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## 1.0 PURPOSE

To be able to sell products in the global market place, Quantum Corporation and its subsidiaries (collectively, “Quantum”) must achieve and maintain environmental materials compliance for all components, materials, packaging and finished products. Quantum’s legal department must approve any deviation from or noncompliance with the requirements of this specification in writing.

This Environmental Requirements Specification (“Specification”) has been developed to communicate to design teams and suppliers the restrictions placed on Quantum either by global legal or global market requirements. The specification should be used in selecting materials for parts, products and packaging.

## 2.0 SCOPE

This Specification applies to all materials, parts, packaging, and products designed or supplied for or by Quantum. Compliance to this specification is communicated to Quantum via Compliance Declarations provided by suppliers. Any substance that is present in an amount that exceeds the applicable limits allowed **must also identify the specific exemption used for compliance.**

## 3.0 DEFINITIONS

For the purposes of this document the following descriptions will be used:

**Assembly:** An integrated set of Components. A populated printed circuit board is an Assembly and not a Component because individually functioning Components can be removed.

**CAS #:** Chemical Abstract System numbers are assigned to chemicals (substances) for unique identification. The CAS numbering system is an international convention. For example, the CAS # for lead is 7439-92-1.

**Compliance Declaration:** Specific regulatory compliance declarations (such as for REACH or RoHS) provided by suppliers to provide information about the environmental considerations of their products or parts. Alternatively, suppliers may choose to provide a complete material declaration rather than specific regulatory compliance declarations.

**Component:** Any mechanical part or electrical device that can be removed without destroying its function. Examples of Components may include microprocessors, plastic enclosures, coin cell batteries, capacitors, etc.

**Conflict Minerals:** As defined in Section 1502 of the US Dodd-Frank Wall Street Reform and Consumer Protection Act.

**Exemption:** An exception to a regulatory requirement; any substance that is allowed by exemption must state the exemption being used and the agency regulatory body allowing the exemption.

**Homogenous Material:** A Material that cannot be mechanically disjointed into different Materials. It is also generally of uniform composition throughout (such as solders, glass, paper, resins, coatings, metals, alloys, plastics, etc). Mechanically disjointed means the Materials, in principle, can be separated by mechanical actions such as unscrewing, cutting, crushing, grinding, or applying abrasive processes.

**ISO:** International Standards Organization

**Materials:** Materials that are assembled into, used on, or shipped with a Product, such as structural plastics, metals,

materials for boards and wafers, coatings, paints, pastes, toner, cleaners, etc. Materials are made up of Substances.

**Packaging:** Materials used to protect products from damage due to storage, or transportation (e.g. boxes, shipping supplies, cushioning & foam, bags, shrink wrap, tape/adhesives). Includes the inks and dyes used to label packages.

**Products:** All manufactured Components, parts, Assemblies, and/or Materials supplied to Quantum.

**Prohibited Substances:** Substances that are subject to either a legal ban or restriction (including REACH or RoHS), or a voluntary industry prohibition, in any applicable usage.

**REACH:** Registration, Evaluation, Authorization and restriction of Chemicals, a European Union Regulation, EC/2006/1907.

**Reportable Substances:** Substances that industry has determined are relevant for disclosure. These Substances must be reported if present in concentrations above those allowed by applicable regulations.

**RoHS:** Restriction of the use of certain Hazardous Substances in electrical and electronic equipment. 2011/65/EU and (EU) 2015/863 Directives are applicable.

**SDS:** Safety Data Sheet, also called Material Safety Data Sheet

**Substances:** Substances are chemical elements and their compounds (for example, lead is a chemical element while lead oxide is a compound). Substances should be identified by CAS # wherever possible.

**Threshold Limit:** The maximum concentration by weight (mass of restricted substance/mass of material) at which a restricted substance may be present in a Homogeneous Material.

#### **4.0 DOCUMENT ADMINISTRATION**

This Specification is maintained and updated by Quantum's legal department. The most recent revision of this Specification will be available to suppliers on Quantum's website at <http://www.quantum.com/aboutus/ethicsandcompliance/index.aspx>. Questions regarding the requirements in this Specification should be referred to [compliance@quantum.com](mailto:compliance@quantum.com).

#### **5.0 REFERENCES**

- Quantum Product/Packaging Marking Specification 6464115-01
- US Toxic Substances Control Act
- REACH Regulation (EC) No 1907/2006 of the European Parliament
- RoHS Directive 2011/65/EU and (EU) 2015/863 of the European Parliament
- International Electrotechnical Commission (IEC) 62474 – Material Declaration for Products of and for the Electrotechnical Industry
- International Electrotechnical Commission (IEC) 62133 – Safety Requirements for Portable Sealed Secondary Lithium Cells, and for Batteries Made from Them, for Use in Portable Applications
- Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act
- Quantum Form QF00305

## 6.0 REQUIREMENTS

### 6.1 Prohibited Substances

Prohibited Substances are not to be present in Quantum products unless:

- (i) The concentration of the substance in the homogeneous material is below Threshold Limits; or
- (ii) The substance is used or included in an application or manner that is exempt from the restriction and the use of such exemption is identified in the Compliance Declaration.

It is important to note that the concentration of the substance must be calculated based on the amount of the Prohibited Substance contained in a Homogenous Material. This means the plating on the part must be considered for compliance, not just the part itself. For example, if hexavalent chrome is present in a plating applied to a screw, the reportable quantity would be the amount of hex-chrome divided by the mass of the homogeneous plating material solely - not the weight of the entire screw.

The Materials and Substances that are subject to use or marketing restrictions are available at <http://std.iec.ch/iec62474> or by searching for the International Electrotechnical Commission's publication on material declaration for products of and for the electrotechnical industry.

### 6.2 Reportable Substances

In addition to legislative restrictions and prohibitions, there are other substances that the industry has determined relevant for disclosure because they meet one or more of the following criteria:

- (i) Precious Materials or Substances that provide economic value for end-of-life management purposes;
- (ii) Materials or Substances that are of significant environmental, health, or safety interest;
- (iii) Materials or Substances that would trigger hazardous waste management requirements; or
- (iv) Materials or Substances that could have a negative impact on end-of-life management.

Quantum is required to track the content of these substances in Quantum Materials, Products and Packaging. These Materials must be disclosed on the supplier's Compliance Declarations when they are used in amounts greater than those identified at <http://std.iec.ch/iec62474> or by searching for the International Electrotechnical Commission's publication on material declaration for products of and for the electrotechnical industry.

### 6.3 Materials Restriction Guidelines

**Quantum requires its suppliers to comply with US Toxic Substances Control Act, 2011/65/EU (RoHS 2), and DIRECTIVE (EU) 2015/863 requirements for any relevant items sold to Quantum. Compliance must be documented via a Compliance Declaration.** This requirement extends to similar legislation in other jurisdictions such as China RoHS or Taiwan RoHS.

### 6.4 REACH Guidelines

**Quantum requires its suppliers to comply with Regulation (EC) 1907/2006 requirements for any relevant items sold to Quantum. Use of any Reportable Substance above applicable Threshold Limits must be identified on the Compliance Declaration.**

## **6.5 Conflict Minerals**

Quantum requires all applicable suppliers to obtain tantalum, tin, tungsten, and gold through only conflict-free conformant smelters and refiners, regardless of whether the supplier is otherwise subject to conflict minerals rules. In addition, all suppliers must provide conflict minerals data using the current version of an industry standard, widely accepted template format.

## **6.6 Compliance Declaration Requirements**

A supplier is required to communicate conformance to this Specification by completing a Compliance Declaration for each individual lowest level piece part or Component supplied to Quantum. The values entered on the sheet should be the worst-case scenario of the Prohibited Substances and Reportable Substances as measured in each Homogenous Material. Applicable compliance exemptions must be identified on the Compliance Declaration. Any nonconformance with this Specification must be disclosed with a full explanation regarding the presence and purposes of the Substance.

Suppliers may provide Compliance Declarations by:

- (i) Completing and returning Quantum Form QF00305;
- (ii) Completing and returning a form provided by an authorized third party with whom Quantum contracts to collect environmental compliance data;
- (iii) Providing their own Compliance Declarations or certifications, provided that they contain all of the information required to be provided in this Specification; or
- (iv) Providing a complete material disclosure listing all Substances contained in a given Component or part by Homogenous Material concentration (parts per million) and by concentration by weight of the Component.

## **6.7 Chemical Requirements**

The following requirements will apply to all chemicals supplied to Quantum that do not meet the definition of an article according to the US Hazard Communication Standard.

### **6.7.1 Labels**

The chemical substance's individual container or individual protective packaging must be labeled with the following information:

- (i) The chemical name as it appears on the associated SDS;
- (ii) The name and address of the appropriate chemical manufacturer, supplier or other responsible party; and
- (iii) Appropriate hazard warnings as applicable.

The label must be provided in English at a minimum. It may also be required to have text in other languages and format as required by law or regulation in countries outside the USA.

### **6.7.2 Safety Data Sheet**

Where an SDS applies to a Substance or Material being purchased by Quantum, one must be provided by the supplier. It must be provided in English even if it is primarily written in another language. In addition,

where applicable law or regulation requires the SDS to be available in other local languages, the supplier must provide translated versions as needed. The format of the SDS should comply with applicable industry standards.

### 6.7.3 Chemical Registration Requirements

Each chemical substance contained in parts, Components, Materials, and Products sold to Quantum must comply with applicable chemical registration and pre-manufacture notification requirements that may exist in various countries worldwide.

### 6.8 Recyclability of Materials, Parts, or Products

Parts should be designed with ease of disassembly in mind. Therefore, suppliers and Quantum engineers should:

Consider Using	Avoid Using
– Fewer types of materials	– Metallic inserts, hinges, brackets, etc
– Molded-in decorative finish	– Materials containing cadmium, chromium, lead, mercury, arsenic, chlorine, and other hazardous or restricted metals or Substances
– Snap-fit Components	– Decorative or conductive paints
– Reusable parts of subassemblies	– Labels using adhesive
– Metallic foils that are easily separable for electromagnetic compatibility applications rather than conductive paint or plating	– Plating
– Materials containing thermally stable flame retardants to allow reprocessing	– Intermixed plastics

### 6.9 Marking Requirements for Materials

Parts molded partially or totally from plastic materials having adequate surface area must be permanently marked for identification. Except where laws may require the use of a particular code, manufacturers should adhere to relevant ISO identification and marking standards. Suppliers should also reference Quantum Product/Packaging Marking Specification 6464115-01 for more information and assistance.

### 6.10 Packaging and Consumables Requirements

Part and Product Packaging Materials, in addition to consumables like media, booklets, and supply kits supplied to Quantum shall be designed and produced in such a way as to permit their reuse, recovery and recycling. This should specifically allow for recycling of a certain percentage by weight of the materials used, in compliance with current legal and regulatory standards. Packaging shall be manufactured in such a way so its volume and weight is limited to the minimum to adequately maintain the necessary level of safety, hygiene and integrity for the packed product.

Manufacturing processes must be certified to be free from toxic chloride bleaches, glycol ethers, ozone depleting substances and other toxic substances. In addition, Quantum prohibits the use of urea formaldehyde based resins in the manufacture of composite wood Packaging.

External Packaging markings must comply with international legal and regulatory requirements, as specified in Quantum’s Product/Packaging Marking Specification document 6464115-01. Only biodegradable and non-toxic ink

shall be used for marking.

Packaging and its markings and labels shall be compliant with applicable regulations on Prohibited and Reportable Substances as identified at <http://std.iec.ch/iec62474> or by searching for the International Electrotechnical Commission’s publication on material declaration for products of and for the electrotechnical industry.

**6.11 Battery Requirements**

All batteries contained in parts and products covered by this specification shall be designed for easy identification and removal. Batteries must be classified as non-hazardous for all modes of transport, and data supporting that classification, such as test reports, must be supplied upon request. Additionally, all batteries contained in parts or products supplied to Quantum shall meet the requirements provided below:

Battery Type	Restrictions
All battery types	<ul style="list-style-type: none"> <li>- May not contain intentionally-introduced mercury, lead, or cadmium</li> <li>- Must contain less than 0.0005% mercury by weight</li> <li>- Must contain less than 0.025% cadmium by weight</li> <li>- Must contain less than 0.04% lead by weight</li> <li>- All batteries contained in electronic products must meet any other applicable environmental regulations in addition to those stated above</li> </ul>
Button cell batteries	<ul style="list-style-type: none"> <li>- Must contain less than 0.0005% cadmium by weight</li> </ul>
Sealed lead acid batteries	<ul style="list-style-type: none"> <li>- Must be classified as non-spillable and should be avoided where alternative battery chemistries are available</li> </ul>
Lithium batteries	<ul style="list-style-type: none"> <li>- Only the following lithium batteries may be used:               <ul style="list-style-type: none"> <li>- Lithium cobalt dioxide</li> <li>- Lithium nickel dioxide</li> <li>- Lithium manganese dioxide (LiMn<sub>2</sub>O<sub>4</sub> or LiMnO<sub>2</sub>)</li> <li>- Lithium iodine</li> <li>- Lithium carbon monofluoride</li> <li>- Lithium vanadium</li> <li>- Lithium niobium</li> </ul> </li> </ul>
Mercuric oxide batteries	<ul style="list-style-type: none"> <li>- Prohibited</li> </ul>
Alkaline-manganese batteries	<ul style="list-style-type: none"> <li>- Must contain less than 0.001% cadmium by weight</li> </ul>
Nickel cadmium batteries	<ul style="list-style-type: none"> <li>- Restricted to applications where no technically feasible alternative exists</li> </ul>
Nickel metal hydride batteries	<ul style="list-style-type: none"> <li>- Must contain less than 0.025% cadmium by weight</li> </ul>
Zinc carbon batteries	<ul style="list-style-type: none"> <li>- Must contain less than 0.001% cadmium by weight</li> <li>- Must contain less than 0.0001% mercury by weight</li> </ul>

**6.11.1 Rechargeable Sealed Lead Acid Batteries**

All rechargeable sealed lead acid batteries must meet applicable hazardous materials transport and packaging criteria and must be tested at 55°F (130°F) to ensure no free liquid flows from the case when it is cracked or ruptured. Suppliers providing parts or products containing rechargeable lead acid batteries must maintain a battery management plan in all countries where such a plan is required. Upon request, suppliers must provide Quantum with documentation describing the appropriate procedures for the return

of used rechargeable sealed lead acid batteries.

**6.11.2 Lithium Batteries**

All lithium batteries must meet International Electrotechnical Commission (IEC) 62133 2<sup>nd</sup> Edition and other applicable hazardous materials transport criteria, such as US Department of Transportation or International Air Transport Association requirements.

**6.11.3 Nickel Metal Hydride Batteries**

Nickel Metal Hydride Batteries shall not be labeled with a recycling symbol of any kind. The following statement shall appear on all batteries (or adjacent to battery where battery size does not allow a legible label): **“NICKEL METAL HYDRIDE BATTERY MUST BE DISPOSED OF PROPERLY”**.

**6.11.4 Nickel Cadmium Batteries**

The use of Nickel Cadmium batteries is restricted to applications where no technically feasible alternative exists. Unless specifically called out in a Quantum specification or part drawing, Nickel Cadmium batteries may not be used in parts and/or products covered by this specification.

Suppliers providing parts and products containing Nickel Cadmium batteries must maintain a battery management plan in all jurisdictions requiring such plans. Upon request, the Supplier must provide Quantum with documentation indicating procedures for the proper return of used Nickel Cadmium batteries from Quantum or its customers or third-party service providers.

**7.0 RECORDS**

<b>Records Identification</b> (Title of record. Example: DVT Report, ECO, etc.)	<b>Location</b> (Where are records stored?)	<b>Category</b> Hard Copy – enter the Record Description found in QF00155 Soft Copy – enter Soft Copy	<b>Retention</b> Hard Copy - see QF00155 Soft Copy - governed by IT system backup and retention processes
Compliance Declaration Form	Agile, Third Party Data Management System, or OneDrive	Soft Copy	Governed by IT system backup and retention processes