IEC 62090

Edition 2.0 2017-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Product package labels for electronic components using bar code and two dimensional symbologies

Étiquettes d'emballage de produits pour composants électroniques, utilisant un code à barres et une symbologie bidimensionnelle

IEC 62090:2017-04 (en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PRODUCT PACKAGE LABELS FOR ELECTRONIC COMPONENTS USING BAR CODE AND TWO-DIMENSIONAL SYMBOLOGIES

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62090 has been prepared by IEC technical committee 91: Electronics assembly technology.

This bilingual version (2019-09) corresponds to the monolingual English version, published in 2017-04.

This second edition cancels and replaces the first edition published in 2002. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Applicable data elements have been added. Data identifiers of those data elements are "10D", "14D", "2P", "25L", "18V", "V", "J", "3S", "13E", "33L" and "34L".

b) The following new informative annexes have been added:
   – Annex C, *URL*;
   – Annex D, *Examples of data element short titles*;
   – Annex E, *Package levels for component package labels*.

The text of this International Standard is based on the following documents:

CDV	Report on voting
91/1394/CDV	91/1430/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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PRODUCT PACKAGE LABELS FOR ELECTRONIC COMPONENTS USING BAR CODE AND TWO-DIMENSIONAL SYMBOLOGIES

1 Scope

This document applies to labels on the packaging of electronic components for automatic handling in B2B processes. These labels use linear bar code and two-dimensional (2D) symbols. Labels for direct product marking and shipping labels are excluded. Labels required on the packaging of electronic components that are intended for the retail channel of distribution in B2C processes are also excluded from this document.

Bar code and 2D symbol markings are used, in general, for automatic identification and automatic handling of components in electronics assembly lines. Intended applications include systems that automate the control of component packages during production, inventory and distribution.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 15417, *Information technology – Automatic identification and data capture techniques – Code 128 bar code symbology specification*

ISO/IEC 15418, *Information technology – Automatic identification and data capture techniques – GS1 Application Identifiers and ASC MH 10 Data Identifiers and maintenance*

ISO/IEC 15434, *Information technology – Automatic identification and data capture techniques – Syntax for high-capacity ADC media*

ISO/IEC 15459 (all parts), *Information technology – Automatic identification and data capture techniques – Unique identification*

ISO/IEC 16022, *Information technology – Automatic identification and data capture techniques – Data Matrix bar code symbology specification*

ISO/IEC 16388, *Information technology – Automatic identification and data capture techniques – Code 39 bar code symbology specification*

ISO/IEC 18004, *Information technology – Automatic identification and data capture techniques – QR Code bar code symbology specification*

ISO/IEC 19762, *Information technology – Automatic Identification and data capture (AIDC) techniques – Harmonized vocabulary*

ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ANSI MH10.8.2, *Data Identifier and Application Identifier Standard*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
component
electronic or electrical parts (e.g. bare printed circuit boards, integrated circuits, capacitors, diodes, electronic modules, switches, heat sinks, resistors, electronic/electrical connectors, etc.) used in a first level assembly

3.2
component package
commercial unit of components defined by the supplier including, if applicable, their means for protection, structured alignment or for automated assembly

Note 1 to entry Typical examples are shown in Figure 4.

Note 2 to entry For the purposes of this document, the term "component package" includes a multiple of the elements depicted in Figure 4, e.g. four reels in one box.

3.3
country of origin
manufacturing country where the product obtained its present identity as a part, subassembly, or finished product

Note 1 to entry: The definition of "country of origin" should be in line with local regulations.

4 Label data content and requirements

4.1 Data elements – general

This document allows mutual agreements between the supplier and the customer to alter or enhance any of the specifications done in this document.

The label format accommodates mandatory, optional and mutually agreed data elements. Examples of data element short titles are given in Annex D.

This document does not supersede or replace any applicable safety or regulatory marking or labelling requirements. This document is to be applied in addition to any other mandated labelling requirements. The labelling requirements of this document and other documents may be combined into one label or appear as separate labels.

Approval and conformity markings, branding elements and other information can be added when applicable. Typically, these are not relevant for automatic processing, and therefore not further outlined in this document.

The number included in the character count is exclusive of overhead characters such as start and stop characters, data identifiers and any other characters required by a standard symbology specification for properly encoded data.

All data elements encoded in a machine-readable medium shall be preceded by the appropriate ISO/IEC 15418 or ANSI MH10.8.2 Data Identifier.

The manufacturer may add any data on the label. Additional linear bar codes or data elements in the 2D symbol shall use the appropriate data identifiers.

If the optional data specified in 4.3 are indicated on the labels, they should be used as described below.

Any further additional data or specific formats or anything else may mutually be agreed between the supplier and the customer. Mutual agreements between trading partners are not restricted by this document.

Data elements where global uniqueness is relevant shall follow the ISO/IEC 15459 series' rules, or be combined with the ISO/IEC 15459 series' compliant company ID with data identifier “18V” and be unique within the scope in this company.

4.2 Mandatory data elements

4.2.1 Manufacturer item identification – DI “1P” and “25P”

The manufacturer-assigned item identification is mandatory.

If “1P” is used, the conformity to the ISO/IEC 15459 series is achieved by its combination with the globally unique company ID “18V”.

4.2.2 Customer product code – DI “P”

The customer product code is the code assigned to the product by the customer, and may be transmitted together with the order.

NOTE Customer product codes on component packages are relatively widely adopted. But when manufacturing on stock or selling via distributors, this information is not yet known.

Adding customer information on the label is subject to a purchase agreement between the supplier and the customer. If there is no specific purchase agreement, it is up to the manufacturer to add this information or not.

4.2.3 Manufacturer identification – DI “18V” and “21V”

The manufacturer identification shall uniquely identify the manufacturer to which the component is traceable.

“18V” is the default manufacturer identification.

In case the manufacturer’s organizational sub unit is required, e.g. to indicate a manufacturing location, then DI “21V” is used in addition to “18V”. In case of mutual agreement between trading partners, “21V” can be used instead of “18V”.

In human-readable form, the manufacturer identification is the full manufacturer name or its logo. In machine-readable form, the manufacturer identification is assigned by a recognized body that assigns company identification according to the ISO/IEC 15459 series.

The human-readable manufacturer identification and the machine-readable manufacturer identification are different. It is recommended that there be a 1:1 relation between human-readable and machine-readable manufacturer identification.

4.2.4 Quantity – DI “Q” and “7Q”

The quantity shall be the quantity in the package or container to which the label is affixed. The default unit of measure for data identifier “Q” is “EACH” or “PIECES”.

When a different unit of measure is required, as agreed between trading partners, data identifier “7Q” shall be used with the quantity followed by two alphanumeric characters representing the unit of measurement code defined in Annex D of ANSI MH10.8.2.

It is recommended to use the quantity with a unit of measure only if the unit is different from “piece”.

Print only the significant digits for the human-readable quantity. Do not print leading zeros.

4.2.5 Traceability identification – DI “S” and “25S”, “1T” and “25T”

4.2.5.1 General

The traceability identification shall be assigned by the manufacturer. This category of identification includes serial numbers and lot/batch numbers.

Traceability identification should be either a serial number (using data identifier “S” or “25S”) or a lot/batch number (using data identifier “1T” or “25T”).

In certain circumstances, both the serial number and the lot/batch number may be shown on the label. In this case, at least one of the two shall be encoded in a linear bar code and both shall be included in the 2D symbol.

4.2.5.2 Serial number – DI “S” and “25S”

A serial number is a unique code assigned by the supplier to an entity for its lifetime. The format for the serial number is to be defined by the manufacturer.

4.2.5.3 Lot/batch number – DI “1T” and “25T”

A lot/batch number is a code assigned by the supplier to identify or trace a unique group of entities (e.g. manufacturing lot, batch, inspection lot). The format for the lot/batch number is to be defined by the manufacturer.

4.2.6 Country of origin – DI “4L”

The country of origin shall be shown in human-readable information using the full country name.

This shall be in addition to the two-character country codes as per ISO 3166 data being encoded in a machine-readable symbol.

4.2.7 Production date – DI “16D”

Date code shall be in accordance with ISO 8601. When encoded in a machine-readable symbol, either the data identifiers “10D”, “11D” or “16D” shall be used. Preference should be given to “16D”.

The production date is determined by the manufacturer in an appropriate manner for the specific product.

NOTE ISO 22742 recommends the format “16D” for the production date.

4.2.8 Package identification – DI “J” and “3S”

Unique package identification (i.e. licence plate) shall be in accordance with the ISO/IEC 15459 series.

A licence plate with data identifier “J” is the recommended format.

If there are several layers of packages with a 1:1 relation each, then the same package ID is to be used for the labels on the different levels of packaging. If there is more than one package in a package, then there shall be different package IDs.

EXAMPLE 1 A reel in a dry pack in a pizza box all have the same package ID on their respective labels.

EXAMPLE 2 Multiple reels in one pizza box each have different package IDs, and the pizza box itself has another ID, too.

NOTE 1 However, as there is also the unique company code according to the ISO/IEC 15459 series with data identifier “18V” as mandatory data element, global uniqueness can be achieved by the combination of this unique company ID and a package ID unique within the domain of this company with data identifier “3S”.

NOTE 2 When using “3S”, this element is not suited to be used as primary key in an RFID tag in case of future RFID marking of the component package.

4.3 Optional data elements

4.3.1 Expiration date – DI “14D”

An expiration date may be shown on a package label when the packaged items need to be consumed/processed (e.g. soldered) before a certain date, when stored under conditions defined by the manufacturer.

The data format of the expiration date is YYYYMMDD.

4.3.2 Revision level – DI “2P”

The revision level specifies the revision or version of an item, e.g. engineering change level, edition, or revision.

4.3.3 EIAJ ID – DI “3N”

Data identifier “3N” is a coding structure in accordance with the format defined by the Electronic Industries Association of Japan (EIAJ).

Refer to Electronic Commerce Alliance for Global Business Activity (ECALGA) Standards.

4.3.4 Manufacturer location – DI “25L”

The global unique location code according to the ISO/IEC 15459 series is structured as a sequence of three concatenated data elements: the issuing agency code (IAC), followed by the company identification number (CIN), followed by the physical internal location code that is unique within the CIN holder's domain, shall be used to identify a manufacturer’s location.

EXAMPLE 1 Using IAC LE (EDIFICE): **25LLEIBMABCDE**

EXAMPLE 2 Using IAC UN (Dun&Bradstreet): **25LUN123456789ABCDE**

NOTE The extension to the DUNS # for different locations is not needed when each location has its own DUNS #.

4.3.5 Customer assigned supplier code – DI “V”

Some customers use their own assigned codes for suppliers, and require this information also on component packages.

It is to be considered that a customer-assigned vendor/supplier code is specific for this one customer. Labels with customer-specific content cause additional efforts and challenges, e.g. in case of production on stock, distribution via resellers or customer returns. Some distribution models may not work when customer data is required on labels. Returning packages with customer specific data usually will imply re-labelling. Therefore, using a customer-assigned vendor/supplier code is allowed but not recommended by this document.

4.3.6 Moisture sensitivity level – DI “13E”

The moisture sensitivity level is a class of time period in which a moisture-sensitive device can be exposed to ambient room conditions, according to IPC/JEDEC J-STD-020 and IEC 61760-4. This is important information, especially for components exposed to soldering processes. At least the moisture sensitivity level should be indicated for such components.

4.3.7 URL – DI “33L” and “34L”

A link to further information accessible via the internet for this specific package can be added in a dedicated data element using data identifier and corresponding data structure “33L”, or using the data identifier and corresponding data structure “34L”. See Annex C “URL” for details.

NOTE 1 These DIs are used upon agreement between the supplier and the customer.

NOTE 2 Whether additional data or information is provided, what kind of data and how data is provided, is at the discretion of the party owning the data.

4.4 Data semantics and formats defined by the data identifiers

Table 1 lists all the relevant data elements sorted by their respective data identifier.

Table 1 – Data identifiers

Data identifier	Mandatory (M)/optional (O)	Data field	Data characteristics type/length	Description
10D	M[a]	Date	an3 + n4	Format YYWW
11D		Date	an3 + n6	Format YYYYWW
16D		Production date	an3 + n8	Format YYYYMMDD
14D	O	Expiration date	an3 + n8	Format YYYYMMDD
4L	M	Country code	an2 + an2	two-character country code assigned by ISO. The country of origin is defined as the manufacturing country where the product obtained its present identity as a part, sub-assembly, or finished product. With the agreement of the trading partners and when the country of origin is mixed, country code “AA” shall be used. The country code is found in ISO 3166. EXAMPLE 4L US
1P	M[b]	Manufacturer part number		
25P		Product number	an3 + an...32	Combined IAC/CIN and item code assigned by the supplier
2P	O	Revision level		Code assigned to specify the revision level for an item
P	M	Customer product code	an1 + an...25	Code assigned to the product by the customer Mandatory only in case the customer product code is available to the manufacturer at the time of manufacturing. Subject to the purchase agreement between manufacturer and customer.

Data identifier	Mandatory (M)/optional (O)	Data field	Data characteristics type/length	Description
25L	O	Manufacturer location ID	an3 + an...25	Globally unique location ID, assigned by the manufacturer according to the rules of the ISO/IEC 15459 series
18V	M	Manufacturer ID	an3 + an...25	Default manufacturer ID according to the ISO/IEC 15459 series
21V	O	Organizational sub unit ID	an3 + an...25	Organizational Sub Unit according to the rules of the ISO/IEC 15459 series
V	O	Customer assigned vendor code	an1 + an...18	Code assigned to the supplier by the customer
J	M[c]	Licence plate, package ID	an2 + an...25	
3S		Package ID	an2 + an...25	
S	M[d]	Serial number	an1+ an...25	Serial number or code assigned by the supplier to an entity for its lifetime
25S		Serial number	an3 + an...32	Combined IAC/CIN and the serial number assigned by the supplier[c]
1T	M	Lot/batch number	an2 + an...25	Lot/batch number defined by the manufacturer
25T	M	Lot/batch number	an3 + an...32	Combined IAC/CIN and entity identification and lot/batch number assigned by the supplier
7Q	M[e]	Quantity with unit of measure	an2 + n..8 + an2	The quantity with qualifier[e] of products in the product package (CR = cubic metre) EXAMPLE 7Q1CR (This includes an encoded decimal point, if necessary)
Q		Quantity in package	an1 + n...8	The number of products (pcs) in the product package. EXAMPLE Q2000
13E	O	Moisture sensitivity level	an3 + an1...3	MSL indicator defined in IEC 61760-4 or IPC/JEDEC J-STD-020 should be used based on mutual agreement between trading partners. EXAMPLE 13E2a
33L	O	Uniform resource locator (URL)	Includes all characters that form a URL, including header data such as e.g. HTTP://. Character set as listed in RFC 1738.	Complete URL linking to an internet destination determined by the labeller. See Annex C: URL

Data identifier	Mandatory (M)/optional (O)	Data field	Data characteristics type/length	Description
34L	O	Pointer to process URL (P2P URL)	Includes all characters that form a URL, including header data such as e.g. HTTP://. Character set as listed in RFC 1738.	Pointer to process URL (P2P URL) is setting the rules for generating a URL out of item data in conjunction with a portal address encoded in AIDC media jointly with other data. The rules are described with ANSI MH10.8.2 (34L). See Annex C: URL

[a] One of the date formats “10D”, “11D” or “16D” shall be used. Although format “16D” with “YYYYMMDD” is recommended, the manufacturer may choose one of the other date formats.

[b] One of the manufacturer assigned product code formats “1P” or “25P” shall be used.

[c] Either “J” or “3S” applies. If “3S” is used, global uniqueness is achieved by combining this element with the company ID “18V”.

[d] One of the manufacturer assigned serial number formats “S” or “25S” shall be used.

[e] Either quantity in format “7Q” or “Q” applies. Refer to Annex D of ANSI MH10.8.2.

4.5 Data representation

4.5.1 General formatting

All data elements shall be represented on the label as human-readable text. Mandatory data shall be encoded in a 2D machine-readable symbol. In addition, some of the data should be encoded in linear bar codes. See Table 2.

Table 2 – Mandatory data elements and their representations

Data	Human readable	Linear bar code [a]	Two-dimensional symbol
Item identification code assigned by the manufacturer	M	M	M
Manufacturer	M	O	M
Quantity	M	M	M
Traceability information	M	M	M
Country of origin	M	O	M
Production date	M	O	M
Package ID	M	O	M

Key

M: mandatory

O: optional

Mandatory information of linear bar code in this table shall be encoded in linear bar code whenever there is enough free space on the label for these linear bar codes.

[a] EIAJ has prescribed special data semantic rules and requirements for a linear bar code for component packages intended to meet EIAJ requirements.

If the optional elements are used, then they shall be at least human-readable. And if they are also machine-readable, then they shall be presented in a 2D symbol and optionally be presented in a linear bar code. See Table 3.