



# **Celestica's General Quality Requirements for Chemical and Consumable Items**

Document Number: CELQ-033-STD-62

Revision Level: 3.0

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## 1. GENERAL REQUIREMENTS

The supplier is required to comply with all sections of this document with the exception of Section 4, which specifies testing internal to Celestica. The supplier shall not dispatch any goods to Celestica, which vary from the exact specification ordered by Celestica without receiving prior written approval from the Celestica Purchasing Department. Celestica reserves the right to reject the entirety or any part of a shipment that does not conform to this specification.

The standard documents listed below (“Related Documents”) are referenced in this Agreement and Seller acknowledges and agrees that it has a copy of the Related Documents in its possession on the Effective Date. Seller agrees to adhere to the terms and standards set out in the Related Documents (as they are updated and amended from time to time) and shall be responsible for ensuring that it is always in possession of the latest update version of the Related Documents. Celestica Specifications listed below are available through Celestica Internet Web Site:

<http://www.celestica.com/SupplyChain/SupplyChain.aspx?id=798>

The Related Documents are as follows:

- (a) JEDEC standard No. 46 (JESD46-B) – Guide for product/process changes.
- (b) JEDEC standard No. 671 (JESD671-A) – Failure Analysis and Corrective Action.
- (c) JEDEC standard No. 48 (JESD48-B) – Product discontinuance
- (d) CELQ-033-STD-51 – Celestica Bar Coding Standard for Procured Production Goods
- (e) PK0763-1 – Celestica Packaging and Handling Specification
- (f) CELQ-033-POL-2 – Celestica Notification of Products / Process Changes, Discontinued Availability and Product Alerts by Suppliers
- (g) CELQ-033-POL-15 – Celestica Environmental Requirements for Chemicals / Consumables

## 2. APPLICABILITY

This document applies when referenced in an appropriate Celestica request for quotation, purchase order, contract, or QSPEC. It then becomes part of any such document. All questions must be referred to the Celestica Purchasing Department.

This document applies to Chemicals & consumables production materials.

### 2.1 Chemical and Consumable Item Defined

The following production material categories are defined as Chemicals & Consumables production materials

- Solder paste, bar, wire, preform
- Flux
- Underfill materials
- Encapsulants / conformal coating
- Adhesives
- Thermal grease
- Thermal Interface Materials
- Labels / inks used on labels
- Tapes, e.g., kapton
- Markings, e.g., marker
- Defect labels / markers

- Solder mask / repair chemicals
- Braid
- o Flux brushes
- o Solvents, e.g., IPA, Proclean
- o Wash de-foamer
- o Saponifiers
- o Vapour phase oven solvent
- o Tie wraps
- o Wire-add materials

### 3. SPECIFICATION

#### 3.1 Technical requirements

Supplier shall ensure that all materials comply with relevant technical specifications; either the specifications provided by Celestica or, if no specification is provided by Celestica, the supplier's or manufacturer's own specification. The vendor shall provide supporting test data, when required by Celestica, to confirm compliance to the technical specification.

#### 3.2 Environmental Requirements

When specifically stated on QSPEC, and/or Purchase Order, and/or RFQ, parts must comply with Celestica Environmental Requirements for Chemicals / Consumables (Document number: CELQ-033-POL-15). This document includes applicable sections on Qualification Requirements, Minimum Process Requirements, Logistical Requirements, Documentation Requirements (including reporting), and Materials Requirements.

#### 3.3 Product Identification

All product containers must be identified with:

- 1) Product name
- 2) Product description
- 3) Manufacturer's name
- 4) Manufacturer's part number
- 5) Date of manufacture and shelf life, or date of expiry
- 6) Lot code

**3.4** All lots of solder paste, and flux require a Certificate of Analysis to accompany the incoming shipment. Each lot of shipped material must be analyzed and the Certificate of Analysis, containing all relevant composition analysis procedures and the respective results as determined by the manufacturer, is to be furnished by the supplier with each shipment.

**3.5** All lots of the following process chemicals require a Certificate of Conformance to the technical specifications as mentioned in paragraph 2.1 to accompany the incoming shipment.

- surface mount adhesives
- heat sink attach adhesives, thermal greases, Thermal Interface Materials
- encapsulant, sealants, potting compounds, conformal coating
- cleaners, isopropyl alcohol

**3.6** Unless otherwise agreed in writing by Celestica, the supplier shall ensure that the following requirements are met on the date of delivery to Celestica:

- 1) Materials with a 3-month shelf life cannot be greater than 45 days old.
- 2) Materials with a 6-month shelf life cannot be greater than 3 months old.
- 3) Materials with a 1-year shelf life cannot be greater than 6 months old.
- 4) Materials with a 2-year shelf life cannot be greater than 1 year old.

## 4. INCOMING INSPECTION TEST PROCEDURES TO ASSESS ENVIRONMENTAL COMPLIANCE

Section 4 details test requirements internal to Celestica. Suppliers need not adhere to the test requirements detailed in Section 4 unless specifically requested by Celestica.

Unless otherwise specified/required, initial tests and measurements shall be made using the XRF test equipment and according to Celestica test procedure document number: CELQ-033-PROC-232. This procedure also defines all the additional tests to be performed in case XRF is not appropriate (JIG 101 materials) or gives results too close to specified limits.

### 4.1 Threshold Levels

The following absolute threshold levels apply for chemical and consumable items with a requirement for environmental compliance and applies when QSPEC, and/or Purchase Order, and/or RFQ contain require compliance to Celestica Environmental Requirements for Chemical / Consumable (document number: CELQ-033-POL-15).

*Note: Levels listed below are absolute threshold limits as defined by relevant legislation and industry recognized standards. Actual XRF test results thresholds will be set at allowed limits to compensate for accuracy tolerances associated with this test method. Refer to CELQ-033-PROC-232 for further details.*

RoHS Materials (Per Thresholds Listed at a HOMOGENEOUS MATERIAL Level)					
Pb	Cd	Hg	Cr VI	PBB	PBDE
< 1000 ppm	< 75 ppm	< 1000 ppm	< 1000 ppm	< 1000 ppm	< 1000 ppm

Other JIG Level A Materials (Per Thresholds Listed OR Intentionally Added (I.A.) at a PART Level)					
Asbestos	Certain Azocolourants and Azodyes (per Directive 76/769/EEC)	ODS Class I	Class II HCFC	PCB	Polychlorinated Naphthalenes
I.A.	I.A.	I.A.	< 1000 ppm	I.A.	I.A.
Radioactive Substances	Certain Shortchain Chlorinated Paraffins	TBT & TPT	TBTO		
I.A.	I.A.	I.A.	I.A.		

Reportable JIG Level B Materials (Per Thresholds Listed at a PART Level)					
Antimony	Arsenic	Beryllium	Bismuth	Other BFR	Nickel (External Applications)
< 1000 ppm	< 1000 ppm	< 1000 ppm	< 1000 ppm	< 1000 ppm	< 1000 ppm
Certain Phthalates	Selenium	PVC			
< 1000 ppm	< 1000 ppm	< 1000 ppm			

Additional Customer Specific Materials (Per Thresholds Listed OR Intentionally Added (I.A.) as indicated)					
Beryllium	Magnesium	Polychlorinated Phenols and Derivatives	Polychlorinated Terphenyls	Lead	Halogenated Diphenyl Methanes
< 200 ppm	< 1000 ppm	I.A.	I.A.	< 100 ppm in HOMOGENEOUS MATERIAL or I.A. in Paints	I.A.
PFC	PFC				
I.A.	0 ppm residual				

## 5. ADDITIONAL TESTING REQUIREMENTS

Additional testing will be undertaken to confirm physical/chemical compliance to technical specification, as defined by the site chemical coordinator or a responsible engineer. Any additional test requirements will be documented in individual QSPEC documents.

## 6. PACKAGING REQUIREMENTS

**6.1** Unless otherwise agreed in writing, supplier shall be responsible for the specification and provision of all packaging of goods supplied to Celestica and shall ensure that such packaging is sufficient to ensure that goods are received at Celestica's premises free from any damage.

**6.2** Each separate container received by Celestica should be labeled with the following information:

- 1) Celestica's part number
- 2) Manufacturer's part number
- 3) Celestica's purchase order number
- 4) Lot code
- 5) Date of manufacture
- 6) Date of expiry or expected shelf life
- 7) Quantity (if applicable).

Labeling of delivered goods as per Celestica Bar code Standard for procured production goods CELQ-033-STD-51.

**6.3** It is a requirement of Celestica that the supplier shall provide Celestica with goods that have internal boxes that do not contain mixed date and/or lot codes. However, for situation in which a mixture of date codes is unavoidable, all of the date codes must be recorded on the outside of the internal box, and Celestica is to be informed in writing prior to shipment of the goods.

**6.4** Supplier shall comply with all relevant provisions of applicable health and safety legislation, and shall ensure that goods, which are potentially dangerous to health or safety, shall be delivered only in suitable protective packing or containers. The external surface of such packing and/or containers shall be clearly labeled so as to indicate any hazards to health or safety involved in handling and usage, and as to the method of safe handling and storage of goods.

## 7. QUALITY ACCEPTANCE

**7.1** Manufacturer shall maintain outgoing quality inspection and reliability records for a minimum of five (5) years from the date of goods shipment.

**7.2** Manufacturer shall use statistical process controls and a supporting process capability analysis to achieve continuous quality improvement and failure rate reductions. Manufacturer shall, upon request, provide Celestica with evidence of such process controls and capabilities, including all supporting documentation.

## 8. NOTIFICATION OF CHANGE

**8.1** Manufacturer shall get approval from Celestica before implementing any changes to the documented design, materials, process, or process controls relating to this product. All process change notifications (PCN) must be sent to the Celestica Global PCN Coordinator at [pcn@celestica.com](mailto:pcn@celestica.com).

**8.2** Timelines for change notifications shall adhere to those defined in “Celestica Notification of Product / Process Changes, Discontinued Availability and Product Alerts by Suppliers” (document number: CELQ-033-POL-2).

## 9. PRODUCT DISCONTINUANCE

**9.1** Supplier shall provide written notice of planned product discontinuation to Celestica as follows:

- a) 6 months notice of the last order dates for multiple-source standard materials.
- b) 12 months notice of the last order dates for single-source standard and custom materials.

## 10. FAILURE ANALYSIS RESPONSE AND CORRECTIVE ACTION PLAN

**10.1** The supplier is expected to be able to perform a failure analysis upon request, and is therefore required to maintain failure analysis and corrective action expertise and equipment within the company, or have such expertise and equipment available through subcontracted services to allow effective and timely analysis and conclusion.

**10.2** The supplier is required to track and report actual performance vs. schedule. The supplier is required to notify Celestica in the event they are unable to meet previously agreed schedules as soon as is practicable. The failure analysis response time is to be used as part of the supplier rating measurement.

**10.3** Supplier shall provide corrective action on goods returned for failure analysis. Corrective action must be in a format that specifically addresses:

- (a) Definition of problem.
- (b) Verification of the defect.
- (c) Containment action.
- (d) Definition and verification of the root cause.
- (e) Permanent corrective action.
- (f) Verification of corrective action.

**10.4** Failure analysis response times must comply with the guidelines in section 6.8 of JESD671-A or as otherwise reasonably requested by Celestica. Celestica considers the following internal priorities as equivalent to URGENT in JESD671-A:

- (a) Priority 1 - Stop Ship or Stop Build,
- (b) Priority 2 - Field or Boxline failure,
- (c) Priority 3 - High line fallout, and Celestica considers the following internal priority as equivalent to STANDARD in JESD671-A,
- (d) Priority 4 - Routine line fallout analysis. The failure analysis response time is being used as part of the supplier rating measurement.

*Note: The seller is required to provide lot/date code information within 24 hours upon request.*