Bar Coding
Standard for Procured
Production Goods

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1 Introduction

1.1 Purpose

The purpose of this document is to simplify the barcode labeling specifications that Celestica suppliers must follow for shipping product to Celestica locations globally. By doing this, it will make it easier for Celestica suppliers to comply to the label specification and simultaneously will increase Celestica's barcode compliance to aid us in improving our operational goals.

This document defines the standard to be followed by Celestica suppliers when applying bar code labels applied to 1) the inner most level of supplier part packaging (referred to as "*Final Carrier*" in this document), and 2) outer and intermediate levels of supplier packaging (referred to as "*Carton*" in this document) for procured production goods (including components and PWB's) supplied to Celestica locations globally.

1.2 Scope and Application

This specification is applicable to *final carrier*, *carton* and *intermediate carton* packaging of all components and PWB's supplied to Celestica to be utilized in Celestica's manufacturing operations. Compliance to this specification is required by all suppliers of components and PWB's (Printed Wiring Boards) to Celestica locations globally.

This document defines both the minimum information requirements as well as the preferred format of the bar code labels. This document does not apply to labeling of "finished goods" produced by Celestica and shipped to our end OEM customers.

1.3 References

Document Number	Source	Document Title
EIA-624 (1995)	EIA	Product Package Bar Code Label Standard for Non-Retail Applications
EIA/CEA-624 (January 2002)	EIA	Linear Bar Code and Two-Dimensional Symbols for the Labeling of Product Packages
EIA/CEA 556	EIA	Outer Shipping Container Bar Code Label Standard
ANSI X3.182-1009	ANSI	Bar Code Print Quality Guideline
ANSI MH10.8.2-1995	ANSI	Data Application (FACT) Identifier Standard
ISO 3166	ISO	Country Codes
CELQ-001-REF-1134 (Celestica Internal Document)	Celestica	Supplier ID Codes for Final Component Carrier Bar Code Specification
CELQ-001-STD-039 (Celestica Internal Document)	Celestica	Packaging and Handling Supplier and Interplant Requirements
CELQ-033-STD-66 (Celestica Internal Document)	Celestica	Bar Coding Standard for Intercompany Shipments (non-L3)

1.4 Document Acquisition

The above ANSI, ISO and EIA documents may be obtained from Global Engineering Documents. Contact information is as follows:

Global Engineering Documents, World Headquarters
15 Inverness Way East
Englewood,CO
USA   80112-5776

Phone 800-854-7179
Fax 303-397-2740
Internet: http://global.ihs.com
Email global@ihs.com

Contact Celestica Purchasing for information regarding other documents.

2 General Bar Code Characteristics

The bar code label shall adhere to the conditions listed below.

2.1 Bar code Characteristics

Bar Code Characteristics	
Characteristic	Requirement
Symbology	Code 39
"X" Dimension (Width of Narrow Line)	Not less than 0.0066 inches (0.167mm)
N (Ratio of Wide Bar width to Narrow Bar Width	Minimum value of 2.5
Check Character	None
Print / Scan Quality	Bar code print/scan quality shall be in accordance with the ANSI X3.182 - 1990, Bar Code Print Quality Guideline.
Bar code Height	Minimum 0.20 Inches (5.08mm)
Quiet Zones	Minimum 0.25 Inch (6.35mm) quiet zone before and after each bar code.
Intercharacter Gap	Recommended equal to "X Dimension" above

2.2 Human Readable Data Characteristics

Characteristic	Requirement
Minimum Character Height	0.100 inches (2.5mm)
Location of Human Readable Text	Human readable interpretation of bar coded data shall appear above the bar coded data
Data Identifier(s)	Must be enclosed in parenthesis and precede the field title.
Format of Human Readable Text Fields	Starting from left to right: 1) *Data Identifier* enclosed in parenthesis 2) Data Field Title 3) Human Readable interpretation of bar coded data Example: (Q) Quantity: 1000

2.3 Label Characteristics

The following conditions shall be adhered to regarding general label characteristics.

General Label Characteristics	
Label Colour and Printing	Label shall be white in color with black printing.
Recyclability	Where possible, label material and adhesive should not prevent recyclability of the package / carrier to which label is affixed.
Material	Label shall not present ESD risk to components contained within carrier to which label is affixed.
Dimensions	The label dimensions will depend upon the dimensions of the package to which it is affixed. A *final carrier* label size of 4" wide by 2" high will fit on most 7" reels and accommodates the required information. Recommended *Carton* label size is 4" wide by 3".
Layout	Celestica's recommended layout (as shown in the respective sections on *Final Carrier* and *Carton* labels) shall be adhered to unless the size and shape of the carrier preclude doing so; in which case labels shall be laid out to contain all required data while adhering to bar code and human readable characteristics and requirements.

3 *Final Carrier* Bar code Label

A *Final carrier* is defined as the inner most level of packaging containing the physical parts (ex. tube, tray, reel, box, bag, etc…). All *final carriers* must be labeled with a *final carrier* label.

3.1 Data format and mandatory fields for *final carrier* bar code label

3.1.1 Mandatory Fields

The fields listed below shall be included on the bar code label. Also identified are conditions related to each field. The preferred field titles are included below. Other permissible field titles are included in Appendix A.

1. **Celestica Part Number -** Celestica part number as identified on Purchase Order / QSPEC document shall appear in this field. The preferred *data identifier* for this field shall be: (P). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be a maximum of 25 characters excluding the *data identifier* and start / stop characters. The preferred title of this field shall be "Celestica P/N".

2. **Manufacturer Part Number** – Manufacturer part number as shown on Celestica's QSPEC document shall be identified in this field. The preferred *data identifier* for this field shall be: (1P). However, other data identifiers can be used depending on what is suitable for the supplier. The preferred title of this field shall be "Manufacturer P/N". Field length shall be a maximum of 25 characters excluding the *data identifier* and start / stop characters.

3. **Traceability Code** – This field is a traceability code, also commonly referred to as lot code, assigned by the supplier to identify / trace a unique group of entities such as: lot, batch, or heat. The preferred *data identifier* for this field shall be: (1T). However, other data identifiers can be used depending on what is suitable for the supplier. The preferred title for this field shall be: "Trace Code". The maximum data field length shall be 25 characters excluding the *data identifier* and start / stop characters.

4. **Date Code** – This field identifies the date of manufacture of the parts and is represented by a year and week code. The format of the data shall be: YYWW where:

    YY = last two digits of the year of manufacture
    WW = the number of the week of manufacture

    The date code should represent the date of assembly of the component. The preferred title of this field shall be: "Date Code". The preferred *data identifier* for this field shall be: (10D). However, other data identifiers can be used depending on what is suitable for the supplier.

    Only a single date code shall be contained in a final carrier.

5. **Quantity** – This field identifies the quantity contained within the container that the label is affixed to. The preferred *data identifier* for this field shall be: (Q). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be 8 characters maximum excluding *data identifier* and start / stop character(s). The preferred title for this field shall be: "Quantity".

6. **Supplier ID Code** – This field identifies the supplier of the parts via a unique supplier code assigned by Celestica (refer to Celestica International internal document number: CELQ-001-REF-1134). The preferred *data identifier* for this field shall be: (V). However, other data identifiers can be used depending on what is suitable for the supplier. The field length is 7 digits not including the *data identifier*. The preferred title of this field is: "Supplier Code".

7. **Country of Origin** – This field indicates the country of origin as a two-character code. The Country of Origin is defined as the manufacturing country wherein the product obtained its final form, fit, and function as a part, subassembly, or finished product. The preferred *data identifier* for this field shall be: (4L). However, other data identifiers can be used depending on what is suitable for the supplier. The maximum data field length shall be 2 characters excluding the *data identifier* and start / stop characters.   The preferred title of this data field shall be "COO". The country of origin code shall be as defined in ISO 3166.

3.2 General layout and location of *Final Carrier* bar code label

3.2.1 Layout of *Final Carrier* bar code label

The layout of the label will be dependent upon the size of the container / carrier to which the label is affixed. The recommended format of the label is shown below (*Figure 3-1*) and should be adhered to where possible. Concatenation of the data fields is not permitted (i.e. each field must be a separate bar coded entity). Note that the *data identifier* (without brackets) precedes the actual data in the bar code scanned data. The title of the data field is NOT included in the scanned data nor is the identifier's brackets. Please refer to *Appendix C* for specific scanned data characteristics and label layout.
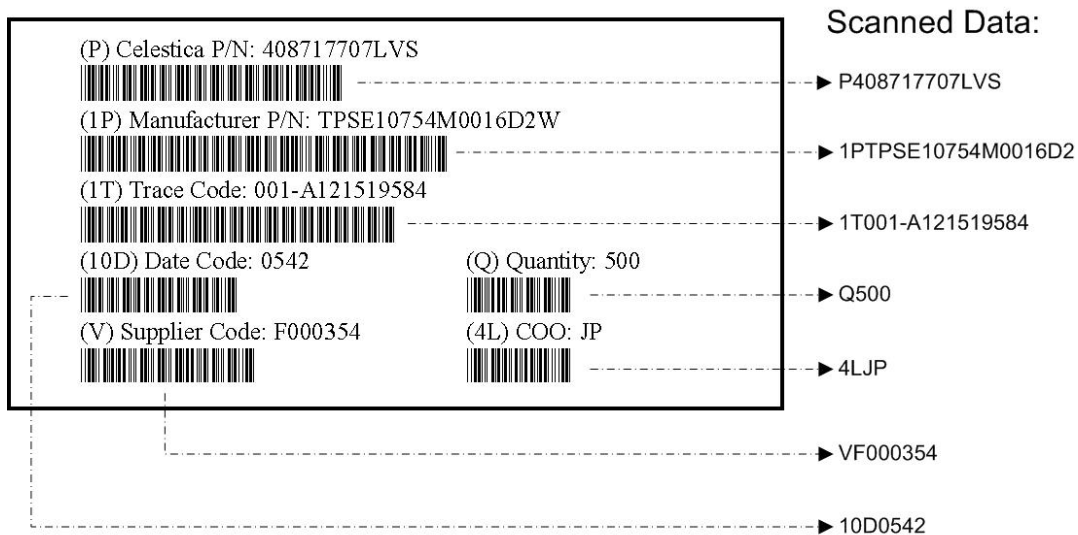
Figure 3-1: *Final Carrier* label layout

3.2.2 Location on *Final Carrier* Package

Final carrier bar code label placement shall adhere to the following general requirements:

- *Final Carrier* labels shall be placed on the lowest level of packaging which contains the components (e.g. Tube, Tray, Reel, Ammo-Box, etc).
- Labels shall be positioned on the package in such a manner as to facilitate scanning of all fields.
- Labels shall be placed on the component carrier such that they do not interfere with any other manufacturing labels.
- If the bar code cannot be scanned through the protective material (ESD Bag, moisture proof bag, box, etc. that contains the component carrier) then a redundant bar code must be adhered to the outside of the material.
- See Appendix D for carrier specific label placement information

4 *Carton* Bar code Label

A *carton* is defined as packaging containing either *final carriers* or inner level *cartons*. Inner level *cartons* (not including *final carriers*) shall be referred to as *intermediate cartons* for the purposes of this document. All *intermediate cartons* must adhere to *carton* bar code label requirements.

All production inventory shipped to Celestica must be packaged in a minimum of one *carton*. *Cartons* shall contain either *final carriers* or *intermediate cartons*. Each *carton* must be labeled to facilitate the receiving process at the manufacturing site.

The *carton* label contains all information regarding the items packaged within the *carton*, unique *carton* identifiers and order information that the *carton* is being transacted against. This is the level of packaging that Celestica executes receiving operations against.

The following is divided into two sections:

1. L3 Carton Barcode requirements
2. Non L3 Carton Barcode requirements

4.1 Data Format and Mandatory Fields for *Carton* Bar code Label – "L3 Requirements"

4.1.1 Mandatory fields for c*arton* bar code label

1. *Carton* **License Plate -** This is a unique number assigned by the supplier to identify/trace a *carton*. The preferred *data identifier* for this field shall be: (3S). However, other data identifiers can be used depending on what is suitable for the supplier. *Carton* license plate must be unique for each for a minimum of 12 months. The preferred title for this field shall be: "Carton". The maximum data field length shall be 25 characters excluding the *data identifier* and start / stop characters. Where a *carton* contains intermediate *cartons*, the bar code and human readable data for this field shall contain: "VARIOUS".

2. **Celestica Part Number -** Celestica part number as identified on Purchase Order / QSPEC document shall appear in this field. The preferred *data identifier* for this field shall be: (P). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be a maximum of 25 characters excluding the *data identifier* and start / stop characters. The preferred title of this field shall be "Celestica P/N". Where components contained within a *carton* reflect multiple Celestica part numbers, the bar code and human readable data in this field shall contain: "VARIOUS".

3. **Manufacturer Part Number** – Manufacturer part number as shown on Celestica's QSPEC document shall be identified in this field. The preferred *data identifier* for this field shall be: (1P). However, other data identifiers can be used depending on what is suitable for the supplier. The preferred title of this field shall be "Manufacturer P/N". Field length shall be a maximum of 25 characters excluding the *data identifier* and start / stop characters. Where components contained within a *carton* reflect multiple manufacturer part numbers, the bar code and human readable data in this field shall contain: "VARIOUS".

4. **Quantity** – This field identifies the quantity contained within the container that the label is affixed to. The preferred *data identifier* for this field shall be: (Q). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be 8 characters maximum excluding *data identifier* and start / stop character(s). The preferred title for this field shall be: "Quantity". Where components contained within a *carton* reflect multiple Celestica part numbers or purchase orders, the bar code and human readable data in this field shall contain: "VARIOUS".

5. **Date Code** – This field identifies the date of manufacture of the parts and is represented by a year and week code. The format of the data shall be: YYWW where:

    YY = last two digits of the year of manufacture
    WW = the number of the week of manufacture

    The date code should represent the date of assembly of the component. The preferred title of this field shall be: "Date Code". The preferred *data identifier* for this field shall be: (10D). However, other data identifiers can be used depending on what is suitable for the supplier. Where components contained within a *carton* reflect multiple date codes, bar code and human readable data in this field shall contain: "VARIOUS".

6. **Purchase Order Number –** This is the Celestica purchase order number. The preferred *data identifier* for this field shall be: (K). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be a maximum of 25 characters excluding the *data identifier* and start / stop characters. The preferred title of this field shall be "PO". Where components contained within a *carton* reflect multiple purchase orders, the bar code and human readable data in this field shall contain: "VARIOUS".

7. **Purchase Order Line Number** – This is the Celestica purchase order line number. The preferred *data identifier* for this field shall be: (4K). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be a maximum of 3 characters excluding the *data identifier* and start / stop characters. The preferred title of this field shall be "PO Line". Where components contained within a *carton* reflect multiple purchase order lines and Celestica part numbers, the bar code and human readable data in this field shall contain: "VARIOUS".

8. **Country of Origin** – This field is human readable only and indicates the country of origin as a two-character code. The Country of Origin is defined as the manufacturing country wherein the product obtained its final form, fit, and function as a part, subassembly, or finished product. The preferred title of this data field shall be "COO". The country of origin code shall be as defined in ISO 3166.   Where components contained within a *carton* reflect multiple countries of origin, the human readable data in this field shall remain blank.

For more information on the use of the "VARIOUS" term as it appears in the preceding field definitions, please refer to *Appendix B* and/*or Section 5.1.1* of this document.

4.1.2 Layout of *Carton* bar code label

The recommended format of the label is shown on the next page (*Figure 4-1*) and should be adhered to where possible. Note that concatenation of the data fields is not permitted (i.e. each field must be a separate bar coded entity). Note that the *data identifier* (without brackets) precedes the actual data in the bar code scanned data. The title of the data field is NOT included in the scanned data nor is the identifier's brackets. Please refer to Appendix C for specific scanned data characteristics and label layout.

L3 Requirements
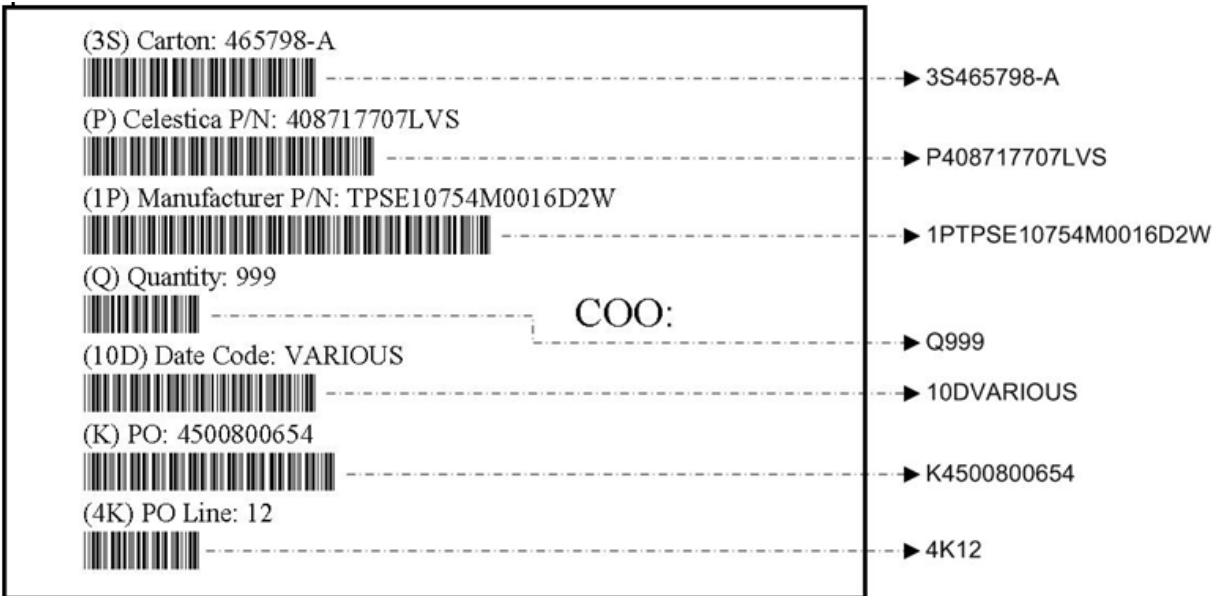
Figure 4-1: *Carton* label layout (not to scale)

4.1.3 Carton bar code Label Placement Requirements

The following requirements apply to the application of bar code labels to *cartons* containing *final carriers* or *intermediate cartons:*

- Labels shall be applied to the side of the *carton*. They shall not be applied to the top or bottom of the *carton* since they may be damaged by contact with other *cartons* due to stacking.
- Labels shall be placed on the side of the *carton* containing the manufacturer's internal label (if present). The bar code label shall not obscure nor interfere with any other manufacturer's label on the *carton*.
- In cases where there is insufficient room to place the bar code label on the same side as a manufacturer's label, the label should be placed on the side adjacent to the manufacturer's label.

4.2 Data Format and Mandatory Fields for *Carton* Bar code Label – <mark>"Non L-3 Requirements"</mark>

4.2.1 Mandatory fields for c*arton* bar code label

1. **Purchase Order Number –** This is the Celestica purchase order number. The preferred *data identifier* for this field shall be: (K). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be a maximum of 25 characters excluding the *data identifier* and start / stop characters. The preferred title of this field shall be "PO". Where components contained within a *carton* reflect multiple purchase orders, the bar code and human readable data in this field shall contain: "VARIOUS".

2. **Celestica Part Number -** Celestica part number as identified on Purchase Order / QSPEC document shall appear in this field. The preferred *data identifier* for this field shall be: (P). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be a maximum of 25 characters excluding the *data identifier* and start / stop characters. The preferred title of this field shall be "Celestica P/N". Where components contained within a *carton* reflect multiple Celestica part numbers, the bar code and human readable data in this field shall contain: "VARIOUS".

3. **Quantity** – This field identifies the quantity contained within the container that the label is affixed to. The preferred *data identifier* for this field shall be: (Q). However, other data identifiers can be used depending on what is suitable for the supplier. Field length shall be 8 characters maximum excluding *data identifier* and start / stop character(s). The preferred title for this field shall be: "Quantity". Where components contained within a *carton* reflect multiple Celestica part numbers or purchase orders, the bar code and human readable data in this field shall contain: "VARIOUS".

For more information on the use of the "VARIOUS" term as it appears in the preceding field definitions, please refer to *Appendix B* and/*or Section 5.1* of this document.

4.2.2 Layout of *Carton* bar code label

The recommended format of the label is shown below (*Figure 4-2*) and should be adhered to where possible. Note that concatenation of the data fields is not permitted (i.e. each field must be a separate bar coded entity). Note that the *data identifier* (without brackets) precedes the actual data in the bar code scanned data. The title of the data field is NOT included in the scanned data nor is the identifier's brackets. Please refer to Appendix C for specific scanned data characteristics and label layout.

Non L3 Requirements
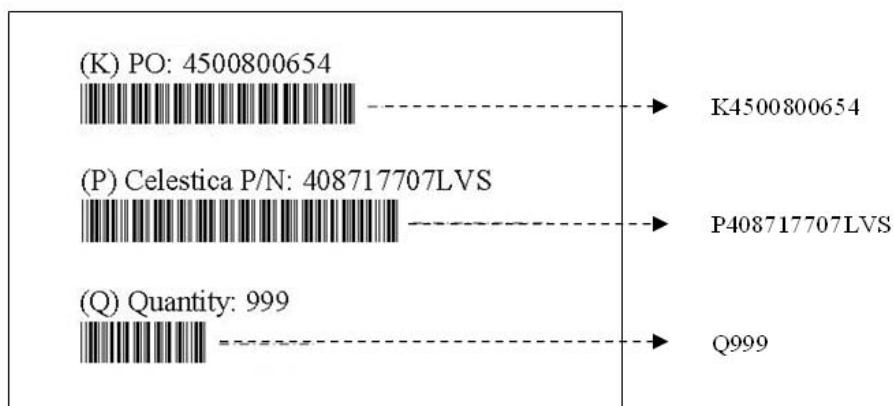
Figure 4-2: Carton Barcode Label Recommended Format

4.2.3 Carton bar code Label Placement Requirements

The following requirements apply to the application of bar code labels to *cartons* containing *final carriers* or *intermediate cartons:*

- Labels shall be applied to the side of the *carton*. They shall not be applied to the top or bottom of the *carton* since they may be damaged by contact with other *cartons* due to stacking.
- Labels shall be placed on the side of the *carton* containing the manufacturer's internal label (if present). The bar code label shall not obscure nor interfere with any other manufacturer's label on the *carton*.
- In cases where there is insufficient room to place the bar code label on the same side as a manufacturer's label, the label should be placed on the side adjacent to the manufacturer's label.

The following is divided into two sections:

1. **Labeling and Package Flow - L3 Barcode requirements**
2. **Labeling and Package Flow – Non L3 Barcode requirements**

5   Labeling Hierarchy and Grouping

5.1   Labeling Hierarchy and Grouping – "L3 Requirements"

5.1.1 Labeling/Packaging Flow and Use of "VARIOUS" Placeholder

Labeling shall be implemented such that all available data has been populated into its respective fields. On the *final carrier* label, this includes all fields. At the *carton* level, certain fields may be populated with a placeholder, "VARIOUS", under specific circumstances to accommodate the possibility of multiple part numbers, date codes and/or purchase orders. *Figure 5-1*, below, is a flow chart illustrating several possible scenarios involving *carton* label levels and the "VARIOUS" placeholder. This packaging/labeling flow chart shall be adhered to for shipment of all production goods to Celestica globally.

As *Figure 5-1* indicates, the "VARIOUS" placeholder shall only be used to populate the "(10D) Date Code" field, if applicable, until section 'C.' of the flow chart, at which point multiple Celestica part numbers and/or purchase orders may be packaged and shipped together, therefore, creating an allowance for the "VARIOUS" placeholder to be used as directed for remaining applicable fields. The purpose of this placeholder is to notify Celestica receiving personnel that complete and required information is available on labels found at *intermediate carton* levels.

Key
CPN - Celestica Part Number
PO - Purchase Order

A. Labeling and packaging final carriers

Final carrier shall **not be** used as shipping container. Final carriers shall be labeled. Date codes shall not be mixed within a final carrier; therefore, '(10D) Date Code' field shall represent the date code for all components contained within a given final carrier.

> Apply label to final carrier per final carrier label requirements. All fields shall be populated. **Only a single date code shall be used in any given final carrier.**

B. Labeling carton containing final carriers

May be used as shipping container if shipping a single CPN, single purchase order, and single purhcase order line number. All final carriers contained within this carton shall represent a single CPN. In the case where various date codes exist among individual final carriers, all fields on carton label shall be populated except '(10D) Date Code' which shall indicate "VARIOUS"; in the case where date codes are common, (10D) field shall be populated with actual data.

> Package final carriers in carton. All final carriers must contain identical PO, PO Line and CPN

> Different date codes on final carriers? — **Yes** → Create carton label, populating all fields and indicating "VARIOUS" for '(10D) Date Code' field.

> **No** → Create carton label, populating all fields including date code.

> Apply label to carton.

> Additional CPN or PO Lines from same PO? — **No** → Additional PO's? — **Yes** → **D**

> Additional PO's? — **No** → This container is the shipping container. No more packaging/labeling levels required.

> Additional CPN or PO Lines from same PO? — **Yes**

C. Labeling carton containing multiple Celestica P/N and/or PO Lines within a single purchase order.

May be used as shipping container if shipping multiple CPN's or PO Lines within a single purchase order. Carton label shall be created. '(K) PO' field shall be populated, while all other fields shall indicate "VARIOUS". Each intermediate carton contained within this carton shall represent it's own unique CPN.

> Package all cartons containing identical PO into an outter level carton.

> Affix carton label, populating '(K) PO' field and indicating "VARIOUS" for all other fields

> Additional PO's? — **No** → This container is the shipping container. No more packaging/labeling levels required.

> Additional PO's? — **Yes**

D. Labeling shipping carton containing multiple Purchase Orders

May be used as shipping container if shipping multiple PO's. Each intermediate carton contained within this carton shall represent it's own unique PO. The label on this carton shall indicate "VARIOUS" for all fields and will be the outer most, shipping, carton.

> **D** → Group all cartons, each containing unique PO's into an outter level shipping carton.

> Affix carton label, indicating "VARIOUS" for all fields.

> This container is the shipping container. No more packaging/labeling levels required.

Figure 5-1: Barcode Labeling Flow for all levels of packaging

5.1.2 Multilevel Labeling/Packaging Example – L3 Requirements

Figure 5-2, below, illustrates an example of multilevel labeling as described in Section 5.1. *Final carriers*, in this case, reels, are packaged together according to common Celestica P/N, PO. The *final carriers* displayed in this example do not contain common date codes (as the date codes on their respective *final carrier* labels differ); therefore, the label on the *carton* that contains these *final carriers* indicates "VARIOUS" in the "(10D) Date Code" field. This *carton* is grouped and packaged alongside other *cartons* which contain the same PO but different Celestica P/N. Notice that the label on the *carton* containing Celestica P/N 659795462LVS (middle left) indicates a specific date code. From this we know that date code is consistent amongst *final carriers* contained within this *carton*. The outer most level in this example contains, within it, *intermediate cartons* for all common PO's being packaged together. The label on this *carton* shall be populated with actual data only for the '(K) PO' field while indicating "VARIOUS" for all other fields. Although not shown in this example, the case where multiple PO's are packaged and shipped would entail all PO numbers being grouped according to section "D" in the flow chart (Figure 5-1, previous page).
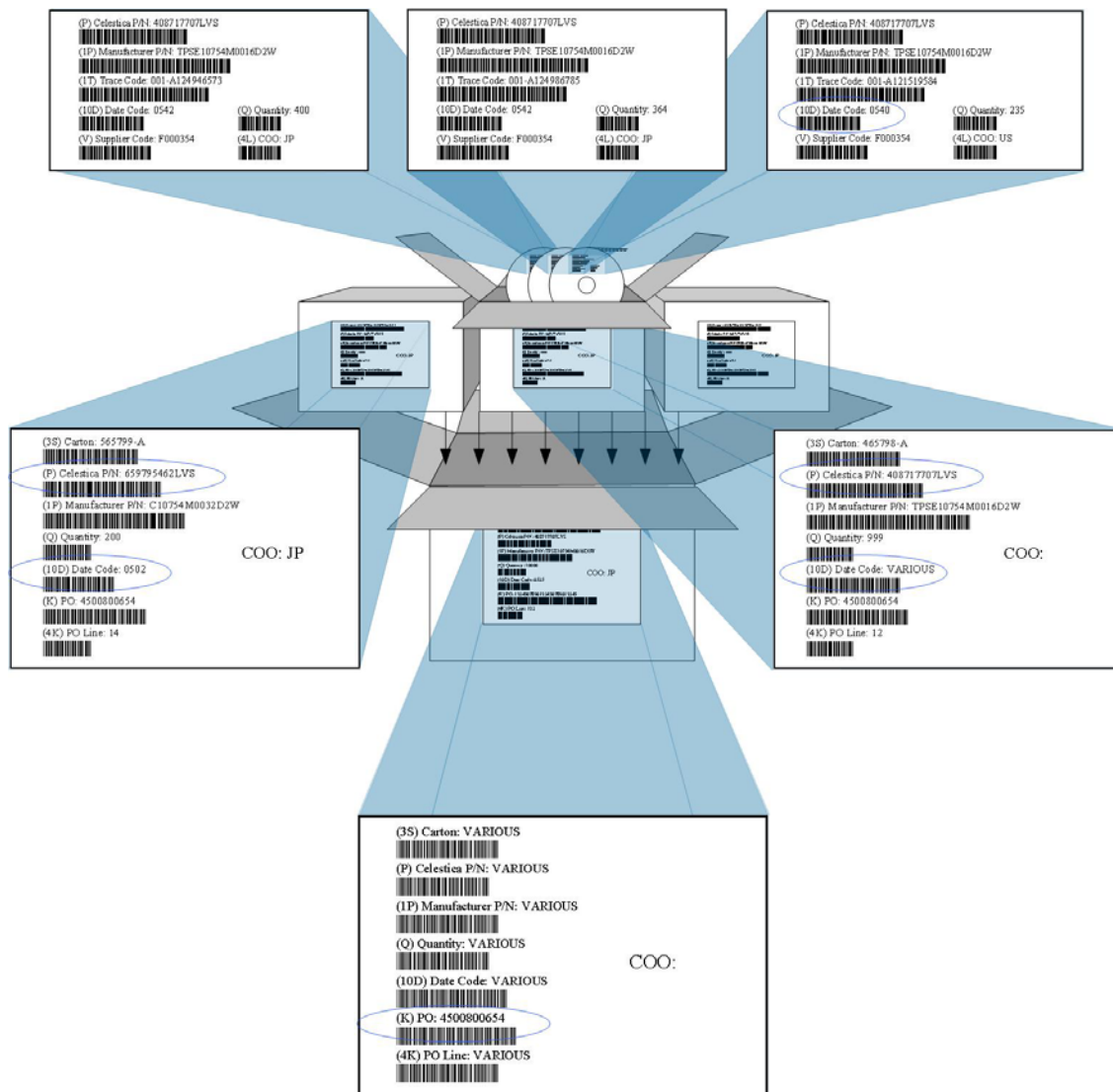

Figure 5-2: Shipment labeling example

5.2 Labeling Hierarchy and Grouping – "Non L3 Requirements"

5.2.1 Labeling/Packaging Flow and Use of "VARIOUS" Placeholder

Labeling shall be implemented such that all available data has been populated into its respective fields. On the *final carrier* label, this includes all fields. At the *carton* level, certain fields may be populated with a placeholder, "VARIOUS", under specific circumstances to accommodate the possibility of multiple part numbers and/or purchase orders. *Figure 5-3*, next page, is a flow chart illustrating several possible scenarios involving *carton* label levels and the "VARIOUS" placeholder. This packaging/labeling flow chart shall be adhered to for shipment of all production goods to Celestica globally.

As *Figure 5-3* (section C & D) indicates, the "VARIOUS" placeholder can be used when shipping multiple Celestica part numbers and/or purchase orders that are packaged and ultimately shipped together. The purpose of this placeholder is to notify Celestica receiving personnel that complete and required information is available on labels found at *intermediate carton* levels.

A. Labeling and packaging final carriers
Final carrier shall not be used as shipping container. Final carriers shall be labeled. Date codes shall not be mixed within a final carrier; therefore, "(10D) Date Code" field shall represent the date code for all components contained within a given final carrier.

Apply label to final carrier per final carrier label requirements. All fields shall be populated. Only a single date code shall be used in any given final carrier

Legend:
CPN – Celestica Part Number
PO – Purchase Order

Package final carriers in carton. All final carriers must contain identical PO, PO line and CPN

B. Labeling carton containing final carriers
This may be used as a shipping container if shipping a single Celestica Part Number (CPN), single purchase order and single purchase order line number. All final carriers contained within this carton shall represent a single CPN. All the fields should be populated (e.g. no fields should state "various").

Create carton label

Apply label to carton

Additional CPN or PO Lines from same PO?

No → Additional PO's? — Yes → D

No → This container is the shipping container. No more packaging/labeling levels required.

Yes ↓

Package all cartons containing identical PO into outer level carton.
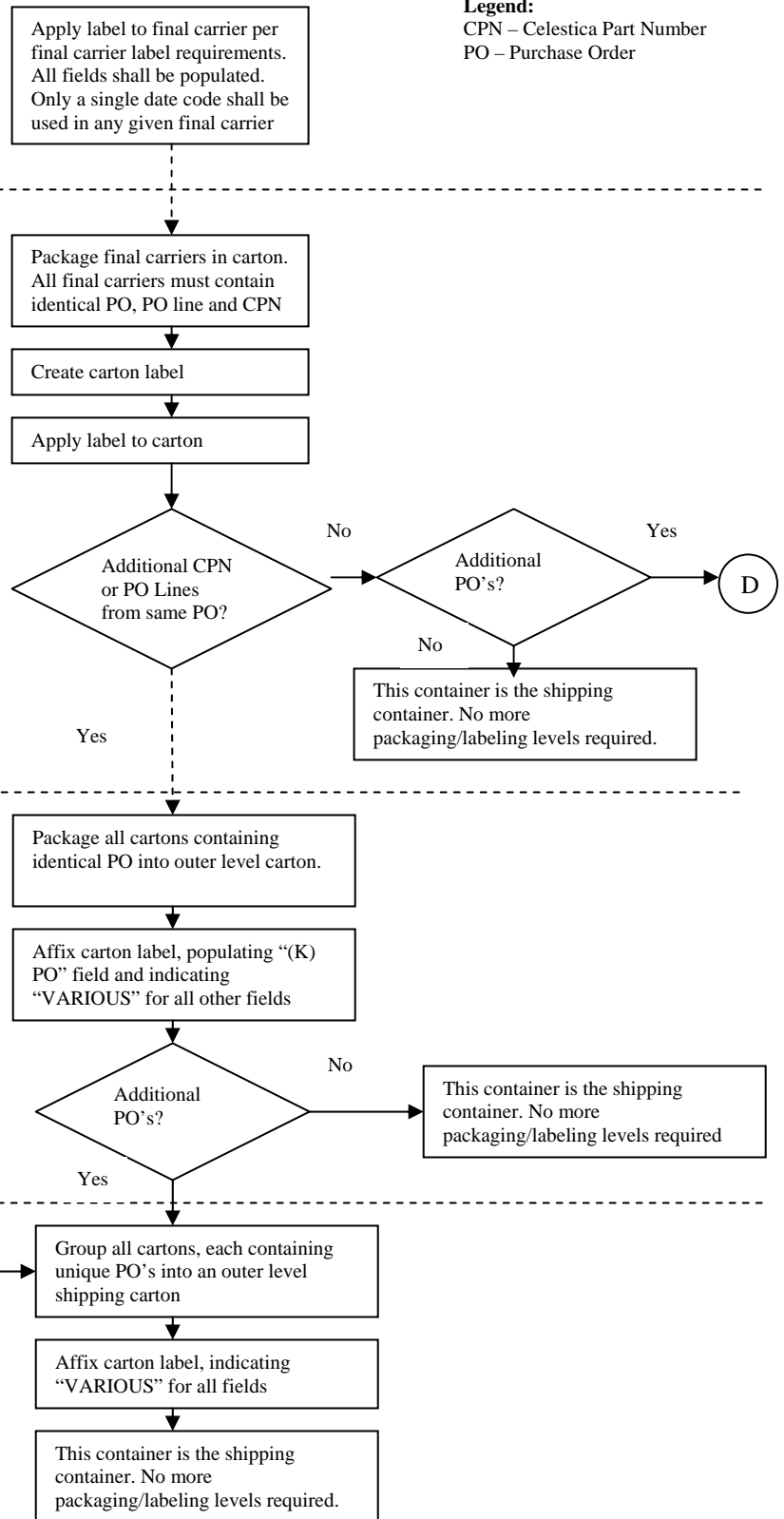
D. Labeling carton containing multiple Celestica P/N and/or PO Lines within a single purchase order
This may be used as shipping container if shipping multiple CPN's or PO Lines within a single purchase order. Carton label shall be created; (K) PO field shall be populated while all other fields shall indicate "VARIOUS". Each intermediate carton contained within this carton shall represent it's own unique CPN.

Affix carton label, populating "(K) PO" field and indicating "VARIOUS" for all other fields

Additional PO's? — No → This container is the shipping container. No more packaging/labeling levels required

Yes ↓

D → Group all cartons, each containing unique PO's into an outer level shipping carton

C. Labeling shipping carton containing multiple Purchase Orders
This may be used as a shipping container if shipping multiple PO's. Each intermediate carton contained within this carton shall represent it's own unique PO. The label on this carton shall indicate "VARIOUS" for all fields and will be the outer most shipping carton.

Affix carton label, indicating "VARIOUS" for all fields

This container is the shipping container. No more packaging/labeling levels required.

Figure 5-3: Barcoding Labeling Flow for all levels of packaging.

5.2.2 Multilevel Labeling/Packaging Example – Non L3 Requirements

Figure 5-4 (next page), illustrates an example of multilevel labeling as described in Section 5.1. *Final carriers*, in this case, reels, are packaged together according to common Celestica P/N, PO. A carton label is created for these *final carriers*. This *carton* is grouped and packaged alongside other *cartons* which contain the same PO but different Celestica P/N. The outer most level in this example contains, within it, *intermediate cartons* for all common PO's being packaged together. The label on this *carton* shall be populated with actual data only for the '(K) PO' field while indicating "VARIOUS" for all other fields. Although not shown in this example, the case where multiple PO's are packaged and shipped would entail all PO numbers being grouped according to section "D" in the flow chart (Figure 5-3, on page 20)
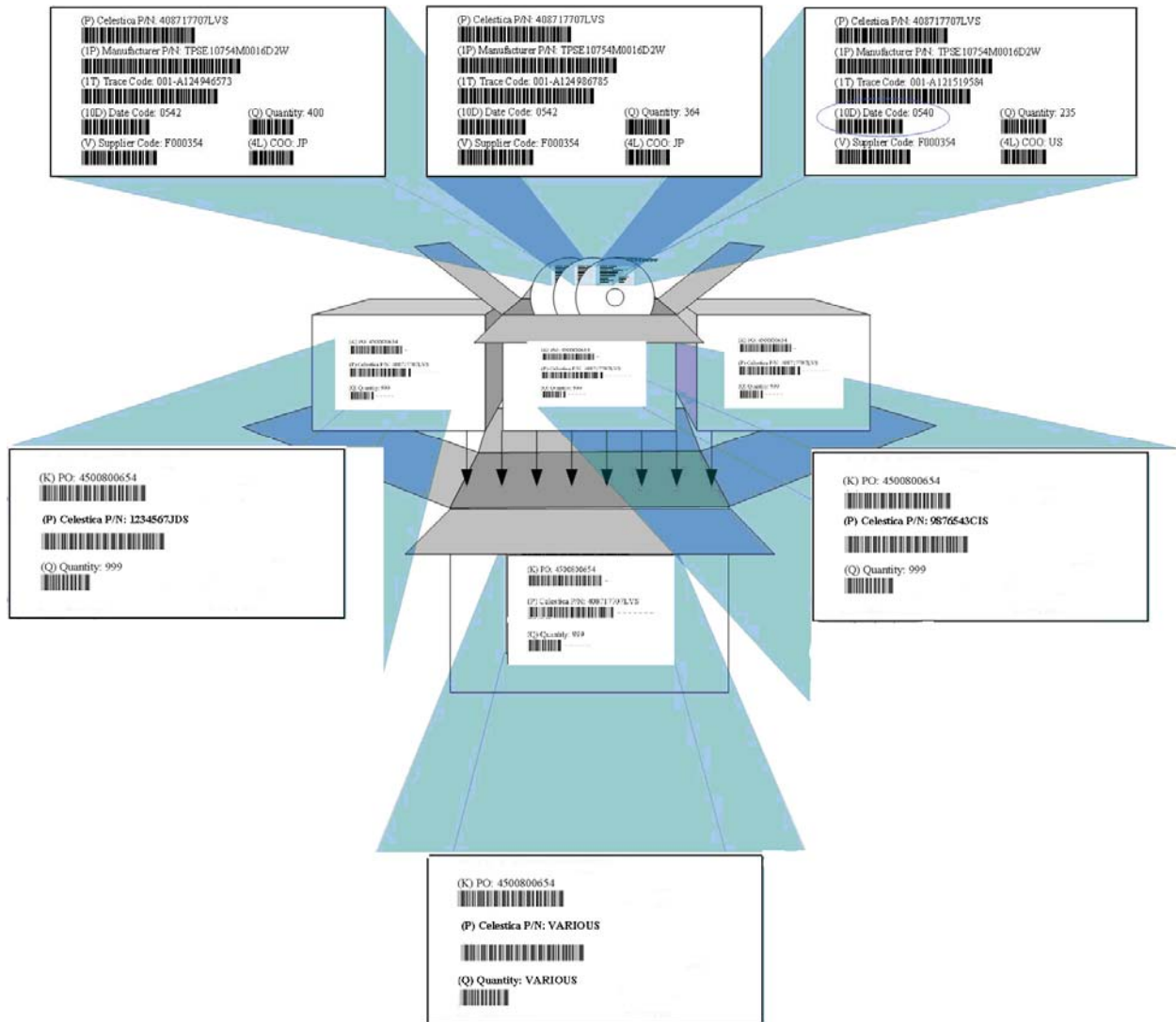
Figure 5-4: Shipment Labeling Example

6 Requirements for Programmed Parts and other Value-Add Services

6.1 Requirements for Programmed Parts

Suppliers shipping programmed parts (programming suppliers) shall track part history for blank programmable parts.

Upon request programming suppliers shall provide Celestica with blank part information as it relates to supplied programmed parts identified by either; P/O (programmed parts P/O), Celestica P/N (the Celestica P/N that represents the programmed part), or Trace Code (programming supplier trace code applied to programmed parts).

Tracked data shall include Blank Celestica P/N (The Celestica P/N that represents the part prior to programming, ie blank part), Manufacturer's P/N (the actual blank part from the manufacturer), Date Code (the blank part's date code as identified by the blank part's manufacturer), Trace/Lot Code (the blank part's Trace/Lot code as identified by the blank part's manufacturer).

Information shall be retrievable for a period no less than 2 years unless otherwise specified by the part's QSPEC.

6.2 Requirements for Value-Add Component Suppliers

Suppliers shipping value-added parts, including testing houses, shall track part history prior to value-added service.

Tracked data shall include Celestica P/N, Manufacturer's P/N, Date Code and Trace/Lot Code. Information shall be retrievable for a period no less than 2 years unless otherwise specified by the part's QSPEC. Upon request, supplier shall provide Celestica with all tracked part information related to a particular PO, Celestica P/N, or Trace Code.

Appendix A – Approved Field Titles

The following table lists approved data field titles. It is strongly recommended that the supplier use Celestica's preferred data field title for each field on the label. No other deviations to field title will be accepted.

Data Field Name	Preferred Field Title	Alternate Field Title
Celestica Part Number	Celestica P/N	Cel P/N Celestica PN Cel PN Customer Product ID Customer Prod ID CPN Customer Part Number Customer Part # CLS P/N CLS PN CLS Part Number CLS Part #
Manufacturer Part Number	Manufacturer P/N	MPN Manufacturer Part Number Supplier Part Number Supplier Part # Supplier Prod ID Vendor P/N Vendor PN Vendor Part Number Vendor Part #
Quantity	Quantity	Qty
Traceability Code	Trace Code	Lot Number Lot # Lot Lot Trace Batch Code Batch Heat
Supplier ID Code	Supplier Code	Supplier ID Supplier ID Code Vendor Vendor Code Vdr Vdr Code
Purchase Order Number	PO	PO PO # PO Number
Purchase Order Line Number	PO Line	PO Line PO Line # PO Line Number
Date Code	Date Code	D/C
Country of Origin	COO	Country of Origin

Appendix B - Definitions

The following is a list of definitions of terms used in this document.

Term	Definition
1D Bar Code Symbology	A type of format of bar code which looks like a picket fence. Data is encoded horizontally. See example
2D Bar Code Symbology	Machine readable symbols that are encoded both vertically and horizontally. See example below:
Bar code	A series of wide and narrow lines and spaces which are used to encode data in a particular bar code symbology
Carton	Packaging containing either *final carriers* or *intermediate cartons*.
Data Identifier	A specified character string which defines the intended use of the data that immediately follows the *data identifier*. For example, "Q" for Quantity, "P" for Celestica Part Number.
Element Width Ratio (N)	The ratio of the average width of the wide elements to the average width of the narrow elements within a bar code symbol
Final Carrier	The inner most level of packaging which contains the physical parts. This may be a tube, tray, reel, box, bag, etc.
Intermediate Carton	*Carton* within a *carton*. Must adhere to all *carton* level labeling requirements.
Label	A card or piece of paper containing printed / bar coded information which identifies the product, supplier, or other pertinent information related to the product to which it is affixed.
PWB	"Printed Wiring Board" – May also be referred to as a Printed Circuit Board.
Quiet Zone	An area free of any marks immediately preceding or following bar coded information.
"VARIOUS"	A placeholder used under specific circumstances to accommodate the possibility of multiple part numbers, date codes and/or purchase orders.

Appendix C – Bar Code Characteristics

This section provides additional explanation of the bar code requirements and the scanned data.

The following diagram shows an example of the data that should be captured when the *final carrier* or *carton* bar coded data fields are scanned. Note that the *data identifier* (without brackets) precedes the actual data in the bar code scanned data. The title of the data field is NOT included in the scanned data nor is the identifier's brackets.
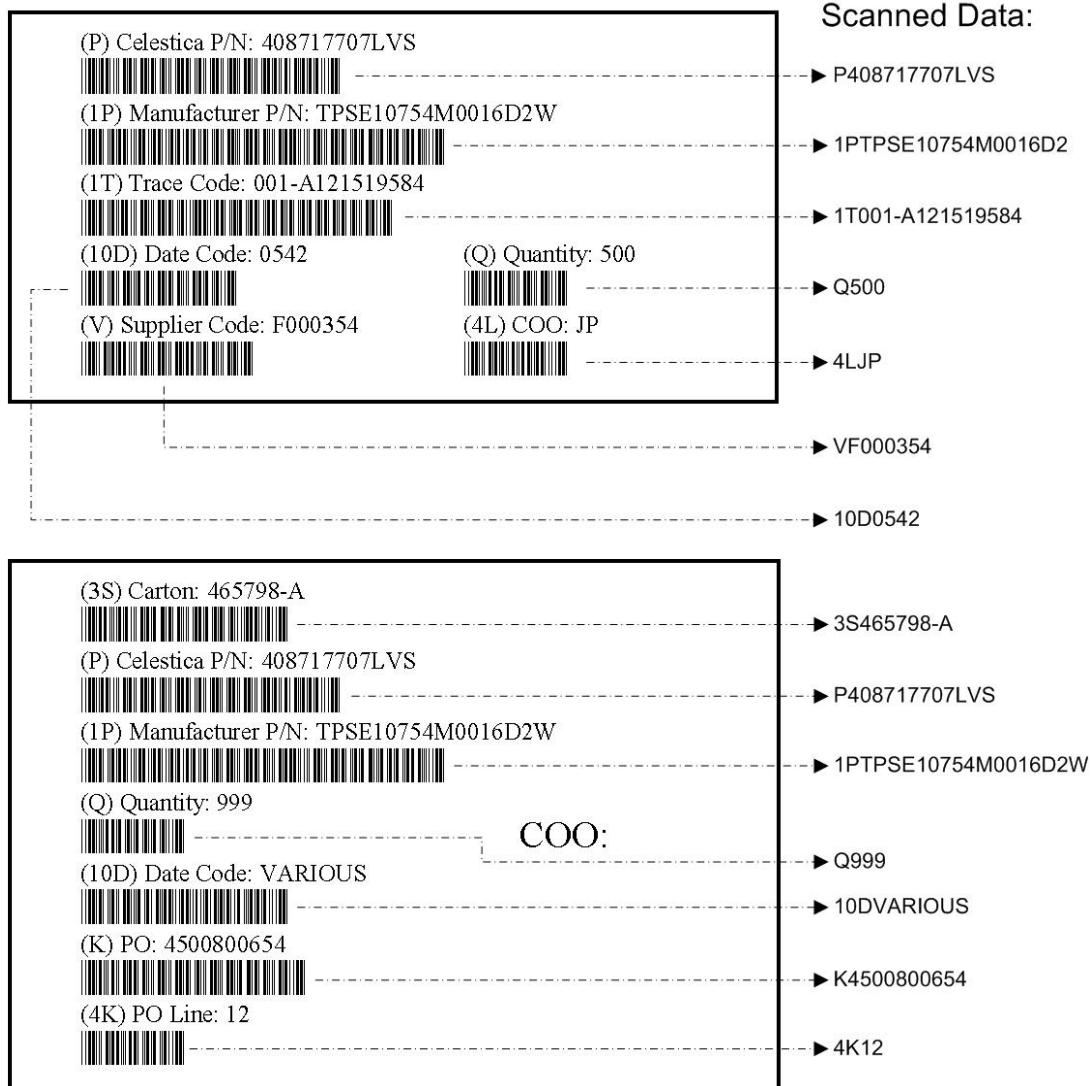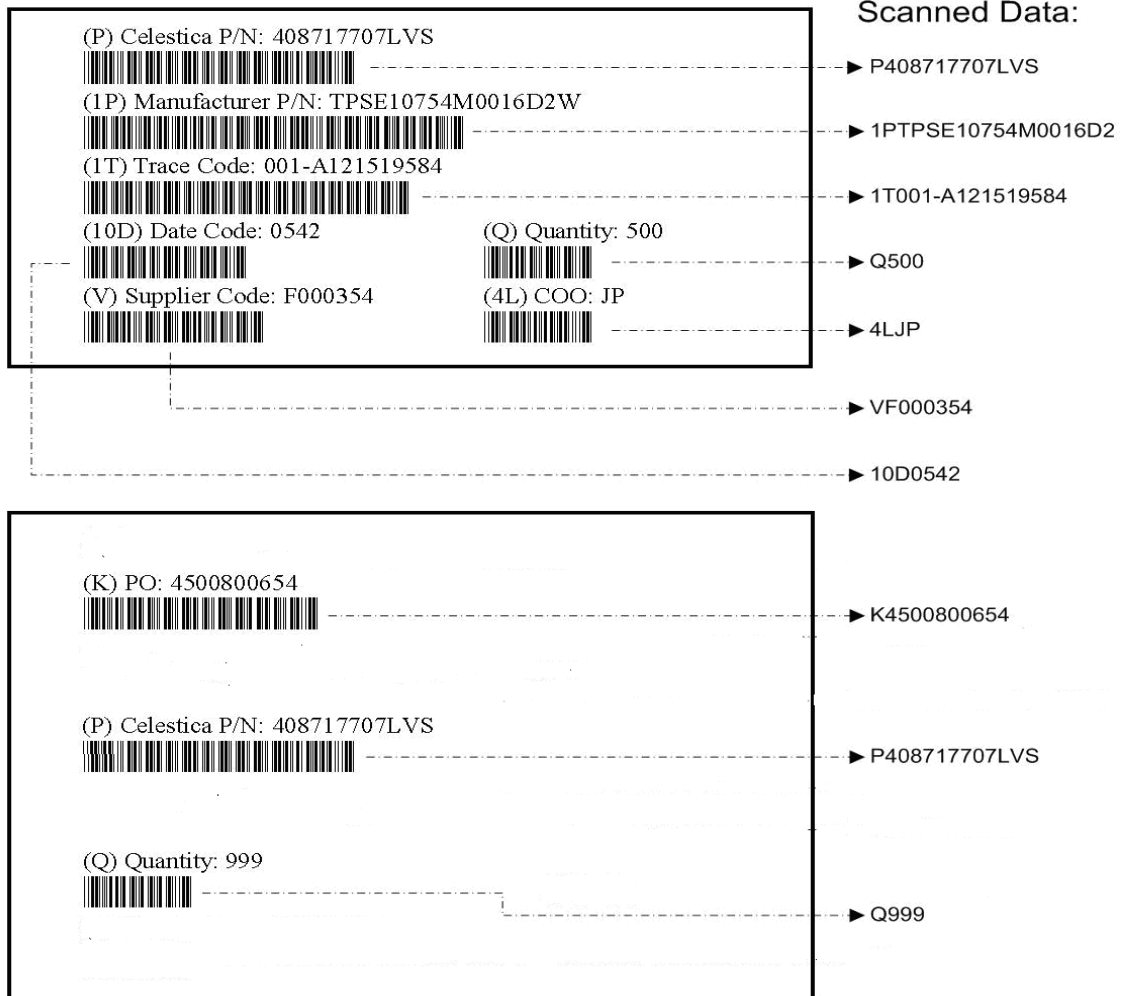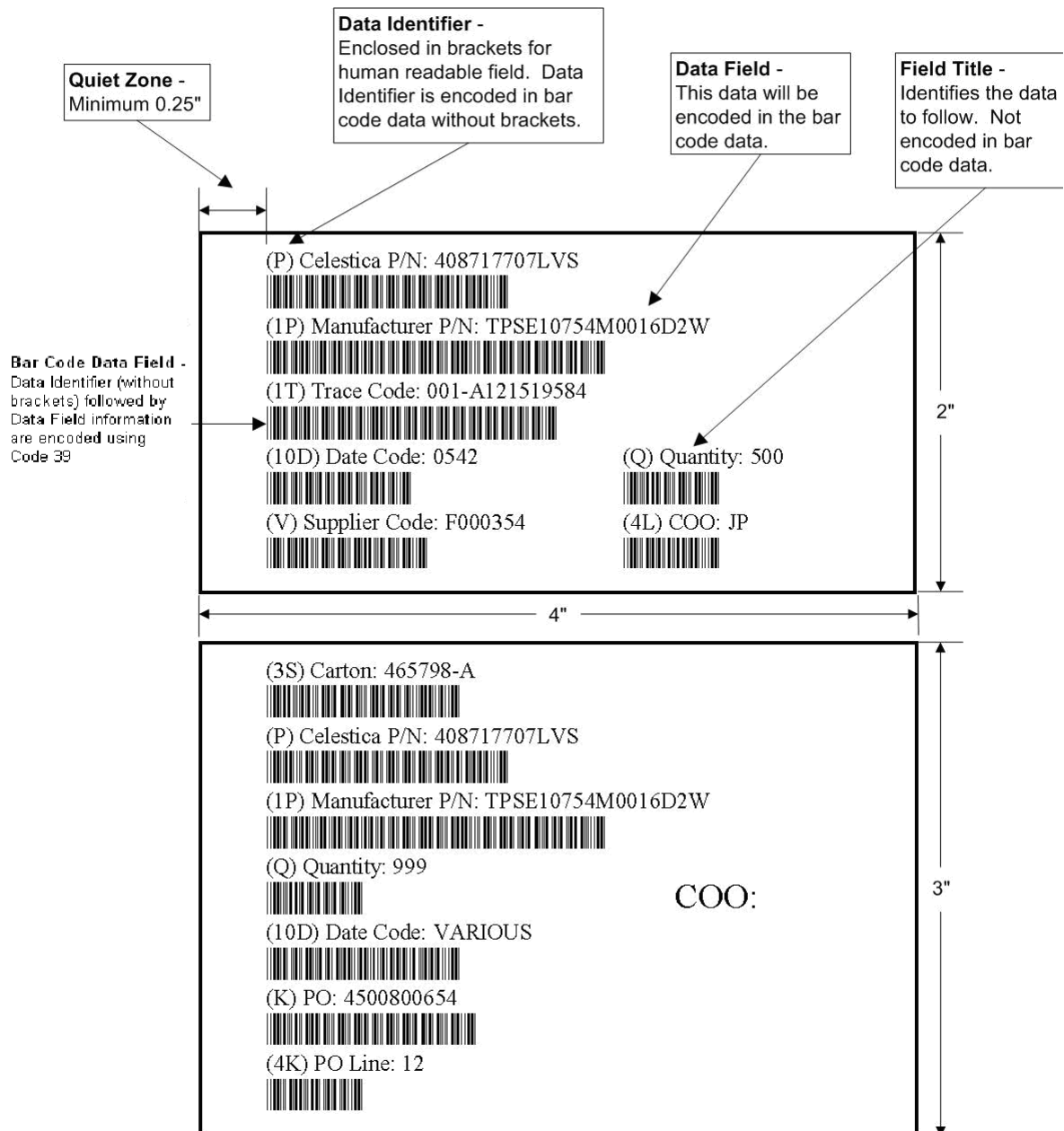
L3 Requirements

Figure C-1: Scanned data on bar code labels

Non L3 Requirements

Scanned Data:

(P) Celestica P/N: 408717707LVS ▶ P408717707LVS

(1P) Manufacturer P/N: TPSE10754M0016D2W ▶ 1PTPSE10754M0016D2

(1T) Trace Code: 001-A121519584 ▶ 1T001-A121519584

(10D) Date Code: 0542   (Q) Quantity: 500 ▶ Q500

(V) Supplier Code: F000354   (4L) COO: JP ▶ 4LJP

▶ VF000354

▶ 10D0542

(K) PO: 4500800654 ▶ K4500800654

(P) Celestica P/N: 408717707LVS ▶ P408717707LVS

(Q) Quantity: 999 ▶ Q999

Figure C-2: Scanned data on bar code labels

The following diagram identifies, in a visual manner, several of the terms identified within this specification. Shown below (not to scale) is a 4 inch by 2 inch (width by height) sample *final carrier* label which will accommodate required data and fit on a 7" reel. It is recommended that a larger label / larger font / larger bar code be utilized where possible in order to enhance scannability and legibility of the Human Readable fields. Terms for *carton* label terms are consistent with this example; however, recommended size for *carton* label is 4 inch by 3 inch (width by height).


Figure C-3: Barcode size dimensions and terminology

Appendix D – *Final Carrier* Specific Placement Requirements
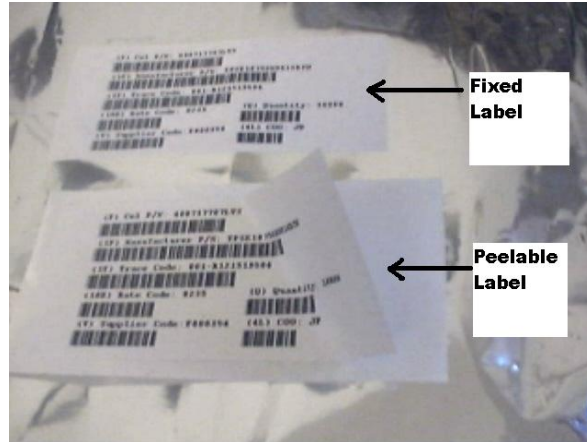
Reel Placement requirements

In addition to the General Label Placement Requirements outlined in section 3.2.2, the following requirements apply to the application of bar code labels to reels of components:

- Reels shall have the bar code on a flat surface close to the periphery of the reel.
- Larger bar codes and human readable fonts than the minimum values defined in Section 3 should be used where possible in order to enhance scanability of the bar code and improve legibility of the human readable information on the label.
- Label shall be placed on the side of the reel opposite to the round sprocket holes on the carrier tape. Refer to Figure D-1 below for a visual example.
- Label shall be placed on the reel such that the carrier tape is wound clockwise on the reel (i.e. it will unwind as shown in Figure D-1). Refer to Figure D-1 below for a visual example.
- Reels which are packaged in a protective bag (moisture barrier bag, ESD bag, etc) shall have a redundant label attached to the bag in addition to a label placed on the reel.
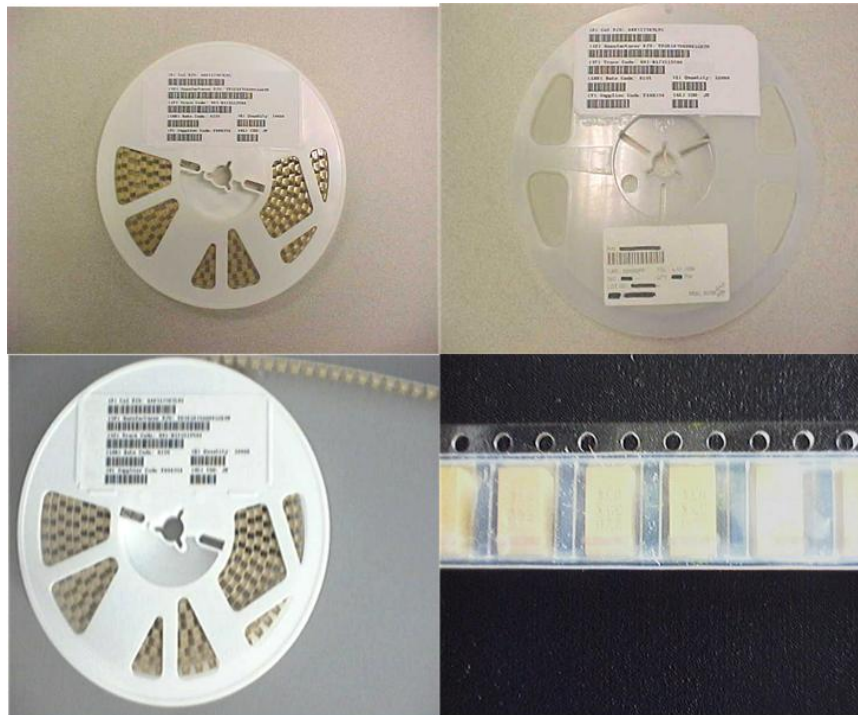
Figure D-1: Example(s) demonstrating labeling of reels which are not packaged in moisture barrier / ESD bags are shown below. Also shown is an example of feed holes in carrier tape.

- In cases where it is not possible to directly label the reel, each single reel may be placed in an ESD or other protective bag. There shall be two labels on the protective bag, one of which must be peelable / removable.


Figure D-2: Example of protective bag packaging with peelable / removable label.

Tube Label Placement Requirements

In addition to the General Label Placement Requirements outlined in section 5.1.1 and 5.2.1, the following requirements apply to labeling of tubes of components.

- Tubes shall have the bar code label placed on a flat surface of the tube. The bar coded data and human readable text must remain legible.
- Application of the label shall be wrinkle free.
- Where possible, labels should adhere to the layout shown in Figure D-1 unless the dimensions of the tube prevent this format. Refer to Figure D-3 below for example(s).
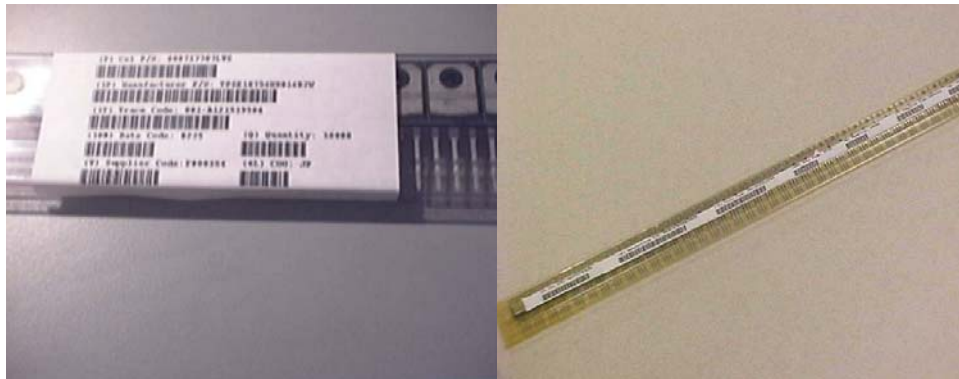
Figure D-3: Example of Labeling of Tubes – Preferred label format is shown on the left

- Although not Celestica's preferred method of labeling, in cases where it is not possible to directly label the tube, each single tube may be placed in an ESD or other protective bag which is labeled as per this specification. Refer to Figure D-4 (shown below).

- Alternatively, the supplier may place multiple tubes within a box or bag and label the box or bag as per this specification. The box or bag must contain product of a single date & lot code.

Figure D-4: Example of alternate labeling method when individual tubes cannot be labeled – Each tube is placed in a protective bag labeled as per this specification.

Tray Label Placement Requirements

In addition to the General Label Placement Requirements outlined in section 5.2.1, the following requirements apply to the application of bar code labels to trays of components:

- Trays shall have the bar code adhered to the empty top protective cover tray of its cover. In cases where the tray is contained within protective material (e.g. moisture barrier bag, ESD bag, etc) and the bar code label cannot be scanned through the protective material, a second redundant label shall be affixed to the protective material (e.g.. Moisture barrier bag, ESD protective bag, etc). Refer to Figure D-5 below.

- In cases where it is not possible to directly label the tray, each tray shall be placed in an ESD or other protective bag bearing two labels, one of which must be peelable / removable. Refer to Figure D-3 for an example of an ESD bag with a peelable / removable label.

Figure D-5: Example of preferred tray labeling. Photo on the left shows label on top cover of tray. Photo on the right shows a redundant label on the ESD / Moisture Barrier Bag which typically contains trays of components.

The Supplier shall comply with each specification in its entirety, unless amended by an agreement entered into by Celestica and the supplier (such as an SMI agreement, for instance).