Lucent Technologies
Bell Labs Innovations

Business Communications Systems (BCS)

Original Equipment Manufacturer (OEM) Manufacturing, Repair, Distribution Labeling and Data Transmission Guideline

801-001-108

May 14, 1999

Use Pursuant to Lucent Technologies Instructions

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PREFACE

This guideline details only labeling requirements. It does not address form, fit, or function of the product being delivered; that information is covered in the manufacturing or repair contract.

This guideline and all Lucent Technologies Business Communications Systems (BCS) drawings and technical information referred to or contained herein are Lucent Technologies BCS property, except insofar as they may cover a supplier's standard product. They must be kept in confidence and returned upon request to Lucent Technologies BCS. They must be used only for preparing quotations for submission to, or for the manufacture of articles ordered by, a Lucent Technologies company. Use for other purposes must be in accordance with terms agreed upon in writing with Lucent Technologies BCS.

The labeling must be in accordance with the latest standards and specifications referred to herein. The quality of the material used and the method of manufacturing, handling, and shipping must be such as to insure for the finished product the properties hereinafter specified. No deviations from this guideline nor any changes in the product previously found to be in compliance with the standards and specifications referred to herein shall be made without written approval.

Where dimensions are given in this guideline without specific tolerances, the tolerances shown on the manufacturer's drawing, or permitted by good labeling practices, shall be considered acceptable.

When samples in accordance with this guideline or standards and specifications referred to herein are ordered for examination and approval, no commitments that obligate the purchaser shall be made and no merchandise shall be furnished by the supplier until such approval is received, unless the supplier is specifically authorized to the contrary. The approval of such samples shall not be construed as waiving the requirements of this guideline or standards and specifications referred to herein in any respect.

Any production testing facilities and personnel required by the inspectors of Lucent Technologies at the manufacturer's plant to determine that the product meets the requirements of this specification shall be provided by the manufacturer.

INTRODUCTION

The majority of this document is intended to define the requirements for Lucent Technologies BCS manufacturing, repair, and warehouse operations and OEMs who manufacture and/or repair Lucent Technologies BCS private-labeled products. Requirements are also included for OEM "off the shelf" products and product package labels being delivered to Lucent Technologies BCS.

Technical questions regarding bar code label specifications, may be directed to either Allan Gilligan at (732) 949-7721 or Ray Cann at (732) 949-7739. General questions regarding BCS serialization contained in this document may be directed to Tom Mock of BCS Serialization at (303) 538-3357.

Scope

This document provides bar code labeling guidance for products and packages shipped to Lucent Technologies BCS locations or Lucent Technologies BCS customers on behalf of Lucent Technologies. It also provides guidance for data communications between Lucent trading partners. The labeling hierarchy described within the body of this guideline is based on the assumption that the SAP system has begun to be implemented within Lucent Technologies BCS.

General Requirements

Lucent Technologies requires that:

1. products and materials be identified by means of bar code labels applied to all products, materials, and packaging.

2. product labeling shall include the product identification (comcode or material ID) and, in the case of serialized products, the serial numbers. The serial number shall be assigned to a product for its entire life cycle.

3. the product identification and serial number must be displayed on the product and product package labels in human-readable form as well as in bar code format.

4. products shipped by OEM vendors and Lucent Technologies BCS warehouse locations to customers and other Lucent Technologies BCS warehouse locations shall meet the labeling requirements of 801-001-105 and 801-001-107 as referenced in this guide.

5. authorized Lucent Technologies BCS OEM and repair vendors will also be expected to meet the product labeling and electronic data feed requirements outlined in this document.

Serialization

Before SAP Implementation

A critical part of the serial number tracking process is the creation and database storage of a unit-child-parent-grandparent serial number relationship for pallets (grandparents) and over/multi-packs (parents) containing single units and product packages (children). The reason for the serial number relationship is to reduce the effort to populate serial number databases when pallets or over/multi-packs are shipped to Lucent Technologies customers. When a whole pallet is shipped to a customer, only the grandparent serial number must be scanned by the personnel receiving the shipment. This associated grandparent serial number can then be exploded in the BCS–CIO database out to the individual unit serial numbers (children).

After SAP Implementation

When SAP is fully implemented there will not be a need for an additional serial number label for pallets or over/multi-packs. The reason for this is that both Lucent and the customer or supplier will be communicating using standard EDI transactions that transmit all data, including serial numbers of all levels of packaging, regarding the shipment and its contents to be accessible to the recipient. Upon receipt of the shipment, the scanning the package ID on the shipping label will automatically make the connection between the previously received EDI message data with the serial numbers in the package and the package being scanned at the receiving area.

Data Transmission Needs

It is advantageous to both Lucent BCS and its suppliers to have electronic data feeds of manufacturing, repair, and shipping information. OEM vendors with EDI capability have the opportunity to speed communications with Lucent BCS by utilizing an advanced ship notification process. Using standard EDI interfaces and format, an OEM vendor can provide not only the product identification (comcode or material ID) but serial numbers of the products shipped. Lucent BCS can use these electronic feeds to create the appropriate material tracking records in its data systems. This EDI capability will be available for purchase orders placed in the forthcoming GES/SAP system. A vendor who does not have EDI may elect to provide an advanced ship notification via an electronic interface or over the internet. Upon shipment of a Lucent customer order, the GES/SAP system will be updated, establishing the relationship between the serial number(s) and the customer. This will give the service organization the ability to associate the serial number(s) with the customer's warranty and maintenance entitlements.

Some OEMs, Lucent BCS warehouses, Lucent BCS manufacturers, Lucent BCS repair centers, and authorized repair vendors are currently providing electronic feeds directly into the Lucent BCS–CIO database for serialized product installed at Lucent BCS customer locations. As Lucent BCS deploys SAP at the warehouse, manufacturing, and repair locations, the current electronic feed to BCS–CIO will be replaced SAP interface.

PRODUCT LABEL REQUIREMENTS

This section contains excerpts from the engineering requirements for pressure-sensitive, adhesive-backed labels contained in the Lucent Technologies specification KS-23490.

Bar Code Symbology

- All product identification (comcode or material ID) bar code symbols printed on the labels covered in this labeling guide must be Code 39[1] symbology with a wide-to-narrow element ratio of either 2.24:1 or 3.0:1. The 2.24:1 wide-to narrow element ratio symbols are used when the label size cannot accommodate the use of the preferred 3:1 wide-to-narrow element ratio labels. Bar code symbols shall be printed with black bars on a white background. Code 39 check digits shall not be used.

- A minimum leading and trailing Quiet Zone of 0.125 inch (3.2 mm) is required. For optimum contact (wand) scanning, a minimum Quiet Zone of 0.250 inch (6.4 mm) is recommended. No mark should be within the Quiet Zones.

- Code 39 bar element heights are specified in KS-23490 and must be at least 0.15 inches high with a preferred height of 0.25 inches when it is anticipated that hand scanning will be used to read the bar code. This is especially applicable to equipment housings, circuit board latches, and product and shipping packaging.

The following nominal dimensions are given to provide general guidance for label printing. Dimensional accuracy will affect the bar code print quality.

Code 39 Bar Code Symbols Using a 2.24:1 Wide-to-Narrow Element	
Nominal bar and space element widths	Narrow elements 0.0075 inch (0.190 mm) Wide elements 0.0168 inch (0.429 mm)
Inter-character space	May vary between 0.0075 inch and 0.018 inch (0.190 to 0.457 mm) with nominal size being 0.008 inch (0.203 mm)

[1] Code 39 is a self-checking, discrete bi-directional bar code symbology. The bar code structures use narrow and wide elements and are capable of producing alphanumeric characters of 0 – 9, A – Z, $, /, +, %, and a start/stop character (*).

Code 39 Bar Code Symbols Using a 3.0:1 Wide-to-Narrow Element	
Nominal bar and space element widths	Narrow elements 0.0075 inch (0.190 mm) Wide elements 0.0225 inch (0.57 mm)
Inter-character space	May vary between 0.005 inch and 0.018 inch (0.127 to 0.457 mm) with nominal size being 0.008 inch (0.203 mm)

Label Format

- Each label must consist of a printed bar code symbol with a human-readable, alphanumeric interpretation of the bar code symbol centered beneath the symbol. The alphanumeric characters must be legibly printed, and the information must be as specified in the purchase order. Any additional text on the label must be specified in the purchase order.

- One or more bar code symbols may be included with other information as part of a larger label. Regardless of the number of bar code symbols on a label, it is important that the product identification(comcode or material ID) and serial number bar code symbols meet the KS-23490 format requirements.

- Product labels may have either one or two individual bar code symbols, along with the necessary Lucent Technologies logo and alphanumeric text.

- A Code 39 bar code label having a single bar code symbol will encode either the product identification(comcode or material ID) (CC) number or the serial number in the bar code symbol with the appropriate human readable text as shown in Figure 1. The serial number format provides a unique identification of the product through the inclusion of a date of manufacture, vendor code, and sequentially generated serial number. The product identification (comcode or material ID) number provides the part identification used by Lucent Technologies BCS and other end users.

- A Code 39 label with two bar code symbols will include a serial number bar code symbol and a product identification (comcode or material ID) number bar code symbol on a separate line as shown in Figure 2.

- The human readable text Lucent Technologies designations “Lucent – CC” and “Lucent – SN” should be distinct for easy recognition.

- When product surface area is limited for the application of the label the human-readable information (“Lucent”) may be omitted. The human-readable information that readily identifies the category of the bar-coded data (“CC” or “SN”) may not be altered. The preface “CC” or “SN” shall not be included in the bar code symbol data.

- Side by side bar code symbols are not permitted on the product label.

Figure 1 KS-23490 Serial Number Label with 2.24:1 W/N element ratio

Figure 1 consists of a 0.25 inch high by 1.75 inch wide bar code label on a white background with a 2.24:1 wide-to-narrow element ratio. This is the smallest recommended label for applications that require hand scanning for data entry. Encoded are 12 data characters with a leading and a trailing start/stop character. The label back is coated with a pressure-sensitive adhesive that is protected with a suitable release liner. This label contains the designation “LUCENT SN” followed by the serial number centered below the bar code symbol. Identical size label formats are specified in KS 23490 for encoding product identification (comcode or material ID) product identification. When the product identification (comcode or material ID) is encoded in the bar code symbol the human readable text shall change from SN to CC to indicate that the product identification (comcode or material ID) is in the bar code symbol.

Figure 2 KS-23490 Serial Number Label with 3:1 W/N element ratio

Figure 2 consists of a 0.25 inch high by 2.0 inch wide bar code label on a white background with a single bar code symbol printed at a 3:1 wide-to-narrow element ratio. Encoded are 12 data characters with a leading and a trailing start/stop character. The label back is coated with a pressure-sensitive adhesive that is protected with a suitable release liner. This label contains the designation “LUCENT SN” followed by the serial number centered below the bar code symbol. Identical size label formats are specified in KS-23490 for encoding product identification (comcode or material ID) product identification. When the product identification (comcode or material ID) is encoded in the bar code symbol the human readable text shall change from SN to CC to indicate that the product identification (comcode or material ID) is in the bar code symbol.

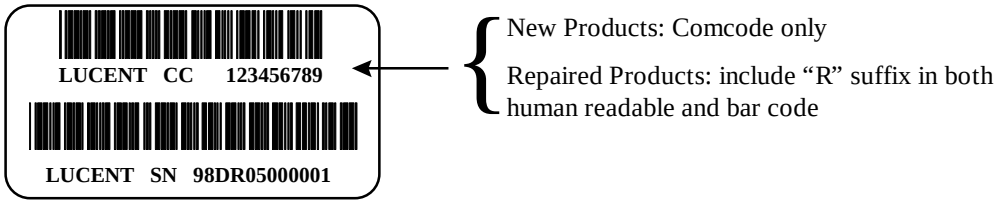


Figure 3 KS-23490 label

Figure 3 consists of a 1.0 inch high by 2.0 inch wide bar code label on a white background with two bar code symbols printed at a 3:1 wide-to-narrow element ratio. Encoded are the 9 digit Comcode number (or Comcode plus the "R" suffix for a repaired product) and 12 characters for the serial number in separate bar code symbols with the appropriate start/stop characters. The label back is coated with a pressure-sensitive adhesive that is protected with a suitable release liner.

Data Content

The following table lists data elements for product labels.

Product Label (Please refer to Figures 1, 2, and 3)	
Data Element	**Description**
Product identification (comcode or material ID)	Material ID of up to 30 characters to support SAP systems or the 9-digit product identification (comcode or material ID) number (followed by an "R" suffix when a repaired product is labeled)
Serial number	12 characters

- On the product identification (comcode or material ID) labels, the product identification (comcode or material ID) number must be that of the part identified by the label. On the serial number labels, the number sequence must not be repeated in any year, month, or week period for the same manufacturer code. The same serial numbers ***must not*** be used on different products shipped from the same location. Number blocks may be used to achieve unique serial number identification of the different products.

Label Placement

- The labels must be accessible by the user without undue difficulty. Where possible, labels should be placed on the product in a location that is normally visible without disruption of service. Labels must not be placed on the bottom of heavy equipment or in other inaccessible locations. Labels with a metallized layer must not be placed over printed wiring circuit board paths, land areas, or components when such labels are used for in-process tracking of printed wiring circuit boards.

Label Printing

- The labels may be printed on-site, either by Lucent Technologies BCS locations using internally approved printers and media or by OEM vendors that have obtained Lucent Technologies Global Bar Code Technologies Group approval for their labels. All labels must comply with the detailed dimensional and physical requirements contained in KS-23490.

- The labels may also be purchased (preprinted) from a Lucent Technologies-qualified label vendor, provided the labels meet the requirements of KS-23490. Evidence of conformance to the dimensional and physical requirements of KS-23490 must be available upon request. Labels may be ordered in various combinations or sets to meet specific product requirements. Duplicate sets of labels may be requested for use on unit packages or wrappings. These duplicate labels permit identification of the product without removal of the protective packaging material. The quantity of labels ordered should correspond to the quantity of product made/repaired and shipped during the designated month or week. Sample preprinted labels have been obtained from Data Documents Systems, 301 Gardner Drive, New Century, Kansas 66031. Stock designated "NS," a 2 mm white polyester stock with a 1 mm clear over-laminate, has met the requirements of this specification.

Bar Code Print Quality Requirements

All Code 39 bar code symbols must be capable of meeting or exceeding the ANSI X3.182 bar code print quality level of 1.5/05/900 both before and after conditioning in accordance with tests described in Annex A of this document and detailed in KS-23490.

Printed Alphanumeric Characters

Single unit product serial numbers are composed of 12 alphanumeric characters as shown below.

Code Format	Year of Manufacture		Manufacturing Location		Month or Calendar Week		Serial Number					
Digit Sequence	1	2	3	4	5	6	7	8	9	10	11	12
Character	y	y	L	L	w	w	X	X	X	X	X	X

Characters	Description
yy	Last two digits of the current year.
LL	Two-character constant location code designation. Each supplier will be assigned a location code.
ww	Two-digit number: 1 –12 to indicate month (e.g. January is month 01) or 21 – 72 to indicate week (20 is added to the week number to differentiate months e.g. week 21 is the first week or partial week in January).
XXXXXX	Sequential six-digit number. The numbers will start over at the start of each week.

NOTES:

- Start/stop characters (*) are not part of the data and are not shown in the alphanumeric characters.

It is recommended that the characters printed below the bar code be OCR-B in accordance with ANSI Standard X3.49 except the minimum character height shall be as specified in the appropriate samples.

Helvetica, Triumphant, and Autologic Geneva are approved alphanumeric character fonts.

If character fonts other than those recommended above are used, the font must be as specified and must offer clear discrimination between letter O and numeral 0 (zero) and the letter 1 and the numeral 1 (one). The use of the slash to differentiate the zero from the letter O is not acceptable

since normal conventions specify both the number zero and the letter O as being represented by the slashed O or zero.

OEM PRODUCT MARKING FOR "OFF THE SHELF" PRODUCTS TO LUCENT TECHNOLOGIES

Bar Code Symbology

Bar code symbols on "off the shelf" products furnished to Lucent Technologies may utilize either of the following symbologies.

- Code 39
- Code 128
- U.P.C.-A/EAN-13
- UCC/EAN-128

The use of these symbologies must be in accordance with the established industry standards as documented in the appropriate ANSI or ISO symbology standard.

Label Format

- Each label must consist of a printed bar code symbol with a human-readable, alphanumeric interpretation of the bar code symbol above or below the bar code symbol. The alphanumeric characters must be legibly printed, and the information must be as specified in the purchase order.
- One or more bar code symbols may be included with other information as part of a larger label.

Data Content

The following table lists the minimum required data elements for OEM "off the shelf" product labels.

Product Label	
Data Element	**Description**
Product identification	Maximum 30 characters
Serial number	Maximum 18 characters

- On the product identification labels, the product identification number must be that of the part identified by the label. The serial number sequence must not be repeated for the same product identification number.

Bar Code Print Quality Requirements

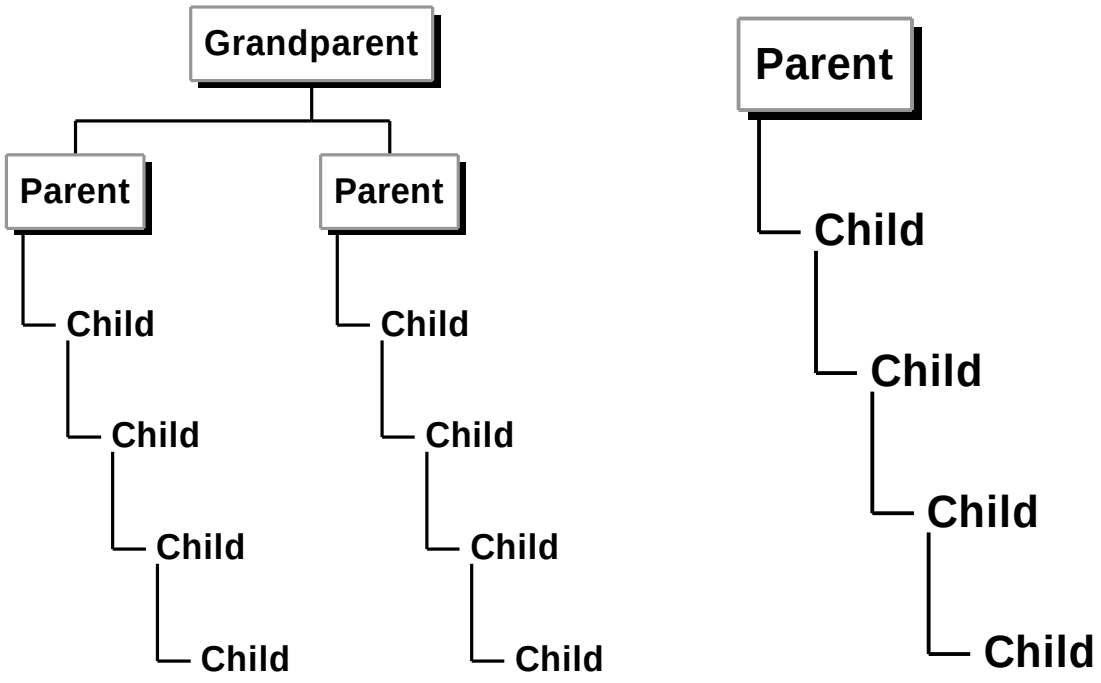
All bar code symbols must be capable of meeting or exceeding the ANSI X3.182 bar code print quality level of C (1.5) at the aperture and wavelength specified in the appropriate ANSI/ISO standard.

CHILD/PARENT/GRANDPARENT PACKAGING RELATIONSHIPS FOR LIKE PRODUCTS ONLY

General Information

Single unit product packages are packed together in several ways. The serial number of a group of identical single unit product packages (children) packed together in an over-pack, multi-pack, or on a pallet is referred to as a parent package serial number. The serial number of a group of identical parent packages packed together on a pallet is referred to as a grandparent package serial number. A pallet can be composed of several parent packages of like items.

The child/parent/grandparent relationship is similar to a tree structure.



Single Unit Pack (Child Packaging)

This is the first packing operation for those products that are placed in a single unit (child) package. The product identification (Comcode or material ID) and serial number of the product in the package must be displayed on the package label in both human-readable and bar code form, along with other label information as specified.

Over-Pack and Palletize

Over-pack is the second level packing operation for those single unit (child) packages that must be combined and placed in a parent package (over-pack container that may have a shipping label on it). Several single unit (child) packages of like items may be placed in one larger parent package that may also have a shipping label on it.

The third level packing operation is palletizing—the term used when several parent packages are placed on a grandparent pallet that is labeled with a shipping label.

Both the parent packages and grandparent pallet are assigned serial numbers as described in the "Format Requirements" section of this document. The product identification (comcode or material ID) number shown on the parent packages and the grandparent pallet will be the same as the product identification (comcode or material ID) for the child packages.

The product identification (comcode or material ID) and grandparent serial number of the package must be displayed on the grandparent pallet label in both human-readable and bar code form, along with other label information as specified. This label is in addition to the shipping label affixed to the pallet load.

The relationships formed when the single unit (child) packages are placed in the parent packages and when the parent packages are placed on the grandparent pallet must be kept in a database for later transmission to BCS–CIO.

Preliminary Multi-Pack

This is the first packing operation for multi-pack parent packages that contain more than one of the same product. A multi-pack parent package consists of several identical products packaged together in an egg crate fashion. Instead of packing the products in a single unit (child) package, the products are placed in specially formed packing material together in a multi-pack parent package.

The parent packages are assigned serial numbers as described in the Product Package Label Requirements section. The multi-pack parent package has a product identification (comcode or material ID) number that is different from the product identification (comcode or material ID) number of the products contained in the box. The product identification (comcode or material ID) number and serial number of the multi-pack parent package must be displayed on the multi-pack parent package label in both human-readable and bar code form, along with other label information as specified.

The relationships formed when the products are placed directly in the multi-pack parent package must be kept in a database for later transmission to BCS–CIO.

Multi-Pack Palletization

This is the second packing operation for those products that are placed in a multi-pack parent package. Palletization is the term used when several multi-pack parent packages are placed on a grandparent pallet.

The grandparent pallets are assigned serial numbers as described in the Product Package Label Requirements section. The product identification (comcode or material ID) number of the units within the multi-pack parent packages and the grandparent pallet are the same as the product identification (comcode or material ID) number.

The product identification (comcode or material ID) number and serial number of the grandparent pallet must be displayed on the grandparent pallet label in both human-readable and bar code form, along with other label information as specified.

The relationships formed when the multi-pack parent packages are placed in grandparent pallet must be kept in a database for later transmission to BCS–CIO.

PRODUCT PACKAGE LABEL REQUIREMENTS

General Information

The product identification (comcode or material ID) and the serial number (if the product is serialized) must be displayed on the box label in human-readable and bar code format. See Figure 4.

Label Layout

Suppliers should use the appropriate figure below as a model for the labels they produce.

Symbology Requirements

All labels covered by this specification utilize Code 39 symbology[3] with the exception of the SCC-14 bar code symbol. The wide-to-narrow element ratio for the Code 39 symbology is 3:1. The SCC-14 is encoded in UCC/EAN-128 symbology in accordance with ANSI/UCC-4. The SCC-14 is concatenated with the four digit Quantity.

Bar Code Print Quality Requirements

The minimum overall bar code symbol print quality grade shall be 1.5/05/660 as measured in accordance with ANSI X3.182-1995 Bar Code Print Quality Guideline. The minimum bar code print quality must be met after testing in accordance with Annex A of this document.

Label Adhesive Requirements

The labels must be tested in accordance with Annex A and must meet or exceed the minimum requirements.

[3] The two start/stop characters (*) are not required printing on the human readable interpretation line under each bar code symbol.

Label Elements

The following tables list data elements for child and parent product package labels.

Child (Unit Package) Labeling

Child (Unit Package) Label (Please refer to Figures 4a and 4b.)	
Data Element	**Description**
Apparatus code	Product description up to 30 alphanumeric characters
Product identification (comcode or material ID)	Material ID of up to 30 characters or a 9-digit comcode (or 9-digit number followed by an "R" suffix for a repaired product) preceded by Data Identifier "1P"
Serial number	12 characters preceded by Data Identifier "S"
Quantity	4 digits preceded by Application Identifier "30"
SCC-14	14 digits preceded by Application Identifier "01"
PEC code	If applicable, 10 alphanumeric characters
Weight of single unit	5 decimal digits (xxx.xx)
Label Production Date (optional)	MM-DD-YYYY
5 lines of variable text	30 alphanumeric characters each

Serial Number Format

Child product package serial numbers are composed of 12 alphanumeric characters as shown below. The child product package serial number must be identical to the serial number of the unit product contained within the package.

Code Format	**Year of Manufacture**		**Manufacturing Location**		**Month or Fiscal Week**		**Serial Number**					
Digit Sequence	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

Character	**y**	**y**	**L**	**L**	**w**	**w**	**X**	**X**	**X**	**X**	**X**	**X**

Characters	Description
yy	Last two digits of the current year.
LL	Two-character constant location code designation. Each supplier will be assigned a location code.
ww	Two-digit number: 1 –12 to indicate month (e.g. January is month 01) or 21 – 72 to indicate week (20 is added to the week number to differentiate months e.g. week 21 is the first week or partial week in January).
XXXXXX	Sequential six-digit number. The numbers will start over at the start of each week.

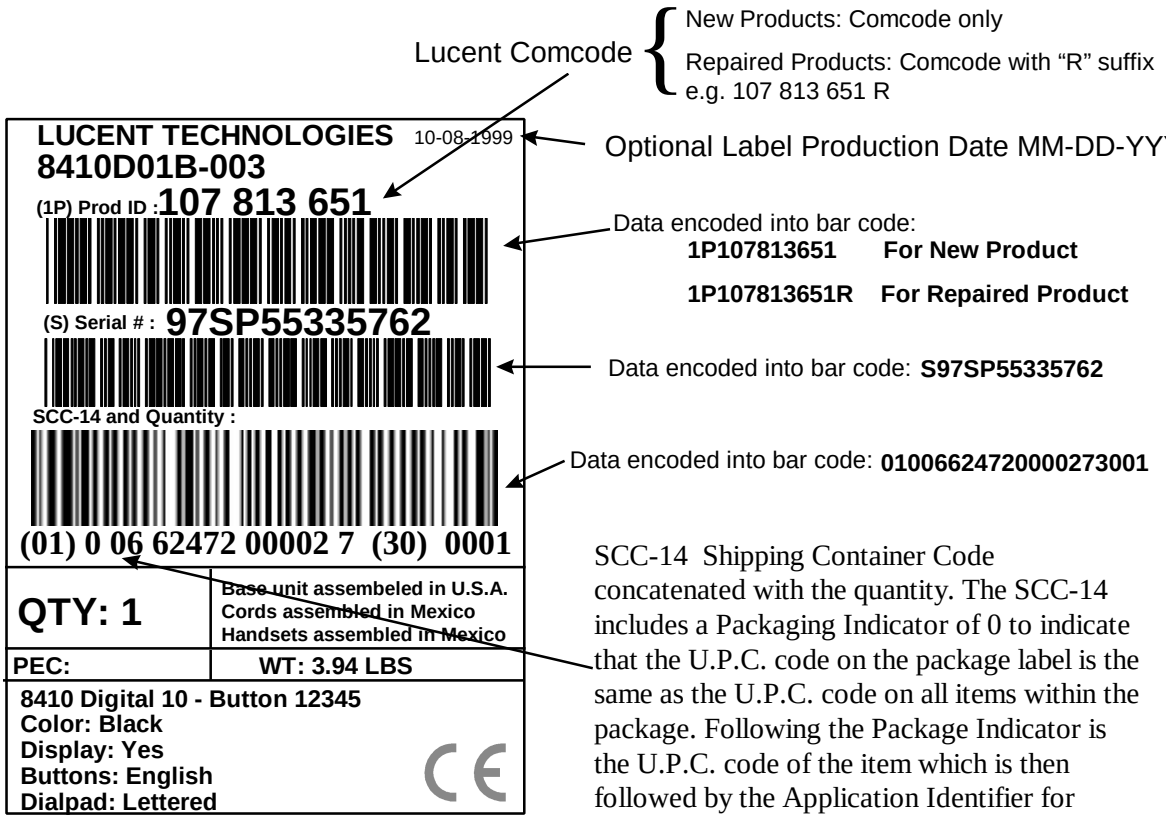
NOTES:

- Start/stop characters (*) are not part of the data and are not shown in the alphanumeric characters.

It is recommended that the characters printed below the bar code be OCR-B in accordance with ANSI Standard X3.49 except the minimum character height shall be as specified in the appropriate samples.

Helvetica, Triumphant, and Autologic Geneva are approved alphanumeric character fonts.

If character fonts other than those recommended above are used, the font must be as specified and must offer clear discrimination between letter O and numeral 0 (zero) and the letter 1 and the numeral 1 (one). The use of the slash to differentiate the zero from the letter O is not acceptable since normal conventions specify both the number zero and the letter O as being represented by the slashed O or zero.



Drawing not to scale

Figure 4a Child (Unit Package) Label

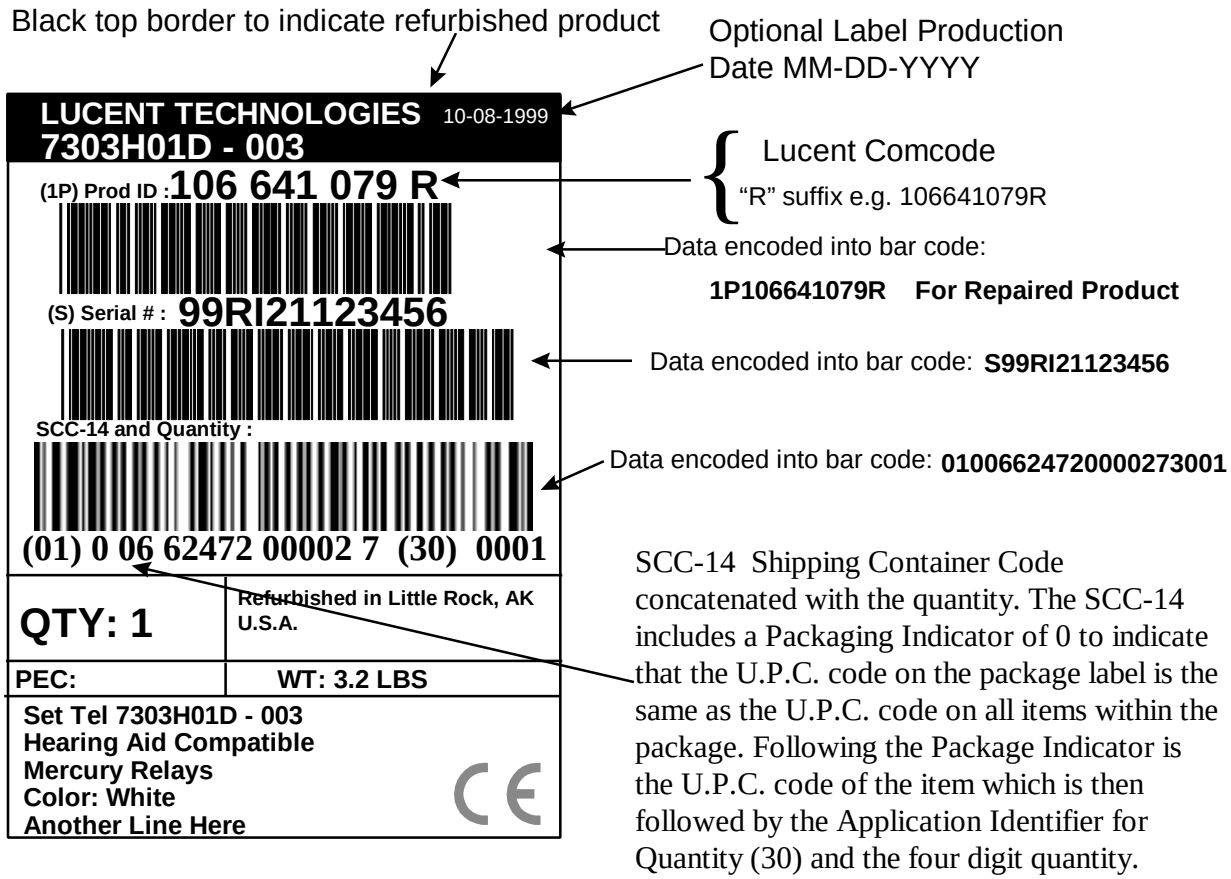


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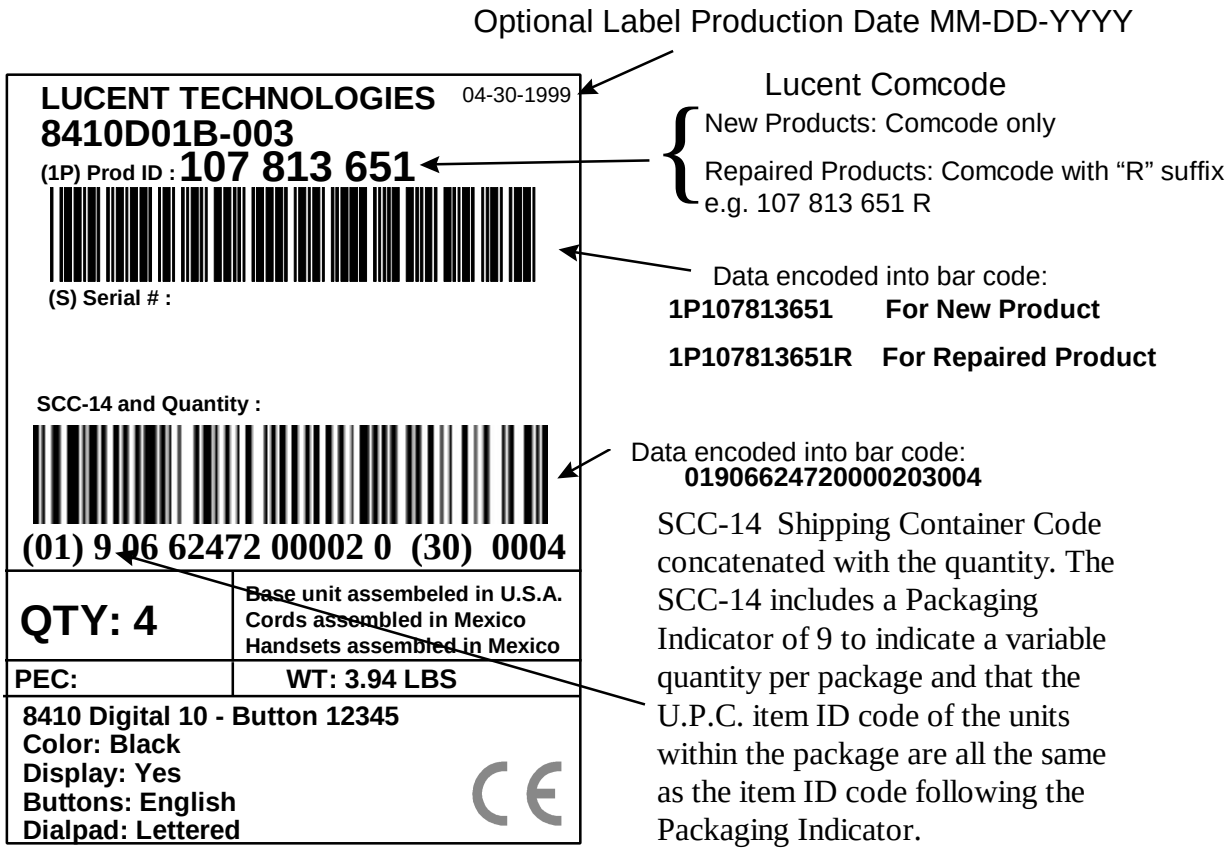
Figure 4b Child (Unit Package) Label with optional black highlight at top of label to identify refurbished or repaired products

Over-Pack and Multi-Pack Labeling

Non-Serialized Products

When the same product is packaged together into a larger container, then the package label must contain the product identification (comcode or material ID), SCC-14, quantity, and weight. See Figure 5.

Non- Serialized Parent (Product Package) Label (Please refer to Figure 5.)	
Data Element	**Description**
Apparatus code	Product description up to 30 alphanumeric characters
Product identification (comcode or material ID)	Material ID of up to 30 characters or 9-digit comcode number (or 9 digit comcode number plus "R" suffix for repaired products), preceded by Data Identifier "1P"
SCC-14	14 digits preceded by Application Identifier "01"
Quantity	4 digits preceded by Application Identifier "30"
PEC code	If applicable, 10 alphanumeric characters
Weight of single unit	5 decimal digits (xxx.xx)
5 lines of variable text	30 alphanumeric characters each



Drawing Not to Scale

Figure 5 - Non-Serialized Parent Label Put on Over-/Multi-Pack Box

Serialized Products

When the same product is packaged together into a larger box, then the over-pack label must contain the product identification (comcode or material ID), parent box serial number, quantity, and weight. See Figure 6. An additional label is required that contains the child product serial numbers, SCC-14 and product identification (comcode or material ID). See Figure 7.

If the parent packages are packed onto a pallet, then the pallet package label must contain the grandparent serial number, product identification (comcode or material ID), SCC-14, and the quantity of units on the entire pallet. See Figure 8.

Serialized Parent (Product Package) Label (Please refer to Figure 6.)	
Data Element	**Description**
Apparatus code	Product description up to 30 alphanumeric characters
Product identification (comcode or material ID)	9-digit part number, or 9 digit part number plus “R” suffix for repaired products, preceded by Data Identifier “1P”
Serial number	12 characters preceded by Data Identifier “S”
SCC-14	14 digits preceded by Application Identifier “01”
Quantity	4 digits preceded by Application Identifier “30”
PEC code	If applicable, 10 alphanumeric characters
Weight of single unit	5 decimal digits (xxx.xx)
5 lines of variable text	30 alphanumeric characters each

Format Requirements for Serial Numbers

Parent Product Package Serial numbers are composed of 12 alphanumeric characters.

Format	Use
yyPLwwXXXXXX	Parent serial number for a group of single units.

Digit Sequence	1	2	3	4	5	6	7	8	9	10	11	12
Code Format	Year of Manufacture		Manufacturing Location		Month or Calendar Week		Serial Number					
Character	y	y	P	L	w	w	X	X	X	X	X	X

NOTES:

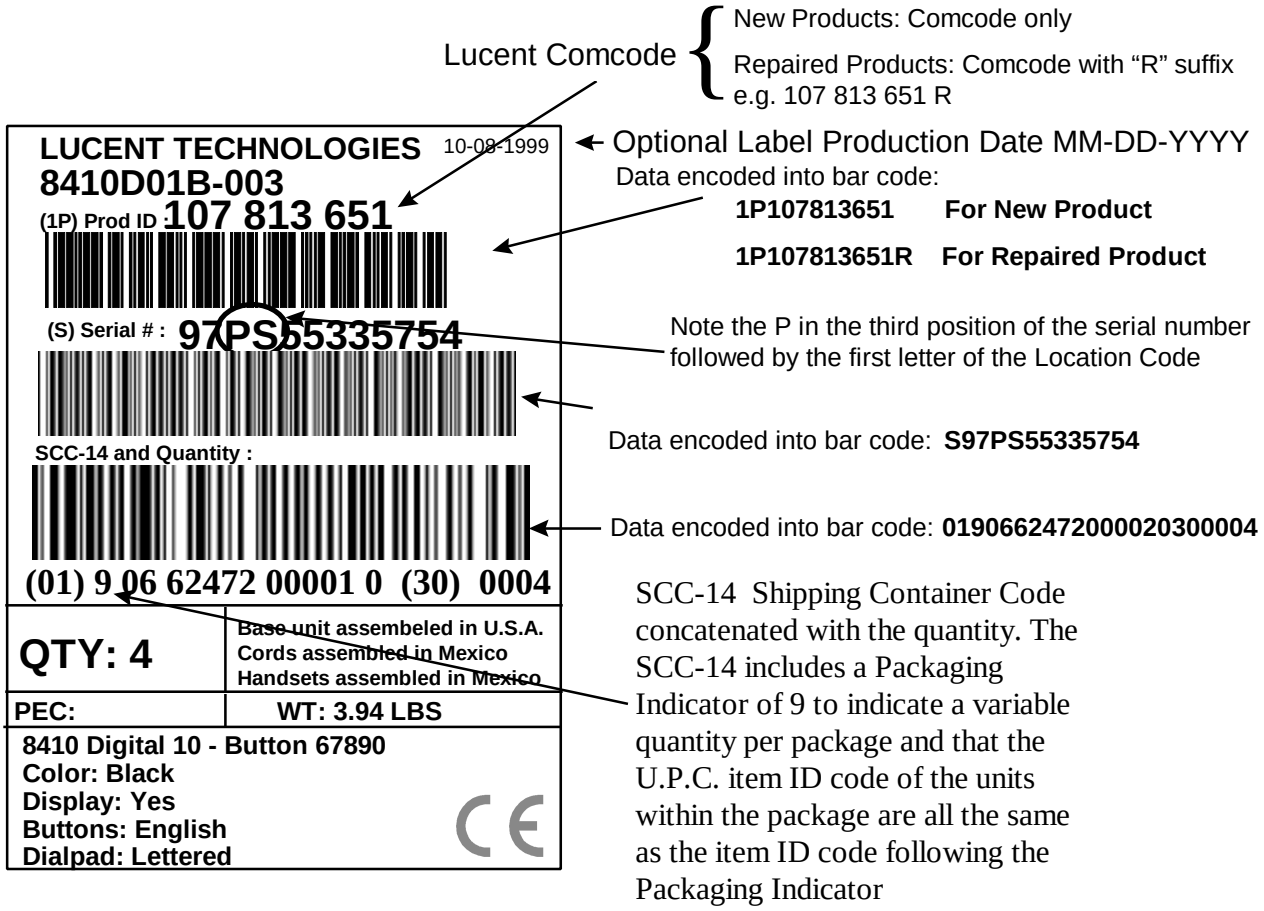
- Start/stop characters (*) are not part of the data and are not shown in the alphanumeric characters.

Characters	Description
yy	Last two digits of the current year.
PL	Two-character constant designation that signals a group of single units (parent). The "P" is constant; the "L" will be the first letter of the supplier location code.
ww	Two-digit number: 1 –12 to indicate month (e.g. January is month 01) or 21 – 72 to indicate week (20 is added to the week number to differentiate months e.g. week 21 is the first week or partial week in January).
XXXXXX	Sequential six-digit number. The "xxxxxx" for parents will be the "xxxxxx" of the first child that goes into the parent.

It is recommended that the characters printed above or below the bar code be OCR-B in accordance with ANSI Standard X3.49 except the minimum character height shall be as specified in the appropriate samples.

Helvetica, Triumphant, and Autologic Geneva are approved alphanumeric character fonts.

If character fonts other than those recommended above are used, the font must be as specified and must offer clear discrimination between letter O and numeral 0 (zero) and the letter 1 and the numeral 1 (one). The use of the slash to differentiate the zero from the letter O is not acceptable since normal conventions specify both the number zero and the letter O as being represented by the slashed O or zero.



Drawing Not to Scale

Figure 6 - Parent label put on Multi-Pack box

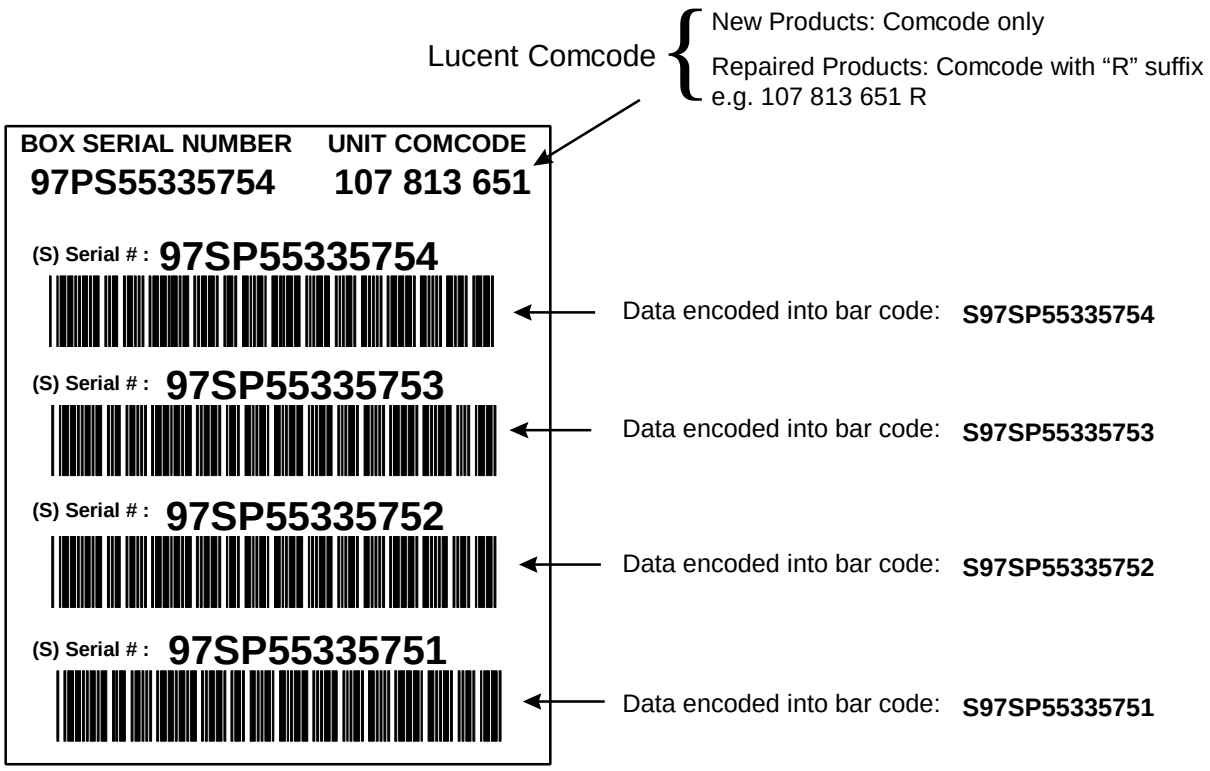


Figure 7 - Parent Label Put on Over-/Multi-Pack Box Showing Children Inside

Grandparent Label (Please refer to Figure 8.)	
Data Element	**Description**
Apparatus code	Product description up to 30 alphanumeric characters
Product identification (comcode or material ID)	9-digit part number, or 9 digit part number with “R” suffix for repaired products, preceded by Data Identifier “1P”
Serial number	12 characters preceded by Data Identifier “S”
SCC-14	14 digits preceded by Application Identifier “01”
Quantity of over-/multi-packs per pallet	4 digits preceded by Application Identifier “30”
5 lines of variable text	30 alphanumeric characters each

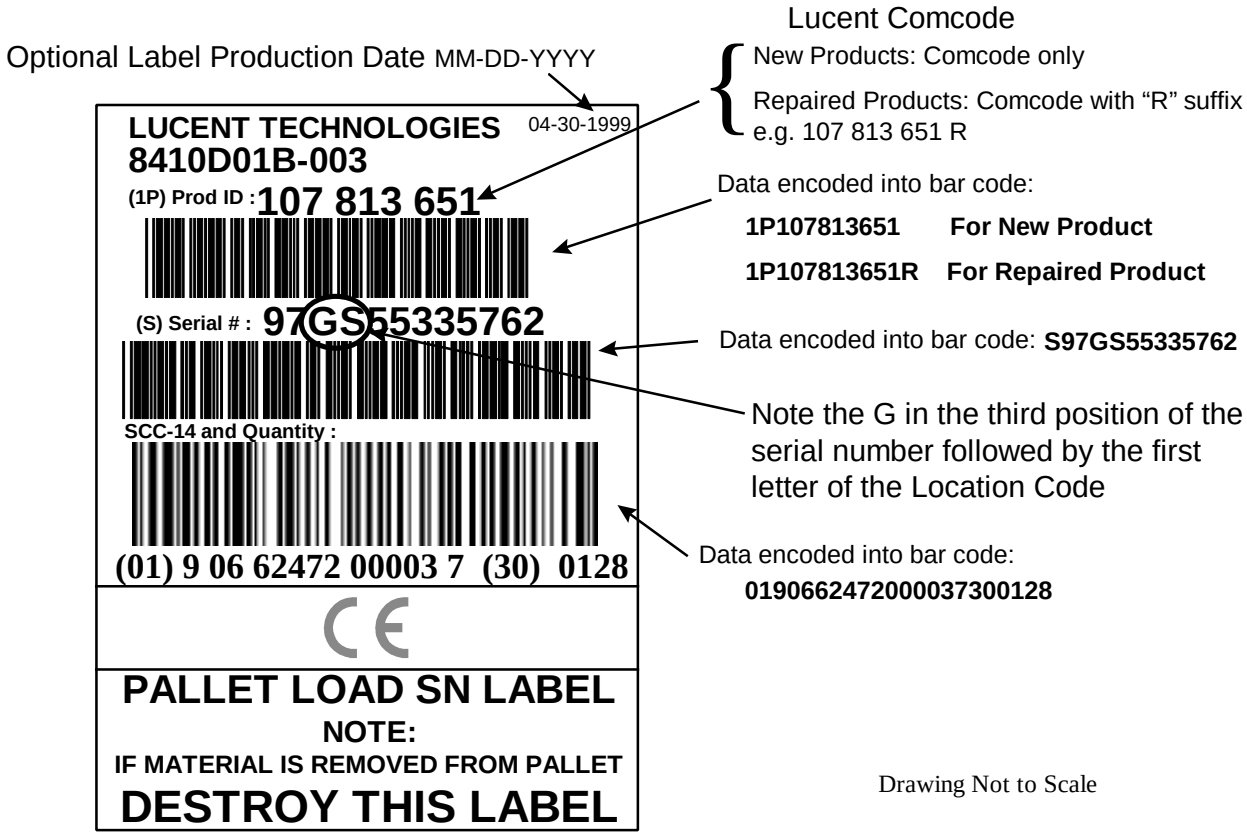


Figure 8 Grandparent (Pallet) Label in addition to the Shipping Label

Format Requirements for Serial Numbers

Grandparent Product Package Serial numbers are composed of 12 alphanumeric characters.

Format	Use
yyGLwwXXXXXX	Grandparent serial number for a group of parents.

Digit Sequence	1	2	3	4	5	6	7	8	9	10	11	12
Code Format	Year of Manufacture		Manufacturing Location		Month or Fiscal Week		Serial Number					
Character	y	y	G	L	w	w	X	X	X	X	X	X

Characters	Description
yy	Last two digits of the current year.
GL	Two-character constant designation signals a group of parents (grandparent). The "G" is constant; the "L" will be the first letter of the supplier location code.
ww	Two-digit number: 1 –12 to indicate month (e.g. January is month 01) or 21 – 72 to indicate week (20 is added to the week number to differentiate months e.g. week 21 is the first week or partial week in January).
XXXXXX	Sequential six-digit number. The "xxxxxx" for grandparents will be the "xxxxxx" of the first parent that goes into the grandparent.

NOTES:

- Start/stop characters (*) are not part of the data and are not shown in the alphanumeric characters.

It is recommended that the characters printed above or below the bar code be OCR-B in accordance with ANSI Standard X3.49 except the minimum character height shall be as specified in the appropriate samples.

Helvetica, Triumphant, and Autologic Geneva are approved alphanumeric character fonts.

If character fonts other than those recommended above are used, the font must be as specified and must offer clear discrimination between letter O and numeral 0 (zero) and the letter 1 and the numeral 1 (one). The use of the slash to differentiate the zero from the letter O is not acceptable since normal conventions specify both the number zero and the letter O as being represented by the slashed O or zero.

OEM PRODUCT PACKAGE MARKING FOR "OFF THE SHELF" PRODUCTS TO LUCENT TECHNOLOGIES

Bar Code Symbology

Bar code symbols on "off the shelf" product packages furnished to Lucent Technologies may utilize either of the following symbologies.

- Code 39
- Code 128
- U.P.C.-A/EAN-13
- UCC/EAN-128

The use of these symbologies must be in accordance with the established industry standards as documented in the appropriate ANSI or ISO symbology standard.

Label Format

- Each label must consist of a printed bar code symbol with a human-readable, alphanumeric interpretation of the bar code symbol above or below the bar code symbol. The alphanumeric characters must be legibly printed, and the information must be as specified in the purchase order.
- One or more bar code symbols may be included with other information as part of a larger label.

Data Content

The following table lists the minimum required data elements for OEM "off the shelf" product package labels.

Product Package Label	
Data Element	**Description**
Product identification	Maximum 30 characters
Serial number	Maximum 18 characters

- On the product package label, the product identification number must be that of the part identified by the label. The serial number sequence must not be repeated for the same product identification number.

Bar Code Print Quality Requirements

All bar code symbols must be capable of meeting or exceeding the ANSI X3.182 bar code print quality level of C (1.5) at the aperture and wavelength specified in the appropriate ANSI/ISO standard.

SHIPPING LABEL REQUIREMENTS

General Information

The Lucent Technologies "*Shipping & Receiving Bar Code Label"* standard 801-001-105 is based on the current version of the ANSI/EIA-556 standard of the Electronic Industries Alliance titled "*Outer Shipping Container Bar Code Label Standard"* and will also meet requirements specified in the Telecommunications Industry Forum (TCIF) "*Shipping Label Guideline*." The intent of the standard is to facilitate automation within shipping, distribution, transportation and receiving operations using bar code technology. This label should be affixed to outer shipping containers, boxes, cartons, pallets, cases, barrels, etc.

A companion document that identifies what data is required by Lucent Technologies business entities and Lucent customers is 801-001-107 "*Customer Shipping Label Profile Program*." The Business Communications Systems profile is A05 and a sample label is shown in Figure 9. The minimum recommended size for the bar code labels shown is 4.0 inch by 6.5. A label size of 5.0 inch by 6.5 inch will accommodate the maximum number of characters in each data field.

Shipping Label Format

Shipping Label Data Fields for Shipments to Lucent Warehouse

Field	Description
From:	Supplier name and address
To:	Customer name and address
Pkg. ID:	7 digit UCC assigned Company Prefix + site code + unique number good for 18 months (Code 39 bar code data field preceded by the appropriate Data Identifier)
Trans ID:	Purchase order number (Code 39 bar code data field preceded by the appropriate Data Identifier)
Cust Prod ID:	Product identification used to order (comcode or material ID); if multiple orders in one pkg./container, "Multi-Order" should be printed (Code 39 bar code data field preceded by the appropriate Data Identifier)
Quantity:	Not used for mixed-load quantity; default is each (Code 39 bar code data field preceded by the appropriate Data Identifier)
Special:	Can be defined by supplier if not required per 801-001-107 (Code 39 bar code data field preceded by the appropriate Data Identifier)
Description:	English description of the product
Pkg. Count:	Package count within the shipment
Pkg. Weight:	weight of package (can be handwritten)

Data Field Format

Data fields encoded in bar code symbols shall include Data Identifiers or Application Identifiers as the first characters in the data field. See Annex B for a listing of commonly used Data and Application Identifiers.

Bar Code Data Field Limit

When printing a 4 inch wide shipping label, a maximum of 17 data characters will fit in any single bar code field on the label. Data characters do not include the required start and stop characters or the required Data Identifier. When printing a 5 inch wide shipping label, a maximum of 23 data characters will fit in any single bar code field.

Supplier Package Identification, PKG ID: Data Field

The first segment (the supplier/manufacturer identification code) of the Supplier Package Identification data field should use the ANSI/EIA-556-A preferred method that specifies the use of a unique seven-digit UCC-assigned company identification code. This code consists of the six-digit company prefix code assigned by the Uniform Code Council, Inc. (UCC) preceded by a zero. The Global Bar Code Technologies Group has obtained the number 662742 from the Uniform Code Council for use by all Lucent Technologies locations. Thus, to identify Lucent Technologies globally, the seven-digit number 0662742 shall be used. To find your company's UCC code, contact the Uniform Code Council, 8163 Old Yankee Road, Suite J, Dayton, Ohio 45458, (513) 435-3870.

The second segment of the package identification data field is the unique package serial number. This segment, which immediately follows the UCC assigned company identification code, may begin with a site code in order to ensure that package serial numbers are not duplicated within a company with many shipping locations.

Shipping Label Example for Shipments to Lucent Technologies BCS

The following example is an excerpt from the Lucent Technologies 801-001-107 standard. The BCS shipping label profile is identified as profile A05. The overlays within the bar code symbols are shown for clarification only and shall not appear on the actual label.

Each package should be labeled and may contain one or more quantities of the same product. It is not recommended to pack items for more than one purchase order in the same package.

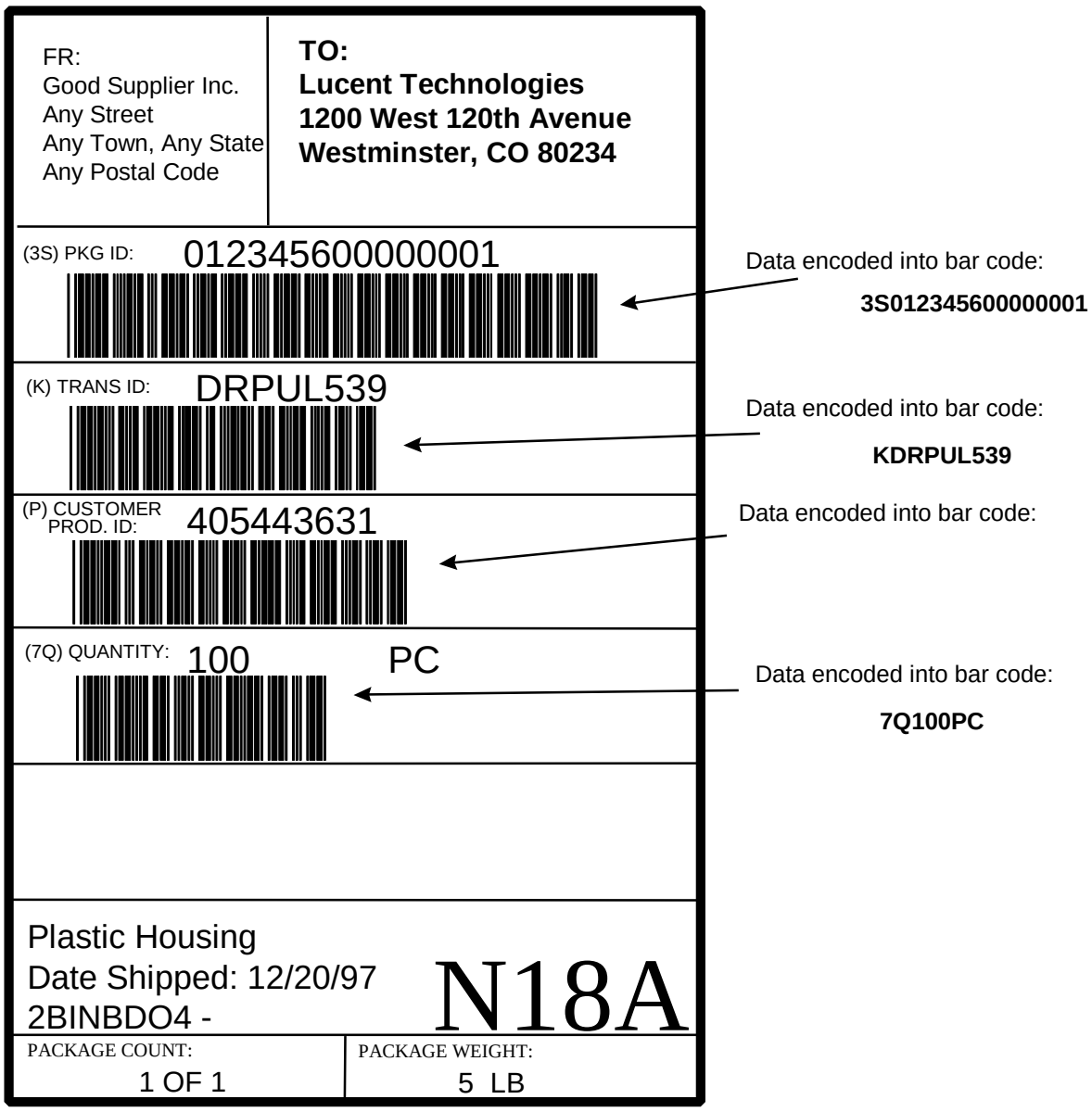


Figure 9 - Shipping Label for packages shipped to Lucent Technologies BCS Facilities

Shipping Label Data Fields for Shipments to Lucent Customers

The format of shipping labels to Lucent Technologies' customers shall follow the guidelines in the 801-001-107 Lucent standard. The following table lists data fields that are most often required.

Field	Description
From:	Supplier name and address
To:	Customer name and address
Pkg ID:	7-digit UCC of supplier + site code + unique number not repeated for 1 1/2 years (Code 39 bar code data field preceded by the appropriate Data Identifier)
Trans ID:	Customer order number (Code 39 bar code data field preceded by the appropriate Data Identifier)
Cust Prod ID:	Product identification used to order (comcode or material ID); if multiple orders in one pkg./container, "Multi-Order" should be printed (Code 39 bar code data field preceded by the appropriate Data Identifier)
Quantity:	Not used for mixed-load quantity; default is each (Code 39 bar code data field preceded by the appropriate Data Identifier)
Special:	Can be defined by supplier if not required per 801-001-107 (Code 39 bar code data field preceded by the appropriate Data Identifier)
Description:	English description of the product as ordered. Can contain other supplier related information
Pkg. Count:	Package count within the shipment
Pkg. Weight:	weight of the package (can be handwritten)

Shipping Label Example for Shipments to Lucent Technologies Customers

The following example is an excerpt from the Lucent Technologies 801-001-107 standard. Unless a specific shipping label customer profile has been developed and included in the 801-001-107 standard, the Generic profile E00 shall be used. The overlays within the bar code symbols are shown for clarification only and shall not appear on the actual label.

Each package should be labeled and may contain one or more quantities of the same product. It is not recommended to pack items for more than one purchase order in the same package.

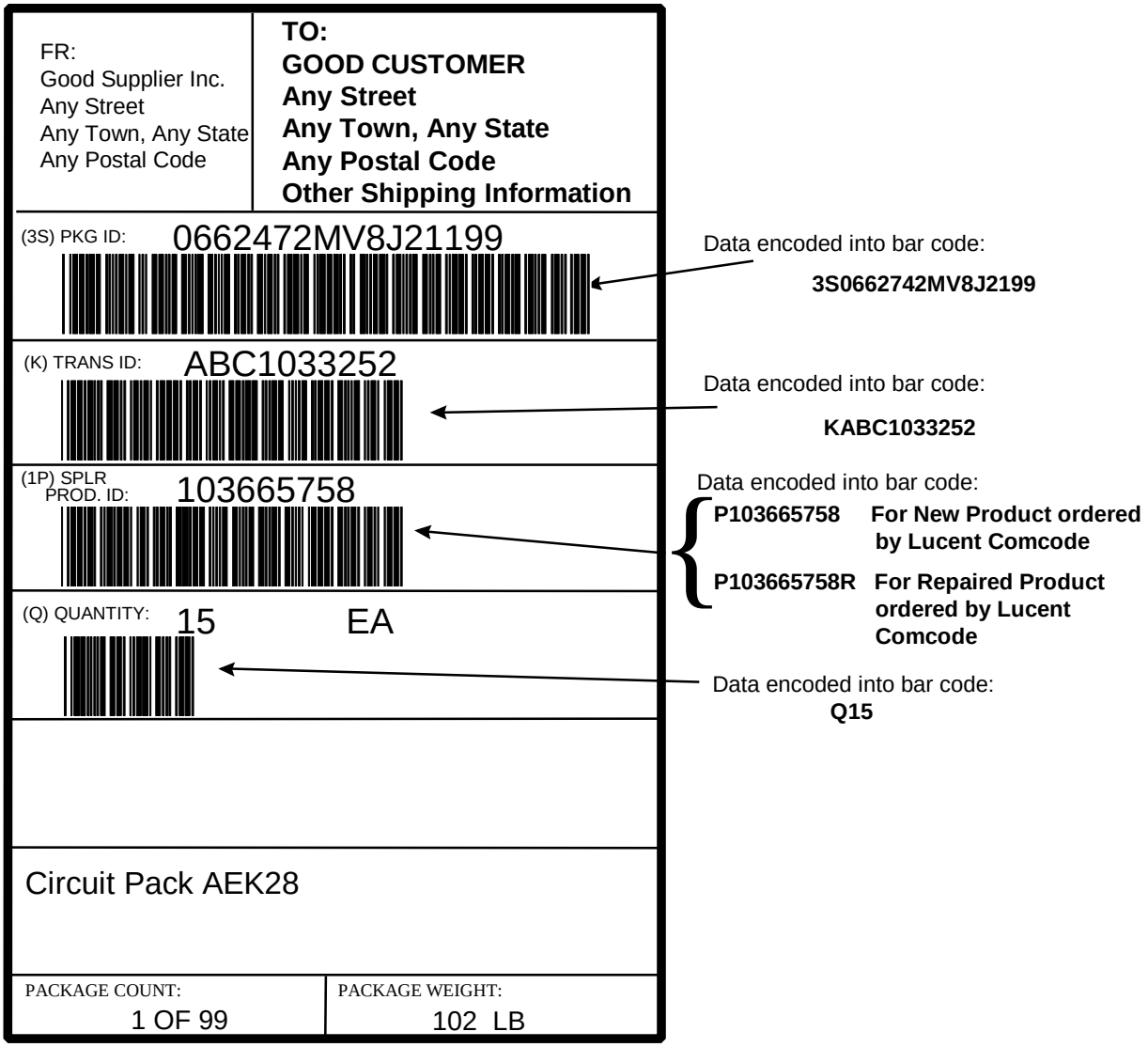


Figure 10 - Generic shipping label for customers not requiring specific label formats

Bar Code Symbol Requirements

Bar Code Symbology

The bar code symbology shall be Code 39 as specified in the *AIM USA Uniform Symbology Specification Code 39.* No check digits shall be used.

Bar Code Density

The nominal narrow element width of all bar codes shall be 0.010 inch. This is the preferred dimension as shown in the Lucent Technologies standard 801-001-105.

A wide-to-narrow element width ratio of 3:1 shall be used.

Bar Code Print Quality

The minimum overall bar code symbol print quality grade shall be 1.5/05/670 as measured in accordance with ANSI X3.182-1995 Bar Code Print Quality Guideline. The minimum bar code print quality must be met after testing in accordance with Annex A of this document.

Label Adhesive Requirements

The labels must be tested in accordance with Annex A and must meet or exceed the minimum requirements.

Label Location

Wherever possible, the label should be affixed to the smaller end of the package or shipping container, which might be facing the aisle if the package is stored on shelving of racks, to permit easy identification during temporary storage. If a label cannot be affixed because of package or container type, shape, or other constraints, the label shall then be affixed to an attached tag. Labels shall not be placed in a position that would inhibit scanning. The label may complement lower-level product package labeling.

Obsolete Labels

Obsolete labels should be removed or covered. When covering obsolete labels, the print quality of the new label applied over the obsolete label shall meet the requirements of this standard.

BCS–CIO DATA TRANSMISSION REQUIREMENTS

Background

This section is currently under review by BCS for implementation of the EDI 3020 version of transaction sets that meet Y2K and other business issues. It is anticipated that a revised requirement will be issued in this document before October 1999.

It is advantageous to both Lucent BCS and its suppliers to have electronic data feeds of manufacturing, repair, and shipping information. OEM vendors with EDI capability have the opportunity to speed payment of invoices utilizing an advanced ship notification process. Using standard EDI interfaces and format, an OEM vendor can provide not only the product identification (comcode or material ID) but serial numbers of the products shipped. Lucent BCS can use these electronic feeds to create the appropriate material tracking records in its data systems. This EDI capability will be available for purchase orders placed in the forthcoming GES (Global Enterprise System) / SAP system.

A vendor who does not have EDI may elect to fax an advanced ship notification that contains the products shipped on a purchase order along with the serial numbers if the product is serialized. Upon shipment of a Lucent customer order, the GES/SAP system will be updated, establishing the relationship between the serial number(s) and the customer. This will give the service organization the ability to associate the serial number(s) with the customer's warranty and maintenance entitlements.

Some OEMs, Lucent BCS warehouses, Lucent BCS manufacturers, Lucent BCS repair centers, and authorized repair vendors are currently providing electronic feeds directly into the Lucent BCS–CIO database for serialized product installed at Lucent BCS customer locations. As Lucent BCS deploys GES at the warehouse, manufacturing, and repair locations, the current electronic feed to BCS–CIO will be replaced by one from GES. Advanced ship notifications will be required from OEM vendors via standard EDI interfaces or fax to provide shipping information and serial numbers for serialized products shipped to Lucent BCS warehouses or directly to customer sites

General Information

Both internal and external suppliers of serialization data to BCS–CIO must meet the data requirements outlined in the following section. Due to the varied technologies and expertise levels outside Lucent Technologies and the need for BCS–CIO security, we require that each entity provide their serial number data to an external server located apart from the BCS–CIO realm of processing. BCS–CIO will poll this external server on a predetermined basis and transfer (FTP or File Transfer Protocol) the serial data for cycle processing.

This procedure duplicates the current internal process for obtaining serial data and consequently allows for commonality on BCS–CIO's side of the process. Specific guidelines for data layout, etc.,

are required. Each supplier will be provided with a unique originating system ID code that identifies to BCS–CIO the sending location.

An external provider may use varied means to provide serial number data, depending on their available technology. Suppliers may use such media as the Internet, E-mail, facsimile, etc., to build a competent interaction system.

The frequency of providing serial data will be determined by the data's volume or other restrictions. BCS–CIO can receive multiple transmissions of BCS–CIO serial data per day. The only requirement is that each new transmission of serial data have a unique cycle number and create time.

If the data feed outlines products moving from a factory to stock, all of the data listed below is not required (see tables for specifics). However, if data covers stock being sent from distributor to customer, customer information must be filled in (again, see tables for specifics).

For both the new internal and external suppliers of BCS–CIO data, we request that BCS–CIO participate in discussions to assess a supplier's ability to satisfy our requirements, whether in the area of data communication or file layout. BCS–CIO requires that inter-system testing be successfully completed before any production is received and processed by BCS–CIO.

Format of Header Record – Record Type 00

The header record identifies the sending location, receiving system, creation date, creation time, and cycle number. Multiple transmissions of serialization data may be sent per day but the create time and cycle number must be unique for each transmission. The cycle number must increment by 1 for each new transmission. New providers of serialization data must acquire a unique originating system ID.

Field Name	Column(s)	Field Length	Required	Default	Comment
Record Type	01 – 02	2	Y	00	Identifies the type of record being sent. Constant value is "00".
Originating System	03 – 10	8	Y	None	Identifies the sending location by a valid assigned code. Constant value is FACTII, where II is the location code.
Destination System	11 – 18	8	Y	None	Identifies serialization's inventory server. Constant value is "INSERV".
Create Date	19 – 26	8	Y	None	The date the originating provider created the file in the format "yyyymmdd".
Create Time	27 – 33	7	Y	None	The time the originating provider created the file in the format "hhmmsss".

Table continued on next page.

Field Name	Column(s)	Field Length	Required	Default	Comment
Cycle Number	34 – 39	6	Y	None	This cycle number will be used to manage/audit sequential transmissions to BCS–CIO. For all locations the cycle number will begin with 000001 and will be incremented by 1 for each subsequent transmission. Multiple transmissions per day are permissible. In the event that the cycle number needs to be reset to 1 or its value needs to be modified in any fashion, the only acceptable procedure will be derived and specified by joint agreement between the production support organizations of both BCS–CIO and the sending location.
Filler	40 - 60	21	Y		Blank space for future use.

Format of Data Record – Record Type 10

The data record identifies either the transfer of equipment between BCS locations (stock) or the shipment to a customer. There will be one Type 10 record for each unit of equipment, at the Product identification (comcode or material ID) level, being "moved" or shipped to a customer. The record Type 10 data must be sequenced by grandparent serial number, parent serial number, and then child serial number.

Field Name	Column(s)	Field Length	Required	Default	Comment
Record Type	01 – 02	2	Y	10	Identifies the type of record being sent. Constant value is "10".
Receiving Location	03 – 10	8	1*		Identifies the location being shipped to.
Grandparent Serial Number	11 – 22	12			Grandparent pseudo serial number. The field will be populated when required to define the grandparent serial number. This is the serial number for the pallet.
Parent Serial Number	23 – 34	12			Parent pseudo serial number. The field will be populated when required to define the parent serial number. This is the serial number for the over/multi-pack.
Comcode	35 – 43	9	1*		Factory Comcode unit identification.
Unit (Child) Serial Number	44 – 55	12	1*		Serial number for shipped units. This field is only populated when units are shipped to a Lucent customer.
PE Code	56 – 65	10	2*		This field is only populated when units are shipped to a Lucent customer.

Table continued on next page.

Field Name	Column(s)	Field Length	Required	Default	Comment
Lucent Tech Order Number	66 – 73	8	1*		This field is only populated when units are shipped to a Lucent customer.
DOSS Order Number	74 – 84	11	2*		This field is only populated when units are shipped to a Lucent customer.
Ship Date	85 – 92	8	2*		Date shipped to customer. This field is only populated when units are shipped to a Lucent customer.
IL	93 –103	11	2*		Installation location code.
Filler	104 –120	17	Y		Blank space for future use.

NOTES:

1* indicates that a unit is being moved between BCS locations (stock) and this field must be populated.

2* indicates that a unit is being shipped to a customer and this field must be populated.

Format of Trailer Record – Record Type 99

The trailer record reflects the completion of the data transmission and indicates the actual count of the Type 10 serialization records prepared. The count is used to validate the reception of all of the data records sent.

Field Name	Column(s)	Field Length	Required	Default	Comment
Record Type	01 – 02	2	Y	99	Identifies the type of record being sent. Constant value is "99".
Total Type 10 Records	03 – 12	10	Y		Actual number of Type 10 records being provided.
Filler	13 – 60	48	Y		Blank space for future use.

Encryption

Lucent BCS requires encryption of electronic data feeds (EDFs) into our system. Secret Agent is the encryption currently being used today. However, corporate policy may change.

RETURNS

When products are returned, Lucent Technologies must be informed as to which serial numbers have been returned.

ANNEX A
PHYSICAL MATERIAL REQUIREMENTS AND TESTING PROCEDURES

A.1 PRODUCT LABEL PHYSICAL MATERIAL REQUIREMENTS AND TESTING PROCEDURES

All labels must be capable of meeting the requirements listed below when analyzed in accordance with the tests described in section A.1.2, Test Methods for Product Labels. Where reference is made to an ASTM designation in this specification, the issue listed in the latest published *ASTM Index to Standards* will apply unless otherwise specified.

The following requirements and tests are intended to ensure that labels and marks can withstand extended long term exposure to a variety of indoor environments, which could include an assembly process, remain affixed to products and are scannable for the intended life of the product. If not subjected to direct sunlight, high humidity, and high temperatures, they should have a useful life of five or more years after application. ***Note: Additional tests may be required for specific exports to specific countries.***

Additionally, all sheet labels must have an outside corner radii of 0.06 inch unless otherwise specified on the purchase order. Roll or strip labels may be square or butt-cut on all corners.[5] Labels must not show delamination, blistered areas, or chipped edges. It must be possible to separate them from the release liner easily without damage.

A.1.1 General

This standard covers the manufacturing and printing requirements for pressure sensitive adhesive backed bar code labels intended primarily to automate product tracking, inventory control and serialized warranty systems.

All labels shall be easily separable from the release liner without damage, be smudge-resistant and be reasonably flat. Label stock should be examined visually for evidence of particles of paper, dust, or other foreign material that would adversely effect print quality.

Observed or calculated values obtained from analysis, measurement, or test shall be rounded off in accordance with the Rounding-Off Method per ASTM E 29 to the nearest unit in the last right-hand place of figures used in expressing the specified limit.

A.1.2 Requirements

The labels shall be capable of meeting the Product Label Requirements as stated in the body of this guideline as well as the requirements of this section when tested in accordance with section A.2, Methods of Test for Product Labels.

[1]Rounded corners are recommended for better adhesion.

Labels shall not show delamination within the label, blistered areas, or chipped edges. The bar code symbol and all alphanumeric characters printed on each label shall be black. Bar code labels shall be scannable and reasonably free from scratches, marks, dots or misplaced color. The labels shall show no evidence of bubbles, adhesive migration or degraded image quality for either the text or the bar code symbol. The minimum bar code print quality shall be 1.5/05/900 both before and after conditioning.

All labels should have minimum outside corner radii of 0.03 inch (0.76 mm) unless otherwise specified.

A.1.2.1 Label thickness

The labels must conform to the dimensions recorded in the appropriate figures. Thickness dimensions are as follows:

Labels without a Laminate	
Overall thickness	0.0020 to 0.0060 inch (0.044 to 0.15 mm)
Label thickness less adhesive	0.042 inch maximum (0.106 mm)
Adhesive thickness	0.0025 inch maximum (0.06 mm)

Labels with a Laminate	
Overall thickness	0.0052 to 0.0078 inch (0.132 to 0.198 mm)
Laminate thickness	0.001 inch maximum (0.025 mm)
Laminate adhesive thickness	0.0015 inch maximum (0.038 mm)
Label thickness less adhesive	0.0042 inch maximum (0.16 mm)
Label adhesive thickness	0.0025 inch maximum (0.06 mm)

A.1.2.2 Nature of adhesive

The adhesive shall be pressure sensitive and permanent. It shall be applied in a uniform layer and be free from bubbles and foreign matter.

A.1.2.2.1 Adhesion strength

The minimum initial adhesion strength two hours after application shall be 0.23 Newton/mm. (25.0 oz/inch).

The minimum adhesion strength after test panel application and conditioning shall be 0.44 Newton/mm (40.0 oz/inch).

A.1.2.3 Abrasion

Labels or marks shall be capable of meeting the requirements of the Product Label Requirements section of this guideline after being subjected to the abrasion test in clause A.2.?.

A.1.2.4 Shelf Life

The shelf life of the labels before application is approximately one year if stored in the original unopened plastic wrapping in a clean area having an ambient temperature of 15 to 37 degrees C (60 to 100 degrees F),[6] maximum 50 percent relative humidity, and no exposure to direct sunlight. Labels may be printed, packaged, opened for label removal, and repackaged before application, provided that the shelf-life expiration date is not extended.

A.1.2.5 Qualification Requirements

Qualification requirements are those requirements that a label manufacturer must comply with in order to become an approved supplier. When on-site labels are to be printed for initial approval, these same qualification requirements apply for each label printer. The qualification requirements do not need to be repeated during regular or periodic product inspections unless any changes have been made to the label media or adhesive.

In order to qualify, sample labels and/or test data must be submitted to establish or show evidence of conformance with all of the requirements of this specification. All (label) sample bar code symbols must:

- Meet or exceed the appropriate ANSI X3.182 bar code print quality level before and after environmental conditioning in accordance with section A.1.3.3.
- Meet or exceed the requirements of section A.1.2.2 of this guideline.

Lucent Technologies Global Bar Code Technology Group will evaluate the labels or test results with respect to these requirements and will retain the responsibility to repeat the evaluation as deemed necessary. Small pilot runs and experimental product will not be considered as complying. Suppliers will be required to certify that product furnished on a contract or purchase order is identical in basic material to that supplied for qualification. Proposed changes either in roll or sheet layout, either to increase printing quality or to reduce costs, must be submitted to the Lucent Technologies Global Bar Code Technology Group for initial approval.

[2] Extended storage at temperatures above 80 degrees F is not advisable.

A.1.2.6 Verification

The recommended bar code verifier for Code 39 symbology is a verifier conforming to ANSI Print Quality Standard X3.182-1995 with a visible and infrared (IR) light source and aperture sizes of 0.005 inch and 0.010 inch. Three verifiers capable of measuring conformance to ANSI print quality requirements are the Photographic Sciences Corp. (PSC) models QC500B, QC600 and QC650; and the RJS, Inc. model Inspector IV. Additional choices for verifiers may be added to this specification after they have been approved by the Lucent Technologies Global Bar Code Technology Group at Holmdel, New Jersey.

A.1.2.7 Assurance of Product Conformance

Label appearance and uniformity are significant issues for Lucent Technologies. Adherence to label dimensions, print font, density (number of bar-coded characters per inch), color, reflectivity, and format requirements will be enforced. Samples are intended to establish compliance of the product supplied to design intent and specification requirements. Submission of either five sheets of labels or a total of 100 labels (the beginning 50 and the end 50) of a roll of production labels is required from each supplier or label printer. Samples must be submitted to Lucent Technologies Global Bar Code Technology group to the attention of Ray Cann, Room 4B305, 101 Crawfords Corner Road, Holmdel, New Jersey 07733-1988. When on-demand labels are being printed there must be evidence of an ongoing quality assurance program to insure continued conformance to Lucent Technologies' requirements.

Pre-production and/or production samples may be required either for product first manufactured to this specification by the supplier or when changes to specification requirements, materials, manufacturing methods, or manufacturing location are made. Production samples may be inspected by the local Lucent Technologies Quality Management Services (QMS) Organization. Unless otherwise directed, samples must be forwarded to Lucent Technologies Global Bar Code Technology group for further evaluation.

Shipment of the product will be deferred until production approval is granted by Lucent Technologies Global Bar Code Technologies group has been received, unless the supplier has been advised in writing that "Shipment need not be withheld pending production sample approval." Shipment of limited quantities in advance of formal production approval may only be authorized by Lucent Technologies Global Bar Code Technologies group. Such approval would normally be given through the QMS Organization.

A.1.2.8 Blank label stock contamination

Blank label stock purchased for the use of on-site printing shall be free of dust and particulate contamination.

A.1.3 Method of test

A.1.3.1 Label thickness

Conformance to the overall label thickness requirements shall use the ASTM D 374, Method C as referenced and modified in ASTM D 1000. Measure the thickness of the label plus the release liner, the release liner alone, and obtain the label thickness by subtraction.

A.1.3.2 Nature of adhesive

The supplier shall certify the degree to which the adhesive is permanent, pressure sensitive and free from bubbles and foreign matter.

A.1.3.3 Adhesive strength

A minimum label size of 10 mm (0.25 inch by 25.4 mm (1.0 inch) should be used for adhesion measurements. When possible, it is recommended to use the actual label size intended for the application.

A.1.3.3.1 Label test panel preparation and adhesion measurement:

Obtain a rubber-covered steel roller and prepare at least 2 stainless steel panels per ASTM D 1000, Method A. Remove labels from the release liner and apply at least four labels to an ASTM stainless steel test panel, and roll per ASTM D 1000 taking care to leave approximately 3 mm (0.125 inch) of release liner on each label for clamping purposes.

Adhesion measurements shall be taken using a crosshead tensile tester making a 90-degree peel (Figure A.1) at a rate of 50 mm (2 inch) per minute using a wire length of approximately 762 mm (30 inch). Calculate the average value of adhesion.

A.1.3.3.2 Initial adhesion strength measurement:

Remove at least three labels from the release liner, apply them to 1 or more stainless steel panels, and roll per ASTM D 1000 taking care to leave approximately 3 mm (0.125 inch) of release liner on each label for clamping purposes. Measure the bar code print quality of the labels on one panel to determine conformance to section A.1.2. In 2 hours (±10 minutes), measure the adhesion strength to conform to the requirements of section A.1.2.2 as described in section A.1.3.3.1.

A.1.3.3.3 Short term 100 degrees centigrade - medium temp adhesion strength measurement:

Place the panel in an oven maintained at 100 degrees Centigrade (212 degrees Fahrenheit). At the end of 168 hours, remove the panel and allow it to cool to room temperature. Within 1 to 3 hours of removing the panel from the conditioning chamber, measure the bar code print quality of the labels on one panel to determine conformance to section A.1.2 and the adhesion strength of the labels on the other panel in accordance with section A.1.3.3.1 to determine conformance with the requirements of section A.1.2.2. Determine the adhesion strength by measuring the adhesive

strength of at least 3 test labels and averaging the results for the overall value. The labels shall show no evidence of self-lifting, delaminating, smudging, or discoloring after conditioning.

A.1.3.3.4 Short term 49 degrees centigrade 95% RH - temp/humidity adhesion strength measurement:

Place the panel in an oven maintained at 49 degrees Centigrade (120 degrees Fahrenheit) and a controlled relative humidity of 95% non-condensing. At the end of 96 hours remove the panel and allow it to cool to room temperature. Within 1 to 3 hours of removing the panel from the conditioning chamber, measure the bar code print quality of the labels on one panel to determine conformance to section 1.2 and the adhesion strength of the labels on the other panel in accordance with section A.1.3.3.1 to determine conformance with the requirements of section A.1.2.2. Determine the adhesion strength by measuring the adhesive strength of at least 3 test labels and averaging the results for the overall value. The labels shall show no evidence of self-lifting, delaminating, smudging, or discoloring after conditioning.

A.1.3.3.5 Long term 82 degrees centigrade - medium temp adhesion strength measurement:

Place the panels in a circulating air oven at 82 degrees Centigrade ±3 degrees Centigrade (180 degrees Fahrenheit ±5 degrees Fahrenheit. At the conclusion of 30 days, measure the bar code print quality of the labels on one panel to determine conformance to section 1.2 and the adhesion strength of the labels on the other panel in accordance with section A.1.3.3.1 to determine conformance with the requirements of section A.1.2.2. Determine the adhesion strength by measuring the adhesive strength of at least 3 test labels and averaging the results for the overall value. The labels shall show no evidence of self-lifting, delaminating, smudging, or discoloring after conditioning.

A.1.3.3.6 Long term 32 degrees centigrade 95% RH - temp/humidity adhesion strength measurement:

Place two panels of labels in a circulating air oven at 32 degrees Centigrade ±3 degrees Centigrade (90 degrees Fahrenheit ±3 degrees Fahrenheit and 95 ±2 percent relative humidity non-condensing. At the conclusion of 30 days, measure the bar code print quality of the labels on one panel to determine conformance to section 1.2 and the adhesion strength of the labels on the other panel in accordance with section A.1.3.3.1 to determine conformance with the requirements of section A.1.2.2. Determine the adhesion strength by measuring the adhesive strength of at least 3 test labels and averaging the results for the overall value. The labels shall show no evidence of self-lifting, delaminating, smudging, or discoloring after conditioning.

A.1.3.4 Abrasion Resistance

The Teledyne Taber Abraser Model 5130 has been found to be a suitable apparatus for abrasion testing. The components needed for this abrasion procedure are:

- Specimen Holder E100-125.
- Specimen Plate S-16.
- Abrading Wheel CS-10.

a) The specimen plate shall be clean and dry. Two labels shall be attached to the specimen plate in such a position that the path of abrasion covers a maximum area of the bar code symbol. The labels shall not be trimmed, rather they are allowed to extend beyond the path of the abrasive wheel. The test labels shall be attached to the specimen plate in accordance with ASTM D-1000, where applicable.

b) When possible the test will be conducted in atmosphere controlled to 50 percent humidity and 21-23 degrees Centigrade (70-74 degrees Fahrenheit). The test samples should be conditioned in the test atmosphere for at least 24 hours before testing.

c) Select one character from the middle of the bar code symbol on each label and measure all the bars and spaces.

d) The specimen plate shall be rotated beneath the abrasion wheels for a period of 100 cycles $\pm$1 cycle with 250 grams of weight. After the required number of cycles, remove the specimen plate and examine the test character on each label.

e) Following the abrasion test linear symbols must meet the print quality requirements of section A.1.2.

A.2 PACKAGE LABEL PHYSICAL MATERIAL REQUIREMENTS AND TEST PROCEDURES

The following requirements and tests are intended to ensure that labels can withstand extended long term exposure to a variety of indoor environments, remain affixed to packages and are scannable for the intended life of the package. Where reference is made to an ASTM designation in this specification, the issue listed in the latest published ASTM index to standards shall apply unless otherwise specified

A.2.1 General

Observed or calculated values obtained from analysis, measurement, or test shall be rounded off in accordance with the Rounding-Off Method per ASTM E 29 to the nearest unit in the last right-hand place of figures used in expressing the specified limit.

All labels shall be easily separable from the release liner without damage, be smudge-resistant and be reasonably flat. Label stock should be examined visually for evidence of particles of paper, dust, or other foreign material that would adversely effect print quality.

A.2.2 Requirements

The labels shall be capable of meeting the symbology requirements as defined within this document when tested in accordance with section A.2.3 Methods of Test.

Labels shall not show delamination within the label, blistered areas, or chipped edges. The bar code symbol and all alphanumeric characters printed on each label shall be black. Bar code labels shall be scannable and reasonably free from scratches, marks, dots or misplaced color. The labels shall show no evidence of bubbles, adhesive migration or degraded image quality for either the text or the bar code symbol. The minimum bar code print quality shall be 1.5/05/660 both before and after conditioning.

A.2.2.1 Adhesion characteristics

The labels shall show no evidence of delamination, bubbles, adhesive migration or degraded image quality for either the text or the bar code symbol..

The minimum initial adhesion strength two hours after application shall be 0.23 Newton/mm. (25.0 oz/inch).

The minimum adhesion strength after test panel application and conditioning shall be 0.44 Newton/mm (40.0 oz/inch).

The label base material shall be capable of resisting tearing during the adhesion testing specified in this standard. The bar code symbols on the label shall withstand damage from 50 passes with a contact type scanner over a path no wider than 0.03 inch (0.76 mm) across the bar code symbol. When contact

scanning, contact should be maintained between scanner and label at all times; but firm pressure, which could damage the label, should be avoided.

A.2.2.2 Nature of adhesive

The adhesive shall be pressure sensitive and permanent. It shall be applied in a uniform layer and be free from bubbles and foreign matter.

A.2.2.3 Use and protection

Label protection against moisture, weathering, abrasion, etc., may be required in harsh environments and is encouraged wherever practicable. Laminates, sprays, window envelopes, and clear plastic pouches are examples of possible protection methods.

In choosing any protection method, however, care must be taken to assure that labels meet print quality requirements of this Annex when the label is in its final configuration affixed to the package.

A.2.2.4 Storage Conditions

Labels affixed to packages that are to be stored for prolonged periods and which are intended to be subsequently scanned, should be stored in areas which do not consistently maintain temperatures above 120 degrees F (49 degrees C) without being protected.

A.2.2.5 Longevity

Labels should continue to be scannable on the package and meet the print quality requirements of this standard for a minimum period of 6 months in a protected environment.

A.2.2.5 Blank label stock contamination

Blank label stock purchased for the use of on-site printing shall be free of dust and particulate contamination.

A.2.2.6 Qualification Requirements

Qualification requirements are those requirements that a label manufacturer or supplier must comply with in order to become an approved. When on-site labels are to be printed for initial approval, these same qualification requirements apply for each label printer. The qualification requirements do not need to be repeated during regular or periodic product inspections unless any changes have been made to the label media or adhesive.

In order to qualify, sample labels and/or test data must be submitted to establish or show evidence of conformance with all of the requirements of this specification. All (label) sample bar code symbols must:

- Meet or exceed the appropriate ANSI X3.182 bar code print quality level before and after environmental conditioning in accordance with section A.2.3.3.

- Meet or exceed the requirements of section A.2.2.1 of this guideline.

Lucent Technologies Global Bar Code Technology Group will evaluate the labels or test results with respect to these requirements and will retain the responsibility to repeat the evaluation as deemed necessary. Small pilot runs and experimental product will not be considered as complying. Suppliers will be required to certify that product furnished on a contract or purchase order is identical in basic material to that supplied for qualification.

A.2.2.7 Verification

The recommended bar code verifier for Code 39 symbology is a verifier conforming to ANSI Print Quality Standard X3.182-1995 with a visible and infrared (IR) light source and aperture sizes of 0.005 inch and 0.010 inch. Three verifiers capable of measuring conformance to ANSI print quality requirements are the Photographic Sciences Corp. (PSC) models QC500B, QC600 and QC650; and the RJS, Inc. model Inspector IV. Additional choices for verifiers may be added to this specification after they have been approved by the Lucent Technologies Global Bar Code Technology Group at Holmdel, New Jersey.

A.2.3 Method of Test

A.2.3.1 Nature of adhesive

The supplier shall certify the degree to which the adhesive is permanent, pressure sensitive and free from bubbles and foreign matter.

A.2.3.2 Adhesive strength

A minimum label size of 10 mm (0.25 inch by 25.4 mm (1.0 inch) should be used for adhesion measurements. When possible, it is recommended to use the actual label size intended for the application.

A.2.3.2.1 Label test panel preparation:

Obtain a rubber-covered steel roller and prepare at least 2 stainless steel panels per ASTM D 1000, Method A. Remove labels from the release liner and apply at least four labels to an ASTM stainless steel test panel, and roll per ASTM D 1000 taking care to leave approximately 3 mm (0.125 inch) of release liner on each label for clamping purposes.

Adhesion measurements shall be taken using a crosshead tensile tester making a 90-degree peel (Figure A.1) at a rate of 50 mm (2 inch) per minute using a wire length of approximately 762 mm (30 inch). Calculate the average value of adhesion.

A.2.3.2.2 Initial adhesion strength:

Remove at least three labels from the release liner, apply them to 1 or more stainless steel panels, and roll per ASTM D 1000 taking care to leave approximately 3 mm (0.125 inch) of release liner on each label for clamping purposes. Measure the bar code print quality of the labels on one panel to determine conformance to section A.2.2. In 2 hours (±10 minutes), measure the adhesion strength to conform to the requirements of section A.2.2.1 as described in section A.2.3.2.1.

A.2.3.2.3 Short term 49 degrees centigrade 95% RH - temp/humidity:

Place the panel in an oven maintained at 49 degrees Centigrade (120 degrees Fahrenheit) and a controlled relative humidity of 95% non-condensing. At the end of 96 hours remove the panel and allow it to cool to room temperature. Within 1 to 3 hours of removing the panel from the conditioning chamber, measure the bar code print quality of the labels on one panel as defined within these guidelines as appropriate and the adhesion strength of the labels on the other panel in accordance with section A.2.3.2.1 to determine conformance with the requirements of section A.2.2.1. Determine the adhesion strength by measuring the adhesive strength of at least 3 test labels and averaging the results for the overall value. The labels shall show no evidence of self-lifting, delaminating, smudging, or discoloring after conditioning.

A.2.3.3 Blank label stock contamination

Prior to installing the roll of blank label stock into an on-site printer, a minimum of 50 consecutive labels shall be visually inspected for evidence of dust or particulate contamination. Use either a piece of black cloth or velvet and wipe lightly over the face of the 50 labels, examine the cloth or the velvet for particles of paper, dust or other foreign material. If any particulate is evident to the unaided eye, the test has been failed and the blank label stock shall be considered non-conforming. Non-conforming stock shall not be used.

A.2.3.4 Recyclable Characteristics

When possible, the label material should be compatible with the substrate material to which it is attached in order to be recycled.

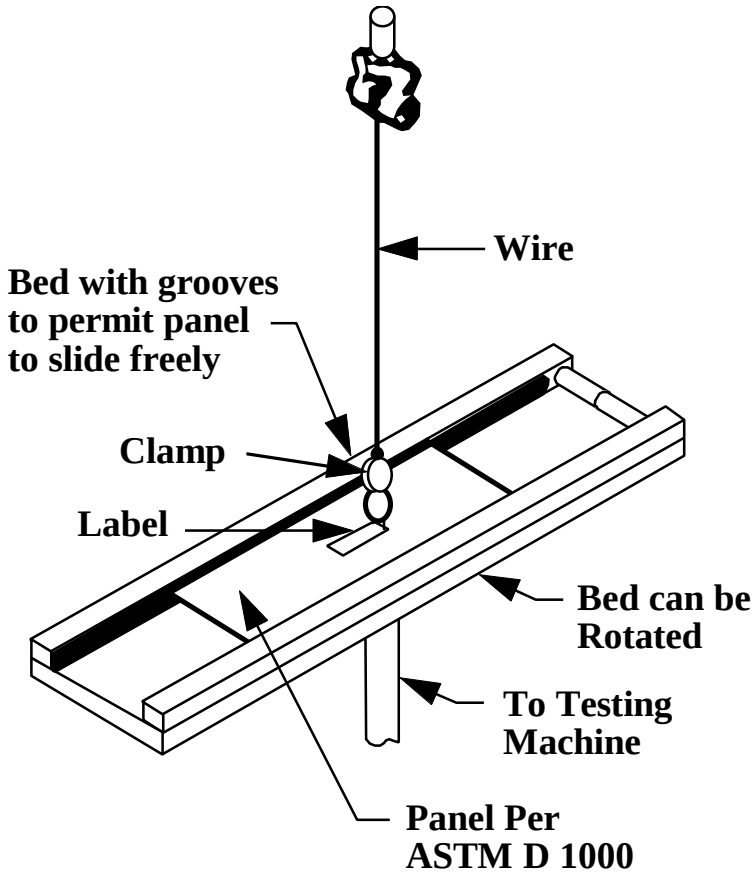


Figure A.1 - Adhesion tester

ANNEX B
COMMONLY USED
DATA IDENTIFIERS &
APPLICATION IDENTIFIERS

Data Identifier	Identifier Description	Application Identifier
5D	ISO format YYMMDD immediately followed by an ANSI X12.3 Data Element 374 Qualifier providing a code specifying type of date (e.g., manufacture date "094")	**11#** **(Prdctn Date)**
J	Unique License Plate number*	**00 (SSCC)**
K	Order number assigned by Customer to identify a Purchasing Transaction (e.g., purchase order number)	**400^**
14K	Combined Order Number and Line Number in the format nn...nn+nn...n where a plus symbol (+) is used as a delimiter between the Order Number and Line Number.	**400^**
4L	Country of Origin, two-character ISO 3166 country code	**422**
52L	Ship To location code defined by a postal authority (e.g., 5-digit and 9-digit ZIP codes identifying U.S. locations or 6-character postal codes identifying Canadian locations)	**420**
55L	Ship To location code defined by a postal authority in the format: postal code (e.g., 5-digit ZIP codes identifying U.S. locations or 6- or 7-character postal codes identifying United Kingdom locations) followed by 2- character ISO 3166 country code (e.g., US or GB)	**421 (Note: AI uses 3-digit 3166 Code)**
3N	Coding Structure in Accordance with Format Defined by Electronic Industries Association Japan (EIAJ)	**903N**
P	Item Identification Code assigned by Customer	**241**
1P	Item Identification Code assigned by Supplier	**01**
2P	Code assigned to specify the revision level for an Item (e.g., engineering change level, edition, or revision)	**240**
3P	Combined manufacturer identification code/item code (12 digit U.P.C. data preceded by the digit zero (0)	**01 (SCC-14)**
7P	Common Language Equipment Identification (CLEI) Code (Telecommunication Equipment Identifier) assigned by the manufacturer per ANSI T1.213 to some telecommunications equipment	**907P**
8P	14-digit UCC/EAN format for Standard Multi-pack Shipping Container Symbol code structure	**01 (SCC-14)**
9P	9-digit DUNS Company ID followed by Supplier Part Number	**909P**
Q	Quantity, Number of Pieces, or Amount (numeric only) (unit of measure and significance mutually defined)	**30**

7Q	Quantity, Amount, or Number of Pieces in the format: Quantity followed by the two character ANSI X12.3 Data Element Number 355 Unit of Measurement Code	**3xxx**
S	Serial number or code assigned by the Supplier to an entity for its lifetime, (e.g., computer serial number, traceability number, contract tool identification)	**21**
1S	Additional code assigned by the Supplier to an entity for its lifetime (e.g., traceability number, computer serial number)	**250**
3S	Unique Package Identification assigned by Supplier (lowest level of packaging which has a package ID code; shall contain like items)	
4S	Package Identification assigned by Supplier to master packaging containing like items on a single customer order	
5S	Package Identification assigned by Supplier to master packaging containing unlike items on a single customer order	
6S	Package Identification assigned by Supplier to master packaging containing like items over multiple customer orders	
7S	Package Identification assigned by Supplier to master packaging containing unlike items over multiple customer orders	
1T	Traceability Number assigned by the Supplier to identify/trace a unique group of entities, (e.g., lot, batch, heat)	**10**
V	Supplier Code assigned by Customer	**90V**
3V	6-digit Company Code as assigned by the Uniform Code Council (UCC) preceded by the digit zero (0) or 7-digit EAN Manufacturer ID	**01 (SCC-14)**
12V	9-digit DUNS Number as assigned by Dun & Bradstreet to identify a manufacturer	**9012V**
13V	9-digit DUNS Number as assigned by Dun & Bradstreet to identify a supplier	**9013V**

(#) : To indicate only year and month, DD can be filled with "00"

(*): For a License Plate number to be unique world wide requires: 1) A unique number assigned by the trading partner, 2) A unique code assigned to the trading partner by an organization, and 3) A unique code providing global identification of the assigning organization.

(^) : The definition of 400 can encode order, release, and line numbers, at the discretion of the issuer. Release is preceded by the delimiter “/” and Line number is preceded by delimiter “+”.

Comments for Consideration in next reissue of 801-001-108. Fax to 732-949-7850.