonconformance.

The following information is required on the REACH Material Declaration and must be provided if SVHCs are present or if SVHC’s are not present in the sellers in product.;

- (a) REACH Compliance Material Declarations signed or authorized by personnel with appropriate authority is required on Company letterhead/website.
- (b) Identification if the product is an article, article with intentional release, preparation or substance.
- (c) Identification of any SVHC above the 0.1% wt/wt in the supplied product and substance weight, PPM or percentage of the total product
- (d) The ECHA SVHC Candidate List date or number of substances that the product list was scanned/analyzed against

## **11. FIRST ARTICLE INSPECTION REQUIREMENTS FOR ENVIRONMENTAL COMPLIANCE:**

The supplier shall provide a First Article Inspection Report (FAIR) which shall include REACH, EU RoHS and China RoHS (if applicable) declarations and/or product analysis/test results in accordance with item 10 above.

## **12. ESAM INC, PURCHASED RAW MATERIAL/ CHEMICALS**

With each raw material shipment to ESAM Inc., the seller shall forward reports of mechanical properties and chemical composition to show evidence of conformance to all applicable REACH (SVHC's) & RoHS requirements for all raw material used in fabrication of the ordered product.

With shipment of chemical orders, the seller shall forward reports of chemical composition to show evidence of conformance to applicable specifications for all raw material used in the ordered material. This report shall comply with the requirements of the Material Safety Data Sheet (MSDS) and EU ECHA (Safety Data Sheets (SDS)) and shall be attached to the first article inspection report (FAIR).

## **13. ENVIRONMENTAL PACKAGING & PACKAGING MARKING**

- (a) All packaging and printed material & products shipping from ESAM to China, must be China RoHS compliant and must be marked according to China RoHS Standards.
- (b) Packaging material must be recyclable or reusable and must be marked with the appropriate international recycling/reuse symbol to facilitate recycling or reuse.
- (c) Packaging shall meet the requirements of EU Directive 94/62/EEC and US state laws consisting of Heavy Metals not greater than 100 PPM for Lead, Mercury and Hexavalent Chromium and less than 50 PPM for Cadmium.
- (d) Upon request from ESAM Inc., the packaging supplier shall provide Packaging Material Declaration.
- (e) All packaging material shall be of non-ozone depleting materials; ref. Volume 40 of the Code Of Federal Regulations, Part 82, Clean Air Act, Title VI.
- (f) Packaging material shall meet the requirements of REACH Regulation 1907/2006 (EC). If any Substances of Very High Concern (SVHC) per REACH Annex XIV are above the 0.1% wt/wt, then ESAM shall be notified and per REACH a "Safety Data Sheet" must ship with the packaging when SVHC's are above the 0.1%wt/wt. As REACH substances are added to AnnexXIV, it is the Supplier's responsibility to automatically notify ESAM Inc. of any SVHC's above the 0.1% wt/wt. when changes are made to REACH SVHC list.

## **14. CHINA ROHS MARKING AND DOCUMENTATION FOR FINISHED GOODS PRODUCTS**

Per the China RoHS SJ/T11364-2006 "Marking Requirement for Control of Pollution Caused by Electronic Information Products" and Ministry of Information Industry (MII) initiative, effective **March 01, 2007**, all product received in country (China) must be properly marked with the appropriate compliance labeling as directed within the aforementioned directive.

**Basic Requirements for Marking:**

a. Product Level:

1. Product must be marked (labeled) with the applicable compliant or non-compliant label denoting China RoHS compliance.

Sample:

The example with the “Green e” is the label that identifies the product as fully RoHS compliant “No exemptions apply”



Note: in the example with the “20” identifies the User friendly period and is determined and used when products have RoHS substances above the acceptable limits. China does not allow all typical exemptions like EU RoHS and requires special product marking

2. Product must have a “China Material Declaration” provided with the unit in Chinese per SJ/T11364-2006.
3. Product identification labels must have the Date Of Manufacture (DOM) indicated on the label (format: YYYY-MM-DD)

b. Package Level:

1. Product packaging must be marked (labeled) with the applicable compliant or non-compliant label denoting China RoHS compliance condition of product contained within.

Sample:



2. Packaging will be marked (labeled) with the appropriate recycling insignia.

Example: Cardboard



CB

3. Product packaging must have a “Material Declaration” provided and is to be provided inside the packaging with the unit if RoHS PPM limits are not acceptable on the packaging

## 15. ESAM FABRICATED ITEMS

### Fabricated Item Environmental Compliance wording as it relates to Mechanical Drawings

- (a) This item may be referenced or the following wording may appear on ESAM Inc. Mechanical Drawings:  
Finished part to be ROHS and REACH compliant per EU Directive 2011/65/EC and EU Regulation 1907/2006 and shall not use ozone depleting substances per US regulatory requirements. Fabricator shall add a unique permanent identification mark in accordance with E-QAPP "Fabricator Facility Marking". Material declarations for ROHS and REACH (SVHC's) shall be provided and updated as needed.

**Requirement Update Notification: Beginning January 02, 2013 EU Directive 2002/95/EC is superseded by EU Directive 2011/65/EC. All references to RoHS 2002/95/EC shall be interpreted to mean the requirements specified in EU DIRECTIVE 2011/65/EC.**

**NOTE: AN ALTERNATE RoHS STATEMENT BELOW ON EXISTING DRAWINGS IS ACCEPTABLE. HOWEVER, IPC1752 REQUIREMENT IS SUPERSEDED BY MATERIAL DECLARATION REQUIREMENTS SPECIFIED IN THIS DOCUMENT.**

#### **RoHS COMPLIANCE**

*FINISHED PART TO BE RoHS COMPLIANT PER DIRECTIVE 2002/95/EC. FABRICATOR MUST PROVIDE A RoHS MATERIAL DECLARATION FOR THIS FINISHED PART IAW IPC-1752 (MINIMUM OF CLASS 1). IF EQUIVALENT ALTERNATIVE RoHS COMPLIANT MATERIALS/COMPONENTS ARE USED, A LIST OF THESE ALTERNATIVES (AND THEIR RESPECTIVE MATERIAL DECLARATIONS) MUST BE PROVIDED WITH THE FINISHED PART MATERIAL DECLARATION. THIS FINISHED PART MAY BE SUBJECTED TO RoHS TESTING/AUDITING, AND FABRICATOR MUST BE ABLE TO PROVIDE SUPPORT DOCUMENTATION FOR THEIR MATERIAL DECLARATION WITHIN 1 WEEK IF REQUESTED. FABRICATOR TO ADD A UNIQUE PERMANENT FABRICATION FACILITY IDENTIFICATION MARK ON EACH FINISHED FABRICATED PART FOR RoHS TRACABILITY. THE MARK USED MUST BE IDENTIFIED ON THE MATERIAL DECLARATION.*

#### (b) Fabricated Item "Fabrication Facility" Marking

When specified on the drawing for RoHS compliance, the Fabrication vendor shall apply a Fabrication Facility mark. ESAM Mechanical Engineering may specify the facility mark location on the drawing, if not specified, then, it must be applied to the part in a discreet location typically not seen by a ESAM customer in an in-service condition. If the part is too small or it is not possible to permanently mark the part, then placing the facility mark on the packaging (Bag & Tag) is acceptable with ESAM QA approval. This facility mark shall be approved by ESAM Inc's Quality Assurance. If product is supplied by a sole source supplier, ESAM QA may deviate from this requirement. Any other deviation to this requirement must be approved by ESAM.

## **16. BATTERY REQUIREMENTS**

**Packaging shall be marked where batteries are installed or shipped with the product-**

- (a) All batteries installed in equipment must be protected from damage & short circuit and the equipment must be packaged to prevent accidental battery activation. The packaging marking is dependent upon the type of battery used in the product but must follow International Civil Aviation Organization (ICAO)'s *Technical Instructions for the Safe Transport of Dangerous Goods by Air*, as set forth in the most recent version of the International Air Transport Association's (IATA) *Dangerous Goods Regulations*.

## **17. PAINTS**

Shall comply per Addendum 1 for substances including Lead in Paints can not exceed 5 PPM and Short Chain Paraffins in paints can not exceed 300 PPM

## **18. INKS**

Shall comply per Addendum 1 for substances including heavy metals such as lead, mercury, and Hexavalent Chromium cannot exceed 100 PPM and Cadmium can not exceed 50 PPM.. Short Chain Paraffins in inks can not exceed 300 PPM

## **19. WELDMENT MATERIAL**

Shall comply with Addendum 1 including Hexavalent Chromium, Lead and Mercury not to exceed a 1000 PPM and Cadmium can not exceed 100 ppm unless otherwise specified on the drawing or specification

## **20. CONVERSION COATINGS FOR METALS**

Shall comply with Addendum 1 and/or shall meet the requirements specified on the ESAM drawing or specification or identified ESAM part number for specific Conversion Coating type which may reference either a Mil Specification or ASTM Standard.

## **21. SPECIFIC ESAM INC. CUSTOMER REQUEST**

On occasions ESAM Inc's customers may request specific substance data outside the scope of this document. This special request for information may be to determine if materials/substances such as/ but not limited to Magnesium, Zinc, PVC, Lithium Batteries, Selenium or Bromines used in flame retardants, etc. are used in the Seller's product and the locations of these substances in the products. ESAM will make a formal request to the Seller using a customized material declaration form for this type of request. The ESAM product supplier has 10 business days to respond to specific substance request.

## References

### EU Documents

- Directive 2002/95/EC EU RoHS Directive
- Directive 2002/96/EC EU WEEE Directive
- Directive 94/64/EC EU Packaging Directive
- Directive 1907/2006/EC EU REACH Regulation
- Directive 2011/65/EC EU RoHS 2 Directive

### China Documents

- SJ/T11363-2006 “Requirements on Concentration Limits to Toxic and Hazardous substances in Electronic Information Products”
- SJ/T11364-2006 “Marking Requirement for Control of Pollution Caused by Electronic Information Product”
- GB 18455-2001 “Packing Material Recovery Symbol”

### IPC Documents

- IPC 1752-2 – Materials Declaration Management form



## Definitions

- **ABS** – Acrylonitrile Butadiene Styrene
- **CFC** – Chlorinated Fluorocarbons
- **DBDPO** – Decabromodiphenyl Oxide (a flame retardant)
- **ECHA** – **European Chemicals Agency** [European Chemicals Agency \(ECHA\)](#)
- **EFUP** – Environmentally Friendly Use Period as defined in China SJ/-T11364-2006, synonymous with EPUP
- **EPUP** – Environmental Protection Use Period (see EFUP)
- **EU** – European Union
- **HFC** – Halogenated Fluorocarbons
- **HIPS** – High Impact Polystyrene
- **Homogeneous Material** – A material that cannot be mechanically disjoined into different materials
- **MSDS** – Materials Safety Data Sheet
- **MCV** – Is the Maximum Concentration Value threshold of the substance that shall be accepted
- **OBDDPO** – Octabromodiphenyl Oxide (a flame retardant)
- **ODS** – Ozone Depleting Substance
- **Parts per Million (PPM)** – used to express concentration. The ppm is 1,000,000 x mass substance / mass of the homogeneous material. Concentrations are unit-less, for example 100 ppm = 0.01% = 100 mg/kg.
- **PeBDPO** – Pentabromodiphenyl Oxide (a flame retardant)
- **Product** – Any item of value sold to ESAM Inc.
- **PVC** – Polyvinyl Chloride
- **REACH** –Registration, **E**valuation, **A**uthorisation and **R**estriction of **C**hemical substances per EU regulation 1907/2006 E/C
- **Restricted** – Allowed in limited quantities
- **RoHS** – restriction of the use of certain hazardous substances in electrical and electronic equipment covered in EU Directive 95/2002 EC and China law SJ/-T11364-2006. RoHS Compliance limits and homogenous material examples are listed in Addendum 1& 2
- **SDS** – Safety Data Sheet as defined in EU Regulation 1907/2006 E/C
- **Seller**– A person or organization that sells products, parts, assemblies, or raw materials to ESAM Inc. (same as Supplier)
- **Supplier** – A person or organization that sells products, parts, assemblies, or raw materials to ESAM Inc.
- **Suppliers Material Declaration** – a declaration made by a ESAM Inc supplier that the product purchased by ESAM Inc. complies with an established list of requirements and standards.
- **SVHC**- Substance of Very High Concern as defined in EU Regulation 1907/2006 E/C
- **WEEE** – **W**aste **E**lectrical and **E**lectronic **E**quipment per European Union Directive 2002/96 E/C

## Addendum 1

### Product Content Restrictions

The following substances are prohibited for use in manufacturing parts, assemblies, components or raw materials. The MCV is defined as the Maximum Concentration Value threshold of the substance that shall be accepted.

### General Restrictions

The following substances shall not be used unless prior written

| # | Substance  | General Industry uses  | Comment   |
|---|--|--|---|
| 1 | Asbestos, Asbestos Materials   | Plastic parts, Insulating materials  | Shall not be allowed  |
| 2 | Ozone depleting substances Class 1<br>See Addendum 2   | Coolant, propellant, refrigerates  | Shall not be allowed and should not be used in production process |
| 3 | Ozone depleting substances Class 2<br>See Addendum 2   | Historically HCFC's were used as substitutes for CFC's   | Shall not be allowed and should not be used in production process |
| 4 | Polychlorinated Biphenyls (PCB)/ Terpheynels (PCT) Monomethyl-tetrachlorodiphenyl methane See Addendum 2 | Historically used in transformers and capacitors   | Shall not be allowed  |
| 5 | Polybrominated Bipheynyls (PBB) and their ethers/oxides (PBDE)   | Historically used as flame retardants. OBDPO was found in ABS and other thermoplastics, DBDPO was found in HIPS and other thermoplastics. PeBDPO was found in polyurethane foams | Shall not be allowed in New Designs                               |

### Product Specific Application for Homogenous Material Restrictions

| Substances   | Restricted Application   | MCV<br>(Not to Exceed)   |
|--|--|--|
| Cadmium (Cd) & its compounds<br>(See EU Directive 2002/95/EC and Annexes for exemptions)   | Anti-corrosion finishes, paints/enamels(excepting safety warnings), Plastic Stabilizer (electric cables) | 50 PPM   |
|  | Other uses (Excluding optical glass and switch contacts)   | 5 PPM  |
| Lead (Pb) & its compounds<br>(See EU Directive 2002/95/EC and Annexes for exemptions)      | Paints   | 5 PPM  |
|  | PVC stabilizer in cable jackets  | 300 PPM  |
| Mercury (Hg) and its compounds<br>(See EU Directive 2002/95/EC and Annexes for exemptions) | Lamps & LCD Monitors   | 10 mg/lamp<br>Note: Product must be labeled according to local and "ship to" regulatory country requirements |
|  | Other uses (excluding lamps & monitors)  | Shall not be present   |
| Short chain chlorinated paraffins  | Softener in paints & coating, oils, or flame retardant in plastic rubber or textiles                     | 1000 PPM   |
| Halogenated Diphenyl Methanes  | Articles in direct contact with human skin (e.g. headphones)   | 5 PPM  |

### Reporting of Hazardous Substances in Electrical, Electronic products and Packaging and Labeling Materials

- (a) The following substances in any homogenous material of electrical, electronic components and products are restricted in all RoHS designed products. Packaging, marking and labeling restrictions also apply. Exemptions are allowed per (See EU Directive 2002/95/EC and Annexes for exemptions for the EU) and SJ/T 11363 - 2006. All exemptions used shall be reported to ESAM. Exempt product must also include a China RoHS Material Declaration as Defined in SJ/T11364-2006
- (b) Any manufactured parts, assemblies, components or raw materials where the seller did not change part numbers to indicate compliance shall provide ESAM Inc. with the manufacture compliant date code when all parts, assemblies, components or raw materials became RoHS compliant.
- (c) Supplier and/or Contract Manufacturer shall maintain all Homogenous Material Declarations and shall provide Material Declarations to ESAM as requested. The person approving such Material Declarations shall be an officer of the company or have official delegated responsibility from an officer of the company to approve Material Declarations

| Substance   | Restricted Application  | MCV Threshold allowed       | Reportable Substance, EU & China Material Declaration Required            |
|---|---|-----------------------------|---|
| Lead (Pb) and its compounds                                   | In Electrical and Electronic components & products  | 1000 PPM                    | YES, must also report all exemptions used                                 |
|   | Packaging materials, package labels, inks and other markings  | 100 PPM                     | YES, must report all exemptions used. Pb can not be intentionally added   |
| Cadmium (Cd) and its compounds                                | In Electrical and Electronic components & products  | 100 PPM                     | YES, must also report all exemptions used                                 |
|   | Packaging, package labels, inks and other markings  | 50 PPM                      | YES, must report all exemptions used. Cd can not be intentionally added   |
| Mercury (Hg) and its compounds                                | In Electrical and Electronic components & products  | 1000 PPM                    | YES, must also report all exemptions used                                 |
|   | Packaging, package labels, inks and other markings  | 100 PPM                     | YES, must report all exemptions used. Hg can not be intentionally added   |
| Hexavalent Chromium (CrVI) & its compounds                    | In Electrical and Electronic components & products  | 1000 PPM                    | YES, must also report all exemptions used                                 |
|   | Packaging, package labels, inks and other markings  | 100 PPM                     | YES, must report all exemptions used. CrVI can not be intentionally added |
| Ozone Depleting substances CFC's and HCFC's                   | Foaming agents, such as foaming polystyrene used in packaging and other processing or manufacturing of packaging, package labels, inks and other markings | Must not be present or used | YES, must report all occurrences.   |
| Polybrominated Biphenyls (PBB) and their ethers/oxides (PBDE) | In Electrical and Electronic components & products  | 1000 PPM                    | YES, must also report all exemptions used                                 |
|   | Packaging, package labels, inks and other markings  | 100 PPM                     | YES, must report all occurrences.   |

## Addendum 2

| Asbestos/Asbestos Materials     | CAS Numbers |
|---------------------------------|-------------|
| Asbestos and Asbestos Materials | 1332-21-4   |

|                     |            |
|---------------------|------------|
| Actinolite          | 77536-66-4 |
| Amosite (Grunerite) | 12172-73-5 |
| Anthophyllite       | 77536-67-5 |
| Chrysotile          | 12001-29-5 |
| Crocidolite         | 12001-28-4 |
| Tremolite           | 77536-68-6 |

| Class 1<br>Ozone Depleting Substances/Isomers   | CAS Numbers              |
|---|--------------------------|
| Trichlorofluoromethane (CFC 11)   | 75-69-4                  |
| Dichlorodifluoromethane (CFC12)   | 75-71-8                  |
| Chlorotrifluoromethane (CFC 13)   | 75-72-9                  |
| Pentachlorofluoroethane (CFC 111)   | 354-56-3                 |
| Tetrachlorodifluoroethane (CFC 112)   | 76-12-0                  |
| Trichlorotrifluoroethane (CFC 113)  | 354-58-5                 |
| 1,1,2 Trichlorotrifluoroethane  | 76-13-1                  |
| Dichlorotetrafluoroethane (CFC 114)   | 76-14-2                  |
| Monochloropentafluoroethane (CFC 115)   | 76-15-3                  |
| Heptachlorofluoropropane (CFC 211)  | 422-78-6<br>135401-87-5  |
| Hexachlorodifluoropropane (CFC 212)   | 3182-26-1                |
| Pentachlorotrifluoropropane (CFC 213)   | 2354-06-5<br>134237-31-3 |
| Tetrachlorotetrafluoropropane (CFC 214)   | 29255-31-0               |
| 1,1,1,3-Tetrachlorotetrafluoropropane   | 2268-46-4                |
| Trichloropentafluoropropane (CFC 215)   | 1599-41-3                |
| 1,1,1-Trichloropentafluoropropane   | 4259-43-2                |
| 1,2,3-Trichloropentafluoropropane   | 76-17-5                  |
| Dichlorohexafluoropropane (CFC 216)   | 661-97-2                 |
| Monochloroheptafluoropropane (CFC 217)  | 422-86-6                 |
| Bromochlorodifluoromethane (Halon 1211)   | 353-59-3                 |
| Bromotrifluoromethane (Halon 1301)  | 75-63-8                  |
| Dibromotetrafluoroethane (Halon 2402)   | 124-73-2                 |
| Carbon Tetrachloride (Tetrachloromethane)   | 56-23-5                  |
| 1,1,1, - Trichloroethane (methyl chloroform) and its isomers except 1,1,2-trichloroethane   | 71-55-6                  |
| Bromomethane (Methyl Bromide)   | 74-83-9                  |
| Bromodifluoromethane and isomers (HBFC's)   | 1511-62-2                |
| Please note: These above materials may contain isomers that are not listed here. Isomers with CAS numbers have been included when available. Refer to <a href="http://www.epa.gov/ozone/ods.html">http://www.epa.gov/ozone/ods.html</a> for chemical names and updates. |                          |

| Class II<br>Ozone Depleting Substances<br>Hydrochlorofluorocarbons/ Isomers* | CAS Numbers |
|--|-------------|
| Dichlorofluoromethane (HCFC 21)  | 75-43-4     |
| Chlorodifluoromethane (HCFC 22)  | 75-45-6     |
| Chlorofluoromethane (HCFC 31)  | 593-70-4    |
| Tetrachlorofluoroethane (HCFC 121)   | 134237-32-4 |
| 1,1,1,2-tetrachloro-2-fluoroethane (HCFC 121a)                               | 354-11-0    |
| 1,1,2,2-tetracloro-1-fluoroethane  | 354-14-3    |

| Class II<br>Ozone Depleting Substances<br>Hydrochlorofluorocarbons/ Isomers*  | CAS Numbers  |
|---|--|
| Trichlorodifluoroethane (HCFC 122)<br>1,2,2-trichloro-1,1-difluoroethane  | 41834-16-6<br>354-21-2   |
| Dichlorotrifluoroethane(HCFC 123)<br>Dichloro-1,1,2-trifluoroethane<br>2,2-dichloro-1,1,1-trifluoroethane<br>1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a)<br>1,1-dichloro-1,2,2-trifluoroethane (HCFC-123b)<br>2,2-dichloro-1,1,2-trifluoroethane (HCFC-123b) | 34077-87-7<br>90454-18-5<br>306-83-2<br>354-23-4<br>812-04-4<br>812-04-4 |
| Chlorotetrafluoroethane (HCFC 124)<br>2-chloro-1,1,1,2-tetrafluoroethane<br>1-chloro-1,1,2,2-tetrafluoroethane (HCFC 124a)  | 63938-10-3<br>2837-89-0<br>354-25-6                                      |
| Trichlorofluoroethane (HCFC 131)<br>1-Fluoro-1,2,2-trichloroethane<br>1,1,1-trichloro-2-fluoroethane (HCFC131b)   | 27154-33-2<br>(134237-34-6)<br>359-28-4<br>811-95-0                      |
| Dichlorodifluoroethane (HCFC 132)<br>1,2-dichloro-1,1-difluoroethane (HCFC 132b)<br>1,1-dichloro-1,2-difluoroethane (HCFC 132c)<br>1,1-dichloro-2,2-difluoroethane<br>1,2-dichloro-1,2-difluoroethane   | 25915-78-0<br>1649-08-7<br>1842-05-3<br>471-43-2<br>431-06-1             |
| Chlorotrifluoroethane (HCFC 133)<br>1-chloro-1,2,2-trifluoroethane<br>2-chloro-1,1,1-trifluoroethane (HCFC-133a)  | 1330-45-6<br>1330-45-6<br>75-88-7  |
| Dichlorofluoroethane(HCFC 141)<br>1,1-dichloro-1-fluoroethane (HCFC-141b)<br>1,2-dichloro-1-fluoroethane  | 1717-00-6;<br>(25167-88-8)<br>1717-00-6<br>430-57-9                      |
| Chlorodifluoroethane (HCFC 142)<br>1-chloro-1,1-difluoroethane (HCFC142b)<br>1-chloro-1,2-difluoroethane (HCFC142a)   | 25497-29-4<br>75-68-3<br>25497-29-4                                      |
| Chlorohexafluoropropane (HCFC 226)  | 134308-72-8  |
| Pentachlorofluoropropane (HCFC 231)   | 134190-48-0  |
| Tetrachlorodifluoropropane (HCFC 232)   | 134237-39-1  |
| Trichlorotrifluoropropane (HCFC 233)<br>1,1,1-Trichloro-3,3,3-trifluoropropane  | 134237-40-4<br>7125-83-9   |
| Dichlorotetrafluoropropane (HCFC 234)   | 127564-83-4  |
| Chloropentafluoropropane (HCFC 235)<br>1-Chloro-1,1,3,3,3-pentafluoropropane  | 134237-41-5<br>460-92-4  |
| Tetrachlorofluoropropane (HCFC 241)   | 134190-49-1  |
| Trichlorodifluoropropane (HCFC 242)   | 134237-42-6  |
| Dichlorotrifluoropropane (HCFC 243)<br>1,1-dichloro-1,2,2-trifluoropropane<br>2,3-dichloro-1,1,1-trifluoropropane<br>3,3-Dichloro-1,1,1-trifluoropropane  | 134237-43-7<br>7125-99-7<br>338-75-0<br>460-69-5                         |
| Chlorotetrafluoropropane (HCFC 244)<br>3-chloro-1,1,2,2-tetrafluoropropane  | 134190-50-4<br>679-85-6  |
| Trichlorofluoropropane (HCFC 251)<br>1,1,3-trichloro-1-fluoropropane  | 134190-51-5<br>818-99-5  |
| Dichlorodifluoropropane (HCFC 252)  | 134190-52-6  |
| Chlorotrifluoropropane (HCFC 253)<br>3-chloro-1,1,1-trifluoropropane (HCFC 253fb)   | 134237-44-8<br>460-35-5  |
| Dichlorofluoropropane (HCFC 261)<br>1,1-dichloro-1-fluoropropane  | 134237-45-9<br>7799-56-6   |
| Chlorodifluoropropane (HCFC 262)<br>2-chloro-1,3-difluoropropane  | 134190-53-7<br>102738-79-4   |
| Chlorofluoropropane (HCFC 271)  | 134190-54-8  |

| Class II<br><b>Ozone Depleting Substances</b><br>Hydrochlorofluorocarbons/ Isomers*  | CAS Numbers |
|--|-------------|
| 2-chloro-2-fluoropropane   | 420-44-0    |
| Please note: These materials may contain isomers that are not listed here. Isomers with CAS numbers have been included when available. Refer to <a href="http://www.epa.gov/ozone/ods.html">http://www.epa.gov/ozone/ods.html</a> for chemical names and updates |             |

| Polychlorinated Biphenyls (PCBs) and Terphenyls (PCT's) | CAS Numbers |
|---|-------------|
| Polychlorinated Biphenyls                               | 1336-36-3   |
| Aroclor   | 12767-79-2  |
| Chlorodiphenyl (Aroclor 1260)                           | 11096-82-5  |
| Kanechlor 500   | 27323-18-8  |
| Aroclor 1254  | 11097-69-1  |
| Terphenyls  | 26140-60-3  |

| Short Chain Chlorinated Paraffins             | CAS Numbers |
|---|-------------|
| Examples of Short Chain Chlorinated Paraffins |             |
| Chlorinated Paraffin                          | 63449-39-8  |
| Chlorinated Paraffin                          | 85535-84-8  |

| Halogenated Diphenyl Methanes        | CAS Numbers |
|--------------------------------------|-------------|
| Monomethyltetrachlorodiphenylmethane | 76253-60-6  |
| Monomethyldichlorodiphenylmethane    | 81161-70-8  |
| Monomethyldibromodiphenylmethane     | 99788-47-8  |

| Certain Glycol Ethers            | CAS Numbers |
|----------------------------------|-------------|
| 2-Ethoxyethanol                  | 110-80-5    |
| 2-Ethoxyethyl acetate            | 111-15-9    |
| 2-Methoxyethanol                 | 109-86-4    |
| 2-Methoxyethyl acetate           | 110-49-6    |
| Diethylene glycol dimethyl ether | 111-96-6    |

### Examples of RoHS Reportable Substances

| Lead and its Compounds<br>Examples of Common Lead Compounds  | CAS Numbers |
|--|-------------|
| Lead   | 7439-92-1   |
| Lead sulfate   | 7446-14-2   |
| Lead carbonate   | 598-63-0    |
| Lead hydrocarbonate  | 1319-46-6   |
| Lead acetate   | 301-04-2    |
| Lead (II) acetate, trihydrate  | 6080-56-4   |
| Lead phosphate   | 7446-27-7   |
| Lead selenide  | 12069-00-0  |
| <p>Note: These are common examples all lead compounds, lead compounds with over 1000 PPM of lead for product as non-compliant via a Material Declaration and 100 PPM for packaging are reportable to ESAM Inc. as non-compliant via a Material Declaration</p> |             |

| Cadmium and its Compounds<br>Examples of Common Cadmium compounds   | CAS Numbers |
|---|-------------|
| Cadmium   | 7440-43-9   |
| Cadmium oxide   | 1306-19-0   |
| Cadmium sulfide   | 1306-23-6   |
| <p>Note: These are common examples of Cadmium compounds, Cadmium compounds with over 100 PPM of Cadmium are reportable to ESAM Inc. via a Material Declaration as non-compliant for products and and over 100 PPM are reportable for packaging via a Material Declaration</p> |             |

| Mercury and its Compounds<br>Examples of Common Mercury Compounds   | CAS Numbers |
|---|-------------|
| Mercury   | 7439-97-6   |
| Mercuric nitrate  | 10045-94-0  |
| Mercuric sulfide  | 1344-48-5   |
| Mercuric chloride   | 33631-63-9  |
| Mercuric sulfate  | 7783-35-9   |
| Mercuric oxide  | 21908-53-2  |
| Mercury bichloride  | 7487-94-7   |
| <p>Note: These are common examples all Mercury and its compounds with over 1000 PPM of Mercury are reportable to ESAM Inc. via a Material Declaration as non-compliant for products and over 100 PPM are reportable as non-compliant for packaging via a Material Declaration</p> |             |

| Chromium VI and its Compounds<br>Examples of Common Chromium Compounds | CAS Numbers |
|--|-------------|
| Chromium   | 7440-47-3   |
| Barium chromate  | 10294-40-3  |
| Calcium chromate   | 13765-19-0  |
| Chromic acetate  | 1066-30-4   |
| Chromium trioxide  | 1333-82-0   |
| Lead chromate  | 7758-97-6   |
| Sodium chromate  | 7775-11-3   |
| Sodium dichromate  | 10588-01-9  |
| Strontium chromate   | 7789-06-2   |

|  |            |
|--|------------|
| Zinc chromate  | 13530-65-9 |
| Note: These are common examples all Chromium and Chromium VI and its compounds with over 1000 PPM of Chromium VI in products are reportable to ESAM Inc. as non-compliant via a Material Declaration and over 100 PPM are reportable as non-compliant for packaging via a Material Declaration |            |

| Polybrominated Biphenyls (PBBs) and their Ethers/Oxides<br>Examples of Common PBB/PBDE Compounds   | CAS Numbers  |
|--|--|
| Bromobiphenyl and its ethers   | 2052-07-5 (2-Bromobiphenyl)<br>2113-57-7 (3-Bromobiphenyl)<br>92-66-0 (4-Bromobiphenyl)<br>101-55-3 (ether)    |
| Decabromobiphenyl and its ethers   | 13654-09-6<br>1163-19-5 (ether)  |
| Dibromobiphenyl and its ethers   | 92-86-4<br>2050-47-7 (ether)   |
| Heptabromobiphenylether  | 68928-80-3   |
| Hexabromobiphenyl and its ethers   | 59080-40-9<br>36355-01-8<br>(hexabromo-1,1'-biphenyl)<br>67774-32-7<br>(Firemaster FF-1)<br>36483-60-0 (ether) |
| Nonabromobiphenylether   | 63936-56-1   |
| Octabromobiphenyl and its ethers   | 61288-13-9<br>32536-52-0 (ether)   |
| Pentabromobiphenyl ether   | 32534-81-9   |
| Polybrominated Biphenyls*  | 59536-65-1   |
| Tetrabromobiphenyl   | 40088-45-7   |
| Tetrabromobiphenyl ether   | 40088-47-9   |
| Tribromobiphenyl ether   | 49690-94-0   |
| * Polybrominated Biphenyl(s)=Polybromobiphenyl(s)=Polybromodiphenyl(s)   |  |
| Note: These are common examples PBB/PBDE Compounds over 1000 PPM PBB/PBDE Compounds of these substances in products are reportable to ESAM Inc. as non-compliant via a Material Declaration and over 1000 PPM are reportable as non-compliant for packaging via a Material Declaration |  |



**Examples of European Chemical Agency (ECHA) REACH Directive 1907/2006/EC EU REACH Regulation for chemicals requiring Notification if the amounts are above 0.1% SVHC weight/total weight of product supplied. Please refer the ECHA website for the most current list of SVHC's (Substances of Very High Concern).**

| SVHC (Substance of Very High Concern)   | Dated added as a SVHC | CAS Numbers                          |
|---|-----------------------|--------------------------------------|
| 2-Methoxyethanol  | 15.12.2010            | 109-86-4                             |
| 2-Ethoxyethanol   | 15.12.2010            | 110-80-5                             |
| Chromic acid  | 15.12.2010            | 7738-94-5                            |
| Oligomers of chromic acid and dichromic acid  | 15.12.2010            | 13530-68-2                           |
| Cobalt(II) sulphate   | 15.12.2010            | 10124-43-3                           |
| Cobalt(II) dinitrate  | 15.12.2010            | 10141-05-6                           |
| Cobalt(II) carbonate  | 15.12.2010            | 513-79-1                             |
| Cobalt(II) diacetate  | 15.12.2010            | 71-48-7                              |
| 2-Methoxyethanol  | 15.12.2010            | 109-86-4                             |
| 2-Ethoxyethanol   | 15.12.2010            | 110-80-5                             |
| Chromium trioxide   | 15.12.2010            | 1333-82-0                            |
| Trichloroethylene   | 18.06.2010            | 79-01-6                              |
| Boric acid  | 18.06.2010            | 10043-35-3<br>11113-50-1             |
| Disodium tetraborate, anhydrous   | 18.06.2010            | 1303-96-4<br>1330-43-4<br>12179-04-3 |
| Tetraboron disodium heptaoxide, hydrate   | 18.06.2010            | 12267-73-1                           |
| Potassium dichromate  | 18.06.2010            | 7778-50-9                            |
| Ammonium dichromate   | 18.06.2010            | 7789-09-5                            |
| Potassium chromate  | 18.06.2010            | 7789-00-6                            |
| Sodium chromate   | 18.06.2010            | 7775-11-3                            |
| 2,4-Dinitrotoluene  | 13.01.2010            | 121-14-2                             |
| Acrylamide  | 30.03.2010            | 79-06-1                              |
| <b>Aluminosilicate Refractory Ceramic Fibres</b> ; are fibres covered by index number 650-017-00-8 in Annex VI part 3, table 3.2 of EC Reg. no 1272/2008 on classification, labeling & packaging of substances & mixtures, and fulfill the two following conditions:<br/> | 13.01.2010            |                                      |

| SVHC (Substance of Very High Concern)   | Dated added as a SVHC | CAS Numbers                           |
|---|-----------------------|---------------------------------------|
| <p>a) Al<sub>2</sub>O<sub>3</sub> and SiO<sub>2</sub> are present within the following concentration ranges:<br/> <ul style="list-style-type: none"> <li>Al<sub>2</sub>O<sub>3</sub>: 43.5 – 47 % w/w, and SiO<sub>2</sub>: 49.5 – 53.5 % w/w,</li> </ul> or<br/> <ul style="list-style-type: none"> <li>Al<sub>2</sub>O<sub>3</sub>: 45.5 – 50.5 % w/w, and SiO<sub>2</sub>: 48.5 – 54 % w/w,</li> </ul> </p> <p>b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm).</p>  |                       |                                       |
| Anthracene oil  | 13.01.2010            | 90640-80-5                            |
| Anthracene oil, anthracene-low  | 13.01.2010            | 90640-82-7                            |
| Anthracene oil, anthracene paste  | 13.01.2010            | 90640-81-6                            |
| Anthracene oil, anthracene paste, anthracene fraction   | 13.01.2010            | 91995-15-2                            |
| Anthracene oil, anthracene paste, distn. lights   | 13.01.2010            | 91995-17-4                            |
| Diisobutyl phthalate  | 13.01.2010            | 84-69-5                               |
| Lead chromate   | 13.01.2010            | 7758-97-6                             |
| Lead chromate molybdate sulphate red (C.I. Pigment Red 104)   | 13.01.2010            | 12656-85-8                            |
| Lead sulfochromate yellow (C.I. Pigment Yellow 34)  | 13.01.2010            | 1344-37-2                             |
| Pitch, coal tar, high temp.   | 13.01.2010            |                                       |
| Tris(2-chloroethyl)phosphate  | 13.01.2010            | 115-96-8                              |
| <p><b>Zirconia Aluminosilicate Refractory Ceramic Fibres</b> are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.2 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the two following conditions:<br/> a) Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub> and ZrO<sub>2</sub> are present within the following concentration ranges:<br/> <ul style="list-style-type: none"> <li>Al<sub>2</sub>O<sub>3</sub>: 35 – 36 % w/w, and</li> <li>SiO<sub>2</sub>: 47.5 – 50 % w/w, and</li> <li>ZrO<sub>2</sub>: 15 - 17 % w/w,</li> </ul> </p> <p>b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm).</p> | 13.01.2010            | Extracted from Index no. 650-017-00-8 |
| 4,4'- Diaminodiphenylmethane (MDA)  | 28.10.2008            | 101-77-9                              |
| 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)  | 28.10.2008            | 81-15-2                               |
| Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)   | 28.10.2008            | 85535-84-8                            |

| SVHC (Substance of Very High Concern)   | Dated added as a SVHC | CAS Numbers  |
|---|-----------------------|--|
| Anthracene  | 28.10.2008            | 120-12-7   |
| Benzyl butyl phthalate (BBP)  | 28.10.2008            | 85-68-7  |
| Bis (2-ethylhexyl)phthalate (DEHP)  | 28.10.2008            | 117-81-7   |
| Bis(tributyltin)oxide (TBTO)  | 28.10.2008            | 56-35-9  |
| Cobalt dichloride   | 28.10.2008            | 7646-79-9  |
| Diarsenic pentaoxide  | 28.10.2008            | 1303-28-2  |
| Diarsenic trioxide  | 28.10.2008            | 1303-28-2  |
| Dibutyl phthalate (DBP)   | 28.10.2008            | 84-74-2  |
| Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified: </td> <td>28.10.2008</td> <td>25637-99-4<br/>3194-55-6<br/>134237-50-6<br/>134237-51-7<br/>134237-52-8</td> | 28.10.2008            | 25637-99-4<br>3194-55-6<br>134237-50-6<br>134237-51-7<br>134237-52-8 |
| Lead hydrogen arsenate  | 28.10.2008            | 7784-40-9  |
| Sodium dichromate   | 28.10.2008            | 7789-12-0<br>10588-01-9  |
| Triethyl arsenate   | 28.10.2008            | 15606-95-8   |